ENTOMOLOGY 2013

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NOVEMBER 10–13, AUSTIN, TEXAS
AUSTIN CONVENTION CENTER

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ENTOMOLOGY 2013
61st Annual Meeting of the
Entomological Society of America
November 10-13, 2013
Austin Convention Center
Austin, Texas

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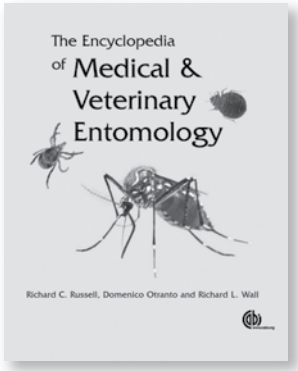
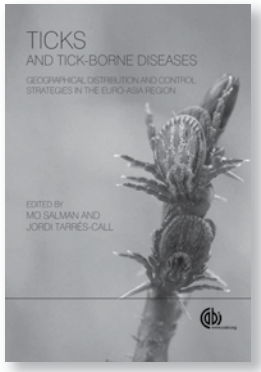
New Entomology Titles



The Encyclopedia of Medical and Veterinary Entomology

Richard C. Russell, Domenico P. Otranto, and Richard L. Wall

Cloth, $240.00

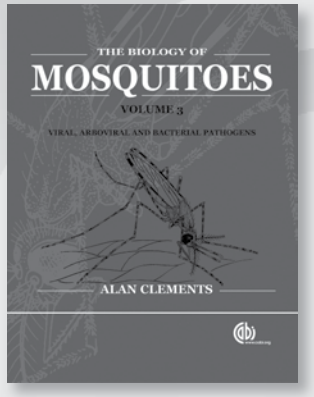


Ticks and Tick-Borne Diseases

Geographical Distribution and Control Strategies in the Euro-Asia Region

Edited by Mo Salman and Jordi Tarrés-Call

Cloth, $180.00



The Biology of Mosquitoes

Volume 3: Transmission of Viruses and Interactions with Bacteria

Alan N. Clements

Cloth, $275.00

Volume 1: Development, Nutrition and Reproduction

Cloth, $220.00

Volume 2: Sensory Reception and Behaviour

Cloth, $240.00

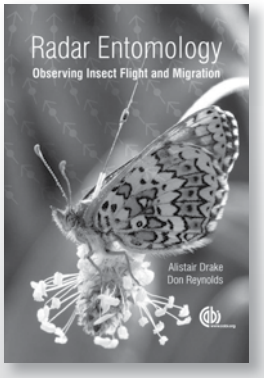
Three-Volume Set, $618.00

Radar Entomology

Observing Insect Flight and Migration

V. Alistair Drake and Don R. Reynolds

Cloth, $295.00



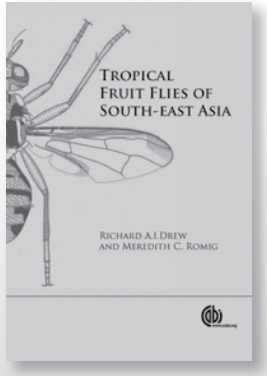
Tropical Fruit Flies of South-East Asia

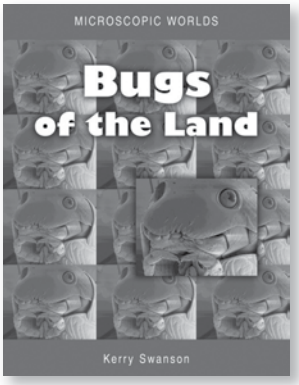
(Tephritidae: Dacinae)

Richard A. Drew and Meredith C. Romig

Cloth, $260.00

November 2013





Microscopic Worlds

Bugs of the Land

Kerry Swanson

Paper, $39.95

Australian Beetles

Morphology, Classification and Keys Volume 1

John F. Lawrence and Adam Slipinski

Cloth, $193.95

December 2013

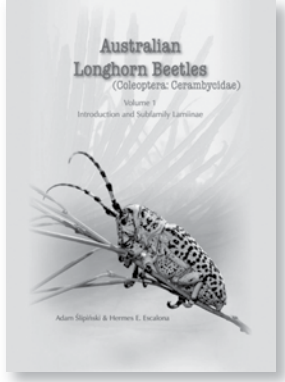
Edible Insects

Future Prospect for Food and Feed Security

Food and Agriculture Organization of the United Nations

Paper, $40.00

August 2013



Australian Longhorn Beetles

Introduction and Subfamily Lamiinae Volume 1: (Coleoptera: Cerambycidae)

Adam Slipinski and Hermes Escalona

Cloth, $148.95

December 2013

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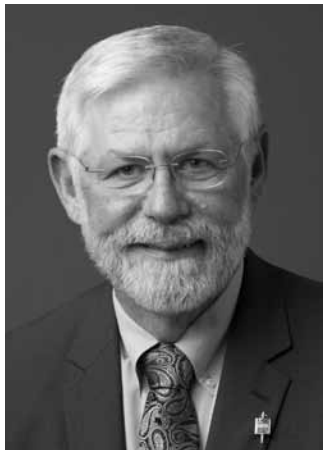
PRESIDENT'S ENTOMOLOGY 2013 WELCOME MESSAGE



Rob Wiedenmann

Friends: Welcome to ENTOMOLOGY 2013, the 61st Annual Meeting of the Entomological Society of America. Welcome also to Austin, a wonderful host city for our meeting. This is the first time that we have met in Austin, and I know you will find it to be fantastic and memorable. You will be glad you attended Entomology 2013—this should be one of the best-attended and best-remembered meetings in recent history. The Convention Center is very user-friendly, with clustered meeting rooms and numerous places for meeting friends or continuing conversations. All of the scientific programming will be at the Convention Center—a few committee meetings and socials will be off-site, but not scientific sessions. The Convention Center is just a few blocks from all of the meeting hotels and Austin's famed entertainment district, with more dining and music than you will have time to sample. Please recall that we moved the meeting dates up by a week to avoid the crowd from Austin's Formula 1 race—we wanted to ensure Entomology 2013 was memorable (in a positive way!).

The theme for this year's Annual Meeting, "Science Impacting a Connected World," continues the thread of themes that align with the Society's Strategic Principles, and recognizes the interconnectedness of our science and our members. We continue to increase the importance of a diverse Society, in which we hope to contribute to the development of all of our members. And we continue to transition from a Society that has been predominantly national to one that is becoming truly international.

The four primary words of this year's theme —Science, Impact, Connected and World—are woven throughout the program and functions for this year's Annual Meeting.

- The Science for Entomology 2013 is as vibrant and current as we have ever had. More than 100 symposia will be presented this year—some revisiting continuing topics, some representing totally new subjects or perspectives.
- The Impact for Entomology 2013 and for ESA has come from our focus on science and public policy, seeking to affect the end-users of our science. We conduct great science; importantly, its impacts are felt in all areas of science and society.
- We are Connected with other disciplines, other societies, new partners. By inviting leaders from other scientific societies, we seek to connect our science and our members with theirs. We have much to offer, and we have much to learn from them.
- We also connect with entomological colleagues throughout the World. Not only will we have virtual presentations from around the globe, we will also host presidents or representatives of several national and regional entomological societies. Again, we have much to offer to our international colleagues, as well as much to learn from them.

Science Impacting a Connected World.
The 2013 Annual Meeting promises to be as exciting and vibrant as the city of Austin. The Program Symposia represent scientific topics of broad interest or of new approaches. The 100 Section and Member Symposia, plus approximately 1,800 other paper and poster presentations, provide a complete program that will engage you and send you away more informed and better connected. At the suggestion of two of our members, we are scheduling the times when poster authors are present to minimize conflicts with ongoing sessions, and offering refreshments during those sessions. With this move, we are seeking to make the poster sessions more of a destination, where you can connect with the poster authors and other colleagues. Be sure to make the poster sessions one of your destinations and let us know your opinion of the new times and the greater focus on interactions at the posters.

As you enjoy the successful 2013 meeting, please offer your thanks to our Program Co-Chairs, Marianne (M.) Alleyne and Luis Cañas, and all of the members of the Program Committee. The vibrant meeting you see that showcases your contributions to our science is the result of the committee's selfless investments in time, thought, and effort. Hearty thanks from me!

Please also take time to acknowledge and thank your ESA staff, whose efforts throughout the year are reflected in a smooth-running meeting. The ESA staff is a team of professionals that complement each other and serve our membership proudly and effectively year-round, but most visibly during our Annual Meeting. Our Executive Director, David Gammel, has brought fresh energy and vision to his leadership of ESA. Your ESA professionals include Rosina Romano (Director of Meetings), Cindy Myers (Manager of Meetings and Exhibits), Debi Sutton (Director of Membership and Marketing), Alan Kahan (Director of Publications), Neil Willoughby (Director of Finance), Chris Stelzig (Director of Certification and Data Management), Pamela Reid (Manager of Marketing & Member Relations), Richard Levine (Communications Program Manager), and our two newest staff members—Alexis Lyons (Staff Accountant) and Katherine Matthews (Member Engagement Specialist). Welcome, Alexis and Katherine! Several of the staff members are old friends and several are newer to ESA. Please make time to introduce yourself or re-acquaint yourself with all of the staff members. Please also thank them for their roles in a successful meeting and the success of your Society.

As I have written before, "the proof of the pudding is in the eating." So it is with Entomology 2013. In the program and the Annual Meeting, you have before you the culmination of long hours of planning. The true test or "proof" is in the beholder—how well you appreciate the meeting, its program, and all of the related functions. The Science you offer and that you learn. The Connections you make and that you keep. The Impact you make and that is made on you. Sharing your discipline and your Society with your World. Make the most of Entomology 2013. Take in all that you can—"the proof of the pudding is in the eating."

Rob Wiedenmann
2013 President
Entomological Society of America

PROGRAM COMMITTEE CO-CHAIRS' WELCOME

Welcome to ENTOMOLOGY 2013, the 61st Annual Meeting of the Entomological Society of America. We are glad you will join us in Austin, TX because we have worked hard to provide you with a diverse and interesting 4-day program. This year will feature 107 symposia and an additional 1800 papers and posters. To stay true to the local atmosphere there will be many different ways to interact with other attendees; to get feedback on your research and to make new friends.

Luis Cañas and Marianne Alleyne

President Wiedenmann's theme for the meeting is "Science Impacting a Connected World". During his presidency it has been his goal to continue to increase the impact of the science and ESA through public policy, to develop new leaders for ESA, and to strengthen connections and develop new partnerships within the membership and from around the world. The theme fits our society so well. Our membership comes from all over the world. (In fact, we, ourselves were born and raised in the Netherlands and El Salvador, respectively, and now make the United States our home.) Many of ESA's members collaborate with scientists, agencies and communities from all over the world. Through our science we have all formed entomological science connections that impact human societies locally and globally. And now it has again become time to share our science, and our impact, at the premier Entomological meeting in the world.

The 2013 Program Committee Co-Chairs solicited the general ESA membership for Program Symposia proposals that best exemplified the Annual Meeting's theme. The Program Committee received 38 proposals for Program Symposia. We took extra care to reflect ESA diversity in the topics, organizers and speakers. The following six Program Symposia were selected for Entomology 2013:

- Broadening Our Public Impact: Novel Ways to Connect the Entomological Community with an Evolving World. This program symposium is organized by graduate students Christina A. Silliman, Catherine Dana, Brendan Morris and Julie Allen, who are blogging about their experience at http://broadenyourimpact.org/ and under @broadenimpact on Twitter. We encourage you to participate in the discussion before, during and after the Annual Meeting.
- Connecting with the World's Best Talent: Attracting and Retaining Diverse Entomologists. Organizers: Michelle S. Smith and Bill Hendrix
- Environmental Determinants and Ecological Consequences of Invasions by Arthropod Disease Vectors. Organizer: Brian F. Allan
- How New Technologies and Interdisciplinary Approaches are Transforming our Understanding of Complex Biological Interactions. Organizer: Fiona L. Goggin
- Impacts of Global Change on Biodiversity and Biological Control. Organizers: David Crowder and James D. Harwood
- Plant-Mediated Interactions among Multiple Players: Making Connections between Ecological Processes and Mechanisms. Organizers: Roxina Soler, Raul F. Medina and Cesar Rodriguez-Saona

Per request of the Section Leadership we increased the number of Section Symposia accepted (43), in addition to the now traditional 4 Section networking meetings. Another 54 Member Symposia were accepted. The Member Symposia fill in an additional level of diversity of topics and member interests. In total there will be a total of 1001 symposium presentations. In addition, we are happy that we can also accommodate ten-minute paper presentations (600+) and posters (550+). It was a difficult task to evaluate and accept this many wonderful symposia, but at the same time it was a very rewarding job. We thank the members who obviously put a lot of thought into organizing interesting symposia.

In order to increase interactions at the poster sessions we would like to invite you to the first-ever "Social Hour with Poster Presenters" in the poster area. Poster presenters are encouraged to attend their posters during assigned times (Monday early evening, Tuesday early evening and Wednesday around noon), and for those interested in speaking with the researchers to visit the poster at that time. For further details please refer to the "Social Hour with Poster Presenters" section later on in this program book.

We are so glad that our student members are again organizing various Program, Section and Member Symposia. And on Monday the students are again the special focus of the meeting. They will be presenting 400+ ten-minute papers and 200+ posters as part of the competition for the President's Prize.

During the meeting students will be competing in the Student Debates. Timely debate topics include: 1. What is the best individual solution to preserving the world's current biodiversity? 2. Using citizen scientists to collect data in scientific experiments, and 3. Using GMOs to increase food-security in regions where the technology is not universally accepted. The student debates will be held on Tuesday afternoon.

Ten University teams will also be competing in the 30th Anniversary of the Linnaean Games at the National Meeting. The preliminary round of the Games will be held Sunday. Come watch the excitement of such a great competition, and maybe learn something too.

To reward the students for their hard work and their importance to our Society the ESA office, with our guidance, is planning an exciting off-site reception at Buffalo Billiards in Downtown Austin. We hope that all students (both undergraduate and graduates) will be able to attend and make new friendships and celebrate their scientific accomplishments. Just remember, don't do anything that we would not have done as graduate students.

We are glad that this year we will again be offering the important Continuum for Research Integrity to Research Misconduct (led by Dr. Ernest Delfosse, Michigan State University). This RCR training, to be held on Sunday morning, is required for all post-doctoral researchers, graduates students, technicians, and undergraduate student who are supported by an NSF grant.

This past year as Program Co-chairs has been a great experience. We are fully aware that our job of promoting the meeting is made much easier because of the reputation of Austin as a great conference destination. Who does not look forward to mixing top-notch entomological science with rock, blues, jazz, hip hop, punk or Latino shows in the live-music capital of the world, as well as with great dining opportunities. Come see us at the meeting if you want our advice on where to experience music or where to eat. And make sure to share your great finds with us. Of course, we all need to get out of the city once in a while. We hope you will find the opportunity to visit some of the natural areas around Austin and beyond. To help you explore the area ESA offers you 3 off-site tours: 1. The macrophotography workshop at a University of Texas Field Sta-

tion. 2. Tour of the Brackenridge Field Laboratory and 3. Tour of the Westcave Preserve.

We would never have been able to put together this exciting program without the help of our wonderful ESA staff and the Annual Meeting Program Committee (photo below). Please take note of all these names and faces so that when you see them in Austin you can thank them in person. Without the help of these great people, and the many other volunteer members that serve on the various committees that are responsible for a large, or even a just a small, part the Annual Meeting would not be as informative, diverse, enjoyable and connected. Thank you all. We wish you all a very successful Annual Meeting.

See you in Austin.

Marianne Alleyne and Luis Cañas
2013 ESA Program Committee Co-Chairs

2013 ESA Program Committee. Pictured front row (from left to right): Sue Blodgett, Luis Cañas, Rob Wiedenmann, Marianne Alleyne, Mike Jackson, Melody Keena; back row (from left to right): John Adamczyk, Michael Strand, Gary Thompson, Carey Minteer, Christiane Weirauch, Ned Walker, Jeff Stuart, Wes Watson, Jerome Grant, Jessica Ware

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AUSTIN, TEXAS

Austin–the Live Music Capital of the World®

Austin consistently ranks as one of America's best cities to visit according to national publications such as US News and World Report, Money Magazine, Kiplinger and Forbes. Nearly 20 million visitors come to Austin annually. Known as the Live Music Capital of the World®, Austin offers world-renowned festivals such as SXSW® and Austin City Limits Music Festival–along with nearly 200 venues featuring rock, blues, jazz, hip hop, punk or Latino shows nightly. Austin's universal appeal extends well beyond music however–with outstanding dining experiences, world-class sporting events, an oasis of outdoor activities and other unique happenings only Austin can offer.

Ground Transportation

Metro Airport Bus

Hop onto a Metro Airport bus for access into downtown. The trip takes approximately 30 minutes and stops included access to the Capitol, business and entertainment districts, restaurants, museums, the University of Texas, plus the Hyatt, Omni, Marriott, and Hilton hotels. $1 bus fare takes you between the airport and downtown every 30 minutes on the hour and half hour. The Metro bus stop is located outside the baggage claim. For additional information please visit: capmetro.org/airport/

SuperShuttle

SuperShuttle can provided shared-van ride service between the Austin-Bergstrom International Airport and the downtown hotels in Austin. Reservations are strongly encouraged in advance. Contact airport reservations at 1-800-BLUE VAN (258-3826) or visit supershuttle.com. The approximate cost is $15 per person each way.

Upon arrival, follow signs to the baggage claim area and collect your luggage. Proceed to the 24-hour SuperShuttle ticket counter located just past baggage carousel #1. Customers must check in with a uniformed Customer Service Representative or self-service ticketing kiosk at the ticket counter to receive a boarding pass and be escorted to the correct shuttle.

Taxi

Taxi service is located outside of baggage claim. The approximate cost for a taxi is $25-30 each way.

For additional taxi service while in Austin:

Austin Cab
512-478-2222

Lone Star Cab
512-836-4900

Yellow Cab
512-434-7720

Parking

Parking rates vary at each hotel. Please check your reservation for parking information.

The Austin Convention Center has two Parking Garages. The 2nd Street Garage is located at 201 East 2nd Street (entrances on Brazos and San Jacinto streets.) The 5th Street Garage is located at 601 East 5th Street (entrance on 5th Street, between Red River and Sabine streets.) Full day rates range from $9–$12.

Hotels

Hilton Austin *(Headquarters Hotel)*
500 E. 4th Street
Austin, TX 78701
Phone: 512-482-8000

Courtyard by Marriott/Residence Inn
300 E. 4th Street
Austin, TX 78701
Phone: 512-236-8008

Embassy Suites Austin – Downtown/Town Lake
300 South Congress Avenue
Austin, TX 78704
Phone: 512-469-9000

Hampton Inn & Suites Austin
200 San Jacinto Blvd.
Austin, TX 78701
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Hilton Garden Inn Downtown
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Phone: 512-480-8181

Holiday Inn Austin – Town Lake
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Austin, TX 78701
Phone: 512-472-8221

Hyatt Place Austin Downtown
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Austin, TX 78701
Phone: 512-476-4440

InterContinental Stephen F. Austin
701 Congress Avenue
Austin, TX 78701
Phone: (512) 457-8800

Omni Austin Hotel Downtown
700 San Jacinto at 8th Street
Austin, TX 78701
Phone: 512-476-3700

Radisson Hotel & Suites Austin Downtown
111 E. Cesar Chavez Street
Austin, TX 78707
Phone: 512-478-9611

GENERAL INFORMATION

ESA Registration and Information Center

Registration will be held at the Austin Convention Center, Solar Atrium, during the following times:

Saturday, November 9, 4:00 PM–8:00 PM
Sunday, November 10, 7:00 AM–9:00 PM
Monday, November 11, 7:00 AM–5:00 PM
Tuesday, November 12, 7:00 AM–5:00 PM
Wednesday, November 13, 8:00 AM–12:00 Noon

Registration and Information Center phone number: 512-404-4720
Attendees can pick up their registration materials at the Registration Center. ESA staff are always available here to answer your questions.

Cancellation and Refund Policy

ESA will honor cancellation refunds in full for its Annual Meeting until 5:00 PM EST, October 4, 2013. Partial refunds will be granted for requests submitted from October 5–18, 2013 (20% service charge will apply). No refunds will be granted for cancellations received after October 19, 2013. Please submit cancellation requests via e-mail to nwilloughby@entsoc.org. Requests can also be faxed to +1 (301) 731-4538. All refunds will be processed after the Annual Meeting and no refunds will be made for on-site registrations.

Any tour reservation must be canceled no later than October 4, 2013 to receive a refund. If insufficient tour enrollment causes a professional or destination tour to be cancelled, ESA will issue a full refund after the meeting closes.

Information Desk

The Information Desk is part of the ESA Registration Center and will be staffed the same hours as registration. Stop by and let us help you out! Phone number: 512-404-4720

Business Center

The Business Center is located opposite the Trinity Street entrance. This is your one-stop shop for all of your business needs. Copying and shipping services are available here each day from 10:00 AM–6:00 PM. Phone number: 512-404-4439

Career Center

The Career Center will be set up in Exhibit Hall 4 in the Austin Convention Center. Review current position openings and/or drop off your résumé. Operating hours are:

Sunday, November 10, 7:30 PM–9:30 PM
Monday, November 11, 9:00 AM–5:00 PM
Tuesday, November 12, 9:00 AM–5:00 PM
Wednesday, November 13, 9:00 AM–2:00 PM

Coat/Bag Check

Attendees will be able to check their coats and bags at the Coat/Bag Check located near the ESA Registration and Information Center, Solar Atrium. ESA provides this complimentary service to you.

Cyber Café (sponsored by BASF)

If you left your laptop at home, we still have you covered! Just head to the ESA Exhibit Hall (Hall 4) during regular exhibit hours where you can use the computer stations located in the Cyber Café to check your e-mail.

Daily Announcements and Messages

In addition to using the ENTO2013 mobile app, you may check last-minute announcements and messages on the bulletin board located outside the Preview Presentation Room (PPR), Austin Convention Center, Meeting Room 11 AB, Austin Convention Center.

ECLOSION: A juried group exhibition of entomological art

Art.Science.Gallery.
Austin, Texas
November 9–December 1, 2013
Opening Reception Saturday, November 9, 2013 7–11 PM

Art.Science.Gallery. is pleased to invite ESA attendees to an art exhibition inspired by the field of entomology. Works by local and international artists will explore the role of insects in a natural and changing world, including aesthetic, cultural, economic, educational and scientific aspects of entomology. This exhibition is intended to enhance public understanding of insects, entomology, biodiversity and the importance of science and conservation. ECLOSION will help fulfill Art.Science.Gallery.'s mission of supporting artist-scientists, engaging our community in the sciences through the visual arts, and providing a space for artists and scientists to forge new and collaborative relationships. The gallery will be open extended hours during the ESA meeting. Details at www.artsciencegallery.com or 512-522-8278.

The exhibition is co-curated by Barrett Klein and Hayley Gillespie with an all-star lineup of jurors including Mark Moffatt, David Maddison, Walter Tschinkel and Diane Ullman.

ESA Central Exhibit Booth

Stop by to experience the new look of the ESA Central booth (#209) in the center of the exhibit hall. The "ESA tower" provides videos, handouts and information on valuable ESA programs and activities. Talk with ESA HQ staff, meet a colleague, rest your feet, and learn about the many benefits of ESA membership and the certification program. Renew your membership, purchase a publication, have your business card laminated into a luggage tag, or grab a bag of popcorn. Test-drive the BCE qualifying exam practice test, pick up an extra copy of the 2014 World of Insects calendar, and enter for your chance at winning a prize during the Passport Drawing. It's all here.

Take time to check out ESA's new blog **(EntomologyToday.org)** for the latest entomological news, jobs, research, discoveries, and events. And submit your own 'Live from Austin' post for the blog.

Don't forget to vote on the funniest insect-related license plate, bumper sticker, or car creation in ESA's 2013 Bug Mobile Contest–via ESA's Facebook page at **facebook.com/entsoc.** Voting opens November 6 and closes Tuesday, November 12 at midnight.

We have a special gift for the first 100 members to stop by and renew their membership or join for 2014! New this year--you can also renew your membership at ESA Registration and bring your receipt to the ESA booth for your gift.

Be sure to be in the ESA booth on Wednesday at 1:00 PM for the **Passport Drawing** where you'll have the opportunity to win valuable prizes donated by our exhibitors. Drop your completed ticket in the prize hopper. You must be present on Wednesday to win–good luck!

For a chance to win a FREE registration to next year's meeting in Portland, OR, attend the Closing Plenary Session on Wednesday afternoon and pick up a ticket there to drop into the prize drum.

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If first aid services are needed while in the Convention Center, please call 512-404-4111. Please have the following information ready: (1) your exact location, (2) the nature of the emergency, (3) whether the patient is conscious, and (4) whether there are life threatening injuries, bleeding, etc. In a life-threatening emergency, dial 911.

Guest Hospitality

Registered guests are allowed access to the Exhibit Hall, Welcome Reception, Opening and Closing Plenary Sessions, the Linnaean Games, the Student Awards Program, and to the presentation given by the primary registrant. For more information, please visit the ESA Registration Center.

Internet Access

ESA is offering complimentary Wi-Fi throughout the convention center and the public spaces of the Hilton Austin. Plenty of networking tables will be positioned at various locations in the convention center including the Cyber Café, so take a break with friends, network, check your e-mail, or Skype with the family back home.

Password login is not required at the Austin Convention Center. In the Hilton Austin public space (i.e. lobbies, foyers) wireless is complimentary. In the Hilton Austin meeting space, connect to the 'HHONORS' wireless signal. Click on the 'here' in the sentence "If you already have an account click here" indicated by the red arrow and enter the following login information:
Username: EntSoc13
Password: EntSoc13

Lost and Found

Check in with the staff at the ESA Registration Center if you have lost something or have found a treasure and need to turn it in. We'll do our best to help you!

ENTOMOLOGY 2013 Mobile App (sponsored by BASF)

Enhance your experience at Entomology 2013 by downloading the ENTO2013 Mobile App. Access the latest program information and schedules, stay organized with the show dashboard, create a personal schedule, link to exhibitors, connect with other attendees, join in on the show chatter with the built in twitter feed, and keep up with the show news with RSS feeds; all from your Smart Phone. The app is fully integrated with the abstract management system so you will always have the latest information at your fingertips. The Mobile App, powered by EventLink and created by Core-Apps LLC, is a native application for smart devices (iPhone, iPad and Android), a hybrid web-based app for Blackberry, and a web-based version of the application for all other web browser-enabled phones.

Downloading the EventLink app for Entomology 2013 is easy: For iPhone and Android: Visit the App Store or Android Market on your phone and search for Entomology 2013.

All phone types, including those listed above, may simply point their mobile browser to m.core-apps.com/ento2013. The system will direct you to the proper app version for download to your device, or on some phones, then bookmark this page for easy future access.

The ENTOMOLOGY 2013 mobile application is made possible through support from BASF.

Mother's Room

ESA is offering a comfortable private place for nursing mothers—within the Austin Convention Center. Please stop by the ESA Registration Desk for room location and to pick up a key to access the space on the third floor.

National Linnaean Games 30th Anniversary

Help celebrate thirty years of national student Linnaean Games by bringing your photos of the games played since 1983 to the ESA Linnaean Games Anniversary area in the exhibit hall. There will be plenty of space to write down your best memories to share with others.

No Photographs Please

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. ESA reserves the right to use photographs and videos taken, and testimonials given during the ENTOMOLOGY 2013 meeting for informational and promotional purposes.

Press

The ESA Information Booth, located in the ESA Registration area (Convention Center, Solar Atrium), serves as the press desk for the meeting. Reporters and other members of the media must register at the Information Booth. Proper media credentials must be presented upon arrival at ENTOMOLOGY 2013, and the credentials must show a direct affiliation with an accredited news organization (print, TV, or radio) or membership with the National Association of Science Writers. Public Information Officers from universities also may receive press passes with proper credentials and ID. Freelance journalists who do not have media credentials and a professional affiliation will not receive press passes, but exceptions may be made on a case-by-case basis. Interviews can be arranged by calling +1 (301) 602-8953. Please refer to the ESA press policy at entsoc.org/entomology2013/press.

Companies or organizations producing publications, videos, and/or other electronic media intended for marketing, advertising, financial analysis, or public relations purposes may not register as members of the media. ESA reserves the right to bar from this and future meetings any registered media personnel who, at the determination of the Executive Director of the ESA, misuse media privileges to engage in activities other than journalistic pursuits. No member of the media will be permitted to record symposia, lectures, meetings, or other events without prior written permission from the ESA; and no film or videotape may be broadcast or rebroadcast without prior review and written permission from the ESA.

The press contact for the ESA Annual Meeting is Richard Levine, rlevine@entsoc.org, 301-602-8953.

Refreshments and Concessions

Hungry or thirsty? Need that morning cup of coffee? For those early morning sessions, stop by one of the concession carts located throughout the convention center Sunday through Wednesday for a quick cup of coffee, juice, Danish, and more. Concessions will be available throughout the day, including for the Lunch-and-Learn sessions, the Exhibit Hall and near Meeting Room 4 ABC in the Austin Convention Center.

Social Media at ENTOMOLOGY 2013

Get connected to ENTOMOLOGY 2013 before you arrive in Austin. ESA is connected to you via social media in a variety of ways.

Twitter: ESA staff and volunteers will be using Twitter for live updates, highlights from sessions, and more. You can follow us by visiting twitter.com/EntsocAmerica. Twitter users can just login and click "follow." View and participate in conversations about ENTOMOLOGY 2013 on Twitter by using the hashtag, #entsoc13. Don't have a Twitter account? You can still view our updates and even bookmark the ESA Twitter webpage.

LinkedIn and Facebook: ESA and the ESA Certification Corporation is on LinkedIn (entsoc.org/LinkedIn) and Facebook (entsoc.org/facebook). Join our groups to connect to colleagues, friends, and new contacts in advance of the conference and start making plans for Austin!

YouTube: View videos from previous conferences on our YouTube Channel (www.entsoc.org/youtube). View the ENTOMOLOGY 2013 videos as they are posted or hear the highlights planned for this year's conference!

Student volunteers will be shooting video throughout the meeting to upload to the ESA Channel on YouTube. Videographers also will be interviewing presenters and others during the meeting. You could be on ESA's YouTube channel!

Smoking Policy

Smoking is not allowed in any of the public meeting space at the Austin Convention Center. Check with the front desk of your hotel about the smoking policy in guest rooms.

Student Mentoring Program

If you are interested in learning more about a new ESA mentoring program sponsored by the Senior Entomologist Network and the ESA Student Affairs Committee, stop by the ESA Career Center. Find a mentor to help you with tips on career development, grant writing, finding collaborations, navigating academic and government jobs, and more.

Sunrise Yoga with Angie Knight

Date: Tuesday November 12, 2013
Time: 6:30 AM–7:30 AM
Fee: Complimentary
Location: Austin Grand Ballroom H, Hilton Austin

Want to begin your week in Austin by boosting your physical, emotional, and mental well-being? Come join us for sunrise yoga on Tuesday, November 12th! Local yoga teacher, Angie Knight, RYT, will lead you in a beginner friendly yoga practice that will refresh and relax you. We will provide towels, so just wear comfortable clothing and show up! All levels welcome!

Tours, Trainings & Workshops

All tours are held rain or shine and require a minimum number of participants. Please stop by the ESA Registration and Information Center to check tour and workshop availability. Tours meet and leave from the Solar Atrium near the ESA Registration & Information Desk in the Austin Convention Center (unless otherwise noted below). Please arrive a few minutes early to board the bus and have your tour ticket(s) with you.

Responsible Conduct of Research (RCR) Training Workshop

Date: Sunday, November 10
Time: 9:30 AM–12:00 PM
Fee: $20 per person
Location: Meeting Room 9 AB, Austin Convention Center

RCR training is an integral part of the preparation and long-term professional development of current and future generations of scientists and engineers. RCR is critical for excellence, as well as public trust, in science and engineering.

Ethical and responsible conduct of research is such an important element of preparation for a professional career in science that ESA recommends that RCR training is taken by all students, even if not currently supported by a grant. ESA RCR Training topics will cover Data Management, Conflict-of-Interest, Protection of Human Subjects, Animal Welfare, Research Misconduct, Publication and Authorship, Mentor-Trainee Responsibilities, Peer Review, Collaborative Science, Intellectual Property, Plagiarism, and Scientists as Responsible Members of Society - Environmental and Societal Impacts of Scientific Research.

RCR training is required for all post-doctoral researchers, graduate students, technicians, and undergraduate students who are supported on an NSF grant that was submitted on or after 4 January 2010.

A certificate of completion will be issued to each student who finishes the training.

Important: Students must check with their Universities to ensure that ESA RCR Training will be accepted as meeting the requirements of that University.

Pre-registration is required via the ENTOMOLOGY 2013 registration site, space is limited. Please stop by the ESA Registration and Information Center to check onsite availability.

Insect Macrophotography Workshop

Date: Sunday, November 10
Time: 1:15 PM–5:15 PM
Fee: $12 per person
Requirement: Own camera equipment
Location: Meeting Room 9 AB, Austin Convention Center

The workshop will begin with a brief introduction to the basics of macro photography. In this section we will discuss the technical aspects of macrophotography and equipment as well as cover more the more artistic aspects of composition, lighting, and exposure. We will also look at a number of images and discuss how these images were made. Together, these discussions will provide a solid foundation for macrophotography technique, covering beginners to experts.

In the next section, participants will travel to a UT field station to spend two hours in the field putting these techniques into practice. We will practice a number of techniques as well as have the opportunity to photograph a wide array of the central Texas insect fauna–so bring your gear! Bottled water will be provided and restrooms are available on site. We will finish the day discussing advanced macrophotography techniques such as the use of studio lighting and controlled backgrounds, backlighting, and focus stacking. Finally we will hold an anonymous image review and critique session.

This workshop is designed for you to make the most out of any camera and skill level and to also provide experience photographing insects in the field. Any skill and equipment level is welcomed, we only require that participants bring their own camera.

Brackenridge Field Laboratory

Date: Monday, November 11, 2013
Time: 9:30 AM–1:30 PM
Fee: $53.00 per person including a boxed lunch
Location: Solar Atrium near ESA Registration and Information Center

Brackenridge Field Laboratory (BFL) is a premier urban field research station for studies in biodiversity, ecosystem change and natural history. The lab is of critical importance to The University of Texas at Austin's top-ten ranked Ecology, Evolution and Behavior graduate program. As an urban field lab, BFL is unsurpassed in regard to historical data, access for students and faculty (only a few minutes from the University of Texas campus), and diversity of habitats. Research at the lab contributes to our understanding of climate change, invasive species, biodiversity, genomics, animal behavior and evolution. You will be divided into two groups to tour this great facility and learn more about the research done here.

Westcave Preserve

Date: Tuesday, November 12, 2013
Time: 9:30 AM–2:30 PM
Fee: $30.00 per person
Location: Solar Atrium near ESA Registration and Information Center

Westcave Preserve is a natural treasure of the Texas Hill Country possessing unique, majestic beauty and ecological diversity. Located adjacent to the Pedernales River, this 75-acre gem has been providing unique educational experiences for Central Texans since 1974.

Two distinct ecosystems meet on the Preserve, forming a unique opportunity for students of nature and an unexpected experience for visitors exploring the Hill Country. You will receive a guided hiking tour of the Preserve that combines the opportunity to observe the plants, animals, and geology of the Edwards Plateau with a hike into a cool, sheltered canyon of lush plant life. Upon returning to Austin, you will be given time on your own to enjoy lunch and shopping in Austin's Market District. This trendy area of town boasts several restaurants, shops, an iconic Austin record store, an Austin-only bookstore, and a flagship Whole Foods store located on the ground floor of the Whole Foods Worldwide Corporate Offices.

*Comfortable walking shoes are recommended for this tour.

Under the Lens – Connecting the Community with Entomology and IPM

Date: Wednesday, November 13
Time: 8:00 AM–5:00 PM
Location: Ballroom E, Austin Convention Center
Fee: Separate registration and fee applies to TIPMAPS

Under the Lens, connecting the Community with Entomology and IPM is a one-day program to help educate school IPM coordinators, pest management professionals and others who work in institutional settings who want to learn more about Integrated Pest Management. This program will mark the 5th year for the Texas IPM Association for Public Schools (TIPMAPS) annual meeting, formed to help bring together school IPM coordinators from around the state to share ideas and learn more about IPM in a setting made just for them. Local pest control vendors will also be on hand to help you learn about new products on the market.

Dr. Nancy Hinkle, University of Georgia, will present on Delusory Parasitosis. Allie Taisey, NE IPM Center, will share her experiences of dealing with bed bugs and teaching IPM to housing authorities. Dr. Claudia Riegel, City of New Orleans, will discuss rodent control and Dr. Mark Johnsen, Steritech, will cover mosquitoes and diseases. Dr. Bob Davis, BASF, will cover the new pyrethroid label changes, and Dr. L C "Fudd" Graham, Auburn University, will have an interactive session on fire ants. This program will offer six (6) CEU credits for TX applicators. For more information, contact Janet Hurley, ja-hurley@tamu.edu or 469-231-8671.

University Entomology Clubs

Club representatives will be available to sell T-shirts and more in ESA's Exhibit Hall (Hall 4) during normal exhibit hall hours. As of August 1, the list of clubs participating includes:

Collegiate Texas Academy of Science Student Group at St. Edwards University
Louisiana State University Entomology Club
Michigan State University G.U.E.S.S.
Millersville University Entomology Club
North Carolina State University Entomology Graduate Students Association
Oklahoma State University
Texas A&M University
The Ohio State University Entomology Graduate Student Association – EGSA
University of Arizona
University of California, Berkeley Entomology Student Organization
University of California, Davis Entomology Graduate Students' Association
University of California, Riverside Entomology Graduate Student Association
University of Florida Entomology and Nematology Student Organization – ENSO
University of Georgia H.O. Lund Club
University of Illinois – Entomology Graduate Students Association
University of Kentucky – H. Garman Entomology Club
University of Minnesota
University of Nebraska Lawrence Bruner Entomology Club
University of Wisconsin-Madison
Virginia Tech

Calling All New ESA Members!

Join us for our Meet & Greet!

If you are new to ESA this year, please stop by our New Members Meet & Greet Reception.

Mingle with other new members, ESA leaders and staff, and learn about ESA benefits and the Entomology 2013 Annual Meeting. The New Member Meet & Greet takes place on Sunday, November 10 from 4:30 – 5:15 PM in Meeting Room 10C of the Austin Convention Center. Refreshments will be served. You should have received a special invitation to the reception in the mail — bring it and exchange it for a special ESA welcome gift!

PROGRAM INFORMATION

Uploading Presentations

Upload your presentation at least 24-hours before your presentation.

Please be aware that if you want to upload your file on the day of your presentation you can only do so in the presentation room itself, before the start of the session or during the short break. It is not the responsibility of the ESA Program Committee nor of the Moderator if there is not enough time available to upload the talk. If you are unable to upload your talk (even just a draft) the day prior to your assigned time it would be considerate to contact the moderator to explain your delay and your intent for when to upload the file.

If using video files or unusual file-types embedded in your presentation you are encouraged to stop by the PPR room (Meeting Room 11 AB) to try the presentation within our system. Confex employees will be available in case you run into problems and need advice. It is always a good idea to bring a backup copy of your presentation on a flash drive.

Presentation Preview Room (PPR Room) is located in Meeting Room 11 AB of the Austin Convention Center, operating hours are:

Saturday, November 9, 2:00–8:00 PM
Sunday, November 10, 6:30 AM–6:00 PM
Monday, November 11, 6:30 AM–6:00 PM
Tuesday, November 12, 6:30 AM–6:00 PM
Wednesday, November 13, 6:30 AM–4:00 PM
PPR Room phone number: 512-404-4721

Moderator Training

Moderators for symposia, student competition sessions, and 10-minute paper sessions must attend one of the moderator training sessions. Here you will receive details on equipment operation, light controls, and other responsibilities. The audio–visual and Confex representatives will be available to answer your questions. Moderators must keep the program on schedule and not move up talks if one is withdrawn. In case of tardy file uploads by presenters the moderators have the right to refuse a presentation to be given.

All moderator training sessions will be held in Meeting Room 12 B at the Austin Convention Center. The dates and times for the training sessions are:

Sunday, November 10, 7:00 AM–7:30 AM or 12:00 Noon–12:30 PM
Monday, November 11, 7:00 AM–7:30 AM or 12:00 Noon–12:30 PM
Tuesday, November 12, 7:00 AM–7:30 AM or 12:00 Noon–12:30 PM
Wednesday, November 13, 7:00 AM–7:30 AM

Judges Training

Judges for the student competitions must attend one of the judges training sessions. Here you will receive details regarding the judging process and criteria.

All judges trainings will be held in Meeting Room 16 A at the Austin Convention Center. The dates and times for the training sessions are:

Sunday, November 10, 4:45 PM–5:15 PM
Monday, November 11, 7:00 AM–7:30 AM

Lunch-and-Learn Sessions

You have a great opportunity to get together with friends and colleagues after the morning sessions, have lunch together, and learn something new all at the same time. Concession options will be available near the Lunch-and-Learn meeting rooms, so you can quickly purchase your lunch and enjoy it during the presentation.

There will be five Lunch–and-Learn sessions this year:

Is Certification Right for Me (and my team)?

Sunday, November 10, 12:15 PM–1:15 PM
Meeting Room 9 C, Austin Convention Center

If you're like most ESA members you've known about ESA's certification programs for years. But hey, you've got a PhD in entomology, you've got nothing to gain by getting your BCE, right? Wrong! There are many valuable reasons for anyone who is involved in entomology including PhDs to become BCE or ACE certified. This session will feature a quick introduction to the ESA certification programs, followed by facilitated discussion tables. Come join us for a lunch and learn more about how certification can benefit you and your organization.

Facilitator: Chris Stelzig, Director of Certification and Data Management, Entomological Society of America

Managing the Big Transition to your First Job (or I'm about to graduate, now what?)

Sunday, November 11, 12:15 PM–1:15 PM
Meeting Room 10 AB, Austin Convention Center

If you are a student who plans to finish your degree in 12-24 months, or you have recently completed your degree and are entering the workforce, this is a must-attend session. After our informative panel discussion, a Q&A session will help attendees address their own career plan questions. A complimentary boxed lunch will be served for the first 120 participants. Sponsored by ESA's Student Transition and Early Professionals (STEP) Committee.

Panel: Mark Asplen, Metropolitan State University; James Harwood, University of Kentucky; Kevin Johnson, Dow AgroSciences; Jonathan Lundgren, USDA ARS, North Central Ag Research Lab.

Re-assessing Tropical Insect Biodiversity - By Looking From the Very Inside to the Very Outside

Monday, November 12, 12:45 PM–1:45 PM
Ballroom F, Austin Convention Center

This session will be about the nitty-gritty mechanics of understanding biodiversity of a neotropical area, and what we can learn from and during the process. Start with a field inventory of a large batch of Costa Rican specimens. Create DNA barcodes and database the specimens, put their information into BOLD at http://www.boldsystems.org, and analyze. Next, get the results, match the results with the field database, iteratively upgrade all the information, re-submit to BOLD, and get a new analysis. Along the way, filter out the contaminants, the mis-identified specimens, and the suspiciously or obviously un-noticed cryptic (usually described) species. Give the specimens interim labels, and then pass on the accumulated information to the collaborating taxonomist for final products and museum deposition. The process matters -- when you do all of this, you discover you have a lot more species in your sample than you ever thought you did, which, in turn, has many, many implications for ecology, evolution, conservation, agriculture and just plain understanding nature.

Facilitators: Dan Janzen and Winnie Hallwachs, Department of Biology, University of Pennsylvania

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Because of our broad interest in entomological expertise and experience, at any given time we may be seeking individuals with newly earned Bachelor's MS, PhD degrees, PhDs with academic tenure, and anything in between.

We continue to look for talented scientists with the following expertise:

- Insect production and rearing
- Trait discovery and characterization
- Laboratory, greenhouse, and field efficacy testing
- Environmental impact and non-target testing
- Population ecology and genetics
- Insect Resistance Management
- Trait stewardship
- Project management
- Global pest control
- Regulatory affairs - to gain product approval from regulatory agencies
- Scientific affairs - to interact with the academic community
- Technology development and extension
- Marketing and sales

If you are an entomologist who wants to be challenged by important problems, and who wants to work for a company which values your efforts and insight, apply now:

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How to Make Meaningful Connections with the Public Using Your Own Research

Tuesday, November 13, 12:15 PM–1:15 PM
Ballroom G, Austin Convention Center

Want to incorporate broader impacts into your research but don't know where to start? Learn how to utilize the vast technological resources at your disposal to design effective outreach activities. This lunch-and-learn will be guided by Kristie Reddick, co-creator of thebugchicks.com, and known for developing multimedia resources for science education.

For further details please visit: broadenyourimpact.org

Facilitators: Christina Silliman, Catherine Dana, Brendan Morris and Julie Allen, Department of Entomology, University of Illinois

Politics and Science: How Congress and the President Impact Your Work (and what you can do about it)

Tuesday, November 12, 12:15 PM–1:15 PM
Ballroom E, Austin Convention Center

National politics and policy priorities influence the conduct of science (e.g., funding for research), and how or whether scientific information is used to inform policy decisions. Scientists can and should play a role in ensuring that lawmakers understand the ramifications of their decisions on science and society. To do this, scientists need to know how, who, when, and where to communicate with lawmakers. This program will provide information about key national players influencing science policy and will consider the potential ramifications of the November elections.

Facilitator: Robert Gropp, Director of Public Policy, American Institute of Biological Sciences

The Art of Writing a Successful Scientific Paper

Wednesday, November 13, 12:15 PM–1:15 PM
Ballroom F, Austin Convention Center

This one-hour presentation is to provide "tips and tricks" for organizing and writing a successful scientific paper and will include an in depth discussion on how to organize, write a successful paper. The facilitator will provide guidelines and hints he's learned throughout his 40 years of experience, including serving as the Editor of *Systematics and Biodiversity*.

Facilitator: Elliot Shubert, Life Sciences, The Natural History Museum

The Art of Negotiation

Wednesday, November 13, 12:15 PM–1:15 PM
Ballroom G, Austin Convention Center

Learn how to promote yourself by improving your negotiation skills so you can get the perfect job offer, secure necessary resources, and build collaborations. This session will help early professionals assess their bargaining strengths and weaknesses, and learn how to position themselves as effective negotiators. Get the 'lessons-learned' from those that have recently been through contract negotiations or are regularly part of the process. A complimentary boxed lunch will be served for the first 120 participants. Sponsored by ESA's Student Transition and Early Professionals (STEP) Committee.

Panel: Sue Blodgett, Iowa State University; Gary Felton, Penn State University; Erin Hodgson, Iowa State University; Scott Hutchins, Dow AgroSciences; Sarah Zuckoff, Kansas State University.

Opening Plenary Session & Founders' Memorial Lecture

Sunday, November 10, 5:30 PM–7:30 PM
Ballroom D, Austin Convention Center

Call to Order, Welcome, Introductions, Remembrance
Robert Wiedenmann, *President*

State of the Society/Presidential Address
Robert Wiedenmann, *President*

ESA Executive Director's Report
C. David Gammel, CAE, *Executive Director*

Entomological Foundation Report
Tom Green, *Entomological Foundation President*

ESA Professional Awards Program
Rob Wiedenmann, *President*, and Frank Zalom, *Vice-President*

Insect Photo Salon Winners
James Appleby, University of Illinois

YouTube Stinger Awards
Marlin Rice, DuPont Pioneer

Annual Founders' Memorial Lecture
Dr. Anurag Agrawal, Professor of Ecology and Evolutionary Biology with a joint appointment in the Department of Entomology at Cornell University will deliver the Founders' Memorial Award lecture and honor Dame Miriam Rothschild.

Dame Rothschild started her research in the 1950s in the area that is now known as chemical ecology. She had no traditional education, but was tutored in natural history by her father and her uncle.

Dame Rothschild catalogued over her long career many species of fleas. Her work in particular on mimicry and sequestration of toxic compounds by insects was outstanding. In addition, her intense interest in fleas made her a pioneer in the field of host-parasite relationships when she deciphered how the reproductive cycle of the female rabbit host was synchronized with that of the fleas feeding upon it, as well as the field of biomechanics, when she challenged herself and other researchers to explain how fleas convert force from spring-like tissues in the leg into a jump. Nature conservation and human rights were extremely important to her, and she worked tirelessly in support of both issues. Interesting fact: during World War II Dame Rothschild joined other scientists at Bletchley Park on the Enigma decryption project and worked as a code breaker.

Closing Remarks
Robert Wiedenmann, *President*

Adjourn to the Welcome Reception, Exhibit Hall 4, Austin Convention Center

Closing Plenary Session, Town Hall and 30th Anniversary: Sharpest in the Science Challenge

Wednesday, November 13, 5:30 PM–7:30 PM
Ballroom D, Austin Convention Center

Join President Wiedenmann as he thanks those who have made ENTOMOLOGY 2013 a success; those who have served their Branches and Sections throughout the year; and Governing Board members and other Society leaders for their valuable service to

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ESA. He'll then pass the gavel to Vice President Dr. Frank Zalom who will announce his theme and thoughts for ENTOMOLOGY 2014, including a town hall-style session exploring the role that entomology can play in the pursuit of grand challenges. Stay and join ESA for the 'Sharpest in the Science Challenge' celebrating the 30th Anniversary of the National Linnaean Games. Gamesmaster Phil Mulder will lead the end of the session with a battle between student winners of the National Linnaean Games and the 'Old Masters' team for the honor of being known as the sharpest in the science. Entomological-related questions and the most popular answers will set the stage for this evening's fun. Make sure your name is in the prize drum for a chance to win a free registration to ENTOMOLOGY 2014 in Portland, Oregon. You must be present to win!

Insect Photo Salon

Tuesday, November 12, 8:00 PM–9:00 PM
Meeting Room 9 C, Austin Convention Center

Some of the most beautiful insect photos will be presented this year in the Insect Photo Salon. Plan on joining the Photographic Society of America and fellow ESA members and guests for the Insect Photo Salon. You'll witness a terrific show of insects, spiders, and other arthropods.

POSTER PRESENTATIONS

Printed Posters

The Program Committee has scheduled three sessions of poster presentations for the Annual Meeting. Posters are numbered sequentially in the Program Book and where possible, grouped according to ESA Section and subject matter. Authors must display their posters on the board bearing the same number as that indicated in the Program Book for each poster.

Poster Size: Each poster must be contained within the 46 × 46 inch (117 × 117 cm) space provided. Two posters will be displayed on each side of a single board (four posters per board). The poster must NOT exceed the size limit. Please be considerate of the person with whom you are sharing a display space.

Set Up: Your poster must be placed in the assigned space in the exhibit hall the night before your poster is scheduled, i.e., Sunday, Monday, and Tuesday between 8:00 PM and 9:30 PM. Bring your own Velcro strips (push pins are not allowed in the exhibit hall) to secure your display to the poster board. The poster board is covered with felt cloth, and the frame is aluminum. Please do not attach anything to the metal frame.

Poster Presentation Times: Because the Exhibit Hall becomes quite congested during presentation hours, presenters of posters with odd and even numbers are assigned specific times to be present at their posters. Presenters are expected to be available at their displays during the "Presenters Present" time slot for questions and discussion. **New this year will be a Social Hour sponsored by Monsanto with Poster Presenters that will coincide with their assigned presentation times in the afternoon.** Below is the schedule of author availability:

Monday, November 11
Student Competition Poster Sessions
Posters with odd numbers: 5:30 PM–6:00 PM
Posters with even numbers: 6:00 PM–6:30 PM

Tuesday, November 12
Scientific Posters
Posters with odd numbers: 5:30 PM–6:00 PM
Posters with even numbers: 6:00 PM–6:30 PM

Wednesday, November 13
Scientific Posters
Posters with odd numbers: 12:15 PM–12:45 PM
Posters with even numbers: 12:45 PM–1:15 PM

Poster Removal: Posters should be removed promptly between 6:30 - 7:30 PM on Monday and Tuesday, and between 2:00 and 3:00 PM on Wednesday. Do not remove poster numbers when removing posters from boards. Student Competition authors should not remove the student competition cards when removing posters.

Monday Posters:
Set up: Sunday, 7:30 PM–9:30 PM
Viewing: Monday, 8:00 AM–6:30 PM
Authors Present:
Posters with odd numbers: 5:30 PM–6:00 PM
Posters with even numbers: 6:00 PM–6:30 PM
Take down: Monday, 6:30 PM–7:30 PM

Tuesday Posters:
Set up: Monday, 8:00 PM–9:30 PM
Viewing: Tuesday, 8:00 AM–6:30 PM
Authors Present:
Posters with odd numbers: 5:30 PM–6:00 PM
Posters with even numbers: 6:00 PM–6:30 PM
Take down: Tuesday, 6:30 PM–7:30 PM

Wednesday Posters:
Set up: Tuesday, 8:00 PM–9:30 PM
Viewing: Wednesday, 8:00 AM–2:30 PM
Authors Present:
Posters with odd numbers: 12:15 PM–12:45 PM
Posters with even numbers: 12:45 PM–1:15 PM
Take down: Wednesday, 2:30 PM–3:30 PM

Virtual Posters

Virtual Posters are back again this year. These electronic posters provide a unique opportunity to view the research of entomologists from outside of the United States who cannot attend the ESA Annual Meeting in person. Virtual posters are presented electronically via Skype, and there will be opportunities for you to interact online with the presenters during prescheduled times. You can view the Virtual Posters from special computers located in the Presentation Preview Room in Meeting Room 11 AB in the Austin Convention Center. See pages 213 for a complete listing of Virtual Posters.

SOCIAL ACTIVITIES & MIXERS

New Member Meet and Greet

Sunday, November 10, 4:30 PM–5:15 PM
Meeting Room 10 C, Austin Convention Center

If you are a new ESA member this year, you are invited to our New Member Meet & Greet Reception. Mingle with other new members, ESA leaders, and staff. Learn about the benefits of ESA membership, and important details of the Entomology 2013 Annual Meeting. Light refreshments will be served. New members should have received a special invitation to the reception in the mail–bring it and exchange it for a special ESA welcome gift!

ENTOMOLOGY 2013 Welcome Reception (sponsored by Mid-South Entomologist Working Group)

Sunday, November 10, 7:30 PM–9:30 PM
Exhibit Hall 4, Austin Convention Center

You are cordially invited to attend the Welcome Reception on Sunday evening in ESA's Exhibit Hall (Exhibit Hall 4) immediately follow-

ing the Opening Plenary Session (Ballroom D). This is a great opportunity to have time with the exhibitors and colleagues and learn about the latest resources and tools available to entomologists. Grab some light refreshments and a drink, network with colleagues and friends, and check out the displays. This year, ENTOMOLOGY 2013 will feature musical entertainment by Weldon Henson in the Exhibit Hall, what a way to kick off ENTOMOLOGY 2013 in Austin! For more information on the musical entertainment for ENTOMOLOGY 2013, see page 28.

Social Events

See the complete schedule of social functions on pages 61. Everyone has the opportunity to network at numerous receptions throughout the week. Monday night is the traditional time for receptions, with no scientific sessions scheduled for the evening.

Social Hour with Poster Presenters (sponsored by Monsanto)

Join us for our first social hour with poster presenters on Monday, Tuesday and Wednesday during poster presentation hours in the ESA exhibit hall (Exhibit Hall 4, Austin Convention Center). Each participant will receive a complimentary drink coupon courtesy of Monsanto to redeem during any of the three sets of presentation times:

Monday, November 11: 5:30 PM–6:30 PM, Student Competition Poster Presentations
Tuesday, November 12: 5:30 PM–6:30 PM, Poster Presentations
Wednesday, November 13: 12:15 PM–1:15 PM, Poster Presentations

For more information on poster presentation set-up and presentation hours, see page 18.

Women in Entomology Breakfast (sponsored by Dow AgroSciences)

Monday, November 11, 6:15 AM– 8:00 AM
Hilton Garden Inn, Eighteenth Over Austin
500 N Interstate 35,
Austin, Texas, 78701
Cost: $16 per person, inclusive of tax and gratuity

Join us for the Women in Entomology Breakfast, a feature of the ESA Annual meeting for over 20 years. This event aims to encourage networking, mentoring, and collegiality among established entomologists and students or young professionals just beginning their career. This is a great opportunity to meet with other women at all points in their careers as well as representatives of the Society leadership.

The first 100 student attendees will receive complimentary access and breakfast courtesy of Dow AgroSciences.

Student Activities

Linnaean Games

Preliminary Round: Sunday, November 10, 2:00 PM–5:00 PM
Ballroom D, Austin Convention Center

Final Round: Tuesday, November 13, 5:30 PM–7:15 PM
Exhibit Hall 4, Austin Convention Center, followed immediately by the Student Awards Session and Student Reception.

Be sure to check out the Linnaean Games, a "College Bowl"-type competition that is one of the more spirited sessions of our annual meetings. Stop in and cheer on your favorite team! Winners and runners-up will be recognized at the Student Awards Session immediately following the Linnaean Games Finals on Tuesday evening.

Student Competition for the President's Prize (sponsored by Monsanto)

Monday, November 11, 8:00 AM–12:30 PM and 5:30 PM–6:30 PM
Austin Convention Center, various locations

To support ESA's student members and encourage them to become more involved in the world of entomology, we dedicate Monday morning to student paper competition. There are 29 sessions containing graduate and undergraduate student oral presentations, 20 sessions of student posters and one virtual poster session. Stop by and show your support for ESA's students! This year first place winners will receive a $175 cash award and second place will receive a $50 cash award. ESA would like to thank Monsanto for their sponsorship of the Student Competition for the President's Prize.

Student Debates

Tuesday, November 12, 1:30 PM–4:30 PM
Ballroom D, Austin Convention Center

The 2013 Student Debate Topic is "Scientific Issues that Arise from a Connected World". Keeping with President Wiedenmann's theme, all topics are issues caused by or made possible because of a Connected World. Two student teams chose what they think is the best solution to help solve the threat to global biodiversity. The solutions to this issue are complex and the best solution is highly contested. The remaining four teams have been assigned traditional "pro/con" stances on the topics of using citizen scientists to conduct research and using GMO technologies in developing nations, where the technology may not be universally accepted. All three of the debates should be interesting, informative, and highly entertaining. Come support your favorite team as they compete for bragging rights and a nice cash prize!

Student Awards

Tuesday, November 12, 7:30 PM–9:30 PM
Ballroom D, Austin Convention Center

The winners of the President's Prize, Entomological Foundation awards, Entomological Society of America student awards, as well as Linnaean Game winners and second place teams, will be recognized.

Student Reception (sponsored by DuPont and Loveland Products)

Tuesday, November 12, 9:30 PM–11:30 PM
Buffalo Billiards - 201 East 6th Street, Austin, TX 78701

Located on Austin's historic Sixth Street district, Buffalo Billiards offers a great location for networking and fun at the same time! The evening's festivities include plenty of LIVE music, dancing, games, prizes, food and beverages. This is a fantastic opportunity to see old friends and to meet new ones. All registered students are invited to attend. ESA graciously thanks DuPont for the student t-shirts, and Loveland Products for the USB giveaways. Make sure to be one of the first 600 to arrive to get your giveaway!

Student Volunteers

Volunteers can pick up their volunteer t-shirt from the volunteer coordinator in the Presentation Preview Room (PPR), Meeting room 11 AB in the Austin Convention Center prior to the start of their first shift. All volunteers should report to their designated assignments 15 minutes before the start of their shift. Needed materials will be provided by ESA. All proof-of-attendance forms should be turned in the volunteer coordinator at the completion of your assignment in order to receive your reimbursement. If you cannot make it to your assignment or you need additional information, please see the volunteer coordinator located in the Presentation Preview Room (PPR), Meeting Room 11 AB, Austin Convention Center.

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For student volunteers for the Insert Expo, please report directly to the Bullock Texas State History Museum by 8:00 AM on Saturday, November 9. Please check in with volunteer coordinator when you arrive.

AWARDS & HONORS

All award recipients are profiled in page 43 of the program book.

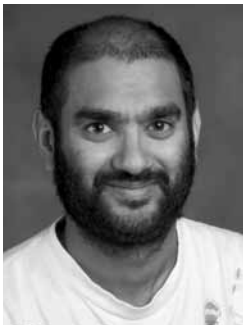
ESA Fellows

The designation of ESA Fellow recognizes individuals who have made outstanding contributions to entomology. The 2013 Fellows will be honored at the Opening Plenary Session, Sunday, November 10, 5:30 PM –7:30 PM, Ballroom D, Austin Convention Center.

The 2013 ESA Fellows are:
Dr. Bryony C. Bonning
Dr. Consuelo M. De Moraes
Dr. Rene Feyereisen
Dr. Michael E. Gray
Dr. Jocelyn G. Millar
Dr. Ralf Nauen
Dr. Christian Y. Oseto
Dr. Jeffrey G. Scott
Dr. Randall Tobias Schuh
Dr. Charles Vincent

Founders' Memorial Award: Dr. Anurag Agrawal

Dr. Agrawal's research accomplishments cover the key areas of arthropod community genetics, real-time evolution of plant defense against insects, phylogenetic ecology, plant neighborhood-insect interactions, and insect colonization and induced defense. Over the course of his career to date, he has published more than 100 peer-reviewed papers in high-profile journals such as PNAS, Science, and Nature, and he has edited two key books on insect ecology.



In the relatively new area of arthropod community genetics, he has addressed natural selection on milkweed defensive traits and how plant genetic variation in these traits influences insect community structure and coexistence. In the area of real time evolution of plant defenses against insects, he has shown that the suppression of insect damage causes the evolution of decreased plant resistance and increased competitive ability. His work in the area of phylogenetic ecology uses a comparative biology approach to address problems ranging from the controls on the success of invasive species to phylogenetic signatures of coevolution. And in the area of plant neighborhood-insect interactions, his ongoing research seeks to partition the relative importance of direct, associational, and trait-mediated effects of competing plants on milkweed and its insect fauna.

Dame Miriam Rothschild
Dame Rothschild started her research in the 1950s in the area that is now known as chemical ecology. She had no traditional education, but was tutored in natural history by her father and her uncle.

She is best known for her work with mimicry, and she conducted classic studies on the role of carotenoids in insect mimicry. In addition to her work cataloging the famous Rothschild flea collection, Dame Rothschild was also a pioneer in the area of insect chemical ecology. Her work in particular on mimicry and sequestration of toxic compounds by insects was outstanding. Nature conservation was extremely important to her, and she lobbied strongly in favor of nature reserves.

ESA Professional Awards

The 2013 ESA professional awards will be presented at the Opening Plenary Session, Sunday, November 10, 5:30 PM–7:30 PM, Ballroom D, Austin Convention Center.

The following ESA award winners will be honored:
Dr. Bryony C. Bonning, Nan-Yao Su Award for Innovation and Creativity in Entomology
Dr. John F. Tooker, Early Career Innovation Award (sponsored by BASF)
Dr. Linda J. Mason, Distinguished Achievement Award in Extension
Dr. Whitney S. Cranshaw, Distinguished Achievement Award in Horticultural Entomology (sponsored by Gowan Company)
Dr. Timothy D. Paine, Distinguished Achievement Award in Teaching
Dr. Elizabeth Dykstra, BCE, Distinguished Service Award to the Certification Program
Dr. Richard Stouthamer, Recognition Award in Entomology (sponsored by Syngenta Crop Protection, Inc.)
Dr. Subba Reddy Palli, Recognition Award in Insect Physiology, Biochemistry and Toxicology (sponsored by Apex Bait Technologies, Inc.)

ESA Student Awards

The winners of the President's Prize, Entomological Foundation awards, Entomological Society of America student awards, as well as Linnaean Game winners and second-place teams will be recognized Tuesday, November 12, 7:30 PM–9:30 PM, Ballroom D, Austin Convention Center.

The following ESA student award winners will be honored:
Dr. Carey R. Minteer, Student Activity Award (sponsored by Monsanto Company)
Mrs. Amanda L. Fujikawa, BCE, ESA Student Certification Award (sponsored by PestWest Environmental Science)

John Henry Comstock Graduate Student Awards:
Dr. Elina Lastro Niño, Eastern Branch
Mr. Kumaran Nagalingam, International Branch
Mr. Nicholas M. Teets, North Central Branch
Mr. Matan Shelomi, Pacific Branch
Mr. Paul M. Bardunias, Southeastern Branch
Ms. Lisa M. Overall, Southwestern Branch

Monsanto Research Grant Award:
Ms. Maria Cristina Carrasquilla
Mr. Jeffrey Grabowski
Ms. Chandra Moffat
Mrs. Erika Machtinger
Ms. Chelsea Wright

Monsanto Student Travel Award:
Ms. Zachary DeVries
Mrs. Sandipa Gautam
Mr. William Morrison
Mr. Chet Joyner
Ms. Diane Silcox Reynolds

USDA AFRI Travel Grant Award:
Ms. Margaret Douglas
Ms. Erica Kistner
Mrs. Laura Ingwell
Mr. David Lowenstein
Ms. Elizabeth Morris
Mrs. Mia Park

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Mr. Christopher Philips
Ms. Loren Rivera Vega
Mr. Suhas Vyavhare
Ms. Stephanie Weldon

Stinger Awards

These awards are given to the winners of the YouTube Your Entomology video contest. This contest gives ESA members the opportunity to showcase their talents and creativity through video. The winners will be announced at the ESA Opening Plenary Session, Sunday, November 10, 5:30 PM–7:30 PM, Ballroom D, Austin Convention Center. Winners will be determined from the following finalists in each of the four categories: Outreach (extension-based); Discovery (research-based); Instruction (teaching-based); and Open (anything goes, for the creative entomologist).

Entomological Foundation Professional Awards

The Entomological Foundation Professional Awards will be presented at the Entomological Foundation Awards Reception, Monday, November 11, 6:00 PM –7:45 PM, Austin Grand Ballroom H, Hilton Austin.

The following Foundation award winners will be honored:
Dr. Douglas Walsh, Award for Excellence in Integrated Pest Management (sponsored by Syngenta Crop Protection)
Mr. John Acorn, Entomological Foundation Medal of Honor
Dr. Doo-Hyung Lee, Henry & Sylvia Richardson Research Grant
NTA IPM Team, Integrated Pest Management Team Award (sponsored by Dow AgroSciences)
Ms. Laura Gagnon, President's Prize for Outstanding Achievement in Primary Education (sponsored by the Entomological Society of America)
Ms. Joyce Forand-Voorhis, President's Prize for Outstanding Achievement in Secondary Education (sponsored by the Entomological Society of America)
Dr. Jules Silverman, Recognition Award in Urban Entomology (sponsored by S.C. Johnson & Son)

Entomological Foundation Student Awards

The Entomological Foundation Student Awards will be presented in conjunction with the ESA Student Awards on Tuesday, November 12, 7:30 PM–9:30 PM, Ballroom D, Austin Convention Center.

The following Foundation student award winners will be honored:
Ms. Brittany Delong, Jeffery P. LaFage Graduate Student Research Award (established by Rousell Bio, Dow AgroSciences, FMC, and the friends and family of Dr. Jeffery P. LaFage)
Ms. Natalie Boyle, Larry Larson Graduate Student Award for Leadership in Applied Entomology (sponsored by Dow AgroSciences)
Ms. Brittany Peterson, Lillian and Alex Feir Graduate Student Travel Award Physiology, Biochemistry, Toxicology, and Molecular Biology (established by Dorothy Feir)
Ms. Garima Kakkar, Shripat Kamble Urban Entomology Graduate Student Award for Innovative Research
Ms. Erika Garcia, Stan Beck Fellowship

Award Sponsors

ESA and the Entomological Foundations thank the following list of sponsors for their continued support of ESA's and the Foundation's Award programs:

Apex Bait Technologies
BASF
Dow AgroSciences
Gowan Company
PestWest Environmental Science
Monsanto
S. C. Johnson & Sons
Syngenta Crop Protection

ENTOMOLOGICAL FOUNDATION

Your Foundation for exciting young people about science through insects! Join us in Austin for exciting events and opportunities to support this very worthy cause and help sustain our profession!

Austin Insect Rodeo

Austin features an opportunity for teachers to learn about using insects in the classroom, and for the public to experience insects first hand! The Rodeo is offered by the Foundation in collaboration with the ESA Education and Outreach Committee.

Teacher Workshop

Saturday, November 9, 8:45 AM–12:30 PM
Bullock Texas State History Museum, 1800 Congress Avenue, Austin

Workshop 1: Movement from Molecules to Migrations: A Bug's-Eye View
Facilitators: Christina Silliman and Catherine Dana

Workshop 2: Bringing Insects into the Classroom: Interactive Lessons in Entomology
Facilitator: Joliene Lindholm

Workshop 3: Bed Bugs and Book Bags: Identification and Prevention
Facilitator: Rebecca Baldwin

Each workshop is designed to demonstrate hands-on lesson plans for K-12 teachers to take back to the classroom. Get your students excited about science through the exciting world of insects! The workshop is free and includes breakfast and lunch, an opportunity to see the IMAX Flight of the Butterflies in 3D, and an opportunity to earn continuing education units. Eligible teachers must pre-register: Email your name, address, school and grade taught to msnyder@ipminstitute.org.

Insect Expo

Saturday November 9, 9:00 AM–1:30 PM
Bullock Texas State History Museum, 1800 Congress Ave., Austin
Andrine Shufran and Marianne Shockley, co-chairs

Open to everyone: Families, children, groups and any anyone interested in learning about the amazing world of insects. Exhibits include presentations, games, crafts and more! The event is free and participants are encouraged to pre- register: Email your name, address, and number in your party to msnyder@ipminstitute.org.

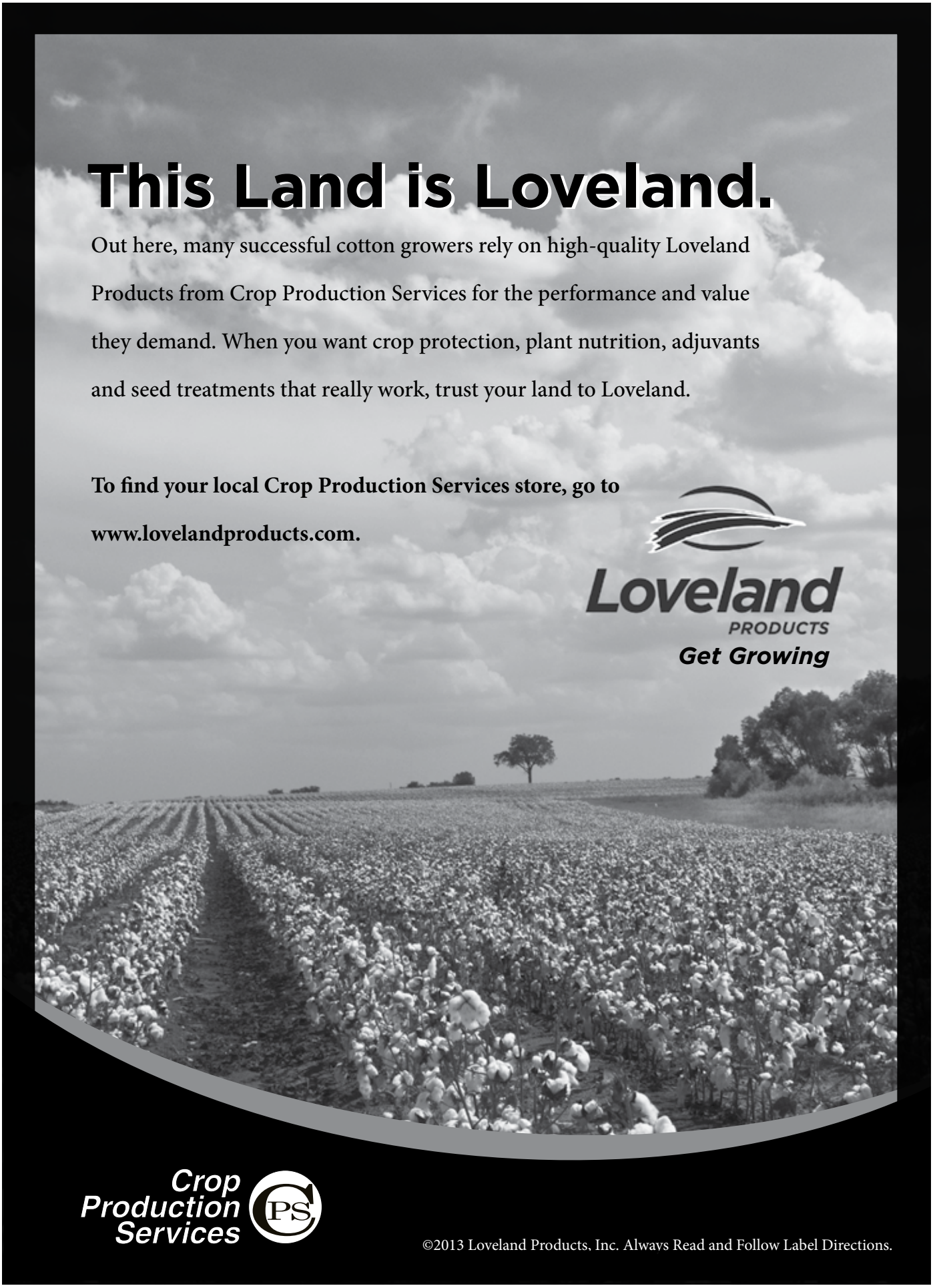
Entomological Foundation Silent Auction & Raffle

Exhibit Hall 4, Austin Convention Center, Booth 401 & 500
Sunday, November 10, 7:30 PM–9:30 PM (Welcome Reception)
Monday, November 11, 9:00 AM–5:00 PM
Tuesday, November 12, 9:00 AM–5:00 PM
Wednesday, November 13, 9:00 AM–2:00 PM

Meet the Entomological Foundation's volunteers and participate in the Entomological Foundation's Raffle and Silent Auction to support our effort to ***educate and excite young people about science through insects***. Raffle and Auction commence on Monday and close with final bids placed by 10 AM on Wednesday.

Entomological Foundation Board of Directors

Monday, November 11, 8:00 AM –9:30 AM (Board of Directors only)
Room 602, Hilton Austin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Entomological Foundation Awards Reception

Monday, November 11, 6:00 PM –7:45 PM
Austin Grand Ballroom H, Hilton Austin

Join us for our 2013 Awards Reception honoring John Acorn, our 2013 Medal of Honor recipient and our 2013 Professional Award Winners. This Annual Event pays tribute to individuals who have demonstrated outstanding support and commitment to entomology, including youth education. Plenty of hors d'oeuvres, desserts, beverages, and more for all! Door prizes too. Come join the fun! This FREE event is made possible by the generous support of our Event Sponsors. If you would like to attend, register via email to msnyder@ipminstitute.org, or stop by the Entomological Foundation's booth (401& 500) in Hall 4 of the Austin Convention Center.

Entomological Foundation Board of Counselors Meeting

Tuesday, November 12, 12:00 PM–1:30 PM
Room 400, Hilton Austin

Foundation Counselors and all curious entomologists are invited to join us to review our activities and outcomes from the past year, and help plan our impact for the coming year. Light lunch provided.

Entomological Foundation Corporate Funding Partners (Jan 1, 2012 to July 31, 2013)

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Dow AgroSciences
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ESA Section: Medical, Urban and Veterinary Entomology
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University of Missouri, College of Agriculture, Food and Natural Resources
Virginia Tech University, Department of Entomology

Enhancement Fund Science Literacy Benefactors (Jan 1, 2012 to July 31, 2013)

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Thomas L. Payne

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Dale Gelman
Dawn Gouge
April Gower-Getz
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Phillip Grau
Great Lakes IPM
Dawn Calibeo Hages
Harold Harlan
Stephen Hight
John Hildebrand
Hoe'n Hope Garden Club
Hillary Hurd
William Hutchison
James Jarvis
Mary Kiely
LT Kok
Michael Kosztarab
Rayda Krell
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Patricia O'Leary
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Nan-Yao & Jill H. Su

Entomological Foundation Funding Partners (Jan 1, 2012 to July 31, 2013)

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Exhibit Hall

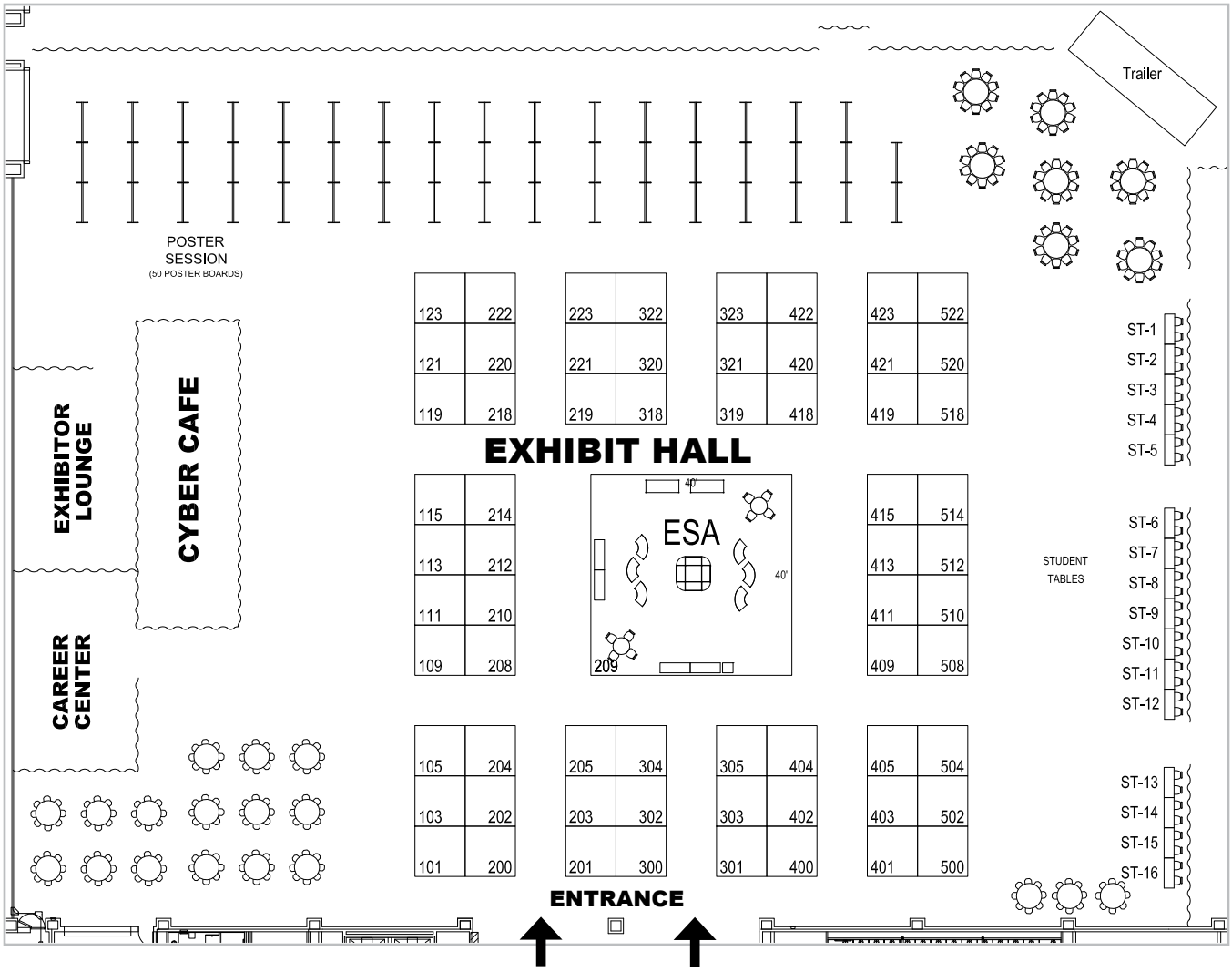
Please plan to visit the exhibits, poster presentations, and more in Exhibit Hall 4 at the Austin Convention Center on the first floor. See the latest in entomological equipment, supplies, gifts, and reference materials. **A map of the exhibit hall and location of exhibit booths is on page 29.**

Exhibit hours are:
Sunday, November 10, 7:30 PM–9:30 PM (Welcome Reception)
Monday, November 11, 9:00 AM–5:00 PM
Tuesday, November 12, 9:00 AM–5:00 PM
Wednesday, November 13, 9:00 AM–2:00 PM

Entertainment Schedule
Taking advantage of being in the Live Music Capital of the World®, ENTOMOLOGY 2013 is excited to feature two local Austin artists during this year's conference. Join us in the exhibit hall to have a true Austin experience during the following times:

Sunday, November 10
7:30 PM–9:30 PM
Weldon Henson is to country music what an ice cold beer is on a "long, hard, hot, day"–refreshing. The first few notes out of his mouth and you know your witnessing the real deal. Henson's shows are a throw-back to the vintage honky-tonk and Texas culture that brought your grandparents together combined with the rock 'n roll attitude and approach of the more modern men of Texas country. You're in good hands with Henson. Prepare to swing, 2-step, waltz, and even polka to authentic, brand new honky-tonk music.

Tuesday, November 12
12:00 PM–1:00 PM
Country singer-songstress **Janie Balderas** was featured on the cover of Southern Music Scene Magazine, performed at Rodeo Austin and her single "Sweet Memories" debuted 2013 and getting airplay on several radio stations. Country music with attitude!"



Exhibitors

The following exhibitors are participating in ENTOMOLOGY 2013 as of September 2013.

Alex Wild Photography **Booth: 123**
Alex Wild, 916 E. Water Street, Urbana, IL 61802
[redacted]
Website: www.alexanderwild.com
Alex Wild Photography features posters, fine art prints, postcards, calendars, and other entomological imagery.

Alpha Scents, Inc **Booth: 305**
Dwayne Hancock, 1089 Willamette Falls Drive, West Linn, OR 97068
[redacted]
Website: www.alphascents.com
A global supplier of quality insect monitoring systems–traps, lures,attract & kill, MalEx™, designed to reduce toxic pesticide use. Products for most native and exotic species in agriculture, horticulture, ornamentals, forestry, and the home & garden PestWizard® brand. Custom pheromone synthesis for research, manufacturing, and government. Made with high-purity pheromones per recommendations from the research community.

Altered Insects **Booth: 512**
Michael Skvarla, 1236 S. Nelson Drive, Fayetville, AR 72701
[redacted]
Website: www.etsy.com/shop/alteredinsects.com
Altered Insects is a small home business run by Ph.D. student Michael Skvarla and his wife Sarah that specializes in steampunk-themed insect and arthropod mounts and shadowboxes. Never heard of steampunk? Come by our booth and check it out.

American Peat Technology, LLC **Booth: 212**
Ryan Menzel, 36203 350th Ave, Aitkin, MN 56431
[redacted]
Website: www.AmericanPeatTech.com
APT develops and produces peat-based products that are beneficial to the environment, including BioAPT, a granular microbe carrier made from reed-sedge peat. BioAPT is proven in the Rhizobia inoculant industry, has exceptional moisture and nutrient retention, superior shelf life, is pH neutral, easy to handle, and available in powder form.

Army Medical Recruiting **Booth: 409/411**
Ina Tyler, Munoz Bldg 206, 9Th Calvary Regiment Road Fort Knox, KY 40121
[redacted]
Website: www.goarmy.com
Your knowledge of insects and their behavior can impact the health, morale and overall environment of our Soldiers. When you serve your country as an entomologist and officer on the U.S. Army health care team, you'll conduct research, perform pest management and provide important information to our leaders regarding biological hazards around the globe. Visit our booth to talk to an Army Entomologist and find out more about exciting Careers in the United States Army.

Atlas Screenprinting **Booth: 413/415**
Paul Wales, 131 SE 10th Ave, Gainesville, FL 32601
[redacted]
Website: www.wildcotton.com
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Big C: Dino-Lite Scopes **Booth: 508**
Pamela Szeto, 20655 S. Western Avenue, Ste. 116, Torrance, CA 90501
[redacted]
Website: www.bigc.com
Dino-Lite portable digital microscopes and eyepiece cameras provide high-quality microscopy video interfacing to PC and MAC with clear and steady imaging. Most models provide 10x-200x along with a multitude of software features. The included DinoCapture software makes it easy to take snapshots, record videos, manipulate images, and save and **Email** discoveries.

Bioo Scientific **Booth: 514**
Dawn Obermeoller, 3913 Todd Lane Suite 312, Austin, TX 78744
[redacted]
Website: www.biooscientific.com
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See the schedule of Board, Section, committee and Editorial Board meetings on pages 61–69.

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Each year the Entomological Society of America and the Entomological Foundation provide annual honors and awards to recognize scientists, educators, and students, who have distinguished themselves through their contributions to entomology.

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The Entomological Society of America is pleased to announce the winners of its 2013 awards. The awards will be presented at Entomology 2013, ESA's 61st Annual Meeting in Austin, TX from November 10-13, 2013.

ESA FELLOWS

The designation of ESA Fellow recognizes individuals who have made outstanding contributions to entomology.

DR. BRYONY C. BONNING is a professor of entomology at Iowa State University (ISU) where she is director of the Plant Sciences Institute Virus-Insect Interactions Initiative, and is founding director of the Center for Arthropod Management Technologies (CAMTech), a research center supported by the National Science Foundation, industry, and universities. CAMTech engages scientists at ISU and its sister institution, the University of Kentucky, in collaborative efforts with the world's largest agricultural and insect pest control companies to better align research conducted within academe with the need of industry for practical pest management solutions.

Bonning, a native of Derbyshire, UK, received her B.S. in zoology from the University of Durham, UK with specialization in entomology and neurobiology in 1985. She was then funded by Sumitomo Corporation to work on insecticide resistance in mosquitoes with Janet Hemingway at the London School of Hygiene and Tropical Medicine, University of London for her Ph.D. (1989), which included fieldwork conducted in Italy and work with the Anti-Malaria Campaign in Sri Lanka. She then moved to Oxford to work as a Higher Scientific Officer at the Natural Environment Research Council Institute of Virology with Robert Possee (1989 to 1990), followed by a postdoctoral position with Bruce Hammock, University of California, Davis (1990 to 1994), with a research focus for both positions on recombinant baculovirus insecticides.

She joined the faculty of ISU in 1994. She oversees fundamental and applied research on insect physiology and insect pathology with the goal of developing novel, environmentally benign alternatives to chemical insecticides for insect pest management. Her research has included the study of insect hormones and enzymes and insecticidal toxins derived from *Bacillus thuringiensis*, insect small RNA, the genetic optimization of insect viruses for pest management, insect virus discovery, and the use of viral proteins for development of insect resistant transgenic plants. Recent research has included modification of *Bt* toxins to target hemipteran pests which typically have low susceptibility to native *Bt* toxins, and the use of the coat protein of an aphid-vectored plant virus for delivery of insect specific neurotoxins to their target site within the aphid hemocoel.

She has served as mentor for more than 30 graduate students and postdoctoral researchers and teaches insect pathology and molecular entomology at the graduate level. Over the course of her career she has authored or co-authored more than 110 scientific papers, reviews, and book chapters, and holds five patents. Her work has been funded by diverse research agencies, including NSF and USDA. She has served as associate editor for the *Journal of Invertebrate Pathology*, as council trustee and chair of the Virus Division and program chair for the Society for Invertebrate Pathology, and on the International Committee on Taxonomy of Viruses, Baculovirus Study Group and Dicistrovirus and Iflavirus Study Group. Her accomplishments were recognized by the Iowa Technology Association through the Iowa Women of Innovation Award for Research Innovation and Leadership, and she is a fellow of the American Association for the Advancement of Science.

DR. CONSUELO DE MORAES, a professor at Penn State University, is an internationally known entomologist and ecologist who studies the complex role of chemistry in interactions among plants, insects, and other organisms. Her research addresses phenomena at scales ranging from the molecular and biochemical bases of plant responses to insect herbivory to the community-level effects of chemical signaling. She is particularly interested in the ecological functions of plant-derived olfactory cues, and many of her most significant research accomplishments have addressed the remarkably complex information conveyed by plant volatile emissions and the sophisticated ways in which insects and other organisms interpret and respond to these chemical cues.

A native Brazilian, Dr. De Moraes, earned her B.S. from the Universidade Federal de Minas Gerais in 1992. She completed her doctorate in entomology at the University of Georgia in 1998. Since 2001, she has been a faculty member in the Department of Entomology at Penn State University. Recently she accepted a professorship at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland, where she will be heading the Laboratory of Biocommunication and Entomology starting in the fall of 2013.

Over the course of her career, Dr. De Moraes has amassed an impressive record of innovative research and has produced a number of truly ground-breaking studies, some of which have revealed completely novel and unexpected aspects of chemical signaling and opened new lines of research into the chemical mediation of interactions among plants and other organisms. This work has been broadly influential both within and beyond the field of chemical ecology. De Moraes's findings have been published in leading scientific journals including *Nature, Science,* and the *Proceedings of the National Academy of Science* and frequently receive coverage from popular press outlets around the world. Her research is discussed in textbooks from a variety of life-science disciplines and has also been the subject of several documentary films and of articles in major media outlets and popular science magazines that reach a broad audience.

Dr. De Moraes's accomplishments have been recognized through numerous awards and honors, including a prestigious Packard Foundation Fellowship; the Beckman Foundation Young Investigator award; the DuPont Young Professor award; the ESA Early Career Innovation Award; the International Chemical Ecology Society's Silverstein-Simeone Award, and the NSF CAREER Award. She was recently named a fellow of the American Association for the Advancement of Science. She has received steady funding from a range of governmental and foundation sources, including the National Science Foundation, the U.S. Department of Agriculture, and the Bill and Melinda Gates Foundation. She has also played an active role in promoting the field of chemical ecology and entomology through public outreach and education. Her research program is engaged in a variety of innovative educational programs centered on the science of chemical ecology, including the development of learning activities for school children and workshops for promising high-school students.

DR. RENÉ FEYEREISEN, director of research at the Institut National de la Recherche Agronomique in France, is recognized internationally for his research on insect biochemistry, physiology, and toxicology, and especially the functions of cytochrome P450 enzymes. Feyereisen received his Ph.D. from Louis Pasteur University in Strasbourg, France in 1979. After postdoctoral fellowships at the Agricultural Research Council, University of Sussex, and in the Department of Zoology, University of Toronto, he served on the faculty of the Department of Entomology at Oregon State University (1981-1991). He moved to the University of Arizona as professor of entomology (1991-2000) and then joined INRA at the Sophia Antipolis Research Center.

Feyereisen's early studies described the roles of P450 enzymes in the biosynthesis of ecdysteroids and juvenile hormones (JH). His laboratory has also made major contributions to the biochemistry of the corpora allata and to the discovery of allatostatins as "brain-gut" neuropeptides that are powerful inhibitors of JH synthesis. More recently, in collaboration with Gary Blomquist's group, Feyereisen showed that highly conserved P450 enzymes, the CYP4Gs specific to insects, are responsible for the last step in cuticular hydrocarbon biosynthesis. The evolution of the CYP4G enzymes is a key innovation that contributed to the colonization of land by insects. Beyond the essential physiological functions of P450 enzymes, Feyereisen's laboratory also showed the role of P450 enzymes in insecticide detoxification and resistance, and in host plant adaptation. From the first sequence of an insect P450 gene and functional expression of recombinant protein, to the annotation of the hundreds of CYP genes in the genomes of insects and mites, his laboratory has continued to make important contributions to our understanding of the diversity of P450 genes. Feyereisen currently focuses on the evolution of this very large family of versatile enzymes in arthropods.

In addition to his research, Feyereisen has served on the editorial committee of the *Annual Review of Entomology* and on the editorial boards of *Archives of Insect Biochemistry and Physiology* and of *Pesticide Biochemistry and Physiology*. Since 2002 he has been co-editor of the top-ranked journal Insect *Biochemistry and Molecular Biology*. He has published over 170 peer-reviewed papers and book chapters and has written influential reviews on JH biosynthesis, insecticide resistance, and on P450 enzymes. He has served as mentor to numerous undergraduates, graduate students, and postdoctoral fellows from around the world. Past honors include a Faculty Excellence Award from the Oregon State Board of Higher Education, the 2011 Distinguished Scientist Award from the International Branch of ESA, and the 2013 International Award for Research in Agrochemicals from the American Chemical Society's Agrochemicals Division.

DR. MICHAEL E. GRAY, a professor at the University of Illinois at Urbana-Champaign, is internationally recognized for his research and extension programs on the management of the western corn rootworm, *Diabrotica virgifera virgifera* LeConte.

Gray was born in Villisca, Iowa on 27 March 1955. He traveled extensively as a youth and lived in several states and other countries, including Germany, Japan, and the Philippines. Following many years overseas, he returned to Iowa and received his B.A. in biology from the University of Northern Iowa in 1977. After his graduation, Gray taught high school science for a brief period and then entered graduate school at Iowa State University, where he earned his M.S. (1982) and Ph.D. (1986) degrees in entomology. He then served as postdoctoral research associate at South Dakota State University from 1987 to 1988. In March of 1988, he accepted a position as an extension entomologist at the University of Illinois. In 1999, he attained the rank of full professor. Gray currently serves as a professor in the Department of Crop Sciences and as an assistant dean for extension programs in agriculture and natural resources.

Gray's research and extension programs have been interwoven throughout his career at the University of Illinois. His primary research emphasis has been to increase our understanding of the biology, ecology, and management of the western corn rootworm. Gray has published numerous journal articles on western corn rootworms, including a 2009 *Annual Review of Entomology* paper, and he also served as co-editor for the *ESA Handbook of Corn Insects*, published in 1999. In 2008, Gray began serving as a program leader with the Energy BioSciences Institute at the University of Illinois, the goal of his program being to evaluate the influence of insects, diseases, and nematodes on the biomass production of biofuel crops. He has served in several leadership roles within the IPM arena, including IPM coordinator at the University of Illinois, co-director of the USDA-CSREES North Central Region IPM Center, and panel manager for the USDA North Central Region IPM Grants Program.

Gray has been a member of ESA since 1979 and has served this professional society in a number of leadership roles, including: Program Chair, North Central Branch Meeting, 1994; editorial board member, *American Entomologist*, 1990-1995; executive committee member, North Central Branch, 1994-1997; editor, *Journal of Economic Entomology*, 1995-1997; Program Co-Chair, ESA National Meeting, San Diego, California, 2001; President, North Central Branch,2002-2003; Governing Board member, Section E, 2004-2005; Chair, ESA Nominations Committee, 2004-2006; and Governing Board Executive Committee member, 2004-2009. Gray served as President of ESA during the first full year of ESA's Renewal and transition to the four new Sections.

Gray is the recipient of the Young (1994) and Senior (2002) Faculty Award for Excellence in Extension, University of Illinois. In 2002, he received the ESA NCB Award for Excellence in Integrated Pest Management. In 2007, Gray received the Paul A. Funk Recognition Award for outstanding achievement and major contributions to the betterment of agriculture, natural resources, and human systems, College of Agricultural, Consumer and Environmental Sciences, University of Illinois. In 2011, he received the ESA Distinguished Achievement Award in Extension. In 2013, the ESA North Central Branch honored Gray with the C.V. Riley Achievement Award.

DR. JOCELYN MILLAR is a professor in the Department of Entomology at the University of California, Riverside (UCR). He is internationally known for his research on insect chemical ecology, and the development of applications for insect semiochemicals and related compounds.

Professor Millar was born in Harlow, England in 1954, and his family immigrated to Canada in 1957. He attended the University of British Columbia for two years, studying engineering, then worked and traveled in Europe, Africa, and Asia for two years. After returning to Canada, he enrolled at Simon Fraser University, graduating with a B.S. in chemistry in 1979. He then obtained his Ph.D. in chemistry at Simon Fraser with A. C. (Cam) Oehlschlager, identifying and synthesizing grain beetle aggregation pheromones. After graduation in 1983, he worked on host plant-based attractants for elm bark beetles with R.M. Silverstein (State University of New York, Syracuse) for a year, before joining the National Research Council of Canada's laboratory in Saskatoon, Saskatchewan for two years, studying

pheromones of geometrid and arctiid moths with E.W. Underhill. He then ran a large toxicology laboratory in Vancouver for two years, before taking his current position at UC Riverside in 1988. He was invited to become a Cooperating Faculty Member in the Department of Chemistry at UC Riverside in 1999.

Millar's research is primarily focused on insect chemical ecology. His program is vertically integrated to encompass basic behavioral studies demonstrating that chemical communication is occurring through the isolation, identification, and synthesis of the chemical signals, to the verification of the biological activity of the various components or blends. Where appropriate, these studies extend to the development of practical applications for insect pheromones and related chemicals that can be exploited for detection, sampling, and management of insects. His group has worked with the semiochemistry of hundreds of species in several insect orders. In addition to chemical ecology, Millar's group has worked on biological control of invasive weevils and cerambycid beetles, and on substrate-borne vibrational communication in true bugs. Much of his work has been done with collaborators, reflecting the multidisciplinary nature of his research program. Millar has published more than 250 scientific papers, 24 book chapters and review articles, and four edited books. He has graduated four M.S. and three Ph.D. students, with five Ph.D. students currently in his group. He has also mentored 17 postdoctoral scientists and 25 visiting scientists.

Millar has been the presenter or a coauthor on more than 200 invited and more than 300 submitted presentations at statewide, national, and international conferences. His work has been recognized by several national ESA awards, including the Recognition Award in Entomology (2001), the Entomological Foundation's Team IPM Award (2006), the Entomological Foundation's Award for Excellence in IPM (2008), and the ESA Pacific Branch's C. W. Woodworth Award. He was elected as a fellow of the American Association for the Advancement of Science in 2003, and has been selected as the 2014 Silver Medal winner by the International Society of Chemical Ecology, in recognition of career achievement in chemical ecology.

DR. RALF NAUEN, a Bayer CropScience research fellow working at Bayer CropScience (BCS) in Monheim, Germany, is internationally recognized for his research in insect toxicology and resistance, which has focused on insecticide mode of action and insecticide and acaricide resistance mechanisms and management. Nauen was born in Leverkusen, Germany, 31 December 1964, and in 1981 he joined Bayer where he completed an educational program as certified laboratory assistant in biology in 1984. While working as a research assistant in the Plant Protection Division, he became interested in insect toxicology and started to study chemistry at the Polytechnical College in Cologne, where he received a national diploma in chemistry in 1992. Afterwards he studied biology at the School of Biological Sciences at the University of Portsmouth, UK and received a Ph.D. for his work on insecticide pharmacokinetics. He then became a research scientist at BCS, working on insect toxicology and all aspects of insecticide resistance and its spread, mechanisms, and management. In 2009 Dr. Nauen was elected as a BCS Research Fellow. He is also a lecturer (equivalent to an adjunct professor) at the University of Hannover and has been the major supervisor for more than 30 Ph.D. and M.S. students in his laboratory.

His early research centered on neonicotinoid insecticides, investigating the antifeedant properties of imidacloprid and, more importantly, reporting on the first issues of neonicotinoid resistance in whiteflies and the molecular mechanisms of resistance. Dr. Nauen's work on neonicotinoids and nicotinic acetylcholine receptors resulted in several highly cited book chapters and reviews. In addition to his extensive publication record (140 peer-reviewed papers, including 14 book chapters cited more than 3,350 times), Dr. Nauen also has 26 patents/patent applications that cover a wide range of novel insect control agents, genetic methods for insecticide discovery, and new chemistries. At BCS he contributed to the discovery, characterization, and development of novel insect control products such as neonicotinoids, cyclic ketoenols (e.g. spirotetramat), flubendiamide, and most recently the new butenolide insecticide, flupyradifurone. His research on insecticide and acaricide resistance at BCS covered more than a dozen invertebrate pests and many classes of insecticides. He and his co-authors published many papers on insecticide resistance and its mechanisms and management, including the first case of complete maternal inheritance of resistance to an acaricide as well as the very first paper on a ryanodine receptor target-site mutation in diamondback moth resistant to the newly introduced class of diamide insecticides.

Dr. Nauen has been a long-time and very active member of the Insecticide Resistance Action Committee (IRAC), serving in a variety of capacities, including chair from 2008-2013. As IRAC chair, he has expanded company membership and its global influence. He also serves as secretary of the German Expert Committee on Pesticide Resistance and is a member of the EPPO Resistance Panel. Dr. Nauen has been one of the preeminent scientists in the world on the subject of insecticide resistance, and he organized and chaired several symposia at international conferences and gave numerous invited and keynote presentations in all sorts of meetings, conferences, and symposia. He is a fellow of the Royal Entomological Society, serves on several editorial boards, and is an executive editor of the well-known international journal *Pest Management Science*.

DR. CHRISTIAN OSETO was born in Japan and immigrated to the United States with his mother and sister to Chicago, Illinois. He received his B.S. in biology at Roosevelt University (Chicago). His interest in insects was nurtured by Hank Dybas, who hired Chris as a laboratory technician to work on featherwing beetles in the Field Museum of Natural History's (FMNH) Division of Insects. After his tenure at the FMNH, Chris attended graduate school at the University of Nebraska-Lincoln and received his M.S. and Ph.D. from the Department of Entomology and subsequently worked as a postdoc under the direction of Dr. Z B Mayo. His first academic position was in the Department of Entomology at North Dakota State University (NDSU) where he conducted research on sunflower IPM and taught the introductory entomology course, external insect morphology, internal insect morphology, and acarology. He reached beyond entomology and taught a course with faculty from the College of Liberal Arts that explored the human condition, and he taught Shotokan karate. At North Dakota State University, Chris developed entomology outreach programs for primary and secondary school students in North Dakota. As director of the North Dakota Science Olympiad, Chris oversaw the administration and conduct of the state competition. For his teaching efforts, NDSU awarded him its highest teaching recognition, the Robert Odney Outstanding Teaching Award.

After serving for 17 years at NDSU, Chris was appointed head of the entomology department at Purdue University in 1990 and served as head for nine years. From 1994 to 1997, Chris directed the National Science Foundation's Young Scholars Program that provided an educational experience for 25 rising high school sophomores and juniors in a seven-week residential program in Purdue's College of Agriculture. From 2005 to 2013, Chris served as director of the newly established University Honors Program (UHP) and with the help of staff and faculty established an innovative program for the top one percent of entering students. Based on the success of the UHP, the UHP was given college status with the first cohort entering in the fall of 2013.

Chris continues to teach several courses on campus and has taught an insect taxonomy course to entomologists in Afghanistan, several courses on biodiversity and sustainable agriculture in Costa Rica, and courses that explored Canada-US issues in Quebec City as part of the honors curriculum. Chris' teaching has earned him a place in Purdue's Book of Great Teachers, membership in the Teaching Academy, and receipt of the Murphy Outstanding Teaching Award, along with the USDA CSREES Excellence in College Teaching in Food and Agricultural Sciences award. Chris has served ESA as President, member of the Governing Board, President and Secretary-Treasurer of the North Central Branch, and through numerous ESA committee assignments.

DR. RANDALL T. SCHUH, George Willett Curator Emeritus at the American Museum of Natural History (AMNH) in New York City is recognized for his research on the taxonomy of Hemiptera-Heteroptera, especially Miridae, the higher-level classification of the Heteroptera, and cladistic methodology.

Randall Schuh, known as Toby, was born in Corvallis, Oregon on 11 May 1943. He grew up in Klamath Falls, Oregon, where his interest in entomology was strongly influenced by his father, Joe Schuh, a consulting agricultural entomologist, and participation in the local 4-H program. He received his B.S. degree from Oregon State University in 1965 and decided to pursue an academic career in entomology while serving as a summer NSF Undergraduate Research Intern under John D. Lattin. Schuh received his M.S. in entomology from Michigan State University in 1967, and his Ph.D. in entomology from the University of Connecticut in 1971, working under the late James A. Slater, with whom he spent eight months in the field in South Africa. Schuh was appointed as AMNH assistant curator in September, 1974 and promoted to full curator in 1984.

Schuh's publications can be divided as follows: First, the taxonomy and classification of the Miridae, a group of more than 11,000 species, >630 of which he described. These papers rely heavily on his own field work which has amassed >100,000 specimens with detailed host data from four continents. He published print and online versions of a World Catalog of Miridae. Second, Schuh has published extensively on phylogenetic relationships within Heteroptera, including his 1995 book *True Bugs of the World*, with co-author James Slater. Third, Schuh has taught courses in systematic methods and published the widely used textbook *Biological Systematics: Principles and Applications*. In addition, Schuh served as chair of the AMNH Department of Entomology from 1980-1987 and of the Division of Invertebrate Zoology from 1999-2007. Schuh has mentored several Ph.D. students in the CUNY and Cornell programs as well as five postdocs.

Schuh served as the ESA Section A Program Chair in 1987. He served as editor of *Systematic Zoology* (1977-1979), *Cladistics* (1990-1992), and the *Journal of the New York Entomological Society* (1980-1987). He has received NSF awards that have transformed systematic entomological methods, including a five-year Planetary Biodiversity Inventories award for the study of Miridae, under which he developed one of the first web-based collection data-capture software applications known as Arthropod Easy Capture. He received a four-year award for Advancing Digitization of Biological Collections, which funded a consortium of 32 entomological and botanical institutions dedicated to the capture of specimen data documenting herbivore and parasitoid relationships with the North American flora.

Randall Schuh is married to Brenda Massie. They have a daughter named Ella. He is a skilled woodworker, and in recent years he has fulfilled the lifelong ambition to harvest, mill, and dry his own lumber. He has published in the field of woodworking as well as entomology.

DR. JEFFREY G. SCOTT, a professor at the Department of Entomology at Cornell University, is internationally recognized for his research on insecticide resistance, toxicology and evolutionary biology. A native of Grand Rapids, MI, he received his A.A. (honors) from Grand Rapids Junior College, his B.S. in biochemistry (Honors, Michigan State), his M.S. in entomology (Michigan State), and his Ph.D. in entomology and toxicology (University of California, Riverside), and he was a postdoctoral associate with John Casida at the University of California, Berkeley before joining the faculty at Cornell in 1986.

A pioneer in the field of insecticide resistance, his outstanding work has led to a greater understanding of the mechanisms, evolution, and population genetics involved. He is the author of more than 170 peer-reviewed publications and has mentored numerous graduate and undergraduate students, postdoctoral associates, and visiting scientists. He was the leader of a global effort that resulted in sequencing the house fly genome. His recent work has expanded into novel methods of insect control and the evolution of sex determination in house flies. He has received many awards and honors, including the UC Riverside Outstanding Young Alumnus Award (1992), the Prominent Achievement Award from the Pesticide Science Society of Japan (1996), the Orkin Award for Research Excellence (1997), the Paul A. Dahm Memorial Lecturer (1999), the Daljit S. and Elaine Sarkaria Professor of Insect Physiology and Toxicology (2002), and the ESA Recognition Award in Insect Physiology, Biochemistry, and Toxicology (2012).

Scott has made many contributions beyond his research. He has provided leadership to ESA by serving as President of the Physiology, Biochemistry, and Toxicology Section, symposia organizer, and judge for student competitions. He currently serves on the editorial boards for *Pesticide Biochemistry and Physiology* (since 1997) and *Insect Molecular Biology* (since 2008). He served as department chair from 2007-2013 and oversaw the merger of the separate Ithaca and Geneva departments into a single department in 2010. He was the director of graduate studies for the field of entomology at Cornell from 1995-1998 and 2005-2007. He has served on numerous grant panels, including being panel manager for USDA and FNIH.

Scott is also a dedicated teacher. He teaches "Pesticides, the Environment and Human Health," where students are exposed to the complex aspects of pesticide use, including both conventional and genetically modified organisms. He also teaches "Insecticide Toxicology," where students learn about the metabolism and mechanisms of action of insecticides.

Scott is married to his college sweetheart, and they have two children and one dog. His hobbies include gardening and fishing.

DR. CHARLES VINCENT is a research scientist at the Horticultural Research and Development Centre of Agriculture and Agri-Food Canada at Saint-Jean-sur-Richelieu, Quebec, Canada. He is recognized as an international leader in agricultural entomology, and has demonstrated innovation in research and development of alternative insect management methods to conventional insecticides.

Born in Montreal, Quebec in 1953, he received a B.S. in agriculture from Université Laval (Quebec City) in 1978, and an M.S. (1980) and a Ph.D. (1983) in entomology from McGill University. In 1983 he joined the Horticultural Research and Development Centre of Agriculture and Agri-Food Canada at Saint-Jean-sur-Richelieu. He was appointed adjunct professor at McGill University in 1984; professeur adjoint at the Université du Québec

à Montréal in 1991; and professeur invité in 2000 at the l'Université Picardie Jules Verne (Amiens, France), where he taught a one-month workshop on scientific writing every year.

Vincent's research involved finding alternatives to insecticides in horticultural crops. His research was instrumental in the development and commercialization of Virosoft CP4® (in collaboration with Biotepp Inc.), the first insecticidal virus registered for agricultural use in Canada, and Requiem®, a Chenopodium-based botanical (in collaboration with Codena Inc.). He has achieved an international reputation for important contributions to classical biological control and physical control methods for management of insect pests in diverse agricultural systems. He supervised the work of 14 Ph.D. students, 22 M.S. students, six postdocs, and more than 100 student interns, mostly from Europe. He has authored 165 scientific papers, and edited 24 books and 8 technical bulletins. He has given more than 500 presentations before diverse audiences worldwide. Vincent served ESA as Co-Chair of the Local Arrangements Committee for the ESA-ESC-SEQ meeting in Montreal (2000); member of the Committee on Common Names of Insects (2001-2003); member of the Committee on International Affairs (2004-2010); Governing Board member, representing the International Branch (2012); and as organizer of five symposia at ESA meetings. He has assumed leadership positions in scientific societies, notably as President of the Société d'entomologie du Québec (1988), President of the Entomological Society of Canada (2004), and President of ESA's International Branch (2011). He has co-organized 26 symposia worldwide, and assumed ca. 50 positions or functions in various scientific societies. He has received numerous awards, including two Exceptional Service Awards from ESA (2000, 2007); Commandor, Order of Agronomical Merit from the Ordre des Agronomes du Québec (2009); a Gold Medal from the Entomological Society of Canada (2010); the Entomological Distinction Award from the Entomological Society of Quebec (2012); Foreign Member from the Académie d'Agriculture de France (2012); and the L.O. Howard Distinguished Achievement Award from ESA's Eastern Branch (2013).

He has lived happily with France Labrèche (a medical epidemiologist) for 40 years. They have two sons, Philippe (a chemist) and Louis (a physicist). His hobbies include reading (history, biographies, thrillers), listening to music, acoustic guitar, singing (occasionally in public), tennis, volleyball, and traveling.

ESA PROFESSIONAL AWARDS

Distinguished Achievement Award in Extension

This annual award recognizes outstanding contributions to extension entomology.

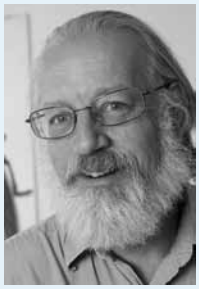
Dr. Linda Mason received her BS degree in wildlife ecology from the University of Florida, and her MS and PhD degrees in entomology at Auburn University and Louisiana State University respectively. Linda and her two very understanding daughters, Felicity and Jenna, reside in West Lafayette, IN, where she is an associate dean of the graduate school and a professor of entomology at Purdue University. Dr. Mason has an internationally recognized post-harvest extension program that provides innovative solutions for farmers, homeowners, and the food processing industry worldwide. She assists some of the leading food manufacturing and retail companies in the world on issues associated with food protection, food processing facility design, and pest management technology development.

Dr. Mason was a founding member of the Purdue interdisciplinary grain storage team that received both the Purdue University Cooperative Extension Specialists Association and Dean's Team Awards in 1999. S.L.A.M., the innovative training approach they developed, is now widely used in by extension educators all over the country. It emphasizes management strategies to control insect pests and reduce residual pesticides in food. Most recently she won the Mortar Board Women of Purdue award (2011), the Purdue University Cooperative Extension Specialists Association Career Award (2012), and the North Central Branch ESA Distinguished Achievement Award in Extension (2013).

Dr. Mason, in collaboration with her team of graduate students and international visitors, conducts research on pest management strategies such as grain chilling and ozonation, which capitalizes on pest biology and behavior vulnerabilities. Her educational programs have resulted in numerous referred publications, including two self-directed correspondence courses, post-harvest IPM training materials, fact sheets, and articles for trade journals and newsletters. She has provided over 500 presentations to audiences ranging from farmers to business managers to home owners and government regulators on topics ranging from pest biology to fumigation management.

Distinguished Achievement Award in Horticultural Entomology

This award, which is sponsored by Gowan Company, honors any ESA member who has contributed to the American horticulture industry.



Dr. Whitney Cranshaw is presently a professor and extension specialist of entomology at Colorado state University. For the past 30 years he has conducted a broadly based program largely directed at questions involving arthropod pests affecting horticultural commodities in Colorado, including vegetables, shade trees, turfgrass, and specialty crops. This has resulted in the production of over 80 refereed publications and several hundred related to extension and outreach. Included among the latter are the books *Pests of the West*, *Garden Insects of North America*, *Guide to Colorado Insects*, and, most recently, *Bugs Rule! An Introduction to the World of Insects*.

Whitney Cranshaw maintains an active extension presence throughout the state, annually addressing 30-50 audiences including master gardeners, arborists, turf care professionals, pest control operators, and vegetable producers. Increasingly, this has also included programs across the country and, following his discovery and 2008 description of thousand cankers disease of walnut (with Ned Tisserat), has involved considerable effort related to management and containment of this emergent threat to North American *Juglans*. On campus teaching includes an introductory class in entomology for non-science majors and the Horticultural Entomology Lab.

In the area of professional service, Whitney Cranshaw maintains the listserv discussion group OrnaEnt (co-founded with Mike Merchant) that provides a heavily used forum for over 220 professionals across the country with interests in subjects related to ornamental pest management. He is also an active participant in providing images through the BugWood/IPM Images system and in the promotion of insect common names through the ESA.

Distinguished Achievement Award in Teaching

This award is presented annually to the member of the Society deemed to be the most outstanding teacher of the year.

Dr. Timothy D. Paine is a distinguished teaching professor in the Department of Entomology at the University of California, River side. He received his BS in entomology and his BA in history from the University of California, Davis. After a brief flirtation with law school, he returned to UC Davis to obtain his PhD in entomology. Tim was a postdoctoral scientist at the University of Arkansas before joining the faculty at UC Riverside in 1986. His research contributions on insect herbivores of woody plants in urban landscapes and forest systems were recognized with both the Entomological Foundation's Recognition Award in Urban Entomology and the ESA Distinguished Achievement Award in Horticultural Entomology.

Tim has taught large (>500 students) introductory biology classes (Introduction to Organismal Biology and Introduction to Evolution and Ecology), a breadth science class for humanities and social science students (Natural History of Insects), upper division classes for entomology and biology majors (General Entomology and Insect Ecology), and a class in the entomology graduate core (Core Areas of Entomology III: Supraorganismal Disciplines). He took the lead in developing a new graduate class (Philosophy & Pedagogy of Teaching Undergraduate Life Science) as part of his strong commitment to undergraduate learning. Intended for graduate students interested in pursuing academic careers, the class explores the challenge of designing new life science courses and provides opportunities to implement approaches for active learning.

Tim's efforts in teaching innovation and developing new materials and methods have been recognized with all of the UC Riverside campus teaching awards (Distinguished Teaching Award in 2004, and Innovative Teaching Award 2010), and he was selected for membership in the UCR Academy of Distinguished Teachers in 2013. He was recognized as a National Academies Education Fellow in the life sciences in 2008-09. Dr Paine is a Fellow of both the AAAS and the ESA.

Distinguished Service Award to the Certification Program

This award encourages, recognizes, and rewards outstanding contributions to the ESA Certification Program and the professionalism of entomology.

Dr. Liz Dykstra is the public health entomologist for the Washington State Department of Health. She is the principle investigator for the state's Centers for Disease Control & Prevention-funded tick & tick-borne disease surveillance project, and she provides technical guidance on mosquito and mosquito-borne disease surveillance throughout the state. Dykstra also provides leadership and expertise on entomological and vector issues of public health importance for the state and represents the Department of Health on issues related to zoonotic and vector-borne diseases at meetings, workshops, invited presentations, committees, and conferences.

Dykstra is a graduate of Luther College, where she received her BA in biology. Following service as a Peace Corps volunteer in Senegal, West Africa, she earned her MS in epidemiology and her PhD in entomology from Texas A&M University, specializing in medical and veterinary entomology. Upon completion of her doctorate, she was commissioned an officer in the U.S. Navy. She served as an active duty entomologist for 6.5 years and continues to serve in the U.S. Navy Reserves, currently as the officer in charge of the 4th Medical Battalion Headquarters & Services Company, Detachment 6. She recently earned her diploma in joint professional military education from the Naval War College in Newport, R.I.

Dykstra is a Board Certified Entomologist in medical and veterinary entomology and is the ESA Pacific Branch Representative to the Certification Board, and she's the Division X Representative for the National Association of Vector Control Officials. She is also an adjunct associate professor in the Department of Entomology at Washington State University and a member of Phi Kappa Phi and Gamma Sigma Delta honor societies.

Early Career Innovation Award

This award, which is sponsored by BASF, honors young professionals working within the field of entomology who have demonstrated innovation through contributions within any area of specialization (research, teaching, extension, product development, public service, etc.).

Dr. John Tooker is an assistant professor and extension specialist in the Department of Entomology at Penn State University. He received his undergraduate degree from Bates College and graduate degrees from the University of Illinois at Urbana-Champaign under the supervision of Larry Hanks. He conducted postdoctoral research with Consuelo De Moraes at Penn State.

In his current position, his extension responsibilities involve helping farmers of Pennsylvania better manage insect pests that attack their field and forage crops. His research program mostly complements his extension efforts and has both applied and basic components, which are largely implemented by a set of outstanding graduate students. The applied portion seeks to understand local pest populations, the risks they pose to crops, and the value of different management options. His research group is particularly focused on scrutinizing new technologies for costs and benefits to stakeholders and understanding their environmental effects.

Current applied research projects focus on the value of crop genotypic diversity for insect control (student: Ian Grettenberger), the influence of insecticidal seed treatments on biological control of early season crop pests (Maggie Douglas), and the influence of volatile herbicides on insect populations (Eric Bohnenblust). His basic ecological research strives to better understand plant-herbivore-beneficial insect interactions because an improved appreciation of relationships among trophic levels will lead to alternative, ecologically sound insect-management strategies. Current basic research projects explore the ability of plants to perceive and respond to insect-produced volatile cues (Anjel Helms) and mechanisms driving foraging preferences of flower-visiting insect species (Anthony Vaudo).

Nan-Yao Su Award for Innovation and Creativity in Entomology

Each year this award is given to an ESA member who is able to demonstrate through his/her projects or accomplishments an ability to identify problems and develop creative, alternative solutions that significantly impact entomology.

Dr. Bryony C. Bonning is a professor of entomology at Iowa State University where she is director of the Center for Arthropod Management Technologies (CAMTech), a National Science Foundation Industry / University Cooperative Research Center. Bonning received her BS in zoology from the University of Durham, UK and her PhD in entomology from the London School of Hygiene and Tropical Medicine. She went on to postdoctoral appointments at the Natural Environment Research Council Institute of Virology in Oxford, UK and at the University of California, Davis. Bonning oversees cutting-edge research on insect physiology and insect pathology with the goal of developing novel, environmentally benign alternatives to chemical insecticides for insect pest management.

Her desire to see delivery of novel pest management solutions played a large part in her authorship of five patents and in the establishment of CAMTech to better align research conducted within academia with the need of industry for practical pest management solutions. Bonning has published more than 110 scientific papers, reviews, and book chapters on diverse subjects including insecticidal toxins derived from *Bacillus thuringiensis*, insect small RNA, genetic optimization of insect viruses for pest management, insect virus discovery, and the development of insect resistant transgenic plants. Recent research has drawn on the disparate fields of plant virus-aphid molecular interactions and insect toxins to produce two innovative hemipteran management technologies: the modification of *Bt* toxins to target hemipteran pests which typically have low susceptibility to native *Bt* toxins, and the use of the coat protein of an aphid-vectored plant virus for delivery of insect specific neurotoxins to their target site within the aphid hemocoel. A native of England, she is a Fellow of the ESA and of the American Association for the Advancement of Science.

Recognition Award in Entomology

This award, which is sponsored by Syngenta Crop Protection, recognizes entomologists who are making significant contributions to agriculture.

Dr. Richard Stouthamer is the author of more than 120 peer-reviewed papers and fifteen book chapters. Dr Stouthamer received his BS degree in environmental sciences in 1976, followed by a BS in biology in 1980 and an MS in biology in 1983, all from the Wageningen Agricultural University in the Netherlands. He did his PhD at UC Riverside under the guidance of Dr. R.F. Luck (1989), and following a postdoc at the University of Rochester with Dr. J.H. Werren, he went back to the Netherlands in 1991 to work in the Department of Entomology of the Wageningen Agricultural University. In 2001 he returned to the Department of Entomology at UC Riverside. During his PhD studies, he discovered the involvement of *Wolbachia* bacteria in causing complete parthenogenesis in parasitoid wasps. The study of the interaction between *Wolbachia* and parasitoid wasps has been a mainstay of his research since that time. He has also been involved in the study of several insect-transmitted bacterial diseases such as *Xylella fastidiosa* (Pierce's Disease), Candidatus *Liberibacter psyllaurous* (Zebra Chip) and most recently with tree branch-dieback caused by the ambrosia beetle *Euwallacea fornicatus* in trees in southern California. In addition, much of the work in his lab, done in cooperation with Dr. P.F. Rugman-Jones, involves the application of molecular genetic tools to easily distinguish cryptic species and determine the area of origin of invasive species.

Recognition Award in Insect Physiology, Biochemistry, and Toxicology

This award, which is sponsored by Apex Bait Technologies, Inc., was established in 1996 to recognize and encourage innovative research in the areas of insect physiology, biochemistry, and toxicology in the broad sense.

Dr. Subba Reddy Palli received his doctorate from the University of Western Ontario and postdoctoral training at the University of Washington. Upon graduation, he worked as a research scientist at the Canadian Forest Service's Great Lakes Forestry Centre and later at Rohm and Hass Company as the senior research scientist and group leader. Dr. Palli joined the University of Kentucky's Department of Entomology as an assistant professor in 2002 and was promoted to associate professor and professor in 2005 and 2008, respectively. He has received several prestigious awards at UK, including a University Research Professorship, the Thomas Poe Cooper Research Award, the Bobby Pass Excellence in Grantsmanship Award, the High Impact Research/Extension Award, and the Wethington Award. Dr. Palli also serves as the co-director of the Center for Arthropod Management Technologies, a recently established National Science Foundation Industry and University Cooperative Research Center.

His research focuses on hormonal regulation of gene expression in insects with a goal of identifying proteins that play key roles in signal transduction of ecdysteroids, juvenile hormones, and other hormones to use them for developing novel, environmentally safe pest management methods. He has published 125 peer-reviewed journal articles, 20 book chapters, and co-edited a book. He holds four patents and has nine patent applications under consideration. He has organized and chaired several symposia at ESA Annual Meetings and at international conferences. Dr. Palli also served as President of the ESA Physiology, Biochemistry, and Toxicology Section. He currently serves on the editorial boards of nine journals and has served on the grant review panels of the NSF, the USDA-National Research Initiative, and the National Institutes of Health.

ESA STUDENT AWARDS

Student Certification Award

Sponsored by PestWest Environmental Science, this award recognizes and encourages outstanding entomology graduate students with interest in the mission of the ESA certification program, and to promote the understanding and importance of the program.

Amanda Fujikawa has wanted to be an entomologist since she was five years old. She took her first official entomology class as an undergraduate at Casper Community College and continued at the University of Wyoming, graduating in 2006. Amanda received her MS from the University of Nebraska-Lincoln in 2009, where her research focused on the morphological changes of blood spatter through blow fly feeding and defecating, and the impact of insect stains on crime scene reconstruction.

Amanda is currently working on her PhD at the University of Nebraska-Lincoln. Her research (and life) consists of counting and watching tens of thousands of fly eggs hatch and develop at different temperatures. During the summer, she also surveys flies and beetles on rabbit and pig carcasses in the Great Plains, hoping to eventually study large vertebrate decomposition and the effect on grassland ecosystems. Amanda became a BCE-Intern during the summer of 2013. When not in the lab, Amanda's life is consumed by one very energetic four-year-old daughter, one not-so-energetic cat, and five noisy chickens.

Student Activity Award

Sponsored by Monsanto Company, this award is presented annually to recognize a student for outstanding contributions to the Society, his/her academic department, and the community, while still achieving academic excellence.

Carey Minteer received her BS in biology from the University of Central Arkansas, where her studies were concentrated in the field of plant biology. She received her MS in biology from the University of Arkansas. During her master's work, she worked with Dr. Johnnie L. Gentry and studied invasion biology with a concentration on invasive plants. For her MS research she investigated the effects of spotted knapweed on plants native to the southeastern United States. Carey recently completed her doctoral studies in the Department of Entomology at the University of Arkansas with a minor in geographic information systems. Her dissertation research, under Dr. Timothy J. Kring, focused on the biological control of spotted knapweed. Carey is very active within her community, her department, and the ESA.

Carey participates in many outreach activities for her department, including assisting local gardeners with insect problems at the local farmers' market, speaking at local elementary schools about the importance of insects, and speaking at the local botanical garden. Carey is also very involved with her community and has volunteered with many local and national organizations, including the American Cancer Society, the Humane Society, Hobbs State Park, and the Great Smoky Mountain National Park. Carey served on the Student Affairs Committee (SAC) of the Southeastern Branch of ESA, and she was Chair in 2011. During her time on that committee, Carey helped plan the student symposium and the Linnaean Games for the Southeastern Branch. Carey also served as Vice Chair and Chair of the ESA SAC, and she helped to organize the student symposium, the student debate competition, and the student reception for Entomology 2012 and Entomology 2013. Carey is currently a postdoctoral associate at the University of Arkansas' Rice Research and Extension Center in Stuttgart Arkansas.

John Henry Comstock Graduate Student Awards

These six awards are given to one graduate student from each ESA Branch to promote interest in entomology and to stimulate interest in attending the ESA Annual Meeting.

Elina Lastro Niño (Eastern Branch) received her PhD in entomology from Penn State University under the guidance of Dr. Christina Grozinger. Her dissertation research involved behavioral, physiological, and molecular characterization of factors affecting honey bee queen post-mating changes and queen-worker interactions. She is particularly interested in understanding the underlying molecular pathways regulating these changes and whether these changes are evident after the queen commences oviposition. She also studied factors that alter queen pheromone profiles and how this in turn regulates worker behavior and physiology which could affect colony status. During her postdoctoral appointment at PSU, Elina will expand on the findings of her doctoral research and will also examine socioeconomic factors affecting the establishment of honey bee breeding and stock improvement programs in the US. This research is supported by a USDA-NIFA postdoctoral fellowship. Elina is also very involved with outreach and extension, and she has received numerous fellowships, scholarships, and awards.

Kumaran Nagalingam (International Branch) is a behavioral and chemical ecologist with a strong interest in understanding the behavior of economically significant arthropods. His interests involve exploring the development of insect resistance to insecticides and insecticidal proteins, and integrated pest management. He is currently studying tephritid fruit flies within the team led by Associate Professor Tony Clarke to answer questions on the evolutionary and functional significance of male lures by examining transcriptional and physiological mechanisms underpinning behavioral changes seen in tephritids after ingestion of phytochemical lures.

Kumaran received his BS in 2004 and MS in 2006 from Tamil Nadu Agricultural University (TNAU) in India with a state government student project award. After graduation, he joined a research team at TNAU as a research fellow to work on insecticide molecules. He has also worked at the Central Institute of Cotton Research on the resurgence of sucking pests in transgenic cotton crops and resistance development in bollworms to *Bt* toxins. Kumaran is also interested in teaching, and has assisted in teaching undergraduate students experimental science and general entomology courses. He has published 12 papers in peer-reviewed journals, including one paper as lead author in Animal Behavior. Kumaran is pursuing his PhD at Queensland University of Technology (QUT). He won an Australian Entomological Society travel grant and QUT grant-in-aid to attend ICE 2012 in Daegu, South Korea.

Dr. Lisa Overall (Southwestern Branch) received her BS degree in biology from the University of Central Oklahoma. During her undergraduate studies, she was involved in research on carpenter and leafcutting bees. She went on to complete her MS and PhD at Oklahoma State University (OSU). Her master's research focused on the management of harlequin bugs and yellowmargined leaf beetles with organic insecticides. Under the supervision of Dr. Eric Rebek, her PhD dissertation focus was on the incidence of *Xylella fastidiosa* that causes Pierce's disease of grapes. This also included a survey of potential insect vectors and the identification of potential plant reservoir hosts.

At OSU, she has been active in departmental student organizations, campus-wide graduate student organizations, and both Southwestern Branch and national ESA activities. She served as the student representative for the OSU Department of Entomology and Plant Pathology for the Graduate and Professional Student Government Association and later as communications director. She has served as Co-Chair and Chair of the SWB ESA Student Affairs Committee (SAC) and has also served as SWB ESA Student Representative for the national ESA SAC. Lisa competed in the Linnaean Games from 2009 until 2012. In 2010, she was awarded the Women's Faculty Council Award at OSU, which is given for outstanding student research and scholarship. After earning her doctorate, she briefly participated in

research on the conservation of the American burying beetle. Lisa is currently a lecturer at Oklahoma State University and teaches Insect Biology and Classification and Insects and Society.

Dr. Paul Michael Bardunias (Southeastern Branch) grew up in Westchester County, New York in a suburban setting that provided a budding entomologist with an endless supply of insects to play with. He received his BS degree from the University of Miami, and his MS in entomology from the University of Kansas for work on three-dimensional path integration with Dr. Deborah Smith and Dr. Rudolf Jander. He earned his PhD in entomology and nematology from the University of Florida for his work with Dr. Nan-Yao Su to uncover the mechanics of self-organized excavation behavior in subterranean termites. He has authored 19 peer-reviewed papers and a book chapter, and he designed a protocol that is being implemented to protect endangered parrot species from Africanized honey bees in Central and South America, along with Caroline Efstathion and Dr. William Kern of the University of Florida. Paul is currently working as a postdoctoral associate for Dr. Scott Turner of the State University of New York's College of Environmental Science & Forestry. He is continuing his work on self-organization in social insects in collaboration with the Termes Project of the Wyss Institute at Harvard University by originating algorithms for autonomous construction in robots based on termite models. He is also adjunct faculty at Florida Atlantic University, where he passes on his knowledge of invertebrates in hopes of rearing a new crop of entomologists. In his spare time he pens articles on ancient Greek history.

Matan Shelomi (Pacific Branch) is a PhD candidate in the Department of Entomology and Nematology at the University of California, Davis. He joined the program after graduating *cum laude* with a bachelor's degree in organismic and evolutionary biology from Harvard University in 2009. His advisor is Prof. Lynn Kimsey, director of the Bohart Museum of Entomology, and his research is on the digestive physiology of the Phasmatodea, in particular their cellulolytic enzymes and the enigmatic "appendices of the midgut." He has also published papers on delusional parasitosis, morphometrics, and forensic entomology, and has given talks at every Pacific Branch and national ESA meeting since 2011, as well as at the International Science in Society Conference in Berkeley (2012), and the International Congress of Orthopterology in Kunming, China (2013).

Shelomi is a National Science Foundation graduate research fellow, and has twice won the NSF East Asia and Pacific Summer Institutes Fellowship—once to work at the National Institute of Agrobiological Sciences in Japan, and again to work at Academia Sinica in Taiwan. He serves on UC Davis's ESA Student Debate team and the Linnaean Games team. Shelomi has organized and taught freshman seminars at UC Davis, and will be taking a position as graduate writing fellow. He has also written for the *California Aggie* (the Davis school newspaper), and is a top entomology expert on the Q&A website Quora.com. Due to graduate in 2014, he is currently seeking postdoctorate or professorship positions.

Dr. Nicholas M. Teets (North Central Branch) is currently a postdoctoral associate in the Department of Entomology and Nematology at the University of Florida, under the direction of Dr. Daniel A. Hahn. Teets earned his PhD in entomology in December of 2012 from Ohio State University, advised by Dr. David L. Denlinger. Teets' research focuses on the environmental stress physiology of insects, including transcriptional, metabolic, and cell-signaling events that allow insects to survive unfavorable conditions. As part of this effort, he has twice traveled to Palmer Station in Antarctica to study mechanisms of stress tolerance in the Antarctic midge, *Belgica antarctica.* He currently has 14 peer-reviewed papers published or in press and has presented his work at numerous professional meetings.

Outside of research, Teets has led the laboratory portion of the graduate level insect physiology course at Ohio State and has also instructed summer entomology courses for high school students through the PAST Foundation, a non-profit organization promoting STEM education for underprivileged high school students. Teets has engaged in professional service both at Ohio State and in the scientific community at large, particularly with ESA. He served on the ESA Student Affairs Committee for two years, and in this capacity he organized and moderated a symposium called "Identifying and Clarifying Emerging Technologies for Entomological Research: From Molecules to Landscapes" at the 2011 ESA Annual Meeting in Reno, NV.

THE STINGER AWARDS
(2013 Finalists)

These awards are given to the winners of the YouTube Your Entomology video contest. This contest gives ESA members the opportunity to showcase their talents and creativity through video. The winners will be announced at the Founders' Memorial Plenary Session and will be determined from the following finalists in each of the four categories:

Instruction Category
"Tritrophic Interactions"
By Rob Morrison, Krista Buehrer, Keith Mason, Chris Adams, Dan Hulbert, Shahlo Safarzoda, and Zsofia Szendrei
Michigan State University

Discovery Category
"Ant War Captured On Video"
By Rachelle Adams and Anders Illum
University of Copenhagen

"Parasitoid Activity"
By Justin Bredlau
Virginia Commonwealth University

Outreach Category
"Bagrada Bug Biology, Damage and Control"
By Surendra Dara
University of California, Davis

"Get Your Paws Off My Asparagus: The Asparagus Miner"
By Rob Morrison
Michigan State University

"Join the Resistance Against the Soybean Aphid -- Host Plant Resistance, That is!"
By Cable Hardin (South Dakota State University), Thelma Heidel-Baker and Erin Hodgson (Iowa State University)

Open Category
"Agastya the Entomologist"
By Kyle Parks and Michelle Duennes
University of Illinois at Urbana-Champaign

"Bed Bugs Bite"
By Buyung Hadi and Cable Hardin
South Dakota State University

"Mandibles 2: Sweeping With the Enemy"
By Wendy Johnson and Brian McCornack
Kansas State University

THE MONSANTO RESEARCH GRANT AWARD

This award grants funds to outstanding ESA student members who are undertaking research projects. The funds may be used for salaries, equipment, supplies, or travel to initiate, accelerate, augment, or expand a research project.

María Cristina Carrasquilla was born and has lived most of her life in Bogotá, Colombia. From a young age she was exposed to entomology as her mother has worked as a medical entomologist for several decades. Furthermore, growing up in Colombia, where vector-borne diseases like malaria, dengue, leishmaniasis, and American trypanosomiasis represent a public health problem, made her interest towards medical entomology grow even more. She received a BS degree in biology at Universidad de los Andes, Colombia (2002), performing undergraduate research on river otter ecology, and subsequently worked as a young researcher in the entomology laboratory of the Instituto Nacional de Salud (National Institute of Health) on a project focused on evaluating impregnated bed nets as a control measure for leishmaniasis. She received her MS in biological sciences at Universidad de los Andes (2008), with thesis research on the ecology and control of biting midges (Ceratopogonidae).

María Cristina is currently pursuing a PhD in entomology with Dr. Phil Lounibos as her advisor and Dr. Jorge Rey as her co-advisor at the Florida Medical Entomology Laboratory, University of Florida, studying reproductive interference between invasive mosquito vectors. Her graduate committee has guided an interdisciplinary approach that integrates ecology, physiology, and evolution. She wants to maintain an interdisciplinary perspective in her research with a career goal of research and teaching in Colombia, working in association with national and international researchers, students, health authorities, and local communities. María Cristina is very grateful to the Entomological Society of America and Monsanto; the Monsanto Research Grant Award will greatly enhance her current PhD research project.

Jeff Grabowski is a PhD candidate at Purdue University working with the vector biology and structural biology programs of Drs. Catherine Hill and Richard Kuhn. Jeff's PhD research focuses on tick-flavivirus interactions and is supported by a National Science Foundation Graduate Research Fellowship, an Indiana Clinical and Translational Sciences Institute (ICTSI) Predoctoral Training Grant, and an ICTSI Core Pilot Grant. His interdisciplinary research utilizes the genome sequence of the Lyme disease tick, *Ixodes scapularis*, and the use of a model tick-borne flavivirus. Potential application of this research includes the development of new approaches for the control of arachnids and tick-borne flaviviruses.

Jeff joined the Purdue University Interdiscplinary Life Science PhD program in 2009 after receiving his BS in biology with a minor in chemistry at Manchester University. He first became interested in vector biology as an undergraduate when he undertook an NSF Research Experience for Undergraduates project in Millbrook, NY at the Cary Institute of Ecosystem Studies, an independent environmental research organization. Jeff completed a field-based study to assess the distribution of *Ixodes scapularis* nymphs in Dutchess County, NY. Subsequently, his senior thesis involved a survey of tick species and *Borrelia burgdorferi* (the bacterium that causes Lyme disease) in southern Kosciusko County, Indiana.

Jeff has made numerous oral and poster presentations on his PhD research at national and regional meetings. He currently serves as a member of the scientific user advisory group to the NIH/NIAID-funded Influenza Research Database/Virus Pathogen Resource database. Since arriving at Purdue, Jeff has participated in numerous scientific outreach activities, most notably as a "Disease Detectives" presenter on the award-winning Purdue zipTrips Program, which is designed to provide middle school students with a virtual field trip to Purdue University.

Erika Machtinger is a PhD student at the University of Florida. She received her BS from the University of Delaware in wildlife conservation and her MS in entomology from the University of Florida. Erika was raised a stone's throw from Acadia National Park. The natural areas surrounding the coast of Maine fostered Erika's love of the environment and wildlife. Erika has worked at the USDA-BIIRL Laboratory in Newark, DE and also as a wildlife biologist and environmental scientist. Erika has been an avid equestrian for over 26 years and has competed on national and international levels. Because of her background with horses, involvement in the equestrian community, and interest in insects and biological control, Erika has been focusing her research on biological control of filth flies in equestrian properties in Florida.

Erika was awarded the best MS Thesis and Outstanding MS Student Scholarship in the University of Florida Department of Entomology and Nematology for her pioneering work with filth fly management on small equine farms in Florida. With the support of Dr. Norm Leppla and Dr. Chris Geden, she is continuing her work by focusing on the olfactory stimuli associated with host location by pteromalid pupal parasitoids of filth flies. Erika has received seven research grants for her work and has received three first-place honors for paper and poster presentations from the Florida Entomological Society and the Southeastern Branch of ESA. She has published 13 papers in refereed scientific journals and extension. Erika is an also an active member of ESA, serving as a Co-Chair of the Student Affairs Committee for the Southeastern Branch. She is also the Supervisory TA for six sections of the Principles of Entomology Laboratory offered through the University of Florida.

Chandra Moffat is a PhD student at the University of New Brunswick, where she studies the process of host-associated differentiation. Specifically, she is interested in how herbivorous insects accept new host plant species into their diets, how new specialist insect species result from novel host use, and how host use differs as insects progress through evolutionary divergence.

Chandra's interest in entomology began while at the University of Victoria (BS, 2008), where she participated in three cooperative education work terms with Agriculture and Agri-Food Canada, first researching behavioural responses of wireworms to IPM, and then investigating the effects of temperature

perturbations on an experimental greenhouse community. Chandra then worked as a research assistant for Natural Resources Canada, detecting and preventing the spread of foreign and invasive insects in Canada; and then for CABI Europe-Switzerland, studying the biological control of canola pests. Chandra completed her MS in 2012 at the University of British Columbia, Okanagan. Her thesis investigated the ecological host range patterns of host plant selection by a candidate weed biocontrol agent (*Aulacidea pilosellae*; Hymenoptera: Cynipidae). Chandra is committed to engaging her peers in the activities of entomological societies.

She has served as the student representative for the Canadian Forum for Biological Control, the Entomological Society of British Columbia, and the Entomological Society of Canada (ESC). She has also served as the Chair or Co-Chair of the ESC Student Affairs Committee since 2010. Chandra has been a member of the Entomological Society of America since 2009 and a University Student Representative for the Eastern Branch since 2012. As part of the ESC Student Affairs Committee, Chandra is currently pursuing opportunities for international student engagement in ICE 2016.

Chelsea Wright obtained her BS in biology at Old Dominion University in 2010. While there she performed undergraduate research in Dr. Wayne Hynes' lab surveying the southeastern Virginia tick population for various tick-borne pathogens. She soon became fascinated by ticks and the pathogens they carry and joined the biomedical sciences PhD program, performing research in the labs of Dr. Wayne Hynes and Dr. Holly Gaff. Her dissertation research primarily focuses on the interaction between rickettsial organisms in hard (*Ixodid)* ticks in the United States, specifically the Gulf Coast tick, *Amblyomma maculatum*, and the lone star tick, *Amblyomma americanum*. Ms. Wright anticipates graduating in 2014 and has great interest in continuing her research in the field of vector-borne diseases.

MONSANTO STUDENT TRAVEL AWARD

The purpose of this award is to promote interest in entomology at the graduate level and to stimulate interest in attending ESA's Annual Meeting.

Zachary DeVries was born in Columbus, Ohio, but raised in Auburn, Alabama. As an undergraduate at Auburn University, Zach jumped right in to field work, exploring his interests in biology. Zach worked for Dr. Rusty Wright, assisting teams collecting fish throughout Alabama, particularly the Mobile Delta. During his undergraduate career, Zach also worked for Dr. Craig Guyer, assisting in the construction of cages for the reintroduction of the eastern indigo snake to previously occupied habitats in southern Alabama. Zach later began conducting research with Dr. Ray Henry, studying the physiology and behavior of giant aquatic salamanders. Zach completed his BS degree in zoology with a minor in statistics in 2011.

He enjoyed his work in biological sciences, but was ultimately attracted to the more applied aspects and fascinating diversity of entomology. He thus began his master's degree in entomology at Auburn University, working with Dr. Art Appel. His research focused on the physiology of urban pests, such as silverfish, firebrats, and bed bugs. His work has led to some interesting discoveries about the metabolism of these species as well as numerous collaborations with other departments and universities. Zach completed his master's degree in entomology in 2013 and is now continuing his studies as a doctoral student, working with Dr. Coby Schal of North Carolina State University. During his PhD, Zach intends to continue his research on the physiology of urban pests.

Sandipa Gautam has a BS in agriculture from Tribhuwan University in Chitwan, Nepal. She obtained her MS in entomology from Oklahoma State University under the mentorship of Dr. George Opit. Her MS research focused on investigating the biology and ecology of stored-product psocids, which are small insects that have emerged to become serious stored-product pests worldwide in the last three decades. Sandipa is currently working on her dissertation entitled "Circumventing ovicidal deficiencies of fumigants during postharvest fumigations" at Oklahoma State University under the mentorship of Drs. George Opit and Spencer Walse. Her research has yielded exciting data on a possible relationship between respiratory structures on the surface of the egg and efficacy of fumigants, and elucidating why eggs of some stored-product insects are tolerant to fumigants. Sandipa's research represents a critical first step in understanding the role that egg morphology plays in efficacy of fumigants and the development of methods that can be used to overcome ovicidal deficiencies of fumigants.

Sandipa is active within ESA and has presented results of her research at Branch and national meetings and in the *Annals of Entomological Society of America; Journal of Economic Entomology; Environmental Entomology; Entomology, Ornithology, and Herpetology; Fumigants and Pheromones; Proceedings of International Organization for Biological and Integrated Control – Integrated Protection of Stored Products;* and *Proceedings of the International Working Conference on Stored Product Protection.* She has won student competition prizes in seven presentations out of 16. She was also the recipient of the 2012 ESA ICE travel award and the 2011 Oklahoma State University Graduate Research Excellence Award.

Chet Joyner grew up on his family's farm in rural Georgia, where he developed an interest in biology as a child. During high school, he was selected to participate in the Georgia Governor's Honors Program and did a summer research project at Valdosta State University. This experience left Chet with a passion for biology and research, and he decided to pursue his BS in biology at Georgia Southern University. At GSU, Chet completed his undergraduate thesis with Dr. Dana Nayduch on house fly-microbe interactions, where he investigated fly antimicrobial responses after ingestion of *Pseudomonas aeruginosa*. This work has been submitted for publication. In addition, Chet co-authored two house fly publications in the *Journal of Medical Entomology* this year, and is a coauthor on two submitted manuscripts that involve house fly antimicrobial responses.

Chet graduated from GSU *summa cum laude* and as a University Honors Program Scholar. He received four internal fellowships at GSU and one summer fellowship for biomedical research from Georgia Regent's University. Additionally, Chet served as a mentor for five high school, master's, and undergraduate students and has presented at two national meetings and one regional meeting, along with numerous presentations while at GSU. He is a previous runner up, and then first-place President's Prize winner (MUVE Section) at Entomology 2011 and 2012, respectively. Currently, Chet is a PhD student in the laboratory of Dr. Mary Galinski at Emory University in the Immunology and Molecular Pathogenesis program where

he is working with the vector-borne protozoan *Plasmodium*, the causative agent of malaria. Chet is continuing to pursue his passion for vector-borne diseases. He is currently a graduate student member of the Malaria Host-Pathogen Interaction Center led from Emory University, and his research is focused on innate immune responses and liver-stage biology.

Rob Morrison is originally from Mesa, Arizona, and he developed an immense appreciation for the natural world from a young age. By high school, he knew that he wanted to be a biologist. Rob graduated with his bachelor's degree in biology *cum laude* from Kalamazoo College in 2006. His senior thesis centered around finding indicator arthropod species of overall invertebrate richness in Michigan old field sites. Since college, Rob has been highly interested in questions of arthropod diversity as well as chemical ecology. After graduating, Rob pursued a research internship at the Archbold Biological Station, dealing with how grazing affects the diversity and abundance of macroinvertebrate communities in Florida wetlands. He graduated with his MS in ecology, evolutionary biology, and systematics from the University of Munich in Germany in 2009. Rob's thesis focused on the ecological, genetic, and chemical divergence between two closely related species of ants.

In 2010, Rob began a PhD program at Michigan State University in the Department of Entomology. His dissertation focuses on the integrated pest management of the asparagus miner, a pest that poses serious problems for the asparagus industry. Using a combination of different approaches, including conservation biological control, chemical and ecological analysis, as well as the development of a degree-day model, Rob is attempting to develop alternative approaches to controlling the asparagus miner. He is expected to graduate in May, 2014 and is actively looking for a postdoctoral position in academia or government. While in his program, Rob has developed a passion for outreach to the public and educating the next generation of scientists. Rob had the privilege of marrying his best friend over a year ago, and in his free time he is an avid photographer and hiker.

Diane Silcox, as the daughter of an entomologist, grew up with a love for insects. During a summer research program at Miami University, she discovered how interesting insects were and that there is much to learn about them. She found her love of turfgrass while spending time with her father, taking cup-cutter cores to sample for annual bluegrass weevil larvae. She found this work fascinating and decided to explore entomology departments that had faculty who specialized in turfgrass entomology. In May of 2008, she moved to Raleigh, North Carolina to begin her master's with Dr. Rick Brandenburg. She spent two years in North Carolina researching the response of the tawny mole cricket to synthetic insecticides. She found some interesting avoidance behaviors by mole crickets to toxic synthetic insecticides, but apparently little avoidance to non-toxic insecticides.

In January of 2011, she successfully defended her master's thesis and decided to stay at NC State for her PhD. Her research focuses on the ecology and behavior of the hunting billbug in warm-season turfgrass. She is primarily investigating the feeding behavior and environmental factors that affect their development. Understanding this pest's biology will allow us to develop a cost-effective and environmentally-sound management plan. Upon graduation she will be seeking employment near College Station, TX where her husband is a faculty member at Texas A&M.

USDA-AFRI STUDENT TRAVEL GRANT

This travel grant award for Entomology 2013 is funded by USDA-NIFA's Agriculture and Food Research Initiative Program on Plant-Associated Insects and Nematodes. It was created to provide financial support to graduate students for new networking, presentation, and research opportunities at Entomology 2013.

Maggie Douglas started her academic career at Oberlin College, where she studied biology. Following several years advocating for sustainable agriculture in the non-profit sector, she was introduced to the world of insect ecology through the labs of Drs. Bob Denno (University of Maryland), John Lill (George Washington University), and Gina Wimp (Georgetown University). Seeing an opportunity to meld her interests in insects and agriculture, she pursued a master's degree at Penn State University under Dr. John Tooker, where she was part of an interdisciplinary cropping systems project where she studied the ecology of slugs and their natural enemies in no-till agroecosystems. Toward the end of her master's degree, she became interested in the potential non-target effects of neonicotinoid seed treatments on natural enemies, particularly through trophic transfer of toxins via tolerant herbivores. This topic forms the basis of her current dissertation work at Penn State, where she is pursuing a dual degree in entomology and international agriculture and development.

Erica Kistner is a fifth year PhD candidate at the University of Notre Dame (Department of Biological Sciences). As part of her broad interests in population and disease ecology, her dissertation research investigates the conditions in which pathogens may limit host populations. She uses a grasshopper fungal pathogen model system to examine host-pathogen dynamics at the environmental, host, and pathogen levels. She has been conducting field experiments that examine how the entomopathogen *Entomophthora macleodii* limits the clear-winged grasshopper (*Camnula pellucida*), an agriculture/rangeland pest in western Montana since 2010. Her past research indicates that host dynamics, mechanical carriers (ants), and abiotic conditions affect host limitation in this grasshopper/fungal pathogen system.

In addition, she has found evidence suggesting climatic warming could reduce fungal pathogen reduction of host numbers. She is currently writing the remainder of her dissertation and building a mechanistic model that predicts *E. macleodii* outbreaks under future climate change. She will receive her PhD in May, 2014, and she is currently seeking postdoctoral positions.

Laura L. Ingwell is an entomology PhD candidate at the University of Idaho. Her doctoral research examines host plant-virus-vector interactions in the barley yellow dwarf virus-*Rhopalosiphum padi* pathosystem. Working under the mentorship of Nilsa A. Bosque-Pérez, she recently reported for the first time that acquisition of a plant virus by a vector directly influences the behavior of an insect vector, as highlighted in their recent paper in *Scientific Reports*.

Laura graduated from the University of Wisconsin-Milwaukee with a BS in biology and a minor in chemistry in 2006. Prior to graduate school, she studied liana dynamics in tropical forests in Costa Rica and Panama with Stefan A. Schnitzer. She received her MS from the

University of Rhode Island under the guidance of Evan L. Preisser in 2009, conducting research on resistance in eastern hemlock to the invasive hemlock woolly adelgid. Her doctoral research is examining the behavioral responses of virus vectors to virus infection of host plants. She has also examined the prevalence of barley yellow dwarf virus in nonmanaged ecosystems, including the endangered Palouse Prairie in Idaho and Washington, and the susceptibility of native and introduced grasses to the virus. More broadly, her research interests are rooted in community dynamics and trophic interactions, plant-insect interactions, insect vectors of plant pathogens, and the impacts of invasive species on community structure and function.

Laura considers herself to be an entomologist and community ecologist with research focused on plant-insect interactions in an applied context. She is the recipient of the ESA Pacific Branch's 2013 Student Leadership Award. Upon the completion of her PhD at the University of Idaho, she will be working as a postdoctoral research associate with Ian Kaplan at Purdue University, focusing on biological control of insects in high tunnel agricultural production of vegetable crops.

David Lowenstein is a graduate student at the University of Illinois under the guidance of Dr. Emily Minor. David's research interests include the roles of insects in agroecosystems and the interactions between hymenopterans and plants. He has collaborated with a diverse group of stakeholders, from ginseng growers in Wisconsin to urban gardeners in Illinois. His interests in entomology began after participating in an independent research project studying biological control of the Colorado potato beetle. David received a master's in entomology from the University of Wisconsin-Madison under the direction of Dr. Russell Groves. During that time, he sampled wild bees in pickling cucumber and studied the impact of land cover on wild bee populations.

Currently, he is investigating pollination services in urban neighborhoods and the interaction between land cover, yard management decisions, and pollinators. David promotes the importance of insects and their ecosystem services in urban areas. The high rate of vacant lots in the urban core brings opportunities to repurpose some of this land for agricultural enterprise, and he aims to study how changes in land use will impact the pollinator and parasitoid communities. Ultimately, David's goal is to broaden the public's knowledge of plant-pollinator interactions and the conservation of beneficial insects in agriculture through a combination of research and extension.

Erin Morris received her MS in entomology from the Ohio State University in 2005. Her MS project was conducted under the supervision of Dr. Parwinder Grewal and focused on the use of entomopathogenic nematodes and fungi to control invasive Japanese beetles (*Popillia japonica*). Currently, Erin is a PhD candidate in entomology at Cornell University in Ithaca, New York, working under Dr. Ann Hajek. For her dissertation research, she has continued to focus on nematodes as biological control agents, concentrating on *Sirex noctilio*, an invasive pest of pine trees. The parasitic nematode *Deladenus siricidicola* is under consideration for release in the United States, and Erin is investigating the potential for non-target effects, better ways to mass-produce the nematode, and potential hurdles to successful control. To do this, she is investigating the numerous interactions between invasive *S. noctilio* woodwasps, their nematode parasites, and the symbiotic fungi with which the woodwasps kill pine trees. Methods she has used to answer these questions include the development of molecular identification techniques for parasitic nematodes, nematode reproduction assays, fungal culture, and phylogenetic analysis, as well as fluorescence and cryogenic scanning electron microscopy. She expects to graduate with her PhD this fall, and is currently looking for postdoctoral opportunities in invertebrate pathology, biological control, or nematology.

Mia Park, a PhD candidate at Cornell University's Department of Entomology, is following through on a career that began as a child exploring a fascination with nature. Completing her degree next summer is the icing on the cake of previous layers of study: a BS in environmental studies from University of California, Davis, and an MS in natural resources from Cornell University. Mia's research work is motivated by a passion for insect conservation and a commitment to promote wise management of our natural resources with sound science. Her dissertation, which investigates the importance of wild bees for apple pollination, has unearthed important facts about the effects of pesticides, as well as grower knowledge and attitudes. Actively advocating for the importance of wild agricultural pollinators, Mia has been outspoken through talks around New York state and through a well-received handbook that she produced entitled *Wild Pollinators of Eastern Apple Orchards and How to Conserve Them.*

Mia has received several research awards and fellowships, including a College of Agriculture and Life Sciences Land Grant Extension Fellowship. For the Entomological Society of America, she has served as a national meeting volunteer, moderator, program symposium co-organizer, and journal reviewer. Service in her community includes supporting events that encourage women in science and that engender appreciation of insects. At the bottom of all this study and activity, Mia simply loves insects because of the boundless sense of discovery that comes from studying them.

Chris Philips grew up in north Texas and completed his BS in entomology from the University of Delaware in 2007. He graduated with his master's degree in entomology from the University of Delaware in 2010, where he worked with Dr. Douglas Tallamy investigating the impact of nonnative plants on native insect communities. In 2010, he began his PhD in the Department of Entomology at Virginia Tech, where he was co-advised by Drs. Thomas Kuhar (vegetable entomologist) and Ames Herbert (field crops entomologist). Working with these two diverse programs enabled him to gain a wide variety of experience in pest management decision-making and control strategies.

In August, 2013 Chris successfully defended his dissertation, which focused on investigating the efficacy of ecologically-based pest management in different agroecosystems. He recently accepted a postdoctoral research associate position at Washington State University working with Dr. Bill Snyder to investigate the ecological basis of natural pest control in organic farming systems. His research interests focus on agricultural land management practices and their impact on insect ecology. He is particularly interested in how plant-provided resources and habitat heterogeneity influence predator communities and the impact of predator-predator interactions on pest suppression in agroecosystems. Ultimately, he hopes to work in academia and interface with industry to conduct applied and theoretical research that addresses agricultural and land management issues to improve our ability to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

Loren Rivera Vega is a PhD candidate in entomology with a dual degree in international agriculture and development at Penn State University. She obtained her bachelor's degree in agriculture at the Escuela Agricola Panamericana (Zamorano) in Honduras in 2007. In 2011, she completed her master's program at Ohio State University, working on the comparative transcriptomics of North American and Asian ash (*Fraxinus* spp.) trees for identification of potential resistance to emerald ash borer (*Agrilus planipennis*). During this time she published three first-author journal articles and collaborated on four others. She is currently studying the effect of host plants on the composition of saliva in the cabbage looper (*Trichoplusia ni*) and its impact on plant defenses. Her research interests focus on understanding the factors that affect plant defenses against insect herbivores and the social impact of scientific advancement in developing countries.

Suhas Vyavhare received his bachelor's in agriculture from the College of Agriculture in Pune, India and his master's in plant, soil, and environmental science from West Texas A&M University. For his master's, he worked on screening of sorghum genotypes for resistance to maize weevil under the guidance of Dr. Bonnie Pendleton.Currently he is a PhD candidate (entomology) at Texas A&M University, where he is being co-advised by Drs. R. F. Medina and M. O. Way. Suhas' research focuses on the development of an integrated pest management program for redbanded stink bug (RBSB), an invasive insect pest of soybeans in the southern U.S. For this project, he is conducting field-cage experiments to study insect-plant interactions for the last three years. Also, he is working on the insecticide resistance monitoring program for RBSB in Texas soybeans and investigating resistance mechanisms of this pest to pyrethroid and organophosphate insecticides.

Recently, Suhas received the College of Agriculture and Life Sciences Dean's Outstanding Achievement Award for Graduate Research at TAMU. Suhas has over three years of experience in designing and conducting field research evaluating insecticide efficacy, promising seed treatments, and germplasm screenings for insect resistance in soybean. He is interested in agricultural entomology, especially insect toxicological aspects such as development of novel insect control strategies and insecticide resistance management. He has written research grants and has published research in scientific journals, extension bulletins, newsletters, and insect management guides. He has also organized research symposia and delivered oral presentations at professional conferences, extension meetings, and field days. He is also a part of TAMU's Linnaean Games and Student Debate teams. Besides academia, Suhas enjoys playing cricket and photography. In 2012, he represented TAMU in the American College Cricket National Championship in Fort Lauderdale, FL.

Stephanie R. Weldon is a PhD candidate in the University of Georgia's Department of Entomology, working under the auspices of Dr. Kerry Oliver. A native of New Orleans, Stephanie has been enjoying Georgia's hospitality for eight years at this point, as she earned her BS in biology at Emory University in Atlanta with the aid of a Robert W. Woodruff merit scholarship. Stephanie's primary area of research is on mobile genetic elements in facultative defensive bacteria in aphids, with a side line in the biology of host-sharing by multiple mutualist species. Apart from her research, Stephanie is the current UGA representative to the Southeastern Branch of the ESA's Student Affairs Committee, and she chairs the subcommittee on student symposia.

In 2011, she acted as team captain for the ESA Student Debates' Overall Best Debate Team. In 2012, she was a member of UGA's Linnaean Games team when they won the national championship—she will never live down the fact that she forgot Jeff Goldblum's name when ringing in to answer a question about *The Fly*. Stephanie has previously won competitive funding for research and travel from the UGA graduate school, the College of Agricultural and Environmental Sciences, and the NextBio Corporation. She was also recently named the UGA Entomology Department's PhD student of the year, and has presented her graduate work at eight professional conferences. When not at either the computer or the lab bench, Stephanie enjoys collecting books and performing dangerous cooking experiments.

The Entomological Foundation is pleased to announce the winners of its 2013 awards. The awards will be presented at Entomology 2013, the 61st Annual Meeting of the Entomological Society of America in Austin, TX, from November 10–13, 2013.

ENTOMOLOGICAL FOUNDATION PROFESSIONAL AWARDS

Entomological Foundation Medal of Honor

This award is the highest award presented by the Foundation and is given only to those who have attained preeminence in the field through outstanding contributions.

Mr. John Acorn was born in Edmonton, Alberta in 1958 and has been fascinated with animals since a very early age. He still lives in Edmonton, with his wife Dena and their two sons, Jesse and Benjamin. John is perhaps best known as the writer and host of the television series *Acorn, The Nature Nut*, a family-oriented, how-to-be-a-naturalist show. He also hosted *Twits and Pishers*, a travel show for bird watchers, as well as the gallery videos of the Royal Tyrell Museum of Paleontology. John has written 17 books, including many well-received field guides, and he produces a regular column, *The Terminal Segment*, for *American Entomologist*. These days John teaches at the University of Alberta and continues his involvement with public communication in a variety of forms.

John is the recipient of NSERC's Michael Smith Award for Science Promotion, the University of Alberta's Distinguished Alumni Award, two "Rosies" (as Best Host in the Alberta Motion Picture Industry Awards), and two nominations for Canada's national television award, the Gemini. The Royal Society of Canada, the Canadian Society of Zoologists, and the Entomological Society of Alberta have all recognized his contributions to public education.

Award For Excellence In Integrated Pest Management

This award, which is sponsored by Syngenta Crop Protection, is based on outstanding contributions which have a direct relation to integrated pest management (IPM).

Dr. Douglas B. Walsh received his BS in biology from the University of California, Santa Cruz in 1985 and his PhD in entomology from the University of California, Davis in 1998. Dr. Walsh was hired as an assistant professor at Washington State University in 1998. He is currently a professor of entomology at WSU, holding a 50% organized research/ 50% extension academic appointment.

Dr. Walsh is the research director of the Environmental and Agricultural Entomology Laboratory located at the Irrigated Agriculture Research and Extension Center in the Yakima Valley near Prosser, Washington. He is the extension integrated pest management coordinator for Washington State and the Washington state liaison representative to the USDA IR-4 Program. Dr. Walsh has an extensive and varied IPM research and extension program, assisting regionally important commodities including hops, alfalfa, grapes, mint, and livestock. Dr. Walsh also directs environmental impact studies on alfalfa leafcutting and alkali bees, the key pollinators of alfalfa produced for seed. Dr. Walsh's efforts in IPM have resulted in the reduction of over 100,000 pounds of insecticide use in the Pacific Northwest annually. Dr. Walsh serves on various advisory boards including the National Alfalfa and Forage Alliance, Salmon Safe, and LIVE (low input viticulture and enology) programs.

Dr. Walsh has served the Pacific Branch of the ESA as President in 2010, Executive Committee Member (2007-2009), Nominations Committee Chair (2010-2011), Representative to the National Awards Committee (2006-2009), and Awards Canvassing Chair (2001-2006 and 2011). Recently Dr. Walsh was selected to represent the Pacific Branch on the ESA Governing board from 2014 through 2016. Dr. Walsh accounts his success as a scientist to the mentoring he received from the University of California, exceptional colleagues, hard working staff and graduate students, loving friends and family, and rock solid support from Washington State University and the commodity organizations he serves.

Integrated Pest Management Team Award

This award, which is sponsored by Dow AgroSciences, recognizes the successful pest-control efforts of a small, collaborative work team which includes at least one entomologist from the private sector and one from the public sector.

The Risk Assessment of *Bt* Plants on Beneficial Non-target Arthropods (NTA) IPM Team members include Jörg Romeis (Agroscope, Switzerland), Anthony M. Shelton (Cornell), Steven E. Naranjo (USDA-ARS), Richard L. Hellmich (USDA-ARS), Morven A. McLean (Center for Environmental Risk Assessment, USA), Alan Raybould (Syngenta, UK), Marco P. Candolfi (Innovative Environmental Services, Switzerland), Jian J. Duan (USDA-ARS), Joseph E. Huesing (USAID/BFS), and Raymond J. Layton (Pioneer Hi-Bred, USA).

The NTA IPM team has significantly enhanced the environmental risk assessment of *Bt* crops. They have developed research and outreach information needed by scientific and regulatory communities to understand potential risks and benefits of *Bt* crops to beneficial non-target arthropods (NTA). The team developed a science-based framework for assessing the potential risks by Bt proteins (and future insecticidal compounds) on beneficial NTAs, made a proposal on how to select surrogate species for laboratory toxicity studies, developed a guidance document on the design criteria for robust and reliable laboratory studies, and conducted non-target studies in the laboratory and in the field on a broad community of species. Additionally, existing data sets from laboratory and field studies throughout the world were analyzed that showed currently used *Bt* crops do not cause any unexpected detrimental effects on predators or parasitoids or on the biological control function they provide.

These analyses also helped to validate the tier-testing system used by various regulatory agencies. In crops where the introduction of *Bt*-transgenic varieties results in significant reductions of insecticide applications, clear benefits on arthropod abundance in general, and natural enemies in particular, were found. *Bt* crops have become a valuable component of IPM by contributing to natural enemy conservation while at the same time protecting the crops from targeted pests. Overall, the assessment and testing approaches developed by the team will enhance the robustness and rigor of risk assessment and thus increase the environmental safety of *Bt* crops and other novel transgenic crops in the future.

Henry & Sylvia Richardson Research Grant

This grant provides research funds to postdoctoral ESA members who have at least one year of promising work experience, are undertaking research in selected areas, and have demonstrated a high level of scholarship.

Dr. Doo-Hyung Lee is a postdoctoral research associate at USDA-ARS, Appalachian Fruit Research Station (AFRS), Kearneysville, WV. Doo-Hyung received his undergraduate degree in agricultural biology from Korea University and his master's degree in bioresource and ecology under the guidance of Dr. Kijong Cho at the same university. His master's project focused on developing mathematical models of spatial distributions and interactions among insect pest populations in greenhouse systems. Doo-Hyung received his PhD in entomology from Cornell University under the guidance of Drs. Jan Nyrop and John Sanderson. His dissertation research examined how habitat structures and non-consumptive predator effects could affect resource use patterns by herbivorous pests and its implications for pest management.

Doo-Hyung joined Dr. Tracy Leskey's lab at AFRS in November, 2011 as a postdoctoral researcher where he studies the overwintering and dispersal ecology of the invasive brown marmorated stink bug, and he applies this knowledge to enhance management tactics for this destructive pest in agricultural ecosystems. He is also very enthusiastic with extension and outreach programs and delivers research findings to the scientific and public communities using diverse outlets.

Recognition Award In Urban Entomology

This award, which is sponsored by S.C. Johnson & Son, Inc., recognizes and encourages outstanding extension, research, and teaching contributions in urban entomology.

Dr. Jules Silverman is Charles G. Wright Distinguished Professor of Structural Pest Management at North Carolina State University. He received his PhD in entomology from the University of California, Riverside in 1981, specializing in the biology and management of insect pests of urban importance with a focus on the cat flea, *Ctenocephalides felis*. Dr. Silverman was an R&D scientist at American Cyanamid Co. and the Clorox Company from 1981–1999. As an industry scientist, Dr. Silverman made key contributions, including bioassay design, to the development of the first effective consumer and professional bait products for cockroach and ant control (COMBAT® and MAXFORCE®). He is co-discoverer of the first example of behavioral resistance—glucose-aversion—in the German cockroach.

Dr. Silverman joined the faculty at North Carolina State University in 1999. His research has focused on the behavior, ecology, and management of invasive ants, particularly the Argentine ant and Asian needle ant. His notable accomplishments (with graduate students, postdoctoral associates, and colleagues) include discovering the role of prey-based cues in modifying Argentine ant nestmate recognition, determining the importance of hemipteran honeydew for Argentine ant colony founding success, and identifying trap mulching as an Argentine ant management strategy.

Dr. Silverman was subject editor for the household and structural insects section of the *Journal of Economic Entomology* and ESA Subsection Fb Chair, Vice-chair, and Secretary. He has authored/co-authored more than 70 publications (including an invited review), been granted five patents, given numerous invited presentations, and received several awards.

President's Prize For Outstanding Achievement In Primary Education

This award, which is sponsored by the Entomological Society of America, recognizes a primary school educator (grades K-6) who has gone beyond the traditional teaching methods by using insects as educational tools.

Laura Gagnon is the school library media specialist at Joseph B. Radez Elementary in Cobleskill-Richmondville School District, located about 40 minutes west of Albany, New York. She received a BA in social studies education (grades 7-12) from the College of Saint Rose in Albany, and her MSIS from the State University of New York at Albany. As a librarian for a school of 460 students in grades three through five, she teaches 21 classes a week in information literacy skills and provides resources to staff and students to support the curriculum. She incorporates the talents of members of the local learning community, which have included astronauts, archaeologists, historians, videographers, authors, veterinarians, soil scientists, and farmers. Her daily collaborations and co-teaching projects have won numerous awards, including the New York State Archives Student Research Award. Her interest in entomology was ignited by master beekeepers Bob and Alyson Montione.

President's Prize For Outstanding Achievement In Secondary Education

This award, which is sponsored by the Entomological Society of America, recognizes a secondary school educator (grades 7-12) who has gone beyond the traditional teaching methods by using insects as educational tools.

Joyce Forand-Voorhis is a biology teacher employed at Brockton High School, an urban public high school of 4,500 students in Southern Massachusetts. Joyce finds that insects are often overlooked in standardized test-driven biology classes, but can be used to inspire in students a sense of awe of the vast diversity and complexity of life on our planet. Insects are also a perfect, easy-to-find, inexpensive vehicle that can be used to direct inquiry-based scientific learning. Students usually enjoy the outdoors, and all types of learning of the scientific process occur as students map, analyze sampling areas and conditions, attempt to standardize sampling techniques, use keys to identify insects, and evaluate biodiversity. Her Junior IB Biology students were also challenged to analyze bacterial DNA from the endosymbionts found within sampled insects. A 13-year, second-career teacher, Joyce began teaching after 20 years in the medical laboratory field. She has received several student-selected teaching awards, and in 2009 was named an MIT Inspirational Teacher by the Massachusetts Institute of Technology in Cambridge, MA.

FOUNDATION STUDENT AWARDS

Jeffery P. Lafage Graduate Student Research Award

This grant, which was established by an endowment from donations by Rousell Bio, Dow AgroSciences, FMC, and the friends and family of Dr. Jeffery P. LaFage, is awarded to a graduate student who proposes innovative research that advances or contributes significantly to the knowledge of the biology or control of pests in the urban environment, especially termites or other wood-destroying organisms.

Brittany Delong is a graduate research assistant in the Department of Entomology at Virginia Tech. She received her BS degree in biology from a small college located in Georgia. Following graduation, she worked as a research technician at the UGA marine institute under Dr. Steve Pennings. While at the institute, she studied insect and crab herbivory of *Iva* plants in salt marsh communities located on a small island off the coast of Georgia. She also worked as a research assistant during the summer of 2010 on a rapid NSF grant investigating the impact of the Deepwater Horizon Gulf oil spill on insect communities along the Eastern seaboard. These research experiences led Brittany to graduate school at Virginia Tech, where she is currently a master's candidate investigating the role the bed bug eggshell plays in insecticide resistance. She has currently investigated metabolic rates and resistance of bed bug eggs and the morphological features of the bed bug eggshell. Brittany has one peer-reviewed publication (and three in-prep from her master's thesis) and has given seven presentations to both the pest control industry and at scientific meetings. She is an active member of the W.B. Alwood Entomology Society at Virginia Tech and the Entomological Society of America.

Larry Larson Graduate Student Award for Leadership in Applied Entomology

This award, which is sponsored by Dow AgroSciences, recognizes Dr. Larry Larson's role as a leader and pioneer in insect management and carries that legacy to the next generation of leaders in applied entomology.

Natalie Boyle is a graduate research assistant in the Department of Entomology at Washington State University. She joined the lab of Dr. Doug Walsh last year, and her dissertation research focuses on evaluating the impacts of pollinator-mediated gene flow in alfalfa seed production. Alfalfa is the first major perennial geneticall-engineered crop, and seed production is largely dependent upon the pollination services of the alfalfa leafcutting bee, *Megachile rotundata.* Surprisingly, little is known about the contribution that the alfalfa leafcutting bee makes to gene flow in alfalfa production regions. Based on her findings, Natalie hopes to develop best management practices for seed producers which would minimize undesired movement of transgenes into sensitive production regions. Natalie received her master's degree in entomology under Dr. Steve Sheppard at Washington State University, where she examined the influence of pesticide residues in brood comb on honey bee colony health and performance. She holds a BS degree in entomology from Western Washington University.

Lillian & Alex Feir Graduate Student Travel Award In Insect Physiology, Biochemistry, or Molecular Biology

This award aims to encourage graduate students working with insects or other arthropods in the broad areas of physiology, biochemistry, and molecular biology to affiliate with ESA's Physiology, Biochemistry, and Toxicology Section and to attend the ESA Annual Meeting or an International Congress of Entomology.

Brittany F. Peterson is a PhD student in the Interdisciplinary Life Science Program (PULSe) and the Department of Entomology at Purdue University. She received both her BS and MS degrees in biology from Western Illinois University. Currently, under the direction of Dr. Michael Scharf, she is investigating how the gut microbiome of the termite *Reticulitermes flavipes* impacts host digestion and immunocompetence. The goal of her dissertation is to generate a better understanding of the broad physiological importance of prokaryotic symbionts in the termite gut. Using antimicrobial treatments, she has shown that the bacterial community significantly impacts the efficiency of lignocellulose degradation in the *R. flavipes* gut. Brittany has also generated and sequenced a clone library from each antimicrobial treatment in an effort to pinpoint how these treatments impact gut biodiversity. Moving forward, her project will focus on how gut symbionts impact disease resistance and the tradeoffs between nutrition and immunity.

Shripat Kamble Urban Entomology Graduate Student Award for Innovative Research

The Entomological Foundation recognizes the contributions of Dr. Shripat Kamble in urban entomology and his services to entomology, the Entomological Society of America, and to the ESA Certification Program. This award is provided to a doctoral student who is currently conducting research which demonstrates innovative and realistic approaches to urban entomology.

Garima Kakkar is a PhD candidate in the Department of Entomology and Nematology at the University of Florida under the guidance of Dr. Nan-Yao Su. After obtaining her bachelor's degree from the University of Delhi, India, Garima earned an MS in entomology from the University of Florida. Her dissertation research involves evaluation of factors affecting the time taken by a chitin synthesis inhibitor based baiting program in subterranean termite colony elimination. Bait technology added another tool for management of subterranean termites in recent years, but there remain challenges due to the large colony size and cryptic nature of subterranean termites. Her research will help understand the termite's complex biological system and whether the time taken for elimination of subterranean termite colonies using CSI baits can be reduced. Garima has 10 peer-reviewed research papers, three extension articles, and a book chapter to her credit. She has received numerous awards and has won several competitions from her participation at student paper presentations and the Linnaean Games in the past. Currently, she is serving on executive committee of the Florida Entomological Society.

Stan Beck Fellowship

This award assists needy students at the graduate or undergraduate level of their education in entomology and related disciplines at a college or university in the United States, Mexico, or Canada.

Erika García is an undergraduate at San Diego State University majoring in biology with a zoology emphasis. She was introduced to the fascinating diversity of the terrestrial arthropod fauna of California and Oregon in 2011. The impressive diversity of this terrestrial arthropod fauna, coupled with the relative lack of knowledge about these organisms, strongly kindled her career interests. Since 2011, Erika has participated in two original research projects at her home institution and at the California Academy of Sciences. Erika is a student in Dr. Marshal Hedin's Lab of Arachnid Evolution, Systematics, and Conservation, studying armored harvestmen (Opiliones, Laniatores). This research tests species-level hypotheses in the *Bishopella laciniosa* species complex, which is widely distributed throughout the heterogeneous landscape of the southern Appalachian Mountains. Her research at the California Academy of Sciences with Dr. Charles Griswold involves the systematics and evolution of the orb-web building araneoid spider genus *Cyatholipus*, endemic to the Afromontane regions of South Africa. With an expected graduation date of December, 2013, Erika plans to apply to both PhD and master's programs in the field of entomology and terrestrial arthropod biology. She hopes to make significant contributions to understanding biodiversity and the evolutionary processes that give rise to diversity. Her career goals are to obtain a faculty research position to spread awareness of the captivating complexity of arthropod life. Ultimately, through education and research, she aspires to help eliminate quotidian practices that threaten species rich habitats and improve efforts of conservation.

DAILY SCHEDULE OF MEETINGS AND FUNCTIONS

SATURDAY, NOVEMBER 9		
Meeting/Function	**Time**	**Location**
Entomological Collections Network	7:00 AM - 5:00 PM	Ballroom F, Austin Convention Center
ESA Governing Board Meeting I	7:30 AM - 2:30 PM	Austin Suite, Austin Convention Center
Annual Review of Entomology Editorial Committee Meeting	8:00 AM - 5:00 PM	Meeting Room 7, Austin Convention Center
Microbial Control Working Group	8:00 AM - 9:00 PM	Meeting Room 400, Hilton Austin
Pioneer Hi-Bred 5th Annual Academic Forum	11:00 AM - 5:00 PM	Rio Grande Salon A, Courtyard by Marriott
ESA Certification Corporation Governing Board Meeting	2:30 PM - 3:00 PM	Austin Suite, Austin Convention Center
Council of Entomological Department Administrators Meeting	3:00 PM - 6:00 PM	Meeting Room 10 C, Austin Convention Center
ESA Registration and Information Center	4:00 PM - 8:00 PM	Solar Atrium, Austin Convention Center
P-IE Governing Council Working Session	4:00 PM - 6:00 PM	Meeting Room 412, Hilton Austin
2013 Annual Meeting Program Committee	5:00 PM - 6:00 PM	Meeting Room 408, Hilton Austin
Entomological Collections Network	6:00 PM - 9:00 PM	Ballroom E, Austin Convention Center
SUNDAY, NOVEMBER 10		
Meeting/Function	**Time**	**Location**
Moderator Training I	7:00 AM - 7:30 AM	Meeting Room 12 B, Austin Convention Center
Entomological Collections Network	7:00 AM - 12:00 PM	Ballroom E, Austin Convention Center
ESA Registration and Information Center	7:00 AM - 9:00 PM	Solar Atrium, Austin Convention Center
Environmental Entomology Editorial Board Meeting	8:00 AM - 10:00 AM	Meeting Room 408, Hilton Austin
Responsible Conduct of Research (RCR) Training Workshop	9:30 AM - 12:00 PM	Meeting Room 9 AB, Austin Convention Center
Annals of the ESA Editorial Board Meeting	10:00 AM - 12:00 PM	Meeting Room 408, Hilton Austin
Moderator Training II	12:00 PM - 12:30 PM	Meeting Room 12 B, Austin Convention Center
Governing Board Nearctic Regional Section, International Organization for Biocontrol	12:00 PM - 3:00 PM	Meeting Room 410, Hilton Austin
Lunch and Learn: Is Certification Right for Me (and my team)?	12:15 PM - 1:15 PM	Meeting Room 9 C, Austin Convention Center
Lunch and Learn: Managing the Big Transition to your First Job (or I'm about to graduate, now what?)	12:15 PM - 1:15 PM	Meeting Room 10 AB, Austin Convention Center
Journal of Economic Entomology Editorial Board Meeting	1:00 PM - 3:00 PM	Meeting Room 408, Hilton Austin
Insect Macrophotography Workshop	1:15 PM - 5:15 PM	Meeting Room 9 AB, Austin Convention Center
Certification Board Meeting	2:00 PM - 5:00 PM	Meeting Room 406, Hilton Austin
Linnaean Games - Preliminary Rounds	2:00 PM - 5:00 PM	Ballroom D, Austin Convention Center
ICE 2016 Meeting	3:00 PM - 4:00 PM	Meeting Room 16 A, Austin Convention Center
Journal of Medical Entomology Editorial Board Meeting	3:00 PM - 5:00 PM	Meeting Room 408, Hilton Austin
Acarology Society of America Business Meeting	4:15 PM - 5:15 PM	Meeting Room 6 A, Austin Convention Center
New Member Reception	4:30 PM - 5:15 PM	Meeting Room 10 C, Austin Convention Center
Judges Training I	4:45 PM - 5:15 PM	Meeting Room 16 A, Austin Convention Center
Opening Plenary Session & Founders' Memorial Lecture	5:30 PM - 7:30 PM	Ballroom D, Austin Convention Center
ESA Booth	7:30 PM - 9:30 PM	Exhibit Hall 4, Austin Convention Center
Exhibit Hall	7:30 PM - 9:30 PM	Exhibit Hall 4, Austin Convention Center
Welcome Reception	7:30 PM - 9:30 PM	Exhibit Hall 4, Austin Convention Center

MONDAY, NOVEMBER 11		
Meeting/Function	**Time**	**Location**
Women in Entomology Breakfast	6:15 AM - 8:00 AM	Eighteenth Over Austin, Hilton Garden Inn
Judges Training II	7:00 AM - 7:30 AM	Meeting Room 16 A, Austin Convention Center
Moderator Training III	7:00 AM - 7:30 AM	Meeting Room 12 B, Austin Convention Center
ESA Registration and Information Center	7:00 AM - 5:00 PM	Solar Atrium, Austin Convention Center
Entomological Foundation Board of Directors	8:00 AM - 9:30 AM	Meeting Room 602, Hilton Austin
Arthropod Management Tests Editorial Board Meeting	8:00 AM - 10:00 AM	Meeting Room 408, Hilton Austin
Coleopterists Society Executive Meeting	7:00 AM - 1:30 PM	Meeting Room 412, Hilton Austin
IRAC-US Meeting	8:00 AM - 2:00 PM	Meeting Room 400, Hilton Austin
Exhibit Hall	9:00 AM - 5:00 PM	Exhibit Hall 4, Austin Convention Center
ESA Booth	9:00 AM - 5:00 PM	Exhibit Hall 4, Austin Convention Center
Tour: Brackenridge Field Laboratory	9:30 AM - 1:30 PM	Solar Atrium, Austin Convention Center
ACE Support Committee Meeting	10:00 AM - 12:00 PM	Meeting Room 410, Hilton Austin
Journal of Integrated Pest Management Editorial Board Meeting	10:00 AM - 12:00 PM	Meeting Room 408, Hilton Austin
Society Presidents' Lunch	11:30 AM - 12:30 PM	Board Room 401, Hilton Austin
Moderator Training IV	12:00 PM - 12:30 PM	Meeting Room 12 B, Austin Convention Center
Outreach to Undergrads Program	12:00 PM - 1:00 PM	Meeting Room 406, Hilton Austin
Yearly Meeting of the Society for Regulatory Entomology	12:00 PM - 1:00 PM	Meeting Room 602, Hilton Austin
Lunch and Learn: Re-assessing Tropical Insect Biodiversity - By Looking From the Very Inside to the Very Outside	12:45 PM - 1:45 PM	Ballroom F, Austin Convention Center
Thomas Say Books Editorial Board Meeting	1:00 PM - 2:00 PM	Meeting Room 408, Hilton Austin
MUVE Highlights	1:30 PM - 6:00 PM	Ballroom G, Austin Convention Center
SysEB Section Meeting	1:30 PM - 5:45 PM	Ballroom E, Austin Convention Center
PBT Networking Section	2:00 PM - 4:40 PM	Meeting Room 19 B, Austin Convention Center
Plant-Insect Ecosystems (P-IE) Section Networking Business Meeting	2:00 PM - 5:50 PM	Ballroom D, Austin Convention Center
Book Reviews Editorial Board Meeting	2:00 PM - 3:00 PM	Meeting Room 408, Hilton Austin
American Entomologist Editorial Board Meeting	3:00 PM - 5:00 PM	Meeting Room 408, Hilton Austin
ICE Organizing Committee Meeting	4:00 PM - 5:00 PM	Meeting Room 410, Hilton Austin
Student Competition Social Hour with Poster Presenters	5:30 PM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
Entomological Foundation Awards Reception	6:00 PM - 7:45 PM	Austin Grand Ballroom H, Hilton Austin
Illinois Entomology Mixer	6:00 PM - 7:30 PM	Meeting Room 400, Hilton Austin
Purdue Entomology Mixer	6:30 PM - 8:00 PM	Brazos II, Courtyard by Marriott
Colorado State University, Kansas State University and University of Nebraska-Lincoln Mixer	6:30 PM - 8:30 PM	Ballroom F, Austin Convention Center
Iowa State University Alumni Mixer	6:30 PM - 8:30 PM	Meeting Room 410, Hilton Austin
University of California Alumni Reception	6:30 PM - 8:30 PM	Governor's Ballroom D, Hilton Austin
University of Florida Alumni Mixer	6:30 PM - 8:30 PM	Austin Grand Ballroom J, Hilton Austin
Ohio State University Mixer	7:00 PM - 8:30 PM	Meeting Room 408, Hilton Austin
The University of Georgia - Entomology Mixer	7:00 PM - 8:30 PM	Austin Grand Ballroom K, Hilton Austin
50th Anniversary of Department of Entomology at Penn State	7:00 PM - 9:00 PM	Austin Grand Ballroom G, Hilton Austin
Maryland Mixer	7:00 PM - 9:00 PM	Rio Grande Salon B, Courtyard by Marriott
Mizzou Mixer	7:00 PM - 9:00 PM	Meeting Room 602, Hilton Austin
North Carolina State University Mixer	7:00 PM - 9:00 PM	Brazos I, Courtyard by Marriott
Northwest Mixer (UI, MSU, OSU,WSU)	7:00 PM - 9:00 PM	Rio Grande Salon A, Courtyard by Marriott
Southwestern Branch Mixer	7:00 PM - 9:00 PM	Meeting Room 12B, Austin Convention Center

University of Arkansas, Auburn University, Clemson University, University of Kentucky, and University of Tennessee Reception	7:00 PM - 9:00 PM	Austin Grand Ballroom F, Hilton Austin
Rutgers Mixer	7:00 PM - 10:00 PM	Governor's Ballroom E, Hilton Austin
Cornell University Entomology Mixer - Reception	8:00 PM - 10:00 PM	Meeting Room 412, Hilton Austin
University of Minnesota Mixer	8:30 PM - 10:00 PM	Brazos III, Courtyard by Marriott
TUESDAY, NOVEMBER 12		
Meeting/Function	**Time**	**Location**
Sunrise Yoga	6:30 AM - 7:30 AM	Austin Grand Ballroom H, Hilton Austin
Moderator Training V	7:00 AM - 7:30 AM	Meeting Room 12 B, Austin Convention Center
Past Presidents Breakfast	7:00 AM - 8:00 AM	Meeting Room 602, Hilton Austin
USDA ARS All Hands Meeting	7:00 AM - 8:00 AM	Meeting Room 10 AB, Austin Convention Center
Fire Ant eXtension Network Meeting	7:00 AM - 8:30 AM	Austin Grand Ballroom J, Hilton Austin
ESA Registration and Information Center	7:00 AM - 5:00 PM	Solar Atrium, Austin Convention Center
Michigan State University Alumni and Friends Breakfast	7:30 AM - 9:00 AM	Austin Grand Ballroom K, Hilton Austin
Committee on Awards and Honors Meeting	8:00 AM - 9:00 AM	Meeting Room 408, Hilton Austin
Committee on Education and Outreach Meeting	8:00 AM - 9:00 AM	Meeting Room 410, Hilton Austin
New Governing Board Member Orientation	8:00 AM - 9:00 AM	Austin Suite, Austin Convention Center
School and Urban IPM eXtension Network Meeting	8:30 AM - 10:00 AM	Austin Grand Ballroom J, Hilton Austin
Awards Review Committee Meeting	9:00 AM - 10:30 AM	Meeting Room 408, Hilton Austin
Exhibit Hall	9:00 AM - 5:00 PM	Exhibit Hall 4, Austin Convention Center
ESA Booth	9:00 AM - 5:00 PM	Exhibit Hall 4, Austin Convention Center
Tour: Westcave Preserve	9:30 AM - 2:00 PM	Solar Atrium, Austin Convention Center
Committee on Membership Meeting	9:30 AM - 10:30 AM	Meeting Room 602, Hilton Austin
Committee on Ethics and Rules	10:00 AM - 11:00 AM	Meeting Room 410, Hilton Austin
Science Policy Committee Meeting	10:30 AM - 12:00 PM	Austin Suite, Austin Convention Center
Common Names Committee Meeting	11:00 AM - 11:45 AM	Meeting Room 408, Hilton Austin
Section Leaders Meeting	11:00 AM - 12:00 PM	Meeting Room 9 C, Austin Convention Center
Certification Business Meeting	11:00 AM - 1:00 PM	Meeting Room 10 AB, Austin Convention Center
Moderator Training VI	12:00 PM - 12:30 PM	Meeting Room 12 B, Austin Convention Center
Entomological Foundation Board of Counselors Meeting	12:00 PM - 1:30 PM	Meeting Room 400, Hilton Austin
Journal of Insect Science Editorial Board Meeting	12:00 PM - 1:30 PM	Austin Grand Ballroom F, Hilton Austin
Lunch and Learn: How to Make Meaningful Connections with the Public Using Your Own Research	12:15 PM - 1:15 PM	Ballroom G, Austin Convention Center
Lunch and Learn: Politics and Science: How Congress and the President Impact Your Work (and what you can do about it)	12:15 PM - 1:15 PM	Ballroom E, Austin Convention Center
Student Transition and Early Professionals Committee Meeting	1:00 PM - 2:00 PM	Meeting Room 602, Hilton Austin
Publications Council Meeting	1:00 PM - 4:00 PM	Meeting Room 408, Hilton Austin
Student Debates	1:30 PM - 4:30 PM	Ballroom D, Austin Convention Center
Branch Leaders Meeting	2:00 PM - 3:00 PM	Meeting Room 9 C, Austin Convention Center
Informal Weevil Conference	2:00 PM - 4:00 PM	Austin Grand Ballroom J, Hilton Austin
Branch Treasurers Meeting	3:00 PM - 3:30 PM	Austin Suite, Austin Convention Center
Southeastern Executive Committee Meeting	3:00 PM - 5:00 PM	Meeting Room 400, Hilton Austin
Section Treasurers Meeting	3:30 PM - 4:00 PM	Austin Suite, Austin Convention Center
Social Hour with Poster Presenters	5:30 PM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
Linnaean Games - Finals	5:30 PM - 7:30 PM	Ballroom D, Austin Convention Center
Nepal Overseas Entomologists Symposium: Promoting Entomological Collaboration through Inter-societal Network and Information Sharing	6:00 PM - 10:00 PM	Meeting Room 15, Austin Convention Center

Korean Young Entomologists (KYE)	6:00 PM - 10:00 PM	Meeting Room 17 B, Austin Convention Center
Annual Business Meeting of the International Union for the Study of Social Insects	6:30 PM - 8:00 PM	Meeting Room 12 B, Austin Convention Center
IOBC Workshop Symposium - Integrating the Macros (Macrobial Biocontrols) and the Micros (Microbial Biocontrols) to Manage Insect Pests	6:30 PM - 9:00 PM	Meeting Room 16 B, Austin Convention Center
Heteropterist Conference	6:30 PM - 9:30 PM	Meeting Room 5 ABC, Austin Convention Center
Overseas Chinese Entomologists Association (OCEA): Building a Foundation for Collaborations on Entomological Research	6:30 PM - 10:00 PM	Meeting Room 18 B, Austin Convention Center
IABE Business Meeting and Mixer	7:00 PM - 9:00 PM	Meeting Room 400, Hilton Austin
Broadening Your Impacts remix featuring Art.Science.Gallery.	7:30 PM - 9:30 PM	Meeting Room 602, Hilton Austin
Coleopterists Society Annual Meeting	7:30 PM - 9:30 PM	Meeting Room 6 A, Austin Convention Center
ESA Student Awards Ceremony	7:30 PM - 9:30 PM	Ballroom D, Austin Convention Center
North American Dipterists Society Meeting	7:30 PM - 9:30 PM	Meeting Room 6 B, Austin Convention Center
ESA Editors Reception	8:00 PM - 9:00 PM	Meeting Room 408, Hilton Austin
Insect Photo Salon	8:00 PM - 9:00 PM	Meeting Room 9 C, Austin Convention Center
Student Reception	9:30 PM - 11:30 PM	Buffalo Billiards, 201 East 6th Street
ESA Governing Board Reception	9:00 PM - 10:00 PM	Meeting Room 410, Hilton Austin
Korean Young Entomologists (KYE) Mixer	9:00 PM - 11:00 PM	Meeting Room 17 B, Austin Convention Center
WEDNESDAY, NOVEMBER 13		
Meeting/Function	**Time**	**Location**
Moderator Training VII	7:00 AM - 7:30 AM	Meeting Room 12 B, Austin Convention Center
MUVE Final Business Meeting with Breakfast	7:00 AM - 8:15 AM	Meeting Room 18 B, Austin Convention Center
PBT Final Business Meeting	7:30 AM - 8:30 AM	Meeting Room 10 C, Austin Convention Center
ESA Governing Board Meeting II	8:00 AM - 11:30 AM	Austin Suite, Austin Convention Center
ESA Registration and Information Center	8:00 AM - 12:00 PM	Solar Atrium, Austin Convention Center
Under the Lens: Connecting the Community with Entomology and IPM	8:00 AM - 5:00 PM	Ballroom E, Austin Convention Center
Exhibit Hall	9:00 AM - 2:00 PM	Exhibit Hall 4, Austin Convention Center
ESA Booth	9:00 AM - 2:00 PM	Exhibit Hall 4, Austin Convention Center
Student Affairs Committee Meeting	12:00 PM - 1:00 PM	Meeting Room 9 C, Austin Convention Center
SysEB Final Business Meeting	12:15 PM - 1:15 PM	Meeting Room 6 B, Austin Convention Center
Lunch and Learn: The Art of Writing a Successful Scientific Paper	12:15 PM - 1:15 PM	Ballroom F, Austin Convention Center
Lunch and Learn: The Art of Negotiation	12:15 PM - 1:15 PM	Ballroom G, Austin Convention Center
Social Hour with Poster Presenters	12:15 PM - 1:15 PM	Exhibit Hall 4, Austin Convention Center
2014 Annual Meeting Program Committee Meeting	12:30 PM - 2:30 PM	Austin Suite, Austin Convention Center
Open P-IE Section Governing Council and Member Feedback Session	4:00 PM - 5:00 PM	Austin Suite, Austin Convention Center
Closing Plenary Session	5:30 PM - 7:30 PM	Ballroom D, Austin Convention Center
THURSDAY, NOVEMBER 14		
Meeting/Function	**Time**	**Location**
Spotted Wing Drosophila Biology, Ecology, and Management	8:30 AM - 3:00 PM	Rio Grande Salon A, Courtyard by Marriott

DAILY SCHEDULE BY DATE AND TIME

SATURDAY, NOVEMBER 9		
Time	**Session/Function**	**Location**
7:00 AM - 5:00 PM	Entomological Collections Network	Ballroom F, Austin Convention Center
7:30 AM - 2:30 PM	ESA Governing Board Meeting I	Austin Suite, Austin Convention Center
8:00 AM - 5:00 PM	Annual Review of Entomology Editorial Committee Meeting	Meeting Room 7, Austin Convention Center
8:00 AM - 9:00 PM	Microbial Control Working Group	Meeting Room 400, Hilton Austin
11:00 AM - 5:00 PM	Pioneer Hi-Bred 5th Annual Academic Forum	Rio Grande Salon A, Courtyard by Marriott
2:30 PM - 3:00 PM	ESA Certification Corporation Governing Board Meeting	Austin Suite, Austin Convention Center
3:00 PM - 6:00 PM	Council of Entomological Department Administrators Meeting	Meeting Room 10 C, Austin Convention Center
4:00 PM - 6:00 PM	P-IE Governing Council Working Session	Meeting Room 412, Hilton Austin
4:00 PM - 8:00 PM	ESA Registration and Information Center	Solar Atrium, Austin Convention Center
5:00 PM - 6:00 PM	2013 Annual Meeting Program Committee	Meeting Room 408, Hilton Austin
6:00 PM - 9:00 PM	Entomological Collections Network	Ballroom E, Austin Convention Center
SUNDAY, NOVEMBER 10		
Time	**Session/Function**	**Location**
7:00 AM - 7:30 AM	Moderator Training I	Meeting Room 12 B, Austin Convention Center
7:00 AM - 12:00 PM	Entomological Collections Network	Ballroom E, Austin Convention Center
7:00 AM - 9:00 PM	ESA Registration and Information Center	Solar Atrium, Austin Convention Center
8:00 AM - 10:00 AM	Environmental Entomology Editorial Board Meeting	Meeting Room 408, Hilton Austin
8:00 AM - 12:00 PM	P-IE Section Symposium: Beyond the LC50: Advancements in Toxicological Research on Pollinators	Meeting Room 17 B, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Americas Neuropterists Meeting	Meeting Room 14, Austin Convention Center
8:00 AM - 12:00 PM	Program Symposium: Connecting with the World's Best Talent: Attracting and Retaining Diverse Entomologists	Meeting Room 16 B, Austin Convention Center
8:00 AM - 12:00 PM	MUVE Section Symposium: The Expanding Boundaries of Tick-Borne Diseases in the Midwestern USA	Meeting Room 18 B, Austin Convention Center
8:00 AM - 12:20 PM	PBT Section Symposium: The Future of Mosquito Endocrinology	Meeting Room 19 A, Austin Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Does Successful Resistance Management Require At Least Some Government Regulation?	Meeting Room 17 A, Austin Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Exchange of Insects between Native and Non-native Plants: Novel Food Webs, Invasions, and Biocontrol	Meeting Room 18 D, Austin Convention Center
8:00 AM - 12:00 PM	Senior Symposium: Honey Bees Connecting Retired Entomologists	Meeting Room 12 B, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Advances in Greenhouse Arthropod Pest Management	Meeting Room 18 A, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Aquatic Entomology for the Protection of Water Resources	Meeting Room 5 ABC, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Chagas Disease in the USA: A New Risk?	Meeting Room 8 C, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Coming Together to Break it Down: A Global Perspective on Decomposers	Meeting Room 15, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Current Advances in Acarology	Meeting Room 6 A, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Insect Pests of Canola (Brassica spp.) and Their Management	Meeting Room 12 A, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Phasmatodea Studies Symposium	Meeting Room 4 ABC, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Phytosanitary Irradiation: How the International Community is Rising to the Regulatory Challenge	Meeting Room 19 B, Austin Convention Center

8:00 AM - 12:00 PM	Symposium: The Effects of Endophytic Fungal Entomopathogens on Insects, Plants, and Plant Pathogens	Meeting Room 16 A, Austin Convention Center
8:00 AM - 12:00 PM	SysEB Section Symposium: Biology and Evolution of Social Insect Symbionts	Meeting Room 6 B, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, MUVE Section: Medical Entomology	Meeting Room 18 C, Austin Convention Center
9:30 AM - 12:00 PM	Responsible Conduct of Research (RCR) Training Workshop	Meeting Room 9 AB, Austin Convention Center
10:00 AM - 12:00 PM	Annals of the ESA Editorial Board Meeting	Meeting Room 408, Hilton Austin
12:00 PM - 12:30 PM	Moderator Training II	Meeting Room 12 B, Austin Convention Center
12:00 PM - 3:00 PM	Governing Board Nearctic Regional Section, International Organization for Biocontrol	Meeting Room 410, Hilton Austin
12:15 PM - 1:15 PM	Lunch and Learn: Is Certification Right for Me (and my team)?	Meeting Room 9 C, Austin Convention Center
12:15 PM - 1:15 PM	Lunch and Learn: Managing the Big Transition to your First Job (or I'm about to graduate, now what?)	Meeting Room 10 AB, Austin Convention Center
12:30 PM - 5:30 PM	P-IE Section Symposium: Corn Rootworm Management: Current Status, Challenges & Novel Strategies	Ballroom F, Austin Convention Center
1:00 PM - 3:00 PM	Journal of Economic Entomology Editorial Board Meeting	Meeting Room 408, Hilton Austin
1:00 PM - 6:00 PM	SysEB Section Symposium: Guy Bush and Santa Rosalia: Speciation with gene flow and the extraordinary diversity of insects	Meeting Room 6 B, Austin Convention Center
1:00 PM - 6:00 PM	Symposium: Red Imported Fire Ants: Global Approaches to a Global Invasive Species	Meeting Room 8 C, Austin Convention Center
1:15 PM - 5:15 PM	Symposium: Frontiers of IPM: Honoring the Career of Marshall Johnson	Meeting Room 17 B, Austin Convention Center
1:15 PM - 5:15 PM	Program Symposium: Environmental Determinants and Ecological Consequences of Invasions by Arthropod Disease Vectors	Meeting Room 16 B, Austin Convention Center
1:15 PM - 5:15 PM	MUVE Section Symposium: Screwworm Eradication: Connecting Science with Customers in the Americas and Beyond	Meeting Room 14, Austin Convention Center
1:15 PM - 5:15 PM	PBT Section Symposium: Insect Lipid Physiology: From the Cell to the Whole Organism	Meeting Room 18 C, Austin Convention Center
1:15 PM - 5:15 PM	P-IE Section Symposium: Connecting Healthy Pollinators, Diverse Microbiota, and the Changing Environment	Meeting Room 18 D, Austin Convention Center
1:15 PM - 5:15 PM	P-IE Section Symposium: The Environment as the Sculptor: How Abiotic Factors Shape Plant-Insect Interactions	Meeting Room 12 A, Austin Convention Center
1:15 PM - 5:15 PM	Symposium: Acarology in Molecular Era	Meeting Room 6 A, Austin Convention Center
1:15 PM - 5:15 PM	Symposium: Advances in Pest Management for Turfgrass and Ornamentals	Meeting Room 15, Austin Convention Center
1:15 PM - 5:15 PM	Symposium: Future Needs for Biological Control Teaching and Outreach	Meeting Room 18 A, Austin Convention Center
1:15 PM - 5:15 PM	Symposium: International Society of Hymenopterists: Symposium Honoring Robert Wharton	Meeting Room 4 ABC, Austin Convention Center
1:15 PM - 5:15 PM	Symposium: Rocking Your Connected World: The Importance of Insect Microbiomes	Meeting Room 19 A, Austin Convention Center
1:15 PM - 5:15 PM	Symposium: SOLA Scarab Workers	Meeting Room 5 ABC, Austin Convention Center
1:15 PM - 5:15 PM	Symposium: Succeeding in the Business Aspects of an Entomological Career	Meeting Room 7, Austin Convention Center
1:15 PM - 5:15 PM	Ten-Minute Papers, MUVE Section: Medical Entomology 2	Meeting Room 17 A, Austin Convention Center
1:15 PM - 5:15 PM	Ten-Minute Papers, PBT Section: Physiology	Meeting Room 19 B, Austin Convention Center
1:15 PM - 5:15 PM	Ten-Minute Papers, P-IE Section: Biological Control 1	Meeting Room 12 B, Austin Convention Center
1:15 PM - 5:15 PM	Ten-Minute Papers, P-IE Section: Crop Protection: Fruit Trees and Vines	Meeting Room 8 AB, Austin Convention Center
1:15 PM - 5:15 PM	Ten-Minute Papers, P-IE Section: Forest and Arboreal Entomology	Meeting Room 9 C, Austin Convention Center
1:15 PM - 5:15 PM	Insect Macrophotography Workshop	Meeting Room 9 AB, Austin Convention Center
2:00 PM - 5:00 PM	Certification Board Meeting	Meeting Room 406, Hilton Austin

2:00 PM - 5:00 PM	Linnaean Games - Preliminary Rounds	Ballroom D, Austin Convention Center
3:00 PM - 4:00 PM	ICE 2016 Meeting	Meeting Room 16 A, Austin Convention Center
3:00 PM - 5:00 PM	Journal of Medical Entomology Editorial Board Meeting	Meeting Room 408, Hilton Austin
4:15 PM - 5:15 PM	Acarology Society of America Business Meeting	Meeting Room 6 A, Austin Convention Center
4:30 PM - 5:15 PM	New Member Reception	Meeting Room 10 C, Austin Convention Center
4:45 PM - 5:15 PM	Judges Training I	Meeting Room 16 A, Austin Convention Center
5:30 PM - 7:30 PM	Opening Plenary Session & Founders' Memorial Lecture	Ballroom D, Austin Convention Center
7:30 PM - 9:30 PM	Welcome Reception	Exhibit Hall 4, Austin Convention Center
7:30 PM - 9:30 PM	Exhibit Hall	Exhibit Hall 4, Austin Convention Center
7:30 PM - 9:30 PM	ESA Booth	Exhibit Hall 4, Austin Convention Center
MONDAY, NOVEMBER 11		
Time	**Session/Function**	**Location**
6:15 AM - 8:00 AM	Women in Entomology Breakfast	Eighteenth Over Austin, Hilton Garden Inn
7:00 AM - 7:30 AM	Judges Training II	Meeting Room 16 A, Austin Convention Center
7:00 AM - 7:30 AM	Moderator Training III	Meeting Room 12 B, Austin Convention Center
7:00 AM - 1:30 PM	Coleopterists Society Executive Meeting	Meeting Room 412, Hilton Austin
7:00 AM - 5:00 PM	ESA Registration and Information Center	Solar Atrium, Austin Convention Center
8:00 AM - 9:30 AM	Entomological Foundation Board of Directors	Meeting Room 602, Hilton Austin
8:00 AM - 10:00 AM	Arthropod Management Tests Editorial Board Meeting	Meeting Room 408, Hilton Austin
8:00 AM - 2:00 PM	IRAC-US Meeting	Meeting Room 400, Hilton Austin
8:00 AM - 6:30 PM	1-Undergraduate Poster PBT	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	2-Undergraduate Poster P-IE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	3-Undergraduate Poster P-IE/PBT	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	4-Undergraduate Poster SysEB	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	5-Graduate Poster MUVE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	6-Graduate Poster MUVE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	7-Graduate Poster PBT	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	8-Graduate Poster PBT	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	9-Graduate Poster P-IE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	10-Graduate Poster P-IE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	11-Graduate Posters P-IE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	12-Graduate Posters P-IE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	13-Graduate Poster P-IE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	14-Graduate Poster P-IE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	15-Graduate Poster P-IE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	16-Graduate Posters P-IE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	17-Graduate Posters P-IE	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	18-Graduate Poster SysEB	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	19-Graduate Poster SysEB	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	20-Graduate Poster SysEB	Exhibit Hall 4, Austin Convention Center
8:00 AM - 12:00 PM	1-Undergraduate Student Ten-Minute Paper Competition: PIE	Meeting Room 4 A, Austin Convention Center
8:00 AM - 12:00 PM	2- Undergraduate Student Ten-Minute Paper Competition: PBT, MUVE, SysEB	Meeting Room 4 BC, Austin Convention Center
8:24 AM - 12:00 PM	3-Graduate Student Ten-Minute Paper Competition: MUVE	Meeting Room 18 A, Austin Convention Center
8:24 AM - 12:00 PM	4-Graduate Student Ten-Minute Paper Competition: MUVE	Meeting Room 18 B, Austin Convention Center
8:24 AM - 12:00 PM	5-Graduate Student Ten-Minute Paper Competition: MUVE	Meeting Room 18 C, Austin Convention Center

8:24 AM - 12:00 PM	6-Graduate Student Ten-Minute Paper Competition: PBT, MUVE	Meeting Room 18 D, Austin Convention Center
8:24 AM - 12:00 PM	7-Graduate Student Ten-Minute Paper Competition: PBT	Meeting Room 19 A, Austin Convention Center
8:24 AM - 12:00 PM	8-Graduate Student Ten-Minute Paper Competition: PBT	Meeting Room 19 B, Austin Convention Center
8:00 AM - 12:00 PM	9-Graduate Student Ten-Minute Paper Competition: PIE	Ballroom E, Austin Convention Center
8:00 AM - 12:00 PM	10-Graduate Student Ten-Minute Paper Competition: PIE	Ballroom F, Austin Convention Center
8:00 AM - 12:00 PM	11-Graduate Student Ten-Minute Paper Competition: PIE	Ballroom G, Austin Convention Center
8:24 AM - 12:00 PM	12-Graduate Student Ten-Minute Paper Competition: PIE	Meeting Room 9 C, Austin Convention Center
8:24 AM - 12:00 PM	13-Graduate Student Ten-Minute Paper Competition: PIE	Meeting Room 10 AB, Austin Convention Center
8:24 AM - 12:00 PM	14-Graduate Student Ten-Minute Paper Competition: PIE	Meeting Room 10 C, Austin Convention Center
8:00 AM - 12:00 PM	15-Graduate Student Ten-Minute Paper Competition: PIE	Meeting Room 12 A, Austin Convention Center
8:00 AM - 12:00 PM	16-Graduate Student Ten-Minute Paper Competition: PIE	Meeting Room 12 B, Austin Convention Center
8:00 AM - 12:00 PM	17-Graduate Student Ten-Minute Paper Competition: PIE	Meeting Room 14, Austin Convention Center
8:00 AM - 12:00 PM	18-Graduate Student Ten-Minute Paper Competition: PIE	Meeting Room 15, Austin Convention Center
8:00 AM - 12:00 PM	19-Graduate Student Ten-Minute Paper Competition: PIE	Meeting Room 16 A, Austin Convention Center
8:00 AM - 12:00 PM	20-Graduate Student Ten-Minute Paper Competition: PIE	Meeting Room 16 B, Austin Convention Center
8:24 AM - 12:00 PM	21-Graduate Student Ten-Minute Paper Competition: PIE	Meeting Room 17 A, Austin Convention Center
8:24 AM - 12:00 PM	22-Graduate Student Ten-Minute Paper Competition: PIE, MUVE	Meeting Room 17 B, Austin Convention Center
8:00 AM - 12:00 PM	23-Graduate Student Ten-Minute Paper Competition: SysEB	Meeting Room 5 ABC, Austin Convention Center
8:00 AM - 12:00 PM	24-Graduate Student Ten-Minute Paper Competition: SysEB	Meeting Room 6 A, Austin Convention Center
8:00 AM - 12:00 PM	25-Graduate Student Ten-Minute Paper Competition: SysEB	Meeting Room 6 B, Austin Convention Center
8:00 AM - 12:00 PM	26-Graduate Student Ten-Minute Paper Competition: SysEB	Meeting Room 7, Austin Convention Center
8:24 AM - 12:00 PM	27-Graduate Student Ten-Minute Paper Competition: SysEB	Meeting Room 8 AB, Austin Convention Center
8:24 AM - 12:00 PM	28-Graduate Student Ten-Minute Paper Competition: SysEB	Meeting Room 8 C, Austin Convention Center
8:24 AM - 12:00 PM	29-Graduate Student Ten-Minute Paper Competition: SysEB	Meeting Room 9 AB, Austin Convention Center
9:00 AM - 5:00 PM	Exhibit Hall Open	Exhibit Hall 4, Austin Convention Center
9:00 AM - 5:00 PM	ESA Booth	Exhibit Hall 4, Austin Convention Center
9:30 AM - 1:30 PM	Tour: Brackenridge Field Laboratory	Solar Atrium, Austin Convention Center
10:00 AM - 12:00 PM	ACE Support Committee Meeting	Meeting Room 410, Hilton Austin
10:00 AM - 12:00 PM	Journal of Integrated Pest Management Editorial Board Meeting	Meeting Room 408, Hilton Austin
11:30 AM - 12:30 PM	Society Presidents' Lunch	Board Room 401, Hilton Austin
12:00 PM - 12:30 PM	Moderator Training IV	Meeting Room 12 B, Austin Convention Center
12:00 PM - 1:00 PM	Outreach to Undergrads Program	Meeting Room 406, Hilton Austin
12:00 PM - 1:00 PM	Yearly Meeting of the Society for Regulatory Entomology	Meeting Room 602, Hilton Austin
12:45 PM - 1:45 PM	Lunch and Learn: Re-assessing Tropical Insect Biodiversity - By Looking From the Very Inside to the Very Outside	Ballroom F, Austin Convention Center
1:00 PM - 2:00 PM	Thomas Say Books Editorial Board Meeting	Meeting Room 408, Hilton Austin
1:30 PM - 5:45 PM	SysEB Section Meeting	Ballroom E, Austin Convention Center
1:30 PM - 6:00 PM	MUVE Highlights	Ballroom G, Austin Convention Center
2:00 PM - 4:40 PM	PBT Networking Section	Meeting Room 19 B, Austin Convention Center
2:00 PM - 5:50 PM	Plant-Insect Ecosystems (P-IE) Section Networking and Business Session	Ballroom D, Austin Convention Center
2:00 PM - 3:00 PM	Book Reviews Editorial Board Meeting	Meeting Room 408, Hilton Austin
3:00 PM - 5:00 PM	American Entomologist Editorial Board Meeting	Meeting Room 408, Hilton Austin
4:00 PM - 5:00 PM	ICE Organizing Committee Meeting	Meeting Room 410, Hilton Austin
5:30 PM - 6:30 PM	Student Competition Social Hour with Poster Presenters	Exhibit Hall 4, Austin Convention Center
6:00 PM - 7:45 PM	Entomological Foundation Awards Reception	Austin Grand Ballroom H, Hilton Austin

6:00 PM - 7:30 PM	Illinois Entomology Mixer	Meeting Room 400, Hilton Austin
6:30 PM - 8:00 PM	Purdue Entomology Mixer	Brazos II, Courtyard by Marriott
6:30 PM - 8:30 PM	Colorado State University, Kansas State University and University of Nebraska-Lincoln Mixer	Ballroom F, Austin Convention Center
6:30 PM - 8:30 PM	Iowa State University Alumni Mixer	Meeting Room 410, Hilton Austin
6:30 PM - 8:30 PM	University of California Alumni Reception	Governor's Ballroom D, Hilton Austin
6:30 PM - 8:30 PM	University of Florida Alumni Mixer	Austin Grand Ballroom J, Hilton Austin
7:00 PM - 8:30 PM	The Ohio State University Mixer	Meeting Room 408, Hilton Austin
7:00 PM - 8:30 PM	The University of Georgia - Entomology Mixer	Austin Grand Ballroom K, Hilton Austin
7:00 PM - 9:00 PM	50th Anniversary of Department of Entomology at Penn State	Austin Grand Ballroom G, Hilton Austin
7:00 PM - 9:00 PM	Maryland Mixer	Rio Grande Salon B, Courtyard by Marriott
7:00 PM - 9:00 PM	Mizzou Mixer	Meeting Room 602, Hilton Austin
7:00 PM - 9:00 PM	North Carolina State University Mixer	Brazos I, Courtyard by Marriott
7:00 PM - 9:00 PM	Northwest Mixer (UI, MSU, OSU,WSU)	Rio Grande Salon A, Courtyard by Marriott
7:00 PM - 9:00 PM	Southwestern Branch Mixer	Meeting Room 12B, Austin Convention Center
7:00 PM - 9:00 PM	University of Arkansas, Auburn University, Clemson University, University of Kentucky, and University of Tennessee Reception	Austin Grand Ballroom F, Hilton Austin
7:00 PM - 10:00 PM	Rutgers Mixer	Governor's Ballroom E, Hilton Austin
8:00 PM - 10:00 PM	Cornell University Entomology Mixer - Reception	Meeting Room 412, Hilton Austin
8:30 PM - 10:00 PM	University of Minnesota Mixer	Brazos III, Courtyard by Marriott
TUESDAY, NOVEMBER 12		
Time	**Session/Function**	**Location**
6:30 AM - 7:30 AM	Sunrise Yoga	Austin Grand Ballroom H, Hilton Austin
7:00 AM - 7:30 AM	Moderator Training V	Meeting Room 12 B, Austin Convention Center
7:00 AM - 8:00 AM	Past Presidents Breakfast	Meeting Room 602, Hilton Austin
7:00 AM - 8:00 AM	USDA ARS All Hands Meeting	Meeting Room 10 AB, Austin Convention Center
7:00 AM - 8:30 AM	Fire Ant eXtension Network Meeting	Austin Grand Ballroom J, Hilton Austin
7:00 AM - 5:00 PM	ESA Registration and Information Center	Solar Atrium, Austin Convention Center
7:30 AM - 9:00 AM	Michigan State University Alumni and Friends Breakfast	Austin Grand Ballroom K, Hilton Austin
8:00 AM - 9:00 AM	Committee on Awards and Honors Meeting	Meeting Room 408, Hilton Austin
8:00 AM - 9:00 AM	Committee on Education and Outreach Meeting	Meeting Room 410, Hilton Austin
8:00 AM - 9:00 AM	New Governing Board Member Orientation	Austin Suite, Austin Convention Center
8:00 AM - 12:00 PM	Program Symposium: Broadening your Impact: eClosing the Gap between Researchers and the Public	Ballroom G, Austin Convention Center
8:00 AM - 12:00 PM	MUVE Section Symposium: Cellular, Molecular and Microbiological Interactions within Hematophagous Arthropods	Meeting Room 18 B, Austin Convention Center
8:00 AM - 12:00 PM	PBT Section Symposium: Small Non-coding RNAs – A New Frontier in Insect Science	Meeting Room 15, Austin Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Arthropod Food Webs: A System for Studying Dynamic Responses to Global Change	Meeting Room 14, Austin Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Biofuel Cropping Systems: Connecting Beneficial Arthropods, Ecosystem Services, and Landscape Effects	Meeting Room 19 A, Austin Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Interactions between Biological Control of Pests and Other Ecosystem Services	Meeting Room 18 C, Austin Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Mechanisms of Resistance: From Mechanism to Management, IRAC US Symposium Series: No.9	Ballroom E, Austin Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Plant Defense and Insect Counter-Defense: An Ongoing Battle	Meeting Room 16 B, Austin Convention Center

8:00 AM - 12:00 PM	P-IE Section Symposium: The Effect of Microbes on Insect-Plant Interactions	Ballroom F, Austin Convention Center
8:00 AM - 12:00 PM	SysEB Section Symposium: Pitfalls, Malaise, and Hoping It All Pans Out: the State of the Art in Field Collecting Methods for Insect Biodiversity Surveys	Meeting Room 6 A, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Making Connections Across Disciplines to Combat Alien Invaders	Meeting Room 9 AB, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Cole Crops Under Siege: U.S. Invasion by the Painted Bug (Bagrada hilaris)	Meeting Room 8 AB, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Emerging Technologies and New Challenges to Control Livestock Pests	Meeting Room 18 A, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Native Bee Ecology, Evolution And Conservation In The 21st Century	Meeting Room 6 B, Austin Convention Center
8:00 AM - 12:15 PM	Symposium: When a Blind Beetle Crawls Over the Surface of the Globe…or Under the Water: Biodiversity and Systematics of Aquatic Beetles	Meeting Room 7, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, PBT Section: Genomics, Transcriptomics and Molecular Biology	Meeting Room 18 D, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, PBT Section: Sensory Physiology, Behavior, and Chemical Ecology	Meeting Room 19 B, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Environmental Entomology 2	Meeting Room 17 B, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Invasive Species	Meeting Room 17 A, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Pollinators	Meeting Room 16 A, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Population Monitoring, and Modeling	Meeting Room 12 B, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, SysEB Section: Evolution and Biodiversity	Meeting Room 5 ABC, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, SysEB Section: Systematics of Diptera and Lepidoptera	Meeting Room 4 ABC, Austin Convention Center
8:00 AM - 6:30 PM	Poster Presentations: MUVE 1	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	Poster Presentations: PBT 1	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	Poster Presentations: P-IE 1	Exhibit Hall 4, Austin Convention Center
8:00 AM - 6:30 PM	Poster Presentations: SysEB 1	Exhibit Hall 4, Austin Convention Center
8:30 AM - 10:00 AM	School and Urban IPM eXtension Network Meeting	Austin Grand Ballroom J, Hilton Austin
9:00 AM - 10:30 AM	Awards Review Committee Meeting	Meeting Room 408, Hilton Austin
9:00 AM - 5:00 PM	Exhibit Hall Open	Exhibit Hall 4, Austin Convention Center
9:00 AM - 5:00 PM	ESA Booth	Exhibit Hall 4, Austin Convention Center
9:30 AM - 10:30 AM	Committee on Membership Meeting	Meeting Room 602, Hilton Austin
9:30 AM - 2:00 PM	Tour: Westcave Preserve	Solar Atrium, Austin Convention Center
10:00 AM - 11:00 AM	Committee on Ethics and Rules	Meeting Room 410, Hilton Austin
10:30 AM - 12:00 PM	Science Policy Committee Meeting	Austin Suite, Austin Convention Center
11:00 AM - 11:45 AM	Common Names Committee Meeting	Meeting Room 408, Hilton Austin
11:00 AM - 12:00 PM	Section Leaders Meeting	Meeting Room 9 C, Austin Convention Center
11:00 AM - 1:00 PM	Certification Business Meeting	Meeting Room 10 AB, Austin Convention Center
12:00 PM - 12:30 PM	Moderator Training VI	Meeting Room 12 B, Austin Convention Center
12:00 PM - 1:30 PM	Entomological Foundation Board of Counselors Meeting	Meeting Room 400, Hilton Austin
12:00 PM - 1:30 PM	Journal of Insect Science Editorial Board Meeting	Austin Grand Ballroom F, Hilton Austin
12:15 PM - 1:15 PM	Lunch and Learn: How to Make Meaningful Connections with the Public Using Your Own Research	Ballroom G, Austin Convention Center
12:15 PM - 1:15 PM	Lunch and Learn: Politics and Science: How Congress and the President Impact Your Work (and what you can do about it)	Ballroom E, Austin Convention Center
1:00 PM - 2:00 PM	Student Transition and Early Professionals Committee Meeting	Meeting Room 602, Hilton Austin
1:00 PM - 4:00 PM	Publications Council Meeting	Meeting Room 408, Hilton Austin

1:30 PM - 4:30 PM	Student Debates	Ballroom D, Austin Convention Center
1:30 PM - 5:30 PM	Program Symposium: How New Technologies and Interdisciplinary Approaches are Transforming our Understanding of Complex Biological Interactions	Ballroom G, Austin Convention Center
1:30 PM - 5:30 PM	MUVE Section Symposium: The Impact of Repellent Research and Development of New Arthropod Repellents	Meeting Room 18 B, Austin Convention Center
1:30 PM - 5:30 PM	MUVE Section Symposium: Healthy Schools: Research, Benefits and Impacts in the Classroom	Meeting Room 10 AB, Austin Convention Center
1:30 PM - 5:30 PM	PBT Section Symposium: Epigenetic Mechanisms Connecting Physiology, Behavior, Ecology, and Evolution in the Insect World	Meeting Room 19 B, Austin Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Insect Ecology in the World's Most Populated Habitat: Connecting Scientists, Practitioners, and the Public	Ballroom F, Austin Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Climate Change & Arthropod Pest Dynamics: Research to Accelerate our Science and Inform Public Policy	Meeting Room 17 A, Austin Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Connecting Research, Outreach and Regulatory efforts to Protect Honey Bee Health	Meeting Room 12 A, Austin Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: The Larry Larson Symposium: How Science has Impacted a Connected World by Expanding the Use of Insecticides Beyond Core Agricultural Markets	Ballroom E, Austin Convention Center
1:30 PM - 5:30 PM	SysEB Section Symposium: Dynamics of the Tropical Ecosystems: A Bug's-Eye View of the Jungle	Meeting Room 6 A, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Challenges and Opportunities for Classical Biological Control: A Roadmap for New Investigators	Meeting Room 10 C, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Connecting Virus Transmitting Mosquito Information: From Laboratory to Surveillance and Management in the Field	Meeting Room 8 AB, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Innovative Global Strategies to Connect Entomologists with their Communities through Education, Outreach and Extension Programs	Meeting Room 8 C, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Making Connections Abroad: First Latin American/Hispanic Symposium	Meeting Room 15, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Mass-Production of Insects and Pathogens for Insect and Weed Biocontrol	Meeting Room 14, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: New Insights into the Evolution of Insect Coloration	Meeting Room 6 B, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Plant Secondary Chemistry and Insect-Plant Interactions: The role of Iridoid Glycosides	Meeting Room 19 A, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Strengthening the Connection between Continents –A Symposium Honoring Silvia Dorn's Impact on Applied Entomological Research	Meeting Room 9 AB, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Taxonomy and Systematics within the Tenebrionoidea (Coleoptera).	Meeting Room 7, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, MUVE Section: Stored Product Pests	Meeting Room 18 A, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, MUVE Section: Veterinary and Forensic Entomology	Meeting Room 18 C, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, PBT Section: Insect-microbe interactions, immunity, and parasitology	Meeting Room 18 D, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, P-IE Crop Protection: Horticulture and Vegetable Production	Meeting Room 17 B, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, P-IE Section: Environmental Entomology 3	Meeting Room 12 B, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, P-IE Section: Host Plant Resistance	Meeting Room 16 B, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, P-IE Section: Biological Control 2	Meeting Room 16 A, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, SysEB Section: Arthropod Symbionts and Ecology of Social Insects	Meeting Room 4 ABC, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, SysEB Section: Biodiversity and Conservation	Meeting Room 5 ABC, Austin Convention Center

2:00 PM - 3:00 PM	Branch Leaders Meeting	Meeting Room 9 C, Austin Convention Center
2:00 PM - 4:00 PM	Informal Weevil Conference	Austin Grand Ballroom J, Hilton Austin
3:00 PM - 3:30 PM	Branch Treasurers Meeting	Austin Suite, Austin Convention Center
3:00 PM - 5:00 PM	Southeastern Executive Committee Meeting	Meeting Room 400, Hilton Austin
3:30 PM - 4:00 PM	Section Treasurers Meeting	Austin Suite, Austin Convention Center
5:30 PM - 6:30 PM	Social Hour with Poster Presenters	Exhibit Hall 4, Austin Convention Center
5:30 PM - 7:30 PM	Linnaean Games - Finals	Ballroom D, Austin Convention Center
6:00 PM - 10:00 PM	Symposium: Korean Young Entomologists (KYE)	Meeting Room 17 B, Austin Convention Center
6:00 PM - 10:00 PM	Symposium: Nepal Overseas Entomologists Symposium: Promoting Entomological Collaboration through Inter-societal Network and Information Sharing	Meeting Room 15, Austin Convention Center
7:00 PM - 8:30 PM	Annual Business Meeting of the International Union for the Study of Social Insects	Meeting Room 12 B, Austin Convention Center
6:30 PM - 9:00 PM	Symposium: IOBC Workshop Symposium - Integrating the Macros (Macrobial Biocontrols) and the Micros (Microbial Biocontrols) to Manage Insect Pests.	Meeting Room 16 B, Austin Convention Center
6:30 PM - 9:30 PM	Symposium: Heteropterist Conference	Meeting Room 5 ABC, Austin Convention Center
6:30 PM - 10:00 PM	Symposium: Overseas Chinese Entomologists Association (OCEA): Building a Foundation for Collaborations on Entomological Research	Meeting Room 18 B, Austin Convention Center
7:00 PM - 9:00 PM	IABE Business Meeting and Mixer	Meeting Room 400, Hilton Austin
7:30 PM - 9:30 PM	Broadening Your Impacts remix featuring Art.Science.Gallery.	Meeting Room 602, Hilton Austin
7:30 PM - 9:30 PM	ESA Student Awards Ceremony	Ballroom D, Austin Convention Center
7:30 PM - 9:30 PM	Symposium: North American Dipterists Society Meeting	Meeting Room 6 B, Austin Convention Center
7:30 PM - 9:30 PM	Symposium: Coleopterists Society Annual Meeting	Meeting Room 6 A, Austin Convention Center
8:00 PM - 9:00 PM	ESA Editors Reception	Meeting Room 408, Hilton Austin
8:00 PM - 9:00 PM	Insect Photo Salon	Meeting Room 9 C, Austin Convention Center
9:00 PM - 10:00 PM	ESA Governing Board Reception	Meeting Room 410, Hilton Austin
9:00 PM - 11:00 PM	Korean Young Entomologists (KYE) Mixer	Meeting Room 17 B, Austin Convention Center
9:30 PM - 11:30 PM	Student Reception	Buffalo Billards, 201 East 6th Street

WEDNESDAY, NOVEMBER 13

Time	Session/Function	Location
7:00 AM - 7:30 AM	Moderator Training VII	Meeting Room 12 B, Austin Convention Center
7:00 AM - 8:15 AM	MUVE Final Business Meeting with Breakfast	Meeting Room 18 B, Austin Convention Center
7:30 AM - 8:30 AM	PBT Final Business Meeting	Meeting Room 10 C, Austin Convention Center
8:00 AM - 11:30 AM	ESA Governing Board Meeting II	Austin Suite, Austin Convention Center
8:00 AM - 12:00 PM	ESA Registration and Information Center	Solar Atrium, Austin Convention Center
8:00 AM - 12:00 PM	Program Symposium: Impacts of Global Change on Biodiversity and Biological Control	Ballroom G, Austin Convention Center
8:00 AM - 12:00 PM	MUVE Section Symposium: Thermal Biology of Mosquito Vectors of Disease: Ecology and Epidemiological Consequence	Meeting Room 14, Austin Convention Center
8:00 AM - 12:00 PM	MUVE Section Symposium: Applied Research on Bed Bug Management	Ballroom F, Austin Convention Center
8:00 AM - 12:00 PM	MUVE Section Symposium: Arthropod Associated Allergy	Meeting Room 18 B, Austin Convention Center
8:00 AM - 12:00 PM	PBT Section Symposium: ABC Transporters: An Important "New" Player in Insect Biology	Meeting Room 19 A, Austin Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Current Status of Vegetable Insect Pests in the USA	Meeting Room 18 D, Austin Convention Center
8:00 AM - 12:00 PM	P-IE Section Symposium: Modern Concepts for Statistical Modeling of Field Studies: From GLMs to GLMMs.	Meeting Room 7, Austin Convention Center

8:00 AM - 12:00 PM	P-IE Section Symposium: Solutions for Invasive Insect Pests in a Connected World	Meeting Room 16 A, Austin Convention Center
8:00 AM - 12:00 PM	SysEB Section Symposium: Systematics and Evolution of Native Bees (Hymenoptera: Apoidea)	Meeting Room 6 A, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Connecting Our Past with Our Future. A Look at Past Student Award Winners. Then, Now, and in the Future.	Meeting Room 8 C, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Evolution of Insect Pests In a Connected and Changing World	Meeting Room 9 AB, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: IPM for Small-Scale Farmers: Research and Extension Needs and Experiences	Meeting Room 12 B, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Science Impacting a Connected INSECT World: Use of Aggregation Pheromones in Pest Management	Meeting Room 15, Austin Convention Center
8:00 AM - 12:00 PM	Symposium: Strategies for Managing the Asian Citrus Psyllid and Huanglongbing Disease	Meeting Room 17 B, Austin Convention Center
8:00 AM - 12:15 PM	Symposium: Ecological and Evolutionary Origins of Sociality: Connecting Commonalities of Social Behavior Across Diverse Insect Taxa	Meeting Room 10 AB, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, MUVE: Structural Pests	Meeting Room 18 C, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, PBT Section: Toxicology	Meeting Room 19 B, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Biology and Ecology	Meeting Room 16 B, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, P-IE Section: Transgenic Host Plants	Meeting Room 17 A, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, SysEB Section: Arthropod Systematics	Meeting Room 4 ABC, Austin Convention Center
8:00 AM - 12:00 PM	Ten-Minute Papers, SysEB Section: Systematics of Coleoptera and Biodiversity Technology	Meeting Room 5 ABC, Austin Convention Center
8:00 AM - 2:00 PM	Poster Presentations: MUVE 2	Exhibit Hall 4, Austin Convention Center
8:00 AM - 2:00 PM	Poster Presentations: P-IE 2	Exhibit Hall 4, Austin Convention Center
8:00 AM - 2:00 PM	Poster Presentations: PBT 2	Exhibit Hall 4, Austin Convention Center
8:00 AM - 2:00 PM	Poster Presentations: SysEB 2	Exhibit Hall 4, Austin Convention Center
8:00 AM - 5:00 PM	Under the Lens: Connecting the Community with Entomology and IPM	Ballroom E, Austin Convention Center
9:00 AM - 2:00 PM	Exhibit Hall Open	Exhibit Hall 4, Austin Convention Center
9:00 AM - 2:00 PM	ESA Booth	Exhibit Hall 4, Austin Convention Center
12:00 PM - 1:00 PM	Student Affairs Committee Meeting	Meeting Room 9 C, Austin Convention Center
12:15 PM - 1:15 PM	Social Hour with Poster Presenters	Exhibit Hall 4, Austin Convention Center
12:15 PM - 1:15 PM	Lunch and Learn: The Art of Negotiation	Ballroom G, Austin Convention Center
12:15 PM - 1:15 PM	Lunch and Learn: The Art of Writing a Successful Scientific Paper	Ballroom F, Austin Convention Center
12:15 PM - 1:15 PM	SysEB Final Business Meeting	Meeting Room 6 B, Austin Convention Center
12:30 PM - 2:30 PM	2014 Annual Meeting Program Committee Meeting	Austin Suite, Austin Convention Center
1:00 PM - 1:30 PM	Passport Drawing in ESA Booth	Exhibit Hall 4, Austin Convention Center
1:30 PM - 5:30 PM	Program Symposium: Plant-mediated Interactions Among Multiple Players: Making Connections Between Ecological Processes and Mechanisms	Ballroom F, Austin Convention Center
1:30 PM - 5:30 PM	PBT Section Symposium: Insect Resistance Management: Lessons Learned from Biochemical and Molecular Paths to Bt Resistance	Meeting Room 19 B, Austin Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Ecological Services of Insect Microbial Control Agents	Meeting Room 7, Austin Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Insect-Microbe-Plant Interactions	Meeting Room 10 C, Austin Convention Center
1:30 PM - 5:30 PM	P-IE Section Symposium: Integrated Pest Management in the Connected World of Whole-Farm Ecosystems	Meeting Room 12 A, Austin Convention Center
1:30 PM - 5:30 PM	SysEB Section Symposium: What Arthropods Reveal about the Biogeography of the American Southwest and Mexico; with a Report on Work from Joshua Tree National Park	Meeting Room 18 A, Austin Convention Center

1:30 PM - 5:30 PM	SysEB Section Symposium: Interactive Keys Transforming Identification: Melding Traditional Methods with New Technologies	Meeting Room 6 A, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Forest Entomology Connecting the World	Meeting Room 18 D, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: How Cool is Entomology?	Meeting Room 16 A, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Integrated Insect Omics: From Transcriptomics to Interactomics	Meeting Room 19 A, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Stored Product Entomology: Impacts on a Connected World	Meeting Room 9 AB, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: The Menace of Palm Weevils: Challenges and Strategies	Meeting Room 15, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Urban Pests and Disease Vectors: Sustainable Management and Future Research	Meeting Room 8 C, Austin Convention Center
1:30 PM - 5:30 PM	Symposium: Youthful Perspectives in Forensic Entomology: Who are These Young Punks?	Meeting Room 18 B, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, MUVE Section: Urban Entomology	Meeting Room 18 C, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, P-IE Section: Crop Protection: Row Crops	Meeting Room 16 B, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, P-IE Section: Environmental Entomology	Meeting Room 17 B, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, P-IE Section: Pheromones and Attractants	Meeting Room 17 A, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, SysEB Section: Ecology and Behavior	Meeting Room 5 ABC, Austin Convention Center
1:30 PM - 5:30 PM	Ten-Minute Papers, SysEB Section: Systematics of Hymenoptera	Meeting Room 4 ABC, Austin Convention Center
4:00 PM - 5:00 PM	Open P-IE Section Governing Council and Member Feedback Session	Austin Suite, Austin Convention Center
5:30 PM - 7:30 PM	Closing Plenary Session	Ballroom D, Austin Convention Center
THURSDAY, NOVEMBER 14		
Time	**Session/Function**	**Location**
8:30 AM - 3:00 PM	Spotted Wing Drosophila Biology, Ecology, and Management	Rio Grande Salon A, Courtyard by Marriott

DAILY SCHEDULE BY SCIENTIFIC PROGRAM

SATURDAY, NOVEMBER 9		
Session	**Time**	**Location**
Entomological Collections Network	7:00 AM - 5:00 PM	Ballroom E, Austin Convention Center
Microbial Control Working Group	8:00 AM - 9:00 PM	Meeting Room 400, Hilton
Entomological Collections Network	6:00 PM - 9:00 PM	Ballroom F, Austin Convention Center
SUNDAY, NOVEMBER 10		
Session	**Time**	**Location**
Program Symposia		
Connecting with the World's Best Talent: Attracting and Retaining Diverse Entomologists	8:00 AM - 12:00 PM	Meeting Room 16 B, Austin Convention Center
Environmental Determinants and Ecological Consequences of Invasions by Arthropod Disease Vectors	1:15 PM - 5:15 PM	Meeting Room 16 B, Austin Convention Center
Section Symposia		
The Expanding Boundaries of Tick-Borne Diseases in the Midwestern USA (MUVE)	8:00 AM - 12:00 PM	Meeting Room 18 B, Austin Convention Center
The Future of Mosquito Endocrinology (PBT)	8:00 AM - 12:20 PM	Meeting Room 19 A, Austin Convention Center
Beyond the LC50: Advancements in Toxicological Research on Pollinators (P-IE)	8:00 AM - 12:00 PM	Meeting Room 17 B, Austin Convention Center
Does Successful Resistance Management Require At Least Some Government Regulation? (P-IE)	8:00 AM - 12:00 PM	Meeting Room 17 A, Austin Convention Center
Exchange of Insects between Native and Non-native Plants: Novel Food Webs, Invasions, and Biocontrol (P-IE)	8:00 AM - 12:00 PM	Meeting Room 18 D, Austin Convention Center
Biology and Evolution of Social Insect Symbionts (SysEB)	8:00 AM - 12:00 PM	Meeting Room 6 B, Austin Convention Center
Screwworm Eradication: Connecting Science with Customers in the Americas and Beyond (MUVE)	1:15 PM - 5:15 PM	Meeting Room 14, Austin Convention Center
Insect Lipid Physiology: From the Cell to the Whole Organism (PBT)	1:15 PM - 5:15 PM	Meeting Room 18 C, Austin Convention Center
Connecting Healthy Pollinators, Diverse Microbiota, and the Changing Environment (P-IE)	1:15 PM - 5:15 PM	Meeting Room 18 D, Austin Convention Center
Corn Rootworm Management: Current Status, Challenges & Novel Strategies (P-IE)	12:30 PM - 5:30 PM	Ballroom F, Austin Convention Center
The Environment as the Sculptor: How Abiotic Factors Shape Plant-Insect Interactions (P-IE)	1:15 PM - 5:15 PM	Meeting Room 12 A, Austin Convention Center
Guy Bush and Santa Rosalia: Speciation with gene flow and the extraordinary diversity of insects (SysEB)	1:00 PM - 6:00 PM	Meeting Room 6 B, Austin Convention Center
Member Symposia		
Americas Neuropterists Meeting	8:00 AM - 12:00 PM	Meeting Room 14, Austin Convention Center
Honey Bees Connecting Retired Entomologists	8:00 AM - 12:00 PM	Meeting Room 12 B, Austin Convention Center
Advances in Greenhouse Arthropod Pest Management	8:00 AM - 12:00 PM	Meeting Room 18 A, Austin Convention Center
Aquatic Entomology for the Protection of Water Resources	8:00 AM - 12:00 PM	Meeting Room 5 ABC, Austin Convention Center
Chagas Disease in the USA: A New Risk?	8:00 AM - 12:00 PM	Meeting Room 8 C, Austin Convention Center
Coming Together to Break it Down: A Global Perspective on Decomposers	8:00 AM - 12:00 PM	Meeting Room 15, Austin Convention Center
Current Advances in Acarology	8:00 AM - 12:00 PM	Meeting Room 6 A, Austin Convention Center
Insect Pests of Canola (Brassica spp.) and Their Management	8:00 AM - 12:00 PM	Meeting Room 12 A, Austin Convention Center
Phasmatodea Studies Symposium	8:00 AM - 12:00 PM	Meeting Room 4 ABC, Austin Convention Center

Phytosanitary Irradiation: How the International Community is Rising to the Regulatory Challenge	8:00 AM - 12:00 PM	Meeting Room 19 B, Austin Convention Center
The Effects of Endophytic Fungal Entomopathogens on Insects, Plants, and Plant Pathogens	8:00 AM - 12:00 PM	Meeting Room 16 A, Austin Convention Center
Red Imported Fire Ants: Global Approaches to a Global Invasive Species	1:00 PM - 6:00 PM	Meeting Room 8 C, Austin Convention Center
Frontiers of IPM: Honoring the Career of Marshall Johnson	1:15 PM - 5:15 PM	Meeting Room 17 B, Austin Convention Center
Acarology in Molecular Era	1:15 PM - 5:15 PM	Meeting Room 6 A, Austin Convention Center
Advances in Pest Management for Turfgrass and Ornamentals	1:15 PM - 5:15 PM	Meeting Room 15, Austin Convention Center
Future Needs for Biological Control Teaching and Outreach	1:15 PM - 5:15 PM	Meeting Room 18 A, Austin Convention Center
International Society of Hymenopterists: Symposium Honoring Robert Wharton	1:15 PM - 5:15 PM	Meeting Room 4 ABC, Austin Convention Center
Rocking Your Connected World: The Importance of Insect Microbiomes	1:15 PM - 5:15 PM	Meeting Room 19 A, Austin Convention Center
SOLA Scarab Workers	1:15 PM - 5:15 PM	Meeting Room 5 ABC, Austin Convention Center
Succeeding in the Business Aspects of an Entomological Career	1:15 PM - 5:15 PM	Meeting Room 7, Austin Convention Center
Ten Minute Paper (TMP) Oral		
MUVE Section: Medical Entomology	8:00 AM - 12:00 PM	Meeting Room 18 C, Austin Convention Center
MUVE Section: Medical Entomology 2	1:15 PM - 5:15 PM	Meeting Room 17 A, Austin Convention Center
PBT Section: Physiology	1:15 PM - 5:15 PM	Meeting Room 19 B, Austin Convention Center
P-IE Section: Biological Control 1	1:15 PM - 5:15 PM	Meeting Room 12 B, Austin Convention Center
P-IE Section: Crop Protection: Fruit Trees and Vines	1:15 PM - 5:15 PM	Meeting Room 8 AB, Austin Convention Center
P-IE Section: Forest and Arboreal Entomology	1:15 PM - 5:15 PM	Meeting Room 9 C, Austin Convention Center
Poster		
Virtual Posters	6:30 AM - 6:00 PM	Meeting Room 11 AB, Austin Convention Center
MONDAY, NOVEMBER 11		
Session	**Time**	**Location**
Student TMP Competition		
1-Undergraduate Student Ten-Minute Paper Competition: PIE	8:00 AM - 12:00 PM	Meeting Room 4 A, Austin Convention Center
2-Undergraduate Student Ten-Minute Paper Competition: PBT, MUVE, SysEB	8:00 AM - 12:00 PM	Meeting Room 4 BC, Austin Convention Center
3-Graduate Student Ten-Minute Paper Competition: MUVE	8:24 AM - 12:00 PM	Meeting Room 18 A, Austin Convention Center
4-Graduate Student Ten-Minute Paper Competition: MUVE	8:24 AM - 12:00 PM	Meeting Room 18 B, Austin Convention Center
5-Graduate Student Ten-Minute Paper Competition: MUVE	8:24 AM - 12:00 PM	Meeting Room 18 C, Austin Convention Center
6-Graduate Student Ten-Minute Paper Competition: PBT, MUVE	8:24 AM - 12:00 PM	Meeting Room 18 D, Austin Convention Center
7-Graduate Student Ten-Minute Paper Competition: PBT	8:24 AM - 12:00 PM	Meeting Room 19 A, Austin Convention Center
8-Graduate Student Ten-Minute Paper Competition: PBT	8:24 AM - 12:00 PM	Meeting Room 19 B, Austin Convention Center
9-Graduate Student Ten-Minute Paper Competition: PIE	8:00 AM - 12:00 PM	Ballroom E, Austin Convention Center
10-Graduate Student Ten-Minute Paper Competition: PIE	8:00 AM - 12:00 PM	Ballroom F, Austin Convention Center
11-Graduate Student Ten-Minute Paper Competition: PIE	8:00 AM - 12:00 PM	Ballroom G, Austin Convention Center
12-Graduate Student Ten-Minute Paper Competition: PIE	8:24 AM - 12:00 PM	Meeting Room 9 C, Austin Convention Center
13-Graduate Student Ten-Minute Paper Competition: PIE	8:24 AM - 12:00 PM	Meeting Room 10 AB, Austin Convention Center
14-Graduate Student Ten-Minute Paper Competition: PIE	8:24 AM - 12:00 PM	Meeting Room 10 C, Austin Convention Center
15-Graduate Student Ten-Minute Paper Competition: PIE	8:00 AM - 12:00 PM	Meeting Room 12 A, Austin Convention Center
16-Graduate Student Ten-Minute Paper Competition: PIE	8:00 AM - 12:00 PM	Meeting Room 12 B, Austin Convention Center

17-Graduate Student Ten-Minute Paper Competition: PIE	8:00 AM - 12:00 PM	Meeting Room 14, Austin Convention Center
18-Graduate Student Ten-Minute Paper Competition: PIE	8:00 AM - 12:00 PM	Meeting Room 15, Austin Convention Center
19-Graduate Student Ten-Minute Paper Competition: PIE	8:00 AM - 12:00 PM	Meeting Room 16 A, Austin Convention Center
20-Graduate Student Ten-Minute Paper Competition: PIE	8:00 AM - 12:00 PM	Meeting Room 16 B, Austin Convention Center
21-Graduate Student Ten-Minute Paper Competition: PIE	8:24 AM - 12:00 PM	Meeting Room 17 A, Austin Convention Center
22-Graduate Student Ten-Minute Paper Competition: PIE, MUVE	8:24 AM - 12:00 PM	Meeting Room 17 B, Austin Convention Center
23-Graduate Student Ten-Minute Paper Competition: SysEB	8:00 AM - 12:00 PM	Meeting Room 5 ABC, Austin Convention Center
24-Graduate Student Ten-Minute Paper Competition: SysEB	8:00 AM - 12:00 PM	Meeting Room 6 A, Austin Convention Center
25-Graduate Student Ten-Minute Paper Competition: SysEB	8:00 AM - 12:00 PM	Meeting Room 6 B, Austin Convention Center
26-Graduate Student Ten-Minute Paper Competition: SysEB	8:00 AM - 12:00 PM	Meeting Room 7, Austin Convention Center
27-Graduate Student Ten-Minute Paper Competition: SysEB	8:24 AM - 12:00 PM	Meeting Room 8 AB, Austin Convention Center
28-Graduate Student Ten-Minute Paper Competition: SysEB	8:24 AM - 12:00 PM	Meeting Room 8 C, Austin Convention Center
29-Graduate Student Ten-Minute Paper Competition: SysEB	8:24 AM - 12:00 PM	Meeting Room 9 AB, Austin Convention Center
Student Poster Competition		
1-Undergraduate PBT	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
2-Undergraduate P-IE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
3-Undergraduate P-IE/PBT	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
4-Undergraduate SysEB	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
Undergraduate Virtual Poster	6:30 AM - 6:30 PM	Meeting Room 11 AB, Austin Convention Center
5-Graduate Poster MUVE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
6-Graduate Poster MUVE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
7-Graduate Poster PBT	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
8-Graduate Poster PBT	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
9-Graduate Poster P-IE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
10-Graduate Poster P-IE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
11-Graduate Posters P-IE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
12-Graduate Posters P-IE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
13-Graduate Poster P-IE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
14-Graduate Poster P-IE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
15-Graduate Poster P-IE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
16-Graduate Posters P-IE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
17-Graduate Posters P-IE	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
18-Graduate Poster SysEB	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
19-Graduate Poster SysEB	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
20-Graduate Poster SysEB	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
Graduate Virtual Poster	6:30 AM - 6:30 PM	Meeting Room 11 AB, Austin Convention Center
Section Networking Sessions		
MUVE Highlights	1:30 PM - 6:00 PM	Ballroom G, Austin Convention Center
PBT Networking Section	2:00 PM - 4:40 PM	Meeting Room 19 B, Austin Convention Center
Plant-Insect Ecosystems (P-IE) Section Networking and Business Session	2:00 PM - 5:50 PM	Ballroom D, Austin Convention Center
SysEB Section Meeting	1:30 PM - 5:45 PM	Ballroom E, Austin Convention Center

TUESDAY, NOVEMBER 12		
Session	**Time**	**Location**
Program Symposia		
Broadening your Impact: eClosing the Gap between Researchers and the Public	8:00 AM - 12:00 PM	Ballroom G, Austin Convention Center
How New Technologies and Interdisciplinary Approaches are Transforming our Understanding of Complex Biological Interactions	1:30 PM - 5:30 PM	Ballroom G, Austin Convention Center
Section Symposia		
Cellular, Molecular and Microbiological Interactions within Hematophagous Arthropods (MUVE)	8:00 AM - 12:00 PM	Meeting Room 18 B, Austin Convention Center
Small non-coding RNAs – A New Frontier in Insect Science (PBT)	8:00 AM - 12:00 PM	Meeting Room 15, Austin Convention Center
Arthropod Food Webs: A System for Studying Dynamic Responses to Global Change (P-IE)	8:00 AM - 12:00 PM	Meeting Room 14, Austin Convention Center
Biofuel Cropping Systems: Connecting Beneficial Arthropods, Ecosystem Services, and Landscape Effects (P-IE)	8:00 AM - 12:00 PM	Meeting Room 19 A, Austin Convention Center
Interactions between Biological Control of Pests and Other Ecosystem Services (P-IE)	8:00 AM - 12:00 PM	Meeting Room 18 C, Austin Convention Center
Mechanisms of Resistance: From Mechanism to Management, IRAC US Symposium Series: No.9 (P-IE)	8:00 AM - 12:00 PM	Ballroom E, Austin Convention Center
Plant Defense and Insect Counter-Defense: An Ongoing Battle (P-IE)	8:00 AM - 12:00 PM	Meeting Room 16 B, Austin Convention Center
The Effect of Microbes on Insect-Plant Interactions (P-IE)	8:00 AM - 12:00 PM	Ballroom F, Austin Convention Center
Pitfalls, Malaise, and Hoping It All Pans Out: the State of the Art in Field Collecting Methods for Insect Biodiversity Surveys (SysEB)	8:00 AM - 12:00 PM	Meeting Room 6 A, Austin Convention Center
The Impact of Repellent Research and Development of New Arthropod Repellents (MUVE)	1:30 PM - 5:30 PM	Meeting Room 18 B, Austin Convention Center
Healthy Schools: Research, Benefits and Impacts in the Classroom (MUVE)	1:30 PM - 5:30 PM	Meeting Room 10 AB, Austin Convention Center
Epigenetic Mechanisms Connecting Physiology, Behavior, Ecology, and Evolution in the Insect World (PBT)	1:30 PM - 5:30 PM	Meeting Room 19 B, Austin Convention Center
Insect Ecology in the World's Most Populated Habitat: Connecting Scientists, Practitioners, and the Public (P-IE)	1:30 PM - 5:30 PM	Ballroom F, Austin Convention Center
Climate Change & Arthropod Pest Dynamics: Research to Accelerate our Science and Inform Public Policy (P-IE)	1:30 PM - 5:30 PM	Meeting Room 17 A, Austin Convention Center
Connecting Research, Outreach and Regulatory efforts to Protect Honey Bee Health (P-IE)	1:30 PM - 5:30 PM	Meeting Room 12 A, Austin Convention Center
The Larry Larson Symposium: How Science has Impacted a Connected World by Expanding the Use of Insecticides Beyond Core Agricultural Markets (P-IE)	1:30 PM - 5:30 PM	Ballroom E, Austin Convention Center
Dynamics of the Tropical Ecosystems: A Bug's-Eye View of the Jungle (SysEB)	1:30 PM - 5:30 PM	Meeting Room 6 A, Austin Convention Center
Member Symposia		
Making Connections Across Disciplines to Combat Alien Invaders	8:00 AM - 12:00 PM	Meeting Room 9 AB, Austin Convention Center
Cole Crops Under Siege: U.S. Invasion by the Painted Bug (Bagrada hilaris)	8:00 AM - 12:00 PM	Meeting Room 8 AB, Austin Convention Center
Emerging Technologies and New Challenges to Control Livestock Pests	8:00 AM - 12:00 PM	Meeting Room 18 A, Austin Convention Center
Native Bee Ecology, Evolution And Conservation In The 21st Century	8:00 AM - 12:00 PM	Meeting Room 6 B, Austin Convention Center
When a Blind Beetle Crawls Over the Surface of the Globe...or Under the Water: Biodiversity and Systematics of Aquatic Beetles	8:00 AM - 12:15 PM	Meeting Room 7, Austin Convention Center
Challenges and Opportunities for Classical Biological Control: A Roadmap for New Investigators	1:30 PM - 5:30 PM	Meeting Room 10 C, Austin Convention Center

Connecting Virus Transmitting Mosquito Information: From Laboratory to Surveillance and Management in the Field	1:30 PM - 5:30 PM	Meeting Room 8 AB, Austin Convention Center
Innovative Global Strategies to Connect Entomologists with their Communities through Education, Outreach and Extension Programs	1:30 PM - 5:30 PM	Meeting Room 8 C, Austin Convention Center
Making Connections Abroad: First Latin American/Hispanic Symposium	1:30 PM - 5:30 PM	Meeting Room 15, Austin Convention Center
Mass-Production of Insects and Pathogens for Insect and Weed Biocontrol	1:30 PM - 5:30 PM	Meeting Room 14, Austin Convention Center
New Insights into the Evolution of Insect Coloration	1:30 PM - 5:30 PM	Meeting Room 6 B, Austin Convention Center
Plant Secondary Chemistry and Insect-Plant Interactions: The role of Iridoid Glycosides	1:30 PM - 5:30 PM	Meeting Room 19 A, Austin Convention Center
Strengthening the Connection between Continents –A Symposium Honoring Silvia Dorn's Impact on Applied Entomological Research	1:30 PM - 5:30 PM	Meeting Room 9 AB, Austin Convention Center
Taxonomy and Systematics within the Tenebrionoidea (Coleoptera).	1:30 PM - 5:30 PM	Meeting Room 7, Austin Convention Center
IOBC Workshop Symposium - Integrating the Macros (Macrobial Biocontrols) and the Micros (Microbial Biocontrols) to Manage Insect Pests.	6:30 PM - 9:00 PM	Meeting Room 16 B, Austin Convention Center
Korean Young Entomologists (KYE)	6:00 PM - 10:00 PM	Meeting Room 17 B, Austin Convention Center
Nepal Overseas Entomologists Symposium: Promoting Entomological Collaboration through Inter-societal Network and Information Sharing	6:00 PM - 10:00 PM	Meeting Room 15, Austin Convention Center
Overseas Chinese Entomologists Association (OCEA): Building a Foundation for Collaborations on Entomological Research	6:30 PM - 10:00 PM	Meeting Room 18 B, Austin Convention Center
Heteropterist Conference	6:30 PM - 9:30 PM	Meeting Room 5 ABC, Austin Convention Center
North American Dipterists Society Meeting	7:30 PM - 9:30 PM	Meeting Room 6 B, Austin Convention Center
Coleopterists Society Annual Meeting	7:30 PM - 9:30 PM	Meeting Room 6 A, Austin Convention Center
Ten Minute Paper (TMP) Oral		
PBT Section: Genomics, Transcriptomics and Molecular Biology	8:00 AM - 12:00 PM	Meeting Room 18 D, Austin Convention Center
PBT Section: Sensory Physiology, Behavior, and Chemical Ecology	8:00 AM - 12:00 PM	Meeting Room 19 B, Austin Convention Center
P-IE Section: Environmental Entomology 2	8:00 AM - 12:00 PM	Meeting Room 17 B, Austin Convention Center
P-IE Section: Invasive Species	8:00 AM - 12:00 PM	Meeting Room 17 A, Austin Convention Center
P-IE Section: Pollinators	8:00 AM - 12:00 PM	Meeting Room 16 A, Austin Convention Center
P-IE Section: Population Monitoring, and Modeling	8:00 AM - 12:00 PM	Meeting Room 12 B, Austin Convention Center
SysEB Section: Evolution and Biodiversity	8:00 AM - 12:00 PM	Meeting Room 5 ABC, Austin Convention Center
SysEB Section: Systematics of Diptera and Lepidoptera	8:00 AM - 12:00 PM	Meeting Room 4 ABC, Austin Convention Center
MUVE Section: Stored Product Pests	1:30 PM - 5:30 PM	Meeting Room 18 A, Austin Convention Center
MUVE Section: Veterinary and Forensic Entomology	1:30 PM - 5:30 PM	Meeting Room 18 C, Austin Convention Center
PBT Section: Insect-microbe Interactions, Immunity, and Parasitology	1:30 PM - 5:30 PM	Meeting Room 18 D, Austin Convention Center
P-IE Crop Protection: Horticulture and Vegetable Production	1:30 PM - 5:30 PM	Meeting Room 17 B, Austin Convention Center
P-IE Section: Environmental Entomology 3	1:30 PM - 5:30 PM	Meeting Room 12 B, Austin Convention Center
P-IE Section: Host Plant Resistance	1:30 PM - 5:30 PM	Meeting Room 16 B, Austin Convention Center
P-IE Section: Biological Control 2	1:30 PM - 5:30 PM	Meeting Room 16 A, Austin Convention Center
SysEB Section: Arthropod Symbionts and Ecology of Social Insects	1:30 PM - 5:30 PM	Meeting Room 4 ABC, Austin Convention Center
SysEB Section: Biodiversity and Conservation	1:30 PM - 5:30 PM	Meeting Room 5 ABC, Austin Convention Center

Poster		
MUVE 1	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
PBT 1	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
P-IE 1	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
SysEB 1	8:00 AM - 6:30 PM	Exhibit Hall 4, Austin Convention Center
Virtual Posters	6:30 AM - 6:30 PM	Meeting Room 11 AB, Austin Convention Center
WEDNESDAY, NOVEMBER 13		
Session	**Time**	**Location**
Program Symposia		
Impacts of Global Change on Biodiversity and Biological Control	8:00 AM - 12:00 PM	Ballroom G, Austin Convention Center
Plant-mediated Interactions Among Multiple Players: Making Connections Between Ecological Processes and Mechanisms	1:30 PM - 5:30 PM	Ballroom F, Austin Convention Center
Section Symposia		
Thermal Biology of Mosquito Vectors of Disease: Ecology and Epidemiological Consequence (MUVE)	8:00 AM - 12:00 PM	Meeting Room 14, Austin Convention Center
Applied Research on Bed Bug Management (MUVE)	8:00 AM - 12:00 PM	Ballroom F, Austin Convention Center
Arthropod Associated Allergy (MUVE)	8:00 AM - 12:00 PM	Meeting Room 18 B, Austin Convention Center
ABC Transporters: An Important "New" Player in Insect Biology (PBT)	8:00 AM - 12:00 PM	Meeting Room 19 A, Austin Convention Center
Current Status of Vegetable Insect Pests in the USA (P-IE)	8:00 AM - 12:00 PM	Meeting Room 18 D, Austin Convention Center
Modern Concepts for Statistical Modeling of Field Studies: From GLMs to GLMMs. (P-IE)	8:00 AM - 12:00 PM	Meeting Room 7, Austin Convention Center
Solutions for Invasive Insect Pests in a Connected World (P-IE)	8:00 AM - 12:00 PM	Meeting Room 16 A, Austin Convention Center
Systematics and Evolution of Native Bees (Hymenoptera: Apoidea) (SysEB)	8:00 AM - 12:00 PM	Meeting Room 6 A, Austin Convention Center
Insect Resistance Management: Lessons Learned from Biochemical and Molecular Paths to Bt Resistance (PBT)	1:30 PM - 5:30 PM	Meeting Room 19 B, Austin Convention Center
Ecological Services of Insect Microbial Control Agents (P-IE)	1:30 PM - 5:30 PM	Meeting Room 7, Austin Convention Center
Insect-Microbe-Plant Interactions (P-IE)	1:30 PM - 5:30 PM	Meeting Room 10 C, Austin Convention Center
Integrated Pest Management in the Connected World of Whole-Farm Ecosystems (P-IE)	1:30 PM - 5:30 PM	Meeting Room 12 A, Austin Convention Center
Interactive Keys Transforming Identification: Melding Traditional Methods with New Technologies (SysEB)	1:30 PM - 5:30 PM	Meeting Room 6 A, Austin Convention Center
What Arthropods Reveal about the Biogeography of the American Southwest and Mexico; with a Report on Work from Joshua Tree National Park (SysEB)	1:30 PM - 5:30 PM	Meeting Room 18 A, Austin Convention Center
Member Symposia		
Connecting Our Past with Our Future. A Look at Past Student Award Winners. Then, Now, and in the Future.	8:00 AM - 12:00 PM	Meeting Room 8 C, Austin Convention Center
Evolution of Insect Pests In a Connected and Changing World	8:00 AM - 12:00 PM	Meeting Room 9 AB, Austin Convention Center
IPM for Small-Scale Farmers: Research and Extension Needs and Experiences	8:00 AM - 12:00 PM	Meeting Room 12 B, Austin Convention Center
Science Impacting a Connected INSECT World: Use of Aggregation Pheromones in Pest Management	8:00 AM - 12:00 PM	Meeting Room 15, Austin Convention Center
Strategies for Managing the Asian Citrus Psyllid and Huanglongbing Disease	8:00 AM - 12:00 PM	Meeting Room 17 B, Austin Convention Center
Ecological and Evolutionary Origins of Sociality: Connecting Commonalities of Social Behavior Across Diverse Insect Taxa	8:00 AM - 12:15 PM	Meeting Room 10 AB, Austin Convention Center
Forest Entomology Connecting the World	1:30 PM - 5:30 PM	Meeting Room 18 D, Austin Convention Center

How Cool is Entomology?	1:30 PM - 5:30 PM	Meeting Room 16 A, Austin Convention Center
Integrated Insect Omics: From Transcriptomics to Interactomics	1:30 PM - 5:30 PM	Meeting Room 19 A, Austin Convention Center
Stored Product Entomology: Impacts on a Connected World	1:30 PM - 5:30 PM	Meeting Room 9 AB, Austin Convention Center
The Menace of Palm Weevils: Challenges and Strategies	1:30 PM - 5:30 PM	Meeting Room 15, Austin Convention Center
Urban Pests and Disease Vectors: Sustainable Management and Future Research	1:30 PM - 5:30 PM	Meeting Room 8 C, Austin Convention Center
Youthful Perspectives in Forensic Entomology: Who are These Young Punks?	1:30 PM - 5:30 PM	Meeting Room 18 B, Austin Convention Center
Ten Minute Paper (TMP) Oral		
MUVE Section: Structural Pests	8:00 AM - 12:00 PM	Meeting Room 18 C, Austin Convention Center
PBT Section: Toxicology	8:00 AM - 12:00 PM	Meeting Room 19 B, Austin Convention Center
P-IE Section: Biology and Ecology	8:00 AM - 12:00 PM	Meeting Room 16 B, Austin Convention Center
P-IE Section: Transgenic Host Plants	8:00 AM - 12:00 PM	Meeting Room 17 A, Austin Convention Center
SysEB Section: Arthropod Systematics	8:00 AM - 12:00 PM	Meeting Room 4 ABC, Austin Convention Center
SysEB Section: Systematics of Coleoptera and Biodiversity Technology	8:00 AM - 12:00 PM	Meeting Room 5 ABC, Austin Convention Center
MUVE Section: Urban Entomology	1:30 PM - 5:30 PM	Meeting Room 18 C, Austin Convention Center
P-IE Section: Crop Protection: Row Crops	1:30 PM - 5:30 PM	Meeting Room 16 B, Austin Convention Center
P-IE Section: Environmental Entomology	1:30 PM - 5:30 PM	Meeting Room 17 B, Austin Convention Center
P-IE Section: Pheromones and Attractants	1:30 PM - 5:30 PM	Meeting Room 17 A, Austin Convention Center
SysEB Section: Ecology and Behavior	1:30 PM - 5:30 PM	Meeting Room 5 ABC, Austin Convention Center
SysEB Section: Systematics of Hymenoptera	1:30 PM - 5:30 PM	Meeting Room 4 ABC, Austin Convention Center
Poster		
MUVE 2	8:00 AM - 2:00 PM	Exhibit Hall 4, Austin Convention Center
PBT 2	8:00 AM - 2:00 PM	Exhibit Hall 4, Austin Convention Center
P-IE 2	8:00 AM - 2:00 PM	Exhibit Hall 4, Austin Convention Center
SysEB 2	8:00 AM - 2:00 PM	Exhibit Hall 4, Austin Convention Center
Virtual Posters	6:30 AM - 4:00 PM	Meeting Room 11 AB, Austin Convention Center

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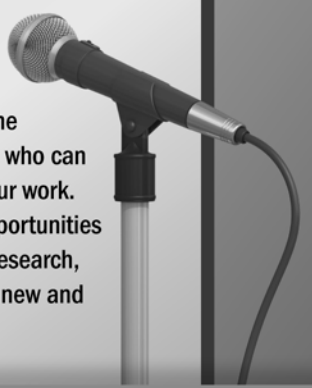

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SUNDAY, NOVEMBER 10, 2013, MORNING

Program Symposium: Connecting with the World's Best Talent: Attracting and Retaining Diverse Entomologists

Meeting Room 16 B (Austin Convention Center)

Moderators and Organizers: Michelle S. Smith and Bill Hendrix, Dow AgroSciences, Indianapolis, IN

8:00 0001 Introduction. **Michelle S. Smith**, mssmith@dow.com, Dow AgroSciences, Indianapolis, IN

8:05 0002 The importance of diversity in the sciences. **Kei Koizumi**, Kei_Koizumi@ostp.eop.gov, White House, Washington, DC

8:25 0003 African American voices in entomology. **Vernard R. Lewis**, urbanpests@berkeley.edu, Univ. of California - Berkeley, Berkeley, CA

8:45 0004 Attraction and retention of Latin-American scientists: A student perspective on diversity. **Claudia H. Kuniyoshi**, kuniyoshi.1@osu.edu, The Ohio State Univ., Wooster, OH

9:05 0005 Lesbian, gay, bisexual and transgender entomologists. **Bill Hendrix**, wmhendrix@dow.com, Dow AgroSciences, Indianapolis, IN

9:25 Break

9:45 0006 Women entomologists in academia. **Sharron Quisenberry**, sharronq@iastate.edu, Iowa State Univ., Ames, IA

10:05 0007 Differently-abled in entomology. **Richard Wendell Mankin**, Richard.Mankin@ars.usda.gov, USDA-ARS-CMAVE, Gainesville, FL

10:25 0008 Asian Americans in entomology. **Nan-Yao Su**, nysu@ufl.edu, Univ. of Florida, Davie, FL

10:45 0009 Panel Discussion. **Kei Koizumi**, Kei_Koizumi@ostp.eop.gov[1], Michelle S. Smith[2], Vernard R. Lewis[3], Claudia H. Kuniyoshi[4], Bill Hendrix[2], Sharron Quisenberry[5], Richard Wendell Mankin[6] and Nan-Yao Su[7], [1]White House, Washington, DC, [2]Dow AgroSciences, Indianapolis, IN, [3]Univ. of California - Berkeley, Berkeley, CA, [4]The Ohio State Univ., Wooster, OH, [5]Iowa State Univ., Ames, IA, [6]USDA-ARS-CMAVE, Gainesville, FL, [7]Univ. of Florida, Davie, FL

11:25 0010 Concluding Remarks. **Michelle S. Smith**, mssmith@dow.com, Dow AgroSciences, Indianapolis, IN

MUVE Section Symposium: The Expanding Boundaries of Tick-Borne Diseases in the Midwestern USA

Meeting Room 18 B (Austin Convention Center)

Moderators and Organizers: Anna Schotthoefer, Marshfield Clinic Research Foundation, Marshfield, WI

8:00 Welcoming Remarks

8:05 0011 Historical overview of tick-borne diseases in the Midwest. **Anna Schotthoefer**, Schotthoefer.Anna@mcrf.mfldclin.edu, Marshfield Clinic Research Foundation, Marshfield, WI

8:25 0012 Changing patterns of tick-borne disease in Wisconsin. **Susan Paskewitz**, paskewit@entomology.wisc.edu, Univ. of Wisconsin - Madison, Madison, WI, Scott Larson, Univ. of Wisconsin-Madison, Madison, WI and Xia Lee, Univ. of Wisconsin, Madison, WI

8:45 0013 A novel *Ehrlichia* species in the Upper Midwest. **Bobbi Pritt**, Pritt.Bobbi@mayo.edu, Mayo Clinic, Rochester, MN

9:05 0014 Change in Population Structure of *Borrelia burgdorferi* in Central Wisconsin using Genetic Markers. **Diane Caporale**, Diane.Caporale@uwsp.edu, Univ. of Wisconsin-Stevens Point, Stevens Point, WI

9:25 0015 A comparison of *Ixodes scapularis* phenologies and associated pathogens among several locations in the Upper Midwest and Northeast. **Jean I. Tsao**, jeanitsao@gmail.com, Michigan State Univ., East Lansing, MI and Howard S. Ginsberg, USGS, Patuxent Wildlife Research Center, Kingston, RI

9:45 Break

10:00 0016 Contrasting ecology and epidemiology of *Ixodes scapularis*-borne diseases in the northeastern and Midwestern United States. **Maria Diuk-Wasser**, maria.diuk@yale.edu, Yale School of Public Health, New Haven, CT

10:20 0017 Assessment of lone star tick associated pathogens in southeastern Nebraska. **M. Roberto Cortinas**, rcortinas@unl.edu[1], Timothy M. Hotaling[2] and Amanda Maegli[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska-Lincoln, Lincoln, NE

10:40 0018 Ticks and tick-borne pathogens in North Dakota. **Nathan Russart**, nathan.russart@email.und.edu and Jefferson Vaughan, Univ. of North Dakota, Grand Forks, ND

11:00 0019 Significance of finding *Ixodes scapularis* and *Borrelia burgdorferi* infection in a prairie habitat. **Nohra Mateus-Pinilla**, nohram@illinois.edu, Illinois Natural History Survey, Champaign, IL

11:20 Panel Discussion

PBT Section Symposium: The Future of Mosquito Endocrinology

Meeting Room 19 A (Austin Convention Center)

Moderators and Organizers: Mark R. Brown[1] and Julian F. Hillyer[2], [1]Univ. of Georgia, Athens, GA, [2]Vanderbilt Univ., Nashville, TN

8:00 0020 Introductory remarks. **Mark R. Brown**, mrbrown@uga.edu, Univ. of Georgia, Athens, GA

8:05 0021 Comparative genomic approaches to classifying peptide hormone receptors in mosquitoes. **Kevin Vogel**, kjvogel@uga.edu, Univ. of Georgia, Athens, GA

8:30 0022 Deciphering the patterns of gene expression during the gonadotrophic cycles of the yellow fever mosquito, *Aedes aegypti*. **Sourav Roy**, sourav.roy@ucr.edu, Univ. of California, Riverside, CA

8:55 0023 Four-way regulation of mosquito yolk protein precursor genes. **Immo A. Hansen**, immoh@nmsu.edu, New Mexico State Univ., Las Cruces, NM

9:20 0024 Intercellular regulation of renal function in mosquitoes: Making connections with innexins. **Peter M. Piermarini**, piermarini.1@osu.edu, The Ohio State Univ., Wooster, OH

9:45 0025 GPCRs signaling in regulation of diuresis in females of *Aedes aegypti* (L.) mosquitoes. **Patricia V. Pietrantonio**, p-pietrantonio@tamu.edu, Texas A&M Univ., College Station, TX

10:10 Break

10:30 0026 Regulation of juvenile hormone synthesis in mosquitoes. **Fernando Noriega**, noriegaf@fiu.edu, Florida International Univ., Miami, FL

10:55 0027 Neurohormonal control of mosquito heart contractions. **Julian F. Hillyer**, julian.hillyer@vanderbilt.edu, Vanderbilt Univ., Nashville, TN

11:20 0028 Insulin signaling in *Anopheles* mosquitoes: Prospects for blocking *Plasmodium* development. **Michael A. Riehle**, mriehle@ag.arizona.edu, Univ. of Arizona, Tucson, AZ

11:45 0029 Re-invigorating the insecticide discovery pipeline: GPCRs as targets for the identification of next gen insecticides. **Catherine Hill**, hillca@purdue.edu, Purdue Univ., West Lafayette, IN

12:10 0030 Concluding remarks. **Julian F. Hillyer**, julian.hillyer@vanderbilt.edu, Vanderbilt Univ., Nashville, TN

P-IE Section Symposium: Beyond the LC50: Advancements in Toxicological Research on Pollinators

Meeting Room 17 B (Austin Convention Center)

Moderators and Organizers: Kristen Hladun[1] and Reed Johnson[2], [1]Univ. of California, Riverside, Riverside, CA, [2]The Ohio State Univ. – OARDC, Wooster, OH

8:00 Introductory Remarks

8:03 0031 Impact of combined pesticide exposure on individual- and colony-level traits in bumblebees. **Nigel Raine**, nigel.raine@rhul.ac.uk, Royal Holloway Univ. of London, Surrey, United Kingdom and Richard Gill, Royal Holloway, Univ. of London, Surrey, United Kingdom

8:19 0032 Sub-lethal effects of imidacloprid exposure on honey bee (*Apis mellifera* L.) queen activity and colony development. **Judy Y. Wu**, judyyuwu@yahoo.com and Marla Spivak, Univ. of Minnesota, St. Paul, MN

8:35 0033 From *in vitro* to field: Examining the toxic effects of soil-borne pollutants on honey bees. **Kristen Hladun**, kristen.hladun@email.ucr.edu, Univ. of California, Riverside, Riverside, CA and John T. Trumble, Univ. of California, Riverside, CA

8:51 0034 The subtle effects of sub-lethal pesticide exposure on honey bee colony health. **Gloria DeGrandi-Hoffman**, Gloria.Hoffman@ARS.USDA.GOV, Carl Hayden Bee Research Center, Tucson, AZ, Yanping (Judy) Chen, Bee Research Laboratory, Beltsville, MD, Roger Simonds, National Science Laboratory, Gastonia, NC and Mark J Carroll, USDA - ARS, Tucson, AZ

9:07 0035 Agrochemical formulant and adjuvant toxicities for honey bees. **Chris Mullin**, camullin@psu.edu[1], Jing Chen[2], Wanyi Zhu[3], Maryann Frazier[4] and James Frazier[2], [1]The Pennsylvania State Univ., Univ. Park, PA, [2]Pennsylvania State Univ., State College, PA, [3]Pennsylvania State Univ., Univ. Park, PA, [4]Penn State Univ., Univ. Park, PA

9:23 0036 Stress and susceptibility in honey bees. **Jay D. Evans**, evansj@ba.ars.usda.gov, USDA, Agricultural Research Service, Beltsville, MD

9:39 0037 Unanticipated effects of "safe" pesticides on comercially managed solitary bees. **Theresa L. Pitts-Singer**, Theresa.Pitts-Singer@ars.usda.gov, USDA, Agricultural Research Service, Logan, UT and Derek R. Artz, USDA - ARS, Logan, UT

9:55 Break

10:05 0038 Stress and the immune response in a solitary bee, implications for toxicology. **Rosalind James**, rosalind.james@ars.usda.gov, USDA - ARS, Logan, UT and Junhuan Xu, Utah State Univ., North Logan, UT

10:21 0039 Comparing pesticide sensitivities between the honey bee and other bee species from a toxicogenomic perspective. **Reed Johnson**, johnson.5005@osu.edu, The Ohio State Univ. – OARDC, Wooster, OH, Junhuan Xu, Utah State Univ., North Logan, UT and Thomas Janini, The Ohio State Univ. – ATI, Wooster, OH

10:37 0040 Ecosystem services and pesticide disturbance: Integrating life history data into predictive population models. **John E. Banks**, banksj@uw.edu, Univ. of Washington-Tacoma, Tacoma, WA, Azmy Ackleh, Univ. of Louisiana-Lafayette, Lafayette, LA, Roger I. Vargas, USDA, Agricultural Research Service, Hilo, HI and John D. Stark, Washington State Univ., Puyallup, WA

10:53 0041 Large-scale field study examining potential impacts on honey bees of exposure to clothianidin seed-treated canola. **G. Christopher Cutler**, chris.cutler@dal.ca[1], Cynthia Scott-Dupree[2], M. Sultan[2], Andrew McFarlane[2] and Larry Brewer[3], [1]Faculty of Agriculture, Dalhousie Univ., Truro, NS, Canada, [2]Univ. of Guelph, Guelph, ON, Canada, [3]Smithers Viscient, Snow Camp, NC

11:09 0042 Research by the crop protection industry to improve the risk assessment process for pesticides and pollinators. **Joseph Wisk**, joseph.wisk@basf.com, BASF Corporation, Agricultural Solutions, Research Triangle Park, NC

11:25 0043 Moving beyond the LC_{50}: Possible constraints and opportunities from a regulatory perspective. Thomas Steeger[1], **Meredith Laws**, Laws.Meredith@epa.gov[1], Kristina Garber[1] and Christina Wendel[2], [1]U.S. Environmental Protection Agency, Washington, DC, [2]U. S. Environmental Protection Agency, Washington, DC

11:41 0044 Does the honey bee risk cup runneth over? **May R. Berenbaum**, maybe@illinois.edu, Univ. of Illinois, Urbana, IL

11:57 Concluding Remarks

P-IE Section Symposium: Does Successful Resistance Management Require At Least Some Government Regulation?

Meeting Room 17 A (Austin Convention Center)

Moderators and Organizers: Rick Roush[1], Fred Gould[2], Anthony M. Shelton[3] and Bruce E. Tabashnik[4], [1]Univ. of Melbourne, Melbourne, Australia, [2]North Carolina State Univ., Raleigh, NC, [3]Cornell Univ., NYSAES, Geneva, NY, [4]Univ. of Arizona, Tucson, AZ

8:00 Introductory Remarks

8:05 0045 The major impediments to resistance management are now in the social sciences. **Rick Roush**, rroush@unimelb.edu.au, Univ. of Melbourne, Melbourne, Australia

8:25 0046 Where and why resistance management has and hasn't succeeded for Bt crops. **Bruce Tabashnik**, brucet@ag.arizona.edu and Yves Carriere, Univ. of Arizona, Tucson, AZ

8:45 0047 Presentation withdrawn.

9:05 0048 Industry, growers and university cooperate to implement resistance management for diamondback moth. **Anthony M. Shelton**, ams5@cornell.edu, Cornell Univ., NYSAES, Geneva, NY

9:25 0049 Successful resistance management for spinosad. **Gary D. Thompson**, gdthompson@dow.com, Dow AgroSciences, Omaha, AR, Jim. E. Dripps, Dow AgroSciences, Indianapolis, IN and T. C. Sparks, Dow AgroSciences, LLC, Indianapolis, IN

9:45 0050 IRAC-US - perspectives on insecticide resistance management, implementation and regulation. **Caydee Savinelli**, caydee.savinelli@syngenta.com, Syngenta Crop Protection, Greensboro, NC and Walt Mullins, Bayer CropScience, Collierville, TN

10:05 Break

10:15 0051 Rootworm apocalypse now: Resistance management challenges and opportunities in Bt corn. **Christian Krupke**, ckrupke@purdue.edu, Purdue Univ., West Lafayette, IN

10:35 0052 Resistance management: Serious externalities that are not being very well managed. **Julian Alston**, julian@primal.ucdavis.edu, Univ. of California, Davis, Davis, CA

10:55 0053 EPA's regulatory role with insect resistance management. **Jeannette C. Martinez**, Martinez.Jeannette@epa.gov, United States Environmental Protection Agency, Office of Pesticide Programs, Washington, DC

11:15 0054 Successful insect resistance management: The need for new roles by the Federal government, seed developers, and farmers. **Greg Jaffe**, gjaffe@cspinet.org, Center for Science in the Public Interest, Washington, DC

11:35 Panel Discussion

P-IE Section Symposium: Exchange of Insects between Native and Non-native Plants: Novel Food Webs, Invasions, and Biocontrol

Meeting Room 18 D (Austin Convention Center)

Moderators and Organizers: Ian S. Pearse, Univ. of California, Davis, Davis, CA

8:00 0055 What should ecologists be asking about native insects and non-native hosts? **Matthew L. Forister**, mforister@unr.edu, Univ. of Nevada, Reno, Reno, NV, James A. Fordyce, Univ. of Tennessee, Knoxville, TN, Alex Buerkle, The Univ. of Wyoming, Laramie, WY and Chris C Nice, Texas State Univ., San Marcos, San Marcos, TX

8:20 0056 Latitudinal and local variation in interactions between non-native plants and their old and new enemies. **Peter Kotanen**, peter.kotanen@utoronto.ca, Univ. of Toronto Mississauga, Mississauga, ON, Canada

8:40 0057 Interactions of plants with insects in their native and introduced ranges. **Evan Siemann**, siemann@rice.edu[1], Juli Carrillo[1], Jianqing Ding[2], Wei Huang[3] and Yi Wang[4], [1]Rice Univ., Houston, TX, [2]Huazhong Agriculture Univ., Wuhan, Hubei, China, [3]Chinese Academy of Sciences, Wuhan, Hubei, China, [4]Chinese Academy of Sciences, Wuhan, HUbei, China

9:00 0058 Methods for predicting novel food webs before they establish. **Ian S. Pearse**, ianspearse@gmail.com, Cornell Lab of Ornithology, Ithaca, NY, Florian Altermatt, Eawag: Swiss Federal Institute of Aquatic Science and Technology, Dübendorf, Switzerland and David Harris, UC Davis, Center for Population Biology, Davis, CA

9:20 0059 How contemporary evolution enables colonization of new habitats and host plants by a biological control insect. **Peter McEvoy**, mcevoyp@science.oregonstate.edu, Oregon State Univ., Corvallis, OR

9:40 0060 Climate change modifies novel interactions between invasive herbivores and native plants. **Nathan Lemoine**, lemoine.nathan@gmail.com, Smithsonian Environmental Research Center, Edgewater, MD

10:00 0061 Experimental time travel: error and its evolutionary consequences. **Scott P. Carroll**, spcarroll@ucdavis.edu, Univ. of California-Davis, Davis, CA

SysEB Section Symposium: Biology and Evolution of Social Insect Symbionts

Meeting Room 6 B (Austin Convention Center)

Moderators and Organizers: Joseph Parker[1], Michael S. Caterino[2] and K. Taro Eldredge[3], [1]Columbia Univ., New York, NY, [2]Santa Barbara Museum of Natural History, Santa Barbara, CA, [3]Univ. of Kansas, Lawrence, KS

8:00 Introductory Remarks

8:03 0062 Coevolution between myrmecophiles and their hosts. **David Nash**, DRNash@bio.ku.dk, Univ. of Copenhagen, Copenhagen, Denmark

8:21 0063 Biology of a spider myrmecophile. **Paula Cushing**, paula.cushing@dmns.org, Denver Museum of Nature and Science, Denver, CO

8:39 0064 Myrmecophiles of ants inhabiting the African ant plant, *Acacia drepanolobium*. **Naomi E. Pierce**, npierce@oeb.harvard.edu, Harvard Univ., Cambridge, MA

8:57 0065 Ecological, morphological, and behavioral diversity in *Pseudacteon* phorid flies specialized on fire ants: Observations and mysteries. **Lawrence E. Gilbert**, lgilbert@mail.utexas.edu, Univ. of Texas, Austin, TX

9:15 0066 A new type of ant-decapitation in the Phoridae. **Brian V. Brown**, bbrown@nhm.org, Natural History Museum, Los Angeles County, Los Angeles, CA

9:33 0067 Predators for the greater good: The role of two ant associated beetles in *Azteca* ant-phorid fly interactions. **Kate Mathis**, Kamathis@berkeley.edu, UC Berkeley, Berkeley, CA

9:51 Break

9:56 0068 Cuticular hydrocarbons and chemical mimicry – how are unique blends of insect hydrocarbons achieved?". **Gary J. Blomquist**, garyb@cabnr.unr.edu, Univ. of Nevada, Reno, Reno, NV

10:14 0069 Integrative work in *Paussus* evolution and ecology: Getting the most out of your specimens. **James A. Robertson**, erotylid@gmail.com, Univ. of Georgia, Athens, GA

10:32 0070 Ant and termite symbionts among aleocharine staphylinids: what does it take to succeed? **Vladimir I. Gusarov**, vladimir.gusarov@nhm.uio.no, Univ. of Oslo, Natural History Museum, Oslo, Norway

10:50 0071 Preadapted for inquilinism: How many independent origins of myrmecophily in Histeridae? **Michael S. Caterino**, mcaterino@sbnature2.org, Santa Barbara Museum of Natural History, Santa Barbara, CA

11:08 0072 The "ant selection" hypothesis: Why are pselaphine beetles so species-rich and prone to myrmecophily? **Joseph Parker**, dibasic@gmail.com, Columbia Univ., New York, NY

11:26 0073 The future of symbiont biology as a unified research field. **K. Taro Eldredge**, taroeldredge@ku.edu, Univ. of Kansas, Lawrence, KS

11:44 Concluding Remarks

Member Symposium: Americas Neuropterists Meeting

Meeting Room 14 (Austin Convention Center)

Moderators and Organizers: David E. Bowles[1] and Atilano Contreras-Ramos[2], [1]United States National Park Service, Republic, MO, [2]Universidad Nacional Autonoma de Mexico, Mexico City, DF, Mexico

8:00 Welcoming Remarks

8:05 0074 A review of the genus *Myrmeleon* in the nearctic region (Neuroptera: Myrmeleontidae). **David Baumgardner**, dbaumgardner@neo.tamu.edu and John D. Oswald, Texas A&M Univ., College Station, TX

8:25 0075 The historical development of systematic Neuropterology in North America. **John D. Oswald**, joswald@ag.tamu.edu, Texas A&M Univ., College Station, TX

8:45 0076 Towards a phylogeny and monography of Myrmeleontini. **Ben Diehl**, b-diehl@tamu.edu, Texas A&M Univ., College Station, TX

9:05 0077 An antlion (Myrmeleontidae) expedition throughout Australia. **Renato Machado**, rjpmachado@neo.tamu.edu, Texas A&M Univ., College Station, TX

9:25 0078 Initial results on the Myrmeleontidae of tropical dry forests of the Mexican Pacific. **Roberto Lopez-Garcia**, exoddous@hotmail.com, Universidad Nacional Autónoma de México, Mexico, DF, Mexico and Atilano Contreras-Ramos, Universidad Nacional Autonoma de Mexico, Mexico City, DF, Mexico

9:45 0079 Progress in the systematics of owlflies (Neuroptera: Ascalaphidae). **Joshua R. Jones**, doc.jones3000@tamu.edu, Texas A&M Univ., College Station, TX

10:05 Break

10:20 0080 The Mantispidae (Insecta: Neuroptera) from the Illinois Natural History Survey Insect Collection. **Daniel Reynoso-Velasco**, drmvd@mail.missouri.edu, Univ. of Missouri, Columbia, MO

10:40 0081 A world review of the Neuropterida/ Hemiptera (Sternorrhyncha) associations. **Gary L. Miller**, gary.miller@ars.usda.gov, USDA, Agricultural Research Service, Belstville, MD

11:00 0082 Coniopterygidae of tropical dry forests of Mexico. **Mariza A. Sarmiento-Cordero**, mariza.sarmiento@ibunam2.ibiologia.unam.mx, Universidad Nacional Autonoma de Mexico, Mexico, DF, Mexico and Atilano Contreras-Ramos, Universidad Nacional Autonoma de Mexico, Mexico City, DF, Mexico

11:20 0083 Possible undescribed species of Neotropical Megaloptera based on female specimens. **Atilano Contreras-Ramos**, acontreras@ibiologia.unam.mx, Universidad Nacional Autonoma de Mexico, Mexico City, DF, Mexico

11:40 0084 Spongillaflies (Sisyridae) of the Americas: State of our knowledge. **David E. Bowles**, david_bowles@nps.gov, United States National Park Service, Republic, MO

Senior Symposium: Honey Bees Connecting Retired Entomologists

Meeting Room 12 B (Austin Convention Center)

Moderators and Organizers: Kenneth A. Sorensen[1] and John Thomas[2], [1]North Carolina State Univ., Raleigh, NC, [2]Texas A&M Univ., College Station, TX

8:00 Introductory Remarks

8:05 0085 Short stories, tall tales and exciting endeavors with honey bees. **Kenneth A. Sorensen**, kenneth_sorensen@ncsu.edu, North Carolina State Univ., Raleigh, NC

8:20 0086 Rev. L. L. Langstroth: A stamp collector's biography. **Kenneth Pruess**, kpruess2@unl.edu, Univ. of Nebraska, Lincoln, NE

8:35 0087 The passion of honey bees? **John Thomas**, jgthomas@aggienetwork.com, Texas A&M Univ., College Station, TX

8:50 0088 Research on Africanized Honey Bees and the History after the find in Texas. **Anita Collins**, collinsa@ba.ars.usda.gov, Bee Research Laboratory, Beltsville, MD

9:05 Open Business Session

Member Symposium: Advances in Greenhouse Arthropod Pest Management

Meeting Room 18 A (Austin Convention Center)

Moderators and Organizers: John P. Sanderson[1] and Michael P. Parrella[2], [1]Cornell Univ., Ithaca, NY, [2]Univ. of California, Davis, Davis, CA

8:00 Introductory Remarks

8:05 0089 Impact of supplemental lighting on greenhouse whitefly and western flower thrips and their control using parasitoids and predators. **Les Shipp**, Les.Shipp@agr.gc.ca, Agriculture and Agri-Food Canada, Harrow, ON, Canada, Abida Nasreen, Ontario Greenhouse Vegetable Growers, Leamington, ON, Canada and Gillian Ferguson, Ontario Ministry of Agriculture, Harrow, ON, Canada

8:21 0090 The economic impact and life history of western tarnished plant bug, Lygus hesperus (Hemiptera: Miridae) on cut gerbera daisy. **James A. Bethke**, jabethke@ucdavis.edu[1], Lucia E. Villavicencio[2], Britta Dahlke[2] and Bryan Vander Mey[3], [1]Univ. of California Cooperative Extension, Riverside, CA, [2]Center for Applied Horticultural Research, Vista, CA, [3]Univ. of California Cooperative Extension, San Diego County, San Marcos, CA

8:37 0091 Completion of a degree-day model and analysis for the European pepper moth, Duponchelia fovealis (Lepidoptera: Crambidae). **Bryan Vander Mey**, bvandermey@ucdavis.edu, Univ. of California Cooperative Extension, San Diego County, San Marcos, CA, James A. Bethke, Univ. of California Cooperative Extension,

Riverside, CA and Rebeccah A. Waterworth, Dept. of Entomology, Riverside, CA

8:53 0092 Effects of physical barriers in managing fungus gnats (Bradysia spp.). **Amy L. Willmott**, awillmot@ksu.edu[1], Raymond A. Cloyd[1] and Erik R. Echegaray[2], [1]Kansas State Univ., Manhattan, KS, [2]Oregon State Univ., Hermiston, OR

9:09 0093 Diverse grain mixtures as banker plants for aphid biological control. **Travis McClure**, tjmcclur@ncsu.edu and Steven D. Frank, North Carolina State Univ., Raleigh, NC

9:25 0094 Control of Bemisia on poinsettia propagative material. **Rose Buitenhuis**, Rose.Buitenhuis@vinelandresearch.com[1], Michael Brownbridge[1], Taro Saito[1], Angela G. Brommit[2], Graeme Murphy[3] and Wayne Brown[4], [1]Vineland Research and Innovation Centre, Vineland Station, ON, Canada, [2]Univ. of Windsor, Windsor, ON, Canada, [3]Ontario Ministry of Agriculture, Food and Rural Affairs, Vineland Station, ON, Canada, [4]Ontario Ministry of Agriculture, Vineland Station, ON, Canada

9:41 0095 Biologically-based IPM in chrysanthemums: It works in Canada!. **Michael Brownbridge**, michael.brownbridge@vinelandresearch.com[1], Rose Buitenhuis[1], Cynthia Scott-Dupree[2], Taro Saito[1], Angela G. Brommit[3], Graeme Murphy[4] and Meghan Waite[2], [1]Vineland Research and Innovation Centre, Vineland Station, ON, Canada, [2]Univ. of Guelph, Guelph, ON, Canada, [3]Univ. of Windsor, Windsor, ON, Canada, [4]Ontario Ministry of Agriculture, Food and Rural Affairs, Vineland Station, ON, Canada

9:57 Break

10:07 0096 Advancing IPM and biological control in greenhouses: Are we making progress? **Michael P. Parrella**, mpparrella@ucdavis.edu, Univ. of California, Davis, Davis, CA

10:23 0097 Influencing oviposition and feeding site selection of Liriomyza trifolii (Burgess) (Diptera: Agromyzidae). **Danny Klittich**, dsklittich@ucdavis.edu, Univ. of California, Davis, CA and Michael P. Parrella, Univ. of California, Davis, Davis, CA

10:39 0098 Interactions among fungus gnats, growing media, cool growing temperatures, and natural enemies. **John P. Sanderson**, jps3@cornell.edu, N. Mattson and E. Lamb, Cornell Univ., Ithaca, NY

10:55 0099 Wettable powder vs. emulsifiable oil formulations of entomopathogenic fungi for microbial biological control. **Stephen P. Wraight**, steve.wraight@ars.usda.gov[1], Melanie Filotas[2], Todd Ugine[3], Mark E. Ramos[4] and John P. Sanderson[3], [1]USDA, Agricultural Research Service, Ithaca, NY, [2]Ontario Ministry of Agriculture, Food & Rural Affairs (OMAFRA), Guelph, ON, Canada, [3]Cornell Univ., Ithaca, NY, [4]USDA-ARS, Ithaca, NY

11:11 0100 Development of whitefly growth curves in greenhouse ornamentals and their use in expert pest management systems. **Alfredo Rios**, rios.43@osu.edu[1], Luis A. Cañas[1], Chris Ranger[2], Michael E. Reding[3], Randall H. Zondag[4] and Heping Zhu[5], [1]The Ohio State Univ., Wooster, OH, [2]USDA Agricultural Research Service, Wooster, OH, [3]USDA - ARS ATRU, Wooster, OH, [4]Ohio State Univ., Painesville, OH, [5]USDA, ARS, Wooster, OH

11:27 0101 Development of a model to predict whitefly distribution on tomato plants and its use to improve the release of a biological control agent. **Diego F. Rincon**, rincon-rueda.1@osu.edu[1], Luis A. Cañas[2], Casey W. Hoy[1] and Larry Phelan[1], [1]Ohio State Univ., Wooster, OH, [2]The Ohio State Univ., Wooster, OH

11:43 0102 Innovative IPM training for greenhouse and interiorscape applicators. **Scott Creary**, Phipps Conservatory, Pittsburgh, PA and Kerry Richards, Penn State Univ., State College, PA

Member Symposium: Aquatic Entomology for the Protection of Water Resources

Meeting Room 5 ABC (Austin Convention Center)

Moderators and Organizers: Alan Leslie[1], Dessie Underwood[2], Wendy L. Willis[3] and Robert Smith[4], [1]Univ. of Maryland, College Park, MD, [2]California State Univ., Long Beach, Long Beach, CA, [3]Aquatic Bioassay and Consulting Laboratory, Ventura, CA, [4]Univ. of Massachusetts, Amherst, MA

8:00 0103 Patterns of macroinvertebrate responses in South Indian Creek and tributaries receiving mineral contributions throughout an elaborate interstate construction project for Tennessee and North Carolina. **Jerry Farris**, jlfarris@astate.edu, Arkansas State Univ., State Univ., AR, Philip Scheuerman, East Tennessee State Univ., Johnson City, TN and Don Cherry, Virginia Tech, Blacksburg, VA

8:20 0104 Comparing insect and fish assemblage responses to urbanization for sustainable management of stream ecosystems. **Robert Smith**, rfsmith@eco.umass.edu and Allison Roy, Univ. of Massachusetts, Amherst, MA

8:40 0105 Use of TITAN on aquatic insect communities. **Ryan King**, Ryan_S_King@baylor.edu, Baylor Univ., Waco, TX

9:00 0106 Underwater with a hand lens in the rivers of Cape Horn, Chile; ecology, biocultural conservation, and education at the top of the world (55°S). **James Kennedy**, kennedy@unt.edu[1], Tamara Contador[2] and Ricardo Rozzi[2], [1]Universidad de Magallanes, Punta Arenas, Chile, [2]Universidad de Magallanes Institute of Ecology and Biodiversity, Punta Arenas, Chile

9:20 0107 On the distributions of stoneflies across formerly glaciated areas: Prospects for conservation in changing climates. **Jason Robinson**, jrob@illinois.edu, Univ. of Illinois at Urbana-Champaign, Champaign, IL

9:40 0108 The role of metamorphosis in regulating metal flux from aquatic to terrestrial food webs. **Jeff Wesner**, jeffwesner@gmail.com[1], Johanna Kraus[2], Travis Schmidt[2], David Walters[2] and William Clements[3], [1]Univ. of South Dakota, Vermillion, SD, [2]U.S. Geological Survey, Fort Collins, CO, [3]Colorado State Univ., Fort Collins, CO

10:00 0109 Using bioassessment in highly urbanized areas – a case study of Southern California. **Dessie Underwood**, dlunderw@csulb.edu, California State Univ., Long Beach, Long Beach, CA

10:20 0110 Characterizing biological integrity using benthic macroinvertebrate communities as indicators within the San Gabriel River watershed. **Wendy Willis**, wendy@aquabio.org[1], Scott Johnson[1] and Kristy Morris[2], [1]Aquatic Bioassay & Consulting Laboratories, inc., Ventura, CA, [2]Council for Watershed Health, Los Angeles, CA

10:40 0111 Biomonitoring of Streams and Rivers: A 2-week short course for students in aquatic entomology and ecology. **Richard Merritt**, merrittr@msu.edu and Michael G. Kaufman, Michigan State Univ., East Lansing, MI

11:00 2018 Urban Signatures in Gene Flow Patterns of Nigronia serricornis (Megaloptera: Corydalidae). **Jeffrey Heilveil,** SUNY College at Oneonta, Oneonta, NY

Member Symposium: Chagas Disease in the USA: A New Risk?

Meeting Room 8 C (Austin Convention Center)

Moderators and Organizers: Jane Breen Pierce, New Mexico State Univ., Artesia, NM

8:00 Introductory Remarks

8:05 0112 Vector-borne transmission of Chagas disease and the ecology of exposure hazard. **JM. Ramsey**, jramsey@correo.insp.mx, 3Centro Regional de Investigación en Salud Pública/CISEI3, Instituto Nacional de Salud Pública, Tapachula, Chiapas, Mexico

8:35 0113 Chagas vectors in the US: A public health perspective. **Ellen Dotson**, ebd6@cdc.gov, Centers for Disease Control and Prevention, Atlanta, GA and Gena Lawrence, CDC, Atlanta, GA

9:00 0114 Is the US a Chagas endemic country? An assessment of the risk of Chagas vectors in the southern US. **Patricia L Dorn**, dorn@loyno.edu, Loyola Univ. New Orleans, New Orleans, LA

9:45 0115 Changes in incidence of *T. cruzi* in triatomines in New Mexico. **Jane Pierce**, japierce@nmsu.edu and Stephen J. Hanson, New Mexico State Univ., Las Cruces, NM

10:05 0116 Triatomine distributions and the burden of Chagas disease along the US/Mexico border. **Sahotra Sarkar**, sarkar@austin.utexas.edu, Univ. of Texas, Section of Integrative Biology, Austin, TX

10:25 0117 Characterization and distribution of Chagas disease in dogs in the southern US. **Karen Snowden**, ksnowden@cvm.tamu.edu, Texas A&M Univ., College Station, TX

10:54 Concluding Remarks

Member Symposium: Coming Together to Break it Down: A Global Perspective on Decomposers

Meeting Room 15 (Austin Convention Center)

Moderators and Organizers: Sean D. Whipple[1] and Jeffrey D. Bradshaw[2], [1]Univ. of Nebraska, Scottsbluff, NE, [2]Univ. of Nebraska - Lincoln, Scottsbluff, NE

8:00 Introductory Remarks

8:10 0118 Termites as decomposers enriching soil and the environment. **Shripat Kamble**, skamble1@unl.edu, Univ. of Nebraska, Lincoln, NE

8:30 0119 Distribution and ecosystem significance of invertebrate decomposers in freshwater habitats. **Matt Whiles**, mwhiles@zoology.siu.edu, Southern Illinois Univ., Carbondale, IL

8:50 0120 Roly-poly recyclers: Isopods as macro-decomposers. **Kerri M. Farnsworth-Hoback**, farnsworthkm@unk.edu, Univ. of Nebraska - Kearney, Kearney, NE

9:10 0121 Maggots as agents of decomposition. **Leon G. Higley**, lhigley@drshigley.com, Univ. of Nebraska, Lincoln, NE

9:30 0122 Burying the dead: The effects of carcass burial and brood development of *Nicrophorus* beetles on surrounding soil nutrients. **W. Wyatt Hoback**, hobackww@unk.edu, Univ. of Nebraska - Kearney, Kearney, NE and Brian Peterson, Univ. of Nebraska at Kearney, Kearney, NE

9:50 Break

10:00 0123 How is dung beetle biology, resource competition and responses to environmental change currently being assessed globally? **Nigel R. Andrew**, nigel.andrew@une.edu.au, Univ. of New England, Armidale, NSW, Australia

10:20 0124 The poop on dung beetle evolution. **T. Keith Philips**, keith.philips@wku.edu, Western Kentucky Univ., Bowling Green, KY

10:40 0125 Dung beetles as indicators of habitat health: Sampling in French Guiana. **Dana Price**, DLPRICE@salisbury.edu, Salisbury Univ., Salisbury, MD

11:00 0126 What are the benefits of dung beetles to agriculture? **Sean D. Whipple**, whip5@hotmail.com and Jeffrey Bradshaw, Univ. of Nebraska - Lincoln, Scottsbluff, NE

11:20 Concluding Remarks

Member Symposium: Current Advances in Acarology

Meeting Room 6 A (Austin Convention Center)

Moderators and Organizers: Raul Villanueva[1] and Jose Carlos V. Rodrigues[2], [1]Texas A&M Univ., Weslaco, TX, [2]Univ. of Puerto Rico, San Juan, PR

8:00 Introductory Remarks

8:05 0127 Does honey bee diet effect *Varroa* mite prevalence? **Diana Sammataro**, diana.sammataro@ars.usda.gov, Carl Hayden Honey Bee Research Center, Tucson, AZ and Abby R. Stilwell, USDA, TUCSON, AZ

8:20 0128 Assessment of non-target effects on soil mites induced by corn seed treatments containing high doses of multiple pesticides. **Mariam Lekveishvili**, lekveish@umd.edu[1], Cerruti RR Hooks[1] and Galen Dively[2], [1]Univ. of Maryland, College Park, MD, [2]Univ. of Maryland, College Park Maryland, MD

8:35 0129 Evaluating miticides for the control of banks grass mites on corn. **Danielle Sekula**, Danielle.Sekula@ag.tamu.edu, Texas A&M Agrilife Extension Service, Weslaco, TX, Webb Wallace, Cotton and Grain Producers of the Lower Rio Grande Valley, Harlingen, TX and Raul Villanueva, Texas A&M Agrilife Extension, Weslaco, TX

8:50 0130 Utilizing evolutionary theory and endosymbiotic bacteria for the biocontrol of mites. **Steven Massey**, stevenemassey@gmail.com, Univ. of Puerto Rico, San Juan, PR, Andorra and Jose Carlos V. Rodrigues, Univ. of Puerto Rico, San Juan, PR

9:05 0131 Mite fauna of dry tree holes in Ohio. George Keeney and **Hans Klompen**, Klompen.1@osu.edu, Ohio State Univ., Columbus, OH

9:20 0132 Impact, dispersal, and management of cleptoparasitic *Chaetodactylus* mites (Acari: Chaetodactylidae) associated with *Osmia* bees (Hymenoptera: Megachillidae). **Yong-Lak Park**, Yong-Lak.Park@mail.wvu.edu, Matthew McKinney and Jb White, West Virginia Univ., Morgantown, WV

9:35 0133 Larval stages of ixodid ticks of the United States: overview and fortchcoming identification guide. **Lance Durden**, Georgia Southern Univ., Statesboro, GA and H Joel Hutcheson, National Veterinary Services Laboratories, Ames, IA

9:50 Break

10:05 0134 Ixodid ticks and feral swine in Texas. **Pete Teel**, pteel@tamu.edu, Texas A&M Univ., College Station, TX

10:35 0135 Comparative transcriptomics: Identification and putative roles of neuropeptides, neurotransmitters and their receptors expressed in the transcriptomes of the synganglia of female tick species . **N. Egekwu**, negek001@odu.edu and Daniel E. Sonenshine, Old Dominion Univ., Norfolk, VA

10:50 0136 Understanding the role of nest proximity and habitat on community composition of ant-associated mites. **Kaitlin Uppstrom Campbell**, uppstrka@muohio.edu and Thomas O. Crist, Miami Univ., Oxford, OH

11:05 0137 Effect of organic pesticides on the predacious phytoseiid mite *Euseius mesembrinus*. **Lauren Fann**, fannlauren@yahoo.com, South Texas College, Weslaco, TX, Gabriela Esparza-Díaz, Texas A&M Univ. - Texas AgriLIFE Extension, Weslaco, TX and Raul Villanueva, Texas A&M Agrilife Extension, Weslaco, TX

11:20 0138 Molecular and morphometric characterization of the citrus rust mites in Texas. **Steven Michael Reyna**, Steven.reyna09@gmail.com, Texas A&M Univ., College Station, TX and Mamoudou Setamou, Texas A&M Univ., Weslaco, TX

11:35 0139 Assessment of *Hemicheyletia wellsina* (Acari: Cheyletidae) as a Potential Predator for Biological Control of Arthropod Pests on Orchids. **Haleigh Ray**, hray12@ufl.edu, Univ. of Florida, FL and Marjorie A. Hoy, Univ. of Florida, Gainesville, FL

11:50 Concluding Remarks

Member Symposium: Insect Pests of Canola (*Brassica* spp.) and Their Management

Meeting Room 12 A (Austin Convention Center)

Moderators and Organizers: Gadi VP Reddy[1] and Héctor A. Cárcamo[2], [1]Montana State Univ., Conrad, MT, [2]Agriculture and Agri-Food Canada, Lethbridge, AB, Canada

8:00 Introductory Remarks

8:02 0140 Insect-resistant canola - Lessons learned from germplasm resistant to root maggots and the cabbage seedpod weevil. **Lloyd M. Dosdall**, lloyd.dosdall@ualberta.ca, Univ. of Alberta, Edmonton, AB, Canada, James Tansey, Univ. of Alberta, Calgary, AB, Canada and Adam Blake, Simon Fraser Univ., Burnaby, BC, Canada

8:22 0141 Entomopathogenic nematodes for the control of oilseed rape pests. **Heikki Hokkanen**, heikki.hokkanen@helsinki.fi, Univ. of Helsinki, Helsinki, Finland

8:42 0142 Effects of lygus bugs on canola yield – lessons from cages, plots and commercial fields. **Héctor A. Cárcamo**, hector.carcamo@agr.gc.ca, Agriculture and Agri-Food Canada, Lethbridge, AB, Canada and Jennifer Otani, Agriculture and Agri-Food Canada, Beaverlodge, AB, Canada

9:02 0143 Is the pollen beetle Brassicogethes viridescens (Coleoptera: Nitidulidae) a pest of concern for canola growers? . **Christine Noronha**, Christine.Noronha@AGR.GC.CA, Agriculture and Agri-Food Canada, Charlottetown, PEI, Canada

9:17 0144 Status of neonicotinoid seed treatments for control of *Phyllotreta* flea beetles in Canola. **JJ. Knodel**, janet.knodel@ndsu.edu[1], Patrick Beauzay[1] and Bryan Hanson[2], [1]North Dakota State Univ., Fargo, ND, [2]North Dakota State Univ., Langdon, ND

9:32 0145 Risk assessment of classical biological control agents of cabbage seedpod weevil. **Peter Mason**, peter.mason@agr.gc.ca, Agriculture and Agri-Food Canada, Ottawa, ON, Canada

9:47 0146 Developing threshold levels for flea beetles on Canola in Montana. **Khanobporn Tangtrakulwanich**, k.tangtrakulwanich@montana.edu, Gadi VP Reddy, Victoria Ophus, John Miller and Julie Prewitt, Montana State Univ., Conrad, MT

10:02 0147 Challenges monitoring lepidopterous pests of canola in the Canadian Prairie Provinces. **Maya L. Evenden**, mevenden@ualberta.ca, Univ. of Alberta, Edmonton, AB, Canada

10:17 0148 Integrated Pest Management in Canola: How Far Have We Come, and What is Still Needed? **John Gavloski**, John.Gavloski@gov.mb.ca, Manitoba Agriculture, Food and Rural Initiatives, Carman, MB, Canada

10:32 0149 Integrated pest management program for canola insects in the Western Triangle agricultural area of Montana. **Gadi VP Reddy**, reddy@montana.edu, Khanobporn Tangtrakulwanich, Victoria Ophus, John Miller and Julie Prewitt, Montana State Univ., Conrad, MT

10:47 0150 Management of Canola Insects in the Southeastern United States. **G. David Buntin**, gbuntin@uga.edu, Univ. of Georgia, Griffin, GA

11:02 0151 Taxonomy and phenology of Hymenopteran parasitoids attacking cutworms (Lepidoptera: Noctuidae) in canola in Manitoba. **R.W.M.U.M. Wanigasekara**, udari_madu@yahoo.com, Univ. of Manitoba, Manitoba, MB, Canada, W. Lodge-Zaparnick, Univ. of Manitoba, Entomology, Manitoba, MB, Canada and Barbara J. Sharanowski, Univ. of Manitoba, Winnipeg, MB, Canada

11:17 0152 Detection and symptomatology of Aster yellows in canola crops in Saskatchewan, Canada. **Chrystel Olivier**, chrystel.olivier@agr.gc.ca, Agriculture and Agri-Food Canada, Saskatoon, SK, Canada and Tim Dumonceaux, Agriculture and Agri-Food Canada/Agriculture et Agroalimentaire Canada, Saskatoon, SK, Canada

11:32 0153 Plant stage-related effects of the swede midge, *Contarinia nasturtii*, in canola. **Rebecca H. Hallett**, rhallett@uoguelph.ca, Mark K. Sears and Jonathon Williams, Univ. of Guelph, Guelph, ON, Canada

11:47 Concluding Remarks

Member Symposium: Phasmatodea Studies Symposium

Meeting Room 4 ABC (Austin Convention Center)

Moderators and Organizers: Matan Shelomi, Univ. of California, Davis, Davis, CA

8:00 0154 Wing evolution and flight biomechanics in stick insects. **Yu Zeng**, dreavoniz@berkeley.edu, Univ. of California Berkeley, Berkeley, CA

8:25 0155 Major ecological shifts both promote and retard speciation in *Timema* stick insects. **Daniel J. Funk**, daniel.j.funk@vanderbilt.edu, Vanderbilt Univ., Nashville, TN

8:50 0156 Legs and Eggs: Autotomy, regeneration and reproduction in phasmids. **Tara Maginnis**, maginnis@up.edu, The Univ. of Portland, Portland, OR

9:15 0157 Anatomy of the Phasmatodea Digestive Tract: Enzymes and Appendices. **Matan Shelomi**, mshelomi@ucdavis.edu, Univ. of California, Davis, Davis, CA

Member Symposium: Phytosanitary Irradiation: How the International Community is Rising to the Regulatory Challenge

Meeting Room 19 B (Austin Convention Center)

Moderators and Organizers: Laura A. Jeffers[1], Michael K. Hennessey[2] and David E. Bellamy[3], [1]USDA, Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ), Center for Plant Health Science and Technology (CPHST), Raleigh, NC, [2]United States Dept. of Agriculture (USDA), Raleigh, NC, [3]USDA, Agricultural Research Service, Parlier, CA

8:00 Introductory Remarks

8:05 0158 The short history of phytosanitary irradiation. **Peter A. Follett**, peter.follett@ars.usda.gov, USDA-ARS, Hilo, HI

8:25 0159 US phytosanitary irradiation program. **Laura A. Jeffers**, laura.a.jeffers@usda.gov, USDA, Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ), Center for Plant Health Science and Technology (CPHST), Raleigh, NC

8:45 0160 Australian irradiated exports to New Zealand. **Brendan McDonald**, brendan.mcdonald@mpi.govt.nz, Ministry for Primary Industries, Wellington, New Zealand and Craig Scheibel, Dept. of Agriculture Fisheries and Forestry, Canberra, Australia

9:05 0161 Phytosanitary irradiation and international trade. **Vanessa Dellis**, vanessa.p.dellis@aphis.usda.gov, USDA, Animal Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ), Plant Health Programs (PHP), Riverdale, MD

9:25 0162 International standards for phytosanitary irradiation. **Woodward Bailey**, woodward.d.bailey@aphis.usda.gov, USDA, Animal Plant Health Inspection Service, Miami, FL

9:45 Break

10:00 0163 Phytosanitary irradiation: Quality studies and consumer acceptance. **Anuradha Prakash**, prakash@chapman.edu, Chapman Univ., Food Science, Orange, CA

10:20 0164 Insect-related specialty crop trade barriers: Logistical and infrastructural challenges for irradiation in California. **Spencer Walse**, spencer.walse@ars.usda.gov, USDA, Agricultural Research Service, Parlier, CA

10:40 0165 Phytosanitary irradiation: An economic perspective. **Chip Starns**, cstarns@scantechsciences.com, ScanTech Sciences, Houston, TX

11:00 0166 FAO/IAEA coordinated research project on the development of generic phytosanitary irradiation treatments. **Guy J. Hallman**, Guy.Hallman@ars.usda.gov, USDA, ARS, Manhattan, KS

11:20 0167 Effects of modified and controlled atmospheres on phytosanitary irradiation; a physiological and biochemical perspective towards efficacy and diagnostics. **Dan A. Hahn**, dahahn@ufl.edu, Univ. of Florida, Gainesville, FL

11:40 0168 Open forum: Stakeholder and research needs for phytosanitary irradiation. **Laura A. Jeffers**, laura.a.jeffers@usda.gov, USDA, Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ), Center for Plant Health Science and Technology (CPHST), Raleigh, NC

Member Symposium: The Effects of Endophytic Fungal Entomopathogens on Insects, Plants, and Plant Pathogens

Meeting Room 16 A (Austin Convention Center)

Moderators and Organizers: Fernando E. Vega[1] and Soroush Parsa[2], [1]United States Dept. of Agriculture, Agricultural Research Service, Beltsville, MD, [2]International Center for Tropical Agriculture, Cali, Colombia

8:00 0169 Are endophytic fungal entomopathogens the answer to sustainable pest management? **Fernando E. Vega**, Fernando.Vega@ars.usda.gov, United States Dept. of Agriculture, Agricultural Research Service, Beltsville, MD and Soroush Parsa, International Center for Tropical Agriculture, Cali, Colombia

8:20 0170 Inoculation of beans and cassava with fungal entomopathogens and their possible effects on insects. **Soroush Parsa**, s.parsa@cgiar.org[1], Viviana Ortiz[1], Melinda Greenfield[1], Madeline Spigler[1], Leidy Sanchez Rey[1] and Fernando E. Vega[2], [1]International Center for Tropical Agriculture, Cali, Colombia, [2]United States Dept. of Agriculture, Agricultural Research Service, Beltsville, MD

8:45 0171 *Beauveria bassiana* as a fungal endophyte in bananas. **Juliet Akello**, akello@uni-bonn.de, Makerere Univ., Kampala, Uganda

9:10 0172 Endophytic *Metarhizium* as a plant growth promoter. **Scott Behie**, sb07fh@brocku.ca and Michael Bidochka, Brock Univ., St. Catharines, ON, Canada

9:35 0173 Endophytic *Beauveria* as a plant pathogen antagonist. **Bonnie Ownley**, bownley@utk.edu, Univ. of Tennessee, Knoxville, TN

10:00 Concluding Remarks

Ten-Minute Papers, MUVE Section: Medical Entomology

Meeting Room 18 C (Austin Convention Center)

Moderators: Gabriel Hamer[1] and Edward D. Walker[2], [1]Texas A&M Univ., College Station, TX, [2]Michigan State Univ., East Lansing, MI

8:00 0174 Blood meal analysis of mosquitoes involved in a Rift Valley fever outbreak. Joel Lutomiah[1], David Omondi[2], Daniel Masiga[2], Collins Mutai[3], Paul O. Mireji[4], Juliette Ongus[5], **Kenneth J. Linthicum**, Kenneth.Linthicum@ars.usda.gov[6] and Rosemary Sang[1], [1]Kenya Medical Research Institute (KEMRI), Nairobi, Kenya, [2]ICIPE, Nairobi, Kenya, [3]Kenya Medical Research Institute (KEMRI), Nairobi, Kenya, [4]International Center of Insect Physiology and Ecology, Nairobi, Kenya, [5]Jomo Kenyatta Univ. of Agriculture and Technology, Nairobi, Kenya, [6]USDA, Agricultural Research Service, Gainesville, FL

8:12 0175 Epidemiological risk factors: Understanding the effect of the environment on pathogen transmission by mosquitoes. **Lauren Carrington**, lbcarrington@gmail.com, Oxford Univ. Clinical Research Unit, Ho Chi Minh City, Vietnam

8:24 0176 Interplay of population genetics and dynamics in the genetic control of mosquitoes. **Nina Alphey**, nina.alphey@zoo.ox.ac.uk and Michael Bonsall, Univ. of Oxford, Oxford, United Kingdom

8:36 0177 Apple snails and tiger mosquitoes: A curious association between two invasive species in Florida, USA. **Nathan D. Burkett-Cadena**, nburkett@health.usf.edu and Thomas R. Unnasch, Univ. of South Florida, Tampa, FL

8:48 0178 Dengue outbreak in Pakistan: Mapping the distribution of vector mosquitoes with DNA barcodes. **Muhammad Ashfaq**, mashfaq@uoguelph.ca[1], Paul Hebert[1], Jawwad Mirza[2] and Sajjad Mirza[2], [1]Biodiversity Institute of Ontario, Univ. of Guelph, Guelph, ON, Canada, [2]National Institute for Biotechnology and Genetic Engineering, Faisalabad, Pakistan

9:00 0179 West Nile virus vector (*Culex* spp.) and nestling host interactions in Central Virginia. **Kevin Caillouët**, kcaillouet@gmail.com, St. Tammany Parish Mosquito Abatement District, Slidell, LA and Lesley Bulluck, Virginia Commonwealth Univ., Richmond, VA

9:12 0180 Can all competent mosquito vectors equally transmit avian malaria parasites? **Jenny S. Carlson**, jencarlson@ucdavis.edu[1], Erika Walther[2], Rebecca Trout-Fryxell[1], Sarah Staley[3], Lisa Tell[3], Ravinder N. M. Sehgal[2], Gregory C. Lanzaro[4] and Anthony J. Cornel[1], [1]Univ. of California, Davis, Davis, CA, [2]San Francisco State Univ., San Francisco, CA, [3]Univ. of California at Davis, Davis, CA, [4]Univ. of California - Davis, Davis, CA

9:24 0181 Effect of leaf type and pesticide exposure on abundance of bacterial taxa in mosquito larval habitats. **Ephantus J. Muturi**, emuturi2@illinois.edu and Chang-Hyun Kim, Univ. of Illinois, Champaign, IL

9:36 0182 Effects of different bacterial isolates on the hatching of *Aedes aegypti* eggs. **Loganathan Ponnusamy**, loganathan_ponnusamy@ncsu.edu, Coby Schal and Charles Apperson, North Carolina State Univ., Raleigh, NC

9:48 Break

10:03 0183 Bacterial midgut microbiota associated with mosquito populations in waste tires from two spatially segregated study sites in Urbana, Illinois. **Chang-Hyun Kim**, maraychk@illinois.edu and Ephantus J. Muturi, Univ. of Illinois, Champaign, IL

10:15 0184 The effect of larval nutritional quantity on aspects of vector competence and vectorial capacity of the malaria mosquito *Anopheles stephensi*. **Lillian Moller-Jacobs**, llm233@psu.edu, Courtney Murdock, Matt Jones, Derek Sim and Matthew Thomas, The Pennsylvania State Univ., Univ. Park, PA

10:27 0185 Mosquito gut ecosystem: Metagenomic and metabolomic configuration. **Jiannong Xu**, jxu@nmsu.edu[1], Phanidhar Kukutla[1], Jinjin Jiang[1], Dong Pei[2], Wanqin Yu[1], Guiyun Yan[3], Lingling An[4], Hongmei Jiang[1], Bo Wang[5], Elizabeth Glennon[5] and Shirley Luckhart[6], [1]New Mexico State Univ., Las Cruces, NM, [2]New Mexico State Univerity, Las Cruces, NM, [3]Univ. of California, Irvine, Irvine, CA, [4]Univ. of Arizona, Tucson, AZ, [5]Univ. of California Davis, Davis, CA, [6]Univ. of California at Davis, Davis, CA

10:39 0186 LT^{50} of malaria vectors against insecticides used in district Muzaffargarh, Pakistan. **Saleem Rana**, smranamedvchsa@hsa.edu.pk, Free Lanser Short Term Consultant, Islamabad, Pakistan

10:51 0187 Pre-treatment of *Aedes aegypti* mosquitoes with sublethal dose of imidacloprid impairs behavioral avoidance induced by lemon oil and DEET. **Fan Tong**, tongf@epi.ufl.edu[1], Steeve Thany[2] and Jeffrey R. Bloomquist[1], [1]Univ. of Florida, Gainesville, FL, [2]Univ. d'Angers, Angers, France

11:03 0188 Slowing the development of insecticide resistance in malaria mosquitoes: Application of a spatially complex simulation model. **Kristine T. Edwards**, kt20@msstate.edu, Michael Caprio and Jerome Goddard, Mississippi State Univ., Mississippi State, MS

11:15 0189 Novel approaches to broaden the portfolio of chemical insecticides for control of adult malaria vectors. **Jessica Waite**, jlw1073@psu.edu, Lauren Cator, Andrew Read and Matthew B. Thomas, Pennsylvania State Univ., Univ. Park, PA

11:27 0190 Genetic control of *Aedes aegypti* (L.). **Luke Alphey**, luke.alphey@oxitec.com, Oxford Univ. and Oxitec LTD, Oxford, United Kingdom

11:39 0191 Entomological surveillance and detection of dengue viruses in vector mosquitoes as an early warning tool for the control of dengue in Pakistan. **Nusrat Jahan**, dr.nusratjahan@gcu.edu.pk, Government College Univ., Lahore, Punjab, Pakistan

ESA Function: Responsible Conduct of Research (RCR) Training Workshop

Meeting Room 9 AB (Austin Convention Center)

Moderators and Organizers: Ernest Delfosse, USDA-ARS-NPS, Beltseville, MD

9:30 - 12:00

SUNDAY, NOVEMBER 10, 2013, AFTERNOON

Lunch and Learn: Is Certification Right for Me (and my team)?

Meeting Room 9 C (Austin Convention Center)

Moderators and Organizers: Chris Stelzig[1] and Mustapha Debboun[2], [1]Entomological Society of America, National Office, Lanham, MD, [2]United States Army, Medical Dept. Center & School, Fort Sam Houston, TX

12:15 - 1:15

Lunch and Learn: Managing the Big Transition to your First Job (or I'm about to graduate, now what?)

Meeting Room 10 AB (Austin Convention Center)

Panel: Mark Asplen, Metropolitan State University; James Harwood, University of Kentucky; Kevin Johnson, Dow AgroSciences; Johnathan Lundgren, USDA-ARS, North Central Ag Research Lab

12:15 - 1:15

Program Symposium: Environmental Determinants and Ecological Consequences of Invasions by Arthropod Disease Vectors

Meeting Room 16 B (Austin Convention Center)

Moderators and Organizers: Brian F. Allan, Univ. of Illinois, Urbana, IL

1:15 Introductory Remarks

1:20 0192 Vector invasion, range expansion, and models of habitat receptivity. **Edward Walker**, walker@msu.edu, Michigan State Univ., East Lansing, MI

1:40 0193 Competition and coexistence among invasive *Aedes*: Insights from ecological theory. **Steven Juliano**, sajulian@ilstu.edu[1], Paul A. O'Neal[1], Joseph E. Fader[1], Ebony G. Murrell[2] and Bruce H Noden[3], [1]Illinois State Univ., Normal, IL, [2]Univ. of Wisconsin-Madison, Madison, WI, [3]Polytechnic of Namibia, Windhoek, Namibia

2:00 0194 Predicting differences in the spread of blacklegged ticks and the Lyme disease bacterium in central and eastern North America: How does ecology matter? **Jean I. Tsao**, jeanitsao@gmail.com, Michigan State Univ., East Lansing, MI, Brian F. Allan, Univ. of Illinois, Urbana, IL, Sarah Hamer, Texas A&M Univ., College Station, TX, Graham J. Hickling, Univ. of Tennessee, Institute of Agriculture, Knoxville, TN and Nick Ogden, Public Health Agency of Canada, St Hyacinthe, QC, Canada

2:20 0195 Expected and observed effects on genetic diversity of ticks and tick-borne pathogens in a zone of invasion of Ixodes scapularis in Canada. **Nick Ogden**, nicholas.ogden@phac-aspc.gc.ca, Public Health Agency of Canada, St Hyacinthe, QC, Canada

2:40 0196 The Landscape Ecology of Invasive Vectors and Invasive Plants. **Michael Reiskind**, michael_reiskind@ncsu.edu, North Carolina State Univ., Raleigh, NC

3:00 Break

3:20 0197 Recent and rapid population growth and range expansion of blacklegged ticks in North America. **Dustin Brisson**, dbrisson@sas.upenn.edu, Univ. of Pennsylvania, Philadelphia, PA

3:40 0198 Invading Virginia: A comparison of the invasion patterns of *Ixodes affinis* and *Amblyomma maculatum*. **Holly Gaff**, hgaff@odu.edu, Old Dominion University, Norfolk, VA

4:00 0199 Surveillance of expanding tick distributions in Saskatchewan, Canada. **Neil Chilton**, neil.chilton@usask.ca, Univ. of Saskatchewan, Saskatoon, SK, Canada

4:20 0200 Flying ticks: Migratory birds in the ecology of invasive ticks and zoonotic pathogens. **Sarah Hamer**, shamer@cvm.tamu.edu, Texas A&M Univ., College Station, TX

4:40 0201 Invasion of the BLTs: Spatial determinants in the geographic expansion of Lyme disease. **Brian F. Allan**, ballan@illinois.edu, Univ. of Illinois, Urbana, IL

5:00 Concluding Remarks

MUVE Section Symposium: Screwworm Eradication: Connecting Science with Customers in the Americas and Beyond

Meeting Room 14 (Austin Convention Center)

Moderators and Organizers: S. R. Skoda, USDA, Agricultural Research Service, Kerrville, TX

1:15 0202 Introduction. **Daniel A. Strickman**, daniel.strickman@ars.usda.gov, USDA Agricultural Research Service, Beltsville, MD

1:30 0203 General history of screwworm eradication. **J. Welch**, john.b.welch@aphis.usda.gov, USDA - APHIS, Panama City, Panama

1:55 0204 Rearing screwworms: From fresh meat to artificial diet. **Muhammad Chaudhury**, Muhammad.Chaudhury@ars.usda.gov, USDA, Agricultural Research Service, Panama City, Panama

2:20 0205 Ecology of screwworms: Field observations to satellite images. **P. Phillips**, pamela.phillips@ars.usda.gov, USDA - ARS, Kerrville, TX

2:45 0206 Molecular genetics for identification and population studies. **S. R. Skoda**, steve.skoda@ars.usda.gov, USDA, Agricultural Research Service, Kerrville, TX

3:10 0207 Intermission.

3:30 0208 Developing male-only strains of the screwworm and the Australian sheep blow fly. **Max Scott**, Max_Scott@ncsu.edu, North Carolina State Univ., Raleigh, NC

3:55 0209 Potential for applications to the Old World Screwworm. **Martin Hall**, m.hall@nhm.ac.uk, Natural History Museum London, London, United Kingdom

4:20 0210 The impact of SIT on pest management. **John E Foster**, jfoster1@unl.edu, Univ. of Nebraska-Lincoln,western corn rootworm Lincoln, NE

4:45 0211 Future prospects and conclusions. **Edward Knipling**, edward.knipling@ars.usda.gov, USDA-ARS, /Washington, DC

PBT Section Symposium: Insect Lipid Physiology: From the Cell to the Whole Organism

Meeting Room 18 C (Austin Convention Center)

Moderators and Organizers: Spencer T. Behmer[1], Que Lan[2] and Angela E. Douglas[3], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Wisconsin, Madison, WI, [3]Cornell Univ., Ithaca, NY

1:15 Introductory Remarks

1:20 0212 Metabolic mechanisms mediate the miserable months: A tale about fat stores, diapause, and host-plant driven climatic adaptation in apple maggots. **Daniel A. Hahn**, dahahn@ufl.edu, Univ. of Florida, Gainesville, FL

1:45 0213 Molecular regulation of fat hypertrophy in the diapausing mosquito *Culex pipiens*. **Cheolho Sim**, Cheolho_Sim@baylor.edu, Baylor Univ., Waco, TX

2:10 0214 Lipids and life histories: Role of adaptive modification of lipid metabolism in insect life-history polymorphisms. **Anthony J. Zera**, azera1@unl.edu, Univ. of Nebraska-Lincoln, Lincoln, NE

2:35 0215 New insights in triglyceride metabolism in *Manduca sexta*. **Estela L. Arrese**, destela@okstate.edu, Oklahoma State Univ., Oklahoma City, OK

3:00 Break

3:15 Second Introductory Remarks

3:20 0216 Defining a balanced diet. **Matthew Piper**, m.piper@ucl.ac.uk, Univ. College London, London, United Kingdom

3:45 0217 Lipid droplets as sites of regulated protein sequestration: *Drosophila* embryos and beyond. **Michael Welte**, mwelte@mail.rochester.edu, Univ. of Rochester, Rochester, NY

4:10 0218 Shared mechanisms of health, aging and sex appeal in *Drosophila*. **Scott Pletcher**, spletch@med.umich.edu, Univ. of Michigan, Ann Arbor, MI

4:35 0219 Survival of the fattest: Obesity in starvation-selected *Sophophora melanogaster*. **Allen Gibbs**, allen.gibbs@unlv.edu, Univ. of Nevada Las Vegas, Las Vegas, NV

5:00 Concluding Remarks

P-IE Section Symposium: Connecting Healthy Pollinators, Diverse Microbiota, and the Changing Environment

Meeting Room 18 D (Austin Convention Center)

Moderators and Organizers: Gloria DeGrandi-Hoffman[1], Tugrul Giray[2] and Vanessa Corby-Harris[3], [1]Carl Hayden Bee Research Center, Tucson, AZ, [2]Univ. of Puerto Rico, San Juan, PR, [3]Univ. of Arizona, Tucson, AZ

1:15 0220 Understanding honey bee colony health from a microbial perspective. **Gloria DeGrandi-Hoffman**, Gloria.Hoffman@ARS.USDA.GOV, Carl Hayden Bee Research Center, Tucson, AZ

1:40 0221 The Microbeeome and development in *Apis mellifera*. **Gloria Dominguez-Bello**, mgdbello2@gmail.com[1], Tugrul Giray[1], Carlos J. Vega Melendez[2], Grace Vélez[1], Carlos Huertas[1] and Selena Rodríguez Rivera[1], [1]Univ. of Puerto Rico, San Juan, PR, [2]Univ. of Puerto Rico, San Juan, Puerto Rico

2:05 0222 Of microbes and bees: How does microbiota influence age-related division of labor? **Tugrul Giray**, tgiray2@yahoo.com, Jose Agosto and Yarira Ortiz, Univ. of Puerto Rico, San Juan, PR

2:30 0223 Associations between Acetobacteriaceae and honey bees (*Apis mellifera*): Effects of experimental inoculations in adults and larvae. **Vanessa Corby-Harris**, vanessa.corby@ars.usda.gov, Univ. of Arizona, Tucson, AZ, Melissa Schwann, Carl Hayden Bee Research Center, Tucson, AZ and Kirk E. Anderson, USDA - ARS, Tucson, AZ

2:55 0224 The microbiology of honey bee guts: Who is there and what they do. **Nancy Moran**, nancy.moran@yale.edu, Philip Engel, Walden Kwong and J Powell, Yale Univ., New Haven, CT

3:20 0225 Gut microbiomes associated with honey bee social caste. **Karen Kapheim**, kapheimk@illinois.edu[1], Vikyath Rao[2], Carl Yeoman[3], Brian White[2], Nigel Goldenfeld[2] and Gene E. Robinson[2], [1]Univ. of Illinois, Urbano, IL, [2]Univ. of Illinois, Urbana, IL, [3]Montana State Univ., Bozeman, MT

3:45 0226 Microbial interactions and honey bee disease. **Jay D. Evans**, evansj@ba.ars.usda.gov, USDA, Agricultural Research Service, Beltsville, MD, Ryan Schwarz, USDA ARS, Beltsville, MD and Yanping (Judy) Chen, Bee Research Laboratory, Beltsville, MD

4:10 0227 The genomics and natural products of Pseudonocardia defensive symbionts of fungus-growing ants. **Jonathan Klassen**, jonathan.klassen@uconn.edu, Univ. of Connecticut, Storrs, CT and Cameron Currie, Univ. of Wisconsin, Madison, WI

4:35 0228 Microbial transmission and the pollination landscape: Bacterial associates from flowers, the alimentary tract, and food stores of honey bees (*Apis mellifera*). **Kirk E. Anderson**, kirk.anderson@ars.usda.gov[1], Timothy Sheehan[2], Brendon Mott[3], Patrick Maes[4], Lucy Snyder[4], Melissa Schwann[4], Alexander Walton[5], Beryl M. Jones[3] and Vanessa Corby-Harris[2], [1]USDA - ARS, Tucson, AZ, [2]Univ. of Arizona, Tucson, AZ, [3]USDA, Agricultural Research Service, Tucson, AZ, [4]Carl Hayden Bee Research Center, Tucson, AZ, [5]Iowa State Univ., Ames, IA

P-IE Section Symposium: Corn Rootworm Management: Current Status, Challenges & Novel Strategies

Ballroom F (Austin Convention Center)

Moderators and Organizers: Murugesan Rangasamy[1] and Nandi Nagaraj[2], [1]Dow AgroSciences LLC, Indianapolis, IN, [2]Dow AgroSciences, LLC, Indianapolis, IN

12:30 Introductory Remarks

12:35 0229 Lessons from the past ignored again and again: The western corn rootworm and our legacy of management miscues. **Michael Gray**, megray@illinois.edu, Univ. of Illinois, Urbana, IL

12:50 0230 Are Bt-resistance alleles rare in western corn rootworm populations? **Nicholas Miller**, nmiller4@unl.edu, Univ. of Nebraska, Lincoln, NE

1:10 0231 A tale of two pests: Successes and challenges with the billion-dollar insects. **Marlin Rice**, marlin.rice@pioneer.com, Clinton D. Pilcher and Timothy M. Nowatzki, DuPont Pioneer, Johnston, IA

1:30 0232 Resistance of Western Corn Rootworm to Bt Corn: Data from the Laboratory and Field. **Aaron J. Gassmann**, aaronjg@iastate.edu, Jennifer L. Petzold-Maxwell, Eric H. Clifton, Mike W. Dunbar, Amanda Hoffmann and David A. Ingber, Iowa State Univ., Ames, IA

1:45 0233 Laboratory selection and an evaluation of techniques for quantifying resistance of western corn rootworm larvae to transgenic corn. **Bruce Hibbard**, Bruce.Hibbard@ars.usda.gov[1], Kenneth Ostlie[2], Sarah N. Zukoff[3], Anthony Zukoff[3] and Lee French[4], [1]USDA-ARS, Univ. of Missouri, Columbia, MO, [2]Univ. of Minnesota, St. Paul, MN, [3]Kansas State Univ., Garden City, KS, [4]French Agricultural Research, Lamberton, MN

2:05 0234 Characterization of a Cry34/35 corn rootworm laboratory resistant colony. **Analiza P. Alves**, analiza.alves@pioneer.com[1], Stephen D. Thompson[1], Andre Crespo[1] and J. Lindsey Flexner[2], [1]DuPont Pioneer, Johnston, IA, [2]DuPont Agricultural Biotechnology, Wilmington, DE

2:20 0235 Rootworm-Bt trait/insecticide combinations: Potential impact on western corn rootworm larval control and adult production in trait failure vs. non-failure history fields. **Lance J. Meinke**, LMEINKE1@unl.edu, Univ. of Nebraska, Lincoln, NE

2:40 Break

2:50 0236 Discovery of novel proteins with activity against western corn rootworm. **Deepa Balasubramanian**, deepa.balasubramanian@bayer.com[1], Kimberly Sampson[2] and Jonathan D. Giebel[2], [1]Bayer Cropscience, Morrisville, NC, [2]Bayer CropScience, Morrisville, NC

3:10 0237 Using transcriptomics and RNAi to better understand gene functions and identify novel targets for the control of western corn rootworm. **Chitvan Khajuria**, ckhajuria2@unl.edu[1], Kenneth Narva[2], Huarong Li[2], Murugesan Rangasamy[2], Seong-il Eyun[1], Haichuan Wang[1] and Blair Siegfried[3], [1]Univ. of Nebraska-Lincoln, Lincoln, NE, [2]Dow AgroSciences LLC, Indianapolis, IN, [3]Univ. of Nebraska, Lincoln, NE

3:25 0238 Effectiveness of dsRNA versus siRNA in RNAi mediated knock-down in western corn rootworm (*Diabrotica virgifera virgifera*). **Huarong Li**, HLi2@dow.com[1], Chitvan Khajuria[2], Murugesan Rangasamy[1], Blair Siegfried[3] and Kenneth Narva[1], [1]Dow AgroSciences LLC, Indianapolis, IN, [2]Univ. of Nebraska-Lincoln, Lincoln, NE, [3]Univ. of Nebraska, Lincoln, NE

3:40 0239 Strategies to address corn rootworm control challenges. **William J. Moar**, william.moar@monsanto.com[1], Matthew W. Carroll[1], Graham P. Head[1], Thomas L. Clark[2] and Gerrit Segers[1], [1]Monsanto Company, St. Louis, MO, [2]Monsanto Company, Chesterfield, MO

4:00 0240 How does RNAi work to control western corn rootworm (*Diabrotica virgifera virgifera*) larvae. **Renata Bolognesi**, renata.bolognesi@monsanto.com[1], Parthasarathy Ramaseshadri[1], Ronald D. Flannagan[1], Juraj Koci[1], Gerrit Segers[2] and Yoonseong Park[1], [1]Monsanto Company, Chesterfield, MO, [2]Monsanto Company, St. Louis, MO

4:20 0241 RNAi resistance studies in insects. **Barry R. Pittendrigh**, pittendr@illinois.edu, Univ. of Illinois, Urbana, IL

4:40 0242 Performance of SmartStax® Technology for control of western corn rootworm. **Dwain M. Rule**, ddrule@dow.com, Dow AgroSciences, LLC, Indianapolis, IN, Kevin Johnson, Dow AgroSciences, LLC, Danville, IL, Amanda Jacobson, Dow AgroSciences, LLC, West Lafayette, IN and Nicholas Storer, Dow AgroSciences, Midland, MI

4:55 0243 Agrisure Duracade™ EZ Refuge a Novel Corn Rootworm Trait. **Isaac Oyediran**, isaac.oyediran@syngenta.com[1], Craig Nichols[1], Von Kaster[2], Jon Sagers[1], Scott Hubert[1], Miloud Araba[3] and Dirk Benson[2], [1]Syngenta Biotechnology Inc., Research Triangle Park, NC, [2]Syngenta Seeds, Raleigh, NC, [3]Syngenta Lawn & Garden, Greensboro, NC

5:10 0244 Ecological Risk Assessment for an RNAi plant incorporated protectant. **Pamela M. Bachman**, pamela.m.bachman@monsanto.com[1], Bonnie Ayden[1], Renata Bolognesi[2], David Carson[3], Samuel Dubelman[3], Joshua Fischer[1], William Moar[3], Geoffrey Mueller[3], Mark S. Paradise[1], Parthasarathy Ramaseshadri[2], Jianguo Tan[1], Joshua Uffman[3], JoAnne Warren[3], Elizabeth Wiggins[2] and Steven Levine[3], [1]Monsanto Company, Creve Coeur, MO, [2]Monsanto Company, Chesterfield, MO, [3]Monsanto Company, St. Louis, MO

P-IE Section Symposium: The Environment as the Sculptor: How Abiotic Factors Shape Plant-Insect Interactions

Meeting Room 12 A (Austin Convention Center)

Moderators and Organizers: Warren B. Sconiers, Texas A&M Univ., College Station, TX

1:15 Welcoming Remarks

1:20 0245 Plant chemical variation and trophic interactions: Time is of the essence. **M. Deane Bowers**, Deane.Bowers@colorado.edu, Univ. of Colorado, Boulder, CO and Carolina Quintero, Univ. of Colorado, Boulder, Boulder, CO

1:40 0246 Environmental effects on inducible maize anti-herbivore defense. **Alisa Huffaker**, alisa.huffaker@ars.usda.gov, USDA-ARS, GAINESVILLE, FL

2:00 0247 Drought stress alters plant chemistry, with contrasting responses of a generalist and a specialist herbivore. **Silvia Dorn**, silvia.dorn@ipw.agrl.ethz.ch, Bettina Gutbrodt and Karsten Mody, ETH Zurich, Zurich, Switzerland

2:20 0248 Stressed plants and herbivores: Exploring the mechanisms of drought's impact on plant-insect interactions. **Warren B. Sconiers**, wsconier@tamu.edu and Micky Eubanks, Texas A&M Univ., College Station, TX

2:40 Break

2:55 0249 Habitat-dependent species interactions and population control of herbivores. **Richard Karban**, rkarban@ucdavis.edu, Univ. of California-Davis, Davis, CA

3:15 0250 Tracking plant virus infections through multiple dimensions: A search for sources of nonpersistent virus vectors and reservoirs at local andregional scales. **Gina M. Angelella**, GAngelel@purdue.edu and Ian Kaplan, Purdue Univ., West Lafayette, IN

3:35 0251 Predicting variation in behavioral, physiological, and developmental responses to predation risk. **Jennifer S. Thaler**, jst37@cornell.edu, Cornell Univ., Ithaca, NY

3:55 0252 Abiotic factors and their potential influence on the geographic structure of host-associated differentiation. **Raul F. Medina**, rfmedina@ag.tamu.edu, Texas A&M Univ., College Station, TX

4:15 0253 Using a long term survey of grasshopper communities in the Colorado Rockies to understand insect herbivores and

climate change. **Cesar R. Nufio**, Cesar.Nufio@colorado.edu, Univ. of Colorado, Boulder, CO

4:35 Concluding Remarks

SysEB Section Symposium: Guy Bush and Santa Rosalia: Speciation with Gene Flow and the Extraordinary Diversity of Insects

Meeting Room 6 B (Austin Convention Center)

Moderators and Organizers: Andrew A. Forbes[1] and Glen Hood[2], [1]Univ. of Iowa, Iowa City, IA, [2]Univ. of Notre Dame, Notre Dame, IN

1:00 Introductory Remarks

1:10 0254 Fifty years of the evolution of an idea: Guy Bush, *Rhagoletis*, and sympatric speciation. **Stewart Berlocher**, stewartb@uiuc.edu, Univ. of Illinois at Urbana-Champaign, Urbana, IL

1:25 0255 The genomics of host race formation and speciation in *Rhagoletis*. **Jeffrey Feder**, jfeder@nd.edu[1], Scott P. Egan[1], Gregory Ragland[1], Tom Powell[1], Glen Hood[1], Sheina Sim[1], Tracy Arcella[1], Lauren Assour[1], Stewart Berlocher[2], Hugh M. Robertson[2], Kimberly K. O. Walden[3] and Dietmar Schwarz[4], [1]Univ. of Notre Dame, Notre Dame, IN, [2]Univ. of Illinois at Urbana-Champaign, Urbana, IL, [3]Univ. of Illinois, Urbana, IL, [4]Western Washington Univ., Bellingham, WA

1:40 0256 Sequential speciation amplifies biodiversity across trophic levels. **Glen Hood**, ghood@nd.edu[1], Andrew Forbes[2], Gregory Ragland[1], Scott P. Egan[1], Tom Powell[1], James J. Smith[3] and Jeffrey Feder[1], [1]Univ. of Notre Dame, Notre Dame, IN, [2]Univ. of Iowa, Iowa City, IA, [3]Michigan State Univ., East Lansing, MI

1:55 0257 Divergent host plant use promotes reproductive isolation among cynipid gall wasp populations. **Scott P. Egan**, scott.p.egan@vanderbilt.edu[1], Glen Hood[1] and James R. Ott[2], [1]Univ. of Notre Dame, Notre Dame, IN, [2]Texas State Univ. - San Marcos, San Marcos, TX

2:10 0258 How insect responses to intraspecific variation among host plants may shape host-race formation. **Stephen B. Heard** and Chandra Moffat, Univ. of New Brunswick, Fredericton, NB, Canada

2:25 0259 Watching adaptation unfold: Soapberry bugs in the novel environments of the Anthropocene. **Scott P. Carroll**, spcarroll@ucdavis.edu, Univ. of California, Davis, CA

2:40 0260 Extreme phenotypes – genetics of adaptive diversification in Australian soapberry bugs. **Jose Andres**, jose.andrew@usask.ca[1], Scott P. Carroll[2] and Prasobh Thampy[1], [1]The Univ. of Saskatchewan, Saskatoon, SK, Canada, [2]Univ. of California, Davis, CA

2:55 0261 Speciation with gene flow: Considerations and reconsiderations. **Douglas J Futuyma**, dfutuyma@life.bio.sunysb.edu, Stony Brook Univ., Stony Brook, NY

3:10 Break

3:20 0262 Repeated hybrid speciation and the evolution of butterfly-host interactions. **Chris C Nice**, Texas State Univ., San Marcos, San Marcos, TX, Alex Buerkle, The Univ. of Wyoming, Laramie, WY, James A. Fordyce, Univ. of Tennessee, Knoxville, TN, Matthew L. Forister, Univ. of Nevada, Reno, Reno, NV, Zachariah Gompert, Utah State Univ., Logan, UT and Lauren Lucas, Texas State Univ., San Marcos, TX

3:35 0263 The role of host-plant hybridization in host range expansion, speciation, and adaptive radiations. **Julie Byrd Hébert**, julie.b.hebert@gmail.com, Rutgers Univ., Beltsville, MD, Sonja J. Scheffer, USDA, Systematic Entomology Laboratory (SEL), Beltsville, MD and David J. Hawthorne, Univ. of Maryland, College Park, MD

3:50 0264 Extraordinary host-associated radiation in parasitic flies. **John O. Stireman**, john.stireman@wright.edu, Wright State Univ., Dayton, OH

4:05 0265 Hyperdiversity and Hutchinsonian niches: Unexpected dimensions. **Marty A. Condon**, mcondon@cornellcollege.edu, Cornell College, Mount Vernon, IA, Sonja J. Scheffer, USDA, Systematic Entomology Laboratory (SEL), Beltsville, MD, Andrew Forbes, Univ. of Iowa, Iowa City, IA, Matthew L. Lewis, USDA-ARS, Beltsville, MD, Kristina Ottens, The Univ. of Iowa, Iowa City, IA and Robert Wharton, Texas A&M Univ., College Station, TX

4:20 0266 "Further on, in the wood down there, they've got no names" – an extraordinary diversity of parasitoid wasps. **M. Alex Smith**, salex@uoguelph.ca[1], Eldon Eveleigh[2], Jose Fernandez-Triana[3], Kevin McCann[1], Josephine J. Rodriguez[4], James B. Whitfield[5], David R. Smith[6], Winnie Hallwachs[7] and Daniel H. Janzen[7], [1]Univ. of Guelph, Guelph, ON, Canada, [2]Natural Resources Canada, Fredericton, NB, Canada, [3]Dept. of Integrative Biology and Biodiversity Institute of Ontario, Guelph, ON, Canada, [4]Univ. of Illinois, Urbana, IL, [5]Univ. of Illinois at Urbana-Champaign, Urbana, IL, [6]USDA Systematic Entomology Laboratory, Washington, DC, [7]Univ. of Pennsylvania, Philadelphia, PA

4:35 0267 Global diversity of host associations in insect herbivores and parasitoids. **Matthew L. Forister**, mforister@unr.edu[1], Anna Panorska[2], Thomas Kozubowski[2], Joshua P. Jahner[1], Nick Pardikes[1], Andrea Glassmire[1] and Lee A. Dyer[1], [1]Univ. of Nevada, Reno, Reno, NV, [2]Univ. of Nevada Reno, Reno, NV

4:50 0268 Insects mediate the evolution of plant reproductive isolation in sympatry. **George Weiblen**, gweiblen@umn.edu, Univ. of Minnesota, St. Paul, MN

5:05 0269 Looking back, looking forward, looking all around. **Guy Bush**, bushfly@msu.edu, Michigan State Univ., Fish Creek, WI

5:20 Concluding Remarks

Member Symposium: Red Imported Fire Ants: Global Approaches to a Global Invasive Species

Meeting Room 8 C (Austin Convention Center)

Moderators and Organizers: Robert Plowes[1], Robert T. Puckett[2] and S. Bradleigh Vinson[2], [1]Univ. of Texas, Austin, TX, [2]Texas A&M Univ., College Station, TX

1:00 Welcoming Remarks

1:05 0270 Global invasion history of the fire ant *Solenopsis invicta*. **Marina Ascunce**, msascunce08@gmail.com, Univ. of Florida, Gainesville, FL

1:20 0271 Population and evolutionary genetics of fire ants. **DeWayne Shoemaker**, dewayne.shoemaker@ars.usda.gov, USDA, Agricultural Research Service, Gainesville, FL

1:35 0272 Dynamics of fire ants in south central Texas since invasion. **Lawrence E. Gilbert**, lgilbert@mail.utexas.edu, Univ. of Texas, Austin, TX

1:50 0273 Impact of the "Imported Fire Ant" in the USA. **S. Bradleigh Vinson**, bvinson@tamu.edu, Texas A&M Univ., College Station, TX

2:05 0274 Presentation withdrawn.

2:20 0275 USDA Fire ant biological control: *Pseudacteon* decapitating flies. **Sanford D. Porter**, sanford.porter@ars.usda.gov, USDA-ARS-CMAVE, Gainesville, FL

2:35 0276 The role of *Pseudacteon* phorid flies in the foraging dynamics of red imported fire ants: Resource size and nutrient composition selection. **Robert T. Puckett**, rpuck@tamu.edu, Janis Reed and Roger E. Gold, Texas A&M Univ., College Station, TX

2:50 0277 Fire ant microsporidia: How do they compare with other microsporidia used for biological control. **David Oi**, david.oi@ars.usda.gov, USDA - ARS, Gainesville, FL

3:05 0278 Solenopsis invicta virus 3: Can it be developed as a biopesticide to control *Solenopsis invicta*? **Steven Valles**, steven.valles@ars.usda.gov, USDA-ARS-CMAVE, Gainesville, FL

3:20 0279 The intersection of microbial pathogens, parasitoids and social form on the immune physiology of *S. invicta*. **Nathan Jones**, ntjones@mail.utexas.edu, Univ. of Texas at Austin, Austin, TX

3:35 0280 Microbiomes of *Solenopsis* species: An intercontinental comparison. **Robert Plowes**, robplowes@gmail.com, Univ. of Texas, Austin, TX

3:50 Break

4:00 0281 Habitat selection by queens: Explaining the distribution of fire ants and native ants. **Joshua R. King**, joshua.king@ucf.edu, University of Central Florida, Orlando, FL and Walter R. Tschinkel, The Florida State Univ., Tallahassee, FL

4:15 0282 Imported fire ants near the edge of their range: Disturbance and moisture determine prevalence and impact of an invasive social insect. **Edward G. LeBrun**, elebrun@mail.utexas.edu, Univ. of Texas, Austin, TX

4:30 0283 The role of mutualisms in the invasion ecology and ecological impacts of fire ants. **Micky Eubanks**, m-eubanks@tamu.edu, Texas A&M Univ., College Station, TX

4:45 0284 A supergene causes alternative colony organization in fire ants. **John Wang**, John.Wang@unil.ch, Univ. of Lausanne, Lausanne, Switzerland

5:00 0285 Receptors and effectors involved in reproductive control in the red imported fire ant, *Solenopsis invicta* Buren. Patricia V. Pietrantonio and **Hsiao-Ling Lu**, nancylu0311@tamu.edu, Texas A&M Univ., College Station, TX

5:15 0286 Fire ant semiochemicals: Interspecific and intraspecific interactions. **Robert Vander Meer**, bob.vandermeer@ars.usda.gov, USDA, Agricultural Research Service, Gainesville, FL

5:30 0287 Olfaction and chemical signaling in ant colonies. **Robert Renthal**, Robert.Renthal@UTSA.edu, Univ. of Texas, San Antonio, TX

5:45 BFL reception 7pm

Member Symposium: Frontiers of IPM: Honoring the Career of Marshall Johnson

Meeting Room 17 B (Austin Convention Center)

Moderators and Organizers: Bruce E. Tabashnik[1] and Jay A. Rosenheim[2], [1]Univ. of Arizona, Tucson, AZ, [2]Univ. of California, Davis, CA

1:15 Welcoming Remarks

1:35 0288 Our war with insects: Minimizing the failure to adapt and anticipate with technology. **Vincent Jones**, vpjones@wsu.edu, Ute Chambers and Brad Petit, Washington State Univ., Wenatchee, WA

1:55 0289 Making cover crops a part of vegetable IPM programs. **Cerruti Hooks**, crrhooks@umd.edu, Univ. of Maryland, College Park, MD

2:15 0290 Refining treatment windows for the control of non-persistent viruses. **Russell L Groves**, groves@entomology.wisc.edu, Univ. of Wisconsin-Madison, Madison, WI

2:35 Break

2:50 0291 USDA-NIFA investments in IPM. **Mary Purcell-Miramontes**, mpurcell@nifa.usda.gov, USDA, Washington, DC

3:10 0292 Invasive species and biocontrol in urbanized California. **Mark S. Hoddle**, mark.hoddle@ucr.edu, Univ. of California, Riverside, Riverside, CA

3:30 0293 What makes a successful insect colonist? Lessons from invasive species and biocontrol. **George Roderick**, roderick@berkeley.edu, Univ. of California, Berkeley, CA and Thomas O. Holtzer, Colorado State Univ., Fort Collins, CO

3:50 0294 Ecoinformatics: Putting the farmer at the center of IPM research. **Jay A. Rosenheim**, jarosenheim@ucdavis.edu, Univ. of California, Davis, CA

4:10 Concluding Remarks

4:15 A reception honoring Dr. Johnson will immediately follow the presentations

Member Symposium: Acarology in Molecular Era

Meeting Room 6 A (Austin Convention Center)

Moderators and Organizers: Mariam Lekveishvili, Univ. of Maryland, College Park, MD

1:15 Welcoming Remarks

1:20 0295 Acarology in the genomic age: Are we keeping up? **Hans Klompen**, Klompen.1@osu.edu, Ohio State Univ., Columbus, OH

1:40 0296 Mites as chelicerates: placement of Acariformes and Parasitiformes among Chelicerata and insights on Acariformes ingroup phylogeny. **Almir Pepato**, apepato@gmail.com, Federal Univ. of Minas Gerais (Brazil), Belo Horizonte, Brazil and Pavel B. Klimov, Univ. of Michigan, Ann Arbor, MI

2:00 0297 Does deep-soil habitat influence the maintenance of ancient asexual lineages in acariform mites? **Pavel B. Klimov**[1], Barry OConnor[1], Almir Pepato[2], Samuel J. Bolton[3] and Andrey Tolstikov[4], [1]Univ. of Michigan, Ann Arbor, MI, [2]Federal Univ. of Minas Gerais

(Brazil), Belo Horizonte, Brazil, [3]Ohio State Univ., Columbus, OH, [4]Tyumen State Univ., Tyumen, Russia

2:20 0298 Exploring host specificity and species boundaries of beetle-associated mites using molecular and morphological analyses. **Wayne Knee**, kneew@agr.gc.ca, Canadian National Collection of Insects, Arachnids and Nematodes Agriculture and Agri-Food Canada, Ottawa, ON, Canada

2:40 Break

2:50 0299 Molecules and models for tracking invasion processes: *Tetranychus evansi* as an emerging pest. **Maria Navajas**, navajas@supagro.inra.fr, Alain Migeon and Christine Meynard, Institut National de la Recherche Agronomique (INRA), Montferrier-sur-Lez cedex, France

3:10 0300 Revisiting the genus *Amblyomma* (Acari: Ixodidae). **Lorenza Beati**, lorenzabeati@georgiasouthern.edu[1], Hans Klompen[2], Lance Durden[1] and Danielle Hibbs[1], [1]Georgia Southern Univ., Statesboro, GA, [2]Ohio State Univ., Columbus, OH

3:30 0301 The mitochondrial genome of *Ixodes ricinus* reveals Tick-Box: A motif involved in 3'-end formation of mitochondrial transcripts and conserved in ticks, basal chelicerates plus *Drosophila*. **Matteo Montagna**, matteo.montagna@unimi.it[1], Sara Epis[2], Davide Sassera[2], Francesca Griggio[2], Claudio Bandi[2] and Carmela Gissi[2], [1]Univ. of Milan, Milan, Italy, [2]Univ. of Milan, Milano, Italy

3:50 0302 RNAi and *Metaseiulus occidentalis*. **Marjorie A. Hoy**, mahoy@ufl.edu and Ke Wu, Univ. of Florida, Gainesville, FL

4:10 Concluding Remarks

4:15 Acarological Society of America Business Meeting

Member Symposium: Advances in Pest Management for Turfgrass and Ornamentals

Meeting Room 15 (Austin Convention Center)

Moderators and Organizers: Jonathan L. Larson, Univ. of Kentucky, Lexington, KY

1:15 Welcoming Remarks

1:20 0303 Apparently-healthy or inapparently-stressed? Ambrosia beetles as indicators of stressed trees in ornamental nurseries. **Chris Ranger**, chris.ranger@ars.usda.gov, USDA Agricultural Research Service, Wooster, OH

1:35 0304 Invasive Species Management in Hawaii. **Arnold H. Hara**, arnold@hawaii.edu, Univ. of Hawaii at Manoa, Hilo, HI and Susan Cabral, Univ. of Hawaii at Manoa, CTAHR, Hilo, HI

1:50 0305 Impact of the invasive "kudzu" bug on landscape ornamentals. **S. Kristine Braman**, kbraman@uga.edu, Univ. of Georgia, Griffin, GA

2:05 0306 Mechanisms affecting pest performance on urban red maple trees. **Adam Dale**, agdale2@ncsu.edu and Steven D. Frank, North Carolina State Univ., Raleigh, NC

2:20 0307 Unraveling the reproductive phenology of *Listronotus maculicollis* (Coleoptera: Curculionidae) on golf courses: Implications for targeted management. **Benjamin McGraw**, mcgrawba@delhi.edu, State Univ. of New York - Delhi, Delhi, NY and Patricia J. Vittum, Univ. of Massachusetts, Amherst, MA

2:35 0308 Effects of systemic applications of imidacloprid on boxwood spider mite abundance, fecundity, feeding damage and the mobility, feeding rates, and survival of associated predators. **Michael J. Raupp**, mraupp@umd.edu, Scott Creary and Ada Szczepaniec, Univ. of Maryland, College Park, MD

2:50 0309 Gall wasp (Hymenoptera: Cynipidae) and gall midge (Diptera: Cecidomyiidae) biology and management in live oak nurseries. **Eileen A. Buss**, eabuss@ufl.edu, Univ. of Florida, Gainesville, FL

3:05 0310 Reducing ambrosia beetle attacks on nursery trees. **Steven D. Frank**, sdfrank@ncsu.edu, North Carolina State Univ., Raleigh, NC and Chris Ranger, USDA Agricultural Research Service, Wooster, OH

3:20 Break

3:30 0311 Pollinator Diversity on Common Lawn Weeds across an Urban Rural Gradient. **Jonathan L. Larson**, Carl T. Redmond and Daniel A. Potter, Univ. of Kentucky, Lexington, KY

3:45 0312 IPM Outreach Tools for a Sustainable Landscape. **Mary Kay Malinoski**, mkmal@umd.edu, Univ. of Maryland, Ellicott City, MD and Jody Gangloff-Kaufmann, Cornell Univ., Farmingdale, NY

4:00 0313 Forecasting pest pressures in turfgrass ecosystems. **Matthew J. Petersen**, mjp266@cornell.edu, Cornell Univ., Geneva, NY

4:15 0314 GF-2860, A New Insecticide for Control of Ornamental Insect Pests in Outdoor Nurseries. **James Breuninger**, jbreuninger@dow.com, DOW AgroSciences, Indianapolis, IN

4:30 0315 ABW reproductive diapause and key factors affecting its termination. **Olga Kostromytska**, kolgaent@rci.rutgers.edu and Albrecht Koppenhöfer, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

4:45 0316 Biocontrol in Urban Ornamental Landscapes: Does Plant Geographic Provenance Matter? **Matthew H. Greenstone**, Matt.Greenstone@ars.usda.gov, Invasive Insect Biocontrol and Behavior Laboratory, Beltsville, MD

5:00 0317 The Elusive Behavior of the Hunting Billbug in North Carolina. **Diane E. Reynolds**, desilcox@ncsu.edu, North Carolina State Univ., Raleigh, NC

5:15 0318 Evaluating Flight Activity, Damage Potential and Feeding Behavior of the Sugarcane Beetle, *Evetheola humilis* for the Development of Effective Control Programs. **Terri Billeisen**, tlhoctor@ncsu.edu, North Carolina State, Raleigh, NC

Member Symposium: Future Needs for Biological Control Teaching and Outreach

Meeting Room 18 A (Austin Convention Center)

Moderators and Organizers: Jim Nechols[1] and Parwinder Grewal[2], [1]Kansas State Univ., Manhattan, KS, [2]The Ohio State Univ., Wooster, OH

1:15 0319 Introductory remarks. **Jim Nechols**, jnechols@ksu.edu, Kansas State Univ., Manhattan, KS

1:25 0320 Current and future teaching needs for biological control. **John Obrycki**, john.obrycki@uky.edu, Univ. of Kentucky, Lexington, KY and Jim Nechols, Kansas State Univ., Manhattan, KS

1:50 0321 Pedagogy and modern teaching methods in biological control. **Parwinder Grewal**, pgrewal@utk.edu, The Univ. of Tennessee, Knoxville, TN

2:15 0322 Uffda! Selling biological control to Norwegian bachelor farmers in the Upper Midwest. **Kelley Tilmon**, kelley.tilmon@sdstate.edu, South Dakota State Univ., Brookings, SD and Matthew O'Neal, Iowa State Univ., Ames, IA

2:40 Break

2:50 0323 Bridging the gap: Bringing biological control to the world through distance education. **John Ruberson**, ruberson@ksu.edu, Kansas State Univ., Manhattan, KS and Kris Braman, Univ. of Georgia, Griffin, GA

3:15 0324 Future educational needs and challenges in conservation biological control. **Jonathan Lundgren**, Jonathan.Lundgren@ars.usda.gov, USDA Agricultural Research Service, Brookings, SD

3:40 0325 Defining biological control: An ecological interactions approach. **George Heimpel**, heimp001@umn.edu, Univ. of Minnesota, St. Paul, MN and Nick Mills, Univ. of California, Berkeley, Berkeley, CA

4:05 Discussion

4:20 0326 Concluding remarks. **Parwinder Grewal**, pgrewal@utk.edu, The Univ. of Tennessee, Knoxville, TN

Member Symposium: International Society of Hymenopterists: Symposium Honoring Robert Wharton

Meeting Room 4 ABC (Austin Convention Center)

Moderators and Organizers: John M. Heraty[1] and James B. Woolley[2], [1]Univ. of California-Riverside, Riverside, CA, [2]Texas A&M Univ., College Station, TX

1:15 0327 Opening Remarks. **John M. Heraty**, john.heraty@ucr.edu, Univ. of California, Riverside, Riverside, CA

1:25 0328 From biodiversity inventory to large-scale descriptive taxonomy: Challenges with hyperdiverse parasitoid wasps. **James Whitfield**, jwhitfie@life.uiuc.edu, Univ. of Illinois, Urbana, IL

1:40 0329 Systematics research on Braconidae in "Whartonia" and beyond. **Robert R. Kula**, Robert.Kula@ars.usda.gov, USDA Systematic Entomology Laboratory, Washington, DC

1:55 0330 Reproductive manipulator symbionts in the parasitoid genus *Encarsia* (Aphelinidae). **Martha S. Hunter**, mhunter@Ag.arizona.edu, Professor, Univ. of Arizona, Tucson, AZ

2:10 0331 Polydnavirus evolution and function in the Braconidae. **Michael R. Strand**, mrstrand@uga.edu, Univ. of Georgia, Athens, GA

2:25 0332 A synopsis of the Australian hymenopteran fauna - a window into the southern hemisphere. **Andrew D. Austin**, andy.austin@adelaide.edu.au, Univ. of Adelaide, Adelaide, SA 5005, Australia

2:40 0333 Phylogeny of the Ichneumonidae. **Andrew MR. Bennett**, andrew.bennett@agr.gc.ca, Agriculture and Agri-Food Canada, Ottawa, ON, Canada, Sophie Cardinal, Cornell Univ., Ithaca, NY, Ian Gauld, (deceased) Natural History Museum, London, England and David Wahl, American Entomological Institute, Gainesville, FL

2:55 0334 From *Agrostocynips* to *Zaeucoila*: Systematic adventures in the Zaeucoilini (Hymenoptera: Figitidae: Eucoilinae). **Matthew Buffington**, matt.buffington@ars.usda.gov, USDA, Agricultural Research Service, Systematic Entomology Laboratory (SEL), Washington, DC

3:10 0335 Competitor free space in tephritid parasitoids: Can 2 millimeters of ovipositor keep extinction at bay. **John Sivinski**, john.sivinski@ars.usda.gov, USDA, Gainesville, FL and Martin Aluja, Instituto de Ecología, A.C, Xalapa, Veracruz, Mexico

3:25 0336 Summary. **James B. Woolley**, jimwoolley@tamu.edu, Texas A&M Univ., College Station, TX

3:35 Reception

4:00 Business Meeting

Member Symposium: Rocking Your Connected World: The Importance of Insect Microbiomes

Meeting Room 19 A (Austin Convention Center)

Moderators and Organizers: Jennifer L. Pechal and M. Eric Benbow, Univ. of Dayton, Dayton, OH

1:15 Welcoming Remarks

1:25 0337 Nutrient provisioning by gut microbiota of a wood-boring beetle. **Kelli Hoover**, kxh25@psu.edu[1], Erin D. Scully[2], Paul Akwettey Ayayee[3], John Carlson[1], Ming Tien[2] and Scott Geib[4], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Pennsylvania State Univ., State College, PA, [3]Pennsylvania State Univ., Univ. park, PA, [4]USDA-ARS, Hilo, HI

1:43 0338 Gut microbial community of *Phlebotomus duboscqi* plays a major role in the vector competence for *Leishmania major*. **Ludek Zurek**, lzurek@ksu.edu[1], Dinesh Erram[1], Anuradha Ghosh[1] and David Sacks[2], [1]Kansas State Univ., Manhattan, KS, [2]National Institute of Allergy and Infectious Diseases, National Institute of Health (NIAID, NIH), Bethesda, MD

2:01 0339 Diversity and function of bacterial communities in the *Drosophila* gut. **Angela E. Douglas**, aes326@cornell.edu[1], Adam Wong[2], John Chaston[2], Adam Dobson[2] and Peter Newell[2], [1]Cornell Univ., Ithaca, NY, [2]Cornell Univ., IIthaca, NY

2:19 0340 The evolution and ecology of ant gut microbiomes. **Corrie Moreau**, cmoreau@fieldmuseum.org, Field Museum of Natural History, Chicago, IL and Jacob Russell, Drexel Univ., Philadelphia, PA

2:37 Break

2:47 0341 Psyllids or associated microbes, who is in charge? **Cecilia Tamborindeguy**, ctamborindeguy@ag.tamu.edu, Freddy Ibanez, Punya Nachappa and Julien Levy, Texas A&M Univ., College Station, TX

3:05 0342 Endosymbiont genome dynamics during dictyopteran evolution. **Zakee Sabree**, sabree.8@osu.edu, The Ohio State Univ., Columbus, OH

3:23 0343 Bacteria living with and talking to the Black Soldier Fly. **Tawni L. Crippen**, tawni.crippen@ars.usda.gov[1], Jeffery K. Tomberlin[2], Longyu Zheng[3], Baneshwar Singh[2], Aaron M. Tarone[2]

and Meaghan Pimsler[2], [1]USDA - ARS, College Station, TX, [2]Texas A&M Univ., College Station, TX, [3]Huazhong Agricultural Univ., Wuhan, China

3:41 Break

3:51 0344 Bacterial community dynamics in Lepidoptera: The importance of host plant and life stage. **Tobin Hammer**, tobin.hammer@colorado.edu, Univ. of Colorado at Boulder, Boulder, CO

4:09 0345 Blow fly predator-prey interactions mediated by microbes: Implications in forensics and vertebrate carrion ecology. **Jeffery K. Tomberlin**, jktomberlin@tamu.edu, Texas A&M Univ., College Station, TX

4:27 0346 The Calliphoridae microbiome: An ecoregion perspective. **Jennifer L. Pechal**, jenpechal18@gmail.com and M. Eric Benbow, Univ. of Dayton, Dayton, OH

4:45 0347 The community composition and core microbiome of the common bed bug *(Cimex lectularius*) across an urban landscape. **Regina Baucom**, regina.baucom@uc.edu, Univ. of Michigan, Ann Arbor, MI

5:03 Concluding Remarks

Member Symposium: SOLA Scarab Workers

Meeting Room 5 ABC (Austin Convention Center)

Moderators and Organizers: Andrew B. T. Smith, Canadian Museum of Nature, Ottawa, ON, Canada

1:15 Introductory Remarks

1:20 0348 An overview of Texas Scarabaeoidea. **Edward G. Riley**, egrchryso@tamu.edu, Texas A&M Univ., College Station, TX

1:40 0349 A never failing source of pleasure and occupation: Alfred Russel Wallace's Cetoniine types at the Natural History Museum. **Maxwell Barclay**, m.barclay@nhm.ac.uk, Natural History Museum, London, United Kingdom

2:00 0350 Scarab collecting in Cuba. **Andrew B. T. Smith**, asmith@unl.edu, Canadian Museum of Nature, Ottawa, ON, Canada

2:20 0351 The *Paracotalpa* (Scarabaeidae: Rutelinae) enigma. **Oliver Keller**, okeller@svsu.edu, Saginaw Valley State Univ., Univ. Center, MI

2:40 0352 A Review of California *Serica*. **Reese John Worthington**, rworthin@go.olemiss.edu, The Univ. of Mississippi, Univ., MS and Paul K. Lago, Univ. of Mississippi, Univ., MS

3:00 Break

3:15 0353 Integrative taxonomy and ecology of the cryptic species complex of *Aphodius fimetarius* (Linnaeus, 1758) and *Aphodius pedellus* (de Geer, 1774) (Coleoptera: Aphodiidae). **Frank Krell**[1], Andreia Miraldo[2], Mirjami Smalen[2], Robert Angus[3] and Tomas Roslin[2], [1]Denver Museum of Nature and Science, Denver, CO, [2]Univ. of Helsinki, Finland, [3]The Natural History Museum, London, United Kingdom

3:35 0354 Unprecedented morphological investigation provides new evidence for the phylogeny of dung beetle (Coleoptera: Scarabaeidae: Scarabaeinae). **Sergei Tarasov**, sergxf@yandex.ru, Univ. of Oslo, Oslo, Oslo, Norway

3:55 0355 Not all dung is created equal: Dung beetles on organic and conventionally managed cattle pastures. **Mallory Hagadorn**, MAHAGADORN@salisbury.edu, Joseph Restein, Kaitlyn Mitchell and Dana Price, Salisbury Univ., Salisbury, MD

4:15 0356 Diversity and succession of dung beetles to horse dung on Assateague Island, Maryland. Elizabeth Rentz and **Dana Price**, DLPRICE@salisbury.edu, Salisbury Univ., Salisbury, MD

4:35 0357 *Anomala denuda* and *A. plebeja* (Coleoptera: Scarabaeidae: Rutelinae): Two poorly known species of shining leaf chafers in Southern Togo (West Africa). **Kwevitoukoui Hounkpati**, khoun75@yahoo.fr[1], Georg Goergen[2] and Joseph V. McHugh[1], [1]Univ. of Georgia, Athens, GA, [2]International Institute of Tropical Agriculture, Cotonou, Benin

4:50 Discussion

Member Symposium: Succeeding in the Business Aspects of an Entomological Career

Meeting Room 7 (Austin Convention Center)

Moderators and Organizers: Miriam Cooperband[1] and Mary A. Sorensen[2], [1]USDA-APHIS-PPQ-CPHST, Buzzards Bay, MA, [2]Placer Mosquito & Vector Control District, Roseville, CA

1:15 Introductory Remarks

1:15 0358 Sink or swim: The skills every entomologist should have. **Miriam Cooperband**, Miriam.F.Cooperband@aphis.usda.gov, USDA-APHIS-PPQ-CPHST, Buzzards Bay, MA

1:25 0359 How did I get here? From summer seasonal to district manager. **Jamesina J. Scott**, jjscott@mchsi.com, Lake County Vector Control Disrtict, Lakeport, CA

1:45 0360 Odors to modify insect behavior: From the bench to the shelf. **Anandasankar Ray**, anand.ray@ucr.edu, Univ. of California, Riverside, CA

2:05 0361 Industry experience as an entomologist and as a businessman. **Raj K. Saran**, raj.k.saran@usa.dupont.com, DuPont Crop Protection, Newark, DE

2:25 0362 Growing pains: Supervision and management in a vector control laboratory. **Mary A. Sorensen**, marys@placermosquito.org, Placer Mosquito & Vector Control District, Roseville, CA

2:35 Break

2:45 0363 Running a Lab in a University: Challenges Within an Ivory Tower. **Ann E. Hajek**, aeh4@cornell.edu, Cornell Univ., Ithaca, NY

3:05 0364 Still having fun: Lessons learned by a retired academic since joining the dark side. **John H. Borden**, john.borden@contech-inc.com, Pherotech International Inc, Delta, BC, Canada

3:45 0365 Presentation withdrawn.

4:05 2017 Project Management – A Supplement to Your Science Education. **Yousuf Sohail Syed**, Alamo Colleges, San Antonio, TX

4:25 Panel Discussion

Ten-Minute Papers, MUVE Section: Medical Entomology 2

Meeting Room 17 A (Austin Convention Center)

Moderators: Graham J. Hickling[1] and Harry Michael Savage[2], [1]Univ. of Tennessee, Institute of Agriculture, Knoxville, TN, [2]Centers for Disease Control and Prevention, Fort Collins, CO

1:15 0366 Aggregation behavior exhibited by blood feeding sand flies (*Phlebotomus papatasi*). **Matt Aubuchon**, Matt.Aubuchon@ars.usda.gov[1], Sandra A. Allan[1] and Gary G. Clark[2], [1]USDA, Agricultural Research Service, Gainesville, FL, [2]USDA-ARS-CMAVE, Gainesville, FL

1:27 0367 Bionomics of black flies and transmission of Onchocerciasis in the Imo River basin. **Emmanuel C. Uttah**, drecuttah@yahoo.com, Cross River Univ. of Technology, Calabar, Cross River Stat, Nigeria

1:39 0368 First detection of Heartland virus (Bunyaviridae: *Phlebovirus*) from field collected arthropods. **Harry Michael Savage**, hms1@cdc.gov, Centers for Disease Control and Prevention, Fort Collins, CO and William Nicholson, Centers for Disease Control and Prevention, Atlanta, GA

1:51 0369 Almost fixation in knockdown resistance alleles to pyrethroids in head louse (*Pediculus humanus capitis*) populations from Argentina. **Ariel C. Toloza**, atoloza@conicet.gov.ar[1], Marina Ascunce[2], David Reed[2], Adriana Delgado[3], Leonor Guardia-Claps[4], María Gutierrez[5] and Maria I. Picollo[1], [1]Centro de Investigaciones de Plagas e Insecticidas, Villa Martelli, Buenos Aires, Argentina, [2]Univ. of Florida, Gainesville, FL, [3]Facultad de Ciencias Naturales, Universidad Nacional de la Patagonia San Juan Bosco, Comodoro Rivadavia., Argentina, [4]Instituto Superior de Entomología "Dr. Abraham Willink" (INSUE, Tucuman, Argentina, [5]eLaboratorio de Zoología de invertebrados II, Dpto. de Biología, Bioquímica y Farmacia, Bahía Blanca., Argentina

2:15 0370 Swarm participation of sterile *Anopheles arabiensis* males on the field in Sudan. David Damiens[1], **Tellal Ageep**, tellalageep@yahoo.com[2], Fayez Ahmed[2], Ayman Ahmed[2], Bashir Ali[2], Jeremie Gilles[1], Badria El Sayed[2] and El waleed Osman[2], [1]Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, Seibersdorf, Austria, [2]Tropical Medicine Research Institute, Khartoum, Sudan

2:27 0371 Eliciting renal failure in mosquitoes. **Peter Piermarini**, piermarini.1@osu.edu[1], Matthew Rouhier[1], Rebecca Hine[2], Klaus W. Beyenbach[2], Rene Raphemot[3] and Jerod Denton[3], [1]The Ohio State Univ., Wooster, OH, [2]Cornell Univ., Ithaca, NY, [3]Vanderbilt Univ., Nashville, TN

2:39 0372 *Enterobacter* sp.: LPS and colonization in the gut of *Anopheles gambiae*. **Phanidhar Kukutla**, buddyacute@gmail.com[1], Jinjin Jiang[1], Wanqin Yu[1], Dong Pei[2] and Jiannong Xu[1], [1]New Mexico State Univ., Las Cruces, NM, [2]New Mexico State Univerity, Las Cruces, NM

2:51 Break

3:06 0373 Biting deterrent activity of essential oils of *Magnolia grandiflora* against *Aedes aegypti*. **Junaid Rehman**, junaiddua@gmail.com, The university of Mississippi, Oxford, MS, Abbeville, MS

3:18 0374 North-South change in *Ixodes scapularis* host-seeking behavior contributes to profound regional variation in Lyme disease prevalence in the eastern United States. **Graham J. Hickling**, ghicklin@tennessee.edu, Univ. of Tennessee, Institute of Agriculture, Knoxville, TN, Isis M. Kuczaj, Michigan State Univ., East Lansing, MI and Ellen Stromdahl, Army Institute of Public Health, Aberdeen Proving Ground, MD

3:30 0375 Effects of lakeshore development and restoration on the abundance and infection prevalence of *Borrelia burgdorferi* in ticks in Vilas County, Wisconsin. **Anna Schotthoefer**, Schotthoefer.Anna@mcrf.mfldclin.edu[1], Daniel Haskell[2], Jennifer Meece[1], Jessica Lovstad[3], Rebecca Osborn[3] and Michael Meyer[4], [1]Marshfield Clinic Research Foundation, Marshfield, WI, [2]Michigan Technological Univ., Houghton, MI, [3]Univ. of Wisconsin-Madison, Madison, WI, [4]Wisconsin Dept. of Natural Resources, Rhinelander, WI

3:42 0376 Tick-borne pathogens prevalence in Sicilian ticks. **Santo Caracappa**, santo.caracappa@izssicilia.it, Alessandra Torina, Salvatore Scimeca, Rosalia D'Agostino, Valeria Blanda and Rossella Lelli, Istituto Zooprofilattico Sperimentale della Sicilia, PALERMO, Italy

3:54 0377 Tick and tick-borne disease surveillance in West Virginia. **Eric J. Dotseth**, Eric.J.Dotseth@wv.gov and Miguella Mark-Carew, West Virginia Dept. of Health & Human Resources, Charleston, WV

4:06 0378 Expansion of zoonotic Babesiosis and Lyme Disease and comparison with human cases in Connecticut, 2001-2010. **Kirby C. Stafford**, Kirby.Stafford@ct.gov[1], Scott Williams[1], Louis Magnarelli[1], Starr-Hope Ertel[2] and Randall Nelson[2], [1]Connecticut Agricultural Experiment Station, New Haven, CT, [2]Connecticut Dept. of Public Health, Hartford, CT

4:18 0379 Tick feeding stimuli responsive genes: Biological characterization of *Amblyomma americanum* acidic chitinase. **Tae Kim**, taekim009@gmail.com and Albert Mulenga, Texas A & M Univ., College Station, TX

4:30 0380 Experimental feeding of larval *Amblyomma maculatum* Koch and *Amblyomma americanum* (L.) on selected invertebrate hosts. **Jose Portugal**, jsp281@msstate.edu and Jerome Goddard, Mississippi State Univ., Mississippi State, MS

4:42 0381 Intra- and inter-species comparative analysis of *Amblyomma americanum* serine protease inhibitor (serpin) sequences. **Lindsay Porter**, lindsayporter84@gmail.com, Zeljko Radulovic, Tae Kim and Albert Mulenga, Texas A & M Univ., College Station, TX

4:54 0382 Distinguishing species of *Dermacentor* ticks using COI DNA barcodes. **Ashlin Reid**, areid2@georgiasouthern.edu, Dmitry Apanaskevich and Quentin Q. Fang, Georgia Southern Univ., Statesboro, GA

Ten-Minute Papers, PBT Section: Physiology

Meeting Room 19 B (Austin Convention Center)

Moderators: Subba Reddy Palli[1] and Nannan Liu[2], [1]Univ. of Kentucky, Lexington, KY, [2]Auburn Univ., Auburn, AL

1:15 0383 Adaptation of the western flower thrips to insecticides. Yinxue Mao, **David Mota-Sanchez**, motasanc@msu.edu, David Smitley and Mark E. Whalon, Michigan State Univ., East Lansing, MI

1:27 0384 Use of reflectance data to identify and detect stress of insects. **Christian Nansen**, christian.nansen@uwa.edu.au, The Univ. of Western Australia, Perth, Australia, José R. P. Parra, Escola Superior de Agricultura Luiz de Queiroz (ESALQ), Universidade de São Paulo (USP), Piracicaba, SP, Brazil and Aloisio Coelho, Univ. of São Paulo, Piracicaba, Brazil

1:39 0385 Calcium signaling mediates cold sensing and triggers rapid cold-hardening in insect tissues. **Nicholas Teets**, teets.23@osu.edu, The Ohio State Univ., Columbus, OH and David L. Denlinger, Ohio State Univ., Columbus, OH

1:51 0386 Macronutrient regulation and performance in the cotton bollworm (*Helicoverpa zea)*. Spencer Behmer, Greg Sword and **Carrie Deans**, cadeans@tamu.edu, Texas A&M Univ., College Station, TX

2:03 0387 A study of the morphology and mechanism behind color change in *Eurypepla calochroma* (Coleoptera: Chrysomelidae). **Chulwoo Shin**, shinio@ku.edu and Steve Davis, Univ. of Kansas, Lawrence, KS

2:15 0388 Molecular and functional characterization of the first tick CAP_{2b} (periviscerokinin) receptor from *Rhipicephalus* (*Boophilus*) *microplus*. **Yunlong Yang**, yangyunlong@neo.tamu.edu[1], Prati Bajracharya[1], Paula Castillo[1], Ronald J. Nachman[2] and Patricia V. Pietrantonio[1], [1]Texas A&M Univ., College Station, TX, [2]USDA, Agricultural Research Service, College Station, TX

2:27 0389 Early life stage nutrition affects adult morphology and metabolisms in honey bees. **Ying Wang**, ying.wang.6@asu.edu, Osman Kaftanoglu, Jacob Campbell, Jon F. Harrison, Gro V. Amdam and Robert E. Page Jr., Arizona State Univ., Tempe, AZ

2:39 0390 RNA interference of glycerol biosynthesis suppresses a rapid cold hardiness of the beet armyworm, *Spodoptera exigua*. **Youngjin Park**, happy2pyj@gmail.com, Andong National Univ., Andong, South Korea and Yonggyun Kim, Andong National Univ., Andong, Gyeoungbuk, South Korea

2:51 0391 Overexpression of tyrosine hydroxylase accounts for pupal melanic mutation in *Spodoptera exigua*. **Sisi Liu**, sisiliu@email.arizona.edu[1], Mo Wang[2] and Xianchun Li[1], [1]Univ. of Arizona, Tucson, AZ, [2]Huazhong Agricultural Univ., Wuhan, Hubei, China

3:03 0392 The development and ecology of a Tephritidae larval-diet. Polychronis Rempoulakis[1], **David Nestel**, nestel@volcani.agri.gov.il[2], Shlomo Sela[3], Esther Lavy[1] and Riki Pinto[3], [1]Institute of Plant Protection, ARO, Beit Dagan, Israel, [2]ARO, The Volcani Center, Bet Dagan, Israel, [3]Agricultural Research Organization, Beit Dagan, Israel

3:15 0393 Study on different methods of ovarian induction in diapausing female adults of the sunn pest *Eurygaster integriceps*. **Sara Khodahemmati**, sara.khodahemmati@gmail.com, Fars Azad Islamic Universiry, Science and research, shiraz, Iran

3:27 0394 Morphological and phenological differences in adult *Dolophilodes distinctus* (Trichoptera) at urban and rural headwater streams. **Sean McCanty**, seanmccanty@gmail.com, Univ. of Massachusetts Boston, Boston, MA, Robert Smith, Univ. of Massachusetts, Amherst, MA and William O. Lamp, Univ. of Maryland, College Park, MD

3:39 0395 Temporal and spatial variation in cuticular hydrocarbon profiles of two species of cerambycid beetles. **Christina A. Silliman**, sillima2@life.illinois.edu[1], Jocelyn G. Millar[2] and Lawrence M. Hanks[1], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of California, Riverside, CA

3:51 0396 Cold tolerance in the redbay ambrosia beetle (Xyleborus glabratus). **John P. Formby**, jpf9@msstate.edu, Natraj Krishnan and John Riggins, Mississippi State Univ., Mississippi State, MS

4:03 0397 Regulation of reproductive changes in honey bee queens. **Elina L. Niño**, elnino@psu.edu and Christina M. Grozinger, Pennsylvania State Univ., Univ. Park, PA

4:15 0398 Repeated exposures to low-oxygen stress lead to hormetic effects during development and adulthood. **Giancarlo Lopez-Martinez**, gc.lopez@ufl.edu[1], Caroline M. Williams[2] and Daniel A. Hahn[1], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Western Ontario, London, ON, Canada

4:27 0399 Effects of pollen nutrition on queen pheromone emissions in the honey bee. **Mark Carroll**, Mark.Carroll@ars.usda.gov[1], Madeline Saunders[1], Austin Brown[2], Craig Goodall[1] and Nicholas Brown[1], [1]USDA-ARS-PWA, Tucson, AZ, [2]Univ. of Arizona, Tucson, AZ

4:39 0400 Suppression of lactation-induced oxidative stress in tsetse flies is critical to the prevention of reproductive senescence. Veronika Michalkova, Slovak Academy of Sciences, Bratislava, Slovakia, **Joshua B. Benoit**, joshua.benoit@yale.edu, Univ. of Cincinnati, Cincinnati, OH, Geoffrey M. Attardo, Yale School of Public Health, New Haven, CT, Jan Medlock, Oregon State Univ., Corvallis, OR and Serap Aksoy, Yale Univ., New Haven, CT

4:51 0401 Can the cricket (*Teleogryllus commodus*) salivary gland act as an alternative endocrine delivery system? **Paul Cooper**, paul.cooper@anu.edu.au, Australian National Univ., Canberra, Australia

Ten-Minute Papers, P-IE Section: Biological Control 1

Meeting Room 12 B (Austin Convention Center)

Moderators: Kelly V. Tindall[1] and John Diaz-Montano[2], [1]DuPoint, Pioneer, Union City, TN, TN, [2]USDA-ARS Center for Grain and Animal Health Research, Manhattan, KS

1:15 0402 A recharged effort at non-sticky alternatives for buprestid trapping. **Michael Domingue**, mjd29@psu.edu[1], Akhlesh Lakhtakia[2], Thomas C. Baker[1] and Drew Pulsifer[2], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Penn State Univ., Univ. Park, PA

1:27 0403 HF (*Mayetiola destructor)* SA Application. **Joshua Underwood**, pharm.boi88@yahoo.com, Fayetteville State Univ., Fayetteville, NC

1:51 0404 Functional response of *Graptocleptes bicolor* (Heteroptera:Reduviidae) and *Podisus nigrispinus* (Heteroptera:Pentatomidae) on *Spodoptera frugiperda* (Lepidoptera:Noctuidae). **Juliana Neves**, juliana.aneves@gmail.com[1], Victor Botteon[1], Juan de Domini[1] and Wesley Godoy[2], [1]Luiz de Queiroz College of Agriculture/Univ. of São Paulo, Piracicaba, Brazil, [2]Luiz de Queiroz College of Agriculture/ Univ. of São Paulo, Piracicaba, Brazil

2:03 0405 Odor concentration learning in the parasitoid, *Microplitis croceipes*. **Dawn Olson**, dawn.olson@ars.usda.gov, USDA-ARS, Tifton, GA, Felix Wackers, Lancaster Univ., Lancaster, United Kingdom and John-Erik Haugen, Nofima, As, Norway

2:15 0406 Factors influencing native coccinellid communities in Missouri. **Lauren M. Diepenbrock**, Lmhd74@mizzou.edu and Deborah L. Finke, Univ. of Missouri, Columbia, MO

2:27 0407 Field-cage and laboratory evaluation of *Scymnus (Pullus) coniferarum* (Coleoptera: Coccinellidae), a potential predator of *Adelges tsugae* (Hemiptera: Adelgidae). **Molly Darr**, mdarr@vt.edu[1], Scott Salom[2], Loke T. Kok[2] and Thomas McAvoy[1], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Virginia Tech, Blacksburg, VA

2:39 0408 Predator life-stage complementarity enhances pest suppression in alfalfa. **Ricardo A. Ramirez**, ricardo.ramirez@usu.edu, Utah State Univ., Logan, UT

2:51 0409 Management of plum curculio (*Conotrachelus nenuphar*) and codling moth (*Cydia pomonella*) using strip cultivation. **William Baughman**, baughm30@msu.edu and Matthew Grieshop, Michigan State Univ., East Lansing, MI

3:03 Break

3:15 0410 Managing yellow margined leaf beetle (*Microtheca ochroloma* Stål) in organic cole crops with trap cropping. **Elena Rhodes**, erhodes@ufl.edu and Oscar Liburd, Univ. of Florida, Gainesville, FL

3:27 0411 Blueberry maggot and extreme low temperatures. **Charles Vincent**, Charles.Vincent@AGR.GC.CA, Horticultural Research and Development Center, Saint-Jean-sur -Richelieu, QC, Canada, Pierre Lemoyne, Horticultural Research and Development Center, Saint-Jean-sur-Richelieu, QC, Canada, Sonia O. Gaul, Agriculture and Agri-Food Canada, Kentville, NS, Canada and Kenna Mackenzie, Agriculture Agri-Food Canada, Summerland, BC, Canada

3:39 0412 Landscape context affects parasitism of aphids in wheat fields by *Lysephlebus testaceipes*. **Norman Elliott**, norman.elliott@ars.usda.gov[1], Michael J. Brewer[2], Georges Backoulou[3] and Kristopher L. Giles[3], [1]USDA, Agricultural Research Service, Stillwater, OK, [2]Texas A&M Univ., Corpus Christi, TX, [3]Oklahoma State Univ., Stillwater, OK

3:51 0413 Inoculative releases of entomopathogenic nematodes and multi-year persistence across crop rotation. **Elson J. Shields**, es28@cornell.edu and Antonio Testa, Cornell Univ., Ithaca, NY

4:03 0414 Do generalist predators prevent spider mite outbreaks? **Karol Krey**, karol.krey@email.wsu.edu, Washington State Univ., Pullman, WA

4:15 0415 Compatibility of the whitefly parasitoid *Eretmocerus eremicus* with three new insecticides. **Hugh A. Smith**, hughasmith@ufl.edu and Curtis Nagle, Univ. of Florida, Wimauma, FL

4:27 0416 Interspecific competence between the ectoparasitoid *Dineulophus phtorimaeae* de Santis (Hymenoptera:Eulophidae) and the endoparasitoid *Pseudapanteles dignus* (Muesebeck) (Hymenoptera:Braconidae), attacking *Tuta absoluta* larvae in the laboratory. Vivina Savino[1], Maria Gabriela Luna[2] and **Carlos Eduardo Coviella**, carlosecoviella@yahoo.com[1], [1]Universidad Nacional de Lujan, Lujan, Buenos Aires, Argentina, [2]Universidad Nacional de La Plata, La Plata, Buenos Aires, Argentina

4:39 0417 Why coccinellids eat plants: Omnivory enhances virility. **Todd Ugine**, tau2@cornell.edu and John Losey, Cornell Univ., Ithaca, NY

4:51 0418 Years of boom and bust: Phenology of the tropical deciduous tree, *Senna polyantha a*nd its bud predator, *Anthonomus rufipennis* LeConte, in central Mexico. Robert W. Jones, Universidad Autonoma de Queretaro, Juriquilla, Qro, Mexico and **Olga Gomez-Nucamendi**, ogomznucamendi@yahoo.com.mx, Doctorado en Ciencias Biológicas, Juriquilla, Qro, Mexico

5:03 0419 Insecticide-resistant cotton bollworms encountering wolf spiders: Predation risks and behavioral effects. **Dalila Rendon**, rendonda@gmail.com[1], Mary Whitehouse[1] and Phillip W. Taylor[2], [1]Australian Cotton Research Institute, Australia, [2]Macquarie Univ., Sydney, New South Wales, Australia

5:15 0420 Effect of the classical biocontrol agent *Diorhabda carinata* on generalist arthropod predators in saltcedar (*Tamarix* spp.). **J. Sunny Evans**, ejessis@okstate.edu, Tom A. Royer and Carmen M. Greenwood, Oklahoma State Univ., Stillwater, OK

Ten-Minute Papers, P-IE Section: Crop Protection: Fruit Trees and Vines

Meeting Room 8 AB (Austin Convention Center)

Moderators: Joshua Temple[1] and D. Henne[2], [1]DuPont Crop Protection, Bradenton, FL, [2]Texas A&M Univ., Weslaco, TX

1:15 0421 Sivanto, a new insecticide for CA citrus IPM programs. **Phil McNally**, phil.mcnally@bayer.com, Bayer CropScience, Lake Forest, CA and Amanda Beaudoin, BayerCropScience, Research Triangle Park, NC

1:27 0422 DuPont™ Exirel™ and Verimark™ insect control: Novel insecticides for crop protection and optimizing yield in citrus in the United States. **Joshua Temple**, joshua.h.temple@dupont.com[1], Stanley S. Royal[2], James E. Taylor[3], Hugo T. Ramirez[4], Hector E. Portillo[5], I. Billy Annan[5] and Juan M. Alvarez[5], [1]DuPont Crop Protection, Bradenton, FL, [2]DuPont Crop Protection, Girard, GA, [3]DuPont Crop Protection, St. Petersburg, FL, [4]Dupont Crop Protection, Visalia, CA, [5]DuPont Crop Protection, Newark, DE

1:39 0423 DuPont™ Exirel™ insect control: Novel insecticide for crop protection and optimizing yield in stone and pome fruit in the U.S. **Amanda Koppel**, amanda.l.koppel@dupont.com[1], Norman D. McKinley[2], Michael Doerr[3], Donald D. Ganske[4], Marsha Martin[5], Greg Hannig[6], Hector E. Portillo[7], I. Billy Annan[7] and Juan M. Alvarez[6], [1]DuPont Crop Protection, Richland, WA, [2]Dupont Crop Protection, Salem, OR, [3]DuPont Crop Protection, Wilmington, DE, [4]DuPont Crop Protection, Winchester, VA, [5]DuPont Crop Protection, Columbus, OH, [6]DuPont Crop Protection, Palmyra, NY, [7]DuPont Crop Protection, Newark, DE

1:51 0424 Management strategies for *Drosophila suzukii* in southeastern highbush blueberry: Approaches to meet grower needs. **Jesse Hardin**, jahardi2@ncsu.edu[1], Mark Bailey[2], Dan L. Horton[2] and Hannah J. Burrack[1], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of Georgia, Athens, GA

2:03 0425 Fruit susceptibility to *Drosophila suzukii*. **Jana C. Lee**, jana.lee@ars.usda.gov, USDA ARS, Corvallis, OR

2:15 0426 Testing for imidacloprid resistance in blackmargined aphid (*Monellia caryella*) poulations from Texas pecan orchards. **Bill Ree**, w-ree@tamu.edu, Texas A&M AgriLife Extension, Bryan, TX and Juan D. Lopez, APMRU, College Station, TX

2:27 0427 Pecan [*Carya illinoinensis* (Wang.) K. Koch] semiochemicals terminate 'diapause' in larvae of *Acrobasis nuxvorella* Neunzig. Irasema Vargas-Arispuro[1], M. Corella-Madueño[1], **Marvin K. Harris**, m-harris@tamu.edu[2], M. Martínez-Téllez[1], A. Gardea[1], A. Fú-Castillo[3] and A. Orozco-Avitia[4], [1]Centro de Investigación en Alimentación y Desarrollo, Hermosillo, Mexico, [2]Texas A&M Univ., College Station, TX, [3]INIFAP, Mexico City, DF, Mexico, [4]3 Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias-Costa de Hermosillo, Hermosillo, Mexico

2:39 0428 Baseline susceptibility of codling moth (*Cydia pomonella*) to spinetoram and chlorantraniliprole. **Robert A. Van Steenwyk**, bobvanst@nature.berkeley.edu[1], Stephen C Welter[2], Frances Cave[1], Lauren Novotny[1] and William Coates[3], [1]Univ. of California, Berkeley, CA, [2]San Deigo State Univ., San Diego, CA, [3]Univ. of California, Hollister, CA

2:51 0429 The interplay between spray timing and insecticide choice for control of navel orangeworm in pistachios. **Joel Siegel**, joel.siegel@ars.usda.gov, USDA, Agricultural Research Service, Parlier, CA and Gary Weinberger, Weinberger & Associates, Hanford, CA

3:03 Break

3:15 0430 Field trials in commercial pecan orchards in Georgia with California prionus pheromone as an attractant for tilehorned prionus and broad necked root borer. **James D. Dutcher**, jimdutcher@lycos.com, Univ. of Georgia, Tifton, GA

3:27 0431 Light Brown Apple Moth (*Epiphyas postvittana*) population dynamics and host range surrounding nurseries in central California. **SA Tjosvold**, satjosvold@ucdavis.edu and NB Murray, Univ. of California Cooperative Extension, Watsonville, CA

3:39 0432 Field evaluation of smart spray systems in Oregon nursery production. **Robin Rosetta**, robin.rosetta@oregonstate.edu[1], Heping Zhu[2], Derek Wells[1] and Adam Clark[3], [1]Oregon State Univ., Aurora, OR, [2]USDA, ARS, Wooster, OH, [3]USDA-ARS, Wooster,, OH

3:51 0433 Integrating new insecticides into the California citrus IPM program - impact on natural enemies. **Elizabeth E. Grafton-Cardwell**, eegraftoncardwell@ucanr.edu, Ping Gu and Sara J. Scott, Univ. of California, Riverside, CA

4:03 0434 Refinement of control programs for the vine mealybug, *Planococcus ficus,* in the Southern San Joaquin Valley in California Table Grapes. **Stephanie M. Rill**, smrill@ucdavis.edu and David R. Haviland, Univ. of California Cooperative Extension, Kern Co, Bakersfield, CA

4:15 0435 The impact of neonicotinoid insecticides on pollinators in tree fruit IPM programs. **David J. Biddinger**, djb134@psu.edu[1], Chris Mullin[2], Jacqueline L. Robertson[3], Edwin Rajotte[4], Mace Vaughn[5], James Frazier[4], Neelendra K. Joshi[1], Mark Otieno[6] and Maryann Frazier[7], [1]Pennsylvania State Univ., Fruit Research & Extension Center, Biglerville, PA, [2]The Pennsylvania State Univ., Univ. Park, PA, [3]LeOra Software, Petaluma, CA, [4]Pennsylvania State Univ., State College, PA, [5]The Xerces Society, Portland, OR, [6]Pennsylvania State Univ., Univ. Park, PA, [7]Penn State Univ., Univ. Park, PA

4:27 0436 Efficacy of imidacloprid applications to manage Asian citrus psyllid infestations on residential and retail nursery citrus in California. **Adam Zeilinger**, adamz@ucr.edu[1], Adam Olguin[2], Frank J. Byrne[3], Mark S. Hoddle[3] and Matt Daugherty[4], [1]Univ. of California Riverside, Riverside, CA, [2]Univ. of California-Riverside, Riverside, CA, [3]Univ. of California, Riverside, CA, [4]Univ. of California, Riverside, Riverside, CA

4:39 0437 Economic Injury Level model for Asian citrus psyllid control in citrus groves with high incidence of HLB. **Cesar Monzo**, cmonzo@ufl.edu, UF Southwest Florida Research and Education Center, Immokalee, FL and Philip A. Stansly, Univ. of Florida, Immokalee, FL

4:51 0438 Behavior of Asian citrus psyllid as influenced by density of conspecifics and damage-induced volatiles. **Xavier Martini**, xmartini@ufl.edu[1], Angelique Hoyte[2] and Lukasz, L. Stelinski[2], [1]Univ. of Florida Citrus Research and Education Center, Lake Alfred, FL, [2]Univ. of Florida, Lake Alfred, FL

Ten-Minute Papers, P-IE Section: Forest and Arboreal Entomology

Meeting Room 9 C (Austin Convention Center)

Moderators: Kevin Rice[1] and John Riggins[2], [1]Penn State Univ., Univ. Park, PA, [2]Mississippi State Univ., Mississippi State, MS

1:15 0439 Fitness and physiology of the hemlock woolly adelgid, *Adelges tsugae* Annand, in relation to the health of the Eastern hemlock, *Tsuga canadensis* Carriere. **Anne C. Jones**, annej@vt.edu[1], Donald E. Mullins[1], Scott M. Salom[1], Carlyle C. Brewster[2] and J. Rusty Rhea[3], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Virginia Tech, Blacksburg, VA, [3]USDA, Forest Service, Asheville, NC

1:27 0440 How effective is the ISPM No. 15 heat treatment schedule in killing *Agrilus planipennis* and related borers? **Robert A. Haack**, rhaack@fs.fed.us, USDA - Forest Service, East Lansing, MI and Toby R. Petrice, USDA Forest Service, East Lansing, MI

1:39 0441 Development and efficacy determination of a catch trap (EGE-TRAP) in control of the pine processionary moth *Thaumetopoea pityocampa* (Schiff.). **Salih Parlak**, parlaks35@yahoo.com, Maneger of Aegean Forest Research Institute, Urla izmir, Turkey

1:51 0442 Impacts of emerald ash borer (*Agrilus planipennis*) induced ash mortality on native and invasive plant communities. **Wendy S. Klooster**, klooster.2@osu.edu, Catherine P. Herms, Daniel A. Herms and John Cardina, The Ohio State Univ., OARDC, Wooster, OH

2:03 0443 Quantifying the relative importance of woodpecker predation as a source of mortality for the emerald ash borer (*Agrilus planipennis*). **David E. Jennings**, dejennin@umd.edu[1], Paula M. Shrewsbury[1] and Jian J. Duan[2], [1]Univ. of Maryland, College Park, MD, [2]USDA, Agricultural Research Service, Newark, DE

2:15 0444 Interactions between invasive species in a forest ecosystem: Hemlock woolly adelgid, elongate hemlock scale, and eastern hemlock. **Evan L. Preisser**, preisser@uri.edu, Univ. of Rhode Island, Kingston, RI

2:27 0445 Influence of habitat fragmentation on community structure of cerambycid beetles. **Linnea R. Meier**, linrmeier@gmail.com[1], Joseph C. H. Wong[1], Judy A. Mongold-Diers[1], Peter F. Reagel[2], Jocelyn G. Millar[3] and Lawrence M. Hanks[1], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Illinois - Urbana/Champaign, Urbana, IL, [3]Univ. of California, Riverside, CA

2:39 0446 Geographic variation in the dynamics of an irruptive herbivore (southern pine beetle) and its clerid predator. **Aaron S. Weed**, aaron.s.weed@dartmouth.edu and Matthew Ayres, Dartmouth College, Hanover, NH

2:51 0447 A new tropical ash (*Fraxinus uhdei*)-based rearing system for Emerald Ash Borer (*Agrilus planipennis*)–implications for biological control programs. **Tim Watt**, tjwatt@UDel.Edu, Univ. of Delaware, Newark, DE and Jian J. Duan, USDA, Agricultural Research Service, Newark, DE

3:03 0448 Accuracy assessment of forest insect and disease aerial detection survey data in the U.S. **Andrew D. Graves**, adgraves@fs.fed.us, USDA Forest Service, Albuquerque, NM, Tom W. Coleman, USDA Forest Service, San Bernardino, CA, Zachary Heath, USDA Forest Service, Davis, CA, Danny Cluck, USDA Forest Service, Redding, CA, Ryan P. Hanavan, USDA Forest Service, Durham, NH, Robbie Flowers, Oregon Dept. of Forestry, Salem, OR and Glenn R. Kohler, Forest Health, Olympia, WA

3:15 Break

3:27 0449 Biological control of cycad scale, *Aulacaspis yasumatsui*, attacking Guam's endemic cycad, *Cycas micronesica*. **Aubrey Moore**, amoore@uguam.uog.edu, Ross Miller and Thomas Marler, Univ. of Guam, Mangilao, Guam

3:39 0450 Collective individuality in defense behavior of *Azteca* ant colonies in *Cecropia* trees. **Peter Marting**, peterrmarting@gmail.

com[1], Stephen C. Pratt[1] and William Wcislo[2], [1]Arizona State Univ., Tempe, AZ, [2]Smithsonian Tropical Research Institute, Dpo, AA

3:51 0451 Multiple year persistence of single treatments of imidacloprid to manage hemlock woolly adelgid on eastern hemlock: The benefits of metabolites. **Elizabeth P. Benton**, ebenton3@utk.edu[1], Carla I. Coots[1], R. Jesse Webster[2], Richard Cowles[3], Anthony Lagalante[4] and Jerome F. Grant[1], [1]Univ. of Tennessee, Knoxville, TN, [2]National Park Service, Gatlinburg, TN, [3]Connecticut Agricultural Experiment Station, Windsor, CT, [4]Villanova Univ., Villanova, PA

4:03 0452 Mapping spatial pattern and mortality of Eastern and Carolina hemlocks to estimate effects and potential spreading of hemlock woolly adelgid infestations in the Southern appalachians. **Tuula Kantola**, tuulak@neo.tamu.edu[1], Maria Tchakerian[1], Päivi Lyytikäinen-Saarenmaa[2], Robert Coulson[1] and Douglas St.t[3], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Helsinki, Helsinki, Finland, [3]USDA Forest Service, Pineville, LA

4:15 0453 Bark beetles (Coleoptera: Socolytidae) decimated *Pinus greggii* populations at the Sierra Gorda, Queretaro, Mexico. **Santiago Vergara-Pineda**, vpinedas@yahoo.com.mx[1], Armando Equihua-Martinez[2], Victor H. Cambron-Sandoval[1] and Robert W. Jones[3], [1]Universidad Autonoma de Queretaro, Queretaro, Mexico, [2]Colegio de Postgraduados, Texcoco, Mexico, [3]Universidad Autonoma de Queretaro, Juriquilla, Qro, Mexico

4:27 0454 Tree injury and mortality associated with the polyphagous shot hole borer (*Euwallacea* sp.) in the forests of southern California. **Tom W. Coleman**, twcoleman@fs.fed.us, USDA Forest Service, San Bernardino, CA, Akif Eskalen, Univ. of California, Riverside, Riverside, CA and Richard Stouthamer, Univ. of California, Riverside, CA

4:39 0455 Geographic variation in the tallow leaf-roller (*Caloptilia triadicae*): Insight into the evolution and emergence of antagonistic interactions. **Rebecca F. Hazen**, rhazen@tulane.edu, Tulane Univ., New Orleans, LA

4:51 0456 Tree mortality following severe defoliation by the pine butterfly (*Neophasia menapia)* in eastern Oregon. Ari DeMarco[1], David Shaw[1], **Robbie Flowers**, rflowers@odf.state.or.us[2] and Lia Spiegel[3], [1]Oregon State Univ., Corvallis, OR, [2]Oregon Dept. of Forestry, Salem, OR, [3]USDA Forest Service, La Grande, OR

5:15 0457 Anti-aggregation control of the mountain pine beetle using a novel verbenone product, SPLAT verb repel. **Michael Reinke**, reinkem3@msu.edu[1], Lyndsie Stoltman[2], Agenor Mafra-Neto[1] and Christopher J. Fettig[3], [1]ISCA Technologies, Inc., Riverside, CA, [2]ISCA Technologies, Riverside, CA, [3]USDA Forest Service, Pacific Southwest Research Station, Davis, CA

Insect Macrophotography Workshop

Meeting Room 9 AB (Austin Convention Center)

Moderators and Organizers: Ian M. Wright, Univ. of Texas at Austin, Austin, TX

1:15 - 5:15

SUNDAY, NOVEMBER 10, 2013, EVENING

Opening Plenary Session & Founders' Memorial Lecture

Ballroom D (Austin Convention Center)

See page 17 for details regarding the Opening Plenary Session and Founders' Memorial Lecture.

5:30 - 7:30

A listing of virtual posters can be found on page 213.

MONDAY, NOVEMBER 11, 2013, MORNING

1- Undergraduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 4 A (Austin Convention Center)

Moderators: Blair Sampson, USDA, Agricultural Research Service, Poplarville, MS

8:00 0458 Temporal patterns of the apple bloom impacts the abundance and diversity of native bees. **Nicholas G. Stewart**, nstewart@ggc.edu and Mark A. Schlueter, Georgia Gwinnett College, Lawrenceville, GA

8:12 0459 A comparison of pollination behaviors in bumble bees, carpenter bees, mining bees, and honey bees on apple and blueberry flowers. **Sterling Brown**, sbrown@ggc.edu, Matthew Coger, Tatiana Rodriguez, Nicholas G. Stewart and Mark A. Schlueter, Georgia Gwinnett College, Lawrenceville, GA

8:24 0460 The seasonal natural history of *Pheidole morrisi* forel revealed by wax-casting. **Tyler Murdock**, tmurdock@bio.fsu.edu, Florida State Univ., Tallahassee, FL

8:36 0461 The effects of temperature on the chronological distribution of european grapevine moth's (*Lobesia botrana)* life stages. **Cindy Preto**, crpreto@ucdavis.edu, Univ. of California, Sacramento, CA

8:48 0462 Observing natural enemies of brown marmorated stink bugs (Pentatomidae: *Halyomorpha halys*) using video surveillance in south-central Michigan. **Kristin Deroshia**, deroshia@msu.edu, Emily Pochubay and Matthew Grieshop, Michigan State Univ., East Lansing, MI

9:00 0463 Effects of osmotin II over expression in transgenic cotton on cotton aphid (*Aphis gossypii*) reproduction and colonization. **Cody Kerns**, codkern92@gmail.com[1], Shelby Williams[1], Kent Chapman[2], Shanmukh Salimath[2] and David Kerns[1], [1]Louisiana State Univ., Winnsboro, LA, [2]Univ. of North Texas, Denton, TX

9:12 Break

9:24 0464 Puke, blood, allelopathic chemicals: Chemical ecology of the Florida rosemary grasshopper. **Cody Gale**, codyg@knights.ucf.edu[1], James Harper[1] and Hojun Song[2], [1]Univ. of Central Florida, Orlando, FL, [2]The Ohio State Univ., Columbus, OH

9:36 0465 Using sticky bands to reduce defoliation of urban trees by cankerworms. **Noukoun Chanthammavong**, nchanth@ncsu.edu and Steven D. Frank, North Carolina State Univ., Raleigh, NC

9:48 0466 Aphid lineage rather than host plant determines *Aphis craccivora* toxicity to ladybeetles. **Joshua McCord**, ekubigguy@yahoo.com and Jennifer A. White, Univ. of Kentucky, Lexington, KY

10:00 0467 The origin of leaf galling in the permian, and the macroevolutionary implications thereof. **Sandra Schachat**, schachatsr@si.edu, Univ. of Maryland, College Park, MD and Conrad Labandeira, National Museum of Natural History, Washington, DC

10:12 0468 A comparison of the spider prey (*Neoscona spp.*) of mud daubers (Hymenoptera: Sphecidae; Crabronidae) today and 50 years ago on a national wildlife refuge. **Breanna Lyle**, bl334@msstate.edu and John Guyton, Mississippi State Univ., Mississippi State, MS

2- Undergraduate Student Ten-Minute Paper Competition: PBT, MUVE, SysEB

Meeting Room 4 BC (Austin Convention Center)

Moderators: D. Wes Watson[1], Catherine Hill[2] and Mark R. Brown[3], [1]North Carolina State Univ., Raleigh, NC, [2]Purdue Univ., West Lafayette, IN, [3]Univ. of Georgia, Athens, GA

8:00 0469 Differential parental investment in the face of pathogenic pressures: *Manduca sexta* as an insect model organism. **Theodore Bowe**, bowe.t@husky.neu.edu, Northeastern Univ., Cape Elizabeth, ME and Rebeca B. Rosengaus, Northeastern Univ., Boston, MA

8:12 0470 Molecular systematics and evolution of the Ptinidae (Coleoptera: Bostrichoidea) and related families: An update. **Suzanne Scott**, suzanne.scott824@topper.wku.edu and T. Keith Philips, Western Kentucky Univ., Bowling Green, KY

8:24 0471 Ready to strike: Exposing the systematics of ambush bugs (Heteroptera: Reduviidae: Phymatinae). Sarah Frankenberg[1], **Amy Michael**, amich003@ucr.edu[2] and Christiane Weirauch[2], [1]Univ. California, Riverside, CA, [2]Univ. of California, Riverside, CA

8:36 0472 Cooperation vs. competition: Factors influencing the success of group-founding queens in the red imported fire ant. **Alison A. Bockoven**, abockoven@tamu.edu and Micky D. Eubanks, Texas A&M Univ., College Station, TX

8:48 0473 Immune responses elicited by social aphid soldier attacks. **Andrew W. Legan**, andrew.w.legan@vanderbilt.edu, Sarah P. Lawson and Patrick Abbot, Vanderbilt Univ., Nashville, TN

9:00 0474 The effects of rearing environment on physiological development of *Polistes* wasps. **Chad Soenksen**, soenksen@iastate.edu, Jennifer M. Jandt and Amy L. Toth, Iowa State Univ., Ames, IA

9:12 Break

9:24 0475 Controlling mosquitoes as a labor of Hercules: Timing of mortality of larvae and production of adult *Aedes albopictus*. **Kristina McIntire**, kmmcint@ilstu.edu and Steven Juliano, Illinois State Univ., Normal, IL

9:36 0476 Presentation withdrawn.

9:48 0477 Effect of storage method on manure as a substrate for filth fly development. **Billie Shine**, bmshine92@gmail.com[1], Cassie A. Schoenthal[2], Sarah McKamie[3], Caitlin Schlagal[3], K. H. Lohmeyer[4] and David H. Kattes[3], [1]Tarleton State Univ., stephenville, TX, [2]Texas A&M Univ., College Station, TX, [3]Tarleton State Univ., Stephenville, TX, [4]USDA, Agricultural Research Service, Kerrville, TX

10:00 0478 Effect of minerals on spinose ear tick (*Otobius megnini*) distribution within animal shelters. **Caitlin Schlagal**, caitlin.schlagal@go.tarleton.edu[1], Billie Shine[2], Sarah McKamie[1] and David H. Kattes[1], [1]Tarleton State Univ., Stephenville, TX, [2]Tarleton State Univ., stephenville, TX

10:12 0479 Exploration of microbial ecosystems in the red imported fire ant (*Solenopsis invicta*), and its control implications. **Chris M. Powell**, cpowell8@patriots.uttyler.edu and Blake R. Bextine, Univ. of Texas, Tyler, TX

10:24 0480 Characterization of *Aedes aegypti* SLC-7 family amino acid transporter CAT3. **Hannah Drumm**, hdrumm@nmsu.edu[1], David P. Price[1], Lisa L. Drake[1], Stacy D. Rodriguez[1], Immo A. Hansen[1]

and Dmitri Boudko[2], [1]New Mexico State Univ., Las Cruces, NM, [2]Rosalind Franklin Univ., North Chicago, IL

10:36 0481 Large number of putative chemosensory genes identified by transcriptomic analysis in the purple stem borer *Sesamia inferens* (Walker). **Ya-Nan Zhang**, ynzhang025@gmail.com[1], Jun-Yan Jin[1], Rong Jin[1], Yi-Han Xia[1], Jing-Jiang Zhou[2], Jian-Yu Deng[3] and Shuang-Lin Dong[1], [1]Nanjing Agricultural Univ., Nanjing, China, [2]Rothamsted Research, Harpenden, United Kingdom, [3]Zhejiang Agriculture and Forestry Univ., Lin'an, China

3- Graduate Student Ten-Minute Paper Competition: MUVE

Meeting Room 18 A (Austin Convention Center)

Moderators: Mustapha Debboun, United States Army, Medical Dept. Center & School, Fort Sam Houston, TX

8:24 0482 The use of cuticular hydrocarbons to enhance toxic exposure in Argentine ant, *Linepithema humile*, control. **Andrew Soeprono**, andrew.soeprono@gmail.com, Univ. of California, Riverside, Colton, CA and Michael K. Rust, Univ. of California, Riverside, CA

8:36 0483 Multiple cuticular hydrocarbons function as a queen pheromone in the Argentine ant, *Linepithema humile*. **Richard Neff**, rneff002@ucr.edu, Jan Bello, Jocelyn G. Millar and Michael K. Rust, Univ. of California, Riverside, CA

8:48 0484 Nest emigration tasks of the worker Asian needle ant, *Pachycondyla chinensis* (Emery) as identified in a laboratory study. **Hamilton R. Allen**, hrallen@clemson.edu, Patricia Zungoli and Eric P. Benson, Clemson Univ., Clemson, SC

9:00 0485 A survey of the red imported fire ant, *Solenopsis invicta*, parasitoid *Pseudacteon* spp. phorid flies (Diptera: Phoridae) in urban areas of central Texas. **Janis Reed**, janisreed@tamu.edu and Roger E. Gold, Texas A&M Univ., College Station, TX

9:12 0486 The environmental habits of *Centruroides sculpturatus* (Scorpiones: Buthidae). **Christopher Bibbs**, csbibbs@email.arizona.edu, Univ. of Arizona, Tucson, AZ and Dawn Gouge, Univ. of Arizona, Maricopa, AZ

9:24 0487 Optimization of ozone technology as an IPM strategy in german cockroach management. **Yanlin Tian**, tian28@purdue.edu, Purdue Univ., West Lafayette, IN

9:36 0488 Evaluating radioprotectors to improve x-ray sterilization techniques for *Aedes aegypti* males. **Stacy D. Rodriguez**, stacyr@nmsu.edu[1], Ramaninder Kaur Brar[1], Lisa L. Drake[1], Hannah Drumm[1], David P. Price[1], John Hammond[2], Jacob Urquidi[1] and Immo A. Hansen[1], [1]New Mexico State Univ., Las Cruces, NM, [2]Univ. of New Mexico, Las Cruces, NM

9:48 Break

10:00 0489 The effect of increasing ambient temperature on the susceptibility of *Aedes aegypti* to permethrin: What's global warming got to do with it? **Shavonn Whiten**, swhiten2010@gmail.com and Robert K. D. Peterson, Montana State Univ., Bozeman, MT

10:12 0490 The toxicological profile of three larvicides for integrated mosquito larval control. **Joy Anogwih**, joyaa10@gmail.com[1], Eric Linton[2], Winifred Ayinke Makanjuola[1] and Lucian Chukwu[3], [1]Univ. of Lagos, Lagos, Nigeria, [2]Central Michigan Univ., USA, Mount Pleasant, MI, [3]Univ. of Lagos, Akoka, Yaba, Nigeria

10:24 0491 Ovipositional responses of *Culex tarsalis* to semiochemicals produced from aquatic taxa in different guilds. **Adena Why**, awhy001@ucr.edu and William E. Walton, Univ. of California, Riverside, CA

10:36 0492 Dietary choices in *Aedes albopictus* are influenced by day-length. **Alexandra Villiard**, a.villiard@gmail.com, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

10:48 0493 Desiccation tolerance and its effect on egg viability and hatch rates in container-inhabiting mosquitoes. **Francis N. Ezeakacha**, kakaluvs@yahoo.com and Donald A. Yee, Univ. of Southern Mississippi, Hattiesburg, MS

11:00 0494 Malaria vector control using *Beauveria bassiana* fungus. **Rebecca Heinig**, yxh5118@psu.edu, Pennsylvania State Univ., State College, PA

11:12 0495 What genes are targeted by miRNAs in the antennae of *Aedes aegypti*? **Luciano Cosme**, cosme@tamu.edu, Craig J. Coates and Michel Slotman, Texas A&M Univ., College Station, TX

11:24 0496 Experimental inoculation of house flies, *Musca domestica* L., with *Corynebacterium pseudotuberculosis* serovar *equi.* **Marta Barba**, martabr@hotmail.es[1], Xing Ping Hu[1], Terri Hathcock[1], Jerome A. Hogsette[2], Anne Wooldridge[1], Thomas Passler[1], Manuel Chamorro[1], Russel Cattley[1] and Allison Stewart[1], [1]Auburn Univ., Auburn, AL, [2]USDA, Agricultural Research Service, Gainesville, FL

4- Graduate Student Ten-Minute Paper Competition: MUVE

Meeting Room 18 B (Austin Convention Center)

Moderators: Justin Talley, Oklahoma State Univ., Stillwater, OK

8:24 0497 The cost of parasitism: Metabolic aspects of the northern fowl mite-hen interaction. **Amy C. Murillo**, alock001@ucr.edu[1], Mark Chappell[1], Jeb Owen[2] and Bradley A. Mullens[1], [1]Univ. of California, Riverside, CA, [2]Washington State Univ., Pullman, WA

8:36 0498 Spatial and temporal distribution of spinose ear ticks, *Otobius megnini,* at the Fossil Rim Wildlife Center. **Jacqueline Glass**, jacqueline.glass@go.tarleton.edu, Thomas Schwertner, David H. Kattes and Barry D. Lambert, Tarleton State Univ., Stephenville, TX

8:48 0499 Spatial and temporal distribution of spinose ear ticks, *Otobius megnini*, within animal shelters at Fossil Rim Wildlife center. **Callie Price**, callieprice31@hotmail.com, David H. Kattes, Chris Higgins, Kristin Herrmann and Thomas Schwertner, Tarleton State Univ., Stephenville, TX

9:00 0500 Comparison of conventional and novel trapping methods for tick collection. **Sarah E. Mays**, sarahmays12@gmail.com, Brian M. Hendricks, Dave P. Paulsen, Allan E. Houston and Rebecca T. Trout Fryxell, Univ. of Tennessee, Knoxville, TN

9:12 0501 Acaricide resistance mechanisms in *Rhipicephalus sanguineus* . **Amanda L. Eiden**, aeiden@ufl.edu[1], Phillip E. Kaufman[1], Faith M Oi[1], Michael J Dark[1] and Robert J. Miller[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA, Agricultural Research Service, Edinburg, TX

9:24 0502 Impacts of *Culicoides* spp. as vectors of bluetongue virus and epizootic hemorrhagic disease in white-tailed deer production facilities. **Cassie A. Schoenthal**, schoenthal@tamu.edu and Roger E. Gold, Texas A&M Univ., College Station, TX

9:36 0503 A survey of the *Culicoides* species (Diptera: Ceratopogonidae) associated with Oklahoma captive white-tailed deer, *Odocoileus virginianus* Zimmermann, farms using both on-host sampling and carbon dioxide traps. **Tyler Ward**, tbward@okstate.edu and Justin Talley, Oklahoma State Univ., Stillwater, OK

9:48 Break

10:00 0504 Understanding olfactory cues in host location of the filth fly parasitoid *Spalangia cameroni* (Hymenoptera:Pteromalidae) to improve release methods on livestock operations. **Erika T. Machtinger**, irishtangerine@ufl.edu[1], Christopher J. Geden[2], Norman Leppla[1], Peter E. A. Teal[2] and Amanda House[1], [1]Univ. of Florida, Gainesville, FL, [2]USDA Agricultural Research Service, Gainesville, FL

10:12 0505 Biodiversity and distribution of blow flies (Diptera: Calliphoridae) across New Jersey ecoregions. **Lauren M. Weidner**, laurenmweidner@gmail.com[1], M. Eric Benbow[2], Jennifer L. Pechal[2], Jeffery K. Tomberlin[3] and George C. Hamilton[1], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Univ. of Dayton, Dayton, OH, [3]Texas A&M Univ., College Station, TX

10:24 0506 Expression of lysozyme throughout the life history of the house fly, *Musca domestica* L. **Chet Joyner**, cjoo734@gmail.com, Emory Univ., Atlanta, GA and Dana Nayduch, USDA, Agricultural Research Service, Manhattan, KS

10:36 0507 Persistence and efficacy of *Beauveria bassiana* against the house fly, *Musca domestica* L., on typical structural components of poultry houses. **Naworaj Acharya**, naworaj@yahoo.com[1], Rebecca Seliga[1], Edwin Rajotte[2], Nina Jenkins[3] and Mattew Thomas[1], [1]Pennsylvania State Univ., state college, PA, [2]Pennsylvania State Univ., State College, PA, [3]Pennsylvania State Univ., Univ. Park, PA

10:48 0508 *Calliphora vicina* (Diptera: Calliphoridae) larvae are developmentally impaired in the presence of decomposed liver. Cameron Richards[1], Catherine Rowlinson[1], **Lue Cuttiford**, lue.cuttiford@gmail.com[2], Rebecca Grimsley[3] and Martin Hall[1], [1]Natural History Museum London, London, United Kingdom, [2]Texas A&M Univ., College Station, TX, [3]Imperial College London, Ascot, United Kingdom

11:00 0509 The role of insect succession in composted and non-composted beef cadavers. **Trisha Dubie**, trishd@okstate.edu, Justin L. Talley and Astri Wayadande, Oklahoma State Univ., Stillwater, OK

11:12 0510 Improving conservation of endangered birds by the use of an integrated pest management scheme to protect nest cavities from invasive Africanized honey bees. **Caroline Efstathion**, cefstathion@ufl.edu[1], Paul Bardunias[2] and Bill Kern[1], [1]Univ. of Florida, Davie, FL, [2]SUNY-ESF, Syracuse, NY

5- Graduate Student Ten-Minute Paper Competition: MUVE

Meeting Room 18 C (Austin Convention Center)

Moderators: Neil Spomer, Dow AgroSciences, LLC, Brookings, SD

8:24 0511 Standard metabolic rate of the common bed bug, *Cimex lectularius*: Effects of temperature, mass, and life stage. **Zachary C. DeVries**, devrizc@auburn.edu[1], Stephen A. Kells[2] and Arthur G. Appel[1], [1]Auburn Univ., Auburn, AL, [2]Univ. of Minnesota, St. Paul, MN

8:36 0512 Effect of caffeine on feeding and fecundity of bed bugs, *Cimex lectularius* L. **Ralph Narain**, ralph@huskers.unl.edu and Shripat Kamble, Univ. of Nebraska, Lincoln, NE

8:48 0513 The importance of surfaces characteristics in pitfall trap designs targeting bed bugs, *Cimex lectularius* (Hemiptera: Cimicidae). **Benjamin A Hottel**, bhottel@ufl.edu[1], Roberto M. Pereira[2] and Philip G. Koehler[2], [1]Univ. of Illinois, Gainesville, FL, [2]Univ. of Florida, Gainesville, FL

9:00 0514 Family dinner or dine alone: Do immature bed bugs make it to the "table" on their own? **Sydney Crawley**, sydney19@gmail.com, Michael F. Potter and Kenneth F. Haynes, Univ. of Kentucky, Lexington, KY

9:12 0515 Assessment of potential barriers of *Metarhizium anisopliae* as a biocontrol against bed bugs. **Kevin R. Ulrich**, kru@umd.edu[1], Mark F. Feldlaufer[2] and Barbara L. Thorne[1], [1]Univ. of Maryland, College Park, MD, [2]USDA, Agricultural Research Service, Beltsville, MD

9:24 0516 Evaluation of ingested insecticides on bed bugs, *Cimex lectularius*. **Angela Sierras**, ajsierra@ncsu.edu and Coby Schal, North Carolina State Univ., Raleigh, NC

9:36 0517 Evaluating the potential for secondary kill in bed bugs, *Cimex lectularius*. **Yvonne Matos**, ymatos@ncsu.edu and Coby Schal, North Carolina State Univ., Raleigh, NC

9:48 Break

10:00 0518 Insecticide resistance in eggs and first instars of the bed bug (Hemiptera:Cimicidae). **Brittany Elise Delong**, edbritt@vt.edu and Dini M. Miller, Virginia Tech, Blacksburg, VA

10:12 0519 Increasing awareness of and education about bed bugs, *Cimex lectularius,* as a public health issue in Hawai'i. **Elizabeth Jablonski**, emjablon@hawaii.edu and Helen Spafford, Univ. of Hawaii, Honolulu, HI

10:24 0520 Formosan subterranean termite use of clay: Attraction, pesticide detoxification, and general health effects. **Cai Wang**, howangcai@gmail.com and Gregg Henderson, Louisiana State Univ., Baton Rouge, LA

10:36 0521 Age polyethism of workers in incipient colonies of the Formosan subterranean termite, *Coptotermes formosanus* Shiraki. **He Du**, hdu@ufl.edu[1], Thomas Chouvenc[1], Weste Osbrink[2] and Nan-Yao Su[1], [1]Univ. of Florida, Davie, FL, [2]USDA Agricultural Research Service, Kerrville, TX

10:48 0522 Tunneling and food transportation speed of four subterranean termite species (Isoptera: Rhinotermitidae) at various temperatures. **Runxin Cao**, caorunxin@ufl.edu, Univ. of Florida, Fort Lauderdale, FL and Nan-Yao Su, Univ. of Florida, Davie, FL

11:00 0523 Red flour beetle, *Tribolium castaneum* (Herbst), larval developmental when fed mixed diet of 90% flour/10% yeast with different proportion of dried distillers grains with soluble. **Mahsa Fardisi**, mfardisi@purdue.edu[1], Linda Mason[2] and Klein Ileleji[2], [1]Purdue Univ., West Lafayette, IN, [2]Purdue Univ., W. Lafayette, IN

11:12 0524 Investigations into the vectorial capacity of bed bugs (*Cimex lectularius*): Feeding and defecation behaviors. **Courtney L. Darrington**, darrington.3@osu.edu, The Ohio State Univ., Columbus, OH

6- Graduate Student Ten-Minute Paper Competition: PBT, MUVE

Meeting Room 18 D (Austin Convention Center)

Moderators: Laura Harrington[1] and Shahid Karim[2], [1]Cornell Univ., Ithaca, NY, [2]The Univ. of Southern Mississippi, Hattiesburg, MS

8:24 0525 The mold mite, *Tyrophagus putrescentiae* (Schrank) (Acari: Acaridae), in ham facilities: Population dynamics and response to temperature and fumigation treatments. **Barbara Amoah**, bamoah@ksu.edu[1], James F. Campbell[2] and Thomas Phillips[1], [1]Kansas State Univ., Manhattan, KS, [2]USDA Agricultural Research Service, Manhattan, KS

8:36 0526 The toxicity of selected pesticides against ham mite, *Tyrophagus putrescentiae* schrank, under *in vitro* assay. **Salehe Abbar**, abbar@ksu.edu[1], M. Wes Schilling[2] and Thomas Phillips[1], [1]Kansas State Univ., Manhattan, KS, [2]Mississippi State Univ., Starkville, MS

8:48 0527 Impacts of reduced risk pesticides on four life stages of *Hippodamia convergens*. **Lisa Fernandez**, fernandez@berkeley.edu and Nicholas J. Mills, Univ. of California, Berkeley, CA

9:00 0528 Efficacy of rice insecticide seed treatments at selected nitrogen rates for control of *Lissorhoptrus oryzophilus kuschel*. **Mallory Everett**, mallorye@uark.edu[1], Gus Lorenz[2], Derek Clarkson[1], Sean Flynn[1], Luis Ricardo Orellana[1] and Benjamin Thrash[1], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Arkansas, Lonoke, AR

9:12 0529 Interaction of cotton insecticide seed treatments and early season herbicides. **Derek Clarkson**, dclarkso@uark.edu[1], Gus Lorenz[2], Benjamin Thrash[1], Mallory Everett[1] and Luis Orellana[1], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Arkansas, Lonoke, AR

9:24 0530 Symbiont-mediated modification of mosquitocide toxicity in the dengue vector, *Aedes aegypti*. **Sara S. Scates**, sara29@vt.edu and Troy D. Anderson, Virginia Tech, Blacksburg, VA

9:36 0531 Effect of systemic imidacloprid on the parasitism rates of the tobacco budworm, *Heliothis virescens*, by *Toxoneuron nigriceps* and *Campoletis sonorensis* in flue-cured tobacco. **Sally Taylor**, svtaylor@ncsu.edu and Clyde E. Sorenson, North Carolina State Univ., Raleigh, NC

9:48 Break

10:00 0532 Characterization of imidacloprid resistance in the house fly, *Musca domestica.* **Lucy Kavi**, lak237@cornell.edu, Cornell Univ., Ithaca, NY

10:12 0533 Direct and indirect effects of the herbicide dicamba on two lepidopteran species. **Eric Bohnenblust**, ewb14@psu.edu[1], J. Egan[2], David A. Mortensen[1] and John F. Tooker[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]USDA Agricultural Research Service, Univ. Park, PA

10:24 0534 Genetic engineering of a termite specific bacterium using a Tn7 transposon vector for paratransgenesis based termite control. **Chinmay Tikhe**, cvtikhe@gmail.com, Louisiana State Univ., Baton Rouge, LA

10:36 0535 Discovery of antibacterial activity in crude protein extracts of the eastern subterranean termite, *Reticulitermes flavipes*. **Yuan Zeng**, yzz0015@auburn.edu, Auburn Univ., auburn, AL and Xing Ping Hu, Auburn Univ., Auburn, AL

10:48 0536 Application of acetylsalicylic acid (aspirin) solution affects plant resistance against psyllids carrying *Candidatus Liberibacter solanacearum*. **Ordom Brian Huot**, obh6@tamu.edu and Cecilia Tamborindeguy, Texas A&M Univ., College Station, TX

11:00 0537 Prey handling of toxic and non-toxic Lepidopteran prey by Chinese mantid, *Tenodera sinensis*. **Jamie L. Rafter**, jamierafter@my.uri.edu[1], Justin Vendettuoli[1], Liahna Gonda-King[1], Anurag Agrawal[2] and Evan L. Preisser[1], [1]Univ. of Rhode Island, Kingston, RI, [2]Cornell Univ., Ithaca, NY

11:12 0538 Voltage-sensitive chloride channels as a screen for new mosquito toxicants. **Lacey J. Jenson**, ljenson@ufl.edu and Jeffrey R. Bloomquist, Univ. of Florida, Gainesville, FL

11:24 0539 Abdomen morphology and venom characteristics of a foaming ant (*Pachycondyla* sp.) from Cambodia. **Fredrick J. Larabee**, larabee@life.illinois.edu[1], Adrian A. Smith[1], Stephen R Johnson[2], Ashwin Bharadwaj[1], Randy H. Ewoldt[1] and Andrew V. Suarez[1], [1]Univ. of Illinois, Urbana, IL, [2]Carbon Dynamics Institute, LLC, Springfield, IL

7- Graduate Student Ten-Minute Paper Competition: PBT

Meeting Room 19 A (Austin Convention Center)

Moderators: Jeffrey Bradshaw[1] and Michael E. Scharf[2], [1]Univ. of Nebraska - Lincoln, Scottsbluff, NE, [2]Purdue Univ., West Lafayette, IN

8:24 0540 Characterization and comparative profiling of miRNAs among various castes of *Reticuliterms flavipes*. **Tian Yu**, shift_david@msn.com, Dongyan Song, Xiangrui Li and Xuguo Zhou, Univ. of Kentucky, Lexington, KY

8:36 0541 Computational prediction of miRNA regulation in Asian Citrus psyllid, *Diaphorina citri*, life stages. **Juan Macias**, Juanfmacias3@gmail.com[1], Ginny Soong[1], Wayne B. Hunter[2] and Blake R. Bextine[1], [1]Univ. of Texas, Tyler, TX, [2]USDA, Agricultural Research Service, Ft. Pierce, FL

8:48 0542 Evaluation of methods of dsRNA delivery for RNA Interference as a functional tool in the Colorado potato beetle, *Leptinotarsa decemlineata* (Say). **Ashley D. Yates**, yatesa@mail.ic.edu and Nicholas Miller, Univ. of Nebraska, Lincoln, NE

9:00 0543 Integrating circadian activity and gene expression profiles to predict chronotoxicity of *Drosophila suzukii* response to insecticides. Kelly Hamby, **Rosanna Kwok**, rskwok@ucdavis.edu, Frank Zalom and Joanna Chiu, Univ. of California, Davis, CA

9:12 0544 Factors affecting polygalacturonase gene expression in the tarnished plant bug (*Lygus lineolaris*). **Daniel Fleming**, def18@msstate.edu, Natraj Krishnan and Fred Musser, Mississippi State Univ., Mississippi State, MS

9:24 0545 Differential gene expression of density-dependent phenotypic plasticity in *Schistocerca americana* (Orthoptera: Acrididae). **Steve Gotham**, sgothamjr@knights.ucf.edu and Hojun Song, Univ. of Central Florida, Orlando, FL

9:36 0546 Do epigenetic mechanisms regulate wing color patterning in painted lady butterflies? **Heidi Connahs**, heidi.connahs@email.und.edu, Rebecca Simmons, Kasey Chelemedos, Diane Darland and Turk Rhen, Univ. of North Dakota, Grand Forks, ND

9:48 Break

10:00 0547 Functional and pharmacological characterization of a tyramine receptor from the southern cattle tick, *Rhipicephalus microplus*. **Aaron Gross**, adgross@iastate.edu[1], Michael J. Kimber[1], Kevin B. Temeyer[2], Andrew Y. Li[3], Robert J. Miller[4], Adalberto Perez de Leon[2] and Joel Coats[1], [1]Iowa State Univ., Ames, IA, [2]USDA, Agricultural Research Service, Kerrville, TX, [3]USDA Agricultural Research Service, Kerrville, TX, [4]USDA, Agricultural Research Service, Edinburg, TX

10:12 0548 The search for the target of the chitin inhibitor, dilfubenzuron (DFB) in the red flour beetle. **Meera Kumari**, meerak@ksu.edu, Kansas State Univ., Manhattan, KS

10:24 0549 Coumaphos metabolism in honey bee, *Apis mellifera*, queens and workers. **Lizette Dahlgren**, lizette@huskers.unl.edu[1], Reed Johnson[2], Marion Ellis[1] and Blair Siegfried[1], [1]Univ. of Nebraska, Lincoln, NE, [2]The Ohio State Univ. – OARDC, Wooster, OH

10:36 0550 Comparative analysis of agrochemical-induced oxidative stress in honey bees. **Jennifer R. Williams**, jdub12@vt.edu, Richard D. Fell and Troy D. Anderson, Virginia Tech, Blacksburg, VA

10:48 0551 Determination of the absolute stereochemistry of methyl-branched hydrocarbons isolated from several orders of insects. **Jan Bello**, jbell011@ucr.edu and Jocelyn G. Millar, Univ. of California, Riverside, CA

11:00 0552 Synergistic actions of P-glycoprotein inhibitors on the activity of tacrine anticholinesterases towards vector mosquitoes. **Ngoc N. Pham**, npham914@vt.edu and Troy D. Anderson, Virginia Tech, Blacksburg, VA

11:12 0553 Comparative genomics of juvenile hormone biosynthesis in the ticks, *Dermacentor variabilis*, *Ixodes scapularis*, and *Ornithodoros turicata*. **Jiwei Zhu**, jzhu4@ncsu.edu[1], SM. Khalil[1], Brooke Bissinger[2], N. Egekwu[3], Kevin V. Donohue[1], Daniel E. Sonenshine[3] and R. Michael Roe[1], [1]North Carolina State Univ., Raleigh, NC, [2]TyraTech, Inc., Morrisville, NC, [3]Old Dominion Univ., Norfolk, VA

11:24 0554 Preliminary results of selection for resistance to v-ATPase-A dsRNA in *Diabrotica undecimpunctata howardi* Barber. **Adriano E Pereira**, aelias374@yahoo.com.br and Blair Siegfried, Univ. of Nebraska, Lincoln, NE

8- Graduate Student Ten-Minute Paper Competition: PBT

Meeting Room 19 B (Austin Convention Center)

Moderators: Troy D. Anderson[1] and Kristina Friesen[2], [1]Virginia Tech, Blacksburg, VA, [2]USDA, Agricultural Research Service, Lincoln, NE

8:36 0555 Microbial contributions to the nitrogen ecology of a xylophagous beetle. **Paul Akwettey Ayayee**, paa141@psu.edu, Pennsylvania State Univ., Univ. park, PA

8:48 0556 Effects of parasitism on aphid symbioses. **Adam J. Martinez**, adamjmtz@gmail.com and Kerry M. Oliver, Univ. of Georgia, Athens, GA

9:00 0557 Mosquito infection with various bacterial species induces periostial hemocyte aggregation and reduces heart contraction rates. **Leah T. Sigle**, leah.t.sigle@vanderbilt.edu, Tania Y. Estevez-Lao and Julian F. Hillyer, Vanderbilt Univ., Nashville, TN

9:12 0558 Gut microbial diversity and function in mosquitoes. **Kerri L. Coon**, kerri@uga.edu, Kevin J. Vogel and Michael R. Strand, Univ. of Georgia, Athens, GA

9:24 0559 Rearing entomopathogenic nematodes on black soldier fly, *Hermetia illucens* (L.) (Diptera: Stratiomyidae). **Joseph Riddle**, riddlej2@msu.edu and Matthew Grieshop, Michigan State Univ., East Lansing, MI

9:36 0560 The importance of symbiotic, prokaryotic groups in termite digestion of lignocellulose. **Brittany F. Peterson**, peter137@purdue.edu, Purdue Univ., West Lafayette, IN, Amit Sethi, DuPont Pioneer, Johnston, IA and Michael E. Scharf, Univ. of Florida, Gainesville, FL

9:48 Break

10:00 0561 A short grooved-peg specific odorant binding protein AlinOBP13 of *Adelphocoris lineolatus* displayed preferential binding behavior to terpenoids. **Liang Sun**, liangsun1029@126.com[1], Shaohua Gu[2], Xiaoyu Ma[1], Zewen Liu[1] and Yongjun Zhang[2], [1]Nanjing Agricultural Univ., Nanjing, China, [2]Chinese Academy of Agricultural Sciences, Beijing, China

10:12 0562 That irresistible scent: Mosquito attraction to human odor in the absence of carbon dioxide. **Genevieve M. Tauxe**, genevieve.tauxe@email.ucr.edu and Anandasankar Ray, Univ. of California, Riverside, CA

10:24 0563 Next-generation sequencing of sensory structures of the American dog tick, *Dermacentor variabilis*. **Ann Louise Carr**, alcarr2@ncsu.edu[1], Brooke Bissinger[2], Anirudh Dhammi[1], Daniel E. Sonenshine[3] and Michael Roe[1], [1]North Carolina State Univ., Raleigh, NC, [2]TyraTech, Inc., Morrisville, NC, [3]Old Dominion Univ., Norfolk, VA

10:36 0564 Different physiological functions of two dopamine receptors in isolated salivary glands of blacklegged tick, *Ixodes scapularis* Say. **Donghun Kim**, kp5091@k-state.edu, Ladislav Simo and Yoonseong Park, Kansas State Univ., Manhattan, KS

10:48 0565 Dorsal vessel structure and hemolymph circulation in A*nopheles gambiae* larvae. **Garrett P. League**, garrett.p.league@vanderbilt.edu and Julian F. Hillyer, Vanderbilt Univ., Nashville, TN

11:00 0566 The influence of diet on egg formation in *Tamarixia radiata* (Waterston) (Hymenoptera: Eulophidae), a parasitoid of *Diaphorina citri* (Kuwayama) (Hemiptera: Psyllidae). **Xulin Chen**, xulin527@ufl.edu and Philip A. Stansly, Univ. of Florida, Immokalee, FL

11:12 0567 Effect of humidity on developmental parameters and field catches of *Drosophila suzukii*. **Samantha L. Tochen**, tochens@hort.oregonstate.edu and Vaughn Walton, Oregon State Univ., Corvallis, OR

9- Graduate Student Ten-Minute Paper Competition: P-IE

Ballroom E (Austin Convention Center)

Moderators: Timothy J. Kring, Univ. of Arkansas, Fayetteville, AR

8:00 0568 Spatial colonization patterns of the European woodwasp, *Sirex noctilio*, at a pine plantation in the Adirondacks. **Christopher J. Foelker**, cjfoelke@syr.edu and Melissa K. Fierke, State Univ. of New York, ESF, Syracuse, NY

8:12 0569 Towards developing ash varieties resistant to emerald ash borer and increasing the efficacy of its biological control agents. **Lindsay Kolich**, lkolich@purdue.edu and Matthew Ginzel, Purdue Univ., West Lafayette, IN

8:24 0570 Development and behavior of *Cerceris fumipennis*. **Jennifer Lund**, jennifer.lund@umit.maine.edu and Eleanor Groden, Univ. of Maine, Orono, ME

8:36 0571 The hosts you know or ones you don't: Patterns of host use by *Halyomorpha halys* in woody plant nurseries. **Erik J. Bergmann**, ebergman@umd.edu, Holly M. Martinson, Paula M. Shrewsbury and Michael J. Raupp, Univ. of Maryland, College Park, MD

8:48 0572 Diurnal and nocturnal activities of the brown marmorated stink bug, *Halyomorpha halys*, in a Pennsylvania orchard. **Deonna C. Soergel**, dcs5112@psu.edu and Greg Krawczyk, Pennsylvania State Univ., Biglerville, PA

9:00 0573 Effects of single and mixed diets of selected fruit trees and wild hosts on *Halyomorpha halys* (Hemiptera: Pentatomidae) development and survival. **Angelita Acebes-Doria**, aacebes@vt.edu[1], Tracy C. Leskey[2] and J. Christopher Bergh[1], [1]Virginia Tech, Winchester, VA, [2]USDA, Agricultural Research Service, Kearneysville, WV

9:12 0574 Withdrawn presentation

9:24 Break

9:36 0575 Effect of diet on *Epiphyas postvittana* (Lepidoptera: Tortricidae) cold tolerance. **Amy C. Morey**, morey041@umn.edu[1], Robert Venette[2] and William D. Hutchison[1], [1]Univ. of Minnesota, St. Paul, MN, [2]U.S. Forest Service, St. Paul, MN

9:48 0576 Estimating yield loss from the Mexican rice borer, *Eoreuma loftini*, in conventional and bioenergy crops. **M.T. VanWeelden**, mvanwe2@lsu.edu[1], B.E. Wilson[1], J.M. Beuzelin[2] and T.E. Reagan[1], [1]Louisiana State Univeristy, Baton Rouge, LA, [2]Louisiana State Univeristy, Alexandria, LA

10:00 0577 Modeling the natural variation in host quality for an invasive consumer, *Cactoblastis cactorum* (Berg). **Tyler E. Schartel**, tes164@msstate.edu and Christopher P. Brooks, Mississippi State Univ., Mississippi State, MS

10:12 0578 Host preference of *Megacopta cribraria* (Hemiptera: Plataspidae) on selected edible beans, soybean and tropical kudzu. **Joni L. Blount**, jonilb@uga.edu[1], G. David Buntin[1] and Alton N. Sparks[2], [1]Univ. of Georgia, Griffin, GA, [2]Univ. of Georgia, Tifton, GA

10:24 0579 Arthropod communities on native and non-native early successional plants. **Meg Ballard**, mballard@udel.edu, Judith A. Hough-Goldstein and Douglas W. Tallamy, Univ. of Delaware, Newark, DE

10:36 0580 Test of enemy release hypothesis with native and invasive genotypes of *Phragmites australis*. **Ganesh P. Bhattarai**, gbhatt2@tigers.lsu.edu[1], Warwick Allen[1], Laura A. Meyerson[2] and James T. Cronin[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Univ. of Rhode Island, Kingston, RI

10:48 0581 Trading spaces: Fungus and nematode switch off as predator and prey. **E. Erin Morris**, eem62@cornell.edu[1], Elliott A. Zieman[2], David Williams[3] and Ann E. Hajek[1], [1]Cornell Univ., Ithaca, NY, [2]Southern Illinois Univ., Carbondale, IL, [3]USDA, Animal Plant Health Inspection Service, Buzzards Bay, MA

10- Graduate Student Ten-Minute Paper Competition: P-IE

Ballroom F (Austin Convention Center)

Moderators: Michael S. Crossley, Univ. of Wisconsin, Madison, WI

8:00 0582 Immunocompetency and oxidative stress resistance of honey bee, *Apis mellifera*, populations across the urbanization gradient. **Robert Appler**, rhappler@ncsu.edu, Steven D. Frank and David R. Tarpy, North Carolina State Univ., Raleigh, NC

8:12 0583 Manipulating the spatial distribution of varroa mites in hives of *Apis mellifera*. **Jackson C. Means**, mjacks4@vt.edu, Carlyle C. Brewster, Loke T. Kok and Richard D. Fell, Virginia Tech, Blacksburg, VA

8:24 0584 Benefits of propolis to honey bee health and immunity. **Renata Borba**, rsborba@umn.edu, Univ. of Minnesota, St Paul, MN

8:36 0585 The honey bee, *Apis mellifera* L., stop signal: Evaluating its uses. **Parry Kietzman**, amacd001@ucr.edu, Univ. of California, Riverside, CA

8:48 0586 Patterns of bacterial endosymbiont diversity in solitary bees. **Abiya Saeed**, abiyasaeed@gmail.com and Jennifer A. White, Univ. of Kentucky, Lexington, KY

9:00 0587 Farming practices affect nest site availability for native ground nesting bees. **Margaret Scampavia**, mrscampavia@ucdavis.edu, Univ. of California, Oakland, CA

9:12 0588 A trait-based comparison of old-field and brownfield plant-pollinator communities in north-central New Jersey. **Caroline M. DeVan**, cmd26@njit.edu and Daniel E. Bunker, New Jersey Institute of Technology, Newark, NJ

9:24 Break

9:36 0589 Pollinator preferences and their potential effects on floral trait diversity. **Margaret W. Thairu**, thairu@wisc.edu, Univ. of Wisconsin, Madison, WI and Johanne Brunet, USDA Agricultural Research Service, Madison, WI

9:48 0590 Comparison of flowering plant-bee linkages between two types of satoyama habitats in Kanazawa, Japan. **Windra Priawandiputra**, windra@stu.kanazawa-u.ac.jp, Tetsuya Kasagi and Koji Nakamura, Kanazawa Univ., Kanazawa, Japan

10:00 0591 Task-dependent effects of colony size on behavioral specialization and brain anatomy in acacia ants (*Pseudomyrmex spinicola*). **Sabrina Amador**, samadorv@utexas.edu, Univ. of Texas, Austin, TX

10:12 0592 The wisdom of the acorn: Social foraging of the ant, *Temnothorax rugatulus.* **Zachary Shaffer**, zshaffe@asu.edu and Stephen Pratt, Arizona State Univ., Tempe, AZ

10:24 0593 Making the cut: Behavioral adaptation by soybean looper to a novel geranium host. **Kyle Hurley**, kylehurley87@gmail.com and David E. Dussourd, Univ. of Central Arkansas, Conway, AR

10:36 0594 Cues eliciting attachment/detachment behaviors of mites phoretic on *Ips* spp. **Jesse A. Pfammatter**, pfammatter@wisc.edu and Kenneth F. Raffa, Univ. of Wisconsin, Madison, WI

10:48 0595 Asian citrus psyllid (*Diaphorina citri)* seasonal movement and spatial distribution patterns. **Scott D. Croxton**,

croxtsd@ufl.edu and Philip A. Stansly, Univ. of Florida, Immokalee, FL

11:00 0596 Effect of condensed tannins in manure on scarab beetle development. **Chelsea Holcomb**, holcomb.chelsea@gmail.com, Roger D. Wittie and David H. Kattes, Tarleton State Univ., Stephenville, TX

11- Graduate Student Ten-Minute Paper Competition: P-IE

Ballroom G (Austin Convention Center)

Moderators: Theresa L. Pitts-Singer, USDA, Agricultural Research Service, Logan, UT

8:00 0597 Pollination in urban yards: Who's there and what socio-ecological variables affect visits to a mobile garden? **David Lowenstein**, dlowen2@uic.edu and Emily Minor, Univ. of Illinois, Chicago, IL

8:12 0598 Pollinator diversity and pollination services provided to urban garden and turf-based vacant lot habitats. **Scott P. Prajzner**, prajzner.1@osu.edu, The Ohio State Univ., OARDC, Wooster, OH and Mary M. Gardiner, The Ohio State Univ., Wooster, OH

8:24 0599 Pollinator interactions with yellow starthistle (*Centaurea solstitialis*) across urban, agricultural, and natural landscapes. **Misha Leong**, mishaleong@berkeley.edu and George Roderick, Univ. of California, Berkeley, CA

8:36 0600 Biotic and abiotic factors guide bumble bee (*Bombus impatiens*) pollen foraging preferences. **Anthony D. Vaudo**, adv124@psu.edu, Christina M. Grozinger, David A. Mortensen, Harland M. Patch and John F. Tooker, Pennsylvania State Univ., Univ. Park, PA

8:48 0601 Small-scale habitat enhancement does not enhance native bee (Hymenoptera: Apoidea) nesting in sunflower fields. **Hillary Sardinas**, hsardinas@berkeley.edu, Kathleen Tom and Claire Kremen, Univ. of California, Berkeley, CA

9:00 0602 Bee contribution to cranberry yield varies with local farm management. **Hannah R. Gaines**, hgaines@wisc.edu and Claudio Gratton, Univ. of Wisconsin, Madison, WI

9:12 0603 Influence of landscape simplification on pollination services to strawberry. **Heather Connelly**, hlc66@cornell.edu, Cornell Univ., Ithaca, NY, Katja Poveda, Cornell Univ., Entomology, Ithaca, NY and Gregory Loeb, Cornell Univ., Geneva, NY

9:24 Break

9:36 0604 Effectiveness and importance of wild bees for apple pollination. **Mia G. Park**, mgp27@cornell.edu, Robert Raguso, John E. Losey and Bryan N. Danforth, Cornell Univ., Ithaca, NY

9:48 0605 Neonicotinoid impact on honey bees (*Apis mellifera*) in cantaloupe production. **Kira L. Albright**, klalbrig@purdue.edu, Purdue Univ., West Lafayette, IN

10:00 0606 Cover crops as an early-season resource for native bees in temperate annual cropping systems. **Katherine Ellis**, kee142@psu.edu and Mary Barbercheck, Pennsylvania State Univ., Univ. Park, PA

10:12 0607 Pollination services provided by wild and managed bees to apple crops of the midwest. **Rachel Mallinger**, remallinger@wisc.edu and Claudio Gratton, Univ. of Wisconsin, Madison, WI

10:24 0608 Wild bee resource utilization on small, diversified farms. **C. Sheena Sidhu**, cks151@psu.edu, Pennsylvania State Univ., Univ. Park, PA

10:36 0609 Pollinator resource use in rangelands managed with patch burn grazing. **Shelly Wiggam-Ricketts**, wiggie@ksu.edu, Gregory Zolnerowich and Brian McCornack, Kansas State Univ., Manhattan, KS

10:48 0610 Insect pollinators in Iowa cornfields: Community identification and trapping methods analysis. **Michael Joseph Wheelock**, wheelock@iastate.edu and Matthew E. O'Neal, Iowa State Univ., Ames, IA

11:00 0611 Evaluating gene flow facilitated by the alfalfa leafcutting bee, *Megachile rotundata*, in alfalfa seed production. **Natalie Boyle**, nboyle@wsu.edu and Doug Walsh, Washington State Univ., Prosser, WA

12- Graduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 9 C (Austin Convention Center)

Moderators: John Ruberson, Kansas State Univ., Manhattan, KS

8:24 0612 Morphological and biochemical aspects of the salivary glands of the western chinch bug, *Blissus occiduus*. **Crystal M. Ramm**, crystal.ramm2@huskers.unl.edu[1], Lisa Baird[2], Keenan L. Amundsen[1], Astri Wayadande[3], Teresa Donze[4], Fred Baxendale[1] and Tiffany M. Heng-Moss[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of San Diego, San Diego, CA, [3]Oklahoma State Univ., Stillwater, OK, [4]Univ. of Nebraska, Kearney, NE

8:36 0613 We are what we eat: Host plant effect on saliva composition in caterpillars. **Loren Rivera Vega**, ljr181@psu.edu and Gary Felton, Pennsylvania State Univ., Univ. Park, PA

8:48 0614 Response of bioenergy switchgrasses (*Panicum virgatum* L.) to Greenbug (*Schizaphis graminum* (Rondani)) and Yellow Sugarcane Aphid (*Sipha flava* (Forbes)) herbivory. **Travis J. Prochaska**, Travis.Prochaska@gmail.com[1], Kyle G. Koch[1], Teresa Donze[1], Tiffany M. Heng-Moss[1], Gautam Sarath[2] and Lisa Baird[3], [1]Univ. of Nebraska, Lincoln, NE, [2]USDA, Agricultural Research Service, Lincoln, NE, [3]Univ. of San Diego, San Diego, CA

9:00 0615 Feeding behavior of *Schizaphis graminum* (Rondani) on resistant and susceptible populations of switchgrass, *Panicum virgatum* L. . **Kyle G. Koch**, kylegkoch@gmail.com[1], Mitchell Stamm[1], Tiffany Heng-Moss[2] and Jeffrey Bradshaw[3], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska - Lincoln, Lincoln, NE, [3]Univ. of Nebraska - Lincoln, Scottsbluff, NE

9:12 0616 Do arbuscular mycorrhizal fungi (AMF) interactions change the resistance of rice plants to pests? **Lina Bernaola**, lbernaola@agcenter.lsu.edu, Michael J. Stout and Raymond Schneider, Louisiana State Univ., Baton Rouge, LA

9:24 0617 Do biotype-1 soybean aphids benefit from the presence of biotype-2 on resistant soybean? **Adam J. Varenhorst**, ajv@iastate.edu and Matthew E. O'Neal, Iowa State Univ., Ames, IA

9:36 0618 The effect of induced plant defense on the performance of light brown apple moth, *Epiphyas postvittana*. **Sara Elizabeth Emery**, semery@berkeley.edu and Nicholas J. Mills, Univ. of California, Berkeley, CA

9:48 Break

10:00 0619 Collateral advantage: Ingestion of foliar bacteria augments herbivore tolerance of plant defense chemicals. **Charles Mason**, cjmason@wisc.edu and Kenneth Raffa, Univ. of Wisconsin, Madison, WI

10:12 0620 Effects of induction by soybean looper, *Chrysodeixis includes* (Walker), (Lepidoptera: Noctuidae) on the feeding behavior of the green peach aphid, *Myzus persicae* (Hemiptera:Aphididae). **John Dryburgh**, jdrybu1@tigers.lsu.edu and Jeffrey A. Davis, Louisiana State Univ., Baton Rouge, LA

10:24 0621 Consequences of chronic ingestion of a selenium-contaminated diet on the Argentine ant, *Linepithema humile*. **Deborah De La Riva**, ddela005@ucr.edu and John T. Trumble, Univ. of California, Riverside, CA

10:36 0622 The biogeography of omnivory: Do omnivores increase prey consumption relative to plants in sodium-poor environments? **Natalie Clay**, naclay@ou.edu, Richard Lehrter and Michael Kaspari, Univ. of Oklahoma, Norman, OK

10:48 0623 Competition between generalist herbivores: Effects of nutrient regulation and body size. **Paul A. Lenhart**, palenhart@neo.tamu.edu, Spencer T. Behmer and Micky D. Eubanks, Texas A&M Univ., College Station, TX

11:00 0624 Plant DNA detection from grasshoppers' gut contents: Method and applications. **Alina Avanesyan**, alina.avanesyan@gmail.com and Theresa Culley, Univ. of Cincinnati, Cincinnati, OH

11:12 0625 Suppression of the human pathogen, *Escherichia coli* 0157:H7, by dung beetles (Coleoptera: Scarabaeidae) using the lowbush blueberry (*Vaccinium angustifolium)* agroecosystem as a conceptual model system. **Matthew Jones**, mattjonesabroad@gmail.com, Washington State Univ., Pullman, WA and Frank Drummond, Univ. of Maine, Orono, ME

13- Graduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 10 AB (Austin Convention Center)

Moderators: Charles Allen, Texas A&M Univ., San Angelo, TX

8:24 0626 Schadenfreude: Tomatoes (*Solanum lycopersicum*) eavesdrop on the misfortune of neighbors to prepare for herbivore attack. **Elizabeth Rowen**, erowen@purdue.edu, Ian Kaplan, Michael Gutensohn and Natalia Doudareva, Purdue Univ., West Lafayette, IN

8:36 0627 Plant perception of herbivore odors: Exposure of host plants to the putative pheromone of a specialist herbivore primes indirect defenses. **Anjel Helms**, amh468@psu.edu, John Tooker and Mark Mescher, Pennsylvania State Univ., Univ. Park, PA

8:48 0628 Thousand cankers disease: Influence of girdling on volatile organic compounds released from black walnut genotypes. **Matthew A. Paschen**, mapasche@purdue.edu[1], William Klingeman[2], Jennifer Juzwik[3], James T. English[4], Sharon E. Reed[4] and Matthew Ginzel[1], [1]Purdue Univ., West Lafayette, IN, [2]Univ. of Tennessee, Knoxville, TN, [3]USDA, Forest Service, St. Paul, MN, [4]Univ. of Missouri, Columbia, MO

9:00 0629 Chemical mediation of oviposition and damage: Wild parsnip, *Pastinaca sativa,* volatiles influence parsnip webworm, *Depressaria pastinacella,* adult and larval host choice. **Tania Jogesh**, tjogesh@life.illinois.edu, Arthur Zangerl and May R. Berenbaum, Univ. of Illinois, Urbana, IL

9:12 0630 The roles of host and non-host volatiles in the attraction of cerambycid beetles to pheromones. **R. Maxwell Collignon**, rmcollig@gmail.com[1], Ian Swift[2], Yunfan Zou[1] and Jocelyn G. Millar[1], [1]Univ. of California, Riverside, CA, [2]California State Collection of Arthropods, Sacramento, CA

9:24 0631 Local host plants and diet mixing: Effects of plant chemistry on a generalist herbivore at the population level. **Marion Le Gall**, le-marron@hotmail.fr and Spencer T. Behmer, Texas A&M Univ., College Station, TX

9:36 Break

9:48 0632 The development of sex pheromone-mediated mating disruption to control *Coleophora deauratella* (Lepidoptera: Coleophoridae): A major pest of red clover, *Trifolium pratense* L., in Canada. **Boyd A. Mori**, bmori@ualberta.ca and Maya L. Evenden, Univ. of Alberta, Edmonton, AB, Canada

10:00 0633 Western flower thrips, *Frankliniella occidentalis*, mediation of primary and secondary metabolism on ethylene-insensitive petunia corollas. **Claudia H. Kuniyoshi**, kuniyoshi.1@osu.edu and Luis A. Cañas, The Ohio State Univ., Wooster, OH

10:12 0634 Withdrawn

10:24 0635 Natural enemy abundance and movement within Oklahoma winter canola and winter wheat landscapes. **Casi N. Jessie**, casi.jessie@okstate.edu[1], Kristopher Giles[1], Brian McCornack[2], Timothy J. Kring[3], James R. Hagler[4], William Jessie[1], Xandra Robideau[1], Nathan Bradford[1] and Scott A. Machtley[5], [1]Oklahoma State Univ., Stillwater, OK, [2]Kansas State Univ., Manhattan, KS, [3]Univ. of Arkansas, Fayetteville, AR, [4]USDA, Agricultural Research Service, Maricopa, AZ, [5]USDA Agricultural Research Service, Maricopa, AZ

10:36 0636 Fungal endophytes and their role as protective agents against herbivores. **Diana Castillo**, dianacastillo8@tamu.edu and Gregory Sword, Texas A&M Univ., College Station, TX

10:48 0637 The effects of endophytic *Chaetomium* fungus on insect herbivores. **Wenqing Zhou**, zhouwq@tamu.edu, Gregory Sword and James Starr, Texas A&M Univ., College Station, TX

11:00 0638 Presentation withdrawn.

11:12 0639 Fate of green ash, *Fraxinus pennsylvanica* phloem phenolics in larval emerald ash borer, *Agrilus planipennis*. **Swapna Priya Rajarapu**, prajarap@purdue.edu[1], Larry Phelan[2] and Omprakash Mittapalli[2], [1]Purdue Univ., West Lafayette, IN, [2]Ohio State Univ., OARDC, Wooster, OH

14- Graduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 10 C (Austin Convention Center)

Moderators: Michael Toews, The Univ. of Georgia, Tifton, GA

8:24 0640 Response of yellow stem borer, *Scirpophaga incertulas*, in warmer world. **MD Ali**, panna_ali@yahoo.com, Bangladesh Rice Research Institute, Gazipur, Bangladesh

8:36 0641 Can crop genotypic diversity mitigate biotic and abiotic stress while maintaining productivity? **Ian M. Grettenberger**, img103@psu.edu, Pennsylvania State Univ., State College, PA and John Tooker, Pennsylvania State Univ., Univ. Park, PA

8:48 0642 Insect-microbe interactions mediate the success of biological control and response to climate change. **Fazila Yousuf**, fazila_yousuf@hotmail.com[1], Geoff Gurr[1], Angus Carnegie[2], Robin A. Bedding[3] and Richard Bashford[4], [1]Charles Sturt Univ., Orange, Australia, [2]Forest Health & Resource Assessment, Industry & Investment NSW, Sydney, Australia, [3]CSIRO Division of Entomology, Canberra, ACT, Australia, [4]Forestry Tasmania, Hobart, Tasmania, Australia

9:12 0643 Contribution of cereal aphids to PVY epidemics in southern Idaho. **Shaonpius Mondal**, mond4500@vandals.uidaho.edu[1], Erik J. Wenninger[2], Pamela J.S. Hutchinson[3], Sanford D. Eigenbrode[1] and Nilsa A. Bosque-Pérez[1], [1]Univ. of Idaho, Moscow, ID, [2]Univ. of Idaho, Kimberly, ID, [3]Univ. of Idaho, Aberdeen, ID

9:24 0644 Analysis and identification of insect vectors causing phytoplasmic diseases in Florida. **Lauren Lambeth**, lauren10_4@msn.com[1], Susan Halbert[2] and Blake R. Bextine[1], [1]Univ. of Texas, Tyler, TX, [2]Florida Dept. of Agriculture and Consumer Services, Gainesville, FL

9:36 0645 Impact of co-infection of wheat streak mosaic and *Triticum mosaic* viruses on transmission rates by the wheat curl mite. **Camila F. de Oliveira**, oliveira-camila@live.com and Gary L. Hein, Univ. of Nebraska, Lincoln, NE

9:48 Break

10:00 0646 Comparison of transcriptomes of vector and non-vector thrips species of tomato spotted wilt virus. Rajagopalbabu Srinivasan[1], **Anita Shrestha**, anita25@uga.edu[2], Donald Champagne[3] and Albert K. Culbreath[2], [1]The Univ. of Georgia, Tifton, GA, [2]Univ. of Georgia, Tifton, GA, [3]Univ. of Georgia, Athens, GA

10:12 0647 Effects of a plant virus on community dynamics in peas. **Paul Chisholm**, paul.chisholm@email.wsu.edu, Washington State Univ., Pullman, WA

10:24 0648 Examining vector movement among infected and noninfected hosts in the *Rhopalosiphum padi*-Barley yellow dwarf virus-wheat pathosystem. **Laura L. Ingwell**, laura.ingwell@gmail.com, Nilsa A. Bosque-Pérez, Sanford D. Eigenbrode and Lana M. Unger, Univ. of Idaho, Moscow, ID

10:36 0649 Ultrastructure and dendritic innervations of antennal sensilla of adult small brown planthopper, *Laodelphax striatellus*. **Fu Bing-xian**, bxfu658@yahoo.com.cn, Zhejiang Univ., Hangzhou, China

10:48 0650 Relative frequency and virulence of the entomopathogenic fungi, *Beauveria* and *Metarhizium* (Ascomycota: Hypocreales), from forested and urban soils in Missouri. **Tamra Reall**, TRFY9F@mail.mizzou.edu and Richard Houseman, Univ. of Missouri, Columbia, MO

11:00 0651 Window of risk for volunteer wheat establishment during the heading stages of wheat and the potential for wheat curl mite infestation. **Anthony J. McMechan**, justin.mcmechan@gmail.com, Univ. of Nebraska - Lincoln, Lincoln, NE and Gary L. Hein, Univ. of Nebraska, Lincoln, NE

11:12 0652 Spatial distribution of hemlock woolly adelgid (Hemiptera: Adelgidae) ovisacs within eastern hemlock. **Sunghoon Baek**, shbaek007@hotmail.com and Yong-Lak Park, West Virginia Univ., Morgantown, WV

11:24 0653 Emergence patterns of *Sirex nigricornis* F. (Hymenoptera: Siricidae) in Arkansas. **Jessica Hartshorn**, jhartsho@uark.edu and F. M. Stephen, Univ. of Arkansas, Fayetteville, AR

15- Graduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 12 A (Austin Convention Center)

Moderators: Bonnie B. Pendleton, West Texas A&M Univ., Canyon, TX

8:00 0654 Is intra-guild predation likely among lady beetles in maize and soybean? **Kristina Prescott**, Presc030@umn.edu, Univ. of Minnesota, Saint Paul, MN and David A. Andow, Univ. of Minnesota, St. Paul, MN

8:12 0655 Release-recovery in the field and reproductive success in the lab of *Laricobius osakensis,* a predatory beetle of the hemlock woolly adelgid (*Adelges tsugae*). **Katlin Mooneyham**, katlinm@vt.edu, Scott Salom, Loke T. Kok, Donald Mullins and Thomas P. Kuhar, Virginia Tech, Blacksburg, VA

8:24 0656 Non-consumptive killing of distasteful pests: Are spiders engaging in superfluous killing of stink bugs? **Kacie J. Athey**, kacie.johansen@uky.edu and James D. Harwood, Univ. of Kentucky, Lexington, KY

8:36 0657 Aphid hide-and-seek: why within-plant location of pests matters in a biological control program for multiple aphid species. **Sarah Jandricic**, sej48@cornell.edu[1], Stephen P. Wraight[2], Dave R. Gillespie[3] and John P. Sanderson[1], [1]Cornell Univ., Ithaca, NY, [2]USDA, Agricultural Research Service, Ithaca, NY, [3]Agriculture & Agri-Food Canada, Agassiz, BC, Canada

8:48 0658 Generalist predators of Asian citrus psyllid, *Diaphorina citri*, in California. **Aviva Goldmann**, agoldmann@gmail.com, Paul F. Rugman-Jones and Richard Stouthamer, Univ. of California, Riverside, CA

9:00 0659 Performance of *Chysoperla rufilabris* Burmeister (Neuroptera: Chrysopidae) feeding on eggs and first instars of *Microtheca ochroloma* Stål (Coleoptera: Chrysomelidae). **Angie A. Niño**, anino@ufl.edu and Ronald Cave, Univ. of Florida, Ft. Pierce, FL

9:12 0660 Predatory insects avoid incidental ingestion by mammalian herbivores. **Matan Ben-Ari**, matbenari@gmail.com and Moshe Inbar, Univ. of Haifa, Haifa, Israel

9:24 Break

9:36 0661 Presentation withdrawn.

9:48 0662 Tracking aphid predation through molecular and spatial analysis. **Katelyn A. Kowles**, katelyn.kowles@uky.edu[1], Kacie J. Athey[1], Douglas W. Johnson[2] and James D. Harwood[1], [1]Univ. of Kentucky, Lexington, KY, [2]Univ. of Kentucky, Princeton, KY

10:00 0663 The annual invasive mile-a-minute weed and its biological control agent's response to moisture and temperature variation. **Scott Berg**, shberg@udel.edu and Judith A. Hough-Goldstein, Univ. of Delaware, Newark, DE

10:12 0664 The effect of olfactory and visual cues on the host selection of the seed-feeding weevil, *Mogulones borraginis*. **Ikju Park**, park0563@vandals.uidaho.edu, Mark Schwarzländer and Sanford Eigenbrode, Univ. of Idaho, Moscow, ID

10:24 0665 Assessing the entomopathogenic nematode community associated with highbush blueberry (Vaccinium corymbosum) in both agroecosystem and natural settings. **Monique J. Rivera**, mjrivera@eden.rutgers.edu, Albrecht M. Koppenhöfer and

Cesar Rodriguez-Saona, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

10:36 0666 Post-application persisence and spatiotemporal dynamics of the entomopathogenic nematode, *Steinernema carpocapsae*, in California pistachio orchards. **Irina Shapiro**, iashapiro@ucdavis.edu[1], Joel Siegel[2] and Edwin Lewis[1], [1]Univ. of California, Davis, CA, [2]USDA, Agricultural Research Service, Parlier, CA

10:48 0667 Interspecific versus intraspecific competition between a native and exotic ladybird beetle. **Rakim Turnipseed**, rkt27@cornell.edu, John Losey and Todd Ugine, Cornell Univ., Ithaca, NY

11:00 0668 Allopatric versus sympatric interspecific mating in coccinellids: Familiarity breeds contempt. **Leo Stellwag**, lms296@cornell.edu and John Losey, Cornell Univ., Ithaca, NY

16- Graduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 12 B (Austin Convention Center)

Moderators: Patrick J. Moran, USDA Agricultural Research Service, Albany, CA

8:00 0669 The impact of natural enemy evenness on biological control in organic and conventional walnut orchards in California. **Kevi C. Mace-Hill**, kmace@berkeley.edu, Univ. of California, Berkeley, CA

8:12 0670 Influence of flowering cover crops and landscape diversity on biological control in vineyards. **Houston Wilson**, houston@berkeley.edu, Albie Miles, Kent Daane and Miguel Altieri, Univ. of California, Berkeley, CA

8:24 0671 European earwig, *Forficula auricularia*, distribution and susceptibility to biological control agents in midwest tree fruit production. **Peter Nelson**, nelsonp8@msu.edu and Mark E. Whalon, Michigan State Univ., East Lansing, MI

8:36 0672 Responses of two parasitoids of emerald ash borer, *Agrilus planipennis* Fairmaire, the introduced *Spathius agrili* Yang, and native *Spathius floridanus* Ashmead, to volatile host-associated cues. **Todd Johnson**, sttdj01@gmail.com[1], Jonathan Lelito[2] and Kenneth Raffa[1], [1]Univ. of Wisconsin, Madison, WI, [2]USDA, Animal and Plant Health Inspection Service, Brighton, MI

8:48 0673 Olfactory and visual cues trigger host location behavior of *Torymus sinensis*, a parasitoid of the globally invasive Asian chestnut gall wasp. **Ignazio Graziosi**, i.graziosi@uky.edu and Lynne Rieske Kinney, Univ. of Kentucky, Lexington, KY

9:00 0674 Behavioral responses of the parasitoids, *Microplitis croceipes* (a specialist) and *Cotesia marginiventris* (a generalist) to single compounds and blends of host related plant volatiles. **Tolulope Morawo**, tom0002@auburn.edu and Henry Fadamiro, Auburn Univ., Auburn, AL

9:12 0675 Phenology of *Pseudacteon* spp. (Diptera: Phoridae) in Alabama. **Kelly Palmer**, ridleka@auburn.edu, Auburn Univ., Auburn, AL

9:24 Break

9:36 0676 Making a feast out of a fly: The asparagus miner (*Ophiomyia simplex*; Diptera: Agromyzidae) and the composition, longevity and flower preference of its parasitoid community. **William R. Morrison**, morri362@msu.edu and Zsofia Szendrei, Michigan State Univ., East Lansing, MI

9:48 0677 Comparative value of various carbohydrate sources for the stink bug egg parasitoid *Telenomus podisi* (Hymenoptera: Scelionidae). **Sriyanka Lahiri**, slahiri@ncsu.edu, David Orr, Clyde Sorenson, Allen C. Cohen and Yasmin J. Cardoza, North Carolina State Univ., Raleigh, NC

10:00 0678 Indigenous natural enemies of the brown marmorated stink bug in ornamental nurseries. **Ashley L. Jones**, ashleyj@umd.edu, Cerruti RR Hooks and Paula M. Shrewsbury, Univ. of Maryland, College Park, MD

10:12 0679 The non-consumptive effects of *Aphidius colemani* on pea aphids interfere with suppression by biological control agent *Aphidius ervi*. **Kathryn Ingerslew**, ksiggc@mail.missouri.edu and Deborah L. Finke, Univ. of Missouri, Columbia, MO

10:24 0680 Parasitism rates of *Lysiphlebus testaceipes* (Hymenoptera: Braconidae) in experienced and novel environments. **Beth Ferguson**, beth.ferguson@okstate.edu, Tom A. Royer and Kristopher L. Giles, Oklahoma State Univ., Stillwater, OK

10:36 0681 Why do older and larger males win contests in the parasitoid wasp *Nasonia vitripennis*? **Yi-Jiun Tsai**, yjt3@georgetown.edu, Martha Weiss and Edward Barrows, Georgetown Univ., Washington, DC

10:48 0682 Interactions of a "risky" biological control agent with target and non-target aphids. **Joe M. Kaser**, kaser008@umn.edu and George Heimpel, Univ. of Minnesota, St. Paul, MN

17- Graduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 14 (Austin Convention Center)

Moderators: Hannah J. Burrack, North Carolina State Univ., Raleigh, NC

8:00 0683 Evaluation of soil-applied entomopathogens as biological control agents of the swede midge, *Contarinia nasturtii*. **Braden Evans**, bevans02@uoguelph.ca[1], Katerina Jordan[1], Michael Brownbridge[2] and Rebecca Hallett[1], [1]Univ. of Guelph, Guelph, ON, Canada, [2]Vineland Research and Innovation Centre, Vineland Station, ON, Canada

8:12 0684 Do fungal endophytes and acephate have interactive or additive effects on early season thrips damage and yield in cotton? **Lauren L Kalns**, lilija01@tamu.edu, Cesar Valencia, John Gonzales and Gregory Sword, Texas A&M Univ., College Station, TX

8:24 0685 Mechanical transmission enhances fungal pathogen control of a grasshopper pest, *Camnula pellucida*. **Erica J. Kistner**, ekistner@nd.edu, Univ. of Notre Dame, South Bend, IN

8:36 0686 Efficacy and persistence of two microbial control agents of *Xylosandrus germanus*. **Joelle Chille Cale**, jnchille@syr.edu[1], Melissa K. Fierke[1], John D. Vandenberg[2] and Michael H. Griggs[2], [1]State Univ. of New York, ESF, Syracuse, NY, [2]USDA Agricultural Research Service, Ithaca, NY

8:48 0687 Utilizing protein marker technology for studying movement of *Drosophila suzukii* . **Jimmy Klick**, klickj@hort.oregonstate.edu, Oregon State Univ., Corvallis, OR, Wei Q. Yang, Oregon State Univ., Aurora, OR, James R. Hagler, USDA, Agricultural Research Service, Maricopa, AZ and Denny Bruck, DuPont Pioneer, Johnston, IA

9:00 0688 Influence of fruit coating on *Drosophila suzukii* oviposition and development and implications for field use.

Katharine Swoboda, kaswobod@ncsu.edu and Hannah J. Burrack, North Carolina State Univ., Raleigh, NC

9:12 0689 Monitoring for *Drosophila suzukii* in southern highbush blueberries using perimeter and central traps and evaluation of tools for management. **Lindsy E. Iglesias**, liglesias@ufl.edu and Oscar Liburd, Univ. of Florida, Gainesville, FL

9:24 Break

9:36 0690 Feeding damage by brown marmorated stinkbug, *Halyomorpha halys*, on commercial hazelnuts. **Christopher S. Hedstrom**, hedstroc@onid.orst.edu[1], Peter W. Shearer[2], Jeffrey C. Miller[1], Jeff Olsen[3] and Vaughn M. Walton[1], [1]Oregon State Univ., Corvallis, OR, [2]Oregon State Univ., Hood River, OR, [3]Oregon State Univ., McMinnville, OR

9:48 0691 A risk model for *Frankliniella bispinosa* (Thysanoptera: Thripidae) in Southern highbush blueberries in North-central Florida. **Tamika Garrick**, tgarrick09@UFL.EDU[1], Oscar Liburd[2] and Clyde Fraisse[2], [1]Univ. of Florida, GAINESVILLE, FL, [2]Univ. of Florida, Gainesville, FL

10:00 0692 Settling behavior of the potato psyllid, *Bactericera cockerelli* (Hemiptera: Triozidae) on cultivated and wild solanaceous hosts in the lower Rio Grande valley of Texas. **J. Thinakaran**, thinakarjeni31@neo.tamu.edu[1], C. Tamborindeguy[2], E. Pierson[3] and D. Henne[1], [1]Texas A&M Univ., Weslaco, TX, [2]Texas A&M Univ., College Station, TX, [3]Texas A&M Univ., College Station,, TX

10:12 0693 The effects of orchard-floor management on the density, dispersal, and distribution of European earwigs (Dermaptera: Forficulidae) in peach orchards of northern Utah. **Andrew S. Tebeau**, Andrew.tebeau@usu.edu[1], Diane G. Alston[2], Jennifer R. Reeve[2], Brent L. Black[2] and Corey V. Ransom[2], [1]Clemson Univ., Clemson, SC, [2]Utah State Univ., Logan, UT

10:24 0694 A field study of western corn rootworm/drought interactions with maize hybrids exhibiting various drought and rootworm tolerance. **Mervat A. B. Mahmoud**, mampr7@mail.missouri.edu, Robert E. Sharp, Melvin J. Oliver and Bruce E. Hibbard, Univ. of Missouri, Columbia, MO

10:36 0695 Comparing larval plum curculio, *Conotrachelus nenuphar*, emergence phenology in cherries and apples with implications for managing the pest in soil. **Roger Duncan Selby**, selbyrog@msu.edu and Mark E. Whalon, Michigan State Univ., East Lansing, MI

10:48 0696 Exploring the mechanisms of winter flooding as a cultural control against rice water weevil, *Lissorhoptrus oryzophilus*. **Mohammad-Amir Aghaee**, maghaee@ucdavis.edu, Univ. of California, Davis, CA

11:00 0697 Biology of the reemergent pest apple flea weevil, *Orchestes pallicornis* Say, and methods for its organic control. **John Pote**, pote30@gmail.com[1], Anne L. Nielsen[1], Matthew Grieshop[2], Larry Gut[2] and Krista Buehrer[2], [1]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, [2]Michigan State Univ., East Lansing, MI

18- Graduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 15 (Austin Convention Center)

Moderators: Ram B. Shrestha, Texas A&M AgriLife Research and Extension Center, Lubbock, TX

8:00 0698 Effect of simulated corn earworm, *Helicoverpa zea*, damage in indeterminate soybean. **Brian Adams**, bpa31@msstate.edu[1], Don Cook[2], Angus Catchot[1], Jeffrey Gore[2] and Fred Musser[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

8:12 0699 Developing sampling plans for the invasive *Megacopta cribraria* in soybeans. **Francesca Stubbins**, fstubbi@g.clemson.edu[1], Francis Reay-Jones[2] and Jeremy K. Greene[1], [1]Clemson Univ., Blackville, SC, [2]Clemson Univ., Florence, SC

8:24 0700 Spatial relationships between ants, prey, and border vegetation in a soybean agroecosystem. **Hannah J. Penn**, hannahjpenn@gmail.com, Katelyn A. Kowles and James D. Harwood, Univ. of Kentucky, Lexington, KY

8:36 0701 Pest status of three cornered alfalfa hoppers in Mississippi soybean. **Jeff Ramsey**, jtr98@msstate.edu[1], Angus Catchot[1], Fred Musser[1], Jeff Gore[2] and Don Cook[3], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, MS, [3]Mississippi State Univ., Stoneville, MS

8:48 0702 Damage by redbanded stink bug (Hemiptera: Pentatomidae) in R2-R6 growth stage soybeans. **Suhas Vyavhare**, suhas.vyavhare@yahoo.com[1], MO. Way[2] and Raul Medina[1], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Beaumont, TX

9:00 0703 Tracking within-field movement of soybean stem borer, *Dectes texanus,* adults using protein markers. **Alice Harris**, alice3@k-state.edu and Brian McCornack, Kansas State Univ., Manhattan, KS

9:12 0704 Soybean aphid feeding increases soybean cyst nematode reproduction. **Michael T. McCarville**, mikemcc@iastate.edu, David Soh, Gregory L. Tylka, Gustavo C. MacIntosh, Erin W. Hodgson and Matthew E. O'Neal, Iowa State Univ., Ames, IA

9:24 Break

9:36 0705 Management of Mexican bean beetle, *Epilachna varivestis* Mulsant, in snap beans using cultural management strategies. **Louis Nottingham**, louisn@vt.edu and Thomas P. Kuhar, Virginia Tech, Blacksburg, VA

9:48 0706 Presentation withdrawn.

10:00 0707 Bottom up effect on top down control: Do plant provided resources improve lepidopteran pest management in Virginia collards? **Christopher R. Philips**, crp@vt.edu[1], Thomas P. Kuhar[1] and D. Ames Herbert[2], [1]Virginia Tech, Blacksburg, VA, [2]Virginia Tech, Suffolk, VA

10:12 0708 Effect of cutting prairie on movement of beneficial arthropods into adjacent crop fields. **Wayne J. Ohnesorg**, wohnesorg2@unl.edu, Univ. of Nebraska - Lincoln, Norfolk, NE, Robert Wright, Univ. of Nebraska, Lincoln, NE, Marion Ellis, Univ. of Nebraska - Lincoln, Lincoln, NE and Thomas E. Hunt, Univ. of Nebraska, Concord, NE

10:24 0709 Manipulation of cultural practices to reduce *Blissus insularis* densities in St. Augustine grass. **Navneet Kaur**, nkaur8@ufl.edu and Eileen A. Buss, Univ. of Florida, Gainesville, FL

10:36 0710 Efficacy of combined applications of insecticides and entomopathogenic fungi for masked chafer grub, *Cyclocephala* spp. (Coleoptera: Scarabaeidae), control in turfgrass. **Sudan Gyawaly**, gyawaly17@gmail.com, Roger R. Youngman, Thomas P. Kuhar and Curt A. Laub, Virginia Tech, Blacksburg, VA

10:48 0711 Multi-species mating disruption in Wisconsin cranberries. **Annie Deutsch**, annie.deutsch7@gmail.com, Univ. of Wisconsin, Madison, WI, Jayne Sojka, Lady Bug IPM, LLC, Pittsville, WI, Tim Dittl, Ocean Spray Cranberries, Inc, Babcock, WI, Agenor Mafra-Neto, ISCA Technologies, Inc., Riverside, CA, Juan Zalapa, USDA-Agricultural Research Service, Madison, WI and Shawn Steffan, USDA Agricultural Research Service, Madison, WI

19- Graduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 16 A (Austin Convention Center)

Moderators: Jeff Gore, Mississippi State Univ., Stoneville, MS

8:00 0712 Experiments concerning the tarnished plant bug, *Lygus lineolaris*, in mid-south cotton. **Wilks Wood**, wwood@drec.msstate.edu, Mississippi State Univ., Cleveland, MS, Jeff Gore, Mississippi State Univ., Stoneville, MS, MS, Angus Catchot, Mississippi State Univ., Mississippi State, MS and Don Cook, Mississippi State Univ., Stoneville, MS

8:12 0713 Influence of nitrogen rate on tarnished plant bug, *Lygus lineolaris,* populations in cotton. **Chase Samples**, CSamples@pss.msstate.edu[1], Darrin Dodds[1], Jeff Gore[2], Angus Catchot[1] and Bobby Golden[3], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, MS, [3]Mississippi State Univ., Stoneville, MS

8:24 0714 Evaluation of pre herbicide and seed treatment on thrips, *Frankliniella fusca*, infestation in cotton. **Drake Copeland**, jdc872@msstate.edu[1], Darrin Dodds[1], Jeff Gore[2] and Angus Catchot[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, MS

8:36 0715 The timing of cotton fleahopper, *Pseudatomoscelis seriatus*, herbivory and cotton's compensatory response. **Loriann C Garcia**, garcia_lc@tamu.edu and Micky Eubanks, Texas A&M Univ., College Station, TX

8:48 0716 Efficacy of aphicides on cotton aphids, *Aphis gossypii,* and their natural enemies. **Jenna Lindsay**, jennalindsay3@aol.com, Shelby Williams, Sebe A. Brown and David L. Kerns, Louisiana State Univ., Winnsboro, LA

9:00 0717 Effects of twospotted spider mite, *Tetranychus urticae*, infestation on cotton development. **Luis Orellana**, lrorella@uark.edu[1], Gus Lorenz[2], Ashley Dowling[1], Benjamin Thrash[1], Derek Clarkson[1], Mallory Everett[1] and Sean Flynn[1], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Arkansas, Lonoke, AR

9:12 0718 Investigating the combined effect of drought stress and neonicotinoid use on two-spotted spider mite, *Tetranychus urticae*, Koch, outbreaks in corn. **Alice Ruckert**, alice.ruckert@usu.edu and Ricardo A. Ramirez, Utah State Univ., Logan, UT

9:24 Break

9:36 0719 Are neonicotinoid seed treatments friendly to natural enemies? A meta-analysis. **Maggie Douglas**, mrd276@psu.edu and John Tooker, Pennsylvania State Univ., Univ. Park, PA

9:48 0720 Effects of foliar applied jasmonic acid and seed applied imidacloprid on phytohormone expression and twospotted spider mite populations. **Sebe Brown**, SBrown@agcenter.lsu.edu[1], Michael J. Stout[2], T. Shelby Williams[1], Jenna Lindsay[1] and David L. Kerns[1], [1]Louisiana State Univ., Winnsboro, LA, [2]Louisiana State Univ., Baton Rouge, LA

10:00 0721 Multi-season effects of foliar and systemic insecticides on calico scale and their natural enemies. **Carlos Quesada**, cquesand@purdue.edu, Adam Witte and Clifford S Sadof, Purdue Univ., West Lafayette, IN

10:12 0722 Drift and deposition of neonicotinoid coated seed lubricants on wild flowers. **Adam Whalen**, daw153@msstate.edu[1], Angus Catchot[1], Jeff Gore[2], Gus Lorenz[3], Scott D. Stewart[4], Don Cook[5], Fred Musser[1] and Jeffrey W. Harris[6], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, MS, [3]Univ. of Arkansas, Lonoke, AR, [4]Univ. of Tennessee, Jackson, TN, [5]Mississippi State Univ., Stoneville, MS, [6]USDA, Agricultural Research Service, Baton Rouge, LA

10:24 0723 A comparison of organophosphates, pyrethroids, and neonicotinoids for managing stink bugs in cotton. **Brian Little**, balittle@uga.edu and Michael D. Toews, Univ. of Georgia, Tifton, GA

10:36 0724 Cultural practices to decrease thrips densities in cotton and peanut production system. **Ian Knight**, ianak@uga.edu[1], Glen Rains[2] and Michael D. Toews[2], [1]Univeristy of Georgia, Tifton, GA, [2]Univ. of Georgia, Tifton, GA

10:48 0725 Bioassays with diamide insecticides in the Mid-South. **Andrew Adams**, aadams@entomology.msstate.edu[1], Jeffrey Gore[2], Angus Catchot[1], Donald Cook[2] and Natraj Krishnan[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS

20- Graduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 16 B (Austin Convention Center)

Moderators: Jonathan Lundgren, USDA Agricultural Research Service, Brookings, SD

8:00 0726 Measuring the foraging distance of the alkali bee, *Nomia melanderi*, using transgenic pollen as a marker. **Amber C. Vinchesi**, avinches@wsu.edu and Douglas Walsh, Washington State Univ., Prosser, WA

8:12 0727 Inheritance and fitness costs of Bt resistance for a field-derived strain of western corn rootworm, *Diabrotica virgifera virgifera* LeConte. **David A. Ingber**, davidngbr@gmail.com[1], Graham P. Head[2] and Aaron J. Gassmann[1], [1]Iowa State Univ., Ames, IA, [2]Monsanto LLC, Saint Louis, MO

8:24 0728 Setting the mood: Effects of various Bt corn refuge configurations on mate selection of the western corn rootworm. **Steven Joel Smith**, smith584@purdue.edu, Purdue Univ., Bluffton, IN

8:36 0729 Susceptibility of Cry1F Resistant Fall Armyworms, *Spodoptera frugiperda,* to cotton expressing Pyramided Bt Toxins. **T. Shelby Williams**, Twilliams@Agcenter.lsu.edu[1], Fangneng Huang[2], Sebe Brown[1], Jenna Lindsay[1] and David Kerns[1], [1]Louisiana State Univ., Winnsboro, LA, [2]Louisiana State Univ., Baton Rouge, LA

8:48 0730 Effect of nitrogen rate on corn rootworm (*Diabrotica* spp.) beetle emergence and sex composition using Bt and non-Bt hybrids. **Trisha Leaf**, trisha.franz@gmail.com and Ken Ostlie, Univ. of Minnesota, St. Paul, MN

9:00 0731 Distribution of *Helicoverpa zea* eggs in a cotton/soybean landscape. **Taylor Dill**, tdd169@msstate.edu[1], Angus Catchot[1], Jeff Gore[2], Don Cook[3] and Fred Musser[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, MS, [3]Mississippi State Univ., Stoneville, MS

9:12 0732 Characteristics of mating western corn rootworms, *Diabrotica virgifera virgifera* LeConte, in refuge and Bt corn. **Sarah A. Hughson**, hughson2@illinois.edu and Joseph L. Spencer, Univ. of Illinois, Urbana, IL

9:24 Break

9:36 0733 Characterization of neonicotinoid uptake in seed-treated soybeans. **Mitchell Stamm**, mstamm3@unl.edu[1], Frederick Baxendale[1], Tiffany M. Heng-Moss[1], Blair Siegfried[1], Thomas E. Hunt[2] and Ralf Nauen[3], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, Concord, NE, [3]Bayer CropScience Aktiengesellschaft, Monheim, Germany

9:48 0734 Do I eat or do I walk? Determining the exposure route of Imidacloprid to green peach aphids in cultivated tobacco. **H. Alejandro Merchán**, hamercha@ncsu.edu, Nicholas Allen and Hannah J. Burrack, North Carolina State Univ., Raleigh, NC

10:00 0735 Effects of neonicotinoid seed treatments on the non-target lady beetle *Coleomegilla maculata:* Transmission through extra floral nectar. **Mike Bredeson**, mmbredeson@jacks.sdstate.edu[1], Jonathan Lundgren[1] and Ralph Reese[2], [1]USDA Agricultural Research Service, Brookings, SD, [2]South Dakota State Univ., Brookings, SD

10:12 0736 Efficacy of different rates and frequency of application of a neem based product, Aza-Direct, on leafminer, *Liriomyza trifolii* (Burgess), activity on snap bean. **Manish Poudel**, mpoude2@ufl.edu and Gary L. Leibee, Univ. of Florida, Apopka, FL

10:24 0737 The effects of hydroxamic acid on specialist and generalist *Diabrotica* spp. **Jelfina Alouw**, jelfine_alouw@yahoo.com and Nicholas J. Miller, Univ. of Nebraska - Lincoln, Lincoln, NE

10:36 0738 The effects of potassium silicate fertilizer on citrus leafminer, *Phyllocnistis citrella*, oviposition preference. **Danica Maxwell**, dfmaxwell@ucdavis.edu and Edwin E. Lewis, Univ. of California, Davis, CA

10:48 0739 Diurnal dispersal of onion thrips, *Thrips tabaci* (Lindeman), in an onion ecosystem. **Erik A. Smith**, eas56@cornell.edu[1], Elson J. Shields[2], Marc F. Fuchs[1] and Brian A. Nault[1], [1]Cornell Univ., Geneva, NY, [2]Cornell Univ., Ithaca, NY

11:00 0740 Impact of planting date and maturity group on the occurence of lepidopteron pest in Mississippi soybeans. **Nicholas R. Bateman**, nickbateman@msstate.edu, Mississippi State Univ., Starkville, MS

21- Graduate Student Ten-Minute Paper Competition: P-IE

Meeting Room 17 A (Austin Convention Center)

Moderators: Paul Neese, BASF Corporation, Research Triangle Park, NC

8:24 0741 The effect of forest fragment quality on the abundance and occupancy of cerambycid beetles. **Kaitlin Handley**, khandley@udel.edu[1], Judith A. Hough-Goldstein[1], Lawrence M. Hanks[2], Jocelyn G. Millar[3] and Vincent D'Amico[4], [1]Univ. of Delaware, Newark, DE, [2]Univ. of Illinois, Urbana, IL, [3]Univ. of California, Riverside, CA, [4]USDA, Forest Service, Newark, DE

8:36 0742 Beetles and spiders as indicators of forest recovery on Prince of Wales Island, Alaska. **Jill Stockbridge**, jmstockbridge@alaska.edu, Univ. of Alaska, Fairbanks, AK

8:48 0743 From canopies to streams: Consequences of hemlock woolly adelgid-induced forest changes for benthic invertebrates. **Christopher J. Strohm**, chris.strohm@uky.edu and Lynne K. Rieske-Kinney, Univ. of Kentucky, Lexington, KY

9:00 0744 Tracking temporal predation shifts in forest wolf spiders. **Thomas D. Whitney**, thomas.whitney@uky.edu and James D. Harwood, Univ. of Kentucky, Lexington, KY

9:12 0745 Symbiosis and wood-feeding in the European woodwasp, *Sirex noctilio.* **Brian M Thompson**, bthomps7@umd.edu[1], Garret Suen[2], Jake Bodart[1], Bo Liu[1], Cameron Currie[2], Mihai Pop[1] and Daniel S. Gruner[1], [1]Univ. of Maryland, College Park, MD, [2]Univ. of Wisconsin, Madison, WI

9:24 0746 A tale of two symbionts: Bacterial facilitation versus restriction of host plant use by *Aphis craccivora*. **Steven M. Wagner**, steven.wagner@uky.edu and Jennifer A. White, Univ. of Kentucky, Lexington, KY

9:36 Break

9:48 0747 Effect of habitat diversity on endosymbiont diversity within the guts of insects. **Ryan Schmid**, rbschmid@jacks.sdstate.edu[1], Michael R. Lehman[2], Volker Brozel[1] and Jonathan Lundgren[2], [1]South Dakota State Univ., Brookings, SD, [2]USDA Agricultural Research Service, Brookings, SD

10:00 0748 Assessing the effects of strip-tillage systems on insect pests and natural enemies in Kentucky cucurbit production systems. **Amanda Skidmore**, amanda.skidmore@gmail.com, Ric Bessin, Mark A. Williams and Timothy Coolong, Univ. of Kentucky, Lexington, KY

10:12 0749 Factors affecting spatial patterns of brown marmorated stink bug, *Halyomorpha halys*, in peach orchard. **Noel Hahn**, nghahn@gmail.com, Cesar Rodriguez-Saona and George C. Hamilton, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

10:24 0750 Ecology of wireworms (Coleoptera: Elateridae) in cereal crops . **Ivan Milosavljevic**, ivan.milosavljevic@email.wsu.edu[1], Aaron Esser[2], Keith S. Pike[3] and David Crowder[1], [1]Washington State Univ., Pullman, WA, [2]Washington State Univ., Ritzville, WA, [3]Washington State Univ., Prosser, WA

10:36 0751 The potential for laurel wilt disease-induced host switching in the palamedes swallowtail, *Papilio palamedes*. **Adam Chupp**, adam.chupp@gmail.com and Loretta Battaglia, Southern Illinois Univ., Carbondale, IL

10:48 0752 Feeding location affects demography of cabbage aphid on winter canola. **Ximena Cibils Stewart**, xcibils@k-state.edu, Brett Sandercock and Brian McCornack, Kansas State Univ., Manhattan, KS

11:00 0753 Effects of simulated climate warming and population source on synchrony of forest tent caterpillar (*Malacosoma disstria* Hübner) egg hatch and host leaf phenology. **Johnny A. Uelmen**, johnnyuelmen@gmail.com, Univ. of Wisconsin, Madison, WI

11:12 0754 Cry protein Persistence in 3rd instar European corn borer, *Ostrinia nubilalis*, Midguts. **Holly Lynn Johnson**, hollylyn83@gmail.com, Univ. of Delaware, Newark, DE

22- Graduate Student Ten-Minute Paper Competition: P-IE, MUVE

Meeting Room 17 B (Austin Convention Center)

Moderators: Michael J. Brewer, Texas A&M Univ., Corpus Christi, TX

8:24 0755 Microbial community structure in a host-associated grasshopper. **Tyler Raszick**, tjraszick@gmail.com and Hojun Song, Univ. of Central Florida, Orlando, FL

8:36 0756 Lady beetle species have different microbial communities in their alimentary tracts – is it a diet effect? **Julia Tiede**, jtiede@uni-goettingen.de[1], James Mutschler[2], Katherine McMahon[2] and Claudio Gratton[2], [1]Georg-August Univ. Goettingen, Goettingen, Germany, [2]Univ. of Wisconsin, Madison, WI

8:48 0757 Differential life history traits of long and short winged grasshoppers across an elevation gradient. **Richard Levy**, ricklevy21@gmail.com and Cesar Nufio, Univ. of Colorado, Boulder, CO

9:00 0758 Latitudinal variation in tritrophic interactions associated with native and exotic genotypes of *Phragmites australis*. **Warwick Allen**, warwick.j.allen@gmail.com[1], Randee Young[1], Ganesh P. Bhattarai[1], Jordan Croy[1], Laura A. Meyerson[2] and James T. Cronin[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Univ. of Rhode Island, Kingston, RI

9:12 0759 Fear-mediated cascades over four trophic levels affect seed predator function. **Carmen K. Blubaugh**, blubaugh@purdue.edu and Ian Kaplan, Purdue Univ., West Lafayette, IN

9:24 0760 Biotic and abiotic factors associated with grape root borer (Lepidoptera: Sesiidae) infestations in Virginia vineyards. **Jhalendra P. Rijal**, jrijal@vt.edu[1], Carlyle Brewster[2] and J. Christopher Bergh[1], [1]Virginia Tech, Winchester, VA, [2]Virginia Tech, Blacksburg, VA

9:36 Break

9:48 0761 Insect assembly gathering on sporocarps of *Ganoderma applanatum* (Ganodermataceae, Basidiomycota) in western Japan. **Ira Taskirawati**, tasqira@yahoo.com, Kanazawa Univ., Kanazawa, Japan and Nobuko Tuno, Kanazawa university, Kanazawa, Ishikawa, Japan

10:00 0762 Influence of host quality on larval competition in *Drosophila suzukii*. **Dylan Kraus**, dakraus@ncsu.edu and Hannah J. Burrack, North Carolina State Univ., Raleigh, NC

10:12 0763 Geographic variation of bacterial communities associated with cotton fleahopper, *Pseudatomoscelis seriatus*. **Josephine Antwi**, jossyantwi@tamu.edu, Gregory Sword and Raul Medina, Texas A&M Univ., College Station, TX

10:24 0764 Non-consumptive effects of spined soldier bug, *Podisus maculiventris*, presence on adult Colorado potato beetle, *Leptinotarsa decemlineata,* behavior. **Sara Hermann**, slh275@cornell.edu and Jennifer S. Thaler, Cornell Univ., Ithaca, NY

10:36 0765 Use of chemical and visual cues by necrophilous insects in detection and orientation to fetal *Sus scrofa domesticus* . **Angela Bucci**, ambucci@ncsu.edu, D. Wes Watson and Coby Schal, North Carolina State Univ., Raleigh, NC

10:48 0766 Diet experience and German cockroach bait performance. **Alexander Ko**, ko.e.alexander@gmail.com, Coby Schal and Jules Silverman, North Carolina State Univ., Raleigh, NC

11:00 0767 Leaf detritus alters survival, fitness, and oviposition site selection of the northern house mosquito, *Culex pipiens* (Diptera: Culicidae). **Allison Gardner**, amgardn2@illinois.edu[1], Brian F. Allan[1] and Ephantus J. Muturi[2], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Illinois, Champaign, IL

23- Graduate Student Ten-Minute Paper Competition: SysEB

Meeting Room 5 ABC (Austin Convention Center)

Moderators: Ligia Cota Vieira, Virginia Tech, Blacksburg, VA

8:00 Welcoming Remarks

8:12 0768 Phylogeny of North American *Aphaenogaster* species (Hymenoptera: Formicidae) reconstructed with morphological and DNA data. **Bernice DeMarco**, demarc10@msu.edu and Anthony, I. Cognato, Michigan State Univ., East Lansing, MI

8:24 0769 The draft genome of the big-eyed arboreal ant, *Pseudomyrmex gracilis*. **Benjamin Rubin**, brubin@fieldmuseum.org and Corrie Moreau, Field Museum of Natural History, Chicago, IL

8:36 0770 Genetics and task selection in the red imported fire ant. **Collin Cutrone McMichael**, cmcmichael@tamu.edu and Micky Eubanks, Texas A&M Univ., College Station, TX

8:48 0771 Phylogeny, taxonomy and nest architecture of the fungus-growing ant genus, *Sericomyrmex* (Hymenoptera: Formicidae). **Ana Jesovnik**, jesovnika@si.edu, Univ. of Maryland, College Park, MD

9:00 0772 Into the mouth of the dragon: Systematics and biology of a specialized ant parasitoid. **Judith Herreid**, jherr019@ucr.edu, Univ. of California, Riverside, CA

9:12 0773 Morphology of the male genitalia in *Brachymyrmex* Mayr (Hymenoptera: Formicidae), and their implications to the Formicine phylogeny. **Christopher M. Wilson**, cmw034@SHSU.EDU, Jerry L. Cook and Autumn Smith-Herron, Sam Houston State Univ., Huntsville, TX

9:24 0774 Tissue-specific endopolyploidy in the giant ant, *Dinoponera australis*. **Daniel R. Scholes**, scholes2@illinois.edu[1], Andrew V. Suarez[1], Adrian A. Smith[1], J. Spencer Johnston[2] and Ken N. Paige[1], [1]Univ. of Illinois, Urbana, IL, [2]Texas A&M Univ., College Station, TX

9:36 Break

9:46 0775 Phylogenetic analysis of the South American velvet ant genus, *Tallium* (Hymenoptera: Mutillidae). **Craig Brabant**, brabant@entomology.wisc.edu, Daniel K. Young and Mark E. Berres, Univ. of Wisconsin, Madison, WI

9:58 0776 Phylogeography of Mesoamerican bumble bees (*Bombus*). **Michelle A. Duennes**, mduennes@life.illinois.edu, Univ. of Illinois, Urbana, IL

10:10 0777 Systematics and taxonomy of the ant parasitoid *Kapala* (Eucharitidae: Hymenoptera). **Elizabeth Murray**, emurr001@ucr.edu and John Heraty, Univ. of California, Riverside, CA

10:22 0778 Getting the most out of old specimens: A phylogenetic analysis of *Cremnops* (Hymenoptera: Braconidae) incorporating the minibarcode region of COI. **Erika Tucker**, erika.tucker@uky.edu and Michael J. Sharkey, Univ. of Kentucky, Lexington, KY

10:34 0779 Phylogenetics of chelonine wasps (Hymenoptera: Braconidae) with special reference to the Australian fauna. **Rebecca Kittel**, rebecca.kittel@adelaide.edu.au[1], John Jennings[1] and Andrew D. Austin[2], [1]Univ. of Adelaide, Adelaide, Australia, [2]Univ. of Adelaide, Adelaide, SA 5005, Australia

10:46 0780 Genes and stings! A molecular phylogeny of the parasitoid wasp subfamily epyrinae (Hymenoptera: Bethylidae). **Carly M. Tribull**, ctribull@amnh.org, American Museum of Natural History, New York City, NY

10:58 0781 Internal anatomy of the enlarged metatibia of gasteruptiid wasps (Hymenoptera: Gasteruptiidae). **Salvatore S. Anzaldo**, ssa5102@psu.edu[1], István Mikó[2] and Andrew R Deans[2], [1]Pennsylvania State Univ., State College, PA, [2]Pennsylvania State Univ., Univ. Park, PA

11:10 Concluding Remarks

24- Graduate Student Ten-Minute Paper Competition: SysEB

Meeting Room 6 A (Austin Convention Center)

Moderators: Kelly Miller[1] and Paul W. Borth[2], [1]Univ. of New Mexico, Albuquerque, NM, [2]Dow AgroSciences, LLC, Indianapolis, IN

8:00 Welcoming Remarks

8:03 0782 Data from whole genome sequences help resolve the subordinal phylogeny of beetles (order Coleoptera). **Robert Samuel de Moya**, robert_demoya@yahoo.com and Duane D. McKenna, Univ. of Memphis, Memphis, TN

8:15 0783 Heavy metals in beetle mandibles: The first comprehensive analysis of incorporation, with evolutionary origins and implications. **Nathan P. Lord**, bothriderid@gmail.com[1], Joseph V. McHugh[2], John Shields[2] and Kelly B. Miller[1], [1]Univ. of New Mexico, Albuquerque, NM, [2]Univ. of Georgia, Athens, GA

8:27 0784 You thought these beetles were just boring: Systematics of the pine sawyers (Cerambycidae: *Monochamus*). **Patrick Scott Gorring**, psg7@cornell.edu, Harvard Univ., Cambridge, MA

8:39 0785 Phylogenetic observations on the elderberry-boring longhorn beetle, *Desmocerus* Dejean (Cerambycidae: Lepturinae). **Philip Schapker**, schapkep@science.oregonstate.edu, Oregon State Univ., Corvallis, OR

8:51 0786 Taxonomy and systematics of New Zealand faronitae (Coleoptera: Staphylinidae: Pselaphinae). **Jong-Seok Park**, jpark16@tigers.lsu.edu and Christopher E. Carlton, Louisiana State Univ., Baton Rouge, LA

9:03 0787 The travertine beetles (Coleoptera: Lutrochidae): A morphological phylogenetic study of a poorly known aquatic dryopoid family. **Crystal Maier**, crystal.maier@gmail.com, Univ. of Kansas, Lawrence, KS

9:15 0788 Up high and down low: phylogeny and zoogeography of the exclusively Nearctic ground beetle genus *Rhadine* LeConte (Coleoptera: Carabidae: Platynini). **R. Antonio Gomez**, ragomez@email.arizona.edu[1], Kipling Will[2] and Wendy Moore[1], [1]Univ. of Arizona, Tucson, AZ, [2]Univ. of California, Berkeley, CA

9:27 Break

9:37 0789 Molecular systematics of the puppet beetles (Coleoptera: Aderidae): Towards the first phylogenetic classification for the family. **Traci L. Grzymala**, mala@berkeley.edu, Univ. of California, Berkeley, CA

9:49 0790 Vegetative communities as indicators of ground beetle (Coleoptera: Carabidae) diversity. **Alan Yanahan**, yanahan2@illinois.edu, Univ. of Illinois, Urbana, IL and Steven Taylor, Univ. of Illinois, Champaign, IL

10:01 0791 A molecular phylogenetic analysis of the basal Cucujoidea, with special consideration of the Cucujidae *sensu latu* (Coleoptera: Cucujiformia). **Thomas McElrath**, tmcelrat@uga.edu[1], James A. Robertson[2], Kelly Miller[3], Michael F. Whiting[4] and Joseph V. McHugh[1], [1]Univ. of Georgia, Athens, GA, [2]Univ. of Arizona, Tucson, AZ, [3]Univ. of New Mexico, Albuquerque, NM, [4]Brigham Young Univ., Provo, UT

10:13 0792 A phylogenetic revision of Minyomerus horn, 1876, and Piscatopus sleeper, 1960 (Coleoptera: Curculionidae: Entiminae: Tanymecini). **Michael Andrew Jansen**, entojansen@gmail.com and Nico M. Franz, Arizona State Univ., Tempe, AZ

10:25 0793 Invasion history and adaptation genomics of the Colorado potato beetle (*Leptinotarsa decemlineata*) using RAD markers. **Tara Madsen-Steigmeyer**, taramadsteig@berkeley.edu[1], Victor Izzo[2], Neil Tsutsui[3] and Yolanda H. Chen[2], [1]Univ. of California, Berkely, CA, [2]Univ. of Vermont, Burlington, VT, [3]Univ. of California, Berkeley, CA

10:37 0794 Systematics and biogeography of the Cychrines, with particular reference to the North American genus *Scaphinotus:* Preliminary results and future directions. **Meghan Culpepper**, mculpepper@berkeley.edu, Univ. of California, Berkeley, CA

10:49 0795 Description of *Heliconia* phytotelmata communities in Central and South America. **Stephanie Schelble**, schelble.stephanie@gmail.com, Univeristy of Southern Mississippi, Hattiesburg, MS, Michael Willig, Univ. of Connecticut, Storrs, CT and Donald A. Yee, Univ. of Southern Mississippi, Hattiesburg, MS

11:01 0796 Elucidating the genes governing rostrum formation in weevils (Coleoptera: Curculionoidea). **Steve Davis**, steved@ku.edu, Univ. of Kansas, Lawrence, KS

11:13 Concluding Remarks

25- Graduate Student Ten-Minute Paper Competition: SysEB

Meeting Room 6 B (Austin Convention Center)

Moderators: Seth M. Bybee[1], Alejandro A. Calixto[2] and Ryan Caesar[3], [1]Brigham Young Univ., Provo, UT, [2]Texas A&M Univ., College Station, TX, [3]Univ. of Hawaii at Manoa, Honolulu, HI

8:00 Welcoming Remarks

8:03 0797 Past, present and future: Phylogeny of *Odonata*. **Haley Cahill Wightman**, haleyw@gmail.com, Seth M. Bybee, Michael F. Whiting and David Morris, Brigham Young Univ., Provo, UT

8:15 0798 An automated system for identifying dragonflies (Odonata: Anisoptera) from wings. **William R. Kuhn**, willkuhn@vt.edu[1], Nidhi Dharithreesan[1] and Gareth Russell[2], [1]Rutgers, The State Univ. of New Jersey, Newark, NJ, [2]New Jersey Institute of Technology, Newark, NJ

8:27 0799 Copulation-associated colour change in *Argia apicalis* (Odonata: Coenagrionidae). **Amanda Purwar**, apurwar@rutgers.edu, Rutgers Univ., New Brunswick, NJ

8:39 0800 Morphological organization within *Disholcaspis* Dalle Torre & Kieffer, 1910 (Hymenoptera: Cynipidae). **Crystal McEwen**, clmcewen@gmail.com, Univ. of Maryland, College Park, MD

8:51 0801 The good, the brown, and the ugly: Biogeography of little brown wasps (Hymenoptera: Chyphotidae). **Emily A. Sadler**, sadler.e@gmail.com and James P. Pitts, Utah State Univ., Logan, UT

9:03 0802 A little orange spot or not: A systematic review of tribe Cirrospilini (Hymenoptera: Eulophidae). **Ryan K Perry**, rkperry@calpoly.edu, Univ. of California, Riverside, CA

9:15 0803 A new look at an old problem: Resolving the *Peristenus pallipes* complex using a multigene approach. **Miles Zhang**, yuanmeng.zhang@gmail.com[1], Henri Goulet[2] and Barbara J. Sharanowski[1], [1]Univ. of Manitoba, Winnipeg, MB, Canada, [2]Agriculture and Agri-Food Canada, Ottawa, ON, Canada

9:27 Break

9:37 0804 Presentation withdrawn.

9:49 0805 Systematics, host plants and life histories of *Phyllocnistis* species on citrus (Lepidoptera, Gracillariidae, Phyllocnistinae). **Qianju Jia**, qianjujia@ufl.edu, Univ. of Florida, McGuire Center for Lepidoptera & Biodiversity, Gainesville, FL, Akito Kawahara, Univ. of Maryland, College Park, MD, Moneen Jones, Univ. of Illinois, Urbana, IL and Philip A. Stansly, Univ. of Florida, Immokalee, FL

10:01 0806 Preliminary molecular phylogeny of the endangered Hawaiian leaf mining moth genus *Philodoria*. **Christopher Johns**, johns.chris.a@gmail.com, Univ. of Florida, Gainesville, FL

10:13 0807 Genetic characterization of turf infesting sod webworms and their host associations . **Devon Rogers**, rogers.781@osu.edu[1], David Shetlar[1] and Steven Passoa[2], [1]The Ohio State Univ., Columbus, OH, [2]USDA Agricultural Plant Health Inspection Service, Columbus, OH

10:25 0808 A molecular phylogeny of deer flies and their closest relatives. **Mauren Turcatel**, mturcat@ncsu.edu and Brian Wiegmann, North Carolina State Univ., Raleigh, NC

10:37 0809 Prospects for using transcriptomic data to expand the evidence for family level relationships in Calyptratae (Diptera). **Keith M. Bayless**, kmbayles@ncsu.edu[1], Michelle Trautwein[2] and Brian Wiegmann[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina Museum of Natural Sciences, Raleigh, NC

10:49 0810 Population genomic analysis of isolation within the African malaria vector *Anopheles melas*. **Kevin C Deitz**, kcdeitz@tamu.edu[1], Daniel E Neafsey[2], Musa Jawara[3], Abrahan Matias[4], Nora J Besansky[5] and Michel A Slotman[1], [1]Texas A&M Univ., College Station, TX, [2]Broad Institute, Cambridge, MA, [3]Medical Research Council Laboratories, Fajara, Banjul, Gambia, [4]Medical Care Development International, Malabo, Equatorial Guinea, [5]Univ. of Notre Dame, Notre Dame, IN

11:01 Concluding Remarks

26- Graduate Student Ten-Minute Paper Competition: SysEB

Meeting Room 7 (Austin Convention Center)

Moderators: Simon Garnier[1] and Hojun Song[2], [1]New Jersey Institute of Technology, Newark, NJ, [2]Univ. of Central Florida, Orlando, FL

8:00 Welcoming Remarks

8:03 0811 Island-like divergence on Florida's sand ridges – the case of a trap-jaw ant. **Daniela Sorger**, dmsorger@ncsu.edu, North Carolina State Univ., Raleigh, NC

8:15 0812 Reproductive Consequences of primary polygyny in a harvester ant population. **Brian Haney**, brhaney@asu.edu and Jennifer H Fewell, Arizona State Univ., Tempe, AZ

8:27 0813 The evolution of head size and shape relative to seed harvesting in the ant genus *Pheidole*. **Jo-anne C. Holley**, jholley@life.illinois.edu[1], Andrew V. Suarez[1] and Corrie Moreau[2], [1]Univ. of Illinois, Urbana, IL, [2]Field Museum of Natural History, Chicago, IL

8:39 0814 The function of leaf-caching behavior in leaf-cutter ant supply chains. **Courtney Rockenbach**, cr222@njit.edu[1], Chris Reid[1], William Wcislo[2] and Simon Garnier[1], [1]New Jersey Institute of Technology, Newark, NJ, [2]Smithsonian Tropical Research Institute, Dpo, AA

8:51 0815 *Wolbachia* as a potential driver of chemical character displacement in *Crematogaster* ants. **Virginia Emery**, vj.emery@berkeley.edu and Neil Tsutsui, Univ. of California, Berkeley, CA

9:03 0816 Testing the predictions of Lanchester's laws of combat with a continously polymorphic ant species. **Bill D. Wills**, bwills2@illinois.edu and Andrew V. Suarez, Univ. of Illinois, Urbana, IL

9:15 0817 Evolving isolation mechanisms between two incipient species of the endoparasitic wasp, *Cotesia congregata*. **Justin Bredlau**, bredlauj@vcu.edu and Karen Kester, Virginia Commonwealth Univ., Richmond, VA

9:27 Break

9:37 0818 Testing the monophyly of *Parapanteles* Ashmead (Hymenoptera: Braconidae: Microgastrinae) and its role in a tritrophic neotropical system. **Kyle Parks**, kparks4@illinois.edu, Univ. of Illinois Urbana Champaign, Urbana, IL and James Whitfield, Univ. of Illinois, Urbana, IL

9:49 0819 Presentation withdrawn.

10:01 0820 Evolution of male lure response in the genus *Bactrocera* (Diptera: Tephritidae). **Michael San Jose**, mdsjose@hawaii.edu, Luc Leblanc and Daniel Z. Rubinoff, Univ. of Hawaii, Honolulu, HI

10:13 0821 *Vive le difference*: what drives intersexual differences in size and development time of *Aedes* mosquitoes? **Jillian Wormington**, jillianwormington@gmail.com, Illinois State Univ., Bloomington, IL and S.A. Juliano, Illinois State Univ., Normal, IL

10:25 0822 Quantification of sexual selection on male song structure in wild populations of sagebrush crickets, *Cyphoderris strepitans* (Orthoptera: Haglidae). **Geoffrey Ower**, geoff.ower@illinoisstate.edu[1], Kevin Judge[2], Sandra Steiger[3], John Hunt[4] and Scott Sakaluk[1], [1]Illinois State Univ., Normal, IL, [2]Grant MacEwan Univ., Edmonton, AB, Canada, [3]Univ. of Ulm, Ulm, Germany, [4]Univ. of Exeter, Cornwall, United Kingdom

10:37 0823 An ancient ecosystem speaks volumes: Analyzing speciation events in scrub islands of the southeastern U.S. via their endemics: *Melanoplus* grasshoppers belonging to the Puer Group. **Derek A. Woller**, asilid@gmail.com[1], Trip Lamb[2], Benjamin Wipfler[3] and Hojun Song[1], [1]Univ. of Central Florida, Orlando, FL, [2]East Carolina Univ., Greenville, NC, [3]Institut für Spezielle Zoologie und Evolutionsbiologie, Jena, Germany

10:49 0824 Relaxed selection in a *Heliconius* hybrid zone and the origin of adaptive variation. **Steven G. Shaak**, sgs130@msstate.edu, Christopher P. Brooks and Brian A. Counterman, Mississippi State Univ., Mississippi State, MS

11:01 Concluding Remarks

27- Graduate Student Ten-Minute Paper Competition: SysEB

Meeting Room 8 AB (Austin Convention Center)

Moderators: John Wenzel[1] and Jessica D. Jurzenski[2], [1]Carnegie Museum of Natural History, Rector, PA, [2]Univ. of Nebraska, Lincoln, NE

8:24 Welcoming Remarks

8:27 0825 Honest signal of male quality in the territorial contests of a Neotropical giant damselfly. **Mingzi Xu**, xumingzi@ou.edu, Univ. of Oklahoma, Norman, OK and Ola Fincke, Univeristy of Oklahoma, Norman, OK

8:39 0826 Consumptive and non-consumptive effects on pea aphids, *Anthrosiphon pisum*, by native and invasive lady beetles. **Evan Hoki**, ewh29@cornell.edu, John Losey and Todd Ugine, Cornell Univ., Ithaca, NY

8:51 0827 Field surveys of APSE, a pea aphid (*Acyrthosiphon pisum*) defensive mutualist-associated bacteriophage. **Stephanie Weldon**, srweldon@uga.edu and Kerry M. Oliver, Univ. of Georgia, Athens, GA

9:03 0828 Necrophagous insects, surely they're not dead wrong? **Amanda Fujikawa**, amanda.roe@hotmail.com and Christian Elowsky, Univ. of Nebraska, Lincoln, NE

9:15 0829 Molecular identification and phylogeny of one host *Dermacentor* ticks in North America. **Kayla Perry**, kp01060@geogiasouthern.edu, Quentin Q. Fang and Dmitry Apanaskevich, Georgia Southern Univ., Statesboro, GA

9:27 0830 Genetic diversity, color pattern, and cryptic species delimitation in North American *Entomobrya* (Collembola). **Aron Katz**, aron.d.katz@gmail.com, Univ. of Illinois, Urbana, IL and Felipe N. Soto-Adames, Univ. of Illinois, Champaign, IL

9:39 0831 Systematics of Pyrgomorphidae (Orthoptera: Caelifera). **Ricardo Mariño-Pérez**, pselliopus@yahoo.com.mx and Hojun Song, Univ. of Central Florida, Orlando, FL

9:51 Break

10:01 0832 The phylogeny of *Arenivaga* (Rehn) (Blattodea, Polyphagidae, Polyphaginae). **Heidi Hopkins**, hhopkins@unm.edu, Univ. of New Mexico, Albuquerque, NM

10:13 0833 Towards a time scale for scales: Divergence time estimation of major lineages in Coccoidea (Hemiptera: Sternorrhyncha). **Isabelle M. Vea**, ivea@amnh.org and David Grimaldi, American Museum of Natural History, New York, NY

10:25 0834 Establishing a framework for a novel evolutionary role of endosymbionts in Adelgidae (Hemiptera: Sternorrhyncha). **Kathryn Weglarz**, kathryn.weglarz@usu.edu and Carol D. von Dohlen, Utah State Univ., Logan, UT

10:37 0835 The molecular phylogeny of the Machaerotidae (Hemiptera: Auchenorrhyncha: Cercopoidea) and the *Pectinariophyes* problem. **Adam J. Bell**, abell@albany.edu, State Univ. of New York, Albany, Albany, NY, Gavin J. Svenson, Cleveland Museum of Natural History, Cleveland, OH and Jason Cryan, North Carolina Museum of Natural Sciences, Raleigh, NC

10:49 0836 Fragments of time: Divergence dating and biogeographic history of Malagasy millipede assassin bugs (Heteroptera: Reduviidae: Ectrichodiinae). **Michael Forthman**, mfort001@ucr.edu and Christiane Weirauch, Univ. of California, Riverside, CA

11:01 0837 Contrasting diversification patterns for two Hawaiian noctuid lineages (Lepidoptera: Noctuidae). **Andersonn Prestes**, aprestes@hawaii.edu and Daniel Rubinoff, Univ. of Hawaii, Honolulu, HI

11:13 0838 Systematics of the millipede-parasitic genus *Myriophora* (Diptera: Phoridae). **John M. Hash**, jhash001@ucr.edu[1], John Heraty[1] and Brian V. Brown[2], [1]Univ. of California, Riverside, CA, [2]Natural History Museum, Los Angeles County, Los Angeles, CA

11:25 Concluding Remarks

28- Graduate Student Ten-Minute Paper Competition: SysEB

Meeting Room 8 C (Austin Convention Center)

Moderators: Gavin J. Svenson[1] and Manpreet Kohli[2], [1]Cleveland Museum of Natural History, Cleveland, OH, [2]Rutgers Univ., Newark, NJ

8:24 Welcoming Remarks

8:36 0839 The impact of prescribed burning on native bee diversity in longleaf pine savannas in the sandhills of North Carolina. **Heather M.C. Moylett**, hmcampbe@ncsu.edu[1], Clyde E. Sorenson[1] and Andrew R Deans[2], [1]North Carolina State Univ., Raleigh, NC, [2]Pennsylvania State Univ., Univ. Park, PA

8:48 0840 How measured richness is affected by species delimitation: An example from Guyanese cockroaches. **Dominic Evangelista**, dominicev@gmail.com and Jessica L. Ware, Rutgers, The State Univ. of New Jersey, Newark, NJ

9:00 0841 A qualitative taxonomic insect survey and similarity analysis of streams in the Chihuahuan Desert of west Texas. Sanjeev Mahabir, sanjeev.mahabir.1008@students.mwsu.edu and **Roy Vogtsberger**, Midwestern State Univ., Wichita Falls, TX

9:12 0842 Factors influencing grasshopper (Orthoptera: Acrididae) subfamily distribution along a vegetation gradient in northern bobwhite habitat. **Kenneth E. Masloski**, kenneth.masloski@okstate.edu[1], Mark Payton[1], Michael Reiskind[2] and Carmen M. Greenwood[1], [1]Oklahoma State Univ., Stillwater, OK, [2]North Carolina State Univ., Raleigh, NC

9:24 0843 Carabid beetles (Coleoptera: Carabidae) of temporally inundated and non-flooded upland lowland forest in the Ecuadorian Amazon. **Kathryn Riley**, rilekn8@wfu.edu[1], Robert A Browne[1] and Terry Erwin[2], [1]Wake Forest Univ., Winston-Salem, NC, [2]Smithsonian Institution, Washington, DC

9:36 0844 Diversity of urban ants (Hymenoptera: Formicidae) in central Illinois, with reference to house-infesting species after 87 years. **Andrea Walker**, awalker@life.illinois.edu, Andrew V. Suarez and May R. Berenbaum, Univ. of Illinois, Urbana, IL

9:48 0845 Projecting distribution and dispersal of subtropical tamarisk beetles, *Diorhabda sublineata*, towards habitat of the endangered southwestern willow flycatcher. **James Tracy**, JamesLTracy@tamu.edu[1], Robert Coulson[1] and Allen Knutson[2], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Dallas, TX

10:00 Break

10:10 0846 Temporal distribution of cocoa mirid species (Hemiptera: Miridae) in the Eastern, Ashanti and Volta regions of Ghana. **Akua Konadu Antwi-Agyakwa**, Kwame Nkrumah Univ. of Science and Technology, Kumasi, Ghana and Richard Adu-acheampong, Cocoa Research Institute of Ghana, Akim-Tafo, Ghana

10:22 0847 A survey of the *Lepturinae* of Wisconsin (Coleoptera: Cerambycidae). **Kari Gullickson**, kagullickson@wisc.edu and Daniel K. Young, Univ. of Wisconsin, Madison, WI

10:34 0848 Macroinvertebrate community convergence between natural, restored, and created wetlands on the Delmarva Peninsula. **Elanor Spadafora**, elanor.stevens@gmail.com[1], Alan Leslie[1], Lauren E. Culler[2] and William O. Lamp[1], [1]Univ. of Maryland, College Park, MD, [2]Dartmouth College, Hanover, NH

10:46 0849 Ant biodiversity in arid urban environments: Effects of fragmentation and habitat modification. **Javier G. Miguelena**, javierm@email.arizona.edu and Paul B. Baker, Univ. of Arizona, Tucson, AZ

10:58 0850 Impacts of rye cover crop on ground-dwelling beneficial arthropods. **Mike W. Dunbar**, dunbar@iastate.edu, Aaron J. Gassmann and Matthew E. O'Neal, Iowa State Univ., Ames, IA

11:10 0851 Presentation withdrawn.

11:22 0852 Effect of multi-stressors on ant community in coastal dunes of Gulf of Mexico. **Xuan Chen**, xchen52@lsu.edu[1], B. Hesson[2], Rachel M. Strecker[2] and L.M. Hooper-Bùi[2], [1]Louisiana State Univeristy, Baton Rouge, LA, [2]Louisiana State Univ., Baton Rouge, LA

11:34 0853 Modeling endemic parasitic wasp elevational range shift as a result of climate change. **Jordie Ocenar**, jordie@hawaii.edu and Mark Wright, Univ. of Hawaii, Honolulu, HI

11:46 Concluding Remarks

29- Graduate Student Ten-Minute Paper Competition: SysEB

Meeting Room 9 AB (Austin Convention Center)

Moderators: Donald A. Yee[1] and Cecilia Dao[2], [1]Univ. of Southern Mississippi, Hattiesburg, MS, [2]Univ. of St. Thomas, Houston, TX

8:24 Welcoming Remarks

8:27 0854 Double trouble: Two distinct endosymbiotic manipulations of the spider *Mermessus fradeorum*. **Meghan M. Curry**, megmay111@gmail.com and Jennifer A. White, Univ. of Kentucky, Lexington, KY

8:39 0855 Observations on the mating behavior of a South American species of the genus *Corydalus* (Megaloptera: Corydalidae). **Clayton A. Sublett**, csublett@shsu.edu, Sam Houston State Univ., Huntsville, TX

8:51 0856 Social immunity and housekeeping behaviors in social aphids. **Sarah P. Lawson**, sarah.p.lawson@vanderbilt.edu and Patrick Abbot, Vanderbilt Univ., Nashville, TN

9:03 0857 Symbiont diversification in ambrosia beetles: Diversity of fungi associated with exotic scolytine beetles. **Craig Bateman**, batemanc@gmail.com and Jiri Hulcr, Univ. of Florida, Gainesville, FL

9:15 0858 Slave Drivers: Increased foraging by host workers under the slavemaking ant, *Protomognathus americanus*. **Kevin Purce**, kevin.purce@gmail.com, CUNY City College, New York, NY

9:27 0859 Meddling neighbors induce an untimely end for foragers of the Florida harvester ant, *Pogonomyrmex badius*. **Christina Kwapich**, ckwapich@bio.fsu.edu and Walter R. Tschinkel, Florida State Univ., Tallahassee, FL

9:39 0860 Presentation withdrawn.

9:51 Break

10:01 0861 Stay cool: Exploring social influence of thermoregulatory behavior in honey bees. **Chelsea N. Cook**, chelsea.cook@colorado.edu, Univ. of Colorado, Boulder, CO

10:13 0862 Assessment of the long term survivability of relocated *Nicrophorus americanus* (ABB) and an identification and breakdown of male *N.* spp. pheromones. **Kyle Risser**, kyle.risser@okstate.edu, Thomas Ferrari and Carmen M. Greenwood, Oklahoma State Univ., Stillwater, OK

10:25 0863 The aggregation pheromones of the aphid predator, *Hippodamia convergens*. **Christopher A. Wheeler**, cwhee002@ucr.edu and Ring T. Cardé, Univ. of California, Riverside, CA

10:37 0864 Do adult mosquitoes support terrestrial predatory invertebrates? A study of emergent mosquitoes from tires piles and the surrounding spider communities. **William C. Glasgow**, william.glasgow@eagles.usm.edu, Donald A. Yee and Ashley Bowler, Univ. of Southern Mississippi, Hattiesburg, MS

10:49 0865 Burrowing aquatic invertebrates alter rates of phosphorus release from aquatic sediments in agricultural drainage ditches. **Alan Leslie**, aleslie@umd.edu and William O. Lamp, Univ. of Maryland, College Park, MD

11:01 0866 How to capture the most species: Assessing malaise trap sampling protocols. **Shelby E. Stedenfeld**, shelby.stedenfeld@uky.edu and Michael J. Sharkey, Univ. of Kentucky, Lexington, KY

11:13 0867 Predation risk shapes thermal physiology of a predaceous damselfly, *Enallagma vesperum* (Odonata: Coenagrionidae). **Lauren E. Culler**, Lauren.E.Culler@dartmouth.edu, Mark A. McPeek and Matthew P. Ayres, Dartmouth College, Hanover, NH

11:25 Concluding Remarks

Lunch and Learn: Re-assessing Tropical Insect Biodiversity - By Looking From the Very Inside to the Very Outside

Ballroom F (Austin Convention Center)

Moderators and Organizers: Dan Janzen, Dan Janzen and Winnie Hallwachs, Univ. of Pennsylvania, Philadelphia, PA

12:45 - 1:45

MONDAY, NOVEMBER 11, 2013, AFTERNOON

MUVE Section Symposium: MUVE Highlights

Ballroom G (Austin Convention Center)

Moderators and Organizers: Edward Walker, Michigan State Univ., East Lansing, MI

1:30 0868 Highlights of Medical Entomology. **Zainulabeuddin Syed**, Zainulabeuddin.Syed.5@nd.edu, Univ. of Notre Dame, Notre Dame, IN

2:30 0869 Highlights of veterinary entomology. **Rebecca Trout Fryxell**, rfryxell@utk.edu, Univ. of Tennessee, Knoxville, TN

3:30 0870 Highlights of urban entomology. **Dong-Hwan Choe**, donghwan.choe@ucr.edu, Univ. of California - Riverside, Riverside, CA

4:30 Preliminary Business Meeting

5:00 MUVE Mixer

PBT Section Symposium: PBT Networking Section

Meeting Room 19 B (Austin Convention Center)

Moderators and Organizers: Michael R. Strand[1] and Jeffrey J. Stuart[2], [1]Univ. of Georgia, Athens, GA, [2]Purdue Univ., West Lafayette, IN

2:00 Welcoming Remarks

2:05 0871 PBT Plenary 1: The evolution of our understanding of insecticide resistance. **Jeffrey G. Scott**, jgs5@cornell.edu, Cornell Univ., Ithaca, NY

2:50 Break

3:10 Business Meeting

3:55 0872 PBT Plenary 2: Regulatory cascades controlling mosquito reproduction: Juvenile hormone, ecdysone and beyond. **Alexander S. Raikhel**, alexander.raikhel@ucr.edu, Univ. of California Riverside, Riverside, CA

4:40 Concluding Remarks

4:45 Reception

P-IE Section Symposium: Plant-Insect Ecosystems (P-IE) Section Networking and Business Session

Ballroom D (Austin Convention Center)

Moderators and Organizers: Gary D. Thompson[1] and John J. Adamczyk[2], [1]Dow AgroSciences, Omaha, AR, [2]USDA-ARS-Thad Cochran Southern Hort. Lab, Poplarville, MS

2:00 0873 P-IE Networking/Buisness Session Overview, Awards and Committee Reports. **Gary D. Thompson**, gdthompson@dow.com, Dow AgroSciences, Omaha, AR

3:15 Learning Session - Entomology Connecting to the Future

3:20 0874 An academic perspective on the state of entomology in academia and what it takes to excel today and survive in the future. **Rick Roush**, rroush@unimelb.edu.au, Univ. of Melbourne, Melbourne, Australia

3:40 0875 A government perspective on the current state of entomology within governments and what it takes to excel today and survive in the future. **Daniel A. Strickman**, daniel.strickman@ars.usda.gov, USDA Agricultural Research Service, Beltsville, MD

4:00 0876 People, Process, Projects, Politics: The Four "P's" that define the present and future state of applied entomology in the private-sector. **Scott Hutchins**, shhutchins@dow.com, Dow AgroSciences, Indianapolis, IN

4:20 Q&A and Panel Discussion

4:30 Networking and Refreshments: P-IE, Drinks and More!

5:00 Prize Drawing for volunteers and members - Must be present to Win!

5:30 Networking Conclusion

SysEB Section Symposium: SysEB Section Meeting

Ballroom E (Austin Convention Center)

Moderators and Organizers: Christiane Weirauch[1] and Jessica L. Ware[2], [1]Univ. of California, Riverside, CA, [2]Rutgers, The State Univ. of New Jersey, Newark, NJ

1:30 Reception

2:00 Introductory Remarks

2:05 0877 Report from the National Science Foundation.

2:35 Travel Awards

3:15 0878 SysEB Business Meeting. **Christiane Weirauch**, christiane.weirauch@ucr.edu, Univ. of California-Riverside, Riverside, CA

4:15 Break

4:25 Featured Young Professional presentation

4:45 0879 Insect Systematics in the age of phylogenomics - the present state and future perspectives. **Rolf Beutel**, rolf.beutel@uni-jena.de, Institut für Spezielle Zoologie und Evolutionsbiologie, Jena, Germany

5:30 Concluding Remarks

MONDAY, NOVEMBER 11, 2013, EVENING

Student Competition Social Hour with Poster Presenters

Exhibit Hall 4 (Austin Convention Center)
5:30 PM–6:30 PM

MONDAY, NOVEMBER 11, 2013, POSTERS

1- Undergraduate Poster PBT

Exhibit Hall 4 (Austin Convention Center)

D0001 Thermal tolerance of common North American ants (Hymenoptera: Formicidae). **Victoria Young**, victoria.c.young@ttu.edu and Robin Verble-Pearson, Texas Tech, LUBBOCK, TX

D0002 Effects of desiccation and starvation stress on thermal tolerance in the forest ant *Aphaenogaster picea*. **Skyler Resendez**, resendezskyler@yahoo.com[1], Kerri Pinder[2], Andrew Nguyen[2], Joel Parker[1] and Sara Cahan[2], [1]SUNY Plattsburgh, Plattsburgh, NY, [2]Univ. of Vermont, Burlington, VT

D0003 Do modified atmospheres used in commodity packaging alter the efficacy of irradiation as a phytosanitary treatment? **Sabrina White**, sabrinawhite@ufl.edu[1], Giancarlo Lopez-Martinez[2], Woodward Bailey[3] and Daniel A. Hahn[2], [1]Univ. of Florida, Winter Garden, FL, [2]Univ. of Florida, Gainesville, FL, [3]USDA, Animal Plant Health Inspection Service, Miami, FL

D0004 Reproductive quality of honey bee (*Apis mellifera*) drones in East Texas. **Michael Wong**, miwong@sas.upenn.edu and Juliana Rangel-Posada, Texas A&M Univ., College Station, TX

D0005 Identifying the function of yeast extract (*Saccharomyces cereviceae*) in modify Cassava (Mocav) production to increase the value of cassava (*Manihot utilissima)* flour. **Devi Puspasafitri**, devipuspasafitri@ymail.com, himalogin, jogjakarta, Indonesia

D0006 Determining the lethal concentration of toluene on *Drosophila melanogaster* and the resulting morphological effects of toluene exposure on fly offspring. **Gina Duong**, gduong@stthom.edu, Zoe Knippa, Heather Skeen-Esterheld, Cecilia Dao, Luke Hebert, Katie Fisher, Maria Ton, Elmer Ledesma and Rosemarie Rosell, Univ. of St. Thomas, Houston, TX

D0007 Stage mortality rates of *Lucilia sericata* (Diptera: Calliphoridae). **Carmen Mostek**, carmenmostek@gmail.com, Amanda Fujikawa and Leon G. Higley, Univ. of Nebraska, Lincoln, NE

D0008 Preliminary data on the efficiency of a trap for continuously collecting sarcosaprophagous flies. **James R. Willett**, jrw023@SHSU.EDU, Natalie K. Lindgren, Michelle L. Lewis and Sibyl, R. Bucheli, Sam Houston State Univ., Huntsville, TX

D0009 Infection of *Manduca sexta* with both host-specific and non-host specific pathogens. **Tanya Josek**, tanyajosek@gmail.com[1], Marianne Alleyne[1], Leellen Solter[2] and Gwyn L. Puckett[3], [1]Univ. of Illinois, Urbana, IL, [2]Illinois Natural History Survey/Univ. of Illinois, Champaign, IL, [3]Univ. of Illinois, Champaign, IL

D0010 Abundance changes and habitat preference of *Aedes aegypti* and *Aedes albopictus* relative to proximity to the Gulf of Mexico. **Samantha Champion**, srchamp23@yahoo.com, Univ. of Texas, Pan American, Edinburg, TX

D0011 The effects of fire on *Acacia* tree (*Acacia drepanolobium)* mutualisms in the laikipia ecosystem. **Todd Palmer** and Todd M. Palmer, Univ. of Florida, Gainesville, FL

2- Undergraduate Poster P-IE

Exhibit Hall 4 (Austin Convention Center)

D0012 Floral resource use by the non-native cavity-nesting bee, *Osmia taurus,* in Morristown National Historical Park, New Jersey. **Karen Wang**, karenwangxd@gmail.com, Caroline M. DeVan and Daniel E. Bunker, New Jersey Institute of Technology, Newark, NJ

D0013 The identification of *Andrena crataegi* as the apple bee in Georgia. **Catherine Schlueter**, catherine.schlueter@yahoo.com[1], Nicholas G. Stewart[2] and Mark A. Schlueter[2], [1]Univ. of North Georgia, Lawrenceville, GA, [2]Georgia Gwinnett College, Lawrenceville, GA

D0014 Diversity and abundance of native bees in orchards are significantly impacted by the timing of the apple bloom. **Nicholas G. Stewart**, nstewart@ggc.edu and Mark A. Schlueter, Georgia Gwinnett College, Lawrenceville, GA

D0015 Native bee pollination behaviors and pollen load measurements. **Tatiana Rodriguez**, trodrigue@ggc.edu, Matthew Coger, Sterling Brown, Nicholas G. Stewart and Mark A. Schlueter, Georgia Gwinnett College, Lawrenceville, GA

D0016 Pollination of the rare desert orchid *Spiranthes infernalis*. **Francis Tapia**, fjricardo@live.com[1], Raymond Vanwey[1], David A. Tanner[1] and James P. Pitts[2], [1]Univ. of North Texas, Dallas, TX, [2]Utah State Univ., Logan, UT

D0017 Histology of ecology: How do caterpillars of *Theroa zethus* (Notodontidae) circumvent host defenses? **Madalyn Van Valkenburg**, mvanvalkenburg1@cub.uca.edu and David E. Dussourd, Univ. of Central Arkansas, Conway, AR

D0018 Bark beetle attraction to semiochemical baits. **Polly Harding**, pollyharding@ufl.edu and Jiri Hulcr, Univ. of Florida, Gainesville, FL

D0019 Effect of *Rhamnus cathartica* (European Buckthorn) invasion on the diversity and abundance of ground dwelling insects in northeast Iowa forests. **Marissa Schuh**, schuma08@luther.edu and Kirk Larsen, Luther College, Decorah, IA

D0020 Impact of prescribed fire on plant and insect communities in a roadside prairie planting. **Austin Bauer**, baueau01@luther.edu and Kirk Larsen, Luther College, Decorah, IA

D0021 Evaluation for crawler vigor of the *Rhizaspidiotus donacis* "arundo scale", a biological control agent of *Arundo donax,* an invasive weed of the Rio Grande Basin. **Joshua Villarreal**, javillarreala@broncs.utpa.edu[1], John A. Goolsby[2], Kenneth R. Summy[1], Alex E. Racelis[1], Don Thomas[3], Adalberto Perez de Leon[4], Ann Vacek[3] and Crystal Salinas[3], [1]Univ. of Texas, Pan American, Edinburg, TX, [2]USDA, Agricultural Research Service, Edinburg, TX, [3]USDA Agricultural Research Service, Edinburg, TX, [4]USDA, Agricultural Research Service, Kerrville, TX

D0022 The effects of farmscaping on trophic interactions in a cucurbit agroecoystem. **Sarah K. Barney**, barney8792@gmail.com, Jason M. Schmidt, Mark A. Williams and James D. Harwood, Univ. of Kentucky, Lexington, KY

3- Undergraduate Poster P-IE/PBT

Exhibit Hall 4 (Austin Convention Center)

D0023 Intraguild predation within an aphidophagous community: Interactions between Chrysopidae and Coccinellidae and their potential for biological control. **Rebecca L. Wente**, rlwe224@g.uky.edu, Katelyn A. Kowles, Jason M. Schmidt and James D. Harwood, Univ. of Kentucky, Lexington, KY

D0024 Variation in efficiency and genetic composition of stink bug parasitoids ovipositing in three insect-hosts on three host-plants. **Pablo Lopez**, pabs.rg78@gmail.com[1], Antonino Cusumano[2] and Raul Medina[1], [1]Texas A&M Univ., College Station, TX, [2]Universita degli Studi di Palermo, Palermo, Italy

D0025 Activity of entomopathogenic fungi against fall armyworm, *Spodoptera frugiperda*: comparison of conidia produced on artificial media and insect hosts. Celso Morales-Reyes, Jose Rodriguez-Contreras, **Fernando Sanchez-Pedraza**, fer_5516g1@hotmail.com, Oscar E. Rosales-Escobar, Agustin Hernandez-Juarez, Moises Felipe-Victoriano and Sergio R. Sanchez-Peña, Universidad Autonoma Agraria Antonio Narro, Saltillo, Mexico

D0026 What fraction of phytophagous insects drops off foliage after application of entomopathogenic fungi? Observations on *Metarhizium brunneum* against the potato psyllid, *Bactericera cockerelli*. **Moises Felipe-Victoriano**, tauro.250499@gmail.com, Livier Guizar-Guzman, Oscar E. Rosales-Escobar and Sergio R. Sanchez-Peña, Universidad Autonoma Agraria Antonio Narro, Saltillo, Mexico

D0027 Psyllid (*Bactericera cockerelli)* nymphal densities and its effects on psyllid fitness. **Devin Beach**, debeach@tamu.edu, Texas A&M Univ., College Station, TX and Dylan Froman, Texas A&M Univ., college station, TX

D0028 Oral delivery of dsRNA to potato psyllid (*Bactericera cockerelli*) via sachet. **Ricardo Estupinian**, restupinian@patriots.uttyler.edu, Daymon Hail and Blake R. Bextine, Univ. of Texas, Tyler, TX

D0029 The effects of soil texture and moisture on the infection of *Galleria mellonella* L. by entomopathogenic nematodes *(Heterorhabditis bacteriophora).* **Suzanne Yocom**, suzyocom@gmail.com and John R. Wallace, Millersville Univ., Millersville, PA

D0030 Variation in volatile emissions of *Arabidopsis thaliana* in response to damage produced by insects with different feeding behaviors. **Caitlin Vore**, cmvrk6@mail.missouri.edu, Chung-Ho Lin, Jack Schultz and Heidi Appel, Univ. of Missouri, Columbia, MO

D0031 *Wolbachia* infection in the horn fly *Haematobia irritans* . **Victoria Moore**, qxx07a@acu.edu and Qiang Xu, Abilene Christian Univ., Abilene, TX

D0032 Selective treatment of Formosan subterranean termite (Isoptera: Rhinotermitidae) colonies in a highly urbanized area in New Orleans, Louisiana. **Eric Guidry**, Carrie Cottone and Claudia Riegel, City of New Orleans Mosquito, Termite, and Rodent Control Board, New Orleans, LA

4- Undergraduate Poster SysEB

Exhibit Hall 4 (Austin Convention Center)

D0033 The effect of iron on the defensive mutualism of *Spiroplasma* bacteria and *Drosophila* flies. **Lauryn Winter**, alexawinter@tamu.edu, Caitlyn Winter, Jialei Xie and Mariana Mateos, Texas A&M Univ., College Station, TX

D0034 The diet of *Cercobrachys winnebago* (Ephemeroptera: Caenidae) in two western Oklahoma sandy bottom streams. **Amber Rymer**, rymera@student.swosu.edu and Peter Grant, Southwestern Oklahoma State Univ., Weatherford, OK

D0035 Evolution of ABC transporters in herbivorous drosophilids. **Allan Castillo**, castillo@email.arizona.edu, Univ. of Arizona, Tucson, AZ

D0036 A new species group of *Opius* Wesmael, with comments on *Apodesmia* Foerster (Hymenoptera: Braconidae: Opiinae). **Danielle Restuccia**, dmr816@neo.tamu.edu and Robert Wharton, Texas A&M Univ., College Station, TX

D0037 Rapid spread of the defensive endosymbiont *Spiroplasma* in *Drosophila hydei* subjected to high parasitoid wasp pressure. **Caitlyn Winter**, alyssawinter@tamu.edu, Jialei Xie, Lauryn Winter and Mariana Mateos, Texas A&M Univ., College Station, TX

D0038 The evolution of wing patterning genes in aposematic and mimetic tiger moths (Lepidoptera: Erebidae: Arctiinae). **Kasey Chelemedos**, kasey.chelemedos@my.und.edu, Heidi Connahs and Rebecca B. Simmons, Univ. of North Dakota, Grand Forks, ND

D0039 Genetic diversity of the ant genus *Aphaenogaster* Mayr in the Southeastern United States. **Clinton E. Trammel**, cetrammel@uark.edu, Amber D. Tripodi and Allen L. Szalanski, Univ. of Arkansas, Fayetteville, AR

D0040 "Why so many colors?" Color variation in the cane root borer *Diaprepes abbreviatus* in Puerto Rico. **Luis Marrero-Ramos**, luiso.ramos@live.com, Inter American Univ. of Puerto Rico, Bayamon, PR, Bert Rivera-Marchand, Univ. of Puerto Rico, San Juan, PR, PR and Stephen L. Lapointe, USDA, Agricultural Research Service, Fort Pierce, FL

D0041 Effects of riparian zone rehabilitation and stream channel modification on the macroinvertebrate community assemblage of Big Spring Run in Lancaster County, PA. **Alex M. Rittle**, amrittle@millersville.edu and John R. Wallace, Millersville Univ., Millersville, PA

D0042 A survey of the wolf spiders (Aranae: Lycosidae) of the Sam D. Hamilton Noxubee National Wildlife Refuge. **Breanna Lyle**, bl334@msstate.edu and John Guyton, Mississippi State Univ., Mississippi State, MS

D0043 Hill prairie butterflies of Allamakee County, Iowa: A comparison of the late 1980s to 2013. **Nicole Powers**, poweni01@luther.edu, Sharon Heyer and Kirk Larsen, Luther College, Decorah, IA

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Exhibit Hall 4 (Austin Convention Center)

D0044 Effects of sodium pentobarbital on insect growth rate and cattle decomposition. **Heather Hankins**, hphankins1@buffs.wtamu.edu, Bonnie B. Pendleton, Marty Rhoades and Lance Baker, West Texas A&M Univ., Canyon, TX

D0045 Effects of concealment of porcine remains on colonization by necrophilous insects. **Jonathan A. Cammack**, jacammac@ncsu.edu, Allen C. Cohen, K. Lane Kreitlow, R. Michael Roe and D. Wes Watson, North Carolina State Univ., Raleigh, NC

D0046 Interaction of filth flies, plants and human pathogens: a dangerous synergy. **Rebecca C. Pace**, rebecca.pace@okstate.edu, Justin L. Talley and Astri Wayadande, Oklahoma State Univ., Stillwater, OK

D0047 Anoxia tolerance of Diptera: Calliphoridae Maggots. **Melissa Lein**, mlein28@huskers.unl.edu, Leon G. Higley and Amanda Fujikawa, Univ. of Nebraska, Lincoln, NE

D0048 Survivorship and Behavior of Termites in Various Moisture Regimes. **John Zukowski**, jzukows2@ufl.edu, Univ. Florida, Davie, FL and Nan-Yao Su, Univ. of Florida, Davie, FL

D0049 Histological changes in the Formosan subterranean termite (Isoptera: Rhinotermitidae) induced by the chitin synthesis inhibitor noviflumuron. **Lin Xing**, lxing@ufl.edu, Thomas Chouvenc and Nan-Yao Su, Univ. of Florida, Davie, FL

D0050 Spread of slow acting bait toxicants and its effect on molting termites across linear foraging distance for *Coptotermes formosanus* (Isoptera: Rhinotermitidae). **Garima Kakkar**, garimaiari@ufl.edu, Thomas Chouvenc, R. Giblin-Davis and Nan-Yao Su, Univ. of Florida, Davie, FL

D0051 Bed bug (*Cimex lectularius*) attraction to residual human-host scents extracted in various solvents. **Corey M. McQueen**, mcqu0116@umn.edu, Univ. of Minnesota, St. Paul, MN

D0052 Impacts of bed bug (*Cimex lectularius* L.) training for pest management professionals in New Orleans, LA. **Molly L. Stedfast**, msted14@vt.edu[1], Dini M. Miller[1], Tim C. McCoy[1] and Claudia Riegel[2], [1]Virginia Tech, Blacksburg, VA, [2]City of New Orleans Mosquito, Termite, and Rodent Control Board, New Orleans, LA

6- Graduate Poster MUVE

Exhibit Hall 4 (Austin Convention Center)

D0053 Fitness cost of phosphine resistance determined by measurement of developmental rates of phosphine-resistant and susceptible populations of *Rhyzopertha dominica* and *Tribolium castaneum*. **Nisha Bajracharya**, nisha.shakya10@okstate.edu, George P. Opit, Justin Talley and Carol L. Jones, Oklahoma State Univ., Stillwater, OK

D0054 Aquaporins in the Malpighian tubules are essential for water transport in the Yellow Fever mosquito, *Aedes aegypti*. **Lisa L. Drake**, drlisa@nmsu.edu, Stacy D. Rodriguez and Immo A. Hansen, New Mexico State Univ., Las Cruces, NM

D0055 Evaluation of La Crosse virus infection on host-seeking activity of mosquito *Aedes triseriatus* and *Aedes albopictus*. **Fan Yang**, yangfan@vt.edu, Carlyle C. Brewster and Sally Paulson, Virginia Tech, Blacksburg, VA

D0056 Effects of larval habitat density and ITN/LLIN use on the spatial distribution of malaria vectors. **Robert S. McCann**, mccannr3@msu.edu[1], Joseph P. Messina[1], David W. MacFarlane[1], M. Nabie Bayoh[2], John M. Vulule[3], John E. Gimnig[4] and Edward D. Walker[1], [1]Michigan State Univ., East Lansing, MI, [2]Centers for Disease Control and Prevention/Kenya Medical Research Institute, Kisumu, Kenya, [3]Kenya Medical Research Institute, Kisumu, Kenya, [4]Centers for Disease Control and Prevention, Atlanta, GA

D0057 Genetic variation in the sensitivity of Anopheles gambiae to DEET. **James Ricci**, jricc001@ucr.edu and Bradley White, Univ. of California, Riverside, CA

D0058 Interspecific mating between *Aedes aegypti* and *Aedes albopictus* and its contribution to population declines of *Aedes aegypti*. **María Cristina Carrasquilla**, mccarrasquilla@ufl.edu and L. Philip Lounibos, Univ. of Florida, Vero Beach, FL

D0059 The influence of forest fragmentation on vector community ecology: Preliminary results and potential implications for La Crosse encephalitis virus. **M. Camille Harris**, camille.harris@vt.edu, Sally Paulson and Dana Hawley, Virginia Tech, Blacksburg, VA

D0060 Population genetic analyses of chewing lice parasitizing pocket gophers. **Caitlin Nessner**, ness87c@tamu.edu and Jessica E. Light, Texas A&M Univ., College Station, TX

D0061 Proliferation and excretion of *Bartonella quintana* in body and head lice following oral challenge. **Ju Hyeon Kim**, biomyst5@snu.ac.kr[1], Domenic J. Previte[2], Kyong Sup Yoon[2], John M. Clark[2] and Si Hyeock Lee[1], [1]Seoul National Univ., Seoul, South Korea, [2]Univ. of Massachusetts, Amherst, MA

D0062 Identifying ivermectin titer levels in bovine serum and its affect on tick development in the cattle tick, *Rhipicephalus microplus*. **Roxett Platas**, rjplatas@broncs.utpa.edu and Christopher Vitek, Univ. of Texas, Pan American, Edinburg, TX

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Exhibit Hall 4 (Austin Convention Center)

D0063 Ecdysis Triggering Hormone (ETH) plays a role in the regulation of juvenile hormone synthesis in the mosquito *Aedes aegypti*. **Maria Areiza**, mareiza@gmail.com, Marcela Nouzova, Crisalejandra Rivera-Perez and Fernando Noriega, Florida International Univ., Miami, FL

D0064 Gap junctions in the yellow fever mosquito, *Aedes aegypti*. **Travis Calkins**, calkins.21@osu.edu and Peter Piermarini, The Ohio State Univ., Wooster, OH

D0065 Permethrin induction of multiple cytochrome P450 genes in insecticide resistant mosquitoes, *Culex quinquefasciatus*. **Youhui Gong**, yzg0016@auburn.edu and Nannan Liu, Auburn Univ., Auburn, AL

D0066 Specific signal pathway inhibition via oral dosage disrupts fecundity and fertility in *Aedes aegypti*. **Melissa Mattee**, mmattee@uga.edu, Mark R. Brown and Michael R. Strand, Univ. of Georgia, Athens, GA

D0067 RNA-seq comparison of larval and adult malpighian tubules of *Aedes aegypt,* the yellow fever mosquito. **David P. Price**, dave.p.price@gmail.com[1], Peter Piermarini[2], Lisa L. Drake[1], Stacy D. Rodriguez[1], Hannah Drumm[1], Sarah E. Aguirre[1] and Immo A. Hansen[1], [1]New Mexico State Univ., Las Cruces, NM, [2]The Ohio State Univ., Wooster, OH

D0068 A whole transcriptomal linkage analysis of gene co-regulation in insecticide resistant house flies, *Musca domestica*. **Ming Li**, mzl0025@auburn.edu, William R. Reid and Nannan Liu, Auburn Univ., Auburn, AL

D0069 The role of thermo-transient receptor potential channels in thermal acclimation in the red flour beetle, *Tribolium castaneum*. **Hong Geun Kim**, hgkim@ksu.edu, David C. Margolies and Yoonseong Park, Kansas State Univ., Manhattan, KS

D0070 Analysis of the role of α-arylphorin in the *Heliothis virescens* midgut response to Cry1Ac toxin from *Bacillus thuringiensis*. **Jerreme J. Jackson**, jjacks56@utk.edu, Univ. of Tennessee, Knoxville, TN, Omaththage P. Perera, USDA Agricultural Research Service, Stoneville, MS and Juan L. Jurat-Fuentes, Univ. of Tennessee, Knoxville, Knoxville, TN

D0071 Electrophysiological response of the olfactory sensilla to human odorants in the common bed bug, *Cimex lectularius*. **Feng Liu**, fzl0009@auburn.edu and Nannan Liu, Auburn Univ., Auburn, AL

D0072 Identification of putative circadian and phototransduction orthologs in the western predatory mite (*Metaseiulus occidentalis*). **Alden Estep**, alden.estep@yahoo.com, Univ. of Florida, Middleburg, FL and Marjorie A. Hoy, Univ. of Florida, Gainesville, FL

D0073 Community based project on 'living the silent spring' in Logba, Ghana. **Akua Konadu Antwi-Agyakwa**, Kwame Nkrumah Univ. of Science and Technology, Kumasi, Ghana, Jakpasu Afun, Ho Polytechnic, Ho, Ghana and Richard Adu-acheampong, Cocoa Research Institute of Ghana, Akim-Tafo, Ghana

8- Graduate Poster PBT

Exhibit Hall 4 (Austin Convention Center)

D0074 Honey bee behavioral responses to xenobiotics. **Ling-Hsiu Liao**, liao19@illinois.edu, Catherine Dana and May R. Berenbaum, Univ. of Illinois, Urbana, IL

D0075 A Spider Toxin X enhances toxicity to insects by expression as a fusion protein with a plant lectin X. **Sheng Yang**, sheng.yang@durham.ac.uk, Durham Univ., Durham, United Kingdom

D0076 Efficacy of propylene oxide against eggs of four key California-based stored-product insect pests. **Sandipa G. Gautam**, sandipa.gautam@okstate.edu[1], George P. Opit[1], Steve Tebbets[2] and Spenser Walse[2], [1]Oklahoma State Univ., Stillwater, OK, [2]USDA Agricultural Research Service, Parlier, CA

D0077 Effects of infection by bacteriophages APSE-2 and APSE-3 on the pea aphid (*Acyrthosiphon pisum*) bacterial symbiont *Hamiltonella defensa*. **Jayce W. Brandt**, jayce@uga.edu, Michael R. Strand and Kerry M. Oliver, Univ. of Georgia, Athens, GA

D0078 Consequences of polydnavirus infection on circulating trehalose in the soybean looper, *Pseudoplusia includens*. **Drew Sutliff**, dsutl1@uga.edu and Michael R. Strand, Univ. of Georgia, Athens, GA

D0079 Effects of entomopathogenic fungi on the brown marmorated stink bug (*Halyomorpha halys*). **Thomas Pike**, tpike@umd.edu and Paula M. Shrewsbury, Univ. of Maryland, College Park, MD

D0080 An initial investigation of the potential association between bacterial symbiosis and insecticide resistance in *Blissus insularis* (Hemiptera: Blissidae). **Yao Xu**, bigantbrl@hotmail.com, Eileen A. Buss and Drion G. Boucias, Univ. of Florida, Gainesville, FL

D0081 Effects of environmental temperature on pre-flight and flight activities in pheromone-stimulated male *Helicoverpa zea*. **Jose Crespo**, jose.crespo@utah.edu, Franz Goller and Neil J Vickers, Univ. of Utah, Salt Lake City, UT

D0082 The effect of temperature on *Drosophila suzukii* developmental parameters. **Samantha L. Tochen**, tochens@hort.oregonstate.edu and Vaughn Walton, Oregon State Univ., Corvallis, OR

D0084 Baseline susceptibility of soybean aphid (*Aphis glycines* Matsumura) to thiamethoxam in the north central region of the United States. **Matheus Ribeiro**, matheusgpmr@gmail.com[1], Blair Siegfried[1] and Thomas Hunt[2], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska, Concord, NE

D0085 Toxicity of the gas methyl isothiocyanate, MITC, as a fumigant for stored product arthropods. **Michael J. Aikins**, mja8338@k-state.edu, Ozgur Saglam and Thomas Phillips, Kansas State Univ., Manhattan, KS

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Exhibit Hall 4 (Austin Convention Center)

D0086 A battle for control in a host-parasitoid system? **Melissa A. Bernardo**, mbernardo@wesleyan.edu and Michael S. Singer, Wesleyan Univ., Middletown, CT

D0087 Biological and ecological consequences of *Diolcogaster* sp. (Hymenoptera: Braconidae) parasitizing *Agaraea minuta* (Lepidoptera: Arctiidae) and the effects on two *Costus* (Costaceae) plant species in Brazil. **Wagner Tavares**, wagnermaias@yahoo.com.br[1], Geraldo Salgado-Neto[2], Jesusa C. Legaspi[3], Francisco Ramalho[4], José Eduardo Serrão[1] and José Zanuncio[5], [1]Universidade Federal de Viçosa, Viçosa, Brazil, [2]Universidade Federal de Santa Maria, Santa Maria, Brazil, [3]United States Dept. of Agriculture-Agricultural Research Service, CMAVE, Center for Biological Control, Florida A&M Univ., Tallahassee, FL, [4]Empresa Brasileira de Pesquisa Agropecuária, Campina Grande, Brazil, [5]Federal Univ. of Viçosa, Viçosa, Brazil

D0088 Effect of *Zelus longipes* againts *Diaphorina citri* and its parasitoid *Tamarixia radiata* under controlled conditions. **Jose Bernardo Navarrete**, bernardonavarrete@hotmail.com[1], Heather J. McAuslane[2] and Jorge E. Peña[1], [1]Univ. of Florida, Homestead, FL, [2]Univ. of Florida, Gainesville, FL

D0089 Integrating biological control into management decisions for whitefly in cotton. **Timothy Vandervoet**, tvandervoet@email.arizona.edu[1], Peter C. Ellsworth[1] and Steven Naranjo[2], [1]Univ. of Arizona, Tucson, AZ, [2]USDA Agricultural Research Service, Maricopa, AZ

D0090 Native parasitoids recovered from *Fraxinus* species in the southern United States: Potential for biological control of emerald ash borer. **Nicholas Hooie**, nhooie@utk.edu[1], Gregory J. Wiggins[1], Paris L. Lambdin[1], Jonathan Lelito[2] and Jerome F. Grant[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Pennsylvania State Univ., Univ. Park, PA

D0091 Potential overwintering refuge sites for kudzu bugs (Hemiptera: Plataspidae) and parasitoids. . **Sriyanka Lahiri**, slahiri@ncsu.edu, David Orr, Clyde Sorenson, Allen C. Cohen and Yasmin Cardoza, North Carolina State Univ., Raleigh, NC

D0092 Susceptibility of Western Corn Rootworm (*Diabrotica virgifera virgifera*, LeConte, Coleoptera: Chrysomelidae) Populations Collected in Nebraska to Bt Corn Events. **David S. Wangila**, sindanidavid@yahoo.com and Lance J. Meinke, Univ. of Nebraska, Lincoln, NE

D0093 Effect of food deprivation period on the development and reproduction of *R. pedestris* (Hemiptera: Alydidae), and its egg parasitism. **Eunmok Kim**, llll7160@gmail.com, Andong National Univ., Andong-si, South Korea and Un Taek Lim, Andong National Univ., Andong, South Korea

D0094 Plum curculio voltinism and damage in western North Carolina. **Amanda J. Bakken**, ajbakken@ncsu.edu[1], Mark R. Abney[1]

and James F. Walgenbach[2], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Fletcher, NC

D0095 Suitability of blue ash (*Fraxinus quadrangulata*) and green ash (*F. pennsylvanica*) to emerald ash borer (*Agrilus planipennis*) and the larval parasitoid *Tetrastichus planipennisi* . **Donnie Peterson**, peter207@purdue.edu, Purdue Univ., West Lafayette, IN

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Exhibit Hall 4 (Austin Convention Center)

D0096 The effect of Polynate™ on the foraging behavior of honey bees (*Apis mellifera*) and other important pollinators in apple, blueberry and cherry. **Julie Adams**, adamsju6@gmail.com[1], Larry Gut[2], Rufus Isaacs[2] and Fred Dyer[2], [1]Michigan State Univ., Okemos, MI, [2]Michigan State Univ., East Lansing, MI

D0097 Insect pollinators of *Piper glabrescens* and *P. umbellatum* in the Rio Abajo Forest Preserve, Puerto Rico. **Christa Wisniewski**, cfwisniewski@yahoo.com and Diane Wood, Southeast Missouri State Univ., Cape Girardeau, MO

D0098 Agricultural development changes native bee community composition in Central Texas peach orchards. **Sarah Cusser**, sarah.cusser@gmail.com and Shalene Jha, Univ. of Texas, Austin, TX

D0099 Honey bee foraging in a Midwestern agroecosystem. **Douglas B. Sponsler**, sponsler.18@osu.edu, The Ohio State Univ., Wooster, OH, Chia-Hua Lin, The Ohio State Univ., Columbus, OH and Reed Johnson, The Ohio State Univ. – OARDC, Wooster, OH

D0100 Survey of wild pollinators in flowering plants in the Corn Belt. **Morgan Lucke**, mlucke@purdue.edu and Christian Krupke, Purdue Univ., West Lafayette, IN

D0101 What is limiting the abundance and richness of wild bees on a reclaimed mine land: Floral resources or nest sites? **Chia-Hua Lin**, lin.724@buckeyemail.osu.edu, The Ohio State Univ., Columbus, OH and Karen Goodell, The Ohio State Univ., Newark, OH

D0102 Size does matter: Larger patches of diverse floral resources increase insect pollinator density, diversity, and their pollination of native wildflowers. **Brett R. Blaauw**, blaauw@aesop.rutgers.edu, Rutgers, The State Univ. of New Jersey, Bridgeton, NJ and Rufus Isaacs, Michigan State Univ., East Lansing, MI

D0103 Is UV just another color to a bee? Nectar guide preferences of stingless bees. **Amber D. Tripodi**, atripodi@uark.edu and Allen L. Szalanski, Univ. of Arkansas, Fayetteville, AR

D0104 Within-nest distribution of *Mondontomerus* spp. (Hymenoptera: Torymidae): Impact on *osmia cornifrons* (Hymenoptera: Megachilidae) propagation for pollination. **Matthew I McKinney**, mm.entomology@gmail.com and Yong-Lak Park, West Virginia Univ., Morgantown, WV

D0105 Ufo's in alfalfa (*Medicago sativa)*: Unveiling the pollinators. **Amelia Jordan**, amelia.jordan@wsu.edu, Washington State Univ., Pullman, WA and Doug Walsh, Washington State Univ., Prosser, WA

11- Graduate Posters P-IE

Exhibit Hall 4 (Austin Convention Center)

D0106 The effects of acylsugars of the wild tomato *Solanum pennellii* on the oviposition behavior of western flower thrips (*Frankliniella occidentalis*) and tobacco thrips (*Frankliniella fusca*). **Damon A. D'Ambrosio**, dadambro@ncsu.edu[1], Martha A. Mutschler[2], James F. Walgenbach[3] and George G. Kennedy[1], [1]North Carolina State Univ., Raleigh, NC, [2]Cornell Univ., Ithaca, NY, [3]North Carolina State Univ., Fletcher, NC

D0107 Presentation withdrawn.

D0108 Plasticity of secreted saliva in two polyphagous Lepidoptera insects and its effect on plant defense responses. **Flor E. Acevedo**, fea5007@psu.edu, Pennsylvania State Univ., Univ. park, PA and Gary Felton, Pennsylvania State Univ., Univ. Park, PA

D0109 Nutritional immunology of a specialist herbivore: Food plant quality mediated effects on the immune system of *Manduca sexta* (Lepidotera: Sphingidae). **Michael Garvey**, garveym@purdue.edu and Ian Kaplan, Purdue Univ., West Lafayette, IN

D0110 Damage assessment of the *Liriomyza huidobrensis* (Blanchard) (Diptera: Agromyzidae) to potato varieties. **Rameswor Maharjan**, mrameswor@gmail.com and Chuleui Jung, Andong National Univ., Andong, South Korea

D0111 Stink bug species composition, seasonal abundance, varietal preference, and feeding injury in Virginia raspberry. **Sanjay Basnet**, sanjayvt@vt.edu, Douglas G. Pfeiffer, Thomas P. Kuhar and Curt A. Laub, Virginia Tech, Blacksburg, VA

D0112 Colorado potato beetles manipulate induced defenses in several *Solanum* hosts. **Seung Chung**, szc154@psu.edu, Cristina Rosa, Kelli Hoover, Dawn Luthe and Gary Felton, Pennsylvania State Univ., Univ. Park, PA

D0113 Intraspecific competition in the southern pine sawyer, *Monochamus titillator* (Fabricius): Effects of oviposition density and phloem thickness. **Ryan Rastok**, rastok@uark.edu and F. M. Stephen, Univ. of Arkansas, Fayetteville, AR

D0114 Overwintering ability of the emerald ash borer (*Agrilus planipennis*): Host effects, microhabitat, and other factors. **Lindsey DE. Christianson**, chri1203@umn.edu, Univ. of Minnesota, St. Paul, MN and Robert Venette, U.S. Forest Service, St. Paul, MN

D0115 Entomological and physiological factors predisposing beech to infection by *Neonectria ditissima* and *N. faginata* in beech bark disease aftermath forests. **Jonathan Cale**, Jacale@syr.edu[1], Justin West[1], Stephen Teale[1], John Castello[1] and Mariann Johnston[2], [1]SUNY-ESF, Syracuse, NY, [2]SUNY-ESF, Wanakena, NY

12- Graduate Posters P-IE

Exhibit Hall 4 (Austin Convention Center)

D0116 Effects of local landscapes on thrips populations and iris yellow spot virus incidence in onion. **Bonnie Bunn**, bonnie.bunn@usu.edu, Utah State Univ., Logan, UT

D0117 Effect of pollen movement on survival and development of corn earworm in seed blended conditions of non-Bt and pyramided Bt corn. **Fei Yang**, fyang@agcenter.lsu.edu[1], David L. Kerns[2], B. Rogers Leonard[1], Graham P. Head[3], Ying Niu[1], Ronnie Levy[4] and Fangneng Huang[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Louisiana State Univ., Winnsboro, LA, [3]Monsanto LLC, Saint Louis, MO, [4]Louisiana State Univ., Alexandria, LA

D0118 Presentation withdrawn.

D0119 Long-term landscape dynamics of an agricultural pest (*Aphis glycines*) at multiple spatial scales. **Kaitlin Rienzo-Stack**, rienzostack@wisc.edu, Claudio Gratton and Timothy D. Meehan, Univ. of Wisconsin, Madison, WI

D0120 Prediction of change in the occurrence of *Chilo suppressalis* (Lepidoptera: Pyralidae) in paddy fields in the context of new climate change scenario. **Hyoseok Lee**, blueorange23@snu.ac.kr[1], Chae-Hoon Paik[2] and Joon-Ho Lee[1], [1]Seoul National Univ., Seoul, South Korea, [2]National Institute of Crop Science, Rural Development Administration, Suwon, South Korea

D0121 Niche-partitioning and community composition of ants in Oklahoma grasslands. **Allison Giguere**, allison.giguere@okstate.edu and Carmen M. Greenwood, Oklahoma State Univ., Stillwater, OK

D0122 Poleward range expansion of jumping plant lice (Psyllidae) in Alaska. **Ashley Asmus**, ashley.asmus@gmail.com, Univ. of Texas, Arlington, TX

D0123 Dispersal and flight of the stored grain pests *Cryptolestes ferrugineus* and *Sitophilus oryzae* in non-storage landscapes. **Stephen Mychal Losey**, entomology@k-state.edu, Kansas State Univ., Manhattan, KS

D0124 Biology of the red flour beetle, *Tribolium castaneum* (Herbst), development on various rice fractions. **Brook Hale**, brookahale@smail.astate.edu and Tanja Mckay, Arkansas State Univ., State Univ., AR

D0125 Possible role for *Melothria pendula* (creeping cucumber) in the epidemiology of whitefly-transmitted *Squash vein yellowing virus*. **Deepak Shrestha**, dshrestha@ufl.edu[1], Susan Webb[1] and Scott Adkins[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA Agricultural Research Service, Fort Pierce, FL

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Exhibit Hall 4 (Austin Convention Center)

D0126 Efficacy of oil-based formulations of *Metarhizium anisopliae* and *Beauveria bassiana* against *Tibraca limbativentris* in flooded rice. **Gabriel Mascarin**, gmmascar@gmail.com[1], Eliane Quintela[1], Rodrigo da Silva[2] and José Barrigossi[1], [1]Embrapa Rice and Beans, Santo Antonio de Goias, Brazil, [2]Instituto Federal de Educação, Ciência e Tecnologia de Brasília, Brasilia, Brazil

D0127 Sublethal effects of selected insecticides on *Halyomorpha halys* (Hemiptera: Pentatomidae) feeding. **Theresa M. Cira**, cirax002@umn.edu, Eric C. Burkness and William D. Hutchison, Univ. of Minnesota, St. Paul, MN

D0129 Evaluating neonicotinoid insecticides for systemic control of brown marmorated stink bug (*Halyomorpha halys*) in fruiting vegetables. **John D. Aigner**, daigner@vt.edu and Thomas P. Kuhar, Virginia Tech, Blacksburg, VA

D0130 Sanitation measures to control walnut twig beetle (*Pityophthorus juglandis*) emergence from felled black walnut logs. **Rachael Sitz**, rachael.fithian@colostate.edu, Emily Luna, Ned Tisserat and Whitney Cranshaw, Colorado State Univ., Fort Collins, CO

D0131 Olfactory response of southern green stink bug and redbanded stink bug (Hemiptera: Pentatomidae) to spinosad. **Kukuh Hernowo**, KHernowo@agcenter.lsu.edu and Jeffrey A. Davis, Louisiana State Univ., Baton Rouge, LA

D0132 Spatial variability of tarnished plant bugs (Lygus lineolaris (Palisot de Beauvois)) in late season cotton in the midsouth. **Erin Kelly**, ekelly@astate.edu[1], Tina G. Teague[2] and Keith Morris[1], [1]Arkansas State Univ., State Univ., AR, [2]Arkansas State Univ., Jonesboro, AR

D0133 Impact of corn earworm on yields of grain sorghum. **Chris Dobbins**, cdobbins@drec.msstate.edu[1], Jeffrey Gore[1], Don Cook[1], Angus Catchot[2] and Fred Musser[2], [1]Mississippi State Univ., Stoneville, MS, [2]Mississippi State Univ., Mississippi State, MS

D0134 Impact of simulated corn earworm kernel damage on field corn yield. **Bryan Olivi**, bmo32@msstate.edu[1], Donald Cook[1], Fred Musser[2], Jeff Gore[3], Angus Catchot[2], Wilks Wood[4] and Chris Dobbins[1], [1]Mississippi State Univ., Stoneville, MS, [2]Mississippi State Univ., Mississippi State, MS, [3]Mississippi State Univ., Stoneville, MS, MS, [4]Mississippi State Univ., Cleveland, MS

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Exhibit Hall 4 (Austin Convention Center)

D0135 Identification and manipulation of natural enemies of key arthropod pests in Oklahoma vineyards. **Shane McMurry**, shane.mcmurry@okstate.edu and Eric J. Rebek, Oklahoma State Univ., Stillwater, OK

D0136 Predator communities associated with buckwheat companion plantings in Virginia. **Christopher R. Philips**, crp@vt.edu[1], Thomas P. Kuhar[1] and D. Ames Herbert[2], [1]Virginia Tech, Blacksburg, VA, [2]Virginia Tech, Suffolk, VA

D0137 Investigation of reduced agent and area treatments for soybean aphid management and its effects on key predators. **Jenny Freed**, jenny.freed@huskers.unl.edu, Univ. of Nebraska, Lincoln, NE

D0138 Aphids use unreliable cues to optimize their response to a reliable cue and avoid being incidentally eaten. **Matan Ben-Ari**, matbenari@gmail.com[1], Stav Talal[2] and Moshe Inbar[1], [1]Univ. of Haifa, Haifa, Israel, [2]Univ. of Haifa, Oranim, Tiv'on, Israel

D0139 Presence of *Bactericera cockerelli* facilitates aphid survival on tomato. **Sasha Kay**, skay@tamu.edu and Cecilia Tamborindeguy, Texas A&M Univ., College Station, TX

D0140 Asynchrony between host plant susceptibility and peak flight activity of the swede midge, *Contarinia nasturtii*, may reduce feeding damage in organic cole crop production. **Braden Evans**, bevans02@uoguelph.ca[1], Katerina Jordan[1], Michael Brownbridge[2] and Rebecca Hallett[1], [1]Univ. of Guelph, Guelph, ON, Canada, [2]Vineland Research and Innovation Centre, Vineland Station, ON, Canada

D0141 Development of a biopolymer-based Tier-1 assay for effects of plant-incorporated protectants (PIPs) on leaf-consuming shredders in aquatic systems. **Ryan Gott**, ryan.c.gott@gmail.com, William O. Lamp and Qin Wang, Univ. of Maryland, College Park, MD

D0142 Interference competition between *Frankliniella occidentalis* (Pergande) and *Frankliniella intonsa* (Trybom): Feeding assay. **Mohammad Bhuyain**, mosharofhstu77@gmail.com and Un Taek Lim, Andong National Univ., Andong, South Korea

D0143 Inheritance of Cry1F resistance in fall armyworm (*Spodoptera frugiperda*). **Vikash Dangal**, vikash2043@gmail.com[1], Fei Yang[1], Ying Niu[1], Jawwad A. Qureshi[2], Robert L. Meagher[3] and Fangneng Huang[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Univ. Florida, Immokalee, FL, [3]USDA, Agricultural Research Service, Gainesville, FL

15- Graduate Poster P-IE

Exhibit Hall 4 (Austin Convention Center)

D0144 Identification of potential spring hosts of redbanded stink bug (*Piezodorus guildinii* westwood) in Louisiana. **Anup Bastola**, bastola.anup@gmail.com and Jeffrey A. Davis, Louisiana State Univ., Baton Rouge, LA

D0145 Drought stress in soybean: Impacts on soybean aphid populations (*Aphis glycines* Matsumura) and *Soybean mosaic virus* infection. **Christopher Culkin**, culkc01@ipfw.edu, Vamsi Nalam and Punya Nachappa, Indiana Univ.-Purdue Univ., Fort Wayne, IN

D0146 Presentation withdrawn.

D0147 Potential lethal effects of fungicides on eggs and larvae of Popillia japonica (Coleoptera: Scarabaeidae). **Glen R. Obear**, obear@wisc.edu, Robert Chris Williamson and Patrick J. Liesch, Univ. of Wisconsin, Madison, WI

D0148 The impact of insect-microbe interactions on the biological control of *Sirex noctilio* (Hymenoptera: Siricidae) and their reaction to climate change. **Fazila Yousuf**, fazila_yousuf@hotmail.com[1], Geoff Gurr[1], Angus Carnegie[2] and Richard Bashford[3], [1]Charles Sturt Univ., Orange, Australia, [2]Forest Health & Resource Assessment, Industry & Investment NSW, Sydney, Australia, [3]Forestry Tasmania, Hobart, Tasmania, Australia

D0149 Collaborative approach to management of hemlock woolly adelgid: Strategies and outcomes. **Abdul Hakeem**, ahakeem@utk.edu[1], Jerome F. Grant[2], Gregory J. Wiggins[2], Paris L. Lambdin[2], Frank A. Hale[3] and Rusty Rhea[4], [1]Texas A&M Univ., Lubbock, TX, [2]Univ. of Tennessee, Knoxville, TN, [3]Univ. of Tennessee, Nashville, TN, [4]USDA - Forest Service, Asheville, NC

D0150 Tree defenses against bark beetles decline with increasing elevation. **Scott Ferrenberg**, scott.ferrenberg@colorado.edu[1], Joseph Langenhan[2] and Jeffry Mitton[1], [1]Univ. of Colorado, Boulder, CO, [2]Seattle Univ., Seattle, WA

D0151 Spatial ecology, phenology, and dispersal of the threatened barrens buck moth, *Hemileuca maia* (Drury), in a fragmented pine-oak barren . **Georgia R. Keene**, grkeene@syr.edu[1], Dylan Parry[1], H. Brian Underwood[1] and Neil Gifford[2], [1]State Univ. of New York, Environmental Science and Forestry, Syracuse, NY, [2]Albany Pine Bush Preserve, Albany, NY

D0152 The impact of rotational hog grazing on non-targets in apple orchards. **Krista Buehrer**, buehrerk@msu.edu and Matthew Grieshop, Michigan State Univ., East Lansing, MI

16- Graduate Posters P-IE

Exhibit Hall 4 (Austin Convention Center)

D0153 Combining host plant resistance and insecticide applications to control stink bugs in soybean. **Miyanda N. Moonga**, MMoonga@agcenter.lsu.edu, Jeffrey A. Davis and Arthur R. Richter, Louisiana State Univ., Baton Rouge, LA

D0154 Susceptibility of Cry1F-susceptible and -resistant fall armyworm to transgenic corn plants containing single or pyramided Bt genes. **Ying Niu**, yniu@agcenter.lsu.edu[1], Robert L. Meagher[2], Fei Yang[1], Vikash Dangal[3] and Fangneng Huang[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]USDA, Agricultural Research Service, Gainesville, FL, [3]Louisiana State Univ. Agricultural Center, Baton Rouge, LA

D0155 Tomato seed priming, its long lasting resistance against insect, *Helicoverpa zea* and associated tradeoffs. **Sulav Paudel**, sup215@psu.edu, Pennsylvania State Univ., State College, PA

D0156 Physiological and behavioral dose-responses of the lesser chestnut weevil, *Curculio sayi*, to host plant volatile organic compounds. **Andrew Fill**, af6v4@mail.missouri.edu and Bruce A. Barrett, Univ. of Missouri, Columbia, MO

D0157 Alpha-thujone prevents apple infestation by codling moth neonates, a study using comparative planar chromatography. **Cory Creed**, corycreed@gmail.com, Ariel Mollhagen, Noelle P. Mollhagen and Maciej A. Pszczolkowski, Missouri State Univ., Mountain Grove, MO

D0158 Cis-Jasmone and lipopolysaccharides (LPS) mediate direct and indirect defense in corn. **Joseph Disi**, jod0003@tigermail.auburn.edu, Simon Zebelo, Esther Ngumbi and Henry Fadamiro, Auburn Univ., Auburn, AL

D0159 The role of insect carcasses in mediating soil microbial community function and composition in a heathland ecosystem. **Madeline Raudenbush**, raudenbush@wisc.edu[1], David Hoekman[2], Randall Jackson[1] and Claudio Gratton[1], [1]Univ. of Wisconsin, Madison, WI, [2]Univ. of Colorado, Boulder, CO

D0160 Trapped in a Prism: Effects of trap color on ambrosia beetle (Coleoptera: Curculionidae: Scolytinae) capture. **Chris Werle**, chris.werle@ars.usda.gov[1], Alicia Bray[2], Jason Oliver[2], Blair Sampson[3], Chris Ranger[4], Peter B. Schultz[5], Michael Reding[4] and Jeff Kuehny[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Tennessee State Univ., McMinnville, TN, [3]USDA, Agricultural Research Service, Poplarville, MS, [4]USDA Agricultural Research Service, Wooster, OH, [5]Virginia Tech, Virginia Beach, VA

D0161 Dectes stem-borer, *Dectes texanus* LeConte, in Nebraska soybeans. **Zach Rystrom**, zrystro@hotmail.com and Robert Wright, Univ. of Nebraska, Lincoln, NE

17- Graduate Posters P-IE

Exhibit Hall 4 (Austin Convention Center)

D0162 A survey of billbugs (*Sphenophorus* spp.) in turf to improve management in the intermountain west. **Madeleine Dupuy**, mmdupuy@aggiemail.usu.edu, Lori R. Spears and Ricardo A. Ramirez, Utah State Univ., Logan, UT

D0163 Land usage around vineyards and its effect on spotted wing drosophila populations and varietal preference testing in Virginia grape growing regions. **Meredith Shrader**, mcassell@vt.edu and Douglas G. Pfeiffer, Virginia Tech, Blacksburg, VA

D0164 Monitoring activity and sampling of potato psyllid, *Bactericera cockerelli* (Hemiptera: Triozidae), adults in potato fields in the Lower Rio Grande Valley of Texas. **J. Thinakaran**, thinakarjeni31@neo.tamu.edu and D. Henne, Texas A&M Univ., Weslaco, TX

D0165 Brown marmornated stink bug diel sampling variance in peaches. **John Cambridge**, john.cambridge000@gmail.com and George C. Hamilton, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

D0166 Distribution of virulent soybean aphid (*Aphis glycines*) biotypes in WI. **Michael S. Crossley**, mcrossley3@gmail.com and David B. Hogg, Univ. of Wisconsin, Madison, WI

D0167 Field trials on biocontrol of *Spodoptera frugiperda* in corn, with *Nomuraea rileyi* and *Metarhizium brunneum*, at arid

and tropical locations of Mexico. **Oscar E. Rosales-Escobar**, ESCOBARLALO@hotmail.com[1], Antonio Teran-Vargas[2], Livier Guizar-Guzman[1], Moises Felipe-Victoriano[1], Paulina Vega-Aquino[3] and Sergio R. Sanchez-Peña[1], [1]Universidad Autonoma Agraria Antonio Narro, Saltillo, Mexico, [2]INIFAP, Cuauhtemoc, Mexico, [3]Dupont Pioneer, Los Mochis, Mexico

D0168 Ground-dwelling arthropod assemblages across a vegetation gradient occupied by Northern Bobwhite Quail (Colinus virginianus) in the Oklahoma Panhandle. **Shane Foye**, sfoye@okstate.edu, Kenneth E. Masloski and Carmen Greenwood, Oklahoma State Univ., Stillwater, OK

D0169 Association between the palamedes swallowtail (*Papilio palamedes*) and orange-fringed orchid (*Platanthera ciliaris*) on the northern Gulf Coast: Potential consequences of laurel wilt disease. **Adam Chupp**, adam.chupp@gmail.com, Sedonia Sipes and Loretta Battaglia, Southern Illinois Univ., Carbondale, IL

18- Graduate Poster SysEB

Exhibit Hall 4 (Austin Convention Center)

D0170 A comparison of reversal-learning abilities and sucrose response thresholds between scout and recruit honey bee (*Apis mellifera*) foragers. **Morgan Carr-Markell**, carrmar2@illinois.edu and Gene E. Robinson, Univ. of Illinois, Urbana, IL

D0171 The behavioral response of the red imported fire ant *Solenopsis invicta* to cuticular hydrocarbons and lipids on inanimate objects. **Jason R. Carbaugh**, jcarbaugh@tamu.edu[1], Robert Renthal[2] and S. Bradleigh Vinson[1], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Texas, San Antonio, TX

D0172 From “scared to death” to “peace of mind”: The functionality of soldiers. **Li Tian**, litian617@uky.edu, Kenneth F. Haynes and Xuguo Zhou, Univ. of Kentucky, Lexington, KY

D0173 Egg laying and colony growth in incipient colonies of the red imported fire ant (*Solenopsis invicta*). **Hester Dingle**, hester.dingle@knights.ucf.edu and Joshua King, Univ. of Central Florida, Orlando, FL

D0174 Development of the adult abdominal defensive gland in *Atheta* coriaria Kraatz: A key innovation for ecological and biological success (Coleoptera: Staphylinidae: Aleocharinae). Steve Davis and **K. Taro Eldredge**, taroeldredge@ku.edu, Univ. of Kansas, Lawrence, KS

D0175 Gut content analysis of Corylophidae: An analysis of biology to inform phylogeny. **James Murphy**, jtmurph@uga.edu, Univ. of Georgia, Athens, GA

D0176 Hunger-dependent and sex-specific antipredator behavior of *Aedes triseriatus*. **Jillian Wormington**, jillianwormington@gmail.com, Illinois State Univ., Bloomington, IL and S.A. Juliano, Illinois State Univ., Normal, IL

D0177 It isn’t easy being yellow: Analysis of yellow coloration in *Perdita* (Hymenoptera: Apoidea: Andrenidae). **Zach Portman**, zportman@gmail.com, Utah State Univ., Logan, UT

D0178 Investigating the role of pheromones in mediating social behavior in bumble bees (*Bombus impatiens*). **Mario Padilla**, mjp419@psu.edu[1], Etya Amsalem[1], Abraham Hefetz[2] and Christina M. Grozinger[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Tel Aviv Univ., Tel Aviv, Israel

D0179 Entomophagy in the highlands and littoral parts of Madagascar. **Maminirina Randrianandrasana**, mrandri2@uiuc.edu and May R. Berenbaum, Univ. of Illinois, Urbana, IL

D0180 Experimental evolution of parasitoid performance on two aphid hosts. **Emily Mohl**, mohlx006@umn.edu and George Heimpel, Univ. of Minnesota, St. Paul, MN

D0760 Avoidance of sticky mud by ants—predator-free space? **Casey Rowley**, rowleyc1@msu.edu and James R. Miller, Michigan State Univ., East Lansing, MI

19- Graduate Poster SysEB

Exhibit Hall 4 (Austin Convention Center)

D0181 Conservation of ash diversity: Effects of wide-scale insecticide application on genetic structure, recruitment, and regeneration of ash in forests invaded by emerald ash borer. **Erin O’Brien**, obrien.501@osu.edu and Daniel A. Herms, The Ohio State Univ., OARDC, Wooster, OH

D0182 Protecting American pine forests: Are unknown pathogens hiding in Asia? **Craig Bateman**, batemanc@gmail.com and Jiri Hulcr, Univ. of Florida, Gainesville, FL

D0183 Survey of the Curculionidae at White Rock Nature Preserve, Monroe County, Illinois, with notes on habitat associations. Korey Byers and **Diane Wood**, dwood@semo.edu, Southeast Missouri State Univ., Cape Girardeau, MO

D0184 We came, we collected, we started a genomic collection! Greater applications for the results of a 2012 BioBlitz by the UCF Terrestrial Invertebrate Team. **Derek A. Woller**, asilid@gmail.com, Ricardo Mariño-Pérez, Shiala Morales and Hojun Song, Univ. of Central Florida, Orlando, FL

D0185 Statistical biodiversity: Analyses of carrion-feeding insects as a function of local weather and stage of decomposition. **Michelle L. Lewis**, mlewis@SHSU.EDU, Natalie K. Lindgren and Sibyl, R. Bucheli, Sam Houston State Univ., Huntsville, TX

D0186 The impact of the invasive fire ant, *Solenopsis invicta*, on dung beetle community composition and ecosystem services. **Christen Steele**, steele@knights.ucf.edu[1], Elizabeth Boughton[2] and Joshua R. King[1], [1]Univ. of Central Florida, Orlando, FL, [2]Archbold Biological Station, Lake Placid, FL

D0187 Response of Chironomidae communities to land use in an urban stream. **Jessica Miller**, mill0769@umn.edu, Univ. of Minnesota, St Paul, MN

D0188 Entomopathogenic fungi associated to leaf-cutting ants from Argentina. Daniela Goffré, Jorge Marfetán and **PJ. Folgarait**, Universidad Nacional de Quilmes, Bernal, Buenos Aires, Argentina

D0189 Presentation withdrawn.

D0190 Distribution of the *Metarhizium anisopliae* species complex in Mexico: Analysis of Chihuahuan desert, subtropical, and Mesoamerican isolates. **Livier Guizar-Guzman**, liviergg_11@yahoo.com.mx[1], Israel Padilla-Guerrero[2], Richard Humber[3], Sergio R. Sanchez-Peña[1] and Michael Bidochka[2], [1]Universidad Autonoma Agraria Antonio Narro, Saltillo, Mexico, [2]Brock Univ., St. Catharines, ON, Canada, [3]USDA Agricultural Research Service, Ithaca, NY

D0191 Habitat utilization by bumble bees (*Bombus* spp.) in Denton County, Texas. **Jessica Beckham**, jessicabeckham@my.unt.edu[1], Sam Atkinson[1], James Kennedy[2] and Armin Mikler[1], [1]Univ. of North Texas, Denton, TX, [2]Universidad de Magallanes, Punta Arenas, Chile

20- Graduate Poster SysEB

Exhibit Hall 4 (Austin Convention Center)

D0192 Ant parasitoids in the *Orasema coloradensis* species group and the problem of host relationships. **Austin Baker**, bakerau73@gmail.com, Univ. of California, Riverside, CA

D0193 A phylogenetic analysis of beetles belonging to the *Trechus ovipennis* group (Coleoptera: Carabidae). **Lisa Bhattacharyya**, lbhattacharyya@calacademy.org and David H. Kavanaugh, California Academy of Sciences, San Francisco, CA

D0194 Phylogenetic analysis of New World Tillinae (Coleoptera: Cleridae) based on morphological characters. **Alan Burke**, burkea@ksu.edu and Gregory Zolnerowich, Kansas State Univ., Manhattan, KS

D0195 The phylogeny of *Temnothorax* Mayr: A global perspective. **Matthew Prebus**, mmprebus@ucdavis.edu, Univ. of California, Davis, CA

D0196 Morphometric comparisons of citrus rust mite (*Phyllocoptrulla oleivora)* populations in Texas and Kenya. **Steven Michael Reyna**, Steven.reyna09@gmail.com[1], Mamoudou Setamou[1] and Sunday Ekesi[2], [1]Texas A&M Univ., Weslaco, TX, [2]International Centre of Insect Physiology and Ecology, Nairobi, Kenya

D0197 Updating the phylogeny of *Rhagoletis*: Relationships of the North American species groups. **Daniel Hulbert**, hulbertd@msu.edu and James J. Smith, Michigan State Univ., East Lansing, MI

D0198 Revision of *Xanthomicrogaster* Cameron 1911 (Hymenoptera: Braconidae), a rare Neotropical genus. **Andrew Debevec**, debevec2@illinois.edu and James Whitfield, Univ. of Illinois, Urbana, IL

D0199 Head, shoulders, knees and toes: Morphological study of the Schizopterid (Heteroptera: Schizopteridae) head and thorax. **Stephanie Leon**, Sleon002@ucr.edu, Rochelle Hoey-Chamberlain and Christiane Weirauch, Univ. of California, Riverside, CA

D0200 Taxonomic revision and phylogenetic analysis of *Paranota* Monrós & Viana, 1949 (Coleoptera, Chrysomelidae, Cassidinae) . **Marianna V. P. Simões**, marianna_simoes1@ku.edu, Univ. of Kansas, Lawrence, KS

D0201 A preliminary look at the phylogeography of the monotypic cave beetle genus *Darlingtonea* (Coleoptera: Carabidae). **Olivia Boyd**, boydolivia@gmail.com and T. Keith Philips, Western Kentucky Univ., Bowling Green, KY

D0202 A review of the Geometrinae (Lepidoptera: Geometridae) of the Caribbean with descriptions of new species and new distribution records. **David M. Plotkin**, dmp215@msstate.edu, Mississippi State Univ., Mississippi State, MS

D0203 Molecular differentiation of *Bathyplectes anurus* and *Bathyplectes curculionis*, parasitoids of alfalfa weevil (*Hypera postica*) in Virginia. **Lisa M. Moore**, lmmoore@vt.edu, Igor V. Sharakhov, Carlyle C. Brewster and Loke T. Kok, Virginia Tech, Blacksburg, VA

Student Virtual Poster Competition: Undergraduate Students

Meeting Room 11 AB (Austin Convention Center)

VP13 The effect of mephedrone upon the development of *Calliphora vomitoria*. **Rebecca Stock**, becajstock@yahoo.co.uk, Univ. of Lincoln, Lincoln, United Kingdom

VP14 Expression, purification and structural analysis of immunosuppressant protein, CrV1 of *Cotesia rubecula* (CrPDV) polydnavirus. **Lihua Wei**, weilihua8888@163.com, Instituto Politécnico Nacional. Centro de Biotecnología Genómica, reynosa, Mexico

Student Virtual Poster Competition: Graduate Students

Meeting Room 11 AB (Austin Convention Center)

VP16 Susceptibility of the German cockroach, *Blattella germanica* to entomopathogenic fungi using two different methods. **Alejandra Gutierrez**, gutialeja@gmail.com[1], Juan García[1], Raul Alzogaray[2], Maria Urrutia[3] and Claudia López Lastra[1], [1]Centro de Estudios Parasitológico y de Vectores (Conicet-UNLP), La Plata, Argentina, [2]Centro de Investigaciones de Plagas e Insecticidas (CIPEIN-UNIDEF/CONICET), Buenos Aires, Argentina, [3]Centro Superior para el Procesamiento de la Información (CeSPi). Universidad Nacional de La Plata., La Plata, Argentina

TUESDAY, NOVEMBER 12, 2013, MORNING

Program Symposium: Broadening your Impact: eClosing the Gap between Researchers and the Public

Ballroom G (Austin Convention Center)

Moderators and Organizers: Christina A. Silliman[1], Catherine Dana[1], Brendan Morris[2] and Julie Allen[2], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Illinois, Champaign, IL

8:00 Welcoming Remarks

8:03 0880 Broadening our political impact: Experiences of a scientist in public policy. **Camille Parmesan**, camille.parmesan@plymouth.ac.uk, Plymouth University, Devon, United Kingdom

8:23 Discussion and Questions

8:27 0881 Naturalist outreach program: Teaching scientific outreach and spreading the ethos of scientific engagement beyond the university. **Linda Rayor**, LSR1@cornell.edu, Cornell Univ., Ithaca, NY

8:47 Discussion and Questions

8:51 0882 Amplify the signal: Graduate education in science communication and outreach. **Katy Heath**, kheath@illinois.edu, Univ. of Illinois at Urbana-Champaign, Urbana, IL and Elizabeth Bagley, Univ. of Illinois at Urbana-Champaign, Champaign, IL

9:11 Discussion and Questions

9:15 0883 Sharing science with diverse audiences (or how I became a cartoon character). **Corrie Moreau**, cmoreau@fieldmuseum.org, Field Museum of Natural History, Chicago, IL

9:35 Discussion and Questions

9:39 Break

9:52 0884 CalBug and Notes from Nature: Metamorphosis of entomology collection legacy data enabled by citizen science. **Kipling Will**, kipwill@berkeley.edu[1], Rosemary Gillespie[2], Peter T. Oboyski[2], Joan E. Ball[3], Joyce Gross[2], Robert Guralnick[4], Chris Snyder[5], Afron Smith[5] and Stuart Lynn[5], [1]Univ. of California, Berkeley, CA, [2]Univ. of California - Berkeley, Berkeley, CA, [3]Univ. of California, Oakland, CA, [4]Univ. of Colorado - Boulder, Boulder, CO, [5]Adler Planetarium, Chicago, IL

10:12 Discussion and Questions

10:16 0885 Project Noah: Integrating a citizen component into your research program. **Yasser Ansari**, yasser@projectnoah.org, Networked Organisms, LLC, New York City, NY

10:36 Discussion and Questions

10:40 0886 Using art to enhance your science. **Hayley Gillespie**, hayley@artsciencegallery.com, Art. Science. Gallery, Austin, TX

11:00 Discussion and Questions

11:04 0887 Entomoart: The power of esthetically communicating entomology. **Barrett Anthony Klein**, barrett@pupating.org, Univ. of Wisconsin - La Crosse, La Crosse, WI

11:24 Discussion and Questions

11:28 Concluding Remarks

MUVE Section Symposium: Cellular, Molecular and Microbiological Interactions within Hematophagous Arthropods

Meeting Room 18 B (Austin Convention Center)

Moderators and Organizers: Dana Nayduch[1] and Brian Weiss[2], [1]USDA, Agricultural Research Service, Manhattan, KS, [2]Yale Univ., New Haven, CT

8:00 0888 Introductory remarks: Cellular, Molecular and Microbiological Interactions within Hematophagous Arthropods. **Dana Nayduch**, dana.nayduch@ars.usda.gov, USDA, Agricultural Research Service, Manhattan, KS

8:05 0889 Insights into the mechanisms of mosquito late-phase immunity that limit *Plasmodium* oocyst survival. **Ryan Smith**, rcsmith@jhsph.edu, Johns Hopkins Univ. Bloomberg School of Public Health, Baltimore, MD

8:25 0890 The significance of a mosquito hyper-variable pattern recognition receptor in the anti-*Plasmodium* defense. **Yuemei Dong**, ydong@jhsph.edu, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

8:45 0891 Bioinformatic analysis of transcriptome data sets to identify putative biting fly innate immune response genes. **Pia Untalan Olafson**, Pia.Olafson@ars.usda.gov, USDA, Agricultural Research Service, Kerrville, TX

9:05 0892 Microbiome-mediated immune mechanisms in the gut of the tsetse fly. **Brian Weiss**, brian.weiss@yale.edu, Yale Univ., New Haven, CT

9:25 Break

9:35 0893 Investigating the microbiome of the Rocky Mountain Wood tick (*Dermacentor andersoni*): Impact on fitness and vector competence. **Glen A. Scoles**, scoles@vetmed.wsu.edu, USDA - ARS, Pullman, WA

9:55 0894 Analysis of tick responses to pathogen infection. **Kelly Brayton**, kbrayton@vetmed.wsu.edu, Washington State Univ., Pullman, WA

10:15 0895 Microbial ecology of *Culicoides sonorensis*. **Ludek Zurek**, lzurek@ksu.edu, Kansas State Univ., Manhattan, KS

10:35 0896 Comparative transcriptomics of *Culicoides sonorensis* adult female biting midges: Insights into hematophagy, reproduction and defense. **Dana Nayduch**, dana.nayduch@ars.usda.gov, USDA, Agricultural Research Service, Manhattan, KS

10:55 Concluding Remarks

PBT Section Symposium: PBT Section Symposium: Small non-coding RNAs – A New Frontier in Insect Science

Meeting Room 15 (Austin Convention Center)

Moderators and Organizers: Alexander S. Raikhel, Univ. of California, Riverside, Riverside, CA

8:00 Introductory Remarks

8:05 0897 The large world of small RNAs. **Fedor Karginov**, fedor.karginov@ucr.edu, Univ. of California Riverside, Riverside, CA

8:40 0898 Small RNAs in insect antiviral defense. **Sara Cherry**, cherrys@mail.med.upenn.edu, Univ. of Pennsylvania School of Medicine, Philadelphia, PA

9:15 0899 Small interfering RNAs and flaviviruses. **Corey L. Campbell**, Corey.Campbell@colostate.edu, Colorado State Univ., Fort Collins, CO

9:40 Break

10:00 0900 MicroRNAs as regulatory factors in host-parasite interactions. **Sassan Asgari**, s.asgari@uq.edu.au, The Univ. of Queensland, St Lucia, Australia

10:25 0901 Characterization of microRNAs involved in regulation of mosquito gonadotrophic cycles. **Keira Lucas**, kneum001@ucr.edu, Univ. of California, Riverside, CA

10:50 0902 MicroRNAs and insect metamorphosis. **Xavier Belles**, xavier.belles@ibe.upf-csic.es, Institute of Evolutionary Biology, Barcelona, Spain

11:15 0903 Small RNAs and phenotypic plasticity in aphids. **Denis Tagu**, denis.tagu@rennes.inra.fr, INRA Rennes, Le Rheu Cedex, France

P-IE Section Symposium: Arthropod Food Webs: A System for Studying Dynamic Responses to Global Change

Meeting Room 14 (Austin Convention Center)

Moderators and Organizers: Ashley Asmus, Univ. of Texas, Arlington, TX

8:00 Welcoming Remarks

8:20 0904 Using arthropod food webs to look at the consequences of declines in global biodiversity. **Chelse Prather**, chelse.prather@gmail.com, Univ. of Houston, Houston, TX

8:40 0905 Under warming, the jack of all trades trumps a master of one: A pest counteracts the benefits of an ant-aphid mutualism. **Shannon Pelini**, spelini@gmail.com, Bowling Green State Univ., Bowling Green, OH

9:00 0906 Longer summers alter the trophic relationships of wolf spiders in the Arctic. **Amanda Koltz**, amanda.koltz@duke.edu and Justin P. Wright, Duke Univ., Durham, NC

9:20 0907 Impacts of nutrient subsidies on a salt marsh food web. **Shannon M. Murphy**, Shannon.M.Murphy@du.edu[1], Gina M. Wimp[2] and Danny Lewis[2], [1]Univ. of Denver, Denver, CO, [2]Georgetown Univ., Washington, DC

9:40 0908 Microclimate and Sonoran Desert food webs. **Karl Wyant**, kawyant@asu.edu and John Sabo, Arizona State Univ., Tempe, AZ

10:00 Break

10:10 0909 Arthropod water stress and urban food webs. **Kevin McCluney**, kevin.e.mccluney@gmail.com and Steven Frank, North Carolina State Univ., Raleigh, NC

10:30 0910 Cross-habitat apparent competition driven by a productivity gradient: A host-parasitoid food web approach. **Carol Frost**, carol.frost@pg.canterbury.ac.nz, Univ. of Canterbury, Christchurch, New Zealand

10:50 0911 Short and long-term effects of resource subsidies on near-shore terrestrial arthropod food webs. **David Hoekman**, davidshoekman@gmail.com, National Ecological Observatory Network, Boulder, CO and Claudio Gratton, Univ. of Wisconsin, Madison, WI

11:10 0912 Seasonal patterns of trophic interactions in an arctic river. **Michael Kendrick**, kendrickmr@gmail.com and Alex Huryn, Univ. of Alabama, Tuscaloosa, AL

11:30 0913 Predators, evolution, nighttime and other things we ignore in climate change experiments–ideas for moving forward. **Brandon Barton**, btbarton@wisc.edu, Univ. of Wisconsin, Madison, WI

P-IE Section Symposium: Biofuel Cropping Systems: Connecting Beneficial Arthropods, Ecosystem Services, and Landscape Effects

Meeting Room 19 A (Austin Convention Center)

Moderators and Organizers: Ashley Bennett[1] and Julie A. Peterson[2], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Minnesota, St. Paul, MN

8:00 Welcoming Remarks

8:05 0914 How contrasting bioenergy scenarios affect pollinators and the potential for pollination services. **Ashley Bennett**, abb@msu.edu[1], Timmothy D. Meehan[2], Claudio Gratton[2] and Rufus Isaacs[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Wisconsin, Madison, WI

8:25 0915 Landscape-level implications of biofuel crop production for pollinators. **Kristen Baum**, kristen.baum@okstate.edu and Shaun McCoshum, Oklahoma State Univ., Stillwater, OK

8:45 0916 Designing farm landscapes to enhance ecosystem services. **James O. Eckberg**, jeckberg@umn.edu, David Mulla, Julie A. Peterson, Donald Wyse, George Heimpel and Gregg A. Johnson, Univ. of Minnesota, St. Paul, MN

9:05 0917 The role of flowering biofuel crops for conservation of beneficial species in the farmscape. **Jonathan Lundgren**, Jonathan.Lundgren@ars.usda.gov, USDA Agricultural Research Service, Brookings, SD and Kristine Nemec, UDSA, Brookings, SD

9:25 Break

9:40 0918 Pollinators and pollination in changing agricultural landscapes; investigating the impacts of bioenergy crops. **Dara Stanley**, stanleyd@tcd.ie, Trinity College, Dublin, Ireland and Jane Stout, Trinity College Dublin, Dublin, Ireland

10:00 0919 Biological control and resource utilization by natural enemies in integrated perennial bioenergy plantings. **Julie A. Peterson**, petersja@umn.edu, James O. Eckberg, Karen E. Blaedow, Joe M. Kaser, Gregg A. Johnson and George Heimpel, Univ. of Minnesota, St. Paul, MN

10:20 0920 Trophic cascades in bioenergy landscapes. **Tania Kim**, tkim@glbrc.wisc.edu[1], Heidi Liere[1], Benjamin Werling[2], Timothy D. Meehan[1], Doug A. Landis[2] and Claudio Gratton[1], [1]Univ. of Wisconsin, Madison, WI, [2]Michigan State Univ., East Lansing, MI

10:40 0921 Why did the natural enemy cross the road? **Brian McCornack**, mccornac@ksu.edu, Kansas State Univ., Manhattan, KS, James Hagler, USDA - ARS, Maricopa, AZ and Kris Giles, Oklahoma State Univ., Stillwater, OK

11:00 0922 Impacts of landscape-scale conversion to bioenergy crops on microlepidopteran diversity: Biofuels and LBMs. **May R. Berenbaum**, maybe@illinois.edu, Univ. of Illinois, Urbana, IL and Terry Harrison, Univ. of Illinois at Urbana-Champaign, Urbana, IL

11:20 Concluding Remarks

P-IE Section Symposium: Interactions between Biological Control of Pests and Other Ecosystem Services

Meeting Room 18 C (Austin Convention Center)

Moderators and Organizers: SD Wratten[1], Doug A. Landis[2] and William E. Snyder[3], [1]Lincoln Univ., Lincoln, New Zealand, [2]Michigan State Univ., East Lansing, MI, [3]Washington State Univ., Pullman, WA

8:00 0923 Ecological engineering for rice pest management: Hierarchical delivery of ecosystem services. **Lu Zhongxian**, luzxmh2004@aliyun.com, Institute of Plant Protection and Microbiology, Zhejiang, China

8:20 0924 Balancing biological control and other ecosystem services in bioenergy landscapes. **Claudio Gratton**, cgratton@wisc.edu and Timmothy D. Meehan, Univ. of Wisconsin, Madison, WI

8:40 0925 Effects of habitat structure, edges, and alternate prey on generalist predators. **Gina M. Wimp**, gmw22@georgetown.edu[1], Shannon M. Murphy[2], Danny Lewis[1] and Leslie Ries[3], [1]Georgetown Univ., Washington, DC, [2]Univ. of Denver, Denver, CO, [3]Univ. of Maryland, College Park, MD

9:00 0926 Native plant hedgerows provide benefits for pollination and pest control in intensively managed agricultural fields in California. **Claire Kremen**, Univ. of California, Berkeley, CA

9:20 0927 Perennial grasslands increase multiple ecosystem services in bioenergy landscapes. **Doug A. Landis**, landisd@msu.edu, Michigan State Univ., East Lansing, MI

9:40 0928 Impacts of predator biodiversity on an insect-vectored plant virus. **Deborah L. Finke**, FinkeD@Missouri.edu, Washington State Univ., Pullman, WA

10:00 0929 Synergies between biocontrol and vertebrate services. **Stephen D. Wratten**, wrattens@lincoln.ac.nz, Lincoln Univ., Christchurch, New Zealand

10:20 0930 Green pest control powered by brown foodwebs. **William E. Snyder**, wesnyder@wsu.edu, Washington State Univ., Pullman, WA

P-IE Section Symposium: Mechanisms of Resistance: From Mechanism to Management, IRAC US Symposium Series: No.9

Ballroom E (Austin Convention Center)

Moderators and Organizers: Graham P. Head[1], Caydee Savinelli[2], Bradley W. Hopkins[3], Natalie Hummel[4], Scott Ludwig[5] and Daniel Vincent[6], [1]Monsanto LLC, Saint Louis, MO, [2]Syngenta Crop Protection, Greensboro, NC, [3]Dow AgroSciences, LLC, Westerville, OH, [4]Bayer CropScience, Research Triangle Park, NC, [5]Nichino America, Inc, Arp, TX, [6]DuPont Crop Protection, Newark, DE

8:00 Welcoming Remarks

8:10 0931 Toxicodynamic consequences of selected target site mutations and implications for resistance management. **Ralf Nauen**, ralf.nauen@bayercropscience.com, Bayer CropScience Aktiengesellschaft, Monheim, Germany

8:30 0932 An overview and analysis of resistance to the spinosyns. **Thomas C. Sparks**, tcsparks@dow.com, Dow AgroSciences LLC, Indianapolis, IN

8:50 0933 The challenge of IRM in *Helicoverpa zea* in North America: Staying ahead of moving molecular targets. **Patricia V. Pietrantonio**, p-pietrantonio@tamu.edu, Texas A&M Univ., College Station, TX

9:10 0934 Applications of new insights on Bacillus thuringiensis toxin mode of action to resistance management. **David G. Heckel**, heckel@ice.mpg.de, Max Planck Institute for Chemical Ecology, Jena, Germany

9:30 0935 Different mechanisms of resistance to Bt crops and what they mean for resistance management. **Graham P. Head**, graham.p.head@monsanto.com, Monsanto LLC, Saint Louis, MO

9:50 Break

10:05 0936 Mechanisms of neonicotinoid resistance in the peach-potato aphid, Myzus persicae. **Martin Williamson**, martin.williamson@rothamsted.ac.uk, Rothamsted Research, Hertfordshire, United Kingdom, Chris Bass, Rothamsted Research, Harpenden, United Kingdom, C. T. Zimmer, Bayer CropScience, Monheim, Germany and Ralf Nauen, Bayer CropScience Aktiengesellschaft, Monheim, Germany

10:25 0937 Colorado potato beetles – Do non-target site mechanisms explain patterns of resistance? **David J. Hawthorne**, djh@umd.edu, Univ. of Maryland, College Park, MD

10:45 0938 Multiple mechanisms of resistance in the common Bed bug (Cimex lectularius L.): Why we must refocus our treatment protocols. **Dini M. Miller**, dinim@vt.edu, Virginia Tech, Blacksburg, VA

11:05 0939 Pyrethroid resistance in the southern house mosquito: Characterization, genetics and fitness. **Jeffrey G. Scott**, jgs5@cornell.edu, Cornell Univ., Ithaca, NY

11:25 0940 Designing resistance management programs that are robust across a range of possible resistance mechanisms. **Rick Roush**, rroush@unimelb.edu.au, Univ. of Melbourne, Melbourne, Australia

11:45 Concluding Remarks

P-IE Section Symposium: Plant Defense and Insect Counter-Defense: An Ongoing Battle

Meeting Room 16 B (Austin Convention Center)

Moderators and Organizers: Joe Louis and Seung Chung, Pennsylvania State Univ., Univ. Park, PA

8:00 Introductory Remarks

8:03 0941 Girdles, acid and spit: Deactivation of host plant defenses by notodontid caterpillars. **David E. Dussourd**, dussourd@uca.edu, Univ. of Central Arkansas, Conway, AR

8:23 0942 Fine-tuning of defenses and counter-chemical defenses in a highly specialized plant-herbivore system. **Sergio Rasmann**, sergio.rasmann@unil.ch, Univ. of Lausanne, Lausanne, Switzerland

8:43 0943 Integrating induced resistance into management programs for pests of US rice. **Michael J. Stout**, mstout@agcenter.lsu.edu, Louisiana State Univ., Baton Rouge, LA

9:03 0944 Inter- and intra-plant volatiles as signals of indirect defense priming. **Ian Kaplan**, ikaplan@purdue.edu, Purdue Univ., West Lafayette, IN

9:23 0945 Lessons from the very hungry caterpillar: Saliva mediates plant defenses. **Gary Felton**, gwf10@psu.edu, Pennsylvania State Univ., Univ. Park, PA

9:43 Break

9:53 0946 The Tug-O-War between plants and pests. **Jyoti Shah**, shah@unt.edu, Univ. of North Texas, Denton, TX

10:13 0947 The role of aphid primary endosymbiont in modulating plant immunity. **Isgouhi Kaloshian**, isgouhi.kaloshian@ucr.edu, Univ. of California, Riverside, CA

10:33 0948 Sieve element occlusion provides resistance in faba bean against the potato aphid. **Karla J. Medina-Ortega**, karlamedina11@gmail.com, Univ. of California, Riverside, Riverside, CA and Gregory P. Walker, Univ. of California - Riverside, Riverside, CA

10:53 0949 Intraplant communication of herbivory in maize: A two-way street? **Dawn S. Luthe**, dsl14@psu.edu, Pennsylvania State Univ., Univ. Park, PA

11:13 0950 Counter-defense in generalist and specialist beetles. **Nicholas Miller**, nmiller4@unl.edu, Univ. of Nebraska, Lincoln, NE

11:33 Concluding Remarks

P-IE Section Symposium: The Effect of Microbes on Insect-Plant Interactions

Ballroom F (Austin Convention Center)

Moderators and Organizers: Allison Hansen[1] and Clare Casteel[2], [1]Yale Univ., West Haven, CT, [2]Boyce Thompson Institute for Plant Research, Ithaca, NY

8:00 Introductory Remarks

8:05 0951 Farming out pharmacology: Symbiont detoxification of phytochemicals. **May R. Berenbaum**, maybe@illinois.edu, Univ. of Illinois, Urbana, IL

8:25 0952 How fungal mutualisms shape plant-insect interactions: Small flies, big patterns. **Patrick Abbot**, patrick.abbot@vanderbilt.edu, Vanderbilt Univ., Nashville, TN

8:45 0953 Flipping a paradigm on its head: Why bark beetles really have fungi. **Diana Six**, diana.six@cfc.umt.edu, Professor, Univ. of Montana, Missoula, MT

9:05 0954 The effects of an intracellular symbiont on plant-whitefly interactions. **Martha S. Hunter**, mhunter@Ag.arizona.edu, Professor, Univ. of Arizona, Tucson, AZ

9:25 0955 Bacteria play go-between in insect-plant interactions. **Einat Zchori Fein**, einat@volcani.agri.gov.il, Faculty, Agricultural Research Organization, Israel, Ramat Yishay, Israel

9:45 0956 Exploring the role of nutritional symbionts in insect host-plant specificity. **Allison Hansen**, allison.hansen@yale.edu, Assistant Professor, Univ. of Illinois, Champaign-Urbana, Urbana, IL

10:05 Break

10:15 0957 How phytoplasma effectors modulate plant development and plant-insect interactions. **Saskia A. Hogenhout**, saskia.hogenhout@bbsrc.ac.uk, Group Leader (PI), The John Innes Centre, Norwich, United Kingdom

10:35 0958 Alteration of host plant phenotypes by vector-borne plant pathogens. **Mark C. Mescher**, mcmescher@psu.edu, Associate Professor, Pennsylvania State Univ., Univ. Park, PA

10:55 0959 Manipulation of plant metabolism by an insect-vectored virus. **Clare Casteel**, clc269@cornell.edu, Post-doctoral Researcher, Cornell Univ., Ithaca, NY

11:15 0960 Herbivores in disguise – The wolf in sheep's clothing? **Gary Felton**, gwf10@psu.edu, Pennsylvania State Univ., Univ. Park, PA

11:35 0961 Aphid-plant-symbiont-virus interactions. **Bryony C. Bonning**, bbonning@iastate.edu, Professor, Iowa State Univ., Ames, IA

11:55 Concluding Remarks

SysEB Section Symposium: Pitfalls, Malaise, and Hoping It All Pans Out: the State of the Art in Field Collecting Methods for Insect Biodiversity Surveys

Meeting Room 6 A (Austin Convention Center)

Moderators and Organizers: Jason Mottern[1] and Michael Forthman[2], [1]Univ. of California-Riverside, Riverside, CA, [2]Univ. of California, Riverside, CA

8:00 Welcoming Remarks

8:05 0962 Collecting Chalcidoidea with limited time and space. **Jason Mottern**, jmott002@ucr.edu, Univ. of California, Riverside, Riverside, CA and John M. Heraty, Univ. of California-Riverside, Riverside, CA

8:25 0963 From "shake and bake" to "hang to dry": Reflections on 30 years of leaf litter sampling. **Robert S. Anderson**, randerson@mus-nature.ca, Canadian Museum of Nature, Ottawa, ON, Canada

8:45 0964 Pan, malaise, and pitfall traps: Modified varieties for pollinators and cave invertebrates. **Joshua W. Campbell**, jcampbel@highpoint.edu, High Point Univ., High Point, NC

9:05 0965 What arthropods are in a forest's canopy? Find out by fogging. **Terry Erwin**, ERWINT@si.edu, Smithsonian Institution, Washington, DC

9:25 0966 How to inventory ants: A synthesis of 20 years of comparative trap sampling across Madagascar. **Brian L. Fisher**, bfisher@calacademy.org, California Academy of Sciences, San Francisco, CA

9:45 0967 Presentation withdrawn.

10:05 Break

10:15 0968 Surveillance of insects attracted to man and animals; methods and challenges. **Alec Gerry**, alec.gerry@ucr.edu, Univ. of California, Riverside, Riverside, CA

10:35 0969 Volatile pheromones as a tool to monitor the U.S. federally threatened Valley Elderberry Borer. **Ann M. Ray**, raya6@xavier.edu, Univ. of Illinois - Urbana/Champaign, Urbana, IL, Richard A. Arnold, Entomological Consulting Services, Ltd, Pleasant Hill, CA, Jocelyn G. Millar, Univ. of California, Riverside, CA and Ian Swift, California State Collection of Arthropods, Sacramento, CA

10:55 0970 Collecting leaf litter arthropods in the Ozark Highlands using pitfalls and Berlese extraction. **Michael Skvarla**, MSkvarla36@gmail.com, Univ. of Arkansas, Fayetteville, AR

11:15 0971 Using malaise traps for qualitative and quantitative information. **Michael Irwin**, meirwin@express.cites.uiuc.edu, Univ. of Illinois Urbana-Champaign, Champaign, IL

11:35 0972 Sampling, processing and "revolving residua": Lessons learned from 50 years in the battle for biodiversity. **Lubomir Masner**, Agriculture and Agri-Food Canada, Ottawa, ON, Canada

11:55 Concluding Remarks

Member Symposium: Making Connections Across Disciplines to Combat Alien Invaders

Meeting Room 9 AB (Austin Convention Center)

Moderators and Organizers: Veronica Manrique, Rodrigo Diaz and William Overholt, Univ. of Florida, Fort Pierce, FL

8:00 Introductory Remarks

8:05 0973 Population genetics of invasive *Bemisia tabaci* cryptic species in the US based on microsatellite markers. **Aaron Dickey**, amdickey@ufl.edu[1], Lance S. Osborne[2], Robert G. Shatters[3], Paula M. Hall[2] and Cindy L. McKenzie[4], [1]Univ. of Florida, Fort Pierce, FL, [2]Univ. of Florida, Apopka, FL, [3]USDA-ARS, US Horticultural Research Laboratory, Fort Pierce, FL, [4]USDA - ARS, Fort Pierce, FL

8:25 0974 Behavioral and ecological interactions of the sugarcane borer, *Diatraea saccharalis,* and its parasitoids. **Andrea L. Joyce**, ajoyce2@ucmerced.edu, Sierra Nevada Research Institute, Univ. of California Merced, Merced, CA

8:45 0975 Impact and management of the 'kudzu bug' *Megacopta cribraria* (Hemiptera: Plataspidae), an invasive pest of soybeans in the southeastern United States. **Nicholas J. Seiter**, nseiter@clemson.edu[1], Jeremy K. Greene[1], Francis Reay-Jones[2] and Phillip M. Roberts[3], [1]Clemson Univ., Blackville, SC, [2]Clemson Univ., Florence, SC, [3]Univ. of Georgia, Tifton, GA

9:05 0976 Integration of diverse strategies and disciplines to combat the North American invasion of *Cactoblastis cactorum*. **Stephen Hight**, stephen.hight@ars.usda.gov, USDA-ARS, Tallahassee, FL and James E. Carpenter, USDA-ARS, Tifton, GA

9:25 0977 Integrating insecticides, biological control, genetic resource conservation, and resistance breeding to combat the invasive hemlock woolly adelgid (*Adelges tsugae*). **Robert M. Jetton**, robert_jetton@ncsu.edu, North Carolina State Univ., Raleigh, NC, Albert Mayfield, USDA, Forest Service, Asheville, NC and Scott M. Salom, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

9:45 Break

10:05 0978 Detection of biotic and abiotic resistance upon the arrival of an exotic plant. **Rodrigo Diaz**, rrdg@ufl.edu[1], Catharine M. Mannion[2], Erin Rosskopf[3] and William A. Overholt[1], [1]Univ. of Florida, Fort Pierce, FL, [2]Univ. of Florida, Homestead, FL, [3]USDA-ARS Horticultural Research Laboratory, Fort Pierce, FL

10:25 0979 Understanding physiological interactions among specialist herbivores to inform weed biological control. **Sathyamurthy Raghu**, raghu@uark.edu, Univ. of Arkansas, Stuttgart, AR, Matt Purcell, USDA-ARS, Brisbane, Australia and Bradley Brown, USDA ARS Australian Biological Control Laboratory, Brisbane, Australia

10:45 0980 The role of rescue effects in invasion and biological control: Insights from a model system. **Ruth A. Hufbauer**, ruth.hufbauer@colostate.edu[1], Marianna Szucs[1], Brett Melbourne[2] and Emily Kasyon[1], [1]Colorado State Univ., Fort Collins, CO, [2]Univ. of Colorado, Boulder, CO

11:05 0981 Partnerships in weed biological control: The quest for Old World natural enemies of cogongrass. **William A. Overholt**, billover@ufl.edu, Univ. of Florida, Fort Pierce, FL, James P. Cuda, Univ. of Florida, Gainesville, FL and John Goolsby, USDA, Agricultural Research Service, Edinburg, TX

11:25 0982 Biological control of the invasive weed *Arundo donax* in the Rio Grande Basin: A bi-national cooperative program. **Maricela Martinez-Jimenez**, mmartine@tlaloc.imta.mx, Instituto Mexicano de Tecnología del Agua, Jiutepec, Mexico, John Goolsby, USDA, Agricultural Research Service, Edinburg, TX, Don Thomas, USDA Agricultural Research Service, Edinburg, TX, Adalberto Perez de Leon, USDA, Agricultural Research Service, Kerrville, TX, Alex E. Racelis, Univ. of Texas Pan-American, Edinburg, TX, Kenneth Summy, Pan American Univ., Edinburg, TX, Alan A. Kirk, USDA - ARS, Montpellier, Herault, France, Guy Mercadier, USDA-ARS, European Biological Control Laboratory, Montpellier, France, M. Cristofaro, BBCA, Rome, Italy, John Gaskin, USDA-ARS, Sidney, MT, Matthew Ciomperlik, USDA, APHIS, Plant Protection & Quarantine,, Edinburg, TX, Chenghai Yang, USDA - ARS, Weslaco, TX and Mike Grusak, USDA-ARS, Houston, TX

11:45 Concluding Remarks

Member Symposium: Cole Crops Under Siege: U.S. Invasion by the Painted Bug (*Bagrada hilaris*)

Meeting Room 8 AB (Austin Convention Center)

Moderators and Organizers: Darcy Reed and Thomas M. Perring, Univ. of California, Riverside, CA

8:00 0983 Welcoming remarks. **Darcy Reed**, darcy.reed@ucr.edu, Univ. of California, Riverside, CA

8:08 0984 The life history and seasonal dynamics of *Bagrada hilaris* in New Mexico. Melise Taylor and **C. Scott Bundy**, cbundy@ad.nmsu.edu, New Mexico State Univ., Las Cruces, NM

8:24 0985 Some like it hot: Effects of various constant temperatures on development and reproduction of *Bagrada hilaris*. **Darcy A. Reed**, darcy.reed@ucr.edu and Thomas M. Perring, Univ. of California, Riverside, CA

8:40 0986 Impact of *Bagrada hilaris* feeding damage on cruciferous crops. **John C. Palumbo**, jpalumbo@ag.arizona.edu[1], Darcy A. Reed[2], Ta-i Huang[1] and Thomas M. Perring[2], [1]Univ. of Arizona, Yuma, AZ, [2]Univ. of California, Riverside, CA

8:56 0987 Host preference and plant growth response of commercial crucifers to *Bagrada hilaris* (Burmeister). **Ta-i Huang**, huang@cals.arizona.edu and John C. Palumbo, Univ. of Arizona, Yuma, AZ

9:12 0988 What's for dinner? Host plant switching by *Bagrada hilaris*. **Thomas M. Perring**, thomas.perring@ucr.edu and Darcy A. Reed, Univ. of California, Riverside, CA

9:28 0989 Unanticipated threat to the ornamental plant production industry from the bagrada bug, *Bagrada hilaris* (Burmeister). **James A. Bethke**, jabethke@ucdavis.edu, Univ. of California Cooperative Extension, Riverside, CA

9:44 Break

9:54 0990 Management of bagrada bug in organic vegetables: Results from New Mexico. **Tessa R. Grasswitz**, tgrasswi@nmsu.edu, New Mexico State Univ., Los Lunas, NM

10:10 0991 Insect and plant-produced volatiles as potential attractants for bagrada bugs. **Jocelyn G. Millar**, jocelyn.millar@ucr.edu[1], Satya Chinta[2], J. Steven McElfresh[2], Darcy A. Reed[1] and Thomas M. Perring[1], [1]Univ. of California, Riverside, CA, [2]Univ. of California, Riverside, Riverside, CA

10:26 0992 Prospects for classical biological control of *Bagrada hilaris*. **Walker Jones**, walker.jones@ars.usda.gov, USDA - ARS, Stoneville, MS

10:42 0993 Outreach and organic solutions for an invasive pest, *Bagrada hilaris*. **Surendra K. Dara**, skdara@ucdavis.edu, Univ. of California Cooperative Extension, San Luis Obispo, CA

10:58 0994 Comparative toxicity of selected insecticides against the painted bug, *Bagrada hilaris*. **Nilima Prabhaker**, nilima.castle@ucr.edu, Univ. of California, Riverside, CA and John C. Palumbo, Univ. of Arizona, Yuma, AZ

11:14 0995 Predicting potential distribution of *Bagrada hilaris* in United States using ecological niche modeling. **Monica Papes**, monapapes@gmail.com[1], Iulian Gherghel[1] and Thomas M. Perring[2], [1]Oklahoma State Univ., Stillwater, OK, [2]Univ. of California, Riverside, CA

11:30 Panel Discussion

Member Symposium: Emerging Technologies and New Challenges to Control Livestock Pests

Meeting Room 18 A (Austin Convention Center)

Moderators and Organizers: Adalberto Perez de Leon[1], D. Wes Watson[2], Joel R. Coats[3], Andrew Li[4] and Aaron D. Gross[3], [1]USDA, Agricultural Research Service, Kerrville, TX, [2]North Carolina State Univ., Raleigh, NC, [3]Iowa State Univ., Ames, IA, [4]USDA-ARS Knipling-Bushland U.S. Livestock Insects Research Laboratory, Kerrville, TX

8:00 Introductory Remarks

8:05 0996 Economic impact of ectoparasitism on animal agriculture in Brazil. **Laerte Grisi**, lgrisi@ufrrj.br, Universidade Federal Rural do Rio de Janeiro, Seropédica, Brazil

8:25 0997 Food safety risks from livestock-associated flies. **Astri Wayadande**, a.wayadande@okstate.edu, Oklahoma State Univ., Stillwater, OK

8:45 0998 Ticks in an arid environment: The role of argasid ticks as vectors of disease in Nevada. **Mike Teglas**, mteglas@cabnr.unr.edu, Univ. Nevada, Reno, Reno, NV

9:05 0999 Mining the tick sialome for potential targets to prevent tick attachment. **Shahid Karim**, shahid.karim@usm.edu, The Univ. of Southern Mississippi, Hattiesburg, MS

9:25 1000 G-protein-coupled receptors (GPCRs): A potential biopesticide target. **Aaron Gross**, adgross@iastate.edu[1], Michael J. Kimber[1], Kevin B. Temeyer[2], Robert J. Miller[3], Adalberto A. Perez de Leon[2] and Joel Coats[1], [1]Iowa State Univ., Ames, IA, [2]USDA, Agricultural Research Service, Kerrville, TX, [3]USDA, Agricultural Research Service, Edinburg, TX

9:45 Break

10:00 1001 Neurosensory transcriptomics and new tick control technology. **R. Michael Roe**, michael_roe@ncsu.edu, North Carolina State Univ., Raleigh, NC

10:20 1002 Tick vaccine R&D: Challenges and opportunities. **Robert J. Miller**, robert.miller@ars.usda.gov, USDA, Agricultural Research Service, Edinburg, TX

10:40 1003 Pesticide resistance and potential new chemistries for the control of ticks and biting flies. **Andrew Y. Li**, Andrew.Li@ars.usda.gov, USDA Agricultural Research Service, Kerrville, TX

11:00 1004 Ticks and tick-borne pathogens affecting cattle in China. **Hong Yin**, yinhong@caas.net.cn, Chinese Academy of Agricultural Sciences, Lanzhou, China

11:20 1005 Innovation for cattle ectoparasite control: Opportunities and challenges for animal health companies. **Loïc Le Hir de Fallois**, le_hir_de_fallois_loic@elanco.com, Elanco Animal Health, Greenfield, IN

11:40 Concluding Remarks

Member Symposium: Native Bee Ecology, Evolution And Conservation In The 21st Century

Meeting Room 6 B (Austin Convention Center)

Moderators and Organizers: S. Hollis Woodard[1], Quinn S. McFrederick[1] and Shalene Jha[2], [1]Univ. of Texas at Austin, Austin, TX, [2]Univ. of Texas, Austin, TX

8:00 1006 Historical Bee Species Diversity and Current Plant-Bee Pollination Networks on Plummers Island, Maryland. **Seán Brady**, bradys@si.edu[1], Robert Oppenheimer[2], David Erickson[1], Carlos Garcia-Robledo[1], Sam Droege[3], John Kress[4] and John T. Lill[2], [1]National Museum of Natural History, Washington, DC, [2]George Washington Univ., Washington, DC, [3]USGS, Beltsville, MD, [4]Smithsonian Institution, Washington DC, WA

8:20 1007 The successful biological invasion of the specialist bee *Peponapis pruinosa*. **Margarita López-Uribe**, mml82@cornell.edu, Cornell Univ., Ithaca, NY

8:40 1008 Assessing how local and landscape features structure pollinator diversity in fragmented communities. **Alexandra N. Harmon-Threatt**, aharmont@wustl.edu, Washington Univ. in St. Louis, St. Louis, MO

9:00 1009 Applying population genomic tools to bumble bee conservation. **Jeffrey D. Lozier**, jlozier@as.ua.edu, Univ. of Alabama, Tuscaloosa, AL

9:20 1010 Urban land use limits regional bumble bee gene flow. **Shalene Jha**, sjha@austin.utexas.edu, Univ. of Texas, Austin, TX

9:40 1011 Microbial Community Assembly in Social and Solitary Bees. **Quinn S. McFrederick**, quinnmcfrederick@gmail.com, California State Univ. Fresno, Fresno, CA

10:00 1012 The Evolutionary Ecology of Native Bee Microbiota, and Their Role in Parasite Defense . **Hauke Koch**, hauke.koch@yale.edu, Yale Univ., West Haven, CT

10:20 1013 The Importance of Taxonomy for Native Bee Ecology and Evolution. **Jason Gibbs**, jason.gibbs@cornell.edu, Cornell Univ., Ithaca, NY

10:40 1014 Using Citizen Science to Evaluate Pollinator Service on a Continental Scale. **Gretchen LeBuhn**, lebuhn@sfsu.edu and Seth Hiatt, San Francisco State Univ., San Francisco, CA

11:00 1015 Reconstructing the ecological history of native California bees using preserved museum specimens. **S. Hollis Woodard**, euglossine@gmail.com, Univ. of California-Berkeley, Berkeley, CA

11:20 1016 Causal Factors in Bumble Bee Decline: Testing the Role of *Nosema bombi*. **Sydney A. Cameron**, Univ. of Illinois at Urbana-Champaign, Urbana, IL

11:40 1017 Genomic Signatures of Bee Diversity. **Karen Kapheim**, kapheimk@illinois.edu, Univ. of Illinois, Urbana, IL

Member Symposium: When a Blind Beetle Crawls Over the Surface of the Globe…or Under the Water: Biodiversity and Systematics of Aquatic Beetles

Meeting Room 7 (Austin Convention Center)

Moderators and Organizers: Donald A. Yee[1] and Kelly B. Miller[2], [1]Univ. of Southern Mississippi, Hattiesburg, MS, [2]Univ. of New Mexico, Albuquerque, NM

8:00 1018 Techniques for evaluation of variation of mandibular geometry and cranial architecture of larval Dytiscidae (Hydradephaga: Coleoptera) with comments on the ecological implications of that variation. **E. Barman**, barman345@charter.net and William Wall, Dept. of Biological & Environmental Sciences, Milledgeville, GA

8:20 1019 Higher-level phylogeny of diving beetles (Dytiscidae) based on larval characters. **Mariano C. Michat**, marianoide@gmail.com, Universidad de Buenos Aires, Buenos Aires, Argentina and Yves Alarie, Laurentian Univ., Sudbury, ON, Canada

8:40 1020 Deciphering the origins of massive radiations in the New Guinean archipelago. **Michael Balke**, Coleoptera-ZSM@zsm.mwn.de[1], Emmanuel Toussaint[1], Robert Hall[2], Michael Monaghan[3], Joan Pons[4] and Helena Shaverdo[5], [1]Bavarian State Collection of Zoology, Munich, Germany, [2]Univ. of London, Surrey, United Kingdom, [3]Leibniz Institute of Freshwater Ecology and Inland Fisheries, Berlin, Germany, [4]Institut Mediterrani d'Estudis Avançats, Illes Balears, Spain, [5]Institute of Zoology NASB, Minsk, Belarus

9:00 1021 An analysis of the classification and phylogeny of the Neoporus-Heterosternuta genera (Coleoptera: Dytiscidae). **Bill Wolfe**, bill.wolfe@gcsu.edu, Dept. of Biological and Environmental Sciences, Milledgeville, GA and Kelly B. Miller, Univ. of New Mexico, Albuquerque, NM

9:20 1022 Distributions, ecology and conservation of diving beetles across endemic hotspots in Arkansas and Tennessee, USA. **Scott Longing**, scott.longing@ttu.edu, Texas Tech Univ., Lubbock, TX, Bill Wolfe, Dept. of Biological and Environmental Sciences, Milledgeville, GA and Douglas Ryan Leasure, Univ. of Arkansas, Fayetteville, AR

9:40 1023 The diversity and evolution of sexual interactions in Dytiscidae (Coleoptera). **Kelly B. Miller**, kbmiller@unm.edu, Univ. of New Mexico, Albuquerque, NM

10:00 Break

10:15 1024 Aquatic beetles in small places. The ecology of tropical phytotelmata inhabiting coleoptera. **Donald A. Yee**, donald.yee@usm.edu, Univ. of Southern Mississippi, Hattiesburg, MS

10:35 1025 Evolutionary dynamics of beetles during the Australian drying-out. **Emmanuel Toussaint**, emmanuel.touss1@gmail.com[1], Fabien Condamine[2], Oliver Hawlitschek[1], Lars Hendrich[1] and Michael Balke[1], [1]Bavarian State Collection of Zoology, Munich, Germany, [2]UMR Centre de Biologie pour la Gestion des Populations,, Montferrier-sur-Lez, France

10:55 1026 Water beetles 'Down Under' - the evolution of a diverse subterranean fauna driven by climate change. **Andrew D. Austin**, andy.austin@adelaide.edu.au[1], Steve Cooper[2], Michelle Guzik[3], Bill Humphreys[4], Remko Leys[2] and Chris Watts[2], [1]Univ. of Adelaide, Adelaide, SA 5005, Australia, [2]South Australian Museum, Adelaide, Australia, [3]Australian Centre for Evolutionary Biology & Biodiversity, Adelaide, Australia, [4]Western Australian Museum, Perth, Australia

11:15 1027 On the tribe formerly known as Enhydrini (Coleoptera: Gyrinidae: Gyrininae). Toward a revision of the tribe and a review of its history. **Grey Gustafson**, gtgustafson@gmail.com and Kelly B. Miller, Univ. of New Mexico, Albuquerque, NM

11:35 1028 Water beetles as models for understanding why most species are rare. **David Bilton**, D.Bilton@plymouth.ac.uk, Plymouth Univ., Plymouth, United Kingdom

11:55 1029 Diversification of the water scavenger beetles: Pattern and process. **Andrew Short**, aezshort@ku.edu[1], Devin Bloom[1] and Martin Fikacek[2], [1]Univ. of Kansas, Lawrence, KS, [2]National Museum, Praha, Czech Republic

Ten-Minute Papers, PBT Section: Genomics, transcriptomics and molecular Biology

Meeting Room 18 D (Austin Convention Center)

Moderators: Christine Picard[1] and Jeffrey J. Stuart[2], [1]Indiana Univ. Purdue Univ. Indianapolis (IUPUI), Indianapolis, IN, [2]Purdue Univ., West Lafayette, IN

8:00 1030 A new transcriptomics resource for Coleoptera – next generation sequencing of the pollen beetle, *Meligethes aeneus* Col. Nitidulidae. **Christoph Zimmer**, christoph.zimmer@me.com[1], Frank Maiwald[2], Mark Ott[2], Corinna Schorn[2] and Ralf Nauen[2], [1]Rothamsted Research, Harpenden, United Kingdom, [2]Bayer CropScience Aktiengesellschaft, Monheim, Germany

8:12 1031 Using RNAi to search for genes important for *Varroa destructor* survival and reproduction. Xianbing Xie[1], **Zachary Y. Huang**, bees@msu.edu[2], Guowu Bian[2] and Zhiyong Xi[2], [1]Nanchang Univ., Nanchang, China, [2]Michigan State Univ., East Lansing, MI

8:24 1032 Developing methods for bioassay of honey bee adults and larvae for RNAi risk assesment. **Ana Maria Velez**, anamaria.velez@gmail.com[1], Jessica D. Jurzenski[1], Xuguo "Joe" Zhou[2] and Blair Siegfried[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Kentucky, Lexington, KY

8:36 1033 Cloning, expression and function detection of major royal jelly protein 1 (MRJP1) genes of *Apis cerana*. **Songkun Su**, susongkun@zju.edu.cn, Fujian Agriculture and Forestry Univ., Fuzhou, China

8:48 1034 An investigation into the venom of the giant ichneumon, *Megarhyssa* (Hymenoptera: Ichneumonidae). **Victoria G. Pook**, victoria.pook@uky.edu and Michael J Sharkey, Univ. of Kentucky, Lexington, KY

9:00 1035 Novel discoveries in the male accessory secretions of the tsetse fly *Glossina morsitans* (A transcriptomic/proteomic analysis). **Geoffrey M. Attardo**, Geoffrey.attardo@yale.edu[1], Francesca Scolari[2], Joshua B. Benoit[3], Veronika Michalkova[1], Marco Falchetto[2], Anna Malacrida[2] and Serap Aksoy[4], [1]Yale School of Public Health, New Haven, CT, [2]Univ. of Pavia, Pavia, Italy, [3]Univ. of Cincinnati, Cincinnati, OH, [4]Yale Univ., New Haven, CT

9:12 1036 Identification and analysis of dehydration genes in phloem-feeding insects. **Xiangfeng Jing**, xj43@cornell.edu[1], Vered Tzin[2], Gerog Jander[2] and Angela E. Douglas[1], [1]Cornell Univ., Ithaca, NY, [2]Boyce Thompson Institute for Plant Research, Ithaca, NY

9:24 1037 Validation of housekeeping genes for gene expression studies in western corn rootworm (*Diabrotica virgifera virgifera*). **Thais Barros Rodrigues**, thaisbarros_bio@yahoo.com.br[1], Chitvan Khajuria[2], John Wang[2], Natalie Matz[3] and Blair Siegfried[4], [1]Federal Univ. of Lavras - Brazil and Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska-Lincoln, Lincoln, NE, [3]NE, [4]Univ. of Nebraska, Lincoln, NE

9:36 1038 Expression and functional analysis of putative sex-determining genes in *Metaseiulus occidentalis* (Acari: Phytoseiidae). **Aaron Pomerantz**, apomerantz@ufl.edu, Univ. of Florida, Gainesville, FL

9:48 1039 Use of complementary "omic" approaches to identify bacterial symbionts in aphid and related impact in multitrophic interactions. **Frederic Francis**, francis.f@fsagx.ac.be[1], Emilie Bosquee[2], Sophie Vandermoten[2], Edwin De Pauw[3] and Eric Haubruge[4], [1]Gembloux Agricultural Univ., Gembloux, Gembloux, Belgium, [2]Univ. of Liege, Gembloux Agro-Bio Tech, Gembloux, Belgium, [3]Univ. of Liege, Liege, Belgium, [4]Gembloux Agricultural Univ., Genbloux, KS, Belgium

10:00 1040 A multi-locus tool for the pathway analysis of Mediterranean fruit fly. **Raul Ruiz-Arce**, Raul.A.Ruiz@aphis.usda.gov, Norman Barr and Terrence Todd, USDA - APHIS, Edinburg, TX

10:12 1041 Seminal fluid proteome of the Asian tiger mosquito, *Aedes albopictus*. **Kathryn Boes**, kboes@wooster.edu[1], Jose Ribeiro[2], Alex Wong[3], Mariana Wolfner[4], Laura Harrington[4] and Laura Sirot[1], [1]The College of Wooster, Wooster, OH, [2]NIAID, NIH, Bethesda, MD, [3]Carleton Univ., Ottawa, ON, Canada, [4]Cornell Univ., Ithaca, NY

10:24 1042 Transcriptome analysis of RNAi induced asian citrus psyllid using quantitative real-time PCR and next generation sequencing. **John Ramos**, johnramos@live.com[1], Robert Shatters[1], Charles A. Powell[2], Dov Borovsky[3], Ritesh Jain[2] and Kasie Sturgeon[2], [1]USDA-Agricultural Research Service, Fort Pierce, FL, [2]Univ. of Florida - IFAS, Fort Pierce, FL, [3]Univ. of Florida - IFAS, Vero Beach, FL

10:36 1043 Transcriptome analysis of honey bee (*Apis mellifera*) pupae in response to *in-vitro* infection with Israel Acute Paralysis Virus (IAPV). **Humberto F. Boncristiani**, hfboncri@uncg.edu, Univ. of North Carolina, Greensboro, Greensboro, NC, Olav Rueppell, Univ. of North Carolina at Greensboro, Greensboro, NC and Micheline Strand, Chemical and Biological Defense Laboratories (CBD), Durham, NC

10:48 1044 Analysis of RNAi pathway and uptake mechanisms in western corn rootworm, *Diabrotic virgifera virgifera* (Le Conte). **Partha Ramaseshadri**, parthasarathy.ramaseshadri@monsanto.com[1], Joanna Pawlak[1], Robert Moore[1], Gerrit Segers[2], Jason Meyer[1], Brian McNulty[1] and Renata Bolognesi[1], [1]Monsanto Company, Chesterfield, MO, [2]Monsanto Company, St. Louis, MO

11:00 1045 Functional metagenomic and transcriptomic profiling of the asian longhorned beetle (Cerambycidae: *Anoplophora glabripennis*) midgut: Insights into nutritional ecology. **Erin D. Scully**, eds14@psu.edu[1], Scott Geib[2], John Carlson[3], Ming Tien[1] and Kelli Hoover[3], [1]Pennsylvania State Univ., State College, PA, [2]USDA-ARS, Hilo, HI, [3]Pennsylvania State Univ., Univ. Park, PA

Ten-Minute Papers, PBT Section: Sensory physiology, behavior, and chemical ecology

Meeting Room 19 B (Austin Convention Center)

Moderators: Joe Hull[1] and Zhaorigetu Chen[2], [1]USDA-ARS, U.S. Arid Land Agricultural Research Center, Maricopa, AZ, [2]Kansas State Univ., Manhattan, KS

8:00 1046 Ultrastructure and three dimensional reconstruction attempts of olfactory sensilla on antennae of adult small brown planthopper, *Laodelphax striatellus* (Fallén) (Hemiptera: Delphacidae). **Bing-Xian Fu**, bxfu658@aliyun.com, Institute of Insect Sciences, Zhejiang Univ., Hangzhou, China

8:12 1047 The evolution of contact pheromones in *Odontomachus* trap-jaw ants. **Adrian A. Smith**, Smithaa@illinois.edu[1], Jocelyn G. Millar[2], Lawrence M. Hanks[1] and Andrew V. Suarez[1], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of California, Riverside, CA

8:24 1048 The role of brood cuticular hydrocarbons in brood recognition by the Argentine ant (*Linepithema humile*). **Judy Chung**, juchu@berkeley.edu[1], Virginia Emery[2] and Neil Tsutsui[2], [1]Univ. of California, Berkeley, Sylmar, CA, [2]Univ. of California, Berkeley, CA

8:36 1049 Host odors mediating oviposition behavior in *Manduca sexta* and their representation in the antennal lobe of the brain. **Robert Mitchell**, rfmitchell@email.arizona.edu and John Hildebrand, Univ. of Arizona, Tucson, AZ

8:48 1050 Development of temperature-related population parameters for *Drosophila suzukii* (Diptera: Drosophilidae) to determine pest risk. **Vaughn Walton**, waltonv@hort.oregonstate.edu[1], Samantha L. Tochen[1], Nik G. Wiman[1], Daniel T Dalton[1], Peter W. Shearer[2] and Christopher A. Hamm[3], [1]Oregon State Univ., Corvallis, OR, [2]Oregon State Univ., Hood River, OR, [3]Univ. of California, Davis, Davis, CA

9:00 1051 Drug-seeking behavior in ants: A new model for morphine-induced reward, sensitization, self-administration and addiction. **Brian Entler**, brian.entler@scranton.edu, J Cannon and Marc Seid, Univ. of Scranton, Scranton, PA

9:12 1052 Morphological characteristics and distribution of sensilla on ovipositor and tarsal of *Ostrinia furnacalis* (Guenée) (Lepidoptera: Crambidae). **Martha Sila**, ms3613@gmail.com,

Ministry of Agriculture/ south china Agricultural Univ., NAIROBI, Kenya

9:24 1053 *In vivo* X-ray 4D cine-tomography for tracking morphological dynamics in insects. **Thomas van de Kamp**, thomas.vandekamp@kit.edu, Tomy dos Santos Rolo, Alexey Ershov and Tilo Baumbach, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany

9:36 1054 Direct behavioral observations uncover shift work on honey bee *Apis mellifera*. **Manuel Giannoni-Guzmán**, manuel.a.giannoni@upr.edu, Tugrul Giray, Jose Agosto and Emmanuel Rivera, Univ. of Puerto Rico, San Juan, PR

9:48 1055 Molecular correlates of time-of-day specific changes in olfactory sensitivity and behavior in *Anopheles gambiae*. **Zainulabeuddin Syed**, Zainulabeuddin.Syed.5@nd.edu[1], Sam Rund[1], Nicolle Bonar[1], Matthew Champion[2], Cameron Houk[1] and Giles Duffield[1], [1]Univ. of Notre Dame, Notre Dame, IN, [2]Eck Institute of Global Health, Notre Dame, IN

10:00 1056 Male-female behavior patterns in the flesh fly, *Sarcophaga crassipalpis*. **Karl H. Joplin**, joplin@etsu.edu, David Elliott, Dylan Shropshire, Edith Seier and Darrell Moore, East Tennessee State Univ., Johnson City, TN

10:12 1057 Dispenser type and trap design affect catch effectiveness of dogwood borer sex pheromone. **Aijun Zhang**, aijun.zhang@ars.usda.gov, USDA-ARS, BARC, Beltsville, MD and Tracy C. Leskey, USDA, Agricultural Research Service, Kearneysville, WV

10:24 1058 The developmental time span model: Quantifying life stage distributions over time and estimating age based on the emergence of adults from their hosts. **David E. Bellamy**, dave.bellamy@ars.usda.gov and Spencer Walse, USDA, Agricultural Research Service, Parlier, CA

10:36 1059 Effect of plant extract *Peganum harmala* against the whitefly, *Bemisia tabaci* (Homoptera: Aleyrodidae), at Doucen, Biskra oasis, Algeria. **Tarai Nacer**, tarainacer@yahoo.fr and Belhamra Mohamed, Univ. Mohamed Khider, Biskra, Algérie, 07000, Biskra, Algeria

10:48 1060 Response of *Bactrocera* fruit flies (Diptera: Tephritidae) to phytochemical lures: Evolutionary and functional significance. **Kumaran Nagalingam**, kumaran.nagalingam@gmail.com, School of Earth, Environmental and Biological Sciences, Science and Engineering Faculty, Queensland Univ. of Technology, Brisbane, Australia

11:00 1061 Synergism of induced plant defenses: Alternative strategies for herbivore pests. **Ian Scott**, ian.scott@agr.gc.ca, Agriculture and Agri-Food Canada, London, ON, Canada and Rana Samara, Agriculture and Agri-Food Canada, Vineland, ON, Canada

11:12 1062 A potential role for 4g family cytochrome P450s in conferring insecticide resistance in mosquitoes by altering cuticle structure. Vasileia Balabanidou[1], Maria Riga[1], M. Patricia Juárez[2], George Chalepakis[1], Mark Paine[3], Hilary Ranson[3], Gareth Lycett[3] and **John Vontas**, vontas@biology.uoc.gr[1], [1]Univ. of Crete, Heraklion, Greece, [2]Instituto de Investigaciones Bioquímicas de La Plata, La Plata, Buenos Aires, Argentina, [3]Liverpool School of Tropical Medicine, Liverpool, United Kingdom

11:24 1063 Termiticidal activities of plant based chemicals extracted from various wood parts of diverse flora. **Muhammad Qureshi**, qureshienv@yahoo.com, GC Univ. Lahore, Lahore, Pakistan, Naveeda Qureshi, Quaid-i-Azam Univ., Islamabad, Islamabad, Pakistan and Alan Reynolds, Brunel Univ. London, London, England

Ten-Minute Papers, P-IE Section: Environmental Entomology 2

Meeting Room 17 B (Austin Convention Center)

Moderators: Jerome F. Grant[1] and Blake R. Bextine[2], [1]Univ. of Tennessee, Knoxville, TN, [2]Univ. of Texas, Tyler, TX

8:00 1064 Tritrophic implications of carotenoid sequestration by the generalist herbivore *Trichoplusia ni*. **Evan Lampert**, Evan.lampert@ung.edu, Obadi Obadi and Bonnie Welch, Univ. of North Georgia, Oakwood, GA

8:12 1065 Stable isotopes and essential elements as biomarkers to determine feeding habits by *Lasioderma serricorne* . **Rizana M. Mahroof**, rmahroof@scsu.edu, South Carolina State Univ., Orangeburg, SC

8:24 1066 Development of an outreach plan for thousand cankers disease: Spread the information, not the fungus. **Jerome F. Grant**, jgrant@utk.edu[1], Alan Windham[2], Frank A. Hale[2], Elizabeth Long[1], Mark T. Windham[1], Katheryne Nix[1], Renee Follum[1] and Paris L. Lambdin[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Univ. of Tennessee, Nashville, TN

8:36 1067 Annual cicada (*Tibicen* sp.) emergence patterns on a college campus: Research REAPing rewards. **Sherilyn G. F. Smith**, smithsg@lemoyne.edu and Jacob Mekete, Le Moyne College, Syracuse, NY

8:48 1068 The endosymbiont, *Arsenophonus,* influences soybean aphid, *Aphis glycines,* performance on soybean. **Jason A. Wulff**, jasonwulff@uky.edu and Jennifer A. White, Univ. of Kentucky, Lexington, KY

9:00 1069 Detecting phytoplasma strains of Lethal Yellowing (LY) and Texas Phoenix Palm Decline (TPPD) in South Texas. **Julia Hope Potocnjak**, jhpotocnjak@gmail.com, Univ. of Texas at Tyler, Tyler, TX, Blake R. Bextine, Univ. of Texas, Tyler, TX and G. Schuster, Texas A&M Univ. - Kingsville, Kingsville, TX

9:12 1070 Plant diversity increases potato leafhopper (*Empoasca fabae*) movement and vulnerability to predation. **Cory Straub**, cstraub@ursinus.edu, Ursinus College, Collegeville, PA

9:24 1071 Climate change and migratory insects; local and continental effects of temperature anomaly on potato leafhopper arrival and severity of infestation. **Mitchell Baker**, Mitchell.Baker@qc.cuny.edu[1], P. Dilip Venugopal[2] and William O. Lamp[2], [1]The City Univ. of New York - Queens College, Flushing, NY, [2]Univ. of Maryland, College Park, MD

9:36 1072 Refining the pre-oviposition period for *Halyomorpha halys* and incorporation into phenological models. **Anne L. Nielsen**, nielsen@aesop.rutgers.edu, Rutgers, The State Univ. of New Jersey, Bridgeton, NJ

9:48 Break

10:00 1073 Beyond gregarious behavior: The influence of clutch size on the development of a parasitoid wasp, *Bracon nigricans*. **Antonio Biondi**, antonio.biondi@unict.it[1], Lucia Zappalà[2], Gaetano Siscaro[2] and Nicolas Desneux[1], [1]French National Institute for Agricultural Research (INRA), Sophia-Antipolis, France, [2]Univ. of Catania, Catania, Italy

10:12 1074 Competition, compression and exclusion: Impact of paleartic coccinellids on neartic natives. **John Losey**, jel27@cornell.edu[1], Louis S. Hesler[2], Jason Lai[1], Kent Fothergill[3], Lauren M.

Diepenbrock[4], Kelly V. Tindall[5] and Deborah L. Finke[6], [1]Cornell Univ., Ithaca, NY, [2]USDA, Agricultural Research Service, Brookings, SD, [3]Orma J. Smith Museum of Natural History, Caldwell, ID, [4]Univ. of Missouri, Columbia, MO, [5]Univ. of Idaho, Twin Falls, ID, [6]Washington State Univ., Pullman, WA

10:24 1075 Effects of farming practices on local and regional abundance, richness and evenness of arthropods. **Elinor Lichtenberg**, e.lichtenberg@wsu.edu[1], Christina Kennedy[2] and David Crowder[1], [1]Washington State Univ., Pullman, WA, [2]The Nature Conservancy, Fort Collins, CO

10:36 1076 Weathering the storm: Hurricane Sandy effects on New York City arthropods. **Elsa Youngsteadt**, ekyoungs@ncsu.edu, Amy Savage, Rob R. Dunn and Steven D. Frank, North Carolina State Univ., Raleigh, NC

10:48 1077 The impact of Hurricane Isaac on the arthropod assemblage of a brackish coastal marsh, and the recovery of species diversity over the following year. **Mark S. Fox**, mfox@tulane.edu, Tulane Univ., New Orleans, LA

11:00 1078 Foraging behavior of *Galendromus flumenis* on Banks grass mite, *Oligonychus pratensis*. **Fatemeh Ganjisaffar**, fatemeh.ganjisaffar@email.ucr.edu, Univ. of California - Riverside, Riverside, CA and Thomas Perring, Univ. of California, Riverside, Riverside, CA

11:12 1079 The role of immigrant inviability in mediating the genetic differentiation between populations of Aphidoidea species associated with pecan and water hickory trees. **Kyle Harrison**, kharrison@tamu.edu and Raul Medina, Texas A&M Univ., College Station, TX

11:24 1080 Estimating the prevalence of facultative bacterial symbionts in aphids. **Jennifer A. White**, jenawhite@uky.edu, Univ. of Kentucky, Lexington, KY

11:36 1081 Adaptation of the brown planthopper *Nilaparvata lugens* (Stål) to resistant rice varieties is mediated by its microbial endosymbionts. **Jedeliza Ferrater**, j.ferrater@irri.org, International Rice Research Institute, College, Los Banos, Philippines

11:48 1082 Noduler augments infection induced cell proliferation through cross-talking with p38 MAPK signaling in wild silkworm, *Antheraea mylitta* . **V Satyavathi Valluri**, vsatya@cdfd.org.in, Centre for DNA Fingerprinting and Diagnostics, Hyderabad, Andhra Pradesh, India

Ten-Minute Papers, P-IE Section: Invasive Species

Meeting Room 17 A (Austin Convention Center)

Moderators: Mark Sisterson[1] and James F. Campbell[2], [1]USDA, Parlier, CA, [2]USDA Agricultural Research Service, Manhattan, KS

8:00 1083 Detection of alien wood boring beetles in Italian ports: A nationwide study. **Davide Rassati**, davide.rassati@studenti.unipd.it, Univ. of Padova, Legnaro, Padova, Italy

8:12 1084 Are sanitation practices important to managing *Drosophila suzukii* in fruit crops? **Amy J. Dreves**, Amy.Dreves@oregonstate.edu[1], Wei Q. Yang[2], Amanda Ohrn[1], Adrienne Basey[2] and Tracy Hueppelsheuser[3], [1]Oregon State Univ., Corvallis, OR, [2]Oregon State Univ., Aurora, OR, [3]British Columbia Ministry of Agriculture, Abbotsford, BC, Canada

8:24 1085 Relationships between fly captures and fruit infestation, and implications for IPM of spottedwing drosophila, *Drosophila suzukii*, in highbush blueberry. **Steven Van Timmeren**, vantimm2@msu.edu and Rufus Isaacs, Michigan State Univ., East Lansing, MI

8:36 1086 Assessing the risk of establishment of western cherry fruit fly (Diptera: Tephritidae) in commercial cherry-growing areas of California. **Sunil Kumar**, sunil@nrel.colostate.edu, Colorado State Univ., Fort Collins, CO, Lisa G. Neven, USDA-ARS, Wapato, WA and Wee Yee, USDA, Agricultural Research Service, Wapato, WA

8:48 1087 Spottedwing drosophila: A new invasive pest for small fruits and berries in Pennsylvania and Maryland and its attraction to different types of lures. **Neelendra K. Joshi**, nkj105@psu.edu[1], David J. Biddinger[1], Kathy Demchak[2], Bryan Butler[3] and Edwin Rajotte[4], [1]Pennsylvania State Univ., Fruit Research & Extension Center, Biglerville, PA, [2]Pennsylvania State Univ., Univ. Park, PA, [3]Univ. of Maryland, Westminster, MD, [4]Pennsylvania State Univ., State College, PA

9:00 1088 Similarities and differences in the chemical ecology of two important buprestid pests- the emerald ash borer and the goldspotted oak borer. **Damon J. Crook**, damon.j.crook@aphis.usda.gov[1], Tom W. Coleman[2], Nate McCartney[3], Joseph Francese[4], Steven J. Seybold[5], Yigen Chen[6] and Victor C. Mastro[1], [1]USDA-APHIS-PPQ, Otis ANGB, MA, [2]USDA Forest Service, San Bernardino, CA, [3]Penn State Univ., Univ. Park, PA, [4]USDA APHIS PPQ CPHST Otis Laboratory, Otis ANGB, MA, [5]USDA, Forest Service, Davis, CA, [6]Univ. of California, Davis, CA

9:12 1089 Quantifying glassy-winged sharpshooter egg maturation. **Mark Sisterson**, mark.sisterson@ars.usda.gov, USDA, Parlier, CA

9:36 1090 Success of an invasive insect, *Bagrada hilaris*, on an invasive plant, *Brassica tournefortii*. **Sarah O'Neill**, sdave001@ucr.edu and Matt Daugherty, Univ. of California, Riverside, Riverside, CA

9:48 Break

10:00 1091 Estimating infestation age and population growth of two semi-rural populations of Asian Longhorned Beetle (*Anoplophora glabripennis*). **Helen Hull-Sanders**, Helen.M.Hull-Sanders@usda.gov, USDA PPQ CHPST APHIS, Buzzards Bay, MA, Victor C. Mastro, USDA APHIS PPQ CPHST, Buzzards Bay, MA and David R. Lance, USDA-APHIS-PPQ, Otis ANGB, MA

10:12 1092 Invasive Species Management with SPLAT Semiochemical Attract & Kill Formulations: A Moth, a Beetle and a Fly. **Agenor Mafra-Neto**, president@iscatech.com[1], Lyndsie Stoltman[2], Rafael Borges[3], Leandro Mafra[4], Carmem Bernardi[5], Katia Mafra-Spencer[1], Margot Mafra-Spencer[1], Cesar Rodriguez[6] and Roger I. Vargas[7], [1]ISCA Technologies, Inc., Riverside, CA, [2]ISCA Technologies, Riverside, CA, [3]ISCA Tecnologias Ltda, Ijui, RS, Brazil, [4]ISCA Tecnologis Ltda, Ijui, Rio Grande do Sul, CA, Brazil, [5]ISCA Technologies, Inc, Riverside, CA, [6]Rutgers, Chatsworth, NJ, [7]USDA, Agricultural Research Service, Hilo, HI

10:24 1093 New exotic insect pests in California and the importance of early detection for control. **Gevork Arakelian**, GArakelian@acwm.lacounty.gov, Los Angeles County Dept. of Agricultural Commissioner/Weights & Measures, South Gate, CA

10:36 1094 Behaviorally-based reduced input management for brown marmorated stink bug in peach. **Brett R. Blaauw**, blaauw@aesop.rutgers.edu[1], Dean Polk[2] and Anne L. Nielsen[1], [1]Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, [2]Rutgers Univ., Chatsworth, NJ

10:48 1095 Environmental effects on feeding patterns of brown marmorated stink bug, *Halyomorpha halys* (Hemiptera: Pentatomidae), as determined by an electronic monitoring system. **Nik G. Wiman**, nik.wiman@oregonstate.edu[1], Peter W. Shearer[2],

Vaughn Walton[1] and Silvia I. Rondon[3], [1]Oregon State Univ., Corvallis, OR, [2]Oregon State Univ., Hood River, OR, [3]Oregon State Univ., Hermiston, OR

11:00 1096 Confirmation of brown marmorated stink bug overwintering in natural landscapes using human and canine surveyors. **Doo-Hyung Lee**, dl343@cornell.edu[1], Tracy C. Leskey[1], Lisa Beckett[2], Jennifer Anderson[2] and Jodi Daugherty[2], [1]USDA, Agricultural Research Service, Kearneysville, WV, [2]USDA-APHIS, Newnan, GA

11:12 1097 Seasonal phenology and feeding preference of brown marmorated stink bug, *Halyomorpha halys* (Heteroptera: Pentatomidae) in vineyards. **Sanjay Basnet**, sanjayvt@vt.edu[1], Douglas G. Pfeiffer[2], Thomas P. Kuhar[2] and Curt A. Laub[2], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Virginia Tech, Blacksburg, VA

11:24 1098 Decisions, decisions, decisions … oviposition behavior in *Trissolcus spp.*, egg parasitoids of the brown marmorated stink bug (*Halyomorpha halys*). **Christine Dieckhoff**, christine.dieckhoff@ars.usda.gov, USDA, Agricultural Research Service, Beneficial Insects Introduction Research Laboratory (BIIRL), Newark, DE and Kim A. Hoelmer, USDA, Agricultural Research Service, Montferrier, France

11:36 1099 Vibrational communication and mating behaviour of potential invasive species *Dichelops melacanthus* (Hemiptera: Pentatomidae). **Maria Blassioli-Moraes**, carolina.blassioli@embrapa.br, Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) Recursos Genéticos e Biotecnologia, Brasília, Brazil, Miguel Borges, Embrapa Recursos Genéticos e Biotecnologia, Brasília, DF, Brazil, Diego Magalhães, Embrapa Recursos Genéticos e Biotecnologia, Brasília, Brazil, Andrej Cokl, National Institute of Biology, Ljubljana,, Slovenia and R. A. Laumann, Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) Recursos Genéticos e Biotecnologia, Brasília, DF, Brazil

Ten-Minute Papers, P-IE Section: Pollinators

Meeting Room 16 A (Austin Convention Center)

Moderators: Logan M. Minter[1] and Rosalind James[2], [1]Univ. of Kentucky, Lexington, KY, [2]USDA - ARS, Logan, UT

8:00 1100 Contingency planning for small hive beetle *Aethina tumida* in the U.K.: Using entomopathogenic nematodes as control agents against larvae. **Andrew Cuthbertson**, andrew.cuthbertson@fera.gsi.gov.uk, James Mathers, Lisa Blackburn, Gay Marris, Mike Brown and Giles Budge, The Food and Environment Research Agency, York, United Kingdom

8:12 1101 The integrated crop pollination project: Pollination status of Michigan highbush blueberry. **Jason Gibbs**, jason.gibbs@cornell.edu, Keith Mason, Knute Gundersen and Rufus Isaacs, Michigan State Univ., East Lansing, MI

8:24 1102 Ecuador: A 'gold mine' for pollinator explorations!. **Sujaya Rao**, sujaya@oregonstate.edu, Oregon State Univ., Corvallis, OR

8:36 1103 Pollen preference and nesting of a native bee, *Osmia lignaria*, in Eastern orchards. **Mark Kraemer**, mkraemer@vsu.edu and Francoise Favi, Virginia State Univ., Petersburg, VA

8:48 1104 Determination of exposure levels of honey bees foraging on flowers of mature citrus trees previously treated with imidacloprid. **Frank J. Byrne**, frank.byrne@ucr.edu[1], Kirk Visscher[1], Bill Leimkuehler[2], David Fischer[3], Elizabeth E. Grafton-Cardwell[1] and Joseph G. Morse[4], [1]Univ. of California, Riverside, CA, [2]Bayer CropScience, Stilwell, KS, [3]Bayer CropScience, Research Triangle Park, NC, [4]Univ. of California, Riverside, Riverside, CA

9:00 1105 The effects of honey bee (*Apis mellifera*) queen insemination volume on colony growth. **Juliana Rangel-Posada,** juliana.rangel-posada@ag.tamu.edu, Texas A&M Univ., College Station, TX.

9:12 1106 Competition between honey bees (*Apis mellifera*) and bumble bees (*Bombus* spp.) foraging on lavender. **Nicholas Balfour**, njbalfour@gmail.com, Sam Gandy and Francis Ratnieks, Univ. of Sussex, Brighton, United Kingdom

9:24 1107 The role of flowering oilseed biofuel crops in pest control and pollination ecosystem services. Jonathan Lundgren, USDA Agricultural Research Service, Brookings, SD and **Kristine Nemec**, kristinenemec14@gmail.com, USDA-ARS, Brookings, SD

9:36 1108 The mining bee, *Andrena crataegi,* a potential new commericial pollinator. **Mark A. Schlueter**, mschluet@ggc.edu and Nicholas G. Stewart, Georgia Gwinnett College, Lawrenceville, GA

9:48 1109 Drone-worker heritability of oxidative stress resistance in honey bees (*Apis mellifera*). **Ming Huang**, mhuang7@ncsu.edu[1], Michael Simone-Finstrom[1], Micheline Strand[2], David R. Tarpy[1] and Olav Rueppell[3], [1]North Carolina State Univ., Raleigh, NC, [2]Chemical and Biological Defense Laboratories (CBD), Durham, NC, [3]Univ. of North Carolina at Greensboro, Greensboro, NC

10:00 Break

10:10 1110 Assessment of diversity, abundance, and pollination efforts of native bees in urban forest fragments. **David Gardner**, dgardner@udel.edu, Univ. of Delaware, Newark, DE and Deborah A. Delaney, Univ. of Delaware, DE

10:22 1111 Mechanisms of parasite resistance in honey bees: Interactions among individual and social immune defenses. **Michael Simone-Finstrom**, mdsimone@ncsu.edu and David R. Tarpy, North Carolina State Univ., Raleigh, NC

10:34 1112 Management practices and honey bee stress: Effects of migratory beekeeping on longevity and oxidative stress. Michael Simone-Finstrom[1], Ming Huang[1], Olav Rueppell[2], Micheline Strand[3] and **David R. Tarpy**, david_tarpy@ncsu.edu[1], [1]North Carolina State Univ., Raleigh, NC, [2]Univ. of North Carolina at Greensboro, Greensboro, NC, [3]Chemical and Biological Defense Laboratories (CBD), Durham, NC

10:46 1113 Landscape pollination services under alternative futures in the Willamette Valley, OR. **Steven Highland**, Steven.Highland@ARS.USDA.GOV, Utah State Univ./USDA ARS, Logan, UT

10:58 1114 An integrated IPM program using non-chemical controls to manage parasites in honey bee, *Apis mellifera*, colonies. **Kathleen Evans**, kciola@udel.edu, university of delaware, newark, DE

11:22 1115 Comparative studies of mating and virus loads in multiple populations of the Eastern honey bee, *Apis cerana*. Olav Rueppell, Univ. of North Carolina at Greensboro, Greensboro, NC, Michael Simone-Finstrom, North Carolina State Univ., Raleigh, NC and **Dominick DeFelice**, dsdefeli@uncg.edu, The Univ. of North Carolina at Greensboro, Newport, NC

11:34 1116 Factors influencing the establishment of the dance floor in honey bee (*Apis mellifera*) colonies. **Darrell Moore**, moored@mail.etsu.edu, Chelsea Corrigan, Robert Reyes, Ashley E. Wagner, Adam White, Jordan Brison, Alyssa Williams, Edith Seier and Michele L. Joyner, East Tennessee State Univ., Johnson City, TN

11:46 1117 Novel defense by Asian honey bees (*Apis cerana*) to attacks by social wasps (*Vespa* spp). **Gard W. Otis**, gotis@uoguelph.ca[1], Heather Mattila[2], Hanh Duc Pham[1], Lien Nguyen[3] and Olivia Knight[1], [1]Univ. of Guelph, Guelph, ON, Canada, [2]Wellesley College, Wellesley, MA, [3]Institute of Ecology and Biological Resources, Hanoi, Vietnam

11:58 1118 Division of labors shifts in response to brood age in *Apis mellifera*. **Kirsten Traynor**, ktraynor@asu.edu and Robert Page, Arizona State Univ., Tempe, AZ

Ten-Minute Papers, P-IE Section: Population Monitoring, and Modeling

Meeting Room 12 B (Austin Convention Center)

Moderators: William Meikle[1] and J. Lindsey Flexner[2], [1]USDA – ARS, Tucson, AZ, [2]Pioneer Hi-Bred International, Wilmington, DE

8:00 1119 The surprising importance of modeling abundance when assessing PIP durability. **Nicholas Friedenberg**, nick@ramas.com and Kevin Shoemaker, Applied Biomathematics, Setauket, NY

8:12 1120 Modeling effects of environmental variation on the population dynamics of the western corn rootworm *Diabrotica virgifera virgifera* LeConte (Coleoptera: Chrysomelidae). **Haridas Chirakkal**, hchirakkal2@unl.edu[1], Lance J. Meinke[2], Blair Siegfried[2] and Brigitte Tenhumberg[2], [1]Univ. of Nebraska-Lincoln, Lincoln, NE, [2]Univ. of Nebraska, Lincoln, NE

8:24 1121 Monitoring garden symphylan (*Scutigerella immaculata*) by essential oil-based pesticides in vegetables. **Wai-Ki Frankie Lam**, frankie.lam@brandt.co, Brandt Consolidated, Inc., Salinas, CA

8:36 1122 Monitoring native- and non-native bark and woodboring insect colonization following a 2011 EF3 tornado in Massachusetts. **Ryan Hanavan**, rhanavan@fs.fed.us[1], Kevin J. Dodds[1] and Marc DiGirolomo[2], [1]USDA Forest Service, Durham, NH, [2]US Forest Service, Durham, NE

8:48 1123 Modeling endemic bark beetle populations in southwestern ponderosa pine forests. **Christopher Garza**, chrisagarza7@gmail.com[1], Andrew Birt[1], Barbara J. Bentz[2] and Robert Coulson[1], [1]Texas A&M Univ., College Station, TX, [2]USDA - Forest Service, Logan, UT

9:00 1124 How good are degree day models in predicting large scale abundances of brown marmorated stink bugs? **P. Dilip Venugopal**, dilip@umd.edu[1], Galen Dively[2] and William O. Lamp[1], [1]Univ. of Maryland, College Park, MD, [2]Univ. of Maryland, College Park Maryland, MD

9:12 1125 Assessing the influence of multiple facets of agricultural landscape simplification on infestation by *Cephus cinctus*, a major pest of wheat. **Tatyana Rand**, tatyana.rand@ars.usda.gov, USDA, Agricultural Research Service, Sidney, MT

9:24 1126 Density-dependent phase polyphenism in the fall armyworm, *Spodoptera frugiperta*. **Weidong Pan**, panwd@mail.iee.ac.cn[1], Maria Julissa Ek-Ramos[1], Cesar Valencia[2], Wenqing Zhou[1] and Gregory Sword[1], [1]Texas A&M Univ., College Station, TX, [2]Texas A & M Univ., College Station, TX

9:36 1127 Modeling pollinator movements to predict transgene escape in insect-pollinated crops. **Johanne Brunet**, jbrunet@wisc.edu[1], Yang Zhao[2], Megan Van Etten[3], Margaret W. Thairu[2], Vera Pfeiffer[2], Jillian Henss[4] and Murray Clayton[2], [1]USDA Agricultural Research Service, Madison, WI, [2]Univ. of Wisconsin, Madison, WI, [3]USDA - ARS, Madison, WI, [4]USDA-ARS, Madison, WI

9:48 Break

10:00 1128 What modeling populations of the small hive beetle, *Aethina tumida*, tells us. **William Meikle**, william.meikle@ars.usda.gov, USDA – ARS, Tucson, AZ, Niels Holst, Univ. of Aarhus, Flakkebjerg, Denmark and Joseph Patt, USDA - ARS, Ft. Pierce, FL

10:12 1129 Lessons from pest simulation modeling using the European corn borer and the Russian wheat aphid. **Scott C. Merrill**, scott.c.merrill@uvm.edu, Univ. of Vermont, Burlington, VT

10:24 1130 Crowdsourcing pest sampling data using a web-based Pest Sampler. **Wendy Johnson**, wendyann@ksu.edu and Brian McCornack, Kansas State Univ., Manhattan, KS

10:36 1131 Modeling the within-plant distribution of *Bemisia tabaci* biotype B using patterns of aggregation and leaf selection as predictors. **Diego Rincon**, rincon@osu.edu, Casey Hoy and Luis A. Cañas, The Ohio State Univ., Wooster, OH

10:48 1132 Surveying aphid vectors and alternative hosts of *Potato virus Y* in Oregon and Washington. **Alexzandra F. Murphy**, Alexzandra.Murphy@oregonstate.edu and Silvia I. Rondon, Oregon State Univ., Hermiston, OR

11:00 1133 Evaluating large-scale monitoring of the potato psyllid (Hemiptera: Triozidae) in the Columbia Basin of Oregon and Washington. **Silvia I. Rondon**, silvia.rondon@oregonstate.edu, Alexzandra F. Murphy and Erik R. Echegaray, Oregon State Univ., Hermiston, OR

11:12 1134 Seasonal population fluctuation of the potato psyllid *Bactericera cockerelli* (Hemiptera: Triozidae) in the lower Columbia Basin. **Erik R. Echegaray**, erik.echegaray@oregonstate.edu and Silvia I. Rondon, Oregon State Univ., Hermiston, OR

11:24 1135 Influences of sea surface temperatures on butterflies across an elevational gradient in California. **Nick Pardikes**, npardikes@hotmail.com, Univ. of Nevada, Reno, Reno, NV

Ten-Minute Papers, SysEB Section: Evolution and Biodiversity

Meeting Room 5 ABC (Austin Convention Center)

Moderators: Andrea Lucky[1] and Nate Hardy[2], [1]Univ. of Florida, Gainesville, FL, [2]Cleveland Museum of Natural History, Cleveland, OH

8:00 Welcoming Remarks

8:02 1136 Does epilithic biofilm community structure affect the mayfly microbiome? **M. Eric Benbow**, eric.benbow@gmail.com, Jennifer M. Lang and Jennifer L. Pechal, Univ. of Dayton, Dayton, OH

8:14 1137 The origin and sequential radiation of the social parasite *Tamalia inquilinus* (Hemiptera: Aphididae). **Donald Miller**, dgmiller@csuchico.edu[1], Heather Estby[2] and Patrick Abbot[2], [1]California State Univ., Chico, Chico, CA, [2]Vanderbilt Univ., Nashville, TN

8:26 1138 Species diversity of host-alternating aphids correlated with diversity of secondary, not primary, host plants. **Nate Hardy**, nbhardy@gmail.com, Auburn Univ., Auburn, AL and Carol D. von Dohlen, Utah State Univ., Logan, UT

8:38 1139 Temporal and Spatial Genetic Variability of the Tarnished Plant Bug, *Lygus lineolaris* (Palisot de Beauvois), Populations in a Small Geographic Area. **Omaththage P. Perera**, op.perera@ars.usda.

gov[1], Jeff Gore[2], Gordon Snodgrass[3], Ryan Jackson[4], Clint Allen[3], Craig A. Abel[5] and Randall Luttrell[3], [1]USDA Agricultural Research Service, Stoneville, MS, [2]Mississippi State Univ., Stoneville, MS, MS, [3]USDA - ARS, Stoneville, MS, [4]USDA, Stoneville, MS, [5]USDA-ARS, Stoneville, MS

8:50 1140 Niche partitioning in a community of aphidophagous ladybeetles (Coccinellidae). **Christie Bahlai**, cbahlai@msu.edu and Doug A. Landis, Michigan State Univ., East Lansing, MI

9:02 1141 Cues to the evolution of leaf-cutting ants: Effects on *Atta mexicana* colonies cultivating fungal symbionts from advanced *(Atta)* or primitive (*Trachymyrmex*) ants. **Sergio R. Sanchez-Peña**, sanchezcheco@gmail.com, Universidad Autonoma Agraria Antonio Narro, Saltillo, Mexico and Ulrich G. Mueller, The Univ. of Texas-Austin, Austin, TX

9:14 1142 Ecology, behavior and natural history of Poneroide and Ectatomminoide ants in the Neotropical cerrado savanna. **Nadia Espirito-Santo**, nadiabarbosa@yahoo.com.br[1], Vincent Fourcassié[2] and Paulo S. Oliveira[1], [1]Universidade Estadual de Campinas, Campinas, Brazil, [2]Univ. de Toulouse III, Toulouse, France

9:26 1143 Thermal constraints to ant activity in six communities along a latitudinal gradient. **Jelena Bujan**, jelena.bujan@ou.edu and Michael Kaspari, Univ. of Oklahoma, Norman, OK

9:38 Break

9:48 1144 Assessing backyard biodiversity across broad spatial scales: The School of Ants citizen science project. **Andrea Lucky**, alucky@ufl.edu[1], Amy Savage[2], Lauren M. Nichols[2], Cristina Castracani[3], Leonora Shell[4], Alessandra Mori[3] and Robert R. Dunn[2], [1]Univ. of FL, Gainesville, FL, [2]North Carolina State Univ., Raleigh, NC, [3]Università degli Studi di Parma, Parma, Italy, [4]NCSU, raleigh, NC

10:12 1145 The uniqueness of Pennsylvania landscape in determining the community composition of native bees delivering pollination services to apples. **Mark Otieno**, mxo22@psu.edu[1], David J. Biddinger[2], Shelby J. Fleischer[3], Neelendra K. Joshi[2] and Edwin Rajotte[3], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Pennsylvania State Univ., Fruit Research & Extension Center, Biglerville, PA, [3]Pennsylvania State Univ., State College, PA

10:24 1146 Soda-bottle trap baited with hand sanitizer is an effective tool for large-scale monitoring of bark and ambrosia beetles. **Sedonia Steininger**, m.sedonia@ufl.edu, Univ. of Florida, Gainesville, FL

10:36 1147 Why can't beetles grow bigger? Evolutionary constraints limit response to selection for larger larvae in *Tribolium castaneum*. **Kristen Irwin**, kay444@gmail.com, Washington State Univ., Pullman, WA

10:48 1148 Taxonomic diversity of *Spiroplasma*-mediated protection of *Drosophila* against parasitoid wasps. **Mariana Mateos**, mmateos@tamu.edu, Texas A&M Univ., College Station, TX

11:00 1149 Radar studies reveal the migration strategies of the silver Y moth (*Autographa gamma*) in Europe. **Jason Chapman**, jason.chapman@rothamsted.ac.uk, Rothamsted Research, Harpenden, United Kingdom

11:12 1150 Population genetic structure of a predatory moth (Lepidoptera: Geometridae) in the Hawaiian Islands. **Ryan Caesar**, rmcaesar@hawaii.edu, Univ. of Hawaii at Manoa, Honolulu, HI and Dan Rubinoff, Univ. of Hawaii - Manoa, Honolulu, HI

11:24 1151 Warning signals are seductive: Color outperforms pattern for both predator avoidance and mate attraction in *Heliconius* butterflies. **Susan D. Finkbeiner**, sfinkbei@uci.edu, Univ. of California, Irvine, Irvine, CA, Adriana D. Briscoe, Univ. of California-Irvine, Irvine, CA and Robert Reed, Cornell Univ., Ithaca, NY

11:36 1152 Impact of the mate-finding Allee effect on the competitiveness of diploid versus haplodiploid parasitoids: A theoretical approach. **Clara Malouines**, claramalouines@hotmail.fr, UMR7625 Universite Pierre et Marie Curie, Paris, France, Anaïs Bompard, UMR7625 universite Pierre et Marie Curie, Paris, France, Thierry Spataro, AgroParisTech, Paris, France and Isabelle Amat, Univ. Lyon 1, CNRS, UMR 5558, Villeurbanne Cedex, France

11:48 1153 Parental diet drives offspring performance: Specialized parental effects in a generalist insect herbivore. **Peri A. Mason**, pmason@wesleyan.edu[1], Melissa A. Bernardo[2] and Michael S. Singer[2], [1]Univ. of Colorado Boulder, Boulder, CO, [2]Wesleyan Univ., Middletown, CT

12:00 1154 Large impacts of vector control on the effective population size (N_e) of malaria vector mosquitoes in Equatorial Guinea. **Giridhar Athrey**, giri.athrey@tamu.edu[1], Theresa Hodges[1], Kevin C Deitz[1], Michael R Reddy[2], Hans J Overgaard[3], Abrahan Matias[4], Frances Ridl[5], Immo Kleinschmidt[6], Adalgisa Caccone[7] and Michel A. Slotman[1], [1]Texas A&M Univ., College Station, TX, [2]Yale Univ. School of Medicine, New Haven, CT, [3]The Norwegian Univ. of Life Sciences, Ås, Akershus, Norway, [4]Medical Care Development International, Malabo, Equatorial Guinea, [5]Medical Research Council, Durban, South Africa, [6]London School of Hygiene and Tropical Medicine, London, United Kingdom, [7]Yale Univ., New Haven, CT

Ten-Minute Papers, SysEB Section: Systematics of Diptera and Lepidoptera

Meeting Room 4 ABC (Austin Convention Center)

Moderators: David Wagner[1] and Karl Magnacca[2], [1]Univ. of Connecticut, Storrs, CT, [2]Oahu Army Natural Resources Program, Schofield Barracks, HI

8:00 Welcoming Remarks

8:02 1155 Are genera arbitrary? **KG. Andrew Hamilton**, Andy.Hamilton@AGR.GC.CA, Agriculture and Agri-Food Canada Biodiversity, Ottawa, ON, Canada

8:14 1156 The horrible truth about deep-level Lepidopteran phylogenetics. **Stephen Cameron**, st.cameron@qut.edu.au, Queensland Univ. of Technology, Brisbane, Australia

8:26 1157 Presentation withdrawn.

8:38 1158 Preliminary phylogenetic analysis of North American *Agonopterix* and *Exaeretia* (Gelechioidea: Elachistidae: Depressariinae). **Melissa S. Sisson**, sisson@shsu.edu and Sibyl, R. Bucheli, Sam Houston State Univ., Huntsville, TX

8:50 1159 Phylogeny and the evolution of pharmocophagy in tiger moths (Lepidoptera: Erebidae: Arctiinae). Jennifer Zaspel[1], C. Taylor Wardell[2], Reza Zahiri[3], Niklas Wahlberg[3] and **Susan J. Weller**, welle008@umn.edu[4], [1]Purdue Univ., West Lafayette, IN, [2]Univ. of Minnesota, St. Paul, MN, [3]Univ. of Turku, Turku, Finland, [4]Univ. of Minnesota, Minneapolis, MN

9:02 1160 Preliminary study of the transcriptomes and metabolite profiles of the lichen moth tribe Lithosiini (Lepidoptera: Erebidae: Arctiinae). **Clare Scott**, scott254@purdue.edu[1], Susan J. Weller[2] and Jennifer Zaspel[1], [1]Purdue Univ., West Lafayette, IN, [2]Univ. of Minnesota, Minneapolis, MN

9:14 1161 Towards a revision and phylogeny of the genera *Heteranassa* (Smith 1899)*, Elousa* (Walker 1857) and *Coxina* (Gueneé 1852). **Nicholas Homziak**, nhomziak@unm.edu and Akito Kawahara, Univ. of Florida, Gainesville, FL

9:26 1162 Recent advances in the Glaphyriinae: Chipping away at the classification of pyraloid moths with atypical habits and morphology (Lepidoptera: Crambidae). **M. Alma Solis**, alma.solis@ars.usda.gov[1], Mark Metz[1], Paul Goldstein[2], Winnie Hallwachs[3], Daniel H. Janzen[3] and Charles Mitter[2], [1]USDA, ARS, Washington, DC, [2]Univ. of Maryland, College Park, MD, [3]Univ. of Pennsylvania, Philadelphia, PA

9:38 1163 New insights into phylogenetic relationships and species boundaries in the spruce budworm (*Choristoneura fumiferana*) species group. **Felix Sperling**, felix.sperling@ualberta.ca, Heather Bird and Bryan Brunet, Univ. of Alberta, Edmonton, AB, Canada

9:50 Break

10:00 1164 Phylogeny of North American Dagger Moths (Noctuidae: Acronictinae) and the uncoupling of phenotypic evolution across life stages. **David L. Wagner**, david.wagner@uconn.edu[1], Jadranka Rota[1], Reza Zahiri[2], Brigette Zacharczenko[1] and Niklas Wahlberg[2], [1]Univ. of Connecticut, Storrs, CT, [2]Univ. of Turku, Turku, Finland

10:12 1165 New genomic evidence to resolve phylogenetic radiations in true flies. **Brian M. Wiegmann**, bwiegman@ncsu.edu[1], Michelle Trautwein[2], David K. Yeates[3] and Keith M. Bayless[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina Museum of Natural Sciences, Raleigh, NC, [3]CSIRO Ecosystem Sciences, Acton, ACT, Australia

10:24 1166 Effect of taxon sampling in morphological phylogenetic analyses: Insights from three Diptera taxa with different diversification rates. **Torsten Dikow**, dikowt@si.edu, National Museum of Natural History, Smithsonian Institution, Washington, DC

10:36 1167 Elucidating the classification of *Sarcophaga* using molecular data (Diptera: Sarcophagidae). **Daniel Whitmore**, d.whitmore@nhm.ac.uk, Natural History Museum, London, United Kingdom, Thomas Pape, Univ. of Copenhagen, Copenhagen, Hovedstaden, Denmark and Eliana Buenaventura, Natural History Museum of Denmark, Copenhagen, Denmark

10:48 1168 Rapid radiation and host plant conservation in Hawaiian picture-wing *Drosophila*. **Karl Magnacca**, knm956@gmail.com, Oahu Army Natural Resources Program, Schofield Barracks, HI and Donald Price, Univ. of Hawaii, Hilo, HI

11:00 1169 Evolution of herbivory in a drosophilid: *Scaptomyza* genomics and phylogenetics. **Richard Lapoint**, rlapoint11@gmail.com and Noah Whiteman, Univ. of Arizona, Tucson, AZ

11:12 1170 Evolution of larval adhesive structures in the ant subfamily Ponerinae. **Sean O'Donnell**, so356@drexel.edu and Kaitlin Baudier, Drexel Univ., Philadelphia, PA

11:24 Concluding Remarks

TUESDAY, NOVEMBER 12, 2013, AFTERNOON

Lunch and Learn: How to Make Meaningful Connections with the Public Using Your Own Research

Ballroom G (Austin Convention Center)

Moderators and Organizers: Christina A. Silliman[1], Catherine Dana[1], Brendan Morris[2] and Julie Allen[2], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of Illinois, Champaign, IL

12:15 - 1:15

Lunch and Learn: Politics and Science: How Congress and the President Impact Your Work (and what you can do about it)

Ballroom E (Austin Convention Center)

Moderators and Organizers: Robert Gropp, American Institute of Biological Sciences, Washington, DC

12:15 - 1:15

Program Symposium: How New Technologies and Interdisciplinary Approaches are Transforming our Understanding of Complex Biological Interactions

Ballroom G (Austin Convention Center)

Moderators and Organizers: Fiona L. Goggin[1] and Lirio Arevalo-Soliz[2], [1]Univ. of Arkansas, Fayetteville, AR, [2]Baylor College of Medicine, Houston, TX

1:30 Introductory Remarks

1:35 1171 Aphid-symbiont interactions in the "omics" era. **Angela Douglas**, aes326@cornell.edu, Cornell Univ., Ithaca, NY

1:55 1172 Genome scan approaches to infer the evolutionary history and mechanisms of plant adaptation in the pea aphid complex. **Jean-Christophe Simon**, Univ. Rennes 1, Le Rheu Cedex, France

2:15 1173 "Omics" approaches to understand host plant resistance and susceptibility to aphids. **Fiona L. Goggin**, fgoggin@uark.edu, Univ. of Arkansas, Fayetteville, AR

2:35 Break

2:50 1174 Understanding the effect of effectors in plant-aphid interactions. **Saskia A. Hogenhout**, saskia.hogenhout@bbsrc.ac.uk, The John Innes Centre, Norwich, United Kingdom

3:10 1175 Aphid saliva: Knowledge about its function in aphid-plant interactions is a key for aphid control. **Torsten Will**, Torsten.Will@agrar.uni-giessen.de, Justus Liebig Univ. Giessen, Giessen, Germany

3:30 1176 New insights on phloem structure and sieve element occlusion. **Michael Knoblauch**, knoblau@wsu.edu, Washinton State Univ., Pullman, WA

3:50 Break

4:10 1177 Using plant transcriptome and metabolome analyses to decipher defense and counter-defense mechanisms in plant-aphid interactions. **Gustavo C. MacIntosh**, gustavo@iastate.edu, Iowa State Univ., Ames, IA

4:30 1178 Omic technologies reveal highly dynamic spatial and temporal responses of plants to phloem feeding insects. **Robert Hancock**, Rob.Hancock@hutton.ac.uk, James Hutton Institute, Dundee, Scotland

4:50 1179 High throughput screening of plant collections for increased resistance towards phloem feeding insects. Xi Chen, Univ. of Missouri, Columbia, MO, Colette Broekgaarden and **Ben Vosman**, ben.vosman@wur.nl, Wageningen UR, Wageningen, Netherlands

MUVE Section Symposium: The Impact of Repellent Research and Development of New Arthropod Repellents

Meeting Room 18 B (Austin Convention Center)

Moderators and Organizers: Mustapha Debboun, United States Army, Medical Dept. Center & School, Fort Sam Houston, TX

1:30 1180 Introductory Remarks. **Mustapha Debboun**, mustapha.debboun.mil@mail.mil, United States Army, Medical Dept. Center & School, Fort Sam Houston, TX

1:35 1181 Activity of the plant-based repellent, TT-4302 against mosquitoes and ticks. **Brooke Bissinger**, bbissinger@tyratech.com, Jason Schmidt, John Owens, Sheila Mitchell and Keith Kennedy, TyraTech, Inc., Morrisville, NC

1:51 1182 Evaluating natural repellents in the high-throughput repellency chamber. **Joel Coats**, jcoats@iastate.edu[1], Kornwika Suwansirisilp[2] and Theeraphap Chareonviriyaphap[2], [1]Iowa State Univ., Ames, IA, [2]Kasetsart Univ., Bangkok, Thailand

2:07 1183 Percutaneous absorption of insect repellents and related compunds - in vitro and in vivo models. **William Reifenrath**, wgr@stratacor-inc.com, Stratacor, Inc, Richmond, CA

2:23 1184 Utilization of the in vitro K&D bioassay system with a blood substitute for screening feeding deterrents against Aedes aegypti. **John Smith**, Florida State Univ., Panama City, FL

2:39 1185 Laboratory evaluations of the repellent activity of selected compounds against haematophagous arthropods. **William A. Donahue**, srl@clearwire.net, Bret E. Vinson, Michael W. Donahue and Sumiko R. De La Vega, Sierra Research Laboratories, Modesto, CA

2:55 1186 The impact of repellency for disease prevention: Results from a meta-analysis. **Sarah Moore**, smoore@ihi.or.tz, Ifakara Health Institute, London, None, United Kingdom

3:11 Break

3:21 1187 Broadening perspectives: Mixing old repellents with new molecules!. **Robert Bedoukian**, rhb@Bedoukian.com, Bedoukian Research Incoproration, Danbury, CT

3:37 1188 Cat Thyme (Tecurein marum) component induced repellency against disease vectors. **Kamlesh R. Chauhan**, Kamal.Chauhan@ars.usda.gov, USDA-ARS, Beltsville, MD

3:53 1189 Development of long lasting, slow release repellent formulations for integrated pest management. **Agenor Mafra-Neto**, president@iscatech.com, ISCA Technologies, Inc., Riverside, CA

4:09 1190 Natural Products as mosquito biting deterrents/repellents: Potential and challenges. **Abbas Aali**, aali@olemiss.edu, The Univ. of Mississippi, Univ., MS and Ikhlas Khan, National Center for Natural Products Research, Univ., MS

4:25 1191 Could mosquito and tick repellents be extended to whiteflies? **Francoise Favi**, ffavi@vsu.edu[1], Mark E. Kraemer[1] and Charles L. Cantrell[2], [1]Virginia State Univ., Petersburg, VA, [2]USDA, Agricultural Research Service, Univ., MS

4:41 1192 Grown in Montana repellents: Aedes aegypti laboratory studies to traditional ecological knowledge. **Florence Dunkel**, ueyfd@montana.edu, Montana State Univ., Bozeman, MT, Robyn Klein, Montana State Univ., Bozman, MT and Ky-Phuong Luong, Univ. of Utah, Salt Lake City, CA

4:57 1193 New developments in skin repellents and repellent-treated uniforms for the United States military. **Ulrich R. Bernier**, Uli.Bernier@ARS.USDA.GOV, USDA-ARS-CMAVE, Gainesville, FL, Melynda Perry, Natick Soldier Center, Natick, MA and Amy Johnson, Natick Soldier Research, Development, and Engineering Center, Natick, MA

MUVE Section Symposium: Healthy Schools: Research, Benefits and Impacts in the Classroom

Meeting Room 10 AB (Austin Convention Center)

Moderators and Organizers: Sherry Glick, US EPA Office of Pesticide Programs, Dallas, TX

1:30 1194 EPA's Healthy Schools Program; National and Regional Perspectives on IPM. **Sherry Glick**, Glick.Sherry@epamail.epa.gov, US EPA Office of Pesticide Programs, Dallas, TX, Kenneth McPherson, TX and Susan T. Ratcliffe, North Central IPM Center, Urbana, IL

1:55 1195 Effective, Sustainable IPM Programs/Coalitions. **Susan T. Ratcliffe**, sratclif@uiuc.edu, North Central IPM Center, Urbana, IL, Deb Young, CO Coalition, TX, William Miller, DC and Herb Bolton, USDA, CREES, Washington, DC

2:35 1196 Panel Discussion: Innovations in IPM; State/Local Efforts to Promote Reduced Risk. **Michael Merchant**, m-merchant@tamu.edu, Texas A&M AgriLife Extension Service, Dallas, TX, Deb Young, CO Coalition, TX and Chris Geiger, San Francisco Dept of the Env., Oakland, CA

3:05 1197 IPM for School Turf and Landscapes: Managing Pests without Pesticides? **Carrie Foss**, cfoss@wsu.edu, Washington State Univ., Puyallup, WA and Benjamin McGraw, Rutgers Univ., New Brunswick, NJ

3:30 Break

3:45 1198 Innovations in Outreach - - eXtension. **Lawrence "Fudd" Graham**, grahalc@auburn.edu, Auburn Univ., Auburn, AL

4:00 1199 Health & Economic Benefits of IPM; Asthma and Allergens and School Performance. John Carlson, Pennsylvania State Univ., Univ. Park, PA and **Janet A. Hurley**, jahurley@ag.tamu.edu, Texas A&M AgriLife Extension Service, TAMU Ag Research & Extension Center, Dallas, TX

4:30 1200 Environmental Justice Challenges for IPM Programs: Role of the Community and theP in an Impacted Area. **Allison Taisey**, aat25@cornell.edu, Cornell Univ., Southborough, MA, Jim Fredericks, National Pest Management Association, VA and Claudia Reigel, New Orleans, LA

5:00 1201 Metrics for Success in IPM Implementation. **Thomas A. Green**, ipmworks@ipminstitute.org, IPM Institute of North America, Madison, WI

PBT Section Symposium: Epigenetic Mechanisms Connecting Physiology, Behavior, Ecology, and Evolution in the Insect World

Meeting Room 19 B (Austin Convention Center)

Moderators and Organizers: Hongmei Li-Byarlay[1], Christina M. Grozinger[2], Susan Weiner[3] and Brendan Hunt[4], [1]Univ. of Illinois, Urbana, IL, [2]Pennsylvania State Univ., Univ. Park, PA, [3]Iowa State Univ., Ames, IA, [4]Georgia Institute of Technology, Atlanta, GA

1:30 Introductory Remarks

1:35 1202 Linking DNA methylation to alternative phenotypes in the pea aphid. **Jennifer Brisson**, jbrisson2@unl.edu, Univ. of Nebraska, Lincoln, Lincoln, NE

2:00 1203 Studying parental effects on gene expression in honey bees and evaluating evolutionary theories of genomic imprinting. **Greg Hunt**, ghunt@purdue.edu, Purdue Univ., West Lafayette, IN

2:20 1204 Decoding DNA methylation and gene splicing in the honey bee genome. **Hongmei Li-Byarlay**, hmli@illinois.edu[1], Yang Li[1], Samuel Wickline[2], Jian Ma[1] and Gene Robinson[3], [1]Univ. of Illinois, Urbana, IL, [2]Washington Univ., School of Medicine, St. Louis, MO, [3]Univ. of Illinois at Urbana-Champaign, Urbana, IL

2:40 1205 Genomic imprinting as a mediator of social interactions within honey bee, *Apis mellifera*, colonies. **David Galbraith**, dag5031@gmail.com[1], Sarah D. Kocher[2], Greg Hunt[3], David C. Queller[4] and Christina M. Grozinger[1], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Harvard Univ., Cambridge, MA, [3]Purdue Univ., West Lafayette, IN, [4]Rice Univ., Houston, TX

3:00 1206 Epigenomics of caste identity in the carpenter ant *Camponotus floridanus*. **Daniel F. Simola**, simola@mail.med.upenn.edu, Univ. of Pennsylvania, Philadelphia, PA

3:20 Break

3:40 1207 Nature, nurture, nutrition: Epigenetic mechanisms of dietary plasticity in insects. **Emilie C. Snell-Rood**, emilies@umn.edu, Univ. of Minnesota, St. Paul, MN

4:05 1208 DNA methylation and caste bias in the primitively eusocial wasp, *Polistes dominula*. **Susan Weiner**, sweiner@iastate.edu and Amy L. Toth, Iowa State Univ., Ames, IA

4:25 1209 Epigenetic basis of complex behavior in honeybees. **Brian Herb**, brianherb@gmail.com[1], Gro Amdam[2] and Andrew Feinberg[1], [1]John Hopkins School of Medicine, Baltimore, MD, [2]Arizona State Univ., Tempe, AZ

4:45 1210 DNA methylation is linked to ploidy in the fire ant *Solenopsis invicta*. **Karl Glastad**, karlglastad@gmail.com, Brendan Hunt, Soojin Yi and Michael Goodisman, Georgia Institute of Technology, Atlanta, GA

5:05 Concluding Remarks

P-IE Section Symposium: Insect Ecology in the World's Most Populated Habitat: Connecting Scientists, Practitioners, and the Public

Ballroom F (Austin Convention Center)

Moderators and Organizers: Elsa Youngsteadt, Emily K. Meineke and Adam Dale, North Carolina State Univ., Raleigh, NC

1:30 Welcoming Remarks

1:35 1211 Urbanization has a huge impact on arthropod communities – What are the patterns, and is it really such a big deal? **Christofer Bang**, christofer.bang@asu.edu, Arizona State Univ., Tempe, AZ, Stanley H. Faeth, Univ. of North Carolina, Greensboro, Greensboro, NC and Susannah Lerman, USDA Forest Service, Amherst, MA

1:55 1212 Divergent responses of terrestrial arthropods to urbanization: A meta-analysis. **Holly M. Martinson**, hmartins@umd.edu and Michael J. Raupp, Univ. of Maryland, College Park, MD

2:15 1213 Urban warming affects herbivore abundance and natural enemy efficacy on street trees. **Emily K. Meineke**, emily.meineke@gmail.com, Robert R. Dunn and Steven D. Frank, North Carolina State Univ., Raleigh, NC

2:35 1214 Pollination in suburban environments: Implications for native plant reproduction. **Adrian L. Carper**, adrian.l.carper@dartmouth.edu, Dartmouth College, Hanover, NH

2:55 Break

3:10 1215 Bees and flowers: A love affair worth knowing. **Gordon W. Frankie**, frankie@nature.berkeley.edu[1], Sarah Guerrero, Jaime Pawelek[1], Mary Schindler[3], Rollin Coville[4] and Robbin W. Thorp[5], [1]Univ. of California-Berkeley, Berkeley, CA, [2]Univ. of California, Berkeley, Berkeley, CA, [3]El Cerrito, CA, [4]Univ. of California-Davis, Davis, CA

3:30 1216 The public health impacts of the emerald ash borer. **Geoffrey Donovan**, gdonovan@fs.fed.us, USDA Forest Service, Portland, OR

3:50 1217 Carabid beetle and human responses to edge effects in urban forests in Helsinki, Finland. **D. Johan Kotze**, johan.kotze@helsinki.fi, Univ. of Helsinki, Lahti, Finland

4:10 1218 Strategies and tactics for managing emerald ash borer in the urban forest. **Daniel A. Herms**, herms.2@osu.edu, The Ohio State Univ., OARDC, Wooster, OH

4:30 1219 Fall cankerworm: New methods of preventing tree defoliation. **Donald Booth**, dbooth@barlettlab.com, Bartlett Tree Experts, Charlotte, NC

4:50 1220 Asian Longhorned Beetle: Battling an invasive insect pest in an urban environment focusing on interactions between governmental agencies and industry, media, politicians and the community. **Clint McFarland**, Clint.D.McFarland@aphis.usda.gov, USDA, Animal and Plant Health Inspection Service (APHIS), Worcester, MA

P-IE Section Symposium: Climate Change & Arthropod Pest Dynamics: Research to Accelerate our Science and Inform Public Policy

Meeting Room 17 A (Austin Convention Center)

Moderators and Organizers: William D. Hutchison[1] and Robert Venette[2], [1]Univ. of Minnesota, St. Paul, MN, [2]U.S. Forest Service, St. Paul, MN

1:30 Introductory Remarks

1:50 1221 Insect distributions under climate change: Addressing uncertainties for policymakers. **Robert Venette**, rvenette@fs.fed.us, U.S. Forest Service, St. Paul, MN, Frank H. Koch, USDA, Forest Service, Research Triangle Park, NC, Denys Yemshanov, Natural Resources Canada, Canadian Forest Service, Sault Ste. Marie, ON, Canada and Kevin M. Potter, North Carolina State Univ., Research Triangle Park, NC

2:10 1222 Climate change, physiological responses, and insect pest distributions. **Jacques Régnière**, Laurentian Forestry Centre, Quebec, QC, Canada, Barbara J. Bentz, USDA - Forest Service, Logan, UT, James Powell, Utah State Univ., Logan, UT and Vince Nealis, Natural Resources Canada, Victoria, BC, Canada

2:30 1223 Insects and climate change: Traps, trends and traits. **Richard Harrington**, richard.harrington@rothamsted.ac.uk, Rothamsted Research, Harpenden, United Kingdom

2:50 1224 Climatic prediction of insect migration patterns. **John Westbrook**, john.westbrook@ars.usda.gov, USDA - ARS, College Station, TX, Rodney Nagoshi, USDA-ARS, Gainesville, FL, Robert L. Meagher, USDA, Agricultural Research Service, Gainesville, FL and Shelby J. Fleischer, Pennsylvania State Univ., State College, PA

3:10 Break

3:30 1225 Protecting against new pest incursions: Weather-based models to inform surveys for quarantine pests. **Daniel M. Borchert**, Daniel.M.Borchert@aphis.usda.gov, USDA-APHIS-PPQ-CPHST-PERAL, Raleigh, NC

3:50 1226 Bioeconomic perspectives on climate, crops, and pests. **Jason Beddow**, beddow@umn.edu and Philip Pardey, Univ. of Minnesota, St. Paul, MN

4:10 1227 Insect seasonality and population dynamics in a world of changing climates: Implications for policy. **Patrick C. Tobin**, pc.tobin@gmail.com, USDA, Forest Service, Morgantown, WV

4:30 Concluding Remarks

P-IE Section Symposium: Connecting Research, Outreach and Regulatory efforts to Protect Honey Bee Health

Meeting Room 12 A (Austin Convention Center)

Moderators and Organizers: Robyn Rose[1] and Jeff Pettis[2], [1]USDA/APHIS, Riverdale, MD, [2]Bee Research Laboratory, Beltsville, MD

1:30 1228 Balancing beekeeper and grower needs to ensure food safety. **Christi Heinz**, christi@projectapism.org, Project Apis m, Chica, CA

1:50 1229 Information in real time: Bee Informed Partnership. **Dennis vanEngelsdorp**, dennis.vanengelsdorp@gmail.com, Univ. of Maryland, College Park, MD

2:10 1230 Assessing the risk of pesticides to honey bees: A tiered evaluation. **Thomas Steeger**, steeger.thomas@epa.gov, U.S. Environmental Protection Agency, Washington, DC

2:30 1231 Colony-level exposure and systemic movement of imadicloprid. **Galen Dively**, galen@umd.edu, Univ. of Maryland, College Park Maryland, MD

2:50 1232 Food security by keeping out the bad guys: APHIS importing and permitting process. **Wayne F. Wehling**, wayne.f.wehling@aphis.usda.gov and Colin Stewart, USDA - APHIS, Riverdale, MD

3:10 1233 National survey of honey bee pests and diseases. **Robyn Rose**, robyn.i.rose@aphis.usda.gov[1], Dennis vanEngelsdorp[2], Jeff Pettis[3] and Karen Rennich[2], [1]USDA-APHIS, Riverdale, MD, [2]Univ. of Maryland, College Park, MD, [3]Bee Research Laboratory, Beltsville, MD

3:30 1234 Failing Colonies; the role of queen health. **Jeff Pettis**, pettisj@ba.ars.usda.gov, Bee Research Laboratory, Beltsville, MD

3:50 1235 Connecting genetics of the colony with research and extension. **David Tarpy**, david_tarpy@ncsu.edu, North Carolina State Univ., Raleigh, NC

4:10 1236 Biomarkers of bee health and the role of nutrition. **Ramesh Saghili**, sagilir@hort.oregonstate.edu, Oregon State Univ., Corvallis, OR

4:30 1237 You are what you eat: Honey and the honey bee. **May R. Berenbaum**, maybe@illinois.edu, Univ. of Illinois, Urbana, IL

P-IE Section Symposium: The Larry Larson Symposium: How Science has Impacted a Connected World by Expanding the Use of Insecticides Beyond Core Agricultural Markets

Ballroom E (Austin Convention Center)

Moderators and Organizers: Luis Gomez[1], Mike P. Tolley[2], Luis Gomez[1], Mike Tolley[1] and Keith Dorschner[3], [1]Dow AgroSciences, LLC, Indianapolis, IN, [2]Dow AgroSciences, Indianapolis, IN, [3]Rutgers Univ., Princeton, NJ

1:30 Welcoming Remarks

1:45 1238 The IR-4 Program: 50 Years of collaboration towards expanding insecticide options for growers. **Jerry Baron**, jbaron@AESOP.Rutgers.edu, Rutgers Univ., Princeton, NJ

2:05 1239 The regulatory view of specialty crops and minor uses. **Lois Rossi**, rossi.lois@epa.gov, US Environmental Protection Agency, Office of Pesticide Programs, Washington, DC

2:25 1240 Working towards a global regulatory program. **Daniel Kunkel**, kunkel@aesop.rutgers.edu, Rutgers Univ., Princeton, NJ

2:45 1241 Spinetoram, spinosad, and methoxyfenozide: Expanding green chemistries into specialty crops and minor uses. **James E. Dripps**, jedripps@dow.com[1], Luis E. Gomez[1], Mike Shaw[1], Kerry Hastings[1] and Keith Dorschner[2], [1]Dow AgroSciences, LLC, Indianapolis, IN, [2]Rutgers Univ., Princeton, NJ

3:05 1242 Novaluron: Adventures in minor crop development, international collaboration and pronunciation. **Robert Everich**, rce@manainc.com, MANA, Norwalk, CT

3:25 Break

3:40 1243 Labeling insecticides for vegetable production under greenhouse: The need of new modes of action. **Michael Bledsoe**, mbledsoe@villagefarms.com, Village Farms International, Heathrow, FL

4:00 1244 Challenges registering and marketing insecticides in markets outside of agriculture. **John Fitt**, jrfitt@dow.com, Dow AgroSciences, LLC, Indianapolis, IN

4:20 1245 Non-agricultural uses of neonicotinoid insecticides. **Ralf Nauen**, ralf.nauen@bayer.com, Bayer CropScience Aktiengesellschaft, Monheim, Germany

4:40 1246 Use and utility of Syngenta insecticide chemistries into the non-ag market segment. **Steve Cosky**[1], Catherine E. Long[1] and David L. Cox[2], [1]Syngenta Crop Protection, LLC, Greensboro, NC, [2]Syngenta Crop Protection, LLC, Madera, CA

5:00 Concluding Remarks

SysEB Section Symposium: Dynamics of the Tropical Ecosystems: A Bug's-Eye View of the Jungle

Meeting Room 6 A (Austin Convention Center)

Moderators and Organizers: Melissa Sánchez Herrera[1], William R. Kuhn[2], Manpreet Kohli[1] and Jessica L. Ware[2], [1]Rutgers Univ., Newark, NJ, [2]Rutgers, The State Univ. of New Jersey, Newark, NJ

1:30 Welcoming Remarks

1:33 1247 Living architectures in army ants. **Simon Garnier**, garnier@njit.edu, New Jersey Institute of Technology, Newark, NJ

1:53 1248 Lianas shape the ecology of tropical canopy ants. **Stephen P. Yanoviak**, steve.yanoviak@louisville.edu, Univ. of Louisville, Louisville, KY

2:13 1249 Population variation in sexual dimorphism in the damselfly *Megaloprepus caerulatus*: Evidence for genetic divergence? **Ola Fincke**, fincke@ou.edu[1], Mingzi Xu[2], Emily Khazan[1] and Jessica L. Ware[3], [1]Univeristy of Oklahoma, Norman, OK, [2]Univ. of Oklahoma, Norman, OK, [3]Rutgers, The State Univ. of New Jersey, Newark, NJ

2:33 1250 Oil Company's impact on the equatorial rainforest entomofauna of eastern Ecuador in the Yasuni region. **Terry Erwin**, ERWINT@si.edu, Smithsonian Institution, Washington, DC

2:53 Break

3:03 1251 Aquatic insects of the Guiana Shield. **Andrew Short**, aezshort@ku.edu, Univ. of Kansas, Lawrence, KS

3:23 1252 Ants of the Tropics. **Seán Brady**, bradys@si.edu, National Museum of Natural History, Washington, DC

3:43 1253 The roles of phylogeny and ecology in shaping Cassidine beetle associations with diverse tropical vegetation. **Caroline S. Chaboo**, cschaboo@ku.edu, Univ. of Kansas, Lawrence, KS

4:03 1254 African dragonflies and damselflies: Becoming the world's best-known tropical insect fauna? **Klass Djikstra**, KD.Dijkstra@ncbnaturalis.nl, NCB Naturalis, Leiden, Netherlands

4:23 1255 Scorpion biogeography: the Antilles. **Lauren Esposito**, espositola@gmail.com, Berkley, Berkley, CA

4:43 1256 Neotropical foodwebs in bromeliads. **Diane S. Srivastava**, srivast@zoology.ubc.ca, Univ. of British Columbia, Vancouver, BC, Canada

5:03 1257 Postcopulatory sexual selection in tropical odonates. **Adolfo Cordero-Rivera**, adolfo.cordero@uvigo.es, Grupo de Ecoloxía Evolutiva e da Conservación, Pontevedra, Spain

5:23 Concluding Remarks

Member Symposium: Challenges and Opportunities for Classical Biological Control: A Roadmap for New Investigators

Meeting Room 10 C (Austin Convention Center)

Moderators and Organizers: Robert M. Nowierski[1] and Kim A. Hoelmer[2], [1]USDA-National Institute of Food and Agriculture, Washington, DC, [2]USDA, Agricultural Research Service, Montferrier, France

1:30 1258 Introduction. **Robert Nowierski**, rnowierski@nifa.usda.gov, USDA-National Institute of Food and Agriculture, Washington, DC and Kim A. Hoelmer, USDA, Agricultural Research Service, Montferrier, France

1:35 1259 Identifying appropriate targets for classical biological control and determining their place of origin. **John Goolsby**, john.goolsby@ars.usda.gov, USDA, Agricultural Research Service, Edinburg, TX

1:50 1260 Importance of taxonomic support for classical biocontrol programs and the contributions of molecular genetics. **John Gaskin**, jgaskin@sidney.ars.usda.gov, USDA-ARS, Sidney, MT

2:05 1261 Gathering stakeholder and monetary support for biological control. **Robert Nowierski**, rnowierski@nifa.usda.gov, USDA-National Institute of Food and Agriculture, Washington, DC

2:20 1262 Importance of foreign collaborators and knowledge of access and benefits sharing in donor countries. **Kim A. Hoelmer**, khoelmer@ars-ebcl.org, USDA, Agricultural Research Service, Montferrier, France

2:35 1263 Foreign exploration: Benefits of experience. **Mark S. Hoddle**, mark.hoddle@ucr.edu, Univ. of California, Riverside, Riverside, CA

2:55 1264 International conventions, standards and commercial carriers. **Dominique Coutinot**, dcoutinot@ars-ebcl.org, USDA ARS, Montferrier, France

3:10 1265 Customs and border protection/APHIS-PPQ inspection stations, importation permits & hand carrying. **Robert H. Tichenor**, Robert.h.tichenor@aphis.usda.gov, USDA, Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ), Riverdale, MD

3:25 Break

3:40 1266 Host specificity studies in quarantine facilities and/or place of origin of natural enemy (physiological vs. ecological host range). **George Heimpel**, heimp001@umn.edu, Univ. of Minnesota, St. Paul, MN

3:55 1267 Regulatory challenges – biological control of weeds. **Alfred F. CoFrancesco**, Al.F.Cofrancesco@erdc.usace.army.mil, United States Army, Corps of Engineers, Vicksburg, MS

4:10 1268 Regulatory challenges – biological control of arthropods. **Peter Mason**, peter.mason@agr.gc.ca, Agriculture and Agri-Food Canada, Ottawa, ON, Canada

4:25 1269 Collecting and exporting genetic resources in Argentina: A case study. **Juan Briano**, jabriano@speedy.com.ar, USDA-ARS-SABCL, Hurlingham, Buenos Aires Pro, Argentina

4:40 1270 Environmental release, redistribution, and monitoring. **Charles H. Pickett**, cpickett@cdfa.ca.gov, California Dept. of Food and Agriculture, Sacramento, CA

4:55 1271 Evaluation of impacts – target and non-target. **Russell Messing**, messing@hawaii.edu, Univ. of Hawaii, Kapaa, HI

Member Symposium: Connecting Virus Transmitting Mosquito Information: From Laboratory to Surveillance and Management in the Field

Meeting Room 8 AB (Austin Convention Center)

Moderators and Organizers: Sonja L. Swiger[1], Wizzie Brown[2] and Janet A. Hurley[3], [1]Texas A&M AgriLife Extension Service, Stephenville, TX, [2]Texas A&M AgriLife Extension Service, Austin, TX, [3]Texas A&M AgriLife Extension Service, TAMU Ag Research & Extension Center, Dallas, TX

1:30 Welcoming Remarks

1:35 1272 Overview of Mosquito Viruses in the United States. **Mark Johnsen, PhD**, mjohnsen@brazoscountytx.gov, Brazos County Health Dept., Bryan, TX

2:05 1273 Overview of Mosquito Abatement Programs from a National Level. **Janet McAllister, PhD, BCE**, jvm6@cdc.gov, Center for Disease Control (CDC) and Prevention, Fort Collins, CO

2:35 1274 New York State: 13 Years of Response to WNV and Other Arboviruses. **P. Bryon Backenson**, bpb01@health.state.ny.us, New York State Dept. of Health, Albany, NY

3:05 1275 Overview Harris County, TX Mosquito Control Program. **Rudy Bueno, PhD**, rbueno@hcphes.org, Harris Country Public Health and Environmental Services, Houston, TX

3:35 Break

3:55 1276 Resurgence of West Nile virus in New Orleans or after a storm. **Claudia Riegel**, criegel@nola.gov[1], Sarah Michaels[2] and Andrew Ruiz[2], [1]City of New Orleans Mosquito, Termite, and Rodent Control Board, New Orleans, LA, [2]City of New Orleans Mosquito, Termite and Rodent Control Board, New Orleans, LA

4:25 1277 Connecting People from Laboratory to the Field - How Laboratory Research can be Utilized by Those Monitoring Mosquitoes in the Field. **Gabriel Hamer, PhD**, ghamer@tamu.edu, Texas A&M Univ., College Station, TX

4:55 1278 The 2012 Dallas West Nile virus Outbreak: Facing the Challenge of Mosquito Control Education in Large Metropolitan Areas. **Michael E. Merchant, PhD, BCE**, m-merchant@tamu.edu, Texas A&M AgriLife Extension, Dallas, TX

5:25 Concluding Remarks

Member Symposium: Innovative Global Strategies to Connect Entomologists with their Communities through Education, Outreach and Extension Programs

Meeting Room 8 C (Austin Convention Center)

Moderators and Organizers: Marianne Shockley[1], Martha Rosett Lutz[2] and Mustapha El-Bouhssini[3], [1]Univ. of Georgia, Athens, GA, [2]Bluegrass Community and Technical College, Lexington, KY, [3]International Center for Agricultural Research in the Dry Areas, Manhattan, KS

1:30 Introductory Remarks

1:35 1279 Farmer Field Schools: Empowering smallholder farmers in IPM and sustainable production intensification. **Alfredo Impiglia**, impiglia-fao@scs-net.org, FAO, Damascus, Syria

1:55 1280 Farmer participatory approaches based integrated pest management in the Cereal and food legume cropping system: a novel way for better technology dissemination in Morocco. **Saadia Lhaloui**, SLhaloui@yahoo.com, INRA, Settat, Morocco

2:15 1281 The potential for web-based, mobile-phone delivered IPM decision supporting developing countries. **Edwin Rajotte**, egrajotte@psu.edu, Pennsylvania State Univ., State College, PA

2:35 1282 International Service-Learning: Connecting students to global communities through education and service. **Marianne Shockley**, entomolo@uga.edu, Univ. of Georgia, Athens, GA

2:55 Break

3:10 1283 President's Prize for Education Teacher Award: Primary Education Winner. **Laura Gagnon**, gagnonl@crcs.k12.ny.us, Howes Cave, NY

3:30 1284 President's Prize for Education Teacher Award: Secondary Education Winner. **Joyce M. Forand-Voorhis**, joycemforandvoorhis@bpsma.org, Brockton, MA

3:50 1285 The potential of tablet computing for resource delivery in studying entomology online. **David Merritt**, Univ. of Queensland, Brisbane, Australia

4:10 1286 Bilingual entomology outreach programs. **Kristie Reddick**, contactus@thebugchicks.com and Jessica Honaker, Texas A&M Univ., Portland, OR

4:30 1287 Lessening the 'Distance' in Distance Education. **Nancy Miorelli**, Univ. of Georgia, Athens, GA

4:50 Concluding Remarks

Member Symposium: Making Connections Abroad: First Latin American/Hispanic Symposium

Meeting Room 15 (Austin Convention Center)

Moderators and Organizers: Silvia I. Rondon[1], Ana Legrand[2], Raul F. Medina[3] and Erik Echegaray[1], [1]Oregon State Univ., Hermiston, OR, [2]Univ. of Connecticut, Storrs, CT, [3]Texas A&M Univ., College Station, TX

1:30 1288 Introduction. **Silvia I. Rondon**, silvia.rondon@oregonstate.edu[1], Ana Legrand[2], Raul F. Medina[3] and Erik Echegaray[1], [1]Oregon State Univ., Hermiston, OR, [2]Univ. of Connecticut, Storrs, CT, [3]Texas A&M Univ., College Station, TX

1:50 1289 Entomologists without borders: How to follow with passion your profession. **Silvia I. Rondon**, silvia.rondon@oregonstate.edu, Oregon State Univ., Hermiston, OR

2:10 1290 Challenges on the road to success for the young hispanic scientist. **Luis Gomez**, EGomez2@dow.com and Boris A. Castro, Dow AgroSciences, Indianapolis, IN

2:30 1291 The advantages of collaborating among friends. **Raul F. Medina**, rfmedina@ag.tamu.edu, Texas A&M Univ., College Station, TX

2:50 1292 Promoting the idea of Integrated Pest Management through borders and connections. **Ana Legrand**, ana.legrand@uconn.edu, Univ. of Connecticut, Storrs, CT

3:10 1293 Connecting research and extension IPM in berry crops: The satisfactions of a job in extension. **Cesar Rodriguez-Saona**, CRodriguez@RCE.Rutgers.edu, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

3:30 1294 A Latino graduate student perspective on pest management research in poplars and soybeans. **Alejandro Del Pozo**, aidelpoz@ncsu.edu, North Carolina State Univ., Raleigh, NC

3:50 Break

4:10 1295 From the field to the molecule and back to the field: 23 years of integrated pest management research. **Juan M. Alvarez**, juan.m.alvarez@usa.dupont.com, DuPont Crop Protection, Palmyra, NY

4:30 1296 How the study of maize domestication provides insight to pest evolution and facilitates connecting abroad. **Julio S. Bernal**, juliobernal@neo.tamu.edu, Texas A&M Univ., College Station, TX

4:50 1297 Collaborative opportunities with beekeepers in Latin America. **Juliana Rangel-Posada,** juliana.rangel-posada@ag.tamu.edu, Texas A&M University, College Station, TX

5:10 1298 An international, team-based graduate education and research program: Lessons from an Idaho-Costa Rica collaboration. **Nilsa Bosque-Pérez**, nbosque@uidaho.edu, Univ. of Idaho, Moscow, ID

5:30 1299 Entomological research and extension from 64 degrees north to 33 degrees south. **Alberto Pantoja**, alberto.pantoja@ars.usda.gov, United Nations Food and Agriculture Organization Regional, Santiago de Chile, Chile

Member Symposium: Mass-Production of Insects and Pathogens for Insect and Weed Biocontrol

Meeting Room 14 (Austin Convention Center)

Moderators and Organizers: Patrick J. Moran[1] and Juan A. Morales-Ramos[2], [1]USDA Agricultural Research Service, Albany, CA, [2]USDA, Agricultural Research Service, Stoneville, MS

1:30 Introductory Remarks

1:35 1300 Mass-production of mite predators. **Guadalupe Rojas**, guadalupe.rojas@ars.usda.gov, USDA - ARS, Stoneville, MS and Juan A. Morales-Ramos, USDA, Agricultural Research Service, Stoneville, MS

1:55 1301 Heteropteran predator production: Status and contributions to mass production of insects. Patrick De Clercq, Ghent Univ., Ghent, Belgium, **Thomas A. Coudron**, tom.coudron@ars.usda.gov, USDA - ARS, Columbia, MO and Eric W. Riddick, USDA - ARS, Stoneville, MS

2:15 1302 Mass-production of coleopteran predators. **Eric W. Riddick**, eric.riddick@ars.usda.gov, USDA - ARS, Stoneville, MS

2:35 1303 Mass-production of tachinid parasitoids. **Maria Luisa Dindo**, marialuisa.dindo@unibo.it, Alma Mater Studium Università di Bologna, Bologna, Italy and Simon Grenier, INRA INSA Lyon (Retired), Chassieu, France

2:55 1304 Mass-rearing of hymenopteran parasitoids of *Bemisia* whiteflies for support of classical and augmentative biological control programs. **John Goolsby**, john.goolsby@ars.usda.gov, USDA, Agricultural Research Service, Edinburg, TX, Matthew Ciomperlik, USDA, APHIS, Plant Protection & Quarantine,, Edinburg, TX, Gregory Simmons, USDA - APHIS, Salinas, CA, Charlie Pickett, California Dept.

of Food and Agriculture, Sacramento, CA, Juli Gould, USDA - APHIS, Buzzards Bay, MA and Kim A. Hoelmer, USDA, Agricultural Research Service, Montferrier, France

3:15 1305 Artificial diet development for entomophagous arthropods. **Juan A. Morales-Ramos**, juan.moralesramos@ars.usda.gov, USDA, Agricultural Research Service, Stoneville, MS, M. Guadalupe Rojas, USDA-ARS-NBCL, Stoneville, MS and Thomas A. Coudron, USDA - ARS, Columbia, MO

3:35 1306 Mass-production of the arundo wasp and other insects for biological weed control. **Patrick J. Moran**, patrick.moran@ars.usda.gov[1], John A. Goolsby[2], Alex E. Racelis[3], Allen C. Cohen[4], Matthew A. Ciomperlik[5], Kenneth R. Summy[3], Don P.A. Sands[6] and Alan A. Kirk[7], [1]USDA Agricultural Research Service, Albany, CA, [2]USDA, Agricultural Research Service, Edinburg, TX, [3]Univ. of Texas, Pan American, Edinburg, TX, [4]North Carolina State Univ., Raleigh, NC, [5]USDA, APHIS, Plant Protection & Quarantine, Edinburg, TX, [6]Commonwealth Science, Industry and Research Organization (CSIRO) (Retired), Brisbane, Queensland, Australia, [7]USDA - ARS, Sainy Gely du Fesc, Montpellier, France

3:55 1307 Concepts and methods of quality assurance for mass-reared parasitoids and predators. **Norman Leppla**, ncleppla@ufl.edu, Univ. of Florida, Gainesville, FL

4:15 1308 Mass-production of entomopathogenic nematodes. **David Shapiro-Ilan**, David.Shapiro@ARS.USDA.GOV[1], Richou Han[2], Xuehong Qiu[2], Juan A. Morales-Ramos[3] and M. Guadalupe Rojas[4], [1]USDA-ARS, SE Fruit and Tree Nut Research Unit, Byron, GA, [2]Guangdong Entomological Institute, Guangzhou, China, [3]USDA, Agricultural Research Service, Stoneville, MS, [4]USDA-ARS-NBCL, Stoneville, MS

4:35 1309 Mass production of entomopathogenic fungi: Challenges to the 'mycodream'. **Stefan T. Jaronski**, stefan.jaronski@ars.usda.gov, USDA-ARS, Sidney, MT

4:55 1310 Production of entomopathogenic viruses. **Steven Reid**, steven.reid@uq.edu.au[1], Leslie Chan[1] and Monique van Oers[2], [1]The Univ. of Queensland, Brisbane, Queensland, Australia, [2]Wageningen Univ., Wageningen, Netherlands

5:15 1311 Microbial bioinsecticide formulations - addressing critical issues. **Robert W Behle**, behlerw@ncaur.usda.gov and Christopher Dunlap, USDA-ARS-NCAUR, Peoria, IL

Member Symposium: New Insights into the Evolution of Insect Coloration

Meeting Room 6 B (Austin Convention Center)

Moderators and Organizers: Heather M. Hines[1] and Brian A. Counterman[2], [1]Pennsylvania State Univ., Univ. Park, PA, [2]Mississippi State Univ., Mississippi State, MS

1:30 Introductory Remarks

1:35 1312 The developmental basis of lepidopteran scale structure. **Nipam Patel**, nipam@berkeley.edu, Univ. of California at Berkeley, Berkeley, CA

1:55 1313 Butterfly wing pattern development: From pattern formation to pigmentation. **Robert Reed**, robertreed@cornell.edu, Cornell Univ., Ithaca, NY

2:15 1314 Genetic architecture of *Heliconius* warning colors. **Brian A. Counterman**, bcounterman@biology.msstate.edu, Mississippi State Univ., Mississippi State, MS

2:35 Break

2:45 1315 Molecular mechanisms underlying sex-specific color pattern formation in dragonflies. **Ryo Futahashi**, ryo-futahashi@aist.go.jp, National Institute of Advanced Industrial Science and Technology (AIST), Ibaraki, Japan and Takema Fukatsu, Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki, Japan

3:05 1316 Dissecting enhancers of the *Drosophila* pigmentation gene *yellow* reveals evolutionary potential for changes in expression. **Gizem Kalay**, gizemkly@umich.edu[1], Richard Lusk[1], Mackenzie Dome[2], Ulises Rosas[3], Antonina Lagovitina[4], Korneel Hens[5], Bart Deplancke[6] and Patricia Wittkopp[1], [1]Univ. of Michigan, Ann Arbor, MI, [2]IN, [3]New York Univ., New York, NY, [4]MI, [5]Univ. of Oxford, Oxford, United Kingdom, [6]EPFL-SV-IBI-LBSG, Lausanne, Switzerland

3:25 1317 Transient versus balanced color polymorphism in adaptive radiation: Spiders in the Hawaiian islands. **Michael Brewer**, michaelsbrewer@gmail.com[1], Peter Croucher[1] and Rosemary Gillespie[2], [1]Univ. of California at Berkeley, Berkeley, CA, [2]Univ. of California - Berkeley, Berkeley, CA

3:45 1318 Molecular and developmental basis of mimetic coloration in bumble bees. **Heather M. Hines**, hmh19@psu.edu, Pennsylvania State Univ., Univ. Park, PA

4:05 Break

4:15 1319 Color and the evolution of insect communication. **Adriana D. Briscoe**, abriscoe@uci.edu, Univ. of California-Irvine, Irvine, CA and Daniel Osorio, Univ. of Sussex, Brighton, United Kingdom

4:35 1320 Linking mimicry and mate choice in butterflies. **Marcus Kronforst**, mkronforst@uchicago.edu, Univ. of Chicago, Chicago, IL

4:55 1321 Good genes, limiting nutrients and female choice: Evolution of exaggerated male coloration in the cabbage white butterfly, *Pieris rapae*. **Nathan Morehouse**, nim@pitt.edu, Univ. of Pittsburgh, Pittsburgh, PA

5:15 Concluding Remarks

Member Symposium: Plant Secondary Chemistry and Insect-Plant Interactions: The role of Iridoid Glycosides

Meeting Room 19 A (Austin Convention Center)

Moderators and Organizers: Saskya van Nouhuys[1] and Deane Bowers[2], [1]Cornell Univ., Ithaca, NY, [2]Univ. of Colorado, Boulder, CO

1:30 Welcoming Remarks

1:35 1322 Ecological costs and benefits of iridoid glycosides in ribwort plantain. **Arjen Biere**, A.Biere@nioo.knaw.nl, The Netherlands Institute of Ecology, Wageningen, Netherlands

1:55 1323 Ecology and evolution of iridoid glycoside sequestration in the Lepidoptera. **M. Deane Bowers**, Deane.Bowers@colorado.edu, Univ. of Colorado, Boulder, CO

2:15 1324 The consequences of iridoid glycosides on host plant choice by herbivores of varying diet breadth. **Caitlin Kelly**, Caitlin.a.kelly@colorado.edu, Univ. of Colorado, Boulder, Boulder, CO

2:35 1325 Linking chemical ecology and biological control of an invasive plant, Dalmatian toadflax (*Linaria dalmatica*). **Mary A. Jamieson**, maryajamieson@gmail.com, Univ. of Wisconsin, Madison, WI

2:55 1326 Caterpillar biochemical responses to host plant iridoid glycosides. **Helga Pankoke**, Helga.pankoke@uni-bielefeld.de, Biozentrum Grindel, Hamburg, Germany

3:15 Break

3:30 1327 What are ecologically meaningful concentrations of Iridoids in plants, herbivores and parasitoids? **Saskya van Nouhuys**, saskya@cornell.edu, Cornell Univ., Ithaca, NY

3:50 1328 Effects of diet quality in a multi enemy world: IG's as a defence against parasitoids, generalist predators and bacteria. **Joanneke Reudler Talsma**, talsma.reudler@jyu.fi, Dept. of Biological and Environmental Science, Jyväskylä, Finland

4:10 1329 Iridoid glycosides from a parasitoid's perspective: Are sequestering herbivores "nasty hosts" or "safe havens"? **Evan Lampert**, Evan.lampert@ung.edu, Univ. of North Georgia, Oakwood, GA

4:30 1330 The effects of iridoid glycosides on the lepidopteran immune response. **Angela Smilanich**, asmilanich@unr.edu, Univ. of Nevada, Reno, NV

4:50 Concluding Remarks

Member Symposium: Strengthening the Connection between Continents –A Symposium Honoring Silvia Dorn's Impact on Applied Entomological Research

Meeting Room 9 AB (Austin Convention Center)

Moderators and Organizers: Mark Sarvary[1] and Jaime C. Pinero[2], [1]Cornell Univ., Ithaca, NY, [2]Lincoln Univ. of Missouri, Jefferson City, MO

1:30 Introductory remarks: symposium overview

1:45 1331 Flying Lessons: Moth movement between Canada, the United States and Switzerland. **Stephanie Bloem**, Stephanie.Bloem@aphis.usda.gov, USDA-APHIS-PPQ, CPHST, PERAL, Raleigh, NC and Kenneth A. Bloem, USDA-APHIS-PPQ-CPHST, Raleigh, NC

2:05 1332 Contributing knowledge to a worldwide challenge: Codling moth (*Cydia pomonella*) - how is it affected by orchard systems? **Ute Chambers**, uchambers@wsu.edu, Washington State Univ., Wenatchee, WA

2:25 1333 No time to be neutral when invasive species jump continents: The *Cactoblastis cactorum* and *Sirex noctilio* stories. **Mark A. Sarvary**, mas245@cornell.edu, Cornell Univ., Ithaca, NY

2:45 1334 Arthropod assemblages and interactions in tropical silvopastoral reforestation systems. **Karsten Mody**, mody@bio.tu-darmstadt.de, Universität Darmstadt, Darmstadt, Germany

3:05 Break

3:20 1335 Leading the way toward innovative and sustainable solutions for agriculture: Silvia Dorn, a role model for women in science. **Tracy C. Leskey**, tracy.leskey@ars.usda.gov, USDA, Agricultural Research Service, Kearneysville, WV

3:40 1336 Getting to know a moth: The chemical ecology of the oriental fruit moth. **Jaime Pinero**, PineroJ@lincolnu.edu, Lincoln Univ., Jefferson City, MO

4:00 1337 High genetic diversity and structured populations of the oriental fruit moth in its range of origin. **Maohua Chen**, maohua.chen@nwsuaf.edu.cn, Northwest A&F Univ., Yangling, China

4:20 1338 From flies to beetles: My metamorphosis at ETH. **Jian J. Duan**, jian.duan@ars.usda.gov, USDA, Agricultural Research Service, Newark, DE

4:40 1339 Behavior matters: Of biological control by parasitoids and other female jobs. **Dominique Mazzi**, dominique.mazzi@usys.ethz.ch, ETH Zürich, Zurich, Switzerland

5:00 Concluding Remarks

Member Symposium: Taxonomy and Systematics within the Tenebrionoidea (Coleoptera)

Meeting Room 7 (Austin Convention Center)

Moderators and Organizers: Nathan P. Lord[1], Kojun Kanda[2] and Traci L. Grzymala[3], [1]Univ. of New Mexico, Albuquerque, NM, [2]Oregon State Univ., Corvallis, OR, [3]Univ. of California, Berkeley, CA

1:30 Introductory Remarks

1:35 1340 Tribulations in the study of the nominate subgenus of *Eleodes*. **Donald B. Thomas**, donald.thomas@ars.usda.gov, USDA-ARS, Edinburg, TX

1:55 1341 Towards a comprehensive phylogenetic revision of the genus *Eleodes* (Coleoptera: Tenebrionidae). **Aaron D. Smith**, pimeliinae@gmail.com, American Museum of Natural History, New York, NY

2:15 1342 Systematics of the tribe Ulomini (Coleoptera: Tenebrionidae) in North and Central America and the West Indies. **Patrice Bouchard**, patrice.bouchard@agr.gc.ca and Yves Bousquet, Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, ON, Canada

2:35 1343 The genus *Cnemodinus* Cockerell: A new view after Casey, 1907 (Coleoptera: Tenebrionidae: Pimeliinae). **Warren E. Steiner**, steinerw@si.edu, Smithsonian Institution, Washington, DC

2:55 1344 The Tenebrionidae of California. **Rolf Aalbu**, raalbu@comcast.net, California Academy of Sciences, San Francisco, CA

3:15 1345 Molecular phylogeny of Tenebrionidae. **Kojun Kanda**, kandak@science.oregonstate.edu and David Maddison, Oregon State Univ., Corvallis, OR

3:35 Break

3:40 1346 *Phreatus* - What is it? **Michael A. Ivie**, mivie@montana.edu, Montana State Univ., Bozeman, MT, Ian A. Foley, Montana Dept. of Agriculture, Helena, MT and Nathan P. Lord, Univ. of New Mexico, Albuquerque, NM

4:00 1347 A review of the Acropini (Coleoptera: Zopheridae). **Ian A. Foley**, IFoley@mt.gov, Montana Dept. of Agriculture, Helena, MT and Michael A. Ivie, Montana State Univ., Bozeman, MT

4:20 1348 An Ironclad family? The first phylogeny of Zopheridae (Coleoptera: Tenebrionoidea) based on molecular data. **Nathan**

P. Lord, bothriderid@gmail.com and Kelly B. Miller, Univ. of New Mexico, Albuquerque, NM

4:40 1349 Evolution and systematics of the family Ulodidae (Coleoptera: Tenebrionoidea). **Richard AB. Leschen**, LeschenR@landcareresearch.co.nz, Landcare Research, Auckland, New Zealand and Hermes Escalona, CSIRO, Canberra, ACT, Australia

5:00 1350 Anthicidae: systematics and dispersalist genera in a vicariant world. **Donald S. Chandler**, dsc1@cisunix.unh.edu, Univ. of New Hampshire, Durham, NH

5:20 1351 Setal brushes, pads, and pits: morphological character evaluation within the Aderidae (Coleoptera: Tenebrionoidea). **Traci L. Grzymala**, mala@berkeley.edu, Univ. of California, Berkeley, CA

5:40 1352 Revisiting the Ripidiinae (Coleoptera: Ripiphoridae): A generic level phylogeny and discussion of their familial placement. **Zachary Falin**, ksem@ku.edu and K. Taro Eldredge, Univ. of Kansas, Lawrence, KS

6:00 Concluding Remarks

Ten-Minute Papers, MUVE Section: Stored Product Pests

Meeting Room 18 A (Austin Convention Center)

Moderators: Frank Arthur[1] and Ellen M. Thoms[2], [1]USDA-ARS, Manhattan, KS, [2]Dow AgroSciences, Gainesville, FL

1:30 1353 Methyl bromide alternatives for pest *Trogoderma* (Coleoptera: Dermestidae) from stored-product systems. **Mukti N. Ghimire**, mukti@ksu.edu[1], Scott W. Myers[2], Frank H. Arthur[3] and Thomas Phillips[1], [1]Kansas State Univ., Manhattan, KS, [2]USDA-APHIS, Buzzards Bay, MA, [3]USDA, Agricultural Research Service, Manhattan, KS

1:42 1354 A closed loop system improves phosphine fumigation in stored grain facilities. **Edmond Bonjour**, edmond.bonjour@okstate.edu, Carol Jones and Randy Beeby, Oklahoma State Univ., Stillwater, OK

1:54 1355 Enhancing identification of cerambycids and buprestids from port interceptions in solid wood packing material. **Peter F. Reagel**, Peter.F.Reagel@aphis.usda.gov[1], Hannah Nadel[2], Scott W. Myers[2] and Ann M. Ray[1], [1]Xavier Univ., Cincinnati, OH, [2]USDA-APHIS, Buzzards Bay, MA

2:06 1356 Intersection of Khapra beetle, *Trogoderma granarium* (Everts) coming to the U.S. from abroad. **Joel Perez-Mendoza**, Joel.Perez-Mendoza@aphis.usda.gov, USDA-APHIS-PPQ, Laredo, TX and Charles Brodel, USDA-APHIS-PPQ, Miami, FL

2:18 Break

2:33 1357 Factors affecting susceptibility of stored product insects to temperatures occurring during heat disinfestation of structures. **Guy J. Hallman**, Guy.Hallman@ars.usda.gov, USDA, ARS, Manhattan, KS

2:45 1358 Residual efficacy of chlorfenapyr (Phantom®) to control the red flour beetle, *Tribolium castaneum*. **Frank Arthur**, frank.arthur@ars.usda.gov, USDA-ARS, Manhattan, KS

2:57 1359 Efficacy of Phantom EC versus Phantom Pl (chlorphenapyr) formulations on warehouse beetle (*Trogoderma variabile*) and red flour beetle (*Tribolium castaneum*). **Sharon Dobesh**, sdobesh@ksu.edu, Kansas State Univ., Manhattan, KS and Frank H. Arthur, USDA, Agricultural Research Service, Manhattan, KS

3:09 1360 Update on use of ProFume® gas fumigant (sulfuryl fluoride) as a post-harvest fumigant. **Ellen M. Thoms**, emthoms@dow.com, Dow AgroSciences, Gainesville, FL

3:21 1361 Resistance levels of cigarette beetle, *Lasioderma serricorne* F. (Coleoptera; Anobiidae) populations to phosphine fumigation. **Ozgur Saglam**, osaglam@ksu.edu[1], Peter Edde[2] and Thomas Phillips[1], [1]Kansas State Univ., Manhattan, KS, [2]Altria Client Services Inc., Richmond, VA

3:33 1362 Oxygenated phosphine fumigation for postharvest control of light brown apple moth on lettuce. **Samuel Liu**, samuel.liu@ars.usda.gov, USDA-ARS, Salinas, CA, Yong-Biao Liu, USDA - ARS, Salinas, CA and Gregory Simmons, USDA - APHIS, Salinas, CA

3:45 1363 A PCR-based method to detect phosphine resistance in stored product beetles. **Zhaorigetu Chen**, jorigtoo@ksu.edu[1], Michael Jamison Aikins[1], George P. Opit[2], David Schlipalius[3] and Thomas Phillips[1], [1]Kansas State Univ., Manhattan, KS, [2]Oklahoma State Univ., Stillwater, OK, [3]Agri-Science Queensland, Brisbane, Australia

3:57 1364 Evaluation of attractants for several stored-product psocid species. **John Diaz-Montano**, john.diaz-montano@ars.usda.gov, USDA-ARS Center for Grain and Animal Health Research, Manhattan, KS, James E. Throne, USDA-ARS San Joaquin Valley Agricultural Sciences Center, Parlier, CA and James F. Campbell, USDA Agricultural Research Service, Manhattan, KS

Ten-Minute Papers, MUVE Section: Veterinary and Forensic Entomology

Meeting Room 18 C (Austin Convention Center)

Moderators: Jimmy Pitzer[1], K. H. Lohmeyer[2] and Aaron Tarone[3], [1]New Mexico State Univ., Las Cruces, NM, [2]USDA, Agricultural Research Service, Kerrville, TX, [3]Texas A&M Univ., College Station, TX

1:30 1365 Utilization grasshopper (*Schistocerca piceifrons piceifrons*) for purposes of use as dietary supplement (nutraceutical) for human and animal consumption. **Martinez Bernardo**, bmartinezg@kimpen.com, KIMPEN S.A DE C.V., YUCATAN, Mexico

1:42 1366 Effect of ambient temperature on the developmental rate of *Chrysomya magacephala* in Thailand. Guntima Suwannapong, Burapha Univ., Chon Buri, Thailand, **Chatupon Chankong**, sguntima2412@hotmail.com, Burapha university, Chon Buri, Thailand and M. Eric Benbow, Univ. of Dayton, Dayton, OH

1:54 1367 Selecting for blow fly development: Forensically important *Cochliomyia macellaria*. **Ernesto Ramos**, ducky3@neo.tamu.edu[1], Christine Picard[2] and Aaron Tarone[1], [1]Texas A&M Univ., College Station, TX, [2]Indiana Univ. Purdue Univ. Indianapolis (IUPUI), Indianapolis, IN

2:06 1368 Implications of sex and ovarian status on the responses of *Luclia sericata* (Meigan) (Diptera: Calliphoridae) to volatile compounds related to carrion. **Wenqi Liu**, veracious@tamu.edu[1], Aaron M. Tarone[2] and Jeffery K. Tomberlin[2], [1]Texas A&M Univ., College station, TX, [2]Texas A&M Univ., College Station, TX

2:18 1369 Forensic examination of the effects of oceanic environments on faunal scavenging of cadaver proxies in two contrasting marine habitats. **Gail Anderson**, ganderso@sfu.ca and Lynne Bell, Simon Fraser Univ., Burnaby, BC, Canada

2:30 1370 A look at collection bias in forensic entomology classes: Does training matter? **Jennifer Seltzer**, jls30@entomology.msstate.edu, Mississippi Entomological Museum, Mississippi State, MS

2:42 1371 Consequences of genome size variation in forensic entomology. **Aaron Tarone**, amtarone@ag.tamu.edu[1], Christine Picard[2], Lisa Ellis[1] and J. Spencer Johnston[1], [1]Texas A&M Univ., College Station, TX, [2]Indiana Univ. Purdue Univ. Indianapolis (IUPUI), Indianapolis, IN

2:54 1372 Genetic diversity and structure of *Cochliomyia hominivorax* populations from the Americas. **Thiago Mastrangelo**, thiagomastrangelo@gmail.com, Center for Nuclear Energy in Agriculture (CENA/USP), Piracicaba, Brazil, Pablo Fresia, Univ. of Sao Paulo/ESALQ, Piracicaba, Brazil, Mariana Lúcio Lyra, Univ. of Campinas, Campinas, São Paulo, Brazil, Rosangela Rodrigues, Univ. of Campinas (UNICAMP), Campinas, Brazil and Ana Maria L. Azeredo-Espin, State Univ. of Campinas (UNICAMP), Campinas, Sao Paulo, Brazil

3:06 Break

3:16 1373 Identification and characterization of physical parameters associated with stable fly (*Stomoxys calcitrans* (L.)) development. **Kristina Friesen**, Kristina.Friesen@ars.usda.gov[1], David Taylor[2], Dennis Berkebile[2] and Brian Wienhold[2], [1]USDA, Agricultural Research Service, Lincoln, NE, [2]USDA-ARS, Lincoln, NE

3:28 1374 Size is important: Characterizing stable fly populations with morphometrics. **David Taylor**, Dave.Taylor@ars.usda.gov, USDA-ARS, Lincoln, NE and Kristina Friesen, USDA, Agricultural Research Service, Lincoln, NE

3:40 1375 Presentation withdrawn.

3:52 1376 Improving fly management with bedding conditioners in dairy calf hutches. **Holly Ferguson**, hferguson@wsu.edu[1], Alec Gerry[2] and Douglas Walsh[1], [1]Washington State Univ., Prosser, WA, [2]Univ. of California, Riverside, Riverside, CA

4:04 1377 Are biting fly larvae biological reservoirs of *Salmonella*? **K. H. Lohmeyer**, kim.lohmeyer@ars.usda.gov[1], P. U. Olafson[1] and T. S. Edrington[2], [1]USDA, Agricultural Research Service, Kerrville, TX, [2]USDA, Agricultural Research Service, College Station, TX

4:16 1378 Association of *Escherichia coli* with the prevalence of flies population west of Baghdad. **Hassan Hassan**, Flayiah@yahoo.com, Univ. of Baghdad, Baghdad, Iraq

4:28 Break

4:38 1379 Efficacy of KnightStick traps and sticky wraps for attraction and capture of stable flies (*Stomoxys calcitrans*). **Jerome Hogsette**, jerry.hogsette@ars.usda.gov and Daniel Kline, USDA-ARS-CMAVE, Gainesville, FL

4:50 1380 EndZone® Insecticide Sticker for indoor filth fly control. **Dina Richman**, Dina.Richman@fmc.com, FMC Corporation, Philadelphia, PA and Steven Mora, FMC Corp., Philadelphia, PA

5:02 1381 Modeling biological control of stable flies (*Stomoxys calcitrans*) by means of *Spalangia cameroni*. **Gösta Nachman**, gnachman@bio.ku.dk, Section of Ecology and Evolution, Univ. of Copenhagen, Copenhagen, Denmark

5:14 1382 Presentation withdrawn.

5:26 1383 Multiplex PCR in the horn fly: Detection of pyrethroid, organophosphate and cyclodiene target site resistance. **Luisa Domingues**, dominguesln@gmail.com[1], Felix Guerrero[2] and Lane Foil[1], [1]Louisiana State Univ. Agricultural Center, Baton Rouge, LA, [2]USDA, Agricultural Research Service, Kerrville, TX

5:38 1384 Insecticide resistance of *Alphitobius diaperinus* to β-Cyfluthrin and commercial insecticides on various surfaces common in poultry operations. **Brandon Lyons**, brandonct@tamu.edu[1], Tawni L. Crippen[2], Pete Teel[1] and Jeffery K. Tomberlin[1], [1]Texas A&M Univ., College Station, TX, [2]USDA - ARS, College Station, TX

5:50 1385 Ten years of entomological surveillance for bluetongue in Sicily. **Alessandra Torina**, alessandra.torina@gmail.com[1], Santo Caracappa[1], Salvatore Scimeca[1], Francesco La Russa[1], Vincenzo Di Marco[2] and Rossella Lelli[1], [1]Istituto Zooprofilattico Sperimentale della Sicilia, PALERMO, Italy, [2]Istituto Zooprofilattico Sperimentale della Sicilia, BARCELLONA P.G., Italy

6:02 1386 Population genetic analyses of chewing lice (*Geomydoecus ewingi*) parasitizing pocket gophers (*Geomys breviceps*). **Caitlin Nessner**, ness87c@tamu.edu, Texas A&M Univ., College Station, TX

Ten-Minute Papers, PBT Section: Insect-microbe interactions, immunity, and parasitology

Meeting Room 18 D (Austin Convention Center)

Moderators: Ping Wang[1] and Brenna E Traver[2], [1]Cornell Univ. NYSAES, Geneva, NY, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

1:30 1387 Gut associated bacteria of insecticide-resistant lines of *Spodoptera frugiperda:* Diversity and potential role in insecticide degradation. Luis Gustavo de Almeida[1], Celso Omoto[2] and **Fernando L Cônsoli**, fconsoli@usp.br[1], [1]Universidade de São Paulo/ESALQ, Piracicaba, Brazil, [2]Univ. of Sao Paulo/ESALQ, Piracicaba, Brazil

1:42 1388 A genome sequence assembly for the *Wolbachia* endosymbiont of the western corn rootworm. **Brad Coates**, Brad.Coates@ARS.USDA.GOV[1], Thomas W. Sappington[1] and Blair Siegfried[2], [1]USDA-ARS, Ames, IA, [2]Univ. of Nebraska, Lincoln, NE

1:54 1389 Domestication of bracoviruses for use as gene delivery vectors by *Microplitis demolitor* parasitoid wasps. **Gaelen Burke**, grburke@uga.edu, The Univ. of Georgia, Athens, GA and Michael R. Strand, Univ. of Georgia, Athens, GA

2:06 1390 Gut microflora of *Helioverpa armigera* influences the biological activity of the delta-endotoxins of the bacterium, *Bacillus thuringiensis*. **Sharma Hari**, h.sharma@cgiar.org, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India and V Surekha Devi, Dept. of Agriculture, Tadepalligudem, West Godavari District, India

2:18 1391 A novel mosquitocidal *Bacillus thuringiensis* strain LLP29 isolated from the phylloplane of *Magnolia denudata*. **Lingling Zhang**, lingling00264@163.com, Fujian Agriculture and Forestry Univ., fuzhou, China

2:30 1392 *Bacillus thuringiensis* Cry1Ca expressed in maize protects against feeding damage from susceptible and Cry1F-resistant *Spodoptera frugiperda*. Joel Sheets, JJSheets@dow.com, Jeff Beringer, Stephanie Burton, Rodney Crosley, Todd Glancy, Sek Yee Tan, Aaron Woosley, Sarah Worden, Andrew Worden, Kenneth Narva, **James Hasler**, Dow AgroSciences LLC, Indianapolis, IN

2:42 1393 A western corn rootworm cadherin-like protein is not involved in the binding and toxicity of Cry34/35Ab1 and Cry3Aa *Bacillus thuringiensis* proteins. **Sek Yee Tan**, stan5@dow.

com[1], Jessica D. Jurzenski[2], James M. Hasler[1], Hong Chen[3], John Wang[4], Huarong Li[1], Matthew Kelker[1], Xiaoping Xu[1], Murugesan Rangasamy[1], Tim Hey[1], Kenneth Narva[1] and Blair Siegfried[2], [1]Dow AgroSciences LLC, Indianapolis, IN, [2]Univ. of Nebraska, Lincoln, NE, [3]US Dept. of Agriculture, Lincoln, NE, [4]Univ. of Nebraska-Lincoln, Lincoln, NE

2:54 1394 Immunocompetent ant larvae: The ontogeny of disease resistance. **Rebeca B. Rosengaus**, r.rosengaus@neu.edu, Tanya Abdul-Malak and Christopher Mackintosh, Northeastern Univ., Boston, MA

3:06 1395 Do beekeeper applied pesticides affect pathogen levels and immunity in honey bees? **Brenna E. Traver**, traverb@vt.edu[1], Nels G. Johnson[2], Haley K. Feazel-Orr[1], Katelyn M. Catalfamo[3], Richard D. Fell[1] and Troy D. Anderson[1], [1]Virginia Tech, Blacksburg, VA, [2]Colorado State Univ., Fort Collins, CO, [3]Virgnina Tech, Blacksburg, VA

3:18 1396 *Nosema ceranae* induced mortality in honey bees depends on methods of infection. **Meghan Milbrath**, milbrat2@msu.edu, Michigan State Univ., E. Lansing, MI, Zachary Y. Huang, Michigan State Univ., East Lansing, MI and Xianbing Xie, Nanchang Univ., Nanchang, China

3:30 1397 Temperature-dependent development and parasitism of *Bracon hebetor* (Say) (Hymenoptera: Braconidae) under laboratory condition. **Muhammad Noor-UL-Ane**, mnoor493@hotmail.com, Univ. of Agriculture Faisalabad, Faisalabad, Pakistan

3:42 1398 Aphid amino acid transporter regulates glutamine supply to intracellular bacterial symbionts. **Daniel R. G. Price**, dan.price@bio.miami.edu[1], Charles W. Luetje[2] and Alex C.C. Wilson[1], [1]Univ. of Miami, Coral Gables, FL, [2]Univ. of Miami, Miami, FL

3:54 1399 Investigating Asian longhorned beetle immunity following maternal immunepriming with a fungal pathogen. **Joanna Fisher**, jjf236@cornell.edu, Cornell Univ., Ithaca, NY

4:06 1400 Expression ofP genes in *Drosophila melanogaster* induced by bacterial components – lipopolysaccharide, lipoteichoic acid and peptidoglycan. **Munmun Chowdhury**, mc8b9@mail.umkc.edu, Univ. of Missouri Kansas City, Kansas City, MO and Xiao-Qiang Yu, Univ. of Missouri, Kansas City, Kansas City, MO

4:18 1401 The changes of four enzyme activities of *Galleria mellonella* larvae infected by entomopathogenic nematode *Heterorhabditis beicherriana*. Qi-zhi LIU and **Xing-yue LI**, xingyuefeifei@yahoo.com.cn, China Agricultural Univ., Beijing, China

4:30 1402 Can parental immunological sate influence brood provisioning in the termite *Zootermopsis angusticollis*? . **Erin Cole**, cole.eri@husky.neu.edu, Andrielle Swaby and Rebeca B. Rosengaus, Northeastern Univ., Boston, MA

4:42 1403 Comparative protozoidal activities of different chemical extracts from various parts of three different woods on the entozoic flagellates of two termite species. **Naveeda Qureshi**, naveedaqresh@gmail.com, Quaid-i-Azam Univ., Islamabad, Pakistan

Ten-Minute Papers, P-IE Crop Protection: Horticulture and Vegetable Production

Meeting Room 17 B (Austin Convention Center)

Moderators: Janine Razze[1] and Chris Werle[2], [1]University of Florida, Gainesville, FL, [2]Louisiana State Univ., Baton Rouge, LA

1:30 1404 DuPont™ Verimark™ and Exirel™ insect control: Novel insecticides for crop protection and optimizing yield in cole crops in the U.S. **Victoria Kleczewski**, victoria.a.kleczewski@dupont.com[1], Glenn G. Hammes[2], Greg Hannig[3], Danny M. Tamayo[4], Travis Hill[5], Terri L. Thomas[6], Hector E. Portillo[7], I. Billy Annan[7] and Juan Alvarez[7], [1]DuPont Crop protection, Wilington, DE, [2]DuPont Crop Protection, Blairsville, GA, [3]DuPont Crop Protection, Palmyra, NY, [4]DuPont Crop Protection, Yuma, AZ, [5]DuPont Crop Protection, Paso Robles, CA, [6]Dupont Crop Protection, Madera, CA, [7]DuPont Crop Protection, Newark, DE

1:42 1405 DuPont™ Verimark™ and Exirel™ insect control: Novel insecticides for crop protection and optimizing yield in leafy vegetables in the U.S. **Hugo T. Ramirez**, HUGO.T.RAMIREZ@dupont.com[1], Wayne J. Steele[2], Danny M. Tamayo[3], Travis Hill[4], Hector E. Portillo[5], I. Billy Annan[5] and Juan Alvarez[5], [1]Dupont Crop Protection, Visalia, CA, [2]DuPont Crop Protection, Fresno, CA, [3]DuPont Crop Protection, Yuma, AZ, [4]DuPont Crop Protection, Paso Robles, CA, [5]DuPont Crop Protection, Newark, DE

1:54 1406 DuPont™ Verimark™ and Exirel™ insect control: Novel insecticides for crop protection and optimizing yield in cucurbit vegetables in the U.S. **Hector E. Portillo**, hector.e.portillo@usa.dupont.com[1], Danny M. Tamayo[2], Glenn G. Hammes[3], Terri L. Thomas[4], Clifton Brister[5], James E. Taylor[6], I. Billy Annan[1] and Juan Alvarez[1], [1]DuPont Crop Protection, Newark, DE, [2]DuPont Crop Protection, Yuma, AZ, [3]DuPont Crop Protection, Blairsville, GA, [4]Dupont Crop Protection, Madera, CA, [5]DuPont Crop Protection, Mission, TX, [6]DuPont Crop Protection, St. Petersburg, FL

2:06 1407 DuPont™ Verimark™ and Exirel™ insect control: Novel insecticides for crop protection and optimizing yield in fruiting vegetables in the U.S. **James E. Taylor**, james.e.taylor-1@dupont.com[1], Stanley S. Royal[2], Glenn G. Hammes[3], Robert W. Williams[4], Wayne J. Steele[5], Stephen F. Colbert[6], Clifton Brister[7], Hector E. Portillo[8], I. Billy Annan[8] and Juan Alvarez[8], [1]DuPont Crop Protection, St. Petersburg, FL, [2]DuPont Crop Protection, Girard, GA, [3]DuPont Crop Protection, Blairsville, GA, [4]DuPont Crop Protection, Raleigh, ND, [5]DuPont Crop Protection, Fresno, CA, [6]Dupont Crop Protection, Escalon, CA, [7]DuPont Crop Protection, Mission, TX, [8]DuPont Crop Protection, Newark, DE

2:18 1408 Applying insecticide through drip irrigation in sweetpotato for control of wireworms (Coleoptera: Elateridae) and other soil pests. **Amber Arrington**, aearring@ncsu.edu, George G. Kennedy and Mark R. Abney, North Carolina State Univ., Raleigh, NC

2:30 1409 *Bemisia tabaci* control and CYSDV mitigation in cantaloupe with Sivanto. **Hank Mager**, hank.mager@bayer.com, Bayer CropScience, Fountain Hills, AZ and Mark White, Bayer CropScience, Yuma, AZ

2:54 1410 How do OMRI approved insecticides affect silverleaf whitefly populations and conservation of beneficial insects in organic squash? **Janine Razze**, jrazze@ufl.edu and Oscar E. Liburd, Univ. of Florida, Gainesville, FL

3:06 1411 The feeding habits of the brown marmorated stink bug, *Halyomorpha halys* (Heteroptera) on select vegetable crops. **Emily Zobel**, ezobel@umd.edu[1], Cerruti Hooks[1] and Galen Dively[2], [1]Univ. of Maryland, College Park, MD, [2]Univ. of Maryland, College Park Maryland, MD

3:18 Break

3:30 1412 The effects of potato psyllid vector density, movement behavior, and host choice on pathogen spread and zebra chip disease severity. **Arash Rashed**, ARashed@ag.tamu.edu[1], Christopher Wallis[2], Fekede Workneh[1], Li Paetzold[3] and Charles Rush[4], [1]Texas A&M Univ., West Amarillo, TX, [2]USDA-ARS, Parlier, CA,

[3]Texas AgriLife Research, Bushland, TX, [4]Texas A&M Univ., Amarillo, TX

3:42 1413 Intricacies of the potato psyllid control in areas of high pressure: South Texas and Mexico. **Raul Villanueva**, rtvillanueva@ag.tamu.edu and Gabriela Esparza-Díaz, Texas A&M Univ. - Texas AgriLIFE Extension, Weslaco, TX

3:54 1414 Efficacy of Blackhawk™ insecticide on Colorado potato beetle in potato. **Patricia Prasifka**, plprasifka@dow.com, Dow AgroSciences, LLC, West Fargo, ND, Harvey A. Yoshida, Dow AgroSciences, Richland, WA, James E. Dripps, Dow AgroSciences, LLC, Indianapolis, IN, Brian D. Olson, Dow AgroSciences, LLC, Geneva, NY, Bradley W. Hopkins, Dow AgroSciences, Westerville, OH and Scott Ditmarsen, Dow AgroSciences, Madison, WI

4:06 1415 Field-level incidence of cabbage maggot on brassicas in the Salinas Valley of California. **Shimat V. Joseph**, svjoseph@ucdavis.edu, Univ. of California, Salinas, CA

4:18 1416 Best management practices for insect pests control in urban vegetables production in North Florida. **Muhammad Haseeb**, Muhammad.Haseeb@FAMU.EDU, Florida A&M Univ., Tallahassee, FL

4:30 1417 Transmission of onion center rot causing bacteria by tobacco thrips, *Frankliniella fusca*. **Rajagopalbabu Srinivasan**, babusri@uga.edu[1], Bhabesh Dutta[2], Apurba K. Barman[3], Diane E. Ullman[4] and Ron Gitaitis[2], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of Georgia, Tifton, GA, [3]Texas Agricultural Experiment Station, Lubbock, TX, [4]Univ. of California, Davis, CA

4:42 1418 Within-plant distribution and sampling method for *Bemisia tabaci* in watermelon in Florida. **Felix Cervantes**, fcervantes@ufl.edu and Susan Webb, Univ. of Florida, Gainesville, FL

4:54 1419 Control of horticultural pests with the novel insecticide Sivanto. **Amanda Beaudoin**, amanda.beaudoin@bayer.com, BayerCropScience, Research Triangle Park, NC

5:06 1420 Replication of *Candidatus Liberibacter asiaticus*, associated with citrus huanglongbing, in its psyllid vector *Diaphorina citri* (Hemiptera: Psyllidae). **El-Desouky Ammar**, eldammar@hotmail.com, Robert G. Shatters and David Hall, USDA-ARS, US Horticultural Research Laboratory, Fort Pierce, FL

5:18 1421 Insights on the activity of insecticides on major tomato pests: *Tuta absoluta* and *Bemisia tabaci* . **Emmanouil Roditakis**, eroditakis@gmail.com, Hellenic Agricultural Organisation - 'Demeter', Heraklion, Crete, Greece

Ten-Minute Papers, P-IE Section: Environmental Entomology 3

Meeting Room 12 B (Austin Convention Center)

Moderators: Robert L. Meagher[1] and Daniel Pitts[2], [1]USDA, Agricultural Research Service, Gainesville, FL, [2]Monsanto, Lexington, SC

1:30 1422 Roles of defense signaling pathways in rice defense against herbivorous insects. **Rensen Zeng**, rszeng@scau.edu.cn[1], YuanYuan Song[2] and Mao Ye[2], [1]South China Agricultural Univ., Guangzhou, IL, China, [2]South China Agricultural Univ., Guangzhou, China

1:42 1423 The control of yellow crazy ants (*Anoplolepis gracilipes*): An empirical study. **Philip Stewart**, p.stewart3@uq.edu.au, Univ. of Queensland, Brisbane, Australia, Greg Richards, 2Greg Richards and Associates Pty Ltd, Gungahlin, Australia, Alan Bernard, Effective Pest Control, Inc., Boca Raton, FL and Joy Wickenden, Christmas Island Phosphates, Christmas Island, Australia

1:54 1424 Influence of shelterbelt (windbreak) resources on beneficial arthropod groups. **Ian Smith**, imsmith@student.unimelb.edu.au, Linda Thomson, Michael Nash and Ary Hoffmann, The Univ. of Melbourne, Parkville, Australia

2:06 1425 Areawide management of fall armyworm using selected ground covers. **Robert L. Meagher**, rob.meagher@ars.usda.gov, USDA, Agricultural Research Service, Gainesville, FL, Rodney Nagoshi, USDA-ARS, Gainesville, FL, Shelby Fleischer, Pennsylvania State Univ., Univ. Park, PA and John Westbrook, USDA - ARS, College Station, TX

2:18 1426 Epigeal insects in an organic cover crop-based reduced tillage cropping system. **Mary Barbercheck**, meb34@psu.edu, Ariel Rivers and Christina Mullen, Pennsylvania State Univ., Univ. Park, PA

2:30 1427 Quantifying food limitation in redback spiders (*Latrodectus hasselti*) in the field. **Shawn Wilder**, wilder.shawn@gmail.com and Stephen Simpson, The Univ. of Sydney, Camperdown, NSW, Australia

2:42 1428 Timing of pesticide application can be the difference between spider mite outbreaks or suppression on honeylocust. **Adam Witte**, arwitte@purdue.edu, Carlos Quesada and Clifford S Sadof, Purdue Univ., West Lafayette, IN

2:54 1429 Putative role of learning and genetics in host range shift in *Manduca sexta*. **Angela Rovnyak**, angelamrovnyak@gmail.com and Ian Renne, Youngstown State Univ., Youngstown, OH

3:18 1430 Analysis *Tiphia* parasitoids pre-ovipositional behaviors and of scarab host defensive responses. **Piyumi Tilanka Obeysekara**, piyumi.obeysekara@uconn.edu and Ana Legrand, Univ. of Connecticut, Storrs, CT

3:30 Break

3:42 1431 Hiding in plain sight: The overwintering reservoir groves of *Diaphorina citri* Kuwayama (Hemiptera: Psyllidae). **Heather Kingdom Gibbard**, hkgibbard@ufl.edu, Xavier Martini, Christopher Gibbard, Mark Hoffmann and Kirsten S Pelz-Stelinski, Univ. of Florida Citrus Research and Education Center, Lake Alfred, FL

3:54 1432 *Pseudococcus meridionalis*, a new species of mealybug found on grapes: Biology, morphological and molecular characterization. **Tania Zaviezo**, tzaviezo@uc.cl, Margarita Correa and Alda Romero, Universidad Católica de Chile, Santiago, Chile

4:06 1433 Movement to the plant of least resistance: Fitness, competition, and movement of soybean aphid (*Aphis glycines* Matsumura) biotypes in a mixed host-plant resistance environment. Andrew Michel and **Jacob Wenger**, wenger.93@osu.edu, The Ohio State Univ., OARDC, Wooster, OH

4:18 1434 Current and projected distribution of three species of leaf beetle (*Diorhabda spp.)* in Texas released for biological control of saltcedar. **Allen Knutson**, a-knutson@tamu.edu[1], James Tracy[2], Gerald Michels, Jr.[3], Mark Muegge[4] and Robert Coulson[2], [1]Texas A&M Univ., Dallas, TX, [2]Texas A&M Univ., College Station, TX, [3]Texas AgriLife Research, Amarillo, TX, [4]Texas A&M Univ., Fort Stockton, TX

4:30 1435 Amino acid isotopic analysis in agricultural systems. **Shawn Steffan**, shawn.steffan@ars.usda.gov, USDA Agricultural Research Service, Madison, WI and Yoshito Chikaraishi, Japan Agency for Marine-Earth Science & Technology, Yokosuka, Japan

4:42 1436 Spread of *Sasajiscymnus tsugae* and coexistence with *Laricobius* species: Won't you be my neighbor? **Gregory J. Wiggins**, wiggybug@utk.edu[1], Jerome F. Grant[1], Paris L. Lambdin[1], Abdul Hakeem[2], Renee Follum[1], Rusty Rhea[3] and Glenn Taylor[4], [1]Univ. of Tennessee, Knoxville, TN, [2]Texas A&M Univ., Lubbock, TX, [3]USDA - Forest Service, Asheville, NC, [4]Great Smoky Mountains National Park, Gatlinburg, TN

4:54 1437 Monarchs dominate plant-mediated interactions between caterpillars and aphids on common milkweed (*Asclepias syriaca*). **Jared Ali**, jaredali@cornell.edu and Anurag Agrawal, Cornell Univ., Ithaca, NY

5:06 1438 Massal production of *Telenomus podisi* Ashmead (Hymenoptera: Platygastridae), in eggs of *Oebalus insularis* (Heteroptera: Pentatomidae). **Bruno Zachrisson**, bazsalam@gmail.com and Onesio Martinez, Instituto de Investigación Agropecuaria de Panamá (IDIAP), Panama City, AL, Panama

5:18 1439 Untangling global change: Effects of climate change and land use change in northern diversity hotspots of North American butterflies. **Kathleen Prudic**, prudick@science.oregonstate.edu, Oregon State Univ., Corvallis, OR, Maxim Larrivée, Montreal Space for Life, Montreal, QC, Canada, Kent McFarland, Vermont Center for Ecostudies, Norwich, VT and Jeremy Kerr, Univ. of Ottawa, Ottawa, ON, Canada

5:30 1440 Outbreaks of the koa looper moth (Geometridae: *Scotorythra paludicola*) in Hawaii: History, monitoring, and research. **William Haines**, whaines@hawaii.edu, Univ. of Hawaii, Honolulu, HI, Cynthia B. A. King, State of Hawaii, Honolulu, HI, Rob Hauff, Hawaii State Dept. of Land and Natural Resources, Honolulu, HI and Lydia Lam, Cornell Univ., Ithaca, NY

5:42 1441 Identification of tri-trophic interactions using real-time PCR: Effect of the host plant resistance on detectable quantity of *Schizaphis graminum* DNA in the *Coccinella septempunctata* gut. **Behshid Barkhordar**, Behshid_Barkhordar@yahoo.com, Science and Research Branch, Islamic Azad Univ., Tehran, Iran, Jafar Khalghani, Agricultural Research, Education and Extension Organization (AREEO), Tehran, Iran, Gholamreza Salehi Jouzani, Dept. of Microbial Biotechnology and Biosafety, Agricultural Biotechnology Research Institute of Iran (ABRII), Karaj, Iran, Gadir Nouri Ganbalani, Dept. of Plant Protection, College of Agriculture, Univ. of Mohaghegh Ardabili, Ardabil, Iran, Mahmood Shojai, Dept. of Entomology, Science and Research Branch, Islamic Azad Univ., Tehran, Iran and Mohammad Taher Boustani, Natural Resources Training Center of Kelar abad, Mazandaran, Iran

Ten-Minute Papers, P-IE Section: Host Plant Resistance

Meeting Room 16 B (Austin Convention Center)

Moderators: Jeffrey A. Davis[1] and Gregg Nuessly[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]Univ. of Florida, Belle Glade, FL

1:30 1442 Susceptibility of different maize varieties to the maize weevil, *Sitophilus zeamais* (Coleoptera: Curculionidae). **Olalekan Soyelu**, jlekan2001@yahoo.co.uk, Obafemi Awolowo Univ., Ile-Ife, Nigeria

1:42 1443 Cotton plant resistance on the basis of its biochemical analysis against aphids. **Nasir Masood**, nasirmasood2004@yahoo.com, Dept. of Environmental Sciences,Comsats Institute of information Technology, Punjab,Vehari, Pakistan

1:54 1444 The foliar trichomes of horsenettle damage the peritrophic membrane of *Manduca sexta* larvae and negatively affect their consumption and growth rates. **Andrew G. Stephenson**, as4@psu.edu[1], Rupesh Ram Kariyat[2], Jason D. Smith[3], Consuelo M. De Moraes[3] and Mark C. Mescher[4], [1]The Pennsylvania State Univ., Univ. Park, PA, [2]Pennsylvania State Univ., State College, PA, [3]Pennsylvania State Univ., Univ. Park, PA, [4]Associate Professor, Pennsylvania State Univ., Univ. Park, PA

2:06 1445 *Rag* gene effects on non-colonizing aphid feeding behavior. **Jeffrey A. Davis**, jeffdavis@agcenter.lsu.edu, LSU AgCenter, Baton Rouge, LA and Christina DiFonzo, Michigan State Univ., East Lansing, MI

2:18 1446 Field evaluation of maize germplasm lines for both whorl- and ear-feeding insect resistance. **Xinzhi Ni**, xinzhi.ni@ars.usda.gov, USDA, Agricultural Research Service, Tifton, GA, Wenwei Xu, Texas AgriLife Extension Service (TAES), Lubbock, TX, Michael H. Blanco, USDA, Agricultural Research Service, Ames, IA and W. Paul Williams, USDA, Agricultural Research Service, Mississippi State, MS

2:30 1447 Role of salicyclic acid in helping wheat maintain resistance against hessian fly (*Mayetiola destructor*) infestation under heat stress. **Joshua Underwood**, junderwo@broncos.uncfsu.edu[1], John Glenn Moch[1], Lieceng Zhu[2], Ming-Shun Chen[3] and Guihua Bai[4], [1]Fayetteville State Univ., Fayetteville, NC, [2]Kansas State Univ., Manhattan, KS, [3]USDA-ARS-NPA-GMPRC-PSERU, Manhattan, KS, [4]USDA-ARS, Manhattan, KS, Manhattan, KS

2:42 1448 Host preference of the brown wheat mite (*Petrobia latens* [Muller]) in Eastern Colorado. **Sheri N. Hessler**, sheri.hessler@gmail.com, Colorado State Univ., Fort Collins, CO

2:54 1449 Synergistic, tritrophic effects of parsnip furanocoumarins on the specialist parasitoid *Copidosoma sosares*. **Paul J. Ode**, paul.ode@colostate.edu[1], Arthur Zangerl[2] and May R. Berenbaum[2], [1]Colorado State Univ., Fort Collins, CO, [2]Univ. of Illinois, Urbana, IL

3:06 Break

3:18 1450 Crop Domestication and its impact on naturally selected trophic interactions. **Yolanda H. Chen**, yolanda.chen@uvm.edu, Univ. of Vermont, Burlington, VT, Rieta Gols, Wageningen Univ., Wageningen, Netherlands and Betty Benrey, Univ. of Neuchatel, Neuchatel, Switzerland

3:30 1451 Plant vigor metrics determine dynamics of interactions between the cereal leaf beetle and its natural enemy. **Swaroop Kher**, skher@ualberta.ca[1], Lloyd M. Dosdall[1] and Héctor A. Cárcamo[2], [1]Univ. of Alberta, Edmonton, AB, Canada, [2]Agriculture and Agri-Food Canada, Lethbridge, AB, Canada

3:42 1452 Effect of soybean leaf position on the antixenosis expression to *Anticarsia gemmatalis* and the relation with nutrients and trichomes. **Bruno Sardinha de Souza**, souzabhs@gmail.com[1], Eduardo Costa[1], Zulene Ribeiro[1], Michael J. Stout[2] and Arlindo Boiça Junior[1], [1]FCAV/UNESP, Jaboticabal, Brazil, [2]Louisiana State Univ., Baton Rouge, LA

3:54 1453 Glandular trichomes and host plant resistance in cultivated sunflower. **Jarrad Prasifka**, jarrad.prasifka@ars.usda.gov, USDA-ARS, Ames, IA

4:06 1454 The effects of domestication of the lima bean (*Phaseolus lunatus*) on its interaction with a leaf herbivore and a seed predator. **J. Gwen Shlichta**, bugheart@gmail.com, Univ. of Neuchâtel, Neuchtael, Switzerland, Maximilien Cuny, Univ. of Neuchâtel, NEUCHATEL, Switzerland and Betty Benrey, Univ. of Neuchatel, Neuchatel, Switzerland

4:18 1455 Broad spectrum insect resistance of the soybean cultivar 'Benning' introgressed with QTLs derived from asian breeding lines. **John All**, jall@uga.edu, Univ. of Georgia, Athens, GA

4:30 1456 RNA-seq analysis of soybean response to attack by virulent and avirulent aphid. **Raman Bansal**, bansal.67@osu.edu, Ohio State Univ., OARDC, Wooster, OH and Andrew P. Michel, The Ohio State Univ., Wooster, OH

4:42 1457 The candidate saliva proteins that might be involved in the host specialization process of the pea aphid (*Acyrthosiphon pisum*) complex. **Akiko Sugio**, akiko.sugio@rennes.inra.fr, INRA Rennes, Le Rheu, France

4:54 1458 Varietal resistance to sugarcane stemborers in Papua New Guinea. **Peter Samson**, psamson@bses.com.au, BSES Ltd, Mackay, Australia and Kaile Korowi, Ramu Agri-Industries, Gusap, Papua New Guinea

5:06 1459 Some preliminary studies of the effects on leaf biochemical contents of date palm (*Phoenix dactylifera*), artificially infested with red palm weevil *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae). **Muhammad Shakeel**, shakeelkhanmarwat@yahoo.com, King Saud Univ., Riyadh, Kingdom of Saudi Arabia, Riyadh, Saudi Arabia

5:18 1460 Effects of early season defense induction in Lima bean (*Phaseolus lunatus*) on a seed beetle and its larval parasitoid. **Johnattan Hernandez-Cumplido**, johnattan.hernandez@unine.ch[1], Martin Heil[2] and Betty Benrey[1], [1]Univ. of Neuchatel, Neuchatel, Switzerland, [2]CINVESTAV, Unidad Irapuato, Irapueto, Mexico

Ten-Minute Papers, P-IE Section: Biological Control 2

Meeting Room 16 A (Austin Convention Center)

Moderators: Sarah Donelson[1] and Andrew Chow[2], [1]Oklahoma State Univ., Stillwater, OK, [2]Texas A&M Univ.-Kingsville, Weslaco, TX

1:30 1461 Biological control of red imported fire ants (*Solenopsis invicta)* in Arkansas using two species of *Pseudacteon* (Diptera: Phoridae). **Sim Barrow**, yosimitesim@yahoo.com, Kelly M. Loftin and Ricky F. Corder, Univ. of Arkansas, Fayetteville, AR

1:42 1462 Challenges of mass rearing Mexican fruit fly (*Anastrepha ludens*). **Hugh E. Conway**, hugh.e.conway@aphis.usda.gov, USDA-APHIS-PPQ-CPHST, Edinburg, TX

1:54 1463 Assessments of native strains of entomopathogenic nematodes for plum curculio management. **Arthur Agnello**, ama4@cornell.edu[1], Elson J. Shields[2], Tony Testa[2], Melissa Keller[2] and Christine Dodge[3], [1]Cornell Univ., Geneva, NY, [2]Cornell Univ., Ithaca, NY, [3]State Univ. of New York at Geneseo, Geneseo, NY

2:06 1464 Climate change, insect pests and biological control: Cereal leaf beetle parasitism as a case study. **Edward W. Evans**, ted.evans@usu.edu, Utah State Univ., Logan, UT

2:18 1465 Threshold temperature for development of a North American diamondback moth population and its larval parasitoid, *Diadegma insulare*. **Md Habibullah Bahar**, md.bahar@agr.gc.ca[1], Juliana J. Soroka[1], Larry Grenkow[1], Lloyd M. Dosdall[2] and Owen O. Olfert[1], [1]Agriculture and Agri-Food Canada, Saskatoon, SK, Canada, [2]Univ. of Alberta, Edmonton, AB, Canada

2:30 1466 Fitness and field performance of a mass-reared biological control agent, the mile-a-minute weevil (*Rhinoncomimus latipes)*. **Judith A. Hough-Goldstein**, jhough@udel.edu, Univ. of Delaware, Newark, DE

2:42 1467 The power of biocontrol for understanding invasions: An analysis of historical and contemporary data. **Christopher Brooks**, cpbrooks@biology.msstate.edu, Mississippi State Univ., Mississippi State, MS

2:54 1468 Prospects for biological control of the small hive beetle (*Aethina tumida*), a pest of the honey bee (*Apis mellifera*). **Donald C. Steinkraus**, steinkr@uark.edu and Natasha A. Wright, Univ. of Arkansas, Fayetteville, AR

3:06 Break

3:18 1469 Compatibility of an entomopathogen, *Isaria fumosorosea*, and a parasitoid wasp, *Tamarixia radiata*, for biological control of Asian citrus psyllid, *Diaphorina citri*, in residential citrus. **Andrew Chow**, andrew.chow@tamuk.edu[1], Christopher Dunlap[2], Mark A. Jackson[2], Daniel Flores[3], Mamoudou Setamou[4] and Joseph Patt[5], [1]Texas A&M Univ.-Kingsville, Weslaco, TX, [2]USDA-ARS-NCAUR, Peoria, IL, [3]USDA APHIS PPQ CPHST Mission Laboratory, Edinburg, TX, [4]Texas A&M Univ., Weslaco, TX, [5]USDA - ARS, Ft. Pierce, FL

3:30 1470 Presentation withdrawn.

3:42 1471 Learned aversion to novel hemolymph defenses of western corn rootworm larvae by common agrobiont predators. **Kelton D. Welch**, kelton.welch@uky.edu, USDA-ARS, Brookings, SD and Jonathan G. Lundgren, USDA - ARS, Brookings, SD

3:54 1472 How not to be eaten: Defensive strategies of *Acronicta* caterpillars. **Brigette Zacharczenko**, brigette.zacharczenko@uconn.edu, Univ. of Connecticut, Storrs, CT

4:06 1473 Host specificity of larval parasitoid *Apanteles opuntiarum* Martínez & Bertha (Hymenoptera: Braconidae), a potential biological control agent against *Cactoblastis cactorum* (Berg) (Lepidoptera: Pyralidae). **Oulimathe Paraiso**, oulimathe.paraiso@freshfromflorida.com[1], Trevor R. Smith[1], Stephen Hight[2], Richard L. Brown Brown[3], James E. Carpenter[4] and Kenneth A. Bloem[5], [1]Florida Dept. of Agriculture and Consumer Services (FDACS), Gainesville, FL, [2]USDA-ARS, Tallahassee, FL, [3]Mississippi Entomological Museum, Mississippi State, MS, [4]USDA-ARS, Tifton, GA, [5]USDA-APHIS-PPQ-CPHST, Raleigh, NC

4:18 1474 Trophic cascades: The impact of spiders on grasshopper herbivory in a northern mixed prairie. **David Branson**, dave.branson@ars.usda.gov, USDA, Agricultural Research Service, Sidney, MT

4:30 1475 Bats feed on codling moth pests in California walnut orchards. **Rachael Long**, rflong@ucdavis.edu, Univ. of California Cooperative Extension, Woodland, CA and Katherine Ingram, Univ. of California, Davis, Davis, CA

4:42 1476 Incidence of field predation of stink bugs by generalist predators using molecular gut-content analysis. **Glynn Tillman**, Glynn.Tillman@ars.usda.gov[1], Matthew H. Greenstone[2] and Jing S. Hu[2], [1]USDA-ARS, Tifton, GA, [2]Invasive Insect Biocontrol and Behavior Laboratory, Beltsville, MD

4:54 1477 Developmental sensitivity to nicotine as a post-zygotic barrier to reproduction between incipient species of the parasitic wasp, *Cotesia congregata* . **Karen Kester**, kmkester@vcu.edu and Justin Bredlau, Virginia Commonwealth Univ., Richmond, VA

5:06 1478 Interactions between the larval stage of the citrus fruit fly (*Diptera: Tephritidae*) with fungus mycelium of *Pleorotus* spp. **Rene Sanjuan-Galindo**, renesg1@yahoo.com.mx[1], Víctor-Manuel Rodríguez-Pérez[1], Patricia Quintero-Álvarez[1] and Ma. del Carmen

Ojeda-Zacarías[2], [1]Instituto Tecnológico de Nuevo León, Guadalupe, N.L., Mexico, [2]Facultad de Agronomía. Universidad Autónoma de Nuevo León., Marín, N.L., Mexico

5:18 1479 Evaluation of *Isaria fumosorosea* CCM 8367 against *Tuta absoluta*. **Rostislav Zemek**, rosta@entu.cas.cz, Biology Centre AS CR, Ceske Budejovice, Czech Republic

Ten-Minute Papers, SysEB Section: Arthropod Symbionts and Ecology of Social Insects

Meeting Room 4 ABC (Austin Convention Center)

Moderators: Corrie Moreau[1] and Jiri Hulcr[2], [1]Field Museum of Natural History, Chicago, IL, [2]Univ. of Florida, Gainesville, FL

1:30 Welcoming Remarks

1:32 1480 *Wolbachia* diversity in the Asian subterranean termite. **Nurmastini Bujang**, sufina@ufl.edu and Nan-Yao Su, Univ. of Florida, Davie, FL

1:44 1481 *Wolbachia*'s Evolutionary Strategies for Adaptation to *Trichogramma* Wasps. **Amelia Lindsey**, alind005@ucr.edu, Univ. of California Riverside, Riverside, CA and Richard Stouthamer, Univ. of California, Riverside, CA

1:56 1482 Draft genome of *Spiroplasma hyd-1*: An endosymbiotic bacterium that protects *Drosophila* flies against parasitic wasps. **Humberto Martinez-Montoya**, lapostisima@neo.tamu.edu, Rodolfo Aramayo and Mariana Mateos, Texas A&M Univ., College Station, TX

2:08 1483 Symbiont mediated defense and pea aphid population dynamics under natural conditions. **Andrew H. Smith**, ahs55@drexel.edu and Jacob A. Russell, Drexel Univ., Philadelphia, PA

2:20 1484 Co-evolution of the planthoppers (Hemiptera: Fulgoroidea) with multiple obligate bacterial endosymbionts. **Julie Urban**, julie.urban@naturalsciences.org, Nature Research Center, NC Museum of Natural Sciences, Raleigh, NC, Charles Bartlett, Univ. of Delaware, Newark, DE and Jason Cryan, North Carolina Museum of Natural Sciences, Raleigh, NC

2:32 1485 Small, smaller, smallest: The origins and evolution of ancient dual-obligate symbioses in *Macrosteles quadrilineatus* (Cicadellidae: Deltocephalinae). **Gordon Bennett**, gbennett@yale.edu, Yale, West Havent, CT and Nancy Moran, Yale Univ., New Haven, CT

2:44 1486 Using genotype-by-sequencing to uncover the population history of fungus farming ambrosia beetles. **Caroline Storer**, cgstorer@gmail.com and Jiri Hulcr, Univ. of Florida, Gainesville, FL

2:56 1487 High-throughput identification of fungal communities associated with ambrosia beetles. **Martin Kostovcik**, kostovcik@ufl.edu, School of Forest Resources and Conservation, Univ. of Florida, Gainesville, FL, Lukasz Stelinski, Univ. of Florida, Lake Alfred, FL and Jiri Hulcr, Univ. of Florida, Gainesville, FL

3:08 1488 DNA profiling of bark beetle (*Scolytinae*) associated fungi: The characterisation of fungal assemblages. **Kirsten Miller**, kirsten.miller09@imperial.ac.uk, The Natural History Museum London, London, United Kingdom

3:20 Break

3:30 1489 Diversity and abundance of microbial symbionts across the ants (Hymenoptera: Formicidae). Jacob A. Russell[1], Piotr Lukasik[1], Yi Hu[1] and **Corrie Moreau**, cmoreau@fieldmuseum.org[2], [1]Drexel Univ., Philadelphia, PA, [2]Field Museum of Natural History, Chicago, IL

3:42 1490 Complexity and the superorganism II: Symbiont switching alters fungal performance in fungus-gardening ants. **Jon Seal**, trachymyrmex@gmail.com, Univ. of Texas at Tyler, Tyler, TX

3:54 1491 Multimodal learning in ants, species differences in Ectatomma. **Marc Seid**, seidm2@scranton.edu[1], Brian Entler[1], Erich Junge[1], Danielle Salvadeo[1] and Andre Riveros[2], [1]Univ. of Scranton, Scranton, PA, [2]Pontificia Universidad Javeriana, Bogota, Colombia

4:06 1492 Ants adjust attribute weights according to prior experience. **Takao Sasaki**, tsasaki1@asu.edu and Stephen C. Pratt, Arizona State Univ., Tempe, AZ

4:18 1493 Epigenetic maternal effects on caste development in *Polistes* wasp. **Jennifer M. Jandt**, jjandt2@gmail.com[1], Robert L. Jeanne[2], John Hermanson[3] and Amy L. Toth[1], [1]Iowa State Univ., Ames, IA, [2]Univ. of Wisconsin - Madison, Madison, WI, [3]USDA Forest Products Laboratory, Madison, WI

4:30 1494 Social signaling effects on learning in honey bee (*Apis mellifera* sp.) workers and drones. **Arián Avalos**, avalos0912@gmail.com, Univ. of Puerto Rico, Rio Piedras, San Juan, PR, Eddie Perez Claudio, Univ. of Puerto Rico, Rio Piedras Campus, San Juan, PR and Tugrul Giray, Univ. of Puerto Rico, San Juan, PR

4:42 1495 "Worker queens"? Behavioral flexibility, juvenile hormone binding protein and vitellogenin in queens of the little fire ant *Wasmannia auropunctata*. **Yarira Ortiz-Alvarado**, y.ortizalvarado@gmail.com and Bert Rivera-Marchand, Univ. of Puerto Rico, San Juan, PR, PR

4:54 1496 Imaging brain activity of honey bees sensing odors while they sleep. **Barrett Klein**, barrett@pupating.org[1], Lisa Rath[2], Arno Klein[3], Satrajit Ghosh[4], C. Giovanni Galizia[2] and Christoph Kleineidam[2], [1]Univ. of Wisconsin - La Crosse, La Crosse, WI, [2]Univ. of Konstanz, Konstanz, Germany, [3]Stony Brook Univ. School of Medicine, Stony Brook, NY, [4]Massachusetts Institute of Technology, Cambridge, MA

5:06 1497 Diversity of pollen diet and viral infection profiles affect survival and physiology in caged honey bees. **Adam G. Dolezal**, Adam.Dolezal@asu.edu[1], Jimena Carrillo-Tripp[1], Allen Miller[1], Bryony C. Bonning[2] and Amy L. Toth[1], [1]Iowa State Univ., Ames, IA, [2]Professor, Iowa State Univ., Ames, IA

5:18 1498 Individual and group transport: What are the benefits of team work ? **Aurélie Buffin**, baurelie@asu.edu, Takao Sasaki and Stephen C. Pratt, Arizona State Univ., Tempe, AZ

5:30 Concluding Remarks

Ten-Minute Papers, SysEB Section: Biodiversity and Conservation

Meeting Room 5 ABC (Austin Convention Center)

Moderators: Guinevere Z. Jones[1] and Jesse A. Eiben[2], [1]Univ. of Wyoming, Laramie, WY, [2]Univ. of Hawaii at Hilo, Hilo, HI

1:30 Welcoming Remarks

1:32 1499 Exploring cloud forest insect biodiversity: Morphological, molecular, and ecological approaches. **Guinevere Z. Jones**, gjones9@uwyo.edu, Univ. of Wyoming, Laramie, WY

1:44 1500 Arthropod biodiversity baseline survey and monitoring methodology for conservation and land management in high alpine Hawaiian ecosystems. **Jesse A. Eiben**, eiben@hawaii.edu, Univ. of Hawaii at Hilo, Hilo, HI and Daniel Rubinoff, Univ. of Hawaii, Honolulu, HI

1:56 1501 Insect conservation on the Hawaiian islands: Strategies and recommendations for land managers. **Matthew J. Medeiros**, matt.j.medeiros@gmail.com[1], Jesse A. Eiben[2], William P. Haines[3], Raina Kaholoaa[4], Cynthia B. A. King[5], Paul Krushelnycky[6], Karl Magnacca[7] and Daniel Rubinoff[3], [1]Univ. of California, Berkeley, Berkeley, CA, [2]Univ. of Hawaii, Manoa, Honolulu, HI, [3]Univ. of Hawaii, Honolulu, HI, [4]Haleakala National Park, Makawao, HI, [5]State of Hawaii, Honolulu, HI, [6]Univ. of Hawaii, Manoa, HI, [7]Oahu Army Natural Resources Program, Schofield Barracks, HI

2:08 1502 Habitat loss reduces parasitoid diversity only in highly fragmented landscapes. **Diego Inclan Luna**, diegojavier.inclanluna@studenti.unipd.it, Univ. of Padova, Legnaro, Padova, Italy

2:20 1503 Presentation withdrawn.

2:32 1504 Eight legs in the North: The ecological structure of Arctic spider assemblages. **Christopher Buddle**, chris.buddle@mcgill.ca, McGill Univ., Macdonald Campus, Ste-Anne-de-Bellevue, QC, Canada and Sarah Loboda, McGill Univ., Ste-Anne-de-Bellevue, QC, Canada

2:44 1505 The dune of a ghost town: Anthropogenically created biodiversity hotspot of sand wasps and their mutillid parasites. **Justin Schmidt**, ponerine@dakotacom.net, Southwestern Biological Institute, Tucson, AZ

2:56 1506 Genetic correlates of morphological diversity in Costa Rican army ants (*Eciton burchellii*). **Max E. Winston**, mewinsto@gmail.com, Univ. of Chicago, Chicago, IL and Corrie Moreau, Univ. of California-Berkeley, Berkeley, CA

3:08 1507 Nested diversity: Mites associated with the ants of conservation grasslands. **Kaitlin U. Campbell**, uppstrka@miamioh.edu and Thomas O. Crist, Miami Univ., Oxford, OH

3:20 Break

3:30 1508 Stingless bees (*Hymenoptera: Apidae, Meliponinae*) abundance and diversity as affected by biotic and abiotic factor in fragmented neotropical habitats. **Macario Fierro**, macarioff1@hotmail.com, Universidad Autónoma de Chiapas, Tapachula, Chiapas, Mexico

3:42 1509 *SWAMP MOTHS!* The moths of Congaree National Park. **Joseph Culin**, jculin@clemson.edu, Clemson Univ., Clemson, SC, Brian G. Scholtens, College of Charleston, Charleston, SC, John Snyder, Furman Univ., Greenville, SC and Tom Smith, College of Charleston, Woodbridge, VA

3:54 1510 Patterns of Ancient Colonization in Hawaii's most diverse moths (*Hyposmocoma*: Cosmopterigidae). **Daniel Rubinoff**, rubinoff@hawaii.edu, William P. Haines and Patrick Schmitz, Univ. of Hawaii, Honolulu, HI

4:06 1511 Estimating the diversity of scarab beetles in South Carolina golf courses. **Juang-Horng Chong**, juanghc@CLEMSON.EDU, Clemson Univ., Florence, SC and Kevin Hinson, Clemson Univ., Clemson, SC

4:18 1512 Coleoptera collected from rotting fishhook barrel cacti (*Ferocactus wislizeni* (Engelm.) Britton and Rose), with a review of Nearctic Coleoptera associated with succulent necrosis. **Michael Ferro**, spongymesophyll@gmail.com[1], Nhu Nguyen[2], Alexey Tishechkin[3], Jong-Seok Park[3], Victoria Bayless[3] and Christopher E. Carlton[3], [1]LSU AgCenter, Baton Rouge, LA, [2]Univ. of California, Berkeley, Berkeley, CA, [3]Louisiana State Univ., Baton Rouge, LA

4:30 1513 Ash mortality caused by emerald ash borer alters ground beetle (Coleoptera: Carabidae) assemblages. **Kayla I. Perry**, perry.1864@osu.edu[1], Rosemary Walker[2] and Daniel A. Herms[1], [1]The Ohio State Univ., OARDC, Wooster, OH, [2]SAIC, Sandusky, OH

4:42 1514 Diversity and distribution of Chironominae (Chironomidae: Diptera) larvae from Balaghat ranges in Maharashtra, India. **Anant Gikwad**, gikwadanantm@gmail.com, Research student, Aurangabad, IN, India

4:54 1515 A tail of two assassins, the best of times in *Proctacanthus* robber fly distributions on a longitudinal gradient in the age of wisdom (Diptera: Asilidae). **C. Riley Nelson**, rileynelson@byu.edu, Brigham Young Univ., Provo, UT

5:06 1516 Diversity and distribution of fruit flies (Diptera: Tephritidae: Dacinae) across habitats gradients in Southeast Asia. **Luc Leblanc**, leblancl@ctahr.hawaii.edu[1], Michael San Jose[1] and Dan Rubinoff[2], [1]Univ. of Hawaii, Honolulu, HI, [2]Univ. of Hawaii - Manoa, Honolulu, HI

5:18 Concluding Remarks

Student Debates

Ballroom D (Austin Convention Center)

Moderators and Organizers: Carey R. Minteer, Univ. of Arkansas, Fayetteville, AR

1:30 Welcoming Remarks

1:40 Unbiased Introduction (University of Arkansas), Topic 1: What is the Best Individual Solution to Preserving the World's Current Biodiversity? **Jessica Hartshorn**, jhartsho@uark.edu, Univ. of Arkansas, Fayetteville, AR

1:45 Team 1 (Mississippi State University, faculty advisor - Jeff Gore), Topic 1: What is the Best Individual Solution to Preserving the World's Current Biodiversity? **Andrew Adams**, aadams@entomology.msstate.edu, **Jose Portugal**, jsp281@msstate.edu, **Breanna Lyle**, bl334@msstate.edu and **Clinton Woods**, Mississippi State Univ., Mississippi State, MS

1:52 Cross-Examination of Team 1 by Team 2 for Topic 1

1:55 Team 2 (Texas A&M University, faculty advisor - Raul F. Medina), Topic 1: What is the Best Individual Solution to Preserving the World's Current Biodiversity? **Meaghan Pimsler**, mlpimsler@gmail.com, **Suhas Vyavhare**, suhas.vyavhare@yahoo.com, **Ordom Brian Huot**, obh6@tamu.edu, **Luciano Cosme**, cosme@tamu.edu and **Lue Cuttiford**, lue.cuttiford@gmail.com, Texas A&M Univ., College Station, TX

2:02 Cross-Examination of Team 2 by Team 1 for Topic 1

2:05 First Rebuttal by Team 2 for Topic 1

2:08 First Rebuttal by Team 1 for Topic 1

2:11 Second Rebuttal by Team 2 for Topic 1

2:14 Second Rebuttal by Team 1 for Topic 1

2:17 Questions from Judges and Audience for Topic 1

2:27 Break

2:37 Unbiased Introduction (Oklahoma State University, faculty advisor - Justin Talley), Topic 2: Using Citizen Scientists to Collect Data in Scientific Experiments. **Trisha Dubie**, trishd@okstate.edu, **Kenneth E. Masloski**, kenneth.masloski@okstate.edu, **Allison Giguere**, allison.giguere@okstate.edu, **J. Sunny Evans**, ejessis@okstate.edu and **Shane McMurry**, shane.mcmurry@okstate.edu, Oklahoma State Univ., Stillwater, OK

2:42 Pro Team (Louisiana State University, faculty advisor - Gregg Henderson), Topic 2: Using Citizen Scientists to Collect Data in Scientific Experiments. **Matt VanWeelden**, mvanweelden@agcenter.lsu.edu, **Blake E. Wilson**, bwils26@lsu.edu, **Nathan Mercer**, nhmercer13@gmail.com and **Brittany Owens**, brittanyeownes@gmail.com, Louisiana State Univ., Baton Rouge, LA

2:49 Cross-Examination by Con Team for Topic 2

2:52 Con Team (Florida A&M, faculty advisor - Raymond Hix), Topic 2: Using Citizen Scientists to Collect Data in Scientific Experiments. **Courtnee Eddington**, cce8706@yahoo.com, **Julius Eason**, jeason21@gmail.com and **Angela Galette**, angela.galette@ars.usda.gov, Florida A&M Univ., Tallahassee, FL

2:59 Cross-examination by Pro Team for Topic 2

3:02 First Rebuttal by Con Team Topic 2

3:05 First Rebuttal by Pro Team for Topic 2

3:08 Second Rebuttal by Con Team for Topic 2

3:11 Second Rebuttal by Pro Team for Topic 2

3:14 Questions from Judges and Audience for Topic 2

3:24 Break

3:34 Unbiased Introduction, Topic 3: Using GMOs to Increase Food-Security in Regions Where the Technology is not Universally Accepted. **Fazila Yousuf**, fazila_yousuf@hotmail.com, Charles Sturt Univ., Orange, Australia and **Akua Konadu Antwi-Agyakwa**, Kwame Nkrumah Univ. of Science and Technology, Kumasi, Ghana

3:39 Pro Team (Auburn University, faculty advisor - David Held), Topic 3: Using GMOs to Increase Food-Security in Regions Where the Technology is not Universally Accepted. **Tolulope Morawo**, tom0002@auburn.edu[1], **Olufemi Ajayi**, osa0001@auburn.edu[2], **Julian Golec**, JRG0027@auburn.edu[3], **Joseph Disi**, jod0003@tigermail.auburn.edu[1] and **Matthew Burrows**[1], [1]Auburn Univ., Auburn, AL, [2]Dept. of Entomology & Plant Pathology, Auburn Univ., Auburn, AL, [3]Auburn Univ., auburn, AL

3:46 Cross-Examination by Con Team for Topic 3

3:49 Con Team (UC Davis, faculty advisor - Larry Godfrey), Topic 3: Using GMOs to Increase Food-Security in Regions Where the Technology is not Universally Accepted. **Mohammad-Amir Aghaee**, maghaee@ucdavis.edu[1], **Matan Shelomi**, mshelomi@ucdavis.edu[2], **Irina Shapiro**, iashapiro@ucdavis.edu[1] and **Danny Klittich**, dsklittich@ucdavis.edu[1], [1]Univ. of California, Davis, CA, [2]Univ. of California, Davis, Davis, CA

3:56 Cross-Examination by Pro Team for Topic 3

3:59 First Rebuttal by Con Team for Topic 3

4:02 First Rebuttal by Pro Team for Topic 3

4:05 Second Rebuttal by Con Team for Topic 3

4:08 Second Rebuttal by Pro Team for Topic 3

4:11 Questions from Judges and Audience for Topic 3

4:21 Concluding Remarks

TUESDAY, NOVEMBER 12, 2013, EVENING

Social Hour with Poster Presenters

Exhibit Hall 4 (Austin Convention Center)

5:30 - 6:30

Member Symposium: IOBC Workshop Symposium - Integrating the Macros (Macrobial Biocontrols) and the Micros (Microbial Biocontrols) to Manage Insect Pests.

Meeting Room 16 B (Austin Convention Center)

Moderators and Organizers: Stefan T. Jaronski, USDA-ARS, Sidney, MT

6:30 International Organization for Biocontrol Annual Meeting

6:40 2013 Distinguished IOBC Scientist and Doctoral Candidate Awards and Presentations

7:30 1517 Microbes and macrobes in a natural system: gypsy moth in U.S. forests. **Ann E. Hajek**, aeh4@cornell.edu, Cornell Univ., Ithaca, NY

7:50 1518 Of microbes and macrobes: Integration and implementation for successful greenhouse IPM. **Michael Brownbridge**, michael.brownbridge@vinelandresearch.com, Vineland Research and Innovation Centre, Vineland Station, ON, Canada

8:10 1519 Interactions Between Invertebrate Natural Enemies and Insect Pathogenic Microsporidia. **Leellen Solter**, lsolter@illinois.edu, Illinois Natural History Survey/Univ. of Illinois, Champaign, IL

8:40 Social Hour

Member Symposium: Korean Young Entomologists (KYE)

Meeting Room 17 B (Austin Convention Center)

Moderators and Organizers: Sunghoon Baek[1] and Ikju Park[2], [1]West Virginia Univ., Morgantown, WV, [2]Univ. of Idaho, Moscow, ID

6:00 Welcoming Remarks

6:05 1520 Shooting insects from the sky: Aerial delivery of natural enemies using aerospace engineering. **Yong-Lak Park**, Yong-Lak.Park@mail.wvu.edu and Srikanth Gururajan, West Virginia Univ., Morgantown, WV

6:17 1521 Control researches of the diamondback moth, *Plutella xylostella* (L.). **Dae-weon Lee**, daeweonlee@ks.ac.kr, Kyungsung Univ., Busan, South Korea and Yonggyun Kim, Andong National Univ., Andong, Gyeoungbuk, South Korea

6:29 1522 Species delimitation in taxonomically difficult Korean insects based on simultaneous analysis of molecular and morphological data. **Hae Chul Park**, culent@korea.kr and Tae Man Han, National Academy of Agricultural Science, Suwon, South Korea

6:41 1523 Exploring overwintering ecology of brown marmorated stink bug using detector dogs. **Doo-Hyung Lee**, doohyung.lee@ars.usda.gov[1], Tracy C. Leskey[1], Lisa Beckett[2], Jennifer Anderson[2] and Jodi Daugherty[2], [1]USDA, Agricultural Research Service, Kearneysville, WV, [2]USDA-APHIS, Newnan, GA

6:53 1524 Plant-microbe-insect interactions: A hidden player manipulates plant defenses. **Seung Chung**, szc154@psu.edu and Gary Felton, Pennsylvania State Univ., Univ. Park, PA

7:05 1525 Evolution of density-dependent phenotypic plasticity in grasshoppers: An overview. **Hojun Song**, song@ucf.edu, Univ. of Central Florida, Orlando, FL

7:17 1526 Silkworm pupa protein ingestion enhances skeletal muscle volume in rats. Sungpil Ryu, **Eunyoung Ahn**, aneunyoung19@gmail.com, Hyobin Seo, Taedong Kwon and Yunghi Yeo, Kyungpook National Univ., Sangju, South Korea

7:29 1527 Antioxidant and immune function effect augmented by exercise training and silkworm pupa ingestion in rats. Sungpil Ryu, Mihee Cho, **Hyobin Seo**, dietnjoy@gmail.com, Taedong Kwon and Yunghi Yeo, Kyungpook National Univ., Sangju, South Korea

7:41 Break

7:55 Introductory Remarks for Student Competition

8:00 1528 Analysis of enhancing fat metabolism and blood lipids lowering effects of swimming exercise training and silkworm pupae-fed in rats. Sungpil Ryu, Hyobin Seo and **Yiseol Kim**, ratsnjoy@gmail.com, Kyungpook National Univ., Sangju, South Korea

8:12 1529 Different physiological roles of two dopamine receptors in salivation of the blacklegged tick, *Ixodes scapularis* Say. **Donghun Kim**, kp5091@k-state.edu, Ladislav Simo and Yoonseong Park, Kansas State Univ., Manhattan, KS

8:24 1530 *Parasitylenchus cyrtogenii* n. sp.(Tylenchida: Allantonematidae) from *Cyrtogenius brevior* (Coleoptera: Scolytidae) from red pine. **Young Hac Jung**, heeyam1227@hanmail.net, Eun Ju You and Ho Yul Choo, Gyeongsang National Univ., Jinju, South Korea

8:36 1531 Biological control of black cutworm, *Agrotis ipsilon* (Lepidoptera: Noctuidae) with Korean entomopathogenic nematode, *Steinernema carpocapsae* GSN1 strain (Rhabditida: Steinernematidae) in turfgrasses. Dong Woon Lee[1], **Chae Min Lee**, Ilbeloved@hanmail.net[1], Sang Myeong Lee[1], Young Hac Jung[2], Ho Yul Choo[2] and Daniel A. Potter[3], [1]Kyungpook National Univ., Sangju, South Korea, [2]Gyeongsang National Univ., Jinju, South Korea, [3]Univ. of Kentucky, Lexington, KY

8:48 1532 Investigating olfactory and visual cues in the host selection of houndstongue seed-feeding weevils (*Mogulones borraginis*). **Ikju Park**, park0563@vandals.uidaho.edu, Mark Schwarzländer and Sanford D. Eigenbrode, Univ. of Idaho, Moscow, ID

9:00 1533 The functions of thermo-trasient receptor potential channels in thermal avoidance behavior and in thermal acclimation in the red flour beetle, *Tribolium castaneum*. **Hong Geun Kim**, hgkim@ksu.edu, David C. Margolies and Yoonseong Park, Kansas State Univ., Manhattan, KS

9:12 1534 The spatial and temporal distribution of hemlock woolly adelgid (Hemiptera: Adelgidae). **Sunghoon Baek**, shbaek007@hotmail.com and Yong-Lak Park, West Virginia Univ., Morgantown, WV

9:24 Concluding Remarks

Member Symposium: Nepal Overseas Entomologists Symposium: Promoting Entomological Collaboration through Inter-societal Network and Information Sharing

Meeting Room 15 (Austin Convention Center)

Moderators and Organizers: Ram B. Shrestha[1], Bal Krishna Gautam[2], Sandipa G. Gautam[3] and Jhalendra P. Rijal[4], [1]Texas A&M AgriLife Research and Extension Center, Lubbock, TX, [2]Louisiana State Univ., Baton Rouge, LA, [3]Oklahoma State Univ., Stillwater, OK, [4]Virginia Tech, Winchester, VA

6:00 Introductory Remarks

6:05 1535 SONE: History, significance, and role in fostering inter-societal collaborations. **Megha N. Parajulee**, m-parajulee@tamu.edu, Texas A&M AgriLife Research and Extension Center, Lubbock, TX

6:20 1536 Why should we be a member of the ESA International Branch?. **T. X. Liu**, tongxianliu@yahoo.com, Northwest A&F Univ., Yangling, Shaanxi, China

6:35 1537 AIENA: Conquering entomology innovations. Shripat Kamble, Univ. of Nebraska, Lincoln, NE and **Nandi Nagaraj**, nnagaraj@dow.com, Dow AgroSciences, Indianapolis, IN

6:50 1538 SEB (Brazilian Entomological Society): A neotropical network seeking a growing collaboration. **P. M. O. J. Neves**, pedroneves@uel.br, State Univ. of Londrina, Londrina, Brazil and Antônio Panizzi, Embrapa (NACIONAL WHEAT RESEARCH CENTER), Passo Fundo, Brazil

7:05 1539 Can't we just all be entomologists? **Gail E. Kampmeier**, gkamp@illinois.edu, Univ. of Illinois, Champaign, IL

7:20 1540 Overseas Chinese entomologists association (OCEA): History, current status, and future prospects. **Haobo Jiang**, haobo@okstate.edu, Oklahoma State Univ., Stillwater, OK

7:35 Break

7:40 1541 Entomological outreach in Himachal Pradesh: Potential collaborative linkages with the west. **Rakesh Gupta**, rgupta1512@gmail.com, Dr YS Parmar Univ. of Horticulture & Forestry, Solan, Himachal Pradesh, India

7:55 1542 Project management in a web-based application for interstate, international and interdisciplinary stakeholders. **Douglas G. Pfeiffer**, dgpfeiff@vt.edu, Virginia Tech, Blacksburg, VA

8:10 1543 Senior network and senior entomologists: Foster collaboration by connecting with Nepalese entomologists. **Kenneth A. Sorensen**, kenneth_sorensen@ncsu.edu, North Carolina State Univ., Raleigh, NC

8:25 1544 Experiences with Plant Protection Societies in India: Their role and constraints in the research, education and extension of plant protection Sciences. **Govind Gujar**, gtgujar@yahoo.com, Head, New Delhi, India

8:40 1545 Chinese academy of science: Promoting national and international entomological partnership. **Feng Ge**, gef@ioz.ac.cn, Professor and Director, Beijing, China

8:55 1546 Role of NPPS and its global networks in the development of sustainable IPM program in Nepal. **Yubak Gc**, director@ppdnepal.gov.np, Plant Protection Directorate, Lalitpur, Bagmati, Nepal

9:10 Concluding Remarks

Member Symposium: Overseas Chinese Entomologists Association (OCEA): Building a Foundation for Collaborations on Entomological Research

Meeting Room 18 B (Austin Convention Center)

Moderators and Organizers: Haobo Jiang[1], Nannan Liu[2] and Xiao-Qiang Yu[3], [1]Oklahoma State Univ., Stillwater, OK, [2]Auburn Univ., Auburn, AL, [3]Univ. of Missouri, Kansas City, Kansas City, MO

6:30 Welcoming Remarks

6:50 1547 The response of agricultural insect pests to elevated CO2 in China. **Feng GE**, gef@ioz.ac.cn, Professor and Director, Beijing, China

7:10 1548 The experience of an overseas entomologist returned to China: Taste the sourness, bitterness, spiciness, sweetness, and successes. **TX. Liu**, tongxianliu@yahoo.com, Northwest A&F Univ., Yangling, Shaanxi, China

7:30 Break

7:50 OCEA highlights

8:10 OCEA financial report

8:30 OCEA student paper competition and award

8:50 OCEA business meeting and election

9:10 OCEA service recognition award

9:30 OCEA policy discussion

9:50 1549 Silkworm is metamorphosing from an economic insect into a lepidopteran model. **Yongping Huang**, yongping@sippe.ac.cn, Chinese Academy of Sciences, Shanghai, Shanghai, China

Member Symposium: Heteropterist Conference

Meeting Room 5 ABC (Austin Convention Center)

Moderators and Organizers: Thomas J. Henry[1] and Katrina L. Menard[2], [1]USDA - ARS, Washington, DC, [2]Sam Noble Oklahoma Museum of Natural History, Norman, OK

6:30 1550 Bean Plataspid aka "Kudzu Bug": An Update from *Megacopta*'s Facebook Page. **Joe E. Eger**, jeeger@dow.com, Dow AgroSciences, Tampa, FL

6:50 1551 Bugs, Guns, and Shakedowns: Collecting in the Congo. **Robert W. Sites**, SitesR@missouri.edu, Univ. of Missouri, Columbia, MO

7:10 1552 The Pentatomidae of Chile. **Eduardo Faundes**, North Dakota State Univ., ND and David A. Rider, North Dakota State Univ., Fargo, ND

7:30 Break

7:50 1553 Synopsis of the Black Bugs (Thyreocoridae) of Eastern North America, with Emphasis on the Ohio Fauna. **Steve Chordas**, Chordas.2@osu.edu, The Ohio State Univ., OH

8:10 1554 Exploring litter bug diversity: The challenges of collecting and curating some of the smallest Heteroptera. **Christiane Weirauch**, christiane.weirauch@ucr.edu, Univ. of California, Riverside, CA

8:30 1555 Notes on the Acanthosomatidae of South America. Mariom Carvajal and **David A. Rider**, David.Rider@ndsu.edu, North Dakota State Univ., Fargo, ND

8:50 1556 Trials and Tribulations of Research in Central Africa: Collecting True Bugs in Cameroon. **Eric Robert Lucien Gordon**, erg55@cornell.edu, Univ. of California, Riverside, Riverside, CA

Member Symposium: North American Dipterists Society Meeting

Meeting Room 6 B (Austin Convention Center)

Moderators and Organizers: Keith M. Bayless, North Carolina State Univ., Raleigh, NC

7:30 Welcoming Remarks

7:35 1557 A tour of Tabanomorpha with a large concatenated matrix phylogeny. **Keith M. Bayless**, kmbayles@ncsu.edu, North Carolina State Univ., Raleigh, NC

7:55 1558 Flies like us: Exploring the diversity of Diptera in our houses. **Michelle Trautwein**, michelle.trautwein@naturalsciences.org, North Carolina Museum of Natural Sciences, Raleigh, NC

8:15 1559 Diversification, cospeciation, and host plant evolution in Fergusonina galling flies feeding on Myrtaceae. Sonja J. Scheffer[1], Kerrie Davies[2], Matthew L. Lewis[3], R. Giblin-Davis[4], Matt Purcell[5], Gary Taylor[2], Andrew Thornhill[6] and **David K. Yeates**, david.yeates@csiro.au[7], [1]USDA, Systematic Entomology Laboratory (SEL), Beltsville, MD, [2]Univ. of Adelaide, Adelaide, South Australia, Australia, [3]USDA-ARS, Beltsville, MD, [4]Univ. of Florida, Davie, FL, [5]USDA-ARS, Brisbane, Australia, [6]The Australian National Univ., Canberra, Australia, [7]CSIRO Ecosystem Sciences, Acton, ACT, Australia

8:35 Discussion

9:05 Concluding Remarks

Member Symposium: Coleopterists Society Annual Meeting

Meeting Room 6 A (Austin Convention Center)

Moderators and Organizers: Victoria Bayless, Louisiana State Univ., Baton Rouge, LA

7:30 Welcoming Remarks

7:50 1560 Almost anything is paussible: Explosive defenses, radiations and convergences within Flanged Bombardier Beetles (Coleoptera: Carabidae: Paussinae. **Wendy Moore**, wmoore@email.arizona.edu, Univ. of Arizona, Tucson, AZ

8:50 Break

9:05 Annual General Business Meeting

TUESDAY, NOVEMBER 12, 2013, POSTERS

Section Poster Presentations: MUVE 1

Exhibit Hall 4 (Austin Convention Center)

D0204 Effect of sugar feeding on the lifespan of four phorid fly species: *Pseudacteon cultellatus, P. curvatus, P. obtusus,* and *P. tricuspis* - natural enemies of imported fire ants. **Olufemi Ajayi**, osa0001@auburn.edu, Dept. of Entomology & Plant Pathology, Auburn Univ., Auburn, AL and Henry Fadamiro, Auburn Univ., Auburn, AL

D0205 Automontage microscopy of four sympatric container-inhabiting mosquitoes and the first images and differentiation of *Aedes albopictus* diapause eggs. **Jake E. Bova**, jbova86@vt.edu and Sally L. Paulson, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

D0206 Design and construction of a trap for surveillance of the mosquito *Aedes aegypti* (Diptera: Culicidae). Mónica Navarro Aranda[1], Jessica Peña Torres[1], **Héctor Parra Moreno**, hparra@uis.edu.co[2] and Jonny Duque Luna[3], [1]Escuela de Diseño Industrial, Universidad Industrial de Santander-UIS-, Grupo de Investigación Interfaz, Bucaramanga, Colombia, [2]Escuela de Diseño Industrial, Universidad Industrial de Santander, Grupo de Investigación Interfaz, Bucaramanga, Colombia, [3]Centro de Investigaciones en Enfermedades Tropicales (CINTROP) y Grupo de Investigación en Enfermedades Infecciosas y Metabólicas (GINEM). Escuela de Medicina. Universidad Industrial de Santander, Bucaramanga, Colombia

D0207 New trap for surveillance of the mosquito *Aedes aegypti* (Diptera: Culicidae). Mónica Navarro Aranda[1], Jessica Peña Torres[1], Héctor Parra Moreno[2] and **Jonny Duque Luna**, jonedulu@uis.edu.co[3], [1]Escuela de Diseño Industrial, Universidad Industrial de Santander-UIS-, Grupo de Investigación Interfaz, Bucaramanga, Colombia, [2]Escuela de Diseño Industrial, Universidad Industrial de Santander, Grupo de Investigación Interfaz, Bucaramanga, Colombia, [3]Centro de Investigaciones en Enfermedades Tropicales (CINTROP) y Grupo de Investigación en Enfermedades Infecciosas y Metabólicas (GINEM). Escuela de Medicina. Universidad Industrial de Santander, Bucaramanga, Colombia

D0208 Utilizing mosquito surveillance to prevent West Nile virus infection—Indiana, 2012. **Bryan Price**, bprice@isdh.in.gov, Jennifer House, Pam Pontones, Mark Glazier, Lee Green, Doug Ginder, Nikki Collins, Michael Denton and Chris Waldron, Indiana State Dept. of Health, Indianapolis, IN

D0209 Repellent activities by ultrasonic sound against the mosquito *Aedes aegypti*. Hyung wook Kwon[1], **Jewon Jung**, jjwf82@snu.ac.kr[1], Seung-Jae Baeck[2], Kun woong Park[1], Doo-Ri Jang[2] and Bong-Kyun Park[2], [1]Seoul National Univ., Seoul, South Korea, [2]LG Electronics, Seoul, South Korea

D0210 Comparison of oviposition lures used to trap *Culex* mosquitoes. **Janel Garza**, jdgarza22@gmail.com, Univ. of Texas-Pan American, Edinburg, TX and Christopher Vitek, Univ. of Texas Pan American, Edinburg, TX

D0211 Sexual behavior of *Aedes aegypti* males during the auto-dissemination of the entomopathogenic fungi *Metarhizium anisopliae*. **Javier Alfonso Garza-Hernandez**, biolgarza@gmail.com[1], Filiberto Reyes-Villanueva[1], Stephany Laredo-TiscarreÑo[1], Erik De Luna-Santillana[1] and Mario Rodriguez-Perez[2], [1]CENTRO DE BIOTECNOLOGIA GENOMICA-INSTITUTO POLITECNICO NACIONAL,

REYNOSA, Mexico, [2]Centro de Biotecnologia Genomica- Instituto Politecnico Nacional, Reynosa, Mexico

D0212 Larval habitat diversity and ecology of mosquito larvae (Diptera: Culicidae) in the Republic of Moldova. **Tatiana Sulesco**, tatiana_sulesco@yahoo.com, Toderas Lidia, Toderas Ion and Aliona Bujor, Academy of Sciences of Moldova, Chisinau, Moldova

D0213 *Aedes albopictus* in northeast Mexico: Update on adult distribution and first report of parasitism by *Ascogregarina taiwanensis*. **Mario Rodriguez-Perez**, drmarodriguez@hotmail.com[1], Stephany Laredo-Tiscarreño[2], Javier Garza-Hernandez[1] and Filiberto Reyes-Villanueva[2], [1]Centro de Biotecnologia Genomica-Instituto Politecnico Nacional, Reynosa, Mexico, [2]CENTRO DE BIOTECNOLOGIA GENOMICA-INSTITUTO POLITECNICO NACIONAL, REYNOSA, Mexico

D0214 Ecological analyses of adult mosquito (Diptera: Culicidae) communities in Iowa. **Mike W. Dunbar**, dunbar@iastate.edu and Lyric Bartholomay, Iowa State Univ., Ames, IA

D0215 Competitiveness test in mosquitoes: A fair game? **David Damiens**, D.Damiens@iaea.org[1], Odessa Madakacherry[1], Hamidou Maiga[2], Abdoulaye Diabaté[2] and Jeremie Gilles[1], [1]Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, Seibersdorf, Austria, [2]Institut de Recherche en Sciences de la Santé/Centre Muraz, Bobo-Dioulasso, Burkina Faso

D0216 Analysis of *Anopheles* spp. blood feeding habits in south Texas. **Norma Hermelinda Martinez**, normahmtz@aol.com[1], Erin Schuenzel[2] and Christopher Vitek[2], [1]Univ. of Texas - Pan American, Edinburg, TX, [2]Univ. of Texas Pan American, Edinburg, TX

D0217 Ecology of mosquitoes (Diptera: Culicidae) potentially vectors of arboviruses according to the kinds of animal husbandry in Belgium. Slimane Boukraa[1], Ana De La Grandiere[2], Thomas Bawin[1], Fara Raharimalala[1], Jean-Yves Zimmer[1], Eric Haubruge[3], Etienne Thiry[2] and **Frederic Francis**, francis.f@fsagx.ac.be[4], [1]Univ. of Liege, Gembloux Agro-Bio Tech, Gembloux, Belgium, [2]Univ. of Liege, Liege, Belgium, [3]Gembloux Agricultural Univ., Genbloux, KS, Belgium, [4]Gembloux Agricultural Univ., Gembloux, Gembloux, Belgium

D0218 Exploring the potential transmission of Rift Valley fever virus in North America by quantifying the relative importance of mosquito vectors and vertebrate hosts. **Andrew Golnar**, agolnar@tamu.edu, Samantha Casas and Gabriel Hamer, Texas A&M Univ., College Station, TX

D0219 Frequencies of voltage-gated sodium channels kdr mutations in *Culex quinquefasciatus* and *Aedes albopictus* (Diptera: Culicidae) of northeastern México. **Gustavo Ponce**, gponcealfa@gmail.com[1], Iram Rodriguez[2], Adriana Flores[2], Selene Garcia[2] and Derek Jimenez[2], [1]Universidad Autonoma de Nuevo León, Guadalupe, N. L., Mexico, [2]Universidad Autonoma de Nuevo León, San Nicolas de los Garza, Mexico

D0220 Characterization and phylogenetic analysis of carboxypeptidase A gene of Indian malaria vector, *Anopheles culicifacies* (Diptera: Culicidae). **Ashwani Kumar**, ashwanikhairwal@gmail.com, Maharshi Dayanand Univ., Rohtak, Haryana, India and Surendra Kumar Gakhar, Maharshi Dayanand Univ., Rohtak, India

D0221 Cloning and characterization of vitellogenin gene of Indian malaria vector, *Anopheles culicifacies*, and comparison with other mosquito vitellogenin genes (Diptera: Culicidae). **Surendra Kumar Gakhar**, surengak@gmail.com and Monika Miglani, Maharshi Dayanand Univ., Rohtak, India

D0222 Control of *Culex pipiens* mosquitoes at a sawmill by chemigation with Altosid larvicide (methoprene). **Mary A. Sorensen**, marys@placermosquito.org, Kelly Burcham and Joel Buettner, Placer Mosquito & Vector Control District, Roseville, CA

D0223 Plant essential oils and their efficacy against adult mosquitoes. **Aaron Gross**, adgross@iastate.edu, Edmund Norris, Lyric Bartholomay, Michael J. Kimber and Joel Coats, Iowa State Univ., Ames, IA

D0224 Inheritance of resistance to deltamethrin in *Aedes aegypti* (Diptera: Culicidae) from Cuba. **Maria Rodriguez**, mrodriguezc@ipk.sld.cu, Juan Bisset, Leidys French and Daymi Hurtado, Institute of Tropical Medicine Pedro Kouri, Havana, Cuba

D0225 Insecticide resistance mechanisms in *Aedes aegypti* (L.) from Merida, Yucatan, Mexico, related with two dengue transmission seasons. **Gabriela González**, gabygzzo@gmail.com[1], Gustavo Ponce[2], Susana Favela[2] and Adriana Flores[3], [1]Laboratorio de Entomología Médica. Universidad Autónoma de Nuevo León, San Nicolas de los Garza, Nuevo León, Mexico, [2]Universidad Autonoma de Nuevo Leon, Facultad de Ciencias Biologicas, San Nicolas de los Garza, Mexico, [3]Universidad Autonoma de Nuevo Leon, San Nicolas de los Garza, Mexico

D0226 Survival and behavioral disorders of *Aedes aegypti* larvae exposed to different insecticides. Hudson Tomé, Tales Pascini, Rômulo Dângelo, Raul Guedes and **Gustavo Martins**, gmartins@ufv.br, Universidade Federal de Viçosa, Viçosa, Brazil

D0227 Detection of multiple parasites in bloodfed *Culex pipiens* mosquitoes. Gabriel Hamer and **Emily Boothe**, emilyboothe@tamu.edu, Texas A&M Univ., College Station, TX

D0228 Interaction of bacteria and *Aedes albopictus* larvae: Differential effects of bacterial species on larval growth and transstadial movement of bacteria. **Nicholas Travanty**, nvtravan@ncsu.edu, Loganathan Ponnusamy, Michael Reiskind and Charles Apperson, North Carolina State Univ., Raleigh, NC

D0229 Microbial community and nutrient dynamics in experimental mesocosms following a biorational larval mosquito control application. **Dagne Duguma**, ddemi002@student.ucr.edu[1], Michael Hall[2], Paul F. Rugman-Jones[3], Josh Neufeld[2], Richard Stouthamer[3] and William E. Walton[3], [1]Univ. of California Riverside, Riverside, CA, [2]Univ. of Waterloo, Waterloo, ON, Canada, [3]Univ. of California, Riverside, CA

D0230 Interactions among three La Crosse encephalitis competent vectors (*Aedes triseriatus*, *Aedes albopictus*, *Aedes japonicus*) in a La Crosse encephalitis endemic state. **Eric J. Dotseth**, Eric.J.Dotseth@wv.gov[1], Hannah Cavender[2], Courtney Stamm[2], Mickey King-Fowler[3] and Daniel Payne[2], [1]West Virginia Dept. of Health & Human Resources, Charleston, WV, [2]West Virginia State Univ., Institute, WV, [3]N/a, Charleston, WV

D0231 Characterizing the distribution and seasonal activity of the first population of sand flies (Diptera: Psychodidae) discovered in Kansas. **Samantha Young**, syoung@gus.pittstate.edu, Pittsburg State Universtiy, Pittsburg, KS, David M. Gordon, Pittsburg State Univ., Pittsburg, KS, Ju-Lin Weng, Kansas State Univ., Manhattan, KS and Marcelo Ortigao, Kansas State Universtiy, Manhattan, KS

D0232 Different sand fly species in Sicily and their abundance. **Alessandra Torina**, alessandra.torina@gmail.com, Santo Caracappa, Francesco La Russa, Elena Scariano, Marcellocalogero Blanda and Rossella Lelli, Istituto Zooprofilattico Sperimentale della Sicilia, PALERMO, Italy

D0233 Feeding antisera targeting the peritrophic matrix-associated proteins Ppchit1 and PpPer1 interferes with kinetics in the sand flies *Phlebotomus papatasi* and *Lutzomyia longipalpis*. **Juliana**

Malta, jumalta@gmail.com[1], Maricela Robles-Murguia[2], Wiviane Assis[1], José Marcelo Ramalho-Ortigao[3] and Gustavo Martins[1], [1]Universidade Federal de Viçosa, Viçosa, Brazil, [2]Kansas State Univ., Manhattan, KS, [3]Kansas State Universtiy, Manhattan, KS

D0234 Preliminary studies on the *Culicoides spp.* complex (Ceratopogonidae) in northeastern Kansas that includes vectors of epizootic hemorrhagic disease of ruminants. **Robert Pfannenstiel**, Bob.Pfannenstiel@ars.usda.gov and Mark Ruder, USDA-ARS, Manhattan, KS

D0235 Dr. George H. Bradley and the southern buffalo gnat, *Cnephia pecuarum* (Riley) in Mississippi and Arkansas. **Kristine T. Edwards**, kt20@msstate.edu and Jerome Goddard, Mississippi State Univ., Mississippi State, MS

D0236 Behavioral assays to examine house fly, *Musca domestica* L., attraction to honeydew. **Kim Hung**, kim.hung@ucr.edu and Alec Gerry, Univ. of California, Riverside, Riverside, CA

D0237 Reproductive compatibility among New World screwworm strains from the Amazon, northeastern and southeastern Brazil. **Thiago Mastrangelo**, thiagomastrangelo@gmail.com, Univ. of Campinas, Campinas, Brazil, Salete Couto, Univ. of Campinas (UNICAMP), Campinas, Brazil and Ana Maria L. Azeredo-Espin, State Univ. of Campinas (UNICAMP), Campinas, Sao Paulo, Brazil

D0238 Carboxylesterase E3 gene evolution: Selection effects and geographic distribution of mutations associated to insecticide resistance in *Cochliomyia hominivorax* (Diptera: Calliphoridae). **Luana Bergamo**, bergamo.luana@gmail.com, Campinas State Univ. (UNICAMP), Campinas, Brazil, Pablo Fresia, Univ. of Sao Paulo/ESALQ, Piracicaba, Brazil and Ana Maria L. Azeredo-Espin, State Univ. of Campinas (UNICAMP), Campinas, Sao Paulo, Brazil

D0239 Comparitive genetics of two selective lines of the secondary screwworm, *Cochliomyia macellaria* (Diptera: Calliphoridae). **John Whale**, whalej@iupui.edu[1], Ernesto Ramos[2], Anne Andere[1], Ashleigh Faris[2], Aaron Tarone[2] and Christine Picard[1], [1]Indiana Univ. Purdue Univ. Indianapolis (IUPUI), Indianapolis, IN, [2]Texas A&M Univ., College Station, TX

Section Poster Presentations: PBT 1

Exhibit Hall 4 (Austin Convention Center)

D0240 Pyrosequencing the *Cosmopolites sordidus* midgut transcriptome reveals candidate genes for silencing (RNAi). **Arnubio Valencia J**, arnubio.valencia@ucaldas.edu.co[1], Alberto Soto G[1], Manuel Aristizabal L[1], Jorge Arboleda V[2], Haichuan Wang[3], Blair Siegfried[4] and Seong-il Eyun[3], [1]Universidad de Caldas, Manizales, Colombia, [2]Universidad del Atlantico, Barranquilla, Colombia, [3]Univ. of Nebraska-Lincoln, Lincoln, NE, [4]Univ. of Nebraska, Lincoln, NE

D0241 cDNA library construction of the sweetpotato whitefly, *Bemisia tabaci*, using Gateway System. **Na-Yeon Ko**, 042-jung@hanmail.net, Moon Nam, Sang-Eun Park, Tae-Hee Ryu, Jeong-Gon Kim, Hyo-Seob Shin, Hye-Ri Kwon, Mi-Ja Seo, Hyoun-Sub Lim, Yong-Man Yu and Young-Nam Youn, Chungnam National Univ., Daejeon, South Korea

D0242 Expression and functional study of the mAbG9 against the spore wall protein of *Nosema bombycis* in BmE cells. **Chunfeng Li**, licf@swu.edu.cn, Maofei Bian, Guoqing Pan, Tian Li and Zeyang Zhou, Southwest Univ., Chongqing, China

D0243 Involvement of small RNAs in *Microplitis demolitor* Bracovirus replication. **Gaelen Burke**, grburke@uga.edu, The Univ. of Georgia, Athens, GA and Michael R. Strand, Univ. of Georgia, Athens, GA

D0244 Expression ofP genes in *Drosophila melanogaster* induced by bacterial components. **Munmun Chowdhury**, mc8b9@mail.umkc.edu, Univ. of Missouri Kansas City, Kansas City, MO and Xiao-Qiang Yu, Univ. of Missouri, Kansas City, Kansas City, MO

D0245 Regulation of antimicrobial peptide genes by a new transcription factor, LPS-induced TNF-α factor (LITAF). **Xue Zhong**, xzd23@mail.umkc.edu[1], Xiangjun Rao[2], Xinyu Lin[3], Xiaohong Huang[3] and Xiao-Qiang Yu[1], [1]Univ. of Missouri, Kansas City, Kansas City, MO, [2]Univ. of Southern California, Los Angeles, CA, [3]Fujian Agriculture and Forestry Unversity, Fuzhou, China

D0246 Identification of conserved and novel microRNAs in *Manduca sexta* and their possible roles in the regulation of immunity-related gene expression. **Xiufeng Zhang**, xiufeng.zhang@okstate.edu[1], Yun Zheng[2], Guru Jagadeeswaran[1], Ramanjulu Sunkar[1] and Haobo Jiang[1], [1]Oklahoma State Univ., Stillwater, OK, [2]Fudan Univ., Shanghai, China

D0247 Midgut transcriptome of the cabbage looper, *Trichoplusia ni*. **Guillaume Tetreau**, guillaume.tetreau@gmail.com[1], Xiaozhao Song[1], Yun-Ru Chen[2], Shan Gao[2], Zhangjun Fei[2], Gary Blissard[2] and Ping Wang[1], [1]Cornell Univ. NYSAES, Geneva, NY, [2]Boyce Thompson Institute for Plant Research, Ithaca, NY

D0248 Uricolityc fungi symbionts of nopal cochineal *Dactylopius* spp. (Hemiptera: Dactylopiidae). **Arturo Vera**, avera@ccg.unam.mx, Mónica Rosenblueth and Esperanza Martínez-Romero, CCG-UNAM, Cuernavaca, Mexico

D0249 Delivery of *Maize mosaic rhabdovirus* into *Peregrinus maidis* by microinjection for functional analysis of genes involved in response to virus infection. **Jianxiu Yao**, jianxiuy@gmail.com, Dorith Rotenberg and Anna E. Whitfield, Kansas State Univ., Manhattan, KS

D0250 The expression of antimicrobial peptides by bollworm larvae feeding on maize and cotton from Texas and Mexican fields. Marcela Martinez-Valenzuela[1], Patricia Tamez-Guerra[2], **Alberto Valadez-Lira**, jalvali@hotmail.com[1], Patricia V. Pietrantonio[3] and Ricardo Gomez-Flores[1], [1]Universidad Autonoma de Nuevo Leon, San Nicolás de los Garza, NL, Mexico, [2]Universidad Autonoma de Nuevo Leon, San Nicolás de los Garza, NL., Mexico, [3]Texas A&M Univ., College Station, TX

D0251 Molecular and functional approaches for understanding cytochrome P450-based detoxification mechanisms in major agricultural pests. Maria Riga[1], Dimitra Tsakireli[2], Aris Ilias[2], Evangelia Morou[2], Kriton Kalantidis[2], Ralf Nauen[3], Thomas Van Leeuwen[4], Mark Paine[5] and **John Vontas**, vontas@biology.uoc.gr[1], [1]Univ. of Crete, Heraklion, Greece, [2]Univ. of Crete, Herakleion, Greece, [3]Bayer CropScience Aktiengesellschaft, Monheim, Germany, [4]Ghent Univ., Ghent, Belgium, [5]Liverpool School of Tropical Medicine, Liverpool, United Kingdom

D0252 Utilizing sodium alginate pellets for delivery of DNA. **MacKenzie F. Patton**, mpatton3@patriots.uttyler.edu[1], Juan Macias-Velasco[2], Daymon Hail[3] and Blake R. Bextine[3], [1]Univ. of Texas, Tyler, Tyler, TX, [2]The Univ. of Texas at Tyler, Tyler, TX, [3]Univ. of Texas, Tyler, TX

D0253 Identification of the sex pheromone of the Chilean fruit leafroller, *Proeulia auraria* (Lepidoptera: Tortricidae). **Tomislav Curkovic**, tcurkovi@uchile.cl, Univ. of Chile, Chile

D0254 Evidence of biogenic amines regulating oviposition in the western tarnished plant bug, *Lygus hesperus*. **Colin S. Brent**, colin.brent@ars.usda.gov[1], Rachna Nath[2], Bronwen Steele[3], Brittany

Miranda[3] and Katelyn Miyasaki[4], [1]US Dept. of Agriculture, Maricopa, AZ, [2]Chandler-Gilbert Community College, Chandler, AZ, [3]Estrella Mountain Community College, Avondale, AZ, [4]Desert Vista High School, Phoenix, AZ

D0255 Ultrastructure of integument wax and wax-producing structures in the melaleuca psyllid, *Boreioglycaspis melaleucae* (Hemiptera: Psyllidae). **El-Desouky Ammar**, eldammar@hotmail.com, Rocco Alessandro, David Hall and Robert G. Shatters, USDA-ARS, US Horticultural Research Laboratory, Fort Pierce, FL

D0256 The *Reticulitermes flavipes* (Kollar) peritrophic matrix: Silencing of its main components. **Andres Sandoval-Mojica**, sandova0@purdue.edu, Purdue Univ., West Lafayette, IN

D0257 An estimation of cold hardiness of the tawny crazy ant, *Nylanderia fulva* (Hymenoptera: Formicidae). **David Cross**, dcross@entomology.msstate.edu, John Riggins, Natraj Krishnan and Michael Caprio, Mississippi State Univ., Mississippi State, MS

D0258 DNA underreplication in the majority of nuclei in the *Drosophila* thorax: Evidence from SuUR and flow cytometry. **J. Spencer Johnston**, spencerj@tamu.edu[1], Molly Schoener[1], Astha Ahuja[2] and Dino McMahon[3], [1]Texas A&M Univ., College Station, TX, [2]Baylor Human Genome Sequencing Center, Houston, TX, [3]Queen's Univ. Belfast, Belfast, United Kingdom

D0259 Identification and characterization of multiple functional aquaporins from the western tarnished plant bug, *Lygus hesperus*. **Jeff Fabrick**, jeff.fabrick@ars.usda.gov, USDA-ARS U.S. Arid Land Agricultural Research Center, Maricopa, AZ, Joe Hull, USDA-ARS, U.S. Arid Land Agricultural Research Center, Maricopa, AZ and Andrea Yool, School of Molecular & Biomedical Science, Univ. of Adelaide, Adelaide, Australia

D0260 Inbreeding and phenotypic genetic marker strains in *Coleomegilla maculata*. **Margaret L. Allen**, meg.allen@ars.usda.gov, USDA-ARS, Stoneville, MS and Joe Ballenger, USDA ARS, Stoneville, MS

D0261 JH biosynthetic enzymes in the mosquito *Aedes aegypti*. **Pratik Nyati**, pnyat001@fiu.edu, Crisalejandra Rivera-Perez and Fernando Noriega, Florida International Univ., Miami, FL

D0262 Dynamic assembly of cuticular proteins into the elytral procuticle of *Tribolium castaneum*. **Beibei Li**, libeibei@ksu.edu, Kansas State Univ., Manhattan, KS

D0263 Morphology, dendritic innervations and development of antennal sensilla of the small brown planthopper, *Laodelphax striatellus* (Fallén) (Hemiptera: Delphacidae). **Bing-Xian Fu**, bxfu658@aliyun.com, Institute of Insect Sciences, Zhejiang Univ., Hangzhou, China

D0264 Antennal transcriptomics of the exotic invasive insect pest emerald ash borer, *Agrilus planipennis*. **Praveen Mamidala**, p.mamidala@yahoo.com, The Ohio State Univ., OARDC, Wooster, OH

D0265 Characterization of fatty acyl-coA reductases involved in the sex pheromone biosynthesis of the cotton leafworm, *Spodoptera littoralis* (Lepidoptera: Noctuidae). **Binu Antony**, binuantony1@yahoo.co.in, Saleh A. Aldosari and Abdulrahman Saad Aldawood, King Saud Univ., Riyadh, Saudi Arabia

D0266 Presentation withdrawn.

D0267 Comparative sucrose sensitivity in *Apis mellifera* and *A. cerana* foragers. Wenchao Yang[1], Haiou Kuang[2], Xiaoqing Miao[1] and **Zachary Y. Huang**, bees@msu.edu[3], [1]Fujian Agriculture and Forestry Univ., Fuzhou, China, [2]Yunnan Agricultural Univ., Kunming, China, [3]Michigan State Univ., East Lansing, MI

D0268 Transcriptional analysis of teratocyte in *Cotesia plutellae*. **Dae-weon Lee**, daeweonlee@ks.ac.kr[1], Wook Hyun Cha[1] and Yonggyun Kim[2], [1]Kyungsung Univ., Busan, South Korea, [2]Andong National Univ., Andong, Gyeoungbuk, South Korea

D0269 Grooming behavior and *Neurexin* expression in honey bees. **Jennifer M. Tsuruda**, jtsuruda@purdue.edu[1], Subhashree Subramanyam[1], Christie E. Williams[2], Mollah Md. Hamiduzzaman[3], Ernesto Guzman-Novoa[3], Berna Emsen[3] and Greg J. Hunt[1], [1]Purdue Univ., West Lafayette, IN, [2]USDA, Agricultural Research Service, West Lafayette, IN, [3]Univ. of Guelph, Guelph, ON, Canada

D0270 Juvenile hormone and insulin regulate trehalose homeostasis in the red flour beetle, *Tribolium castaneum* . **Jingjing Xu**, jxu222@uky.edu and Subba Reddy Palli, Univ. of Kentucky, Lexington, KY

D0271 Exoskeleton nitrogen investment and loss during the molt cycles of developing American grasshoppers, *Schistocerca americana.* . **Donald Mullins**, mullinsd@vt.edu and Sandra Gabbert, Virginia Tech, Blacksburg, VA

D0272 Evaluating previously developed microsatellite markers on populations of *Anastrepha ludens*. **Johnathon Waggoner**, johnathon_waggoner@yahoo.com[1], Erin Schuenzel[1], Norman Barr[2] and Raul Ruiz-Arce[2], [1]Univ. of Texas Pan American, Edinburg, TX, [2]USDA - APHIS, Edinburg, TX

D0273 Diet influences resting metabolism in adult, female *Gryllus firmus* crickets. **Rebecca Clark**, r11clark@gmail.com[1], Anthony J. Zera[2] and Spencer T. Behmer[1], [1]Texas A&M Univ., College Station, TX, [2]Univ. of Nebraska-Lincoln, Lincoln, NE

D0274 Nutritional constraints on ant colony foundation. **Katie A. Miller**, mill1168@stthomas.edu[1], Katie Bell[1], Michael Kaspari[2] and Adam Davidson Kay[1], [1]Univ. of St. Thomas, St. Paul, MN, [2]Univ. of Oklahoma, Norman, OK

D0275 Determination of western cherry fruit fly meatbolism using differential scanning calorimetry. **Lisa G. Neven**, Lisa.Neven@ars.usda.gov, USDA-ARS, Wapato, WA

D0276 Identifying signal peptides in potato psyllids, *Bactericera cockerelli*. **Jessica Woodruff**, wood815@gmail.com[1], Chris Powell[1], Daymon Hail[2] and Blake Bextine[1], [1]Univ. of Texas at Tyler, Tyler, TX, [2]Univ. of Texas, Tyler, TX

D0277 Charlotte goes to space: Student scientists study spider egg-sac development and cannibalism in weeks of weightlessness. **José-Cristian Martínez**, jmarti51@uic.edu[1], David H. Wise[1], Elsa Berrios[2] and Crystal McDowell[2], [1]Univ. of Illinois, Chicago, Chicago, IL, [2]Cicero School District 99, Cicero, IL

D0278 Factors impacting overwintering success of honey bees, *Apis mellifera*. **Mehmet Ali Doke**, mad435@psu.edu, Sara Ashcraft, Bernardo Niño, Tracey Baumgarten, Christina M. Grozinger and Maryann Frazier, Pennsylvania State Univ., Univ. Park, PA

D0279 Using *Drosophila* as a model system for analyzing insect-fungal interactions. **Hsiao-Ling Lu**, hllu@umd.edu and Raymond J. St. Leger, Univ. of Maryland, College Park, MD

D0280 Light response differences between male and female Asian gypsy moth, *Lymantria dispar*, and across subspecies. **Helen Hull-Sanders**, Helen.M.Hull-Sanders@usda.gov[1], Damon J. Crook[2], Victor C. Mastro[3] and David R. Lance[2], [1]Pennsylvania State Univ., Univ.

Park, PA, [2]USDA-APHIS-PPQ, Otis ANGB, MA, [3]USDA APHIS PPQ CPHST, Buzzards Bay, MA

D0281 Examining the causes of differential responses to the queen in drones and workers of the honey bee, *Apis mellifera*. **Gabriel Villar**, gabrielvillar@gmail.com[1], Thomas Baker[2], Harland M. Patch[2] and Christina M. Grozinger[2], [1]Pennsylvania State Univ. - Center for Pollinator Research, State College, PA, [2]Pennsylvania State Univ., Univ. Park, PA

D0282 *Trichoplusia ni* (Lepidoptera: Noctuidae) somatic and immune response alterations by electromagnetic fields. Karen Martínez-Trejo[1], Alonso Orozco-Flores[1], Alberto Valadez-Lira[1], José Heredia-Rojas[1], Abraham Rodríguez de la Fuente[1], Mayela Castañeda-Ramírez[1] and **Patricia Tamez-Guerra**, patricia.tamezgr@uanl.edu.mx[2], [1]Universidad Autonoma de Nuevo Leon, San Nicolás de los Garza, NL, Mexico, [2]Universidad Autonoma de Nuevo Leon, San Nicolás de los Garza, NL., Mexico

D0283 Hormone regulation of a seasonally plastic, sexually dimorphic mating ornament in the squinting bush brown butterfly, *Bicyclus anynana*. **Kathleen Prudic**, prudick@science.oregonstate.edu[1], Ashley Bear[2], Bethany Wasik[2] and Antónia Monteiro[2], [1]Oregon State Univ., Corvallis, OR, [2]Yale Univ., New Haven, CT

D0284 Examining the role of trehalose in thermal tolerance by the whitefly *Bemisia tabaci*. **Jesse Hardin**, jahardi2@ncsu.edu, North Carolina State Univ., Raleigh, NC, David N. Byrne, Univ. of Arizona, Tucson, AZ and Michael Salvucci, USDA-ARS, Maricopa, AZ

D0285 Auditory evoked potentials recorded from the brain in the cricket, *Acheta domesticus*. **Al Yonovitz**, al.yonovitz@umontana.edu and Rita Quigley, Univ. of Montana, Missoula, MT

D0286 Acarian chemotaxis by a sinusoidal walk: A non-directional mechanism modulating counterturning patterns generates robust chemotaxis in mites. **Takeshi Kojima**, kojimat@sc.sumitomo-chem.co.jp and Masayuki Sakuma, Kyoto university, Kyoto, Japan

D0287 Field survey of insecticide resistance and cross-resistance in the Asian citrus psyllid, *Diaphorina citri* Kuwayama (Hemiptera: Psyllidae). **Monique Coy**, mrcoy@ufl.edu and Lukasz, L. Stelinski, Univ. of Florida, Lake Alfred, FL

Section Poster Presentations: P-IE 1

Exhibit Hall 4 (Austin Convention Center)

D0288 Entomology and Hollywood: History of the 1950's science fiction "Big Bug" movies. **Raymond A. Cloyd**, rcloyd@ksu.edu, Kansas State Univ., Manhattan, KS

D0289 #UFBugs, how the University of Florida used public relations resources to promote the first ever BugWeek. **Jennifer L. Gillett-Kaufman**, gillett@ifas.ufl.edu, Univ. of Florida, Gainesville, FL

D0290 Using a Master Gardener volunteer network for quantitative adult sampling of spottedwing drosophila, *Drosophila suzukii*, in Minnesota. **Mark K. Asplen**, asple001@umn.edu[1], Eric C. Burkness[2] and William D. Hutchison[2], [1]Metropolitan State Univ., Saint Paul, MN, [2]Univ. of Minnesota, St. Paul, MN

D0291 Woodlands in peril: Evaluating natural resource volunteerism as a weapon against invasive pests. **Lesley Tylczak**, latylczak@gmail.com[1], David A. Andow[2], Eugene Borgida[3] and Terrance Hurley[2], [1]Univ. of Minnesota, St Paul, MN, [2]Univ. of Minnesota, St. Paul, MN, [3]Univ. of Minnesota, Minneapolis, MN

D0292 Modeling geographical distribution of insect population under possible climate change scenario in Korea. **Jung-Joon Park**, jungpark@gnu.ac.kr, Gyeongsang National Univ., Jinju, South Korea and Kijong Cho, Korea Univ., Seoul, South Korea

D0293 Challenges of dose-response studies for meeting desired efficacy levels of phytosanitary treatments. **Guy J. Hallman**, Guy.Hallman@ars.usda.gov, USDA, ARS, Manhattan, KS and Mark S. West, USDA, Fort Collins, CO

D0294 Purdue Plant Doctor brings problem diagnosis and solutions to clientele as resident smartphone apps. **Clifford S Sadof**, csadof@purdue.edu[1], Janna Beckerman[2], Adam Witte[1], David McClure[2] and Eileen Luke[1], [1]Purdue Univ., West Lafayette, IN, [2]Purdue Univ., West Lafayatte, IN

D0295 The Pesticide Risk Mitigation Engine: A farmer-friendly online tool for field-specific risk assessment and mitigation. **Thomas A. Green**, ipmworks@ipminstitute.org[1], Chuck Benbrook[2], Karen Benbrook[3], Michael Guzy[4], Paul Jepson[4], Susan Kegley[5], Jonathan Kaplan[6], Pierre Mineau[7] and Wade D. Pronschinske[1], [1]IPM Institute of North America, Madison, WI, [2]Organic Center, Enterprise, OR, [3]BCS Ecologic, Inc., Enterprise, OR, [4]Oregon State Univ., Corvallis, OR, [5]Pesticide Research Institute, Berkeley, CA, [6]Natural Resources Defense Council, San Francisco, CA, [7]Pierre Mineau Consulting, Ottawa, ON, Canada

D0296 Use of a phone App to optimize pesticide spray applications and reduce risk of resistance development in target pest populations. **Christian Nansen**, christian.nansen@uwa.edu.au[1], Nicolas Garel[2], Olivier Baissac[1] and Jerome Gumley[1], [1]The Univ. of Western Australia, Perth, Australia, [2]ngperceptive, Cloverdale, Australia

D0297 Codling moth phenology in North Carolina: Modeling the effects of resistance for improved forecasting and management. **Thomas M. Chappell**, tmchappe@ncsu.edu[1], James F. Walgenbach[2] and George G. Kennedy[1], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Fletcher, NC

D0298 Long-term survey of bollworm moth flight activity and pyrethroid resistance monitoring in the Texas High Plains. **Stanley C. Carroll**, s-carroll2@tamu.edu and Megha N. Parajulee, Texas A&M AgriLife Research and Extension Center, Lubbock, TX

D0299 Influence of modified atmosphere packaging on radiation tolerance in the phytosanitary pest melon fly. **Peter A. Follett**, peter.follett@ars.usda.gov, USDA-ARS, Hilo, HI

D0300 Measuring ecosystem services of some pollinator bees in apple orchards in Pennsylvania. **Neelendra K. Joshi**, nkj105@psu.edu[1], David J. Biddinger[1], Edwin Rajotte[2], Mark Otieno[3], Katie Ellis[4] and Amanda Ritz[5], [1]Pennsylvania State Univ., Fruit Research & Extension Center, Biglerville, PA, [2]Pennsylvania State Univ., State College, PA, [3]Pennsylvania State Univ., Univ. Park, PA, [4]Entomology, Pennsylvania State Univ., Biglerville, PA, [5]Pennsylvania State Univ., Biglerville, PA

D0301 Bagging of watermelon, *Citrullus lanatus*, flowers has strong effects on honey bee, *Apis mellifera*, foraging behavior and pollen deposition. **Joan Leong**, jomleong@csupomona.edu, Jacob Cecala, Stephanie Duenas and Robert Polanco, California State Polytechnic Univ., Pomona, Pomona, CA

D0302 Field monitoring of plum curculio, *Conotrachelus nenuphar*, activity with motion-sensor cameras and system applications in general entomology. **Roger Duncan Selby**, selbyrog@msu.edu, Stuart H. Gage and Mark E. Whalon, Michigan State Univ., East Lansing, MI

D0303 Abiotic factors influencing the burrowing and pupation of plum curculio, *Conotrachelus nenuphar*, larvae. **Peter Nelson**, nelsonp8@msu.edu and Mark E. Whalon, Michigan State Univ., East Lansing, MI

D0304 Seasonal and spatial dynamics of plum curculio (Coleoptera: Curculionidae) adults in highbush blueberries. **Sunil Tewari**, tewari.sunil@gmail.com[1], Dean Polk[1], Tracy C. Leskey[2] and Cesar Rodriguez-Saona[3], [1]Rutgers Univ., Chatsworth, NJ, [2]USDA, Agricultural Research Service, Kearneysville, WV, [3]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

D0305 Domestication of highbush blueberry, *Vaccinium corymbosum*, affects community composition. **Matthew Strom**, m.cliffstrom@gmail.com[1], Monique J. Rivera[2] and Cesar Rodriguez-Saona[2], [1]Rutgers Univ., New Brunswick, NJ, [2]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

D0306 Dealing with an alien invasive pest: Sustainable management tactics for the cereal leaf beetle in western Canada. **Swaroop Kher**, skher@ualberta.ca[1], Lloyd M. Dosdall[1] and Héctor A. Cárcamo[2], [1]Univ. of Alberta, Edmonton, AB, Canada, [2]Agriculture and Agri-Food Canada, Lethbridge, AB, Canada

D0307 Wireworm populations increase dramatically in an organic reduced-tillage grain rotation in Maryland. **Lauren Young**, lauren.young@ars.usda.gov[1], Mary Barbercheck[2], Steven Mirsky[3] and Donald C. Weber[1], [1]USDA, Agricultural Research Service, Beltsville, MD, [2]Pennsylvania State Univ., Univ. Park, PA, [3]USDA, Agricultural Research Service, Beltsville, MD

D0308 Damage caused by *Costalimaita ferruginea* (Coleoptera: Chrysomelidae) in access of guava trees cultivated in organic system. **Juliana Galli**, julianagalli@apta.sp.gov.br[1], Marcos Doniseti Michelotto[1], Ivan Fischer[2], Maria Beatriz Soares[1] and Antonio Lucio Martins[1], [1]Apta North Centre, Pindorama, Brazil, [2]Apta Midwest, Bauru, Brazil

D0309 Field and laboratory assays on *Phthia picta* (Coreidae) and *Murgantia histrionica* (Pentatomidae) using organic pesticides. **Gabriela Esparza-Díaz**, gesparzadiaz@ag.tamu.edu, Texas A&M Univ. - Texas AgriLIFE Extension, Weslaco, TX and Raul Villanueva, Texas A&M Agrilife Extension, Weslaco, TX

D0310 Organic options for suppression of *Amphorophora agathonica* egg hatch. **Danielle Lightle**, danielle.lightle@gmail.com, Oregon State Univ., Corvallis, OR and Jana C. Lee, USDA ARS, Corvallis, OR

D0311 Trap cropping for management of the yellowmargined leaf beetle, *Microtheca ochroloma*, in organic crucifer production. **Rammohan Rao Balusu**, balusrr@auburn.edu and Henry Fadamiro, Auburn Univ., Auburn, AL

D0312 Occurrences and friendly environmental control effects of several insect pests on Chinese boxthorn, *Lycium chinense*, with organic farming in Korea. **Tae-Hee Ryu**, fbxogml89@naver.com, Sang-Eun Park, Na-Yeon Ko, Jeong-Gon Kim, Hyo-Seob Shin, Hye-Ri Kwon, Mi-Ja Seo, Yong-Man Yu and Young-Nam Youn, Chungnam National Univ., Daejeon, South Korea

D0313 Investigating the role of alfalfa trap crops in mitigating *Lygus hesperus* immigration into organic strawberries. **Diego J. Nieto**, dnieto@ucsc.edu[1], Sean L. Swezey[1], James R. Hagler[2], Scott A. Machtley[3] and Janet A. Bryer[4], [1]Univ. of California, Santa Cruz, Santa Cruz, CA, [2]USDA, Agricultural Research Service, Maricopa, AZ, [3]USDA Agricultural Research Service, Maricopa, AZ, [4]Univ. of California, Santa Cruz, CA

D0314 Impact of *Beauveria bassiana* applications on *Hypothenemus hampei* infestation on organic coffee farms. Weliton Dias Silva, Univ. of São Paulo, Piracicaba-SP, Brazil and **Gabriel Mascarin**, gmmascar@gmail.com, Embrapa Rice and Beans, Santo Antonio de Goias, Brazil

D0315 Monitoring brown marmorated stink bug, *Halyomorpha halys,* movement in organic crop systems for proper management. **Taliaferro Trope**, talia84@vt.edu[1], Douglas G. Pfeiffer[2] and Thomas P. Kuhar[2], [1]Virginia Tech, Christiansburg, VA, [2]Virginia Tech, Blacksburg, VA

D0316 Impact of natural enemy populations on *Halyomorpha halys* in organic and conventional vegetables in western North Carolina. **Rachel Suits**, rsuits@ncsu.edu and James L. Walgenbach, North Carolina State Univ., Mills River, NC

D0317 Attracting beneficial insects to organically grown blackberries using methyl salicylate-based lures. **Karen L. Friley**, kare.friley@kysu.edu, John D. Sedlacek, Justina A. Riddick and Michael K. Bomford, Kentucky State Univ., Frankfort, KY

D0318 Potential of Entrust® SC insecticide on western flower thrips management in organic cotton. Monti Vandiver[1], **Megha N. Parajulee**, m-parajulee@tamu.edu[2], Dylan Wann[2], Ram B. Shrestha[2], Jane Dever[2], Mark Arnold[2] and Apurba K. Barman[3], [1]Texas AgriLife Extension Service (TAES), Muleshoe, TX, [2]Texas A&M AgriLife Research and Extension Center, Lubbock, TX, [3]Texas A&M AgriLife Extension Service, Lubbock, TX

D0319 Using the Environmental Impact Quotient (EIQ) to quantify the impact of pesticide use on natural enemy guilds in organic and conventionally-managed agroecosystems. **Andrea Kautz**, kautz.14@osu.edu and Mary M. Gardiner, The Ohio State Univ., Wooster, OH

D0320 Developing biological pest management programs for high tunnel grown organic raspberries and cherries. Emily Pochubay, **Kristin Deroshia**, deroshia@msu.edu, Paul Owen-Smith, Josh Moses and Matthew Grieshop, Michigan State Univ., East Lansing, MI

D0321 Getting benefits out of a bad bug: On-farm composting of Japanese beetles, *Popillia japonica* (Coleoptera: Scarabaeidae). **Grato Ndunguru**, ndungurug@lincolnu.edu, Hwei-Yiing Johnson, Jacob Wilson and Jaime Pinero, Lincoln Univ., Jefferson City, MO

D0322 Mass trapping: A potential organic management option for the Japanese beetle (Coleoptera: Scarabaeidae). **Jacob Wilson**, wilsonj@lincolnu.edu and Jaime Pinero, Lincoln Univ., Jefferson City, MO

D0323 The future role of navel orangeworm mass trapping in California almond and pistachio IPM. **Justin Nay**, nayj01@student.ucr.edu, Integral Ag. Inc, Durham, CA and Elizabeth Boyd, California State Univ., Chico, Chico, CA

D0324 Navel orangeworm, *Amyelois transitella*, pheromone and egg trap data for management in almonds. **Charles S. Burks**, charles.burks@ars.usda.gov, USDA, Agricultural Research Service, Parlier, CA and Bradley S. Higbee, Paramount Farming Co, Bakersfield, CA

D0325 Sex pheromone traps for monitoring the tomato leafminer, *Tuta absoluta:* Effect of colored traps and field weathering of lure on male captures. **Mohamed Braham**, braham.mohamed@gmail.com, Entomology and Ecology Laboratory, SOUSSE, Tunisia

D0326 Comparison of emerald ash borer captures among different trap designs at varying stages of the invasion wave. **Jacob N. Bournay**, bournayj@msu.edu[1], Deborah G. McCullough[1], Therese

M. Poland[2] and Molly Robinett[1], [1]Michigan State Univ., East Lansing, MI, [2]USDA Forest Service, East Lansing, MI

D0327 Assessment of three systemic insecticides on emerald ash borer life stages in a young green ash plantation. **Deborah G. McCullough**, mccullo6@msu.edu[1], Therese M. Poland[2], Andrea Anulewicz[1], Andrew R. Tluczek[1] and Phillip A. Lewis[3], [1]Michigan State Univ., East Lansing, MI, [2]USDA Forest Service, East Lansing, MI, [3]USDA-APHIS, Otis ANGB, MA

D0328 Managing red palm weevil by Attract & Kill. **Lyndsie Stoltman**, lyndsie.stoltman@iscatech.com, ISCA Technologies, Riverside, CA, Agenor Mafra-Neto, ISCA Technologies, Inc., Riverside, CA, Hug Vazquez, Llibreria Arrels C.B., Tortosa, Spain and J. R. Faleiro, Ministry of Agriculture, Al-Hassa, Saudi Arabia

D0329 Efficacy of sulfoxaflor (Transform®) against aphids. **Fikru Haile**, fhaile@dow.com[1], Jamey Thomas[2], Patricia Prasifka[3], Dave Ruen[4], Kevin Johnson[3], Eric Scherder[5] and Scott Ditmarsen[6], [1]Dow AgroSciences, Carmel, IN, [2]Dow AgroSciences, Indianapolis, IN, [3]Iowa State Univ., Ames, IA, [4]Dow AgroSciences, LLC, Lanesboro, MN, [5]Dow AgroSciences, LLC, Huxley, IA, [6]Dow AgroSciences, Madison, WI

D0330 Applying the concept of data transportability to non-target arthropod field studies conducted for biotechnology-derived crops. **Christopher Brown**, christopher.r.brown@monsanto.com, Aqeel Ahmad, Sarah Donelson, Joy Whitsel, Michael Horak and David Carson, Monsanto Company, St. Louis, MO

D0331 Introducing Bollgard III to control *Helicoverpa* spp. in Australia. **Kristen Knight**, kristen.m.knight@monsanto.com, Monsanto Australia, Toowoomba, Australia

D0332 Improved methods to evaluate Bt corn ear feeding damage. **Amanda Jacobson**, ajjacobson@dow.com, Dow AgroSciences, LLC, West Lafayette, IN, Mary Kubiszak, Dow AgroSciences, Indianapolis, IN, Dwain M. Rule, Dow AgroSciences, LLC, Indianapolis, IN, Bradley W. Hopkins, Dow AgroSciences, LLC, Westerville, OH, Kevin Johnson, Dow AgroSciences, LLC, Danville, IL and Melissa Willrich Siebert, Dow AgroSciences, Greenville, MS

D0333 Surveying adult corn rootworm, *Diabrotica* spp., populations in Minnesota: A focus on resistance to Bt transgenic traits. **Megan E. Carter**, carte544@umn.edu[1], Kenneth Ostlie[1] and Bruce D. Potter[2], [1]Univ. of Minnesota, St. Paul, MN, [2]Univ. of Minnesota, Lamberton, MN

D0334 Economic impact of the brown marmorated stink bug on farmers. **Eric R. Day**, idlab@vt.edu, VPI&SU, Blacksburg, VA and Carrie Koplinka-Loehr, Northeastern IPM Center, Ithaca, NY

D0335 Damage rates from brown marmorated stink bug in processing tomatoes: Influence of farm management, cultivar, and landscape. **Kevin Rice**, kbr10@psu.edu[1], Shelby Fleischer[2], John F. Tooker[2] and Kristal Watrous[3], [1]Penn State Univ., Univ. Park, PA, [2]Pennsylvania State Univ., Univ. Park, PA, [3]Penn State, Univ. Park, PA

D0336 New egg sanitizing treatment for mass-rearing. John Claus[1], Guolei Tang[1], **Michelle Walters**, michelle.l.walters@aphis.usda.gov[1], Larry E. Jech[1], Eoin Davis[1], Anna Lowe[1] and Ernie D. Miller[2], [1]USDA - APHIS, Phoenix, AZ, [2]Retired USDA-APHIS, Phoenix, AZ

D0337 Evaluating the potential impact of insect pests on the biomass production of *Spartina pectinata*. **Godshen Robert Pallipparambil**, godshen@illinois.edu and Michael E. Gray, Univ. of Illinois, Urbana, IL

D0338 Non-random host preference by cabbage aphids in canola. **Dustin Devertson**, 21229377@student.uwa.edu.au, Christian Nansen and Jerome Gumley, The Univ. of Western Australia, Perth, Australia

D0339 Using crop fertilizer treatments to manipulate host selection by herbivorous field pests. **Julius Wong**, 20845388@student.uwa.edu.au, Jerome Gumley, Luigi Solida and Christian Nansen, The Univ. of Western Australia, Perth, Australia

D0340 Enhancing the health, management, and production of crops through the Plant Management Network's "Focus On" webcast series. **Ryan Kurtz**, rkurtz@cottoninc.com, Cotton Incorporated, Cary, NC and Phil Bogdan, Plant Management Network International, St. Paul, MN

D0341 Determining pest and pesticide interactions as a means to optimize soybean yield. **Eric H. Clifton**, eclifton@iastate.edu, Erin W. Hodgson, Gregory L. Tylka and Aaron J. Gassmann, Iowa State Univ., Ames, IA

D0342 Preliminary data on rearing the tarnished plant bug, *Lygus lineolaris*, on host plant tissues: With an emphasis on comparisons of Mississippi Delta and Hills populations. **Daniel Fleming**, def18@msstate.edu and Fred Musser, Mississippi State Univ., Mississippi State, MS

D0343 Effect of cold temperature treatment on confused flour beetle, *Tribolium confusum*. Veronica Fernandez[1], **Christopher Vitek**, vitekc@utpa.edu[1], Hugh E. Conway[2] and Kristen Hopperstad[3], [1]Univ. of Texas Pan American, Edinburg, TX, [2]USDA-APHIS-PPQ-CPHST, Edinburg, TX, [3]North Carolina State Univ., Raleigh, NC

D0344 Role of crop border and host patch size on retention of electronically tagged walking adult Colorado potato beetle. Gilles Boiteau, Agriculture and Agri-Food Canada, Fredericton, NB, Canada, **Charles Vincent**, Charles.Vincent@AGR.GC.CA, Agriculture and Agri-Food Canada, Saint-Jean-sur -Richelieu, QC, Canada, Tracy C. Leskey, USDA, Agricultural Research Service, Kearneysville, WV and Bruce Colpitts, Univ. of New Brunswick, Fredericton, NB, Canada

D0345 Assessing the feasibility of small scale hop production in Ohio. **Chelsea Smith**, smith.7231@osu.edu[1], Mary M. Gardiner[2], Brad Bergefurd[3] and Thom Harker[3], [1]Ohio State Univ., OARDC, Wooster, OH, [2]The Ohio State Univ., Wooster, OH, [3]Ohio State Univ., Piketon, OH

D0346 Effect of pre-diapause temperature exposure on the emergence of codling moth, *Cydia pomonella*. **Ute Chambers**, uchambers@wsu.edu and Vincent P. Jones, Washington State Univ., Wenatchee, WA

D0347 Methyl isothiocyanate, MITC, as a new fumigant for stored grain insects. **Ozgur Saglam**, osaglam@ksu.edu, Michael J. Aikins, Mukti N. Ghimire and Thomas Phillips, Kansas State Univ., Manhattan, KS

D0348 Understanding and managing the relationship between insect damage and mycotoxin accumulation in grain corn. Victor Limay-Rios, **Jocelyn L. Smith**, jocelyn.smith@uoguelph.ca and Arthur W. Schaafsma, Univ. of Guelph, Ridgetown Campus, Ridgetown, ON, Canada

D0349 Population suppression of plant-parasitic nematodes using nematicides in fruit vegetables cultivation area in Korea. **Sang-Eun Park**, tkddms2622@naver.com, Sae-Hee Kim, Na-Yeon Ko, Tae-Hee Ryu, Jeong-Gon Kim, Hyo-Seob Shin, Hye-Ri Kwon, Mi-Ja Seo, Yong-Man Yu and Young-Nam Youn, Chungnam National Univ., Daejeon, South Korea

D0350 Distribution of plant-parasitic nematodes at fruit-vegetable fields in Korea. **Sae-Hee Kim**, saehee8875@nate.com, Sang-Eun Park, Na-Yeon Ko, Tae-Hee Ryu, Jeong-Gon Kim, Hyo-Seob Shin, Hye-Ri Kwon, Mi-Ja Seo, Yong-Man Yu and Young-Nam Youn, Chungnam National Univ., Daejeon, South Korea

D0351 Corn yield loss to fall armyworm, *Spodoptera frugiperda*, and its associated fungi. **Patrick Porter**, p-porter@tamu.edu[1], Ed Bynum[2], Monti Vandiver[3], Blayne Reed[4], Gary Cross[4], Gregory B Cronholm[5] and Sydney Glass[6], [1]Texas Cooperative Extension, TAMU Ag Research & Extension Center, Lubbock, TX, [2]Texas AgriLife Extension, Amarillo, TX, [3]Texas AgriLife Extension Service (TAES), Muleshoe, TX, [4]Texas AgriLife Extension, Plainview, TX, [5]TAMU/ Texas Cooperative Extension, Plainview, TX, [6]Texas AgriLife Extension, Lubbock, TX

D0352 Evaluation of commercial formulations of entomopathogenic fungi to manage the redbay ambrosia beetle, vector of laurel wilt, a lethal disease affecting avocados in Florida. **Daniel Carrillo**, dancar@ufl.edu[1], Pasco B. Avery[2], Jose B. Navarrete[1], Rita E. Duncan[1], Alejandro Rooney[3], Christopher Dunlap[3], Mark A. Jackson[3], Robert W. Behle[3], Ronald D. Cave[2], Jonathan H. Crane[1] and Jorge E. Peña[4], [1]Univ. of Florida, Tropical Research and Education Center, Homestead, FL 33031, Homestead, FL, [2]Univ. of Florida, Fort Pierce, FL, [3]USDA-ARS-NCAUR, Peoria, IL, [4]Univ. of Florida, Homestead, FL

D0353 Interactions between tannic acid and *Bacillus thuringiensis* subsp. *kurstaki* KB100 against *Spodoptera exigua*. **Na-Young Jin**, dool12340@cnu.ac.kr, You-Kyoung Lee, Mi-Jin Jeon, San-Na Oh, Mi-Ja Seo, Young-Nam Youn and Yong-Man Yu, Chungnam National Univ., Daejeon, South Korea

D0354 Effects of plant growth regulators on survival and fitness of the oleander aphid, *Aphis nerii* (Homoptera: Aphididae), and the citrus mealybug, *Planococcus citri* (Homoptera: Pseudococcidae). **Antonios Tsagkarakis**, atsagarakis@aua.gr, Ephie Karamatzoglou, Athanasios Papathanasis, Maria Papafotiou and George Papadoulis, Agricultural Univ. of Athens, Athens, Greece

D0355 Understanding the distribution and flight activity of western bean cutworm, *Striacosta albicosta*, a new corn and dry bean pest in the northeastern USA. **J. Keith Waldron**, jkw5@cornell.edu[1], Margaret Skinner[2], Cheryl Frank Sullivan[2], Stephen Crawford[3], Douglas Miller[3] and John Tooker[4], [1]NYS IPM Program, Geneva, NY, [2]Univ. of Vermont, Burlington, VT, [3]The Pennsylvania State Univ., Univ. Park, PA, [4]Pennsylvania State Univ., Univ. Park, PA

D0356 Field testing a solid set canopy delivery system in Michigan apples. **Matthew Grieshop**, grieshop@msu.edu, Larry Gut, John C. Wise, Mark E. Whalon and Ron Perry, Michigan State Univ., East Lansing, MI

D0357 Insect abundance in corn rotational/irrigation environments using artificial- and natural-infestation of western corn rootworm eggs as potential prey. **Billy Fuller**, Billy.Fuller@sdstate.edu[1], Kaushal Chaudhary[1], Bradley McManus[1], Dwayne Beck[2], Walter Riedell[3], Jonathan G. Lundgren[4] and Diane d'Esquerre[5], [1]South Dakota State Univ., Brookings, SD, [2]South Dakota State Univ., Pierre, SD, [3]USDA-ARS, Brookings, SD, [4]USDA - ARS, Brookings, SD, [5]AgroParis Tech, Paris, France

D0358 Effect of solar radiation on the effectiveness of *Beauveria bassiana* infection in *Lygus lineolaris*. **Maribel Portilla**, maribel.portilla@ars.usda.gov[1], Gordon Snodgrass[2] and Randall Luttrell[2], [1]ARS-USDA National Biological Control Laboratory, Stoneville, MS, [2]USDA - ARS, Stoneville, MS

D0359 Reproductive behavior of *Pseudococcus meridionalis* under laboratory conditions. **Tania Zaviezo**, tzaviezo@uc.cl and Guillermo Pérez, Universidad Católica de Chile, Santiago, Chile

D0360 Assessing the impact of fertilization regime on Mexican rice borer, *Eoreuma loftini*, injury in conventional and bioenergy crops. **M.T. VanWeelden**, mvanwe2@lsu.edu[1], B.E. Wilson[1], J.M. Beuzelin[2] and T.E. Reagan[1], [1]Louisiana State Univeristy, Baton Rouge, LA, [2]Louisiana State Univeristy, Alexandria, LA

D0361 Mouthpart deformities, feeding inhibition and mortality of *Euschistus heros* (F.) (Hemiptera: Pentatomidae) by insect growth disruptors (IGDs). **P. M. O. J. Neves**, pedroneves@uel.br and Marcos Aguero, State Univ. of Londrina, Londrina, Brazil

D0362 Effectiveness of spinosad bait stations on Mexican fruit fly, *Anastrepha ludens* (Loew). Daniel Garza[1], Hugh E. Conway[1], Christopher Vitek[2] and **David W. Bartels**, david.w.bartels@aphis.usda.gov[1], [1]USDA-APHIS-PPQ-CPHST, Edinburg, TX, [2]Univ. of Texas Pan American, Edinburg, TX

D0363 Quantifying the effect of sugarcane borer, *Diatraea saccharalis*, injury on yield in conventional and bioenergy sugarcane and sorghum in Louisiana. **Blake Wilson**, bwils26@tigers.lsu.edu, Louisiana State Univ. AgCenter, Baton Rouge, LA, J.M. Beuzelin, Louisiana State Univeristy, Alexandria, LA, Matt VanWeelden, Louisiana State Univ., Baton Rouge, LA and T.E. Reagan, Louisiana State Univeristy, Baton Rouge, LA

D0364 Overwintering biology of twospotted spider mites, *Tetranychus urticae*, and their predators in human made microclimates created for strawberry season extension. **Hannah J. Burrack**, hjburrac@ncsu.edu, North Carolina State Univ., Raleigh, NC

D0365 Influence of intercropping and natural enemies on the potato leafhopper, *Empoasca fabae*, in alfalfa. **Jamie Faselt**, jafaselt@ursinus.edu, Caitlin Johnson, Mary Kathleen Speth, Jamira Bowens and Cory Straub, Ursinus College, Collegeville, PA

D0366 Abundance and diversity of leafhoppers associated with newly established primocane blackberry and raspberry plantings in central Kentucky. **John D. Sedlacek**, john.sedlacek@kysu.edu, Jeannie J. Haak, Karen L. Friley, Kirk W. Pomper, Michael K. Bomford, Sheri B. Crabtree and Jeremiah D. Lowe, Kentucky State Univ., Frankfort, KY

D0367 Glandless cotton: Developing tools to manage insect pests in New Mexico. **Jane Breen Pierce**, japierce@nmsu.edu and Patricia E Monk, New Mexico State Univ., Artesia, NM

D0368 Regional risk assessment of a plant bug on cotton using a cropping system/landscape approach. **Darwin J. Anderson**, DJAnderson@ag.tamu.edu[1], Michael J. Brewer[2], Alby L. Cartwright[1] and John J. Nelson[3], [1]Texas A&M AgriLife Research and Extension Center, Corpus Christi, TX, [2]Texas A&M Univ., Corpus Christi, TX, [3]Del-Mar College, Corpus Christi, TX

D0369 A bloom period-specific economic injury level for a cotton boll-feeding plant bug. **Michael J. Brewer**, mjbrewer@ag.tamu.edu[1], Darwin J. Anderson[2], James P. Glover[2] and J. Scott Armstrong[3], [1]Texas A&M Univ., Corpus Christi, TX, [2]Texas A&M AgriLife Research and Extension Center, Corpus Christi, TX, [3]USDA, Agricultural Research Service, Stillwater, OK

D0370 Cotton plant growth and yield response to various levels of *Lygus* infestations. **Ram B. Shrestha**, rshrestha68@gmail.com and Megha N. Parajulee, Texas A&M AgriLife Research and Extension Center, Lubbock, TX

D0371 Is there a landscape effect on the abundance of *Helicoverpa armigera* larvae in cotton fields? A case study in the northern Benin - West Africa. **Noelline Tsafack**, noelline.tsafack@gmail.com, INP-ENSAT, Castanet-Tolosan / Toulouse, France, Philippe Menozzi, CIRAD, Dpt PERSYST, UPR 102 SCA, Cotonou, Benin, Marc

Deconchat, INRA, Castanet Tolosan / Toulouse, France and Annie Ouin, INP-ENSAT, Castanet-Tolosan/ Toulouse, France

D0372 Spatial association of soil and crop characteristics with insect abundance and injury in cotton. **Francis Reay-Jones**, freayjo@clemson.edu, Clemson Univ., Florence, SC and Jeremy K. Greene, Clemson Univ., Blackville, SC

D0373 Thrips associated with the environs of onion fields in Colorado. **Janet Hardin**, Janet.Hardin@colostate.edu, Whitney Cranshaw and Stephanie Szostek, Colorado State Univ., Fort Collins, CO

D0374 Cowpea, thrips (*Frankliniella fusca*), acephate and their interactions. **Paul J. McLeod**, pjmcleod@uark.edu, Univ. of Arkansas, Fayetteville, AR and Tahir Rashid, Alcorn State Univ., Alcorn State, MS

D0375 Varietal response to thrips injury in Texas cotton. Megha N. Parajulee, Texas A&M AgriLife Research and Extension Center, Lubbock, TX and **Abdul Hakeem**, ahakeem@utk.edu, Texas A&M Univ., Lubbock, TX

D0376 Occurrence and management of thrips on cotton in the Texas High Plains. **Apurba K. Barman**, Apurba.Barman@ag.tamu.edu, Texas A&M AgriLife Extension Service, Lubbock, TX, Monti Vandiver, Texas AgriLife Extension Service (TAES), Muleshoe, TX, Blayne Reed, Texas AgriLife Extension, Plainview, TX and Kerry Siders, Texas A&M AgriLife Extension Service, Levelland, TX

D0377 Selection of *tomato spotted wilt virus* for vector specificity among thrips vectors *Frankliniella occidentalis*, *F. fusca*, and *Thrips tabaci*. **Alana L. Jacobson**, aljacob2@ncsu.edu and George G. Kennedy, North Carolina State Univ., Raleigh, NC

D0378 Field screening of tomato varieties resistant to *tomato yellow leaf curl virus* and *tomato spotted wilt virus* in Hawaii. **Amber P.K. Tateno**, atateno@hawaii.edu[1], Leyla V. Kaufman[2] and Mark G. Wright[2], [1]Univ. of Hawaii - Manoa, Honolulu, HI, [2]Univ. of Hawaii - Manoa, Honolulu, HI

D0379 Effect of seeding rate and insecticide seed treatment on aphid infestation, barley yellow dwarf disease incidence and yield of winter wheat. **G. David Buntin**, gbuntin@uga.edu, Univ. of Georgia, Griffin, GA and R. Dewey Lee, Univ. of Georgia, Tifton, GA

D0380 Improved management of cucumber beetles and bacterial wilt in melons by perimeter trap cropping and extended-duration row covers. **Celeste Welty**, welty.1@osu.edu[1], Mary M. Gardiner[2], Chelsea Smith[3], Laura C. Jesse[4], Donald R. Lewis[4], Fulya Baysal-Gurel[3], Sally A. Miller[3], Jean Batzer[4] and Mark Gleason[4], [1]Ohio State Univ., Columbus, OH, [2]The Ohio State Univ., Wooster, OH, [3]Ohio State Univ., Wooster, OH, [4]Iowa State Univ., Ames, IA

D0381 The citrus greening bibliographical database. **Pilar Vanaclocha**, pvanaclocha@ad.ufl.edu, SWFREC-IFAS-UF, Immokalee, FL and Philip A. Stansly, Univ. of Florida, Immokalee, FL

D0382 Foiling the Yellow Dragon. **Scott D. Croxton**, croxtsd@ufl.edu and Philip A. Stansly, Univ. of Florida, Immokalee, FL

D0383 Results from 2013 efficacy trials evaluating Torac™ 15EC against potato psyllids, *Bactericera cockerelli*. **Scott Ludwig**, swludwig@me.com, Nichino America, Inc, Arp, TX, Jessica Samler, Nichino America, Inc, Kennewick, WA, Donald C. Henne, Texas A&M AgriLife Research, Weslaco, TX, Milo Lewis, Texas A&M Univ., College Station, TX, Gerald J. Michels, Texas A&M Univ., Bushland, TX, Alan Schreiber, Agriculture Development Group, Inc., Eltopia, WA and James Adams, Nichino America, Inc, Wilmington, DE

D0384 Effective management of Asian citrus psyllid in Florida citrus using low volume horticultural oil. **Moneen Jones**, mmjones2@ufl.edu, Southwest Florida Research and Education Center, Immokalee, FL and Philip A. Stansly, Univ. of Florida, Immokalee, FL

D0385 Potential utility of kaolin particle film strategy in Asian citrus psyllid, *Diaphorina citri*, management. **Ki Kim**, kidkim@ufl.edu, Univ. of Florida, Lake Alfred, FL, Rhonda Schumann, Univ. of Florida IFAS Citrus Research and Education Center, Lake Alfred, FL and Michael Rogers, Univ. of Florida-IFAS, Citrus Research and Education Center, Lake Alfred, FL

D0386 Biological control of the Asian citrus psyllid, *Diaphorina citri*, in the Rio Grande Valley using *Tamarixia radiata*. **Daniel Flores**, daniel.flores@aphis.usda.gov, USDA APHIS PPQ CPHST Mission Laboratory, Edinburg, TX

D0387 Effects of *Tibraca limbativentris* Stal (Heteroptera: Pentatomidae) infestations on rice (*Oryza sativa* L.) yield components. **J. Alexandre Barrigossi**, alex@cnpaf.embrapa.br[1], Tavvs Alves[2], Daniel Ferreira Caixeta[1] and Eliane Quintela[3], [1]Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) Rice and Beans, Santo Antônio de Goiás, Goias, Brazil, [2]Univ. of Minnesota, CNPq/Brazil, St. Paul, MN, [3]Embrapa Rice and Beans, Santo Antônio de Goiás, Brazil

D0388 Coccinellid predators do not track populations of the Asian citrus psyllid, *Diaphorina citri*, in citrus in Puerto Rico. **David A. Jenkins**, David.Jenkins@ars.usda.gov and Ricardo Goenaga, USDA-ARS, Mayaguez, PR

D0389 New records of the Asian citrus psyllid, *Diaphorina citri* Kuwayama, predators in northeast Mexico. Santos Díaz-Martínez, INIFAP, Campo Experimental Gral. Terán, Gral. Terán, N.L., Mexico, Marco A. Reyes-Rosas, INIFAP, Río Bravo, Tam., Mexico, Edgardo Cortez-Mondaca, Campo Experimental Valle del Fuerte, J. J. Ríos, Sin., Mexico, Jesús Loera-Gallardo, Campo Experimental Río Bravo, Río Bravo, Tam., Mexico and **J. Isabel López-Arroyo**, lopez.jose@inifap.gob.mx, Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias, Nuevo León, Mexico

D0390 Evaluation of a gall-forming psyllid (*Calophya latiforceps*) as a biological control agent of Brazilian peppertree. Rodrigo Diaz[1], Diego Moscoso[2], **Veronica Manrique**, vero72@ufl.edu[1] and William Overholt[1], [1]Univ. of Florida, Fort Pierce, FL, [2]Zamorano Univ., Tegucigalpa, Honduras

D0391 Ficus whitefly, *Singhiella simplex*, and its predation by a coccinellid beetle, *Delphastus catalinae*. **Jesusa C. Legaspi**, Jesusa.Legaspi@ars.usda.gov, United States Dept. of Agriculture-Agricultural Research Service, CMAVE, Center for Biological Control, Florida A&M Univ., Tallahassee, FL, Neil Miller, USDA-ARS-CMAVE-FAMU-CBC, Tallahassee, FL, Catharine M. Mannion, Univ. of Florida, Homestead, FL and Divina Amalin, Cocoa Foundation of the Philippines, Inc, Quezon City, Philippines

D0392 Effect of the bacteria *Providencia retgerri* and *P. alcalifaciens* on Mexican fruit fly, *Anastrepha ludens* (Loew), production. Mayra Rangel[1], **Hugh E. Conway**, hugh.e.conway@aphis.usda.gov[2], Christopher Vitek[3], Erin Schuenzel[3], Bacilio Salas[4] and Don C. Vacek[5], [1]UTPA, Mission, TX, [2]USDA-APHIS-PPQ-CPHST, Edinburg, TX, [3]Univ. of Texas Pan American, Edinburg, TX, [4]USDA, Edinburg, TX, [5]USDA-APHIS-PPQ-CPHST, Pest Detection, Diagnostic, and Management Laboratory, Edinburg, TX

D0393 Efficacy of an entomopathogenic fungus, *Isaria fumosorosea*, and an insect growth regulator against the rugose spiraling whitefly, *Aleurodicus rugioperculatus* Martin (Hemiptera: Aleyrodidae). **Vivek Kumar**, vivekiari@ufl.edu[1], Pasco B. Avery[2], Ronald D. Cave[2], Antonio Francis[3], Trevor R. Smith[4], Cindy McKenzie[5]

and Lance Osborne[1], [1]Univ. of Florida, Apopka, FL, [2]Univ. of Florida, Fort Pierce, FL, [3]Florida Dept. of Agriculture and Consumer Services (FDACS), Fort Pierce, FL, [4]Florida Dept. of Agriculture and Consumer Services (FDACS), Gainesville, FL, [5]USDA - ARS, Fort Pierce, FL

D0394 Comparison of *Entomophaga maimaiga* infections in *Lymantria dispar* and *L. monacha* (Lepidoptera: Erebidae). **Melody A. Keena**, mkeena@fs.fed.us, USDA, Forest Service, Hamden, CT, Ann E. Hajek, Cornell Univ., Ithaca, NY and Andreas Linde, Univ. of Applied Sciences Eberswalde, Eberswalde, Germany

D0395 Persistence studies of *Metarhizium acridum* under U.S. Northern Plains conditions. **Stefan T. Jaronski**, stefan.jaronski@ars.usda.gov, USDA-ARS, Sidney, MT and Larry E. Jech, USDA - APHIS, Phoenix, AZ

D0396 Field evaluation of candidate *Metarhizium* fungi for grasshopper control on the U.S. Northern Plains. **Larry E. Jech**, larry.e.jech@aphis.usda.gov, USDA - APHIS, Phoenix, AZ, Stefan T. Jaronski, USDA-ARS, Sidney, MT, Rob Schlothauer, United States Dept. of Agriculture (USDA), Sidney, MT and Donald W. Roberts, Utah State Univ., Logan, UT

D0397 Potential natural enemies of *Pityophthorus juglandis* on *Juglans nigra* in eastern Tennessee. **Katheryne Nix**, kavery3@utk.edu[1], Paris L. Lambdin[1], Jerome F. Grant[1], Carla I. Coots[1], Mark T. Windham[1] and Paul Merten[2], [1]Univ. of Tennessee, Knoxville, TN, [2]USDA, Forest Service, Asheville, NC

D0398 Classical biological control of the invasive emerald ash borer with *Tetratistichus planipennisi* in Michigan. **Jian J. Duan**, jian.duan@ars.usda.gov[1], Leah S. Bauer[2], Kristopher J Abell[3], Jonathan Lelito[4] and Roy Gene Van Driesche[3], [1]USDA, Agricultural Research Service, Newark, DE, [2]USDA - Forest Service, East Lansing, MI, [3]Univ. of Massachusetts, Amherst, MA, [4]Pennsylvania State Univ., Univ. Park, PA

D0399 Partial life-table analysis of emerald ash borer in its native range (northeastern Asia). **Juli Gould**, Juli.R.Gould@aphis.usda.gov, USDA - APHIS, Buzzards Bay, MA, Jian J. Duan, USDA, Agricultural Research Service, Newark, DE, Zhong-qi Yang, Chinese Academny of Forestry, Beijing, China, Xiao-yi Wang, Chinese Academy of Forestry, Beijing, Congo-Brazzaville and Galina Yurchenko, Far Eastern Forest Research Institute, Khabarovsk, Russia

D0400 Influence of host stage on attack rate, sex ratio, progeny size and fitness of *Spathius galinae*, a new parasitoid of emerald ash borer, *Agrilus planipennis*. **Tim Watt**, tjwatt@UDel.Edu, Univ. of Delaware, Newark, DE and Jian J. Duan, USDA, Agricultural Research Service, Newark, DE

D0401 Assessment of emerald ash borer parasitoid recovery methods in white ash stands in New York State. **Michael Parisio**, mparisio@syr.edu, SUNY College of Environmental Science and Forestry, Syracuse, NY

D0402 Biological control of *Drosophila suzukii*. **Jana C. Lee**, jana.lee@ars.usda.gov and Kelly Donahue, USDA ARS, Corvallis, OR

D0403 Increasing the efficacy of nucleopolyhedroviruses (NPV) on pickleworm larvae. **D. Michael Jackson**, mike.jackson@ars.usda.gov[1], Martin Shapiro[2] and Merle Shepard[2], [1]USDA, Agricultural Research Service, Charleston, SC, [2]Clemson Univ., Charleston, SC

D0404 Strawberries, alfalfa, and parasitoids: Synergy in pest management. **Charles Pickett**, cpickett@cdfa.ca.gov[1], Diego J. Nieto[2], Janet A. Bryer[3], James R. Hagler[4] and Sean L. Swezey[2], [1]California Dept. of Food and Agriculture, Sacramento, CA, [2]Univ. of California, Santa Cruz, Santa Cruz, CA, [3]Univ. of California, Santa Cruz, CA, [4]USDA, Agricultural Research Service, Maricopa, AZ

D0405 Utilization of brine shrimp eggs as factitious food for culturing *Coleomegilla maculata*. **Eric Riddick**, eric.riddick@ars.usda.gov, USDA-ARS, Stoneville, MS and Zhixin Wu, USDA - ARS, Stoneville, MS

D0406 Standardization of rearing and assaying procedures for green lacewing, *Chrysoperla zastrowi sillemi* (Neuroptera : Chrysopidae). Shailendra Singh[1], Mangesh Patil[1] and **Srinivas Parimi**, srinivas.parimi@mahyco.com[2], [1]MAHYCO, JALNA, India, [2]MAHYCO, Jalna, Maharashtra, India

D0407 Assessment of spined solider bug (Hemiptera: Pentatomidae) as a predator of brown marmorated stink bug (Hemiptera: Pentatomidae). **Jakob Goldner**, jgoldner@mix.wvu.edu and Yong-Lak Park, West Virginia Univ., Morgantown, WV

D0408 Field parasitism of sentinel and semi-naturally laid egg masses of brown marmorated stink bug, *Halyomorpha halys*. **Ashley Colavecchio**, amcola@udel.edu, Univ. of Delaware, Newark, DE, Christine Dieckhoff, USDA, Agricultural Research Service, Beneficial Insects Introduction Research Laboratory (BIIRL), Newark, DE and Kim A. Hoelmer, USDA, Agricultural Research Service, Montferrier, France

D0409 Understanding the mechanisms that influence the response of the parasitic wasp *Dolichogenidea tasmanica* (Hymemoptera: Braconidae) to the density of light brown apple moth. **Maryam Yazdani**, maryam.yazdani@adelaide.edu.au and Mike Keller, Univ. of Adelaide, Adelaide, Australia

D0410 Suitability of winter canola aphids for preimaginal development of *Chrysoperla carnea* (Neuroptera: Chrysopidae) and *Hippodamia convergens* (Coleoptera: Coccinellidae). **William Jessie**, w.jessie@okstate.edu, Kristopher L. Giles, Eric Rebek and Mark Payton, Oklahoma State Univ., Stillwater, OK

D0411 Using molecular methods to analyze ground beetle (Carabidae) gut contents for evidence of predation on lowbush blueberry pests. **Justin Renkema**, renkemaj@uoguelph.ca, Univ. of Guelph, Guelph, ON, Canada, G. Christopher Cutler, Faculty of Agriculture, Dalhousie Univ., Truro, NS, Canada and Berni Benkel, Dalhousie Univ., Truro, NS, Canada

D0412 Effect of host diet on the development of larval parasitoid *Apanteles opuntiarum* Martínez & Bertha (Hymenoptera: Braconidae) in *Cactoblastis cactorum* (Berg) (Lepidoptera: Pyralidae). **Oulimathe Paraiso**, oulimathe.paraiso@freshfromflorida.com[1], Trevor R. Smith[1] and Stephen Hight[2], [1]Florida Dept. of Agriculture and Consumer Services (FDACS), Gainesville, FL, [2]USDA-ARS, Tallahassee, FL

D0413 Back in its native area: Comparative analysis of host range of *Lysiphlebus testaceipes* between a local strain and one introduced into Europe 40 years ago. Nicolas Desneux[1], **Antonio Biondi**, antonio.biondi@unict.it[2], Emily Mohl[2] and George Heimpel[2], [1]French National Institute for Agricultural Research (INRA), Sophia-Antipolis, France, [2]Univ. of Minnesota, St. Paul, MN

D0414 Life-stage at which the aphid parasitoid *Lysiphlebus testaceipes* (Hymenoptera: Braconidae) learns to recognize host cues. **Beth Ferguson**, beth.ferguson@okstate.edu, Tom Royer and Kristopher L. Giles, Oklahoma State Univ., Stillwater, OK

D0415 Comparison of predation in annual versus perennial agroecosystems: Aphid predation in soybean versus alfalfa in Manitoba. **Alejandro Costamagna**, ale_costamagna@umanitoba.ca, Univ. of Manitoba, Winnipeg, MB, Canada

D0416 Increasing beneficial insect abundance through floral provisioning to improve ecosystem services in agricultural crops.

Thelma Heidel-Baker, thelma@iastate.edu, Matthew E. O'Neal, Mark Gleason and Jean Batzer, Iowa State Univ., Ames, IA

D0417 Predatory arthropod communities in edge habitats adjacent to corn and soyben agroecosystems. **Daniel M. Pavuk**, dmpavuk@bgnet.bgsu.edu, Bowling Green State Univ., Bowling Green, OH

D0418 Effects of hedgerow restoration on natural enemies, pests, and pest control in intensive agricultural landscapes. **Rachael Long**, rflong@ucdavis.edu[1], Lora Morandin[2] and Claire Kremen[2], [1]Univ. of California Cooperative Extension, Woodland, CA, [2]Univ. of California, Berkeley, CA

D0419 Effects of landscape composition on the abundance and richness of arthropod natural enemies: Examples from Midwest agriculture. **Heidi Liere**, heliere@sewanee.edu[1], Benjamin Werling[2], Tania Kim[3], Doug Landis[2] and Claudio Gratton[3], [1]Univ. of the South, Sewanee, TN, [2]Michigan State Univ., East Lansing, MI, [3]Univ. of Wisconsin, Madison, WI

D0420 The influence of crop rotation and management intensity on abundance, diversity, and function of predatory arthropods in farming systems. **Andrew Aschwanden**, aca12@psu.edu[1], Maggie Douglas[2], Heather Karsten[3] and John Tooker[2], [1]The Pennsylvania State Univ., Univ. Park, PA, [2]Pennsylvania State Univ., Univ. Park, PA, [3]The Pennsylvania State Univ., Univeristy Park, PA

D0421 The fit of Cyazypyr™ in IPM programs that include natural enemies. **Rachel A. Cameron**, rachel.a.cameron@usa.dupont.com[1], Juan Alvarez[1], Hector E. Portillo[1], I. Billy Annan[1], Alan Samel[1], John Wiles[2], Jean-Luc Rison[3], David De Scals[4] and Jose Cardenas[5], [1]DuPont Crop Protection, Newark, DE, [2]DuPont (U.K.) Limited, Stevenage, Hertfordshire, United Kingdom, [3]DuPont de Nemours S.A.S, Nambshm, France, [4]Dupont Iberica, S.L., Murcia, Spain, [5]DuPont Iberica, S.L., Jerez de la Frontera, Spain

D0422 Effects of neonicotinoid seed treatments on spider mites and their natural enemies in soybeans. **Karly Henry**, karly.henry@sdstate.edu and Adrianna Szczepaniec, South Dakota State Univ., Brookings, SD

D0423 A meta-analysis of trophobiotic interactions between ants and hemipteran honeydew producers: Influences on biological control and hemipteran host plants. **Melissa K. Layton**, layt16@tamu.edu, Thomas J. DeWitt, S. Bradleigh Vinson and Julio S. Bernal, Texas A&M Univ., College Station, TX

D0424 Influence of alfalfa on biological control of insect pests in New Mexico. **Patricia E Monk**, pyates@nmsu.edu and Jane Breen Pierce, New Mexico State Univ., Artesia, NM

D0425 Ecology of the celery leaftier, *Udea rubigalis*, aphids, and natural enemies in Michigan celery fields. **Jeremy Jubenville**, jubenvi3@msu.edu, Michigan State Univ., East Lansing, MI and Zsofia Szendrei, USDA, Agricultural Research Service, Beltsville, MD

D0426 Effects of direct and residual exposure of aerosols on adult emergence of *Habrobracon hebetor* Say (Hymenoptera: Braconidae). **Mukti N. Ghimire**, mukti@ksu.edu[1], Subramanyam Bhadriraju[1] and Paul W. Flinn[2], [1]Kansas State Univ., Manhattan, KS, [2]USDA, Agricultural Research Service, Manhattan, KS

D0427 Effect of food, age, and feeding frequency on longevity of olive fruit fly parasitoids. **Livy Williams**, lwilliams@ars-ebcl.org[1], Olivia Pointurier[2], Pauline Deschodt[2] and Kris Wyckhuys[3], [1]USDA-ARS, Montpellier, France, [2]Montpellier SupAgro, Montpellier, France, [3]International Center for Tropical Agriculture CIAT, Palmira, Colombia

D0428 Effect of ants on establishment of *Diorhabda elongata*, a biological control agent of saltcedar. **Mark Muegge**, m-muegge@tamu.edu, Texas A&M Univ., Fort Stockton, TX, Allen Knutson, Texas A&M Univ., Dallas, TX and Manuel Campos, Texas A&M Agrilife Research and Extension Center, Weslaco, TX

D0429 Establishment of *Megamelus scutellaris* Berg (Hemiptera: Delphacidae) as biocontrol agent of common water hyacinth, *Eichhornia crassipes* (Mart.) Solms, in Louisiana. **S.J. Johnson**, sjohnson@agcenter.lsu.edu[1], Michael Ferro[2], Anna Meszaros[1], Michael J. Grodowitz[3], Katherine Parys[4] and Lee J. Eisenberg[5], [1]Louisiana State Univ. Agricultural Center, Baton Rouge, LA, [2]LSU AgCenter, Baton Rouge, LA, [3]US Army Engineer Research and Development Center, Vicksburg, MS, [4]USDA - ARS, Stoneville, MS, [5]Louisiana State Univ. AgCenter, Baton Rouge, LA

D0430 A coalition of invasive species attacks Guam's native cycads . Aubrey Moore, **Ross Miller**, rmiller@uguam.uog.edu and Thomas Marler, Univ. of Guam, Mangilao, Guam

D0431 Apparent selection of field-released genotypes of the biological control agent *Tetramesa romana* Walker. **Alex E. Racelis**, racelisae@utpa.edu, Univ. of Texas, Pan American, Edinburg, TX, John A. Goolsby, USDA, Agricultural Research Service, Edinburg, TX and John Gaskin, USDA-ARS, Sidney, MT

D0432 Biology and host range of the moth *Digitivalva delaireae* as one of two candidate agents for biological control of cape-ivy. **Patrick J. Moran**, patrick.moran@ars.usda.gov, Chris N Mehelis and Angelica Reddy, USDA-ARS, Albany, CA

D0433 Phytoseiids of economic importance. **Rebecca Schmidt**, rebecca.schmidt@wsu.edu and Elizabeth H. Beers, Washington State Univ., Wenatchee, WA

D0434 Understanding the ecological impact of an unknown predacious mite (*Balaustium* sp.) in northern California almond and walnut orchards. **Joanna B. Bloese**, jbloese@gmail.com and Elizabeth Boyd, California State Univ., Chico, Chico, CA

D0435 Effects of the gall midge *Asphondylia borrichiae*, simulated herbivory, and nutritional status on survival, flowering, and seed viability in *Borrichia frutescens*, the sea oxeye daisy. **Lisa Rowan**, n00808894@ospreys.unf.edu and Anthony Rossi, Univ. of North Florida, Jacksonville, FL

D0436 Earthworm community structure, population dynamics, and seasonal casting activity on Kentucky golf courses. **Carl T. Redmond**, ctredm00@uky.edu and Daniel Potter, Univ. of Kentucky, Lexington, KY

Section Poster Presentations: SysEB 1

Exhibit Hall 4 (Austin Convention Center)

D0437 DNA barcoding for the Korean insects at NAAS: Its current advances and prospects. **Hae Chul Park**, culent@korea.kr, Tae Man Han, Young Bo Lee, Nam Jung Kim and Seong-Hyun Kim, National Academy of Agricultural Science, Suwon, South Korea

D0438 Pins to pixels: High-throughput invertebrate collection digitization. Christopher H. Dietrich[1], John Hart[2], David Raila[2], Nahil Sobh[2], Omar Sobh[2] and **Brendan Morris**, brenolmorris@gmail.com[3], [1]Univ. of Illinois, Ilinois Natural History Survey, Champaign, IL, [2]Univ. of Illinois, Urbana, IL, [3]Univ. of Illinois, Champaign, IL

D0439 Edge effects detected at the level of order. **Heather S. Mallory**, mallory.heather@gmail.com, Hamilton College, Clinton, NY

D0440 Native coccinellid range changes based on citizen scientist spotter submissions to the Lost Ladybug Project. **Leslie L. Allee**, lla1@cornell.edu[1], John E. Losey[1], Rebecca R. Smyth[1] and Louis S. Hesler[2], [1]Cornell Univ., Ithaca, NY, [2]USDA, Agricultural Research Service, Brookings, SD

D0441 Introduced coccinellid range changes based on citizen scientist spotter submissions to the Lost Ladybug Project. **Rebecca R. Smyth**, rrs7@cornell.edu[1], John E. Losey[1], Leslie L. Allee[1] and Louis S. Hesler[2], [1]Cornell Univ., Ithaca, NY, [2]USDA, Agricultural Research Service, Brookings, SD

D0442 Monitoring for the diversity of nocturnal insects and bats in the urban landscape of the Bluegrass Region of Kentucky. **Luke E. Dodd**, luke.dodd@uky.edu, Univ. of Kentucky, Lexington, KY and Laurie Thomas, Lexington-Fayette Urban County Government, Lexington, KY

D0443 Comparing macroinvertebrate assemblages in Iowa headwater streams that differ in severity of agricultural impacts. **Brittany Gochenour**, brittany.gochenour@my.simpson.edu, Conor Fair, Dianna Krejsa and Clinton Meyer, Simpson College, Indianola, IA

D0444 Kandyan home gardens: Repositories for insects and their interactions in Sri Lanka. **K.G.L.I. Samaranayake**, ishansamaranayake@yahoo.com, Univ. of Manitoba, Winnipeg, MB, Canada and R.W.M.U.M. Wanigasekara, Univ. of Manitoba, Manitoba, MB, Canada

D0445 Tank organisms of Ecuadorian cloud forest bromeliads. **Megan Wilson**, mwilso39@uwyo.edu, Univ. of Wyoming, Laramie, WY

D0446 Synonymization of tribes Paronellini and Troglopedetini (Collembola: Paronellidae) based on evidence of dorsal chaetotaxy of head and body. **Felipe N. Soto-Adames**, fsoto@illinois.edu[1], Enrique Baquero[2] and Rafael Jordana[2], [1]Univ. of Illinois, Champaign, IL, [2]Univ. of Navarra, Pamplona, Spain

D0447 Abundance and diversity of Collembola (Enthognatha), in rice soils, in Panama, Republic of Panama. **Bruno Zachrisson**, bazsalam@gmail.com and Onesio Martinez, Instituto de Investigación Agropecuaria de Panamá (IDIAP), Panama City, AL, Panama

D0448 Cloning and characterization of cGMP-dependent protein kinase in a lower termite, *Reticulitermes flavipes*. Dongyan Song[1], **Xiaowei Yang**, xiaowei.yang@uky.edu[2], Tian Yu[1] and Xuguo Zhou[1], [1]Univ. of Kentucky, Lexington, KY, [2]Dept. of Entomology Univ. of Kentucky, Lexington, KY

D0449 Counting the spots: A molecular and morphological evaluation of the spotted darner, *Boyeria* (Odonata: Anisoptera: Aeshnidae). **Manpreet Kohli**, mkk24@njit.edu, Rutgers Univ., Newark, NJ

D0450 Choreography of silk spinning behavior in webspinners (Embioptera: Australembiidae; Oligotomidae): Phylogenetic signal or a microhabitat dance? **Janice Edgerly-Rooks**, jedgerlyrooks@scu.edu[1], David McMillan[1] and Kelly Miller[2], [1]Santa Clara Univ., Santa Clara, CA, [2]Univ. of New Mexico, Albuquerque, NM

D0451 Megaloptera of the interior highlands, USA. **David E. Bowles**, david_bowles@nps.gov, United States National Park Service, Republic, MO and Robert W. Sites, Univ. of Missouri, Columbia, MO

D0452 Hybridization of invasive *Diuraphis noxia,* Russian wheat aphid, with native *Diuraphis tritici*, western wheat aphid in the United States. **Gary J. Puterka**, gary.puterka@ars.usda.gov, USDA, ARS, Stillwater, OK

D0453 Biodiversity of scale insects and their natural enemies in Espírito Santo, Brazil. **Mark Culik**, markculik3@yahoo.com, José Ventura and David Martins, INCAPER (Instituto Capixaba de Pesquisa, Assistência Técnica e Extensão Rural), Vitória, Espírito Santo, Brazil

D0454 Cold cicadas and hot rocks. **Maxine Heath**, maxine@txwinet.com and James E. Heath, Univ. of Illinois retired, Buchanan Dam, TX

D0455 Quantifying accelerated emergence of the 17-year periodical cicada (*Magicicada cassini*) in eastern Kansas. **Clinton Meyer**, clinton.meyer@simpson.edu[1], Anna Statz[1] and Phillip Seiwert[2], [1]Simpson College, Indianola, IA, [2]Univ. of Central Arkansas, Conway, AR

D0456 Biology and fecundity of *Ceraeochrysa valida* (Neuroptera: Chrysopidae) reared on *Diaphorina citri* Kuwayama (Hemiptera: Psyllidae). **Iliana Pacheco-Rueda**, atta_mexicana@yahoo.com.mx[1], J.Refugio Lomeli-Flores[1], J. Isabel López-Arroyo[2], Héctor González-Hernández[1], Ma.Teresa Santillán-Galicia[1] and Jesus Romero-Napoles[1], [1]Colegio de Postgraduados, Texcoco, Mexico, [2]Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias, Nuevo León, Mexico

D0457 Why are there so many leafhopper species? **K.G. Andrew Hamilton**, Andy.Hamilton@AGR.GC.CA, Agriculture Canada, Ottawa, ON, Canada

D0458 Genetic variation in *Bactericera cockerelli* from Mexico. Beatriz Lopez[1], **Gustavo Ponce**, gponcealfa@gmail.com[1], Susana Favela[1], Rahim Foroughbakhch[1] and Adriana Flores[2], [1]Universidad Autonoma de Nuevo Leon, Facultad de Ciencias Biologicas, San Nicolas de los Garza, Mexico, [2]Universidad Autonoma de Nuevo Leon, San Nicolas de los Garza, Mexico

D0459 The *Ambrysus* (Heteroptera: Naucoridae) fauna of the Balsas Basin in central Mexico. **Daniel Reynoso-Velasco**, drmvd@mail.missouri.edu and Robert W. Sites, Univ. of Missouri, Columbia, MO

D0460 Comparative morphology of the Pentatomoidea pretarsus (Hemiptera: Heteroptera). **Kim Barão**, kbarao@yahoo.com.br, Gisele Bolze, Augusto Ferrari and Jocelia Grazia, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil

D0461 Phylogeny of the 'broadheaded discocephalines' (Hemiptera, Pentatomidae, Discocephalini). **Thereza Garbelotto**, therezagarbelotto@hotmail.com, Luiz Campos and Jocelia Grazia, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil

D0462 Comparative morphology of the male abdomen in minute litter bugs (Heteroptera: Dipsocoromorpha: Schizopteridae). **Alexander Knyshov**, aleksandr.knyshov@email.ucr.edu, Rochelle Hoey Chamberlain and Christiane Weirauch, Univ. of California, Riverside, Riverside, CA

D0463 Phylogeny and revision of the orthotyline tribe Ceratocapsini (Hemiptera: Heteroptera: Miridae). **Thomas J. Henry**, thomas.henry@ars.usda.gov, USDA - ARS, Washington, DC

D0464 The hatching behavior of two butterfly species. **Luísa L. Mota**, lulismota@yahoo.com.br, Universidade Estadual de Campinas, Campinas, Brazil, André V. L. Freitas, Universidade Estadual de Campinas, Campinas, São Paulo, Brazil and Eduardo P. Barbosa, Unicamp, Campinas, Brazil

D0465 The evolution of eyespot number and position across wings surfaces of nymphalid butterflies. **Sandra Schachat**, schachatsr@si.edu, Dept. of Paleobiology, National Museum of Natural History, Washington, DC, Jeffrey Oliver, Oregon State Univ., Corvallis, OR and Antónia Monteiro, Yale Univ., New Haven, CT

D0466 Identification and control of tomato pinworm, *Keiferia lycopersicella* Walsingham, with *Melia azedarach* L. extracts on tomato in San Luís Potosi, Mexico. Alvaro Hernandez-Hernandez[1], **Rabindranath Thompson-Farfan**, rabindranath.thompson@uaslp.mx[2], Jose Marin-Sanchez[2] and Enrique Ruiz-Cancino[3], [1]Comite Estatal de Sanidad Vegetal de San Luis Potosi, Axtla de Terrazas, Mexico, [2]Universidad Autonoma de San Luis Potosi, San Luis Potosi, Mexico, [3]Universidad Autonoma de Tamaulipas, Ciudad Victoria, Mexico

D0467 Morphological and molecular identification of cotton bollworm, *Helicoverpa armigera*, in Brazil. Alexandre Specht[1], Daniel Sosa-Gómez[2], **Silvana V. Paula-Moraes**, Silvana@cpac.embrapa.br[3] and Silvia Yano[2], [1]Embrapa Cerrados, Planaltina - DF, Brazil, [2]Embrapa Soja, Londrina-PR, Brazil, [3]Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) Cerrados, Planaltina, DF, Brazil

D0468 A triplex real-time polymerase chain reaction assay to diagnose Asian variant of gypsy moth (*Lymantria dispar*) (Lepidoptera: Lymantriidae). **Md-Sajedul Islam**, M.sajed@gmail.com[1], Norman Barr[2], W Braswell[3], John Molongoski[4], Mario Martinez[1] and Erin Schuenzel[5], [1]Univ. of Texas-Pan American and USDA APHIS, Edinburg, TX, [2]USDA - APHIS, Edinburg, TX, [3]USDA, Edinburg, TX, [4]USDA-APHIS, Otis ANGB, MA, [5]Univ. of Texas Pan American, Edinburg, TX

D0469 Geographic distribution and differential feeding behaviors of the fruit-piercing and skin-piercing moth, *Calyptra thalictri* Borkhausen (Lepidoptera: Erebidae). **Jennifer Zaspel**, jzaspel@purdue.edu[1], Sharon Hill[2], Rickard Ignell[3], Clare Scott[1], Vladimir Kononenko[4] and Susan Weller[5], [1]Purdue Univ., West Lafayette, IN, [2]Swedish Agricultural Univ., Alnarp, Sweden, [3]Swedish Univ. of Agricultural Sciences, Alnarp, Skåne, Sweden, [4]Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, Russia, [5]Univ. of Minnesota, St. Paul, MN

D0470 Morphological assessment of tymbal microstructure in relation to acoustic communication in tiger moths (Lepidoptera: Erebiae: Arctiinae). **Stacey L Coy**, coys15@uwosh.edu, Univ. of Wisconsin - Oshkosh, Oshkosh, WI and Jennifer Zaspel, Purdue Univ., West Lafayette, IN

D0471 Variations on a theme: Is there an *Acoustica* clade within mimetic tiger moths? (Lepidoptera: Erebeidae: Arctiinae: Ctenuchina and Euchromiina). **Rebecca B. Simmons**, rebecca.simmons@email.und.edu, Univ. of North Dakota, Grand Forks, ND and Susan J. Weller, Univ. of Minnesota, Minneapolis, MN

D0472 Review of immature stages of robber flies (Diptera: Asilidae). **Jeffrey K. Barnes**, jbarnes@uark.edu, Univ. of Arkansas, Fayetteville, AR

D0473 Comparative analysis of larvae and adult midgut bacterial communities in lab-reared and field collected *Culex* mosquito in the Lower Rio Grande Valley. **Edelio Bazan**, Edbazan90@gmail.com[1], Christopher Vitek[2] and Kristine Lowe[1], [1]Univ. of Texas-Pan American, Edinburg, TX, [2]Univ. of Texas, Pan American, Edinburg, TX

D0474 Monitoring black fly (Diptera: Simuliidae) nuisance in Washington County, MD. **Alan Leslie**, aleslie@umd.edu, Elanor Spadafora and William O. Lamp, Univ. of Maryland, College Park, MD

D0475 Effect of host *Bactrocera dorsalis* fruit fly sex on the parasitoid *Fopius arisanus*. **Nicholas Manoukis**, nicholas.manoukis@ars.usda.gov, USDA-ARS, Hilo, HI

D0476 Inheritance of microsatellite markers in the Mediterranean fruit fly, *Ceratitis capitata*. **Terrance Todd**, Terrance.N.Todd@aphis.usda.gov and Raul Ruiz-Arce, USDA - APHIS, Edinburg, TX

D0477 Host-pathogen-endosymbiont interactions in a natural population of *Drosophila melanogaster*. **Marina Ascunce**, msascunce08@gmail.com[1], Russul Abbas[1], Ana Bermudez[1], Belinda Bajric[1], Edward Atkinson[1], Jérémie Brusini[2] and Marta Wayne[1], [1]Univ. of Florida, Gainesville, FL, [2]Univ. of California at Santa Cruz, Santa Cruz, CA

D0478 Bacteria associated with the Mexican fruit fly, *Anastrepha ludens* and their role in the female choice. **Victor Higareda Alvear**, higareda@ibt.unam.mx, Esperanza Martinez Romero and Monica Rosenblueth, CCG-UNAM, Cuernavaca, Mexico

D0479 Naturally-occurring variation in the relationship between a symbiont, *Wolbachia*, and its host, *Drosophila simulans*. Michael Turelli[1], **Emma Dietrich**, emma.dietrich@utexas.edu[2], Michael May[1], Roger Albertson[3] and William Sullivan[4], [1]Univ. of California - Davis, Davis, CA, [2]Univ. of Texas - Austin, Austin, TX, [3]Albion College, Albion, MI, [4]Univ. of California - Santa Cruz, Santa Cruz, CA

D0480 How do insect organs grow to the correct size? **Joseph Parker**, dibasic@gmail.com, Columbia Univ., New York, NY

D0481 Utilizing dynamic arrays for highly multiplexed amplicon sequencing in multi-gene phylogenetic reconstruction of tephritid fruit fly species. **Scott Geib**, Scott.Geib@ARS.USDA.GOV, USDA-ARS, Hilo, HI

D0482 Expression and evolutionary analysis of microRNAs in *Cochliomyia hominivorax* and *Cochliomyia macellaria*: Implications for parasitism studies in Calliphoridae (Diptera: Brachycera). **Daniel Paulo**, daniel.f.paulo@gmail.com, Campinas State Univ. (UNICAMP), Campinas, SP, Brazil, Campinas, Brazil, Ana Carolina M. Junqueira, Pennsylvania State Univ. (Penn State), Univ. Park, PA, Renato Vicentini, Campinas State Univ. (UNICAMP), Campinas, SP, Brazil., Campinas, Brazil and Ana Maria L. Azeredo-Espin, State Univ. of Campinas (UNICAMP), Campinas, Sao Paulo, Brazil

A listing of virtual posters can be found on page 213.

WEDNESDAY, NOVEMBER 13, 2013, MORNING

Program Symposium: Impacts of Global Change on Biodiversity and Biological Control

Ballroom G (Austin Convention Center)

Moderators and Organizers: David Crowder[1] and James D. Harwood[2], [1]Washington State Univ., Pullman, WA, [2]Univ. of Kentucky, Lexington, KY

8:00 1561 Welcoming remarks. **David Crowder**, dcrowder@wsu.edu, Washington State Univ., Pullman, WA and James D. Harwood, Univ. of Kentucky, Lexington, KY

8:03 1562 Behavioral and physiological ecology of predator biological control under global warming. **Brandon Barton**, btbarton@wisc.edu, Univ. of Wisconsin, Madison, WI and Oswald Schmitz, Yale Univ., New Haven, CT

8:23 1563 Cereal leaf beetle and its parasitoid under future climates of the PNW. **Sanford D. Eigenbrode**, sanforde@uidaho.edu, Univ. of Idaho, Moscow, ID

8:43 1564 Natural enemies on the landscape: A life history approach. **Bernard D. Roitberg**, roitberg@sfu.ca, Simon Fraser Univ., Burnaby, BC, Canada and Dave R. Gillespie, Agriculture & Agri-Food Canada, Agassiz, BC, Canada

9:03 1565 Habitat linkages in conservation biological control: Lessons from the land-water interface. Claudio Gratton and **Jamin M. Dreyer**, jdreyer@entomology.wisc.edu, Univ. of Wisconsin, Madison, WI

9:23 1566 Scale-dependent impacts of pesticides on arthropod biological control. **Craig R. Roubos**, roubos@msu.edu[1], Cesar Rodriguez-Saona[2] and Rufus Isaacs[1], [1]Michigan State Univ., East Lansing, MI, [2]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

9:43 1567 Can change in urban population size represent an opportunity to enhance predator biodiversity and biocontrol services in shrinking cities? **Mary M. Gardiner**, gardiner.29@osu.edu, The Ohio State Univ., Wooster, OH, Caitlin Burkman, Ohio State Univ., Wooster, OH and Scott Prajzner, The Ohio State Univ.-OARDC, Wooster, OH

10:03 1568 Habitat effects on granivore diversity and weed seed predation in a New England farmscape. **Randa Jabbour**, randa.jabbour@maine.edu, Sonja Birthisel, Francis A. Drummond and Eric Gallandt, Univ. of Maine, Orono, ME

10:23 1569 Temporal dynamics of natural enemy: Pest interactions in a changing environment. **James D. Harwood**, james.harwood@uky.edu, Univ. of Kentucky, Lexington, KY and Kelton D. Welch, USDA-ARS, Brookings, SD

10:43 1570 Capturing co-benefits in changing agricultural landscapes: Identifying the right kind of biodiversity to support pest control services. **Sarina MacFadyen**, Sarina.Macfadyen@csiro.au[1], Nancy A. Schellhorn[2], Hazel R. Parry[2] and Jane Memmott[3], [1]CSIRO, Canberra, ACT, Australia, [2]Commonwealth Scientific and Industrial Research Organisation (CSIRO), Dutton Park, QLD, Australia, [3]Univ. of Bristol, Bristol, United Kingdom

11:03 1571 Organic agriculture strengthens natural pest control. **William E. Snyder**, wesnyder@wsu.edu, Washington State Univ., Pullman, WA

11:23 1572 Effects of agricultural intensification on biodiversity and biological control. **Deborah K. Letourneau**, dletour@ucsc.edu, Univ. of California, Santa Cruz, Santa Cruz, CA

11:43 1573 Concluding remarks. **David Crowder**, dcrowder@wsu.edu, Washington State Univ., Pullman, WA and James D. Harwood, Univ. of Kentucky, Lexington, KY

MUVE Section Symposium: Thermal Biology of Mosquito Vectors of Disease: Ecology and Epidemiological Consequence

Meeting Room 14 (Austin Convention Center)

Moderators and Organizers: Michael Reiskind[1] and Courtney Murdock[2], [1]North Carolina State Univ., Raleigh, NC, [2]Pennsylvania State Univ., Univ. Park, PA

8:00 1574 Thermal biology of mosquito vectors: Opening perspectives. **Courtney Murdock**, ccm15@psu.edu, Pennsylvania State Univ., Univ. Park, PA

8:15 1575 Carry-over effects of temperature on survival and intraspecific competition in *Aedes albopictus*. **Francis N. Ezeakacha**, kakaluvs@yahoo.com, Univ. of Southern Mississippi, Hattiesburg, MS

8:35 1576 Hot enough for ya? A test of the effects of climate change on population dynamics and life history traits of the Asian tiger mosquito (*Aedes albopictus*). **Donald A. Yee**, donald.yee@usm.edu[1], Francis N. Ezeakacha[1] and Karen Abbott[2], [1]Univ. of Southern Mississippi, Hattiesburg, MS, [2]Iowa State Univ., Ames, IA

8:55 1577 Life history strategies of *Aedes spp.* in variable thermal and other biophysical conditions. **Michael Reiskind**, michael_reiskind@ncsu.edu, North Carolina State Univ., Raleigh, NC and Harish Padmanabha, National Socio-Environmental Synthesis Center (SESYNC), Annapolis, MD

9:15 1578 Endless summer: A season long field study of the effects of larval density, temperature, and habitat size on adult mosquito vectorial capacity. **Katie May Westby**, kmwest2@ilstu.edu and Steven A. Juliano, Illinois State Univ., Normal, IL

9:35 1579 Integrating temperature effects on mosquito populations and arbovirus transmission. **Cynthia C. Lord**, clord@ufl.edu, Joseph J. Pohedra and Barry W. Alto, Univ. of Florida, Vero Beach, FL

9:55 1580 The tyranny of thermodynamics meets the world of limited resources: Effects of temperature on immune function when resources are limited. **Shelley A Adamo**, sadamo@dal.ca, Dalhousie Univ., Halifax, NS, Canada

10:15 1581 Adaptation and acclimation to temperature in vectors and parasites. **Eleanore Sternberg**, eds16@psu.edu, Pennsylvania State Univ., Univ. Park, PA

10:35 1582 Thermal constraints to avian malaria transmission in Hawaii and the fate of the Hawaiian honeycreepers. **Dennis LaPointe**, dlapointe@usgs.gov, United States Geological Survey, Hawaii National Park, HI

10:55 1583 Daily temperature variation and the fitness of mosquitoes and parasites: Implications for transmission in a changing world. **Krijn Paaijmans**, krijn.paaijmans@cresib.cat, CRESIB; Barcelona Centre for International Health Research, Barcelona, Spain

11:15 1584 Thermal biology of mosquito vectors: Conclusions and future directions. **Michael Reiskind**, michael_reiskind@ncsu.edu, North Carolina State Univ., Raleigh, NC

MUVE Section Symposium: Applied Research on Bed Bug Management

Ballroom F (Austin Convention Center)

Moderators and Organizers: Changlu Wang and Richard Cooper, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

8:00 Introductory Remarks

8:05 1585 What is new in bed bug insecticide research? **Alvaro Romero**, aromero2@nmsu.edu, New Mexico State Univ., Las Cruces, NM

8:35 1586 The importance of bed bug detection devices in bed bug treatments. **Susan C Jones**, esa@esa.com, The Ohio State Univ., Columbus, OH

9:05 1587 Design and implementation of model bed bug management programs. **Richard Cooper**, rcooper@aesop.rutgers.edu[1], Changlu Wang[2] and Narinderpal Singh[1], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Rutgers Univ., New Brunswick, NJ

9:35 1588 Practical methods of controlling bed bugs in the field. **Ron Harrison**, Orkin Pest Control, Atlanta, GA

10:05 Break

10:15 1589 Cost-effective and money-wasting do-it-yourself bed bug control strategies. **Changlu Wang**, cwang@AESOP.Rutgers.edu[1], Richard Cooper[1] and Narinderpal Singh[2], [1]Rutgers Univ., New Brunswick, NJ, [2]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

10:45 1590 Tropical bed bug research updates. **Chow-Yang Lee**, chowyang@usm.my, Universiti Sains Malaysia, Penang, Malaysia

11:15 Panel Discussion

MUVE Section Symposium: Arthropod Associated Allergy

Meeting Room 18 B (Austin Convention Center)

Moderators and Organizers: Shripat T. Kamble, Universiti of Nebraska-Lincoln, Lincoln, NE

8:00 Introductory Remarks

8:05 1591 Updates - Certification Program. **Mustapha Debboun**, mustapha.debboun.mil@mail.mil, United States Army, Medical Dept. Center & School, Fort Sam Houston, TX

8:10 1592 Allergy to Arthropod Allergens/Bites/Secretions/Venomes. **Shripat Kamble**, skamble1@unl.edu, Univ. of Nebraska, Lincoln, NE

8:40 1593 Cockroach allergens. **Coby Schal**, coby_schal@ncsu.edu, North Carolina State Univ., Raleigh, NC

9:10 1594 Fire ant allergy. **Robert Vander Meer**, bob.vandermeer@ars.usda.gov, USDA, Agricultural Research Service, Gainesville, FL

9:40 Break

9:55 1595 Asian needle ant allergy. **Patricia A. Zungoli**, pzngl@clemson.edu, Clemson Univ., Clemson, SC

10:25 1596 Allergic responses to fleas, lice, ticks and mites. **Nancy Hinkle**, nhinkle@uga.edu, Univ. of Georgia, Athens, GA

10:55 1597 Skin reaction to bed bug bites. **Ron Harrison**, Rharriso@rollins.com, Orkin Pest Control, Atlanta, GA

PBT Section Symposium: ABC Transporters: An Important "New" Player in Insect Biology

Meeting Room 19 A (Austin Convention Center)

Moderators and Organizers: David J. Hawthorne[1] and John M. Clark[2], [1]Univ. of Maryland, College Park, MD, [2]Univ. of Massachusetts, Amherst, MA

8:00 Welcoming Remarks

8:05 1598 Possible role of ABC transporters in insecticide resistance in human lice and *Drosophila melanogaster*. **John M. Clark**, jclark@vasci.umass.edu, Univ. of Massachusetts, Amherst, MA

8:30 1599 'The ABC transporter family in the malaria mosquito Anopheles gambiae: Evidence for a role in conferring insecticide resistance. **John Vontas**, vontas@biology.uoc.gr[1], Patricia Pignatelli[2], Vasileia Balabanidou[1], Gareth Lycett[2] and Hilary Ranson[2], [1]Univ. of Crete, Heraklion, Greece, [2]Liverpool School of Tropical Medicine, Liverpool, United Kingdom

8:55 1600 ABC transporters regulate CNS chemoprotection through endogenous ecdysone signalling at the BBB. Samantha Hindle[1], Souvinh Orng[1], Michael Desalvo[1], Elena Dolgikh[1], Hiroshi Ishimoto[2], Fahima Mayer[1], Toshihiro Kitamoto[2], Matt Jacobson[1] and **Roland Bainton**, baintonr@anesthesia.ucsf.edu[1], [1]UCSF, San Francisco, CA, [2]Univ. of Iowa, Iowa City, IA

9:20 1601 Mosquito P-glycoprotein: A pharmacological obstacle to insecticide delivery. **Troy D. Anderson**, anderst@vt.edu and Ngoc N. Pham, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

9:45 Break

9:55 1602 Learning the ABCs of Bt: An unexpected role of ABC transporters in the mode of action of *Bacillus thuringiensis* toxins. **David G. Heckel**, heckel@ice.mpg.de, Max Planck Institute for Chemical Ecology, Jena, Germany

10:20 1603 Identification of ABC transporters in the western tarnished plant bug, *Lygus hesperus*. **Joe Hull**, joe.hull@ars.usda.gov[1], Kendrick Chaney[2], L. Forlow Jech[2], David J. Hawthorne[3], Laura Corley Lavine[4] and Keriann Bennett[4], [1]USDA-ARS, U.S. Arid Land Agricultural Research Center, Maricopa, AZ, [2]USDA-ARS, Arid Land Agricultural Research Center, Maricopa, AZ, [3]Univ. of Maryland, College Park, MD, [4]Washington State Univ., Pullman, WA

10:45 1604 The role of ABC transporters in resistance of bed bugs to pyrethroids. **Subba R. Palli**, rpalli@email.uky.edu, Univ. of Kentucky, Lexington, KY

11:10 1605 ABC transporter-associated resistance to *Bacillus thuringiensis* toxins in insects. **Ping Wang**, pingwang@cornell.edu, Cornell Univ. NYSAES, Geneva, NY

11:35 1606 ABC transporters mediate adverse pesticide interactions in honeybees. **David J. Hawthorne**, djh@umd.edu[1], Jeff Pettis[2], Galen Dively[3], Alex Gusman[1] and Grace Kunkel[1], [1]Univ. of Maryland, College Park, MD, [2]Bee Research Laboratory, Beltsville, MD, [3]Univ. of Maryland, College Park Maryland, MD

P-IE Section Symposium: Current Status of Vegetable Insect Pests in the USA

Meeting Room 18 D (Austin Convention Center)

Moderators and Organizers: Shimat V. Joseph[1] and David G. Riley[2], [1]Univ. of California Cooperative Extension, Salinas, CA, [2]Univ. of Georgia, Tifton, GA

8:00 Introductory Remarks

8:05 1607 Pests of Fruiting Vegetables and Their Management in Subtropical Florida. **Philip A. Stansly**, pstansly@ufl.edu, Barry C. Kostyk and Jose Castillo, Univ. of Florida, Immokalee, FL

8:25 1608 Status of Vegetable Pests in Southern California and Management of Pysllids on Solanaceous Vegetable Crops. **Sean M. Prager**, Sean.prager@ucr.edu, Univ. of California, Riverside, Riverside, CA and John T. Trumble, Univ. of California, Riverside, CA

8:45 1609 Status of Insect Pests on Leafy Vegetables in Arizona: Economic Impacts and Management. **John C. Palumbo**, jpalumbo@ag.arizona.edu and Ta-i Huang, Univ. of Arizona, Yuma, AZ

9:05 1610 Insect Pests of Vegetables in Texas, and Status of the Potato Psyllid, *Bactericera cockerelli* (Hemiptera: Triozidae). **Donald C. Henne**, DCHenne@ag.tamu.edu, Texas A&M AgriLife Research, Weslaco, TX

9:25 1611 From Asparagus to Potatoes: Vegetable IPM in Michigan. **Zsofia Szendrei**, szendrei@msu.edu, William R. Morrison and Jeremy Jubenville, Michigan State Univ., East Lansing, MI

9:45 Break

10:00 1612 It's Not All Fruit in the Big Apple: Vegetable Pest Management of Onion Thrips in Onion and Cabbage. **Brian A. Nault**, ban6@cornell.edu, Cornell Univ., Geneva, NY and Anthony M. Shelton, Cornell Univ., NYSAES, Geneva, NY

10:20 1613 Current Status of Vegetable Pests in the Mid-Atlantic U.S. and the Impact of Brown Marmorated Stink Bug. **Thomas P. Kuhar**, tkuhar@vt.edu, Virginia Tech, Blacksburg, VA, Joanne Whalen, Univ. of Delaware, Newark, DE and Galen Dively, Univ. of Maryland, College Park Maryland, MD

10:40 1614 Resistance Management of Twospotted Spider Mite in North Carolina Vegetables. **James L. Walgenbach**, Jim_Walgenbach@ncsu.edu[1], George G. Kennedy[2] and Edward L. Vargo[2], [1]North Carolina State Univ., Mills River, NC, [2]North Carolina State Univ., Raleigh, NC

11:00 1615 Vegetable Insect Pests in Georgia: Current Status, Recent and Future Challenges. **David G. Riley**, dgr@uga.edu and Alton N. Sparks, Univ. of Georgia, Tifton, GA

11:20 1616 Refined Management of Cucumber Beetles (*Diabrotica* sp. and *Acalymma* sp.) in Central California Melons: Implications for Organic Vegetable Production. **Larry D. Godfrey**, ldgodfrey@ucdavis.edu[1], Rachael F. Long[2] and Amy Bell[1], [1]Univ. of California, Davis, Davis, CA, [2]Univ. of California, Cooperative Extension, Woodland, CA

11:40 Concluding Remarks

P-IE Section Symposium: Modern Concepts for Statistical Modeling of Field Studies: From GLMs to GLMMs.

Meeting Room 7 (Austin Convention Center)

Moderators and Organizers: Sara Duke[1] and Dale W. Spurgeon[2], [1]USDA-ARS, College Station, TX, [2]USDA, ARS, ALARC, Maricopa, AZ

8:00 Introductory Remarks

8:05 1617 Experimental units generated by the field design and sampling process: How to identify and construct an appropriate analysis. **George Milliken**, milliken@k-state.edu, Milliken Associate, Inc., Manhattan, KS

8:50 1618 Design and analysis of experiments for non-normal data using generalized linear mixed models. **Walter Stroup**, wstroup1@unl.edu, Univ. of Nebraska -Lincoln, Lincoln, NE

9:35 Break

9:50 1619 Managing spatial and temporal variation in field experiments through experimental design. **Dale W. Spurgeon**, dale.spurgeon@ars.usda.gov, USDA, ARS, ALARC, Maricopa, AZ

10:30 1620 Analysis of rare events: Making inferences from responses that are often zeros. **Sara Duke**, Sara.Duke@ars.usda.gov, USDA-ARS, College Station, TX

11:10 1621 Overcoming The good, the bad, the ugly of mixed modeling : Useful tips and strategies for mixed modeling with SAS/STAT procedures. **Kathleen Kiernan**, kathleen.Kiernan@sas.com, SAS, Cary, NC

11:50 Panel Discussion

12:10 Concluding Remarks

P-IE Section Symposium: Solutions for Invasive Insect Pests in a Connected World

Meeting Room 16 A (Austin Convention Center)

Moderators and Organizers: Suhas Vyavhare[1], Raul F. Medina[1], MO. Way[2] and Bonnie B. Pendleton[3], [1]Texas A&M Univ., College Station, TX, [2]Texas A&M Univ., Beaumont, TX, [3]West Texas A&M Univ., Canyon, TX

8:00 Introductory Remarks

8:05 1622 Withdrawn

8:25 1623 Growing problems with stink bugs in the Neotropics and potential species to invade the US. **Antônio R. Panizzi**, antonio.panizzi@embrapa.br, National Wheat Research Center - Embrapa, Passo Fundo, Rio Grande do Sul, Brazil

8:45 1624 Integrated control of an invasive stink bug: Tools and tactics for redbanded stink bug pest management. **Jeffrey A. Davis**, jeffdavis@agcenter.lsu.edu, Louisiana State Univ., Baton Rouge, LA

9:05 1625 Seasonal abundance, damage potential and control of redbanded stink bug, *Piezodorus guildinii*, in Texas soybeans. **MO. Way**, moway@aesrg.tamu.edu[1], Suhas Vyavhare[2] and Raul F. Medina[2], [1]Texas A&M Univ., Beaumont, TX, [2]Texas A&M Univ., College Station, TX

9:25 1626 Stink bug feeding behavior and potential for disease transmission. **Jesus Esquivel**, Jesus.Esquivel@ars.usda.gov[1], Lori Hinze[2] and Enrique Medrano[2], [1]USDA-ARS, College Station, TX, [2]USDA, Agricultural Research Service, College Station, TX

9:45 Break

9:55 1627 New frontiers for management of stink bugs in crop protection: Multimodal communication. **Miguel Borges**, mborges@cenargen.embrapa.br, Embrapa Recursos Genéticos e Biotecnologia, Brasília, DF, Brazil

10:15 1628 Life history and management of the intrusive *Megacopta cribraria* in soybeans. **Alejandro Del Pozo**, aidelpoz@ncsu.edu[1], Mark R. Abney[1], Clyde Sorenson[1], Jack S. Bacheler[1] and Dominic R. Reisig[2], [1]North Carolina State Univ., Raleigh, NC, [2]North Carolina State Univ., Plymouth, NC

10:35 1629 Japan partnership toward the classical biological control of *Megacopta cribraria*. **Walker Jones**, walker.jones@ars.usda.gov, USDA - ARS, Stoneville, MS, Keiji Takasu, Kyushu Univ., Fukuoka, Japan, John Ruberson, Kansas State Univ., Manhattan, KS and Jeremy Greene, Clemson Univ., Florence, SC

10:55 1630 Searching for solutions to invasive pests at their origins: Overseas research programs. **Kim A. Hoelmer**, khoelmer@ars-ebcl.org, USDA, Agricultural Research Service, Montferrier, France

11:15 Concluding Remarks

SysEB Section Symposium: Systematics and Evolution of Native Bees (Hymenoptera: Apoidea)

Meeting Room 6 A (Austin Convention Center)

Moderators and Organizers: Karen W. Wright[1] and Rita Isabel Vélez-Ruiz[2], [1]Univ. of New Mexico, Albuquerque, NM, [2]Severin-McDaniel Insect Research Collection, Brookings, SD

8:00 Welcoming Remarks

8:05 1631 The bee tree of life: Insights from a supermatrix approach to apoid phylogeny. **Shannon Hedtke**, shannon.hedtke@gmail.com[1], Sml. Patiny[2] and Bryan N. Danforth[1], [1]Cornell Univ., Ithaca, NY, [2]UMons, Mons, Belgium

8:27 1632 Evolution of extreme morphologies in bees: Examples from the Xeromelissinae. **Laurence Packer**, laurencepacker@yahoo.com, Roshanak Salehi and Jennifer Albert, York Univ., Toronto, ON, Canada

8:49 1633 Rampant parallelism in morphology and nesting behavior in mason bees (Osmia). Molly Rightmyer, Smithsonian Institution, Washington, DC, **Terry Griswold**, tgris@biology.usu.edu, USDA-ARS Bee Biology and Systematics Laboratory, Logan, UT and Seán Brady, National Museum of Natural History, Washington, DC

9:11 1634 Coevolution, coadaptation, and specialization in the Euglossine bee-orchid mutualism. **Santiago Ramírez**, sanram@ucdavis.edu, UC Davis, Davis, CA

9:33 Break

9:53 1635 Evolution of diet breadth in bees. **Karen W. Wright**, karen@sevilleta.unm.edu and Kelly B. Miller, Univ. of New Mexico, Albuquerque, NM

10:15 1636 Morphological evidence, phylogeny and classification reassessment of Euglossa Latreille (Hymenoptera: Apidae). **Ismael A. Hinojosa-Díaz**, hinojosadiaz@gmail.com and Michael S. Engel, Univ. of Kansas, Lawrence, KS

10:37 1637 Biodiversity studies of bees: A perspective from species-level systematics. **Victor H. Gonzalez**, victorgonzab@gmail.com and Michael S. Engel, Univ. of Kansas, Lawrence, KS

10:59 1638 High diversity countries: One of the few challenges for a young bee systematist. **Rita Isabel Vélez-Ruiz**, rita.velez@sdstate.edu, Severin-McDaniel Insect Research Collection, Brookings, SD

11:21 Discussion

Member Symposium: Connecting Our Past with Our Future. A Look at Past Student Award Winners. Then, Now, and in the Future.

Meeting Room 8 C (Austin Convention Center)

Moderators and Organizers: Carey R. Minteer[1], Erin Jones[2] and Tamra Reall[3], [1]Univ. of Arkansas, Fayetteville, AR, [2]West Texas A&M Univ., Bushland, TX, [3]Univ. of Missouri, Columbia, MO

8:00 Welcoming Remarks

8:05 1639 Strategies to develop sustainable resistance management programs. **Ashfaq A. Sial**, ashfaqsial@yahoo.com, Univ. of California, Berkeley, Berkeley, CA

8:23 1640 Questing for the perfect host: How one larva developed into a nymph and plans to become an adult. **Rebecca Trout Fryxell**, RFryxell@utk.edu, Univ. of Tennessee, Knoxville, TN

8:41 1641 From training mosquitoes to decomposing bodies: An unexpected journey. **Michelle Sanford**, Michelle.Sanford@ifs.hctx.net, Harris County Institute of Forensic Sciences, Houston, TX

8:59 1642 The more the merrier? Exploring the role of predator communities in natural and managed ecosystems. **Deborah L. Finke**, FinkeD@Missouri.edu, Univ. of Missouri, Columbia, MO

9:17 Intermission

9:27 1643 Connecting science and policy: Confessions of an entomologist turned bureaucrat. **Andrea F. Huberty**, Andrea.F.Huberty@aphis.usda.gov, USDA, Riverdale, MD

9:45 1644 Fun with bugs: The unintended consequences of applied research. **Christian Krupke**, ckrupke@purdue.edu, Purdue Univ., West Lafayette, IN

10:03 1645 Research and professional service: The value of personal connections. **Jarrad Prasifka**, jarrad.prasifka@ars.usda.gov, USDA, Agricultural Research Service, Fargo, ND

10:21 1646 Towards sustainable IPM in small fruit: Successes and challenges. **Cesar Rodriguez-Saona**, CRodriguez@RCE.Rutgers.edu, Rutgers, The State Univ. of New Jersey, Chatsworth, NJ

10:39 1647 From evolution to ecology to climate change: 20 years studying a symbiosis. **Diana Six**, diana.six@cfc.umt.edu, Professor, Univ. of Montana, Missoula, MT

Member Symposium: Evolution of Insect Pests In a Connected and Changing World

Meeting Room 9 AB (Austin Convention Center)

Moderators and Organizers: Samuel N. Crane[1] and Gabriel Zilnik[2], [1]American Museum of Natural History, New York, NY, [2]North Carolina State Univ., Raleigh, NC

8:00 Introductory Remarks

8:05 1648 Insect pests and biodiversity. **Ke Chung Kim**, kck@psu.edu, Pennsylvania State Univ., Univ. Park, PA

8:30 1649 Expression of the red imported fire ant *foraging* gene and colony-level variation in behavior. **Alison A. Bockoven**, abockoven@tamu.edu, Craig J. Coates and Micky Eubanks, Texas A&M Univ., College Station, TX

8:55 1650 The molecular physiology of an evolving adaptation - insights from the diapause response of *Aedes albopictus*. **Monica Poelchau**, mfp33@georgetown.edu[1], Julie A. Reynolds[2], David L. Denlinger[2], Christine Elsik[3] and Peter Armbruster[1], [1]Georgetown Univ., Washington, DC, [2]Ohio State Univ., Columbus, OH, [3]Univ. of Missouri, Columbia, MO

9:20 1651 Presentation withdrawn.

9:45 Break

9:55 1652 A next-generation sequencing approach to examining the evolution of Bt resistance. **Megan L. Fritz**, mcadamme@msu.edu and Fred Gould, North Carolina State Univ., Raleigh, NC

10:20 1653 Population genomics perspective on insect biotypes related to host-plant resistance. **Andrew Michel**, michel.70@osu.edu[1], Jacob Wenger[1], MA. Rouf Mian[2] and Raman Bansal[3], [1]The Ohio State Univ., OARDC, Wooster, OH, [2]USDA, Agricultural Research Service, Wooster, OH, [3]Kansas State Univ., Manhattan, KS

10:45 1654 Genetic and physiological adaptation of insect pests to insecticides. **Jeff A. Fabrick**, jeff.fabrick@ars.usda.gov, USDA-ARS U.S. Arid Land Agricultural Research Center, Maricopa, AZ

11:10 1655 Landscape-based approach for sustaining efficacy of Bt crops. **Yves Carrière**, ycarrier@ag.arizona.edu and Bruce E. Tabashnik, Univ. of Arizona, Tucson, AZ

11:35 Concluding Remarks

Member Symposium: IPM for Small-Scale Farmers: Research and Extension Needs and Experiences

Meeting Room 12 B (Austin Convention Center)

Moderators and Organizers: Tessa R. Grasswitz[1] and Jaime C. Pinero[2], [1]New Mexico State Univ., Los Lunas, NM, [2]Lincoln Univ. of Missouri, Jefferson City, MO

8:00 Introductory Remarks

8:04 1656 The southern region small farms IPM working group: Who we are and what we do. **Henry Fadamiro**, fadamhy@auburn.edu, Auburn Univ., Auburn, AL

8:21 1657 Native American small farm working group: A step towards food sovereignty. **Susan Ratcliffe**, sratclif@uiuc.edu, North Central IPM Center, Urbana, IL

8:38 1658 The western small-farm IPM working group and the New Mexico small farm IPM pilot project. **Tessa R. Grasswitz**, tgrasswi@nmsu.edu, New Mexico State Univ., Los Lunas, NM

8:55 1659 A survey of insect pests and IPM strategies for small acreage farmers in Idaho. **Brad S. Stokes**, bstokes@vandals.uidaho.edu, Univ. of Idaho, Moscow, ID

9:12 Break

9:22 1660 Stories from the border: Invasion of the Bagrada bug (*Bagrada hilaris*) and other challenges for small-scale farmers in southern Arizona. **Peter Warren**, plwarren@cals.arizona.edu, Univ. of Arizona, Tucson, AZ

9:39 1661 IPM outreach to an underserved audience: Utah's small farm vegetable producers. **Diane Alston**, diane.alston@usu.edu[1], Daniel Drost[1], Claudia Nischwitz[1] and Erin Petrizzo[2], [1]Utah State Univ., Logan, UT, [2]Utah State Univeristy, Logan, UT

9:56 1662 Addressing the IPM needs of small-scale vegetable farmers in Missouri. **Jaime Pinero**, PineroJ@lincolnu.edu, Lincoln Univ., Jefferson City, MO

10:13 1663 The 'other' pests: Progress in managing weeds, mollusks, and vertebrates for small farms. **Cheryl A. Wilen**, cawilen@ucdavis.edu, Univ. of California Statewide IPM Program, San Diego, CA

10:30 Concluding Remarks

Member Symposium: Science Impacting a Connected INSECT World: Use of Aggregation Pheromones in Pest Management

Meeting Room 15 (Austin Convention Center)

Moderators and Organizers: Donald C. Weber[1] and Tracy C. Leskey[2], [1]USDA, Agricultural Research Service, Beltsville, MD, [2]USDA, Agricultural Research Service, Kearneysville, WV

8:00 Introductory Remarks

8:05 1664 Aggregation pheromones of weevils and their use in pest management. **Tracy C. Leskey**, tracy.leskey@ars.usda.gov[1], Aijun Zhang[2], David Shapiro-Ilan[3], Alan Eaton[4], Kathleen Leahy[5], Arthur Tuttle[6] and Daniel Cooley[6], [1]USDA, Agricultural Research Service, Kearneysville, WV, [2]USDA-ARS, BARC, Beltsville, MD, [3]USDA-ARS, SE Fruit and Tree Nut Research Unit, Byron, GA, [4]Univ. of New Hampshire, Durham, NH, [5]Polaris Orchard Management, Colrain, MA, [6]Univ. of Massachusetts, Amherst, MA

8:25 1665 Aggregation pheromones for detection and monitoring of cerambycid beetles. **Jocelyn G. Millar**, jocelyn.millar@ucr.edu, Univ. of California, Riverside, CA and Lawrence M. Hanks, Univ. of Illinois, Urbana, IL

8:45 1666 Aggregation pheromones of chrysomelids and their use in pest management. **Allard Cossé**, allard.cosse@ars.usda.gov[1], Robert J. Bartelt[1], Bruce W. Zilkowski[1], Daniel Bean[2], Miklós Tóth[3] and Robert N. Wiedenmann[4], [1]USDA-ARS, Peoria, IL, [2]Colorado Dept. of Agriculture, Palisade, CO, [3]Hungarian Academy of Science, Budapest, Hungary, [4]Univ. of Arkansas, Fayetteville, AR

9:05 1667 Aggregation pheromones of thrips and their use in pest management. **William D. J. Kirk**, w.d.j.kirk@keele.ac.uk, Keele Univ., Staffordshire, United Kingdom

9:25 Break

9:40 1668 Use of the effective attraction radius in three dimensions (EAR) and two dimensions (EARc) for detection, monitoring, and mass trapping. **John A. Byers**, john.byers@ars.usda.gov, USDA-ARS, Maricopa, Arizona, AZ

10:00 1669 Use of stereoisomeric libraries for discovery of bug aggregation pheromones: A case study with 1,10-bisaboladien-3-ols. **Ashot Khrimian**, Ashot.Khrimian@ars.usda.gov[1], Aijun Zhang[1], Donald C. Weber[2], Hsiao-Yung Ho[3], Jeffrey R. Aldrich[4], Karl E. Vermillion[5], Maxime A. Siegler[6], Shyam Shirali[7], Filadelfo Guzman[7] and Tracy C. Leskey[8], [1]USDA - ARS, Beltsville, MD, [2]USDA, Agricultural Research Service, Beltsville, MD, [3]The Institute of Cellular and Organismic Biology, Taipei, Taiwan, [4]Associate Entomologist, Davis, CA, [5]USDA Agricultural Research Service, Peoria, IL, [6]Johns Hopkins Univ., Baltimore, MD, [7]USDA Agricultural Research Service, Beltsville, MD, [8]USDA, Agricultural Research Service, Kearneysville, WV

10:20 1670 Aggregation pheromones of stink bugs and their use in pest management. **Donald C Weber**, USDA, Agricultural Research Service, Beltsville, MD, Ashot Khrimian, USDA - ARS, Beltsville, MD, Tracy C. Leskey, USDA, Agricultural Research Service, Kearneysville, WV, Jeffrey R. Aldrich, Associate Entomologist, Davis, CA and Jocelyn G. Millar, Univ. of California, Riverside, CA

10:40 1671 Aggregation signals of ancient communicators (Thysanura). Nathan Woodbury, Simon Fraser Universtiy, Burnaby, BC, Canada and **Gerhard Gries**, gries@sfu.ca, Simon Fraser Univ., Burnaby, BC, Canada

11:00 Discussion

Member Symposium: Strategies for Managing the Asian Citrus Psyllid and Huanglongbing Disease

Meeting Room 17 B (Austin Convention Center)

Moderators and Organizers: Elizabeth E. Grafton-Cardwell[1], Mamoudou Setamou[2] and Jawwad A. Qureshi[3], [1]Univ. of California, Riverside, CA, [2]Texas A&M Univ. - Kingsville, Weslaco, TX, [3]Univ. Florida, Immokalee, FL

8:00 Introductory Remarks

8:10 1672 Citrus Huanglongbing – the most serious disease threat to citriculture wordwide and the importance of psyllid control in its management. **John da Graca**, Texas A&M Univ., Weslaco, TX and Mamoudou Setamou, Texas A&M Univ. - Kingsville, Weslaco, TX

8:35 1673 How the biology and movement patterns of Asian citrus psyllid influence management choices. **David W. Bartels**, david.w.bartels@aphis.usda.gov, USDA-APHIS-PPQ-CPHST, Edinburg, TX, Mamoudou Setamou, Texas A&M Univ. - Kingsville, Weslaco, TX and David Hall, USDA-ARS, US Horticultural Research Laboratory, Fort Pierce, FL

9:00 1674 Implementation and success of area-wide psyllid control programs in Florida citrus. **Michael Rogers**, mrgrs@ufl.edu, Univ. of Florida-IFAS, Citrus Research and Education Center, Lake Alfred, FL and Brandon Page, Univ. of Florida, Lake Alfred, FL

9:25 1675 Development and implementation of an areawide management program for Asian citrus psyllid in Texas. **Mamoudou Setamou**, KUMS2006@tamuk.edu, Texas A&M Univ. - Kingsville, Weslaco, TX and David W. Bartels, USDA-APHIS-PPQ-CPHST, Edinburg, TX

9:50 Break

10:05 1676 Managing Asian citrus psyllid in California as the threat of HLB approaches. **Elizabeth E. Grafton-Cardwell**, eegraftoncardwell@ucanr.edu, Univ. of California, Riverside, CA and Joseph G. Morse, Univ. of California, Riverside, Riverside, CA

10:30 1677 Current status of insecticide resistance in Florida populations of Asian citrus pysllid and emerging management strategies. **Lukasz Stelinski**, stelinski@crec.ifas.ufl.edu[1], Siddharth Tiwari[2], Monique Coy[1] and Nabil Killiny[1], [1]Univ. of Florida, Lake Alfred, FL, [2]Virginia Polytechnic Institute and State Univ., Blacksburg, VA

10:55 1678 Role of Biological Control in the Management of Asian Citrus Psyllid Vector of Huanglongbing . **Jawwad A. Qureshi**, jawwadq@ufl.edu, Univ. Florida, Immokalee, FL and Philip A. Stansly, Univ. of Florida, Immokalee, FL

11:20 1679 Asian citrus psyllid control, past, present and future. **Philip A. Stansly**, pstansly@ufl.edu, Univ. of Florida, Immokalee, FL

11:45 Discussion

Member Symposium: Ecological and Evolutionary Origins of Sociality: Connecting Commonalities of Social Behavior Across Diverse Insect Taxa

Meeting Room 10 AB (Austin Convention Center)

Moderators and Organizers: Sarah P. Lawson[1], Sandra M. Rehan[2] and Patrick Abbot[1], [1]Vanderbilt Univ., Nashville, TN, [2]Univ. of Pennsylvania, Philadelphia, PA

8:00 1680 Connecting commonalities of social behavior across diverse insect taxa. **Patrick Abbot**, patrick.abbot@vanderbilt.edu, Vanderbilt Univ., Nashville, TN

8:20 1681 The selective benefits of social behavior in gregarious sawflies. **Lynn Fletcher**, lynn.fletcher@salemstate.edu, Salem State Univ., Salem, MA

8:40 1682 The causes and consequences of the transition to sociality in aphids. **Sarah P. Lawson**, sarah.p.lawson@vanderbilt.edu, Vanderbilt Univ., Nashville, TN

9:00 1683 Thrips soldiers double up as medics. **Tom Chapman**, tomc@mun.ca, Memorial Univ., St. John's, Canada

9:20 1684 Origins of eusociality in termites. **Barbara L. Thorne**, bthorne@umd.edu, Univ. of Maryland, College Park, MD

9:40 1685 The ecology of spider sociality. **Leticia Aviles**, laviles@zoology.ubc.ca, Univ. of British Columbia, Vancouver, BC, Canada

10:00 Break

10:10 1686 The origin and maintenance of sociality in the small carpenter bees. **Sandra M. Rehan**, sandra.rehan@gmail.com, Univ. of Pennsylvania, Philadelphia, PA

10:30 1687 Facultative sociality in the tropical sweat bee (*Megalopta genalis*). **Adam Smith**, adam_smith@gwu.edu, The George Washington Univ., Washington DC

10:50 1688 Social behavior in sweat bees varies across ecological gradients. **Sarah D. Kocher**, skocher@gmail.com, Harvard Univ., Cambridge, MA

11:10 1689 The queens wear the pants: Caste differences in brain investment in eusocial paper wasps. **Sean O'Donnell**, so356@drexel.edu, Drexel Univ., Philadelphia, PA

11:30 1690 Genomic insights into social evolution from primitively social Polistes wasps: Genetic toolkits, epigenetics, and novel genes. **Amy L. Toth**, amytoth@iastate.edu, Iowa State Univ., Ames, IA

11:50 1691 Phylogenetic perspectives on social evolution and co-evolution in ants. **Seán Brady**, bradys@si.edu, National Museum of Natural History, Washington, DC

12:10 Concluding Remarks

Ten-Minute Papers, MUVE Section: Structural Pests

Meeting Room 18 C (Austin Convention Center)

Moderators: Roger Gold, Texas A&M Univ., College Station, TX

8:00 1692 Laboratory evaluation of distinct complimentary aggregate particles as physical barrier to prevent *Reticulitermes flavipes* and *Coptotermes formosanus* (Isoptera: Rhinotermitidae) incursion into structures. **Chris Keefer**, tckeefer@ag.tamu.edu and Roger E. Gold, Texas A&M Univ., College Station, TX

8:12 1693 Determination of efficacy of Trelona termite bait when applied to control *Reticulitermes flavipes* or *Coptotermes formosanus* subterranean termites (Isoptera: Rhinotermitidae). **Roger E. Gold**, r-gold@tamu.edu, Chris Keefer and Robert T. Puckett, Texas A&M Univ., College Station, TX

8:24 1694 Drill-treat technique for treatment of Formosan termite (*Coptotermes formosanus*) infested trees. **Adrian S. Juttner**, adriantree@aol.com, Adrian's Tree Service Inc, Abita Springs, LA

8:36 1695 Water transfer by Formosan subterranean termites. **Bal K. Gautam**, bgauta3@tigers.lsu.edu and Gregg Henderson, Louisiana State Univ., Baton Rouge, LA

8:48 1696 Effectiveness of Tenekil, Termidor and Terminusto *Microtermes obesi* (Isoptera: Termitidae). **Nadeem Sheikh**, s_nadeem77@yahoo.com, Univ. of the Punjab, Lahore, Pakistan

9:00 1697 Evaluation of dyed agar versus dyed filter paper for marking Formosan subterranean termites (*Coptotermes formosanus*). **Carrie Cottone**, cbcottone@nola.gov, Eric Guidry, Ed D. Freytag and Claudia Riegel, City of New Orleans Mosquito, Termite, and Rodent Control Board, New Orleans, LA

9:12 1698 Neoteny in *Reticulitermes flavipes*. **Brian T. Forschler**, bfor@uga.edu, Univ. of Georgia, Athens, GA

9:24 1699 Asymmetrical "snapping" mandibles in termites converge in form with composite bows developed by archers of the Eurasian steppe. **Paul Bardunias**, paulmb@ufl.edu, SUNY-ESF, Syracuse, NY, Aaron Mullins, New Orleans Mosquito and Termite Control Board, New Orleans, LA and Nan-Yao Su, Univ. of Florida, Davie, FL

9:36 1700 Factors affecting flight and dispersal of alates of the Formosan subterranean termite, *Coptotermes formosanus* Shiraki. **Aaron Mullins**, amull81@ufl.edu and Nan-Yao Su, Univ. of Florida, Davie, FL

Ten-Minute Papers, PBT Section: Toxicology

Meeting Room 19 B (Austin Convention Center)

Moderators: Jeffrey G. Scott[1] and Sherry Glick[2], [1]Cornell Univ., Ithaca, NY, [2]US EPA Office of Pesticide Programs, Dallas, TX

8:00 1701 A new formula for estimating insecticide efficacy against bollworms under Egyptian conditions. **Abdallah Albeltagy**, albeltagy515@gmail.com, Plant Protection Research Institute (PPRI), Alexandria, Egypt

8:12 1702 Development of insecticides targeting inward rectifying potassium channels in the malaria vector, *Anopheles gambiae*. **Daniel R. Swale**, dswale@gmail.com[1], Rene Raphemot[1], Peter Piermarini[2] and Jerod Denton[1], [1]Vanderbilt Univ., Nashville, TN, [2]The Ohio State Univ., Wooster, OH

8:24 1703 Temephos resistance and esterase activity in the mosquito *Aedes aegypti (Diptera: Culicidae)* in Havana, Cuba increased dramatically between 2006 and 2013. **Juan Bisset**, bisset@ipk.sld.cu, Maria Rodriguez, Yanelys Ricardo, Leidys French and Daymi Hurtado, Institute of Tropical Medicine Pedro Kouri, Havana, Cuba

8:36 1704 Protein kinases and their regulation in the permethrin-resistant mosquito, *Culex quinquefasciatus*. **Ting Li**, litingwinner@gmail.com and Nannan Liu, Auburn Univ., Auburn, AL

8:48 1705 Knockout of DSC1 antagonizes *kdr*-like resistance in *Drosophila melanogaster*. **Frank Rinkevich**, fdr5@MSU.edu[1], Yuzhe Du[1], Joshua Tolinski[1], Atsushi Ueda[2], Chun-Feng Wu[2], Boris S. Zhorov[3] and Ke Dong[1], [1]Michigan State Univ., East Lansing, MI, [2]Univ. of Iowa, Iowa City, IA, [3]McMaster Univ., Hamilton, ON, Canada

9:00 1706 Presentation withdrawn.

9:12 1707 Effects of two neonicitinoid pesticides on worker honey bee (*Apis mellifera*) metabolic rate. **Steven Cook**, steven.cook@ars.usda.gov, USDA-ARS, Beltsville, MD

9:24 1708 Behavioral responses of honey bees (*Apis mellifera*) to dietary toxins. **Catherine Dana**, cdana2@illinois.edu, Ling-Hsiu Liao and May R. Berenbaum, Univ. of Illinois, Urbana, IL

9:36 1709 Tolerance and cross-tolerance to emamectin benzoate and group 28 insecticides in filed and laboratory population of diamondback moth *Plutella xylostella.* **Mahbub Rahman**, mahbub.rahman@adelaide.edu.au[1], Kevin Powis[2], Rick Roush[3] and Greg Baker[2], [1]The Univ. of Adelaide, Urrbrae, South Australia, Australia, [2]South Australian Research and Development Institute, Adelaide, South Australia, Australia, [3]Univ. of Melbourne, Melbourne, Australia

9:48 1710 Insecticidal activity of essential oils extracted from aromatic plants against *Plutella xylostella* (Lepidoptera: Plutellidae) and *Myzus persicae* (Homoptera: Aphididae). **Nicoletta Faraone**, nfaraone@dal.ca[1], G. Christopher Cutler[1], Kirk Hillier[2], Gurminder Chahil[1] and Rachel Rix[1], [1]Faculty of Agriculture, Dalhousie Univ., Truro, NS, Canada, [2]Acadia Univ., Wolfville, NS, Canada

10:00 1711 Possible relationship between egg morphology of stored-product insect eggs and fumigant efficacy. **Sandipa G. Gautam**, sandipa.gautam@okstate.edu[1], George P. Opit[1], Steve Tebbets[2], Darlene Hoffman[3] and Spenser Walse[2], [1]Oklahoma State Univ., Stillwater, OK, [2]USDA Agricultural Research Service, Parlier, CA, [3]USDA - ARS, Parlier, CA

10:12 1712 Presentation withdrawn.

10:24 1713 Insecticidal tests of *Herpetogramma phaeopteralis* (Lepidoptera: Crambidae) infesting St Augustine grass, *Stenotaphrum secundatum*. **Nastaran Tofangsazi**, ntsazi@ufl.edu[1], Steven P. Arthurs[1] and Ronald Cherry[2], [1]Univ. of Florida, Apopka, FL, [2]Univ. of Florida, Belle Glade, FL

10:36 1714 Toxicity effect of *Persicaria odorata* (Caryophylalles: Plygonaceae) and *Etlingera elatior* (Zingiberalles: Zingiberaceae) against *Globitermes sulphureus* (Isoptera: Termitidae). **Fauziah Abdullah**, q5fauzi@yahoo.com, Univ. Malaya, Kuala Lumpur, Malaysia

10:48 1715 Residual contact vial bioassay for the selection of effective acaricides against the two-spotted spider mite. **Deok Ho Kwon**, jota486@snu.ac.kr[1], Ji Hyun Park[2], Taek Jun Kang[3] and Si Hyeock Lee[2], [1]Research institute for Agriculture and Life Scence, Seoul, South Korea, [2]Seoul National Univ., Seoul, South Korea, [3]Dept. of Horticultural Crop Research, Suwon, South Korea

11:00 1716 Laboratory evaluation of the susceptibility of the Kudzu Bug (Hemiptera: *Megacopta cribraria*) to various insecticides. **Stephanie Piper**, spiper1@my.westga.edu and Gregory Payne, Univ. of West Georgia, Carrollton, GA

11:12 1717 Investigation into insecticide resistance mechanisms in the western tarnished plant bug, *Lygus hesperus* knight (Hemiptera: Miridae). **Herma Amalia**, herma.amalia@email.wsu.edu[1], Joe Hull[2], Douglas Walsh[3] and Laura Corley Lavine[1], [1]Washington State Univ., Pullman, WA, [2]USDA-ARS, U.S. Arid Land Agricultural Research Center, Maricopa, AZ, [3]Washington State Univ., Prosser, WA

Ten-Minute Papers, P-IE Section: Biology and Ecology

Meeting Room 16 B (Austin Convention Center)

Moderators: Robert Pfannenstiel[1] and Clint Allen[2], [1]USDA-ARS, Manhattan, KS, [2]USDA - ARS, Stoneville, MS

12:00 1718 Comparing effectiveness of three traps used to monitor *Tribolium castaneum* (Coleoptera: Tenebrionidae). **Nisha Bajracharya**, nisha.shakya10@okstate.edu, George P. Opit, Justin Talley and Carol L. Jones, Oklahoma State Univ., Stillwater, OK

8:00 1719 Age-specific maternal effects interact with larval food supply to modulate life history in *Coleomegilla maculata*. **J. P. Michaud**, jpmi@ksu.edu, Kansas State Univ., Hays, KS and German Vargas, Colombian Sugarcane Research Center, Cali, KS, Colombia

8:12 1720 Does an increase in invertebrate biodiversity in rice fields affect rice water weevil (*Lissorhoptrus oryzophilus)* populations? **Nathan Mercer**, nhmercer13@gmail.com, Michael J. Stout and Christopher E. Carlton, Louisiana State Univ., Baton Rouge, LA

8:24 1721 Biological observations of the overwinter adult *Megacopta cribraria* (Hemiptera: Plataspidae) in spring. **Julian Golec**, JRG0027@auburn.edu, Auburn Univ., auburn, AL and Xing Ping Hu, Auburn Univ., Auburn, AL

8:36 1722 Immature stage thermal environment and emergence synchrony in the southern pine beetle. **Jeff Lombardo**, jeffrey.a.lombardo.gr@dartmouth.edu, Aaron S. Weed, Carissa Aoki and Matthew Ayres, Dartmouth College, Hanover, NH

8:48 1723 Seasonal phenotypes of *Drosophila suzukii*. **Peter W. Shearer**, peter.shearer@oregonstate.edu and Preston H. Brown, Oregon State Univ., Hood River, OR

9:00 1724 Mobility of olive fruit fly (*Bactrocera oleae*) late third instars and teneral adults in test arenas. **Victoria Y. Yokoyama**, victoria.yokoyama@ars.usda.gov, USDA-ARS, San Joaquin Valley Agricultural Sciences Center, Parlier, CA

9:12 1725 Litter arthropods in forest fragments across an urban-rural gradient: What's driving productivity? **Vincent D'Amico**, vdamico@fs.fed.us[1], Greg Shriver[2] and Ashley Colavecchio[2], [1]USDA, Forest Service, Newark, DE, [2]Univ. of Delaware, Newark, DE

9:24 1726 Temporal occurrence of Plusiinae on soybean in the Mississippi Delta. **Clint Allen**, clint.allen@ars.usda.gov, USDA - ARS, Stoneville, MS

9:36 1727 Feeding preferences of three granivorous carabid species on weed seeds. **Sharavari Kulkarni**, sharavar@ualberta.ca, Ph.D. student, Edmonton, AB, Canada, Lloyd M. Dosdall, Univ. of Alberta, Edmonton, AB, Canada and Christian Willenborg, Assistant Professor, Saskatoon, SK, Canada

9:48 Break

10:00 1728 A comparative proteogenomic survey of differentially virulent *Diuraphis noxia* biotypes. **Scott Nicholson**, scott.nicholson@ars.usda.gov and Gary J. Puterka, USDA, ARS, Stillwater, OK

10:12 1729 You are what you eat: Fatty acid profiles as a method to track insect movement. **Stephen Bayes**, sbayes@berkeley.edu[1], Marc Hellerstein[1], Nicholas J. Mills[2] and Stephen C. Welter[1], [1]Univ. of California, Berkeley, Berkeley, CA, [2]Univ. of California, Berkeley, CA

10:24 1730 Behavioral responses of western corn rootworm larvae (Coleoptera: Chrysomelidae) to roots of alternate hosts. **Elisa Bernklau**, bernklau@lamar.colostate.edu[1], Bruce E. Hibbard[2] and Louis Bjostad[1], [1]Colorado State Univ., Fort Collins, CO, [2]Univ. of Missouri, Columbia, MO

10:36 1731 Pollenivory by spiders: Its potential for augmentation of survival and development. **Robert Pfannenstiel**, Bob.Pfannenstiel@ars.usda.gov, USDA-ARS, Manhattan, KS

10:48 1732 Application of 3D technology in ecological reconstruction of fossil insects. **Chen Wang**, tpgao@cnu.edu.cn[1], Mei Wang[2] and Dong Ren[1], [1]Capital Normal Univ., Beijing, China, [2]Capital Normal Univ., China, Beijing, China

11:00 1733 The ecology and population persistence of an ancestral swallowtail in Southern Mexico. **Jorge Leon Cortes**, jleon@ecosur.mx, El Colegio de la Frontera Sur (ECOSUR), San Cristobal, Chiapas, Mexico and Marisol Almaraz, El Colegio de la Frontera Sur (ECOSUR), San Cristóbal de las Casas, Chiapas, Mexico

11:12 1734 First record of *Diatraea tabernella* (Lepidoptera: Crambidae) in the Cauca river valley of Colombia. **German Vargas**, gavargas@cenicana.org[1], Luz Lastra[1] and M. Alma Solis[2], [1]Colombian Sugarcane Research Center, Cali, Colombia, [2]USDA, ARS, Washington, DC

11:24 1735 Floral entomofaune and phénologic characteristics of *Vitellaria paradoxa* Gaertn.f. (Sapotaceae) in the Sudano – Guinean zone of Cameroon. **Delphine Dongock**, dndongock@yahoo.fr, university of ngaoundere, ngaoundere, Cameroon

Ten-Minute Papers, P-IE Section: Transgenic Host Plants

Meeting Room 17 A (Austin Convention Center)

Moderators: G. David Buntin[1] and Dominic R. Reisig[2], [1]Univ. of Georgia, Griffin, GA, [2]North Carolina State Univ., Plymouth, NC

8:00 1736 Dow AgroSciences' next generation insect protection traits for cotton. Melissa Willrich Siebert[1], **Gary D. Thompson**, gdthompson@dow.com[2], Bo Braxton[3], Andrew Ellis[1], Larry Walton[4], John Richburg[5] and Robert Haygood[6], [1]Dow AgroSciences, Greenville, MS, [2]Dow AgroSciences, Omaha, AR, [3]Dow AgroSciences, Travalers Rest, SC, [4]Dow AgroSciences, Tupelo, MS, [5]Dow AgroSciences, Headland, AL, [6]Dow AgroSciences, Indianapolis, IN

8:12 1737 In-planta efficacy evaluation of *Lygus*-active Bt proteins. **Waseem Akbar**, waseem.akbar@monsanto.com[1], Konasale J. Anilkumar[1], Robert S. Brown[2], Mao Chen[1] and Thomas L. Clark[3], [1]Monsanto Company, Chesterfield, MO, [2]Biotechnology, Monsanto Company, Chesterfield, MO, [3]Technology Crop Team, Monsanto Company, Chesterfield, MO

8:24 1738 Bt-resistant western corn rootworm: 2012 survey results of Iowa farmer perceptions, experiences and actions. **Erin W. Hodgson**, ewh@iastate.edu, Aaron J. Gassmann and Kristine Schaefer, Iowa State Univ., Ames, IA

8:36 1739 Using the appropriate transgenic hybrid, entomopathogenic nematodes can assist western corn rootworm (*Diabrotica virgifera virgifera*) resistance management to Bt maize. **Ivan Hiltpold**, hiltpoldi@missouri.edu and Bruce E. Hibbard, Univ. of Missouri, Columbia, MO

9:00 1740 Responses of *Diabrotica virgifera virgifera* to Bt exposure. **Lisa N. Meihls**, lnm2m9@mail.missouri.edu[1], Bruce Hibbard[2] and Georg Jander[1], [1]Cornell Univ., Ithaca, NY, [2]USDA-ARS, Univ. of Missouri, Columbia, MO

9:12 1741 Resistance evolution to Cry1F in the fall army worm, *Spodoptera frugiperda* (Lepitoptera: Nocutuidae): Lack of fitness costs and implications for resistance management. **Brigitte Tenhumberg**, btenhumberg2@unl.edu[1], Ana Maria Velez[1], Haridas Chirakkal[2] and Blair Siegfried[1], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska-Lincoln, Lincoln, NE

9:24 1742 Frequency of resistance alleles to *Bacillus thuringiensis* Cry1F and Cry1A.105 in Louisiana and Florida populations of fall armyworm, *Spodoptera frugiperda*. **Fangneng Huang**, fhunag@agcenter.lsu.edu[1], Jawwad A. Qureshi[2], Graham Head[3], David L. Kerns[4], B. Rogers Leonard[1], Ronnie Levy[5], Fei Yang[1] and Ying Niu[1], [1]Louisiana State Univ., Baton Rouge, LA, [2]Univ. Florida, Immokalee, FL, [3]Monsanto Company, St. Louis, MO, [4]Texas Agricultural Experiment Station, Lubbock, TX, [5]Louisiana State Univ., Alexandria, LA

9:36 1743 Interaction of Bt traits and a soil insecticide on corn pest management. **Laura A. Campbell**, lacampbell@siu.edu, Sara Mueting, Michael Lydy and Bryan G. Young, Southern Illinois Univ. Carbondale, Carbondale, IL

9:48 Break

10:00 1744 Challenges and successes in managing resistance of *Spodoptera frugiperda* (Lepidoptera: Noctuidae) to a low-dose Bt maize MON810. **Celso Omoto**, celso.omoto@usp.br[1], Eloisa Salmeron[1], Oderlei Bernardi[1], Renato A. de Carvalho[2], Samuel Martinelli[3] and Graham P. Head[3], [1]Univ. of Sao Paulo/ESALQ, Piracicaba, Brazil, [2]Monsanto do Brasil Ltda., São Paulo, Brazil, [3]Monsanto LLC, Saint Louis, MO

10:12 1745 Assessing durability of Bt crops where insect resistance genes are linked. **Kevin Shoemaker**, kevin@ramas.com and Nicholas Friedenberg, Applied Biomathematics, Setauket, NY

10:24 1746 Field trial performance of Smartstax technology for control of western corn rootworm. **Kevin Johnson**, kdjohnson@dow.com, Dow AgroSciences, LLC, Danville, IL, Dwain M. Rule, Dow AgroSciences, LLC, Indianapolis, IN, Amanda Jacobson, Univ. of Tennessee, Knoxville, TN and Nicholas Storer, Dow AgroSciences, Midland, MI

10:36 1747 Best management practices for control of western corn rootworm in fields with greater than expected feeding damage. **Matthew W. Carroll**, matthew.carroll@monsanto.com[1], Graham P. Head[1] and Luke Samuel[2], [1]Monsanto Company, St. Louis, MO, [2]Monsanto, St. Louis, MO

10:48 1748 Contribution of late-season volunteer corn to overwintering *Helicoverpa zea* populations and to potential Bt resistance development. Arun Babu[1], Michael A. Caprio[1], Donald Cook[2], K. Allen[3] and **Fred R. Musser**, fm61@msstate.edu[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, [3]USDA, Agricultural Research Service, Stoneville, MS

11:00 1749 The impact of unequal fitness costs in insect resistance to plants expressing two toxins. **Michael A. Caprio**, mcaprio@entomology.msstate.edu and Kristine T. Edwards, Mississippi State Univ., Mississippi State, MS

11:12 1750 Has *Helicoverpa zea* developed resistance to Bt in corn? **Dominic R. Reisig**, dominic_reisig@ncsu.edu, North Carolina State Univ., Plymouth, NC and Francis Reay-Jones, Clemson Univ., Florence, SC

11:24 1751 Compatibility of transgenic legumes and parasitoids to control bruchids (Coleoptera: Chrysomelidae). Christoph Lüthi, Fernando Alvarez-Alfageme and **Jörg Romeis**, joerg.romeis@agroscope.admin.ch, Agroscope ART, Zurich, Switzerland

Ten-Minute Papers, SysEB Section: Arthropod Systematics

Meeting Room 4 ABC (Austin Convention Center)

Moderators: Olivia Evangelista[1] and Christopher Beatty[2], [1]Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil, [2]Santa Clara Univ., Santa Clara, CA

8:00 Welcoming Remarks

8:02 1752 Roles of insects in the mesozoic ecosystems of Northeastern China. **Mei Wang**, wangmeicnu@163.com[1], Chungkun Shih[2], Chen Wang[2] and Dong Ren[2], [1]Capital Normal Univ., China, Beijing, China, [2]Capital Normal Univ., Beijing, China

8:14 1753 Exceptionally preserved fossil deposits record insect response to environmental change in Colorado. **Dena Smith**, Dena.Smith@colorado.edu and Cesar Nufio, Univ. of Colorado, Boulder, CO

8:26 1754 *Brevipalpus phoenicis*: Unraveling the complex. Jenny Beard, Queensland Museum, South Brisban, Queensland, Australia, Ronald Ochoa, USDA-ARS-PSI, Systematic Entomology Laboratory, Beltsville, MD, **W Braswell**, Evan.Braswell@aphis.usda.gov, USDA,

Edinburg, TX and Gary R. Bauchan, USDA, Agricultural Research Service, Beltsville, MD

8:38 1755 Life in the torrent: Reviving North American water mite taxonomy. **Ray Fisher**, JRFisher@uark.edu, Univ. of Arkansas, Fayetteville, AR and Ashley P. G. Dowling, Univ. of Kentucky, Lexington, KY

8:50 1756 New characters for defining North American genera of Microcreagrinae (Pseudoscorpiones: Neobisiidae). **Garrett Hughes**, budgernaut@hotmail.com and Wendy Moore, Univ. of Arizona, Tucson, AZ

9:02 1757 Gomphidae: A phylogeny of the clubtails. Erik M. Pilgrim, US Environmental Protection Agency, Cincinnati, OH and **Jessica L. Ware**, jware@amnh.org, Rutgers, The State Univ. of New Jersey, Newark, NJ

9:14 1758 Labial mask morphology and strike velocity interact to affect prey-capture success of different prey sizes by Anisoptera (Odonata) nymphs. **Benjamin Allen**, benallen@uta.edu, Univ. of Texas at Arlington, Arlington, TX

9:26 1759 The 'petaltail' dragonflies (Odonata: Petaluridae): Mesozoic habitat specialists that survive to the modern day. **Christopher Beatty**, beattych@yahoo.com, Santa Clara Univ., Santa Clara, CA and Jessica L. Ware, Rutgers, The State Univ. of New Jersey, Newark, NJ

9:38 1760 Molecular systematics and phylogeography of neotropical grasshoppers in the genus *Sphenarium* (Orthoptera: Pyrgomorphidae). **Salomón Sanabria-Urban**, sanabria_os@comunidad.unam.mx[1], Ken Oyama[2], Antonio González-Rodriguez[2] and Raul Cueva del Castillo[3], [1]FES Iztacala UNAM, Tlalnepantla, Mexico, [2]CIECO, UNAM, Morelia, Mexico, [3]FES Iztacala UNAM, Tlalnepantla, Mexico

9:50 1761 The systematics of *Melanoplinos*. **Oskar Sanabria**, peedelud_salo@hotmail.com, unam, mexico, Cape Verde

10:02 Break

10:12 1762 Geographic genetic structure of human lice provides insights into human migrations around the globe and past ecological interactions among hominids. **Marina Ascunce**, msascunce08@gmail.com[1], Ariel Toloza[2], Maria Picollo[2], Angélica González-Oliver[3] and David Reed[1], [1]Univ. of Florida, Gainesville, FL, [2]Centro de Investigaciones de Plagas e Insecticidas, Villa Martelli, Argentina, [3]Universidad Nacional Autonoma de Mexico, México D.F, Mexico

10:24 1763 Bayesian species delimitation in the morphologically diverse *Heteronotus delineatus* complex (Hemiptera: Auchenorrhyncha: Membracidae). **Olivia Evangelista**, olivia_evangelista@yahoo.com.br[1], Marcio R. Pie[2], Jason Cryan[3], Julie Urban[4] and Carlos Lamas[1], [1]Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil, [2]Universidade Federal do Paraná, Curtiba, PR, Brazil, [3]North Carolina Museum of Natural Sciences, Raleigh, NC, [4]Nature Research Center, NC Museum of Natural Sciences, Raleigh, NC

10:36 1764 Five species of *Reuteria* (Hemiptera: Miridae) new for Arkansas, USA. **Stephen Chordas III**, chordas.2@osu.edu, Ohio State Univ., Columbus, OH and Renn Tumlison, Henderson State Univ., Arkadelphia, AR

10:48 1765 Re-examining the Hemiptera phylogeny using supermatrices and phylogenomic data sets. **Christopher L. Owen**, clowen@gwu.edu, George Washington Univ., Ashburn, VA

11:00 1766 Genome size variation in Insecta. **Shawn Hanrahan**, shawnhanrahan@tamu.edu and J. Spencer Johnston, Texas A&M Univ., College Station, TX

11:12 1767 Progress in insect phylogenetics from the 1KITE initiative. **Karl M. Kjer**, kjer@aesop.rutgers.edu, Rutgers Univ., New Brunswick, NJ, Bernhard Misof, Museum Alexander Koenig, Bonn, Germany and Xin Zhou, Beijing Genomics Institute, Shenzhen, China

11:24 Concluding Remarks

Ten-Minute Papers, SysEB Section: Systematics of Coleoptera and Biodiversity Technology

Meeting Room 5 ABC (Austin Convention Center)

Moderators: Duane D. McKenna[1] and Guanyang Zhang[2], [1]Univ. of Memphis, Memphis, TN, [2]Arizona State Univ., Tempe, AZ

8:00 Welcoming Remarks

8:02 1768 Genes, genomes, and the evolution of beetle megadiversity. **Duane D. McKenna**, dmckenna@memphis.edu, Univ. of Memphis, Memphis, TN

8:14 1769 Phylogeny of pterostichine carabid beetles (Coleoptera, Carabidae). **Kipling Will**, kipwill@berkeley.edu, Univ. of California, Berkeley, CA

8:26 1770 Molecular phylogeny and multispecific aggregation behavior of North American *brachinus* (Weber) (Coleoptera: Carabidae: Brachininae). **Jason Schaller**, jschalle@email.arizona.edu and Wendy Moore, Univ. of Arizona, Tucson, AZ

8:38 1771 Molecular phylogeny of the burying beetles (Coleoptera: Silphidae: Nicrophorinae). **Derek S. Sikes**, dssikes@alaska.edu, Univ. of Alaska, Fairbanks, AK and Chandra Venables, Univ. of Calgary, Calgary, AB, Canada

8:50 1772 Molecular and morphological revelations in the subfamiliy classification of checkered beetles (Coleoptera: Cleridae). **John Moeller Leavengood**, tokay@ufl.edu, Eric G Chapman and Michael J. Sharkey, Univ. of Kentucky, Lexington, KY

9:02 1773 Lost in "Malacodermata": Taxonomy and phylogeny of the Prionoceridae (Coleoptera: Cleroidea). **Michael Geiser**, m.geiser@nhm.ac.uk, Univ. of Basel, Basel, Switzerland

9:14 1774 Phylogenomic data help resolve the phylogeny of Curculionoidea and yield insights into the evolution of weevil megadiversity. **Alex Aitken**, aaitken@memphis.edu, Univ. of Memphis, Ripley, TN and Duane D. McKenna, Univ. of Memphis, Memphis, TN

9:26 1775 New phylogenetic insights into the evolution of West Indian entimine weevils (Coleoptera: Curculionidae) with an emphasis on Cuban lineages. **Guanyang Zhang**, gzhan001@ucr.edu and Nico M. Franz, Arizona State Univ., Tempe, AZ

9:38 1776 Sticky harpoons, walking on water, and the systematics of the megadiverse rove beetle subfamily Steninae: How many genera are there anyway? **Dave J. Clarke**, dclarke@fieldmuseum.org, The Field Museum, Chicago, IL

9:50 Break

10:00 1777 Molecular phylogenetics, genomics, and evolution of the subfamily Lamiinae (flat-faced longhorned beetles). **Stephanie**

Haddad, stephanyhaddad@gmail.com and Duane D. McKenna, Univ. of Memphis, Memphis, TN

10:12 1778 Unprecedented morphological investigation provides new evidence for the phylogeny of dung beetles (Coleoptera, Scarabaeidae, Scarabaeinae). **Sergei Tarasov**, sergxf@yandex.ru, Univ. of Oslo, Oslo, Oslo, Norway

10:24 1779 A Long Pupation: Fritz van Emden's larvae, and the handbook to the larvae of the British beetle families. Beulah Garner and **Maxwell Barclay**, m.barclay@nhm.ac.uk, Natural History Museum, London, United Kingdom

10:36 1780 BRUCOL, a database for Bruchidae worldwide (Insecta: Coleoptera).jnapole. **Jesus Romero-Napoles**, jnapoles@colpos.mx, Colegio de Postgraduados, Texcoco, Mexico

10:48 1781 Electronic atlas and catalog of the bark and ambrosia beetles of North America (Curculionidae: Scolytinae, Platypodinae). **Thomas H. Atkinson**, thatkinson.austin@gmail.com, Univ. of Texas, Austin, TX

11:00 1782 Wright and Fisher in the twenty-first century: New rapid species discovery tools in Mesquite. **Jeffrey Oliver**, Jeffrey.Oliver@science.oregonstate.edu and David Maddison, Oregon State Univ., Corvallis, OR

11:12 1783 Presentation withdrawn.

11:24 1784 Interaction visualizations of North American red listed plant and phytophagous insect data assimilated from natural history collections. **Katja C. Seltmann**, enicospilus@gmail.com[1], Christine A. Johnson[2] and Randall T. Schuh[2], [1]The American Museum of Natural History, New York, NY, [2]American Museum of Natural History, New York, NY

11:36 1785 A paradigm shift in biodiversity publishing: Mobilization, mark up, reuse and integration of small data. **Ed Baker**, edward.baker@nhm.ac.uk[1], L. Penev[2] and Vincent Smith[1], [1]Natural History Museum, London, United Kingdom, [2]Bulgarian Academy of Sciences and Pensoft Publishers, Sofia, Bulgaria

WEDNESDAY, NOVEMBER 13, 2013, AFTERNOON

Lunch and Learn: The Art of Negotiation

Ballroom G (Austin Convention Center)

Panel: Sue Blodgett, Iowa State University; Gary Felton, Penn State University; Erin Hodgson, Iowa State University; Scott Hutchins, Dow AgroSciences; Sarah Zuckoff, Kansas State University

12:15 - 1:15

Lunch and Learn: The Art of Writing a Successful Scientific Paper

Ballroom F (Austin Convention Center)

Moderators and Organizers: Elliot Shubert, The Natural History Museum, London, United Kingdom

12:15 - 1:15

Program Symposium: Plant-mediated Interactions Among Multiple Players: Making Connections Between Ecological Processes and Mechanisms

Ballroom F (Austin Convention Center)

Moderators and Organizers: Roxina Soler[1], Raul F. Medina[2] and Cesar Rodriguez-Saona[3], [1]Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, Netherlands, [2]Texas A&M Univ., College Station, TX, [3]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

1:30 Welcoming Remarks

1:35 1786 Adding a temporal dimension to aboveground-belowground interactions. **Martijn Bezemer**, m.bezemer@nioo.knaw.nl, Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, Netherlands

1:55 1787 Stuck in the middle with you: How plants mediate interactions between above- and belowground communities. **Scott Johnson**, Scott.Johnson@uws.edu.au, Univ. of Sidney, Penrith, Australia

2:15 1788 Above-ground endophyte mediates host selection of below-ground herbivore. **Michael Rostas**, Michael.Rostas@lincoln.ac.nz, Lincoln Univ., Canterbury, New Zealand

2:35 1789 What happens when plants are always turned on? Constitutive HIPVs and the sustainable attraction of carnivores. **Ian Kaplan**, ikaplan@purdue.edu, Purdue Univ., West Lafayette, IN

2:55 1790 Indirect effects of herbivory on predator-prey interactions . **David Crowder**, dcrowder@wsu.edu, Washington State Univ., Pullman, WA

3:15 1791 Using HIPV's to manipulate multitrophic interactions and improve crop protection. **Anne Marie Cortesero**, Anne-Marie.Cortesero@univ-rennes1.fr, Univ. de Rennes, Rennes, France

3:35 Break

3:45 1792 Chemical communication in plant-mediated interactions in natural plant communities. **Consuelo De Moraes**, czd10@psu.edu, Pennsylvania State Univ., Univ. Park, PA and Mark C. Mescher, Associate Professor, Pennsylvania State Univ., Univ. Park, PA

4:05 1793 Plant metabolic links between leaf and root feeding insects: Who is running the show? **Matthias Erb**, merb@ice.mpg.de, Max Planck Institute for Chemical Ecology, Jena, Germany

4:25 1794 Independent and interactive effects of plant defenses and predators on aphids. **Monica F. Kersch-Becker**, mf464@cornell.edu, Cornell Univ., Ithaca, NY

4:45 1795 Beneficial soil-borne microbes: Helping plants to deal with insects? **Ana Pineda**, ana.pineda@wur.nl, Wageningen Univ., Wageningen, Netherlands

5:05 1796 Plant-mediated competition or facilitation in insect communities? Feeding styles matter. **Roxina Soler**, r.soler@nioo.knaw.nl, Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, Netherlands

5:25 Concluding Remarks

PBT Section Symposium: Insect Resistance Management: Lessons Learned from Biochemical and Molecular Paths to Bt Resistance

Meeting Room 19 B (Austin Convention Center)

Moderators and Organizers: Amit Sethi[1] and Mao Chen[2], [1]DuPont Pioneer, Johnston, IA, [2]Monsanto Company, Chesterfield, MO

1:30 Welcoming Remarks

1:35 1797 Mode of action of Cry toxins from *Bacillus thuringiensis* and strategies to overcome insect resistance. Mario Soberón, Univ. of Arizona, Tucson, AZ and **Alejandra Bravo**, Universidad Nacional Autonoma de Mexico, Morelos, Mexico

1:58 1798 Variation of the midgut cadherin in the cabbage looper, *Trichoplusia ni*. **Ping Wang**, pingwang@cornell.edu, Cornell Univ. NYSAES, Geneva, NY

2:21 1799 Potential contributions of proteases to Cry1Ac resistance in *Helicoverpa zea*. **Xianchun Li**, lxc@email.arizona.edu[1], Min Zhang[1], Yves Carriere[1], Jeffrey A. Fabrick[2] and Bruce E. Tabashnik[1], [1]Univ. of Arizona, Tucson, AZ, [2]USDA-ARS U.S. Arid Land Agricultural Research Center, Maricopa, AZ

2:44 1800 High degree of resistance to Cry1Ab toxin caused by a single amino acid insertion in an ABC transporter in the silkworm. **Hiroaki Noda**, hnada@affrc.go.jp, National Institute of Agrobiological Sciences, Tsukuba, Japan

3:07 1801 Molecular characterization of field-evolved resistance to Bt corn in *Spodoptera frugiperda*. **Juan L. Jurat-Fuentes**, jurat@utk.edu, Univ. of Tennessee, Knoxville, Knoxville, TN

3:30 Break

3:45 1802 Functional and molecular characterization of Cry1F resistance in european corn borer, *Ostrinia nubilalis*. **Mark Nelson**, mark.e.nelson@cgr.dupont.com, Pioneer Hi-Bred International, Inc, Wilmington, DE

4:08 1803 Understanding Cry1F resistance in European corn borer; implications to resistance management and mitigation. **Blair Siegfried**, bsiegfried1@unl.edu, Univ. of Nebraska, Lincoln, NE

4:31 1804 Preliminary biochemical characterization of Cry3Bb resistance in western corn rootworm: Cry3Bb binding and proteolytic activation. **Jeff Haas**, jeff.a.haas@monsanto.com, Monsanto Company, St. Louis, MO

4:54 1805 Combined proteomics and transcriptomics approach to understand Cry3Bb1-resistance mechanisms in western corn rootworm (*Diabrotica virgifera virgifera*). **Krishnareddy Bayyareddy**, krishnareddy.bayyareddy@monsanto.com, Monsanto Company, St. Louis, MO

5:17 Concluding Remarks

P-IE Section Symposium: Ecological Services of Insect Microbial Control Agents

Meeting Room 7 (Austin Convention Center)

Moderators and Organizers: Denny Bruck[1] and Steven P. Arthurs[2], [1]DuPont Pioneer, Johnston, IA, [2]Univ. of Florida, Apopka, FL

1:30 1806 Opening Remarks. **Denny Bruck**, Denny.Bruck@pioneer.com, DuPont Pioneer, Johnston, IA

1:35 1807 Biocontrol services potential of urban soils: Predictions and implications for urban agriculture. **Parwinder Grewal**, pgrewal@utk.edu, Univ. of Tennessee, Knoxville, TN

2:05 1808 Just another day in paradise: Orange trees, herbivores, EPNs and their enemies. **Larry W. Duncan**, lwduncan@ufl.edu, Fahiem El-Borai and Raquel Campos-Herrera, Univ. of Florida, Lake Alfred, FL

2:35 1809 Abundance, distribution and community structure of fungal entomopathogens in agro-ecosystems: Implications for microbial control. **Nicolai Meyling**, NVM@life.ku.dk[1], Bernhardt Steinwender[1], Jürg Enkerli[2], Stephen Rehner[3] and Jørgen Eilenberg[4], [1]Univ. of Copenhagen, Copenhagen, Denmark, [2]Agroscope Reckenholz-Tänikon ART, Zürich, Switzerland, [3]USDA-ARS Systematic Mycology and Microbiology Laboratory, Beltsville, MD, [4]Univ. of Copenhagen, Frederiksberg C, Denmark

3:05 Break

3:20 1810 Biological control of plant pathogens using insect pathogenic fungi. **David Chandler**, Dave.Chandler@warwick.ac.uk, John Clarkson and Gill Prince, Univ. of Warwick, Warwick, United Kingdom

3:50 1811 Plant-*Metarhizium* interactions. **Raymond J. St. Leger**, stleger@umd.edu and Hsiao-Ling Lu, Univ. of Maryland, College Park, MD

4:20 1812 Closing remarks. **Steven P. Arthurs**, spa@ufl.edu, Univ. of Florida, Apopka, FL

P-IE Section Symposium: Insect-Microbe-Plant Interactions

Meeting Room 10 C (Austin Convention Center)

Moderators and Organizers: Peter Witzgall, SLU, Alnarp, Sweden

1:30 Introductory Remarks

1:40 1813 Yeast associations of spotted wing Drosophila (*Drosophila suzukii,* Diptera: Drosophilidae) in cherries and raspberries. **Kelly A. Hamby**, kahamby@ucdavis.edu[1], Alejandro Hernandez[2], Kyria Boundy-Mills[1] and Frank Zalom[3], [1]Univ. of California, Davis, Davis, CA, [2]Universidad de Extremadura, Bajadoz, Spain, [3]Univ. of California, Davis, CA

2:00 1814 Infection of plants by a bacterial endosymbiont mediates host selection in the potato psyllid. **Thomas Seth Davis**, tsdavis1@gmail.com, Univ. of Idaho, Moscow, ID, Peter J. Landolt, USDA, Agricultural Research Service, Wapato, WA, Joseph E. Munyaneza, USDA - ARS, Wapato, WA and David R. Horton, USDA-ARS, Wapato, WA

2:20 1815 Flies and their environments: microbial interactions via odorants. **Jerry Zhu**, Jerry.Zhu@ars.usda.gov, USDA, Agricultural Research Service, Northern Plains Area (NPA), Lincoln, NE

2:40 1816 Yeast, small hive beetles, honeybees and plants: Evolution of a pest insect. **Peter E. A. Teal**, peter.teal@ars.usda.gov, USDA Agricultural Research Service, Gainesville, FL, Baldwyn Torto, USDA, Gainesville, FL, James H. Tumlinson, Pennsylvania State Univ., Univ. Park, PA, Drion G. Boucias, Univ. of Florida, Gainesville, FL, Adrian J. Duehl, USDA - ARS, Gainesville, FL and Ayuka Fombong, International Centre of Insect Physiology and Ecology (icipe), Nairobi, Nairobi, Kenya

3:00 Break

3:20 1817 Fatal attraction of malaria mosquitoes to fungal spores. **Thomas C. Baker**, tcb10@psu.edu, Justin George, Simon Blanford, Nina Jenkins and Matthew B. Thomas, Pennsylvania State Univ., Univ. Park, PA

3:40 1818 The hidden microbial contribution to plant-insect interactions. **Wilhelm Boland**, Boland@ice.mpg.de, Max Planck Institute, Jena, Germany

4:00 1819 Codling moth granulovirus: Defining use strategies for North American orchardists. **Donald Thomson**, dthomson@pobox.com, Pacific Biocontrol Corporation, Seattle, WA

4:20 1820 Ceci n'est pas une pomme - yeast mutualism in codling moth. **Peter Witzgall**, peter.witzgall@ice3.se, SLU, Alnarp, Sweden

4:40 Concluding Remarks

P-IE Section Symposium: Integrated Pest Management in the Connected World of Whole-Farm Ecosystems

Meeting Room 12 A (Austin Convention Center)

Moderators and Organizers: Norman Leppla[1] and Thomas A. Green[2], [1]Univ. of Florida, Gainesville, FL, [2]IPM Institute of North America, Madison, WI

1:30 1821 Introduction and perspective: IPM in whole-farm ecosystems: Where concepts meet reality. **George G. Kennedy**, gkennedy@ncsu.edu, North Carolina State Univ., Raleigh, NC

1:50 1822 Ecosystem services provided by farmscapes and their potential augmentation. **Russell Mizell**, RFMizell@ufl.edu, Univ. of Florida, Quincy, FL

2:10 1823 Whole Farm Training in IPM at the University of Florida Living Extension IPM Field Laboratory. **Robert Hochmuth**, bobhoch@ufl.edu, Univ. of Florida, Live Oak, FL and Norman Leppla, Univ. of Florida, Gainesville, FL

2:30 1824 Long-term research on extended rotations for corn and soybeans. **Leonor Leandro**, lleandro@iastate.edu, Matt Liebman and Craig Chase, Iowa State Univ., Ames, IA

2:50 1825 Understanding growers' motivations to adopt a whole-farm approach. **Linda Prokopy**, lprodopy@purdue.edu, Purdue Univ., West Lafayette, IN

3:10 1826 Ten years of progress implementing IPM and sustainability in a 4000-grower supply chain. **Georgiann Miller**, miller.georgiann@corp.sysco.com and Ronald Diem, Sysco Corporation, Houston, TX

3:30 1827 Translating whole-farm ecosystem approaches into practice: Current tools and options for agriculture. **Thomas A. Green**, ipmworks@ipminstitute.org, IPM Institute of North America, Madison, WI

SysEB Section Symposium: Interactive Keys Transforming Identification: Melding Traditional Methods with New Technologies

Meeting Room 6 A (Austin Convention Center)

Moderators and Organizers: Su Yee Lim and Thomas McElrath, Univ. of Georgia, Athens, GA

1:30 Welcoming Remarks

1:35 1828 Developing Longicorn ID: Tool for Diagnosing Cerambycoid Families, Subfamilies, and Tribes. **Eugenio H. Nearns**, gino@nearns.com[1], Nathan P. Lord[2], Steven W. Lingafelter[1], Antonio Santos-Silva[3] and Kelly B. Miller[2], [1]National Museum of Natural History, Washington, DC, [2]Univ. of New Mexico, Albuquerque, NM, [3]Universidade de São Paulo, São Paulo, Brazil

1:50 1829 Screening for citrus pests - LUCID® keys and hand-held applications. **Amanda C. Hodges**, achodges@ufl.edu, Univ. of Florida, Gainesville, FL

2:05 1830 MonotomID - an interactive key on a tight budget. **Thomas McElrath**, tmcelrat@uga.edu, Olivia Boyd and Joseph V. McHugh, Univ. of Georgia, Athens, GA

2:20 Break

2:30 1831 Strategies for addressing taxonomic issues when building interactive keys. **A.J. Redford**, USDA - APHIS-PPQ-CPHST, Fort Collins, CO

2:45 1832 Beetles of the World Wide Web: Bringing a DELTA key online. **Ainsley E. Seago**, ainsley.seago@csiro.au, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Ecosystem Sciences, Canberra, ACT, Australia

3:00 1833 IntKey vs MX: Old vs new: A comparison of two interactive key technologies with multiple functionalities. **Michael J Sharkey**, msharkey@uky.edu, Univ. of Kentucky, Lexington, KY and Katja Seltmann, The American Museum of Natural History, New York, NY

3:15 Intermission

3:25 1834 Electronic identification of bark and ambrosia beetles: What works and what doesn't. **Jiri Hulcr**, jhulcr@ncsu.edu, Univ. of Florida, Gainesville, FL

3:40 1835 Interactive identification keys for pest detection and quarantine: Incorporating non-traditional data. **Todd M. Gilligan**, tgilliga@gmail.com, Colorado State Univ., Fort Collins, CO

3:55 1836 3i: Internet-accessible Interactive Identification. **Dmitry A. Dmitriev**, dmitriev@inhs.uiuc.edu, Illinois Natural History Survey, Champaign, IL

4:10 Break

4:20 1837 First interactive taxonomic key for a global pest (Rhinotermitidae: *Reticulitermes* spp.). **Su Yee Lim**, suyee03@gmail.com, Brian T. Forschler and Joseph V. McHugh, Univ. of Georgia, Athens, GA

4:35 1838 NZ ZopherID: A comprehensive electronic tool to a taxonomically difficult group of New Zealand beetles. Nathan P. Lord[1], **Richard AB. Leschen**, LeschenR@landcareresearch.co.nz[2] and Thomas Buckley[2], [1]Univ. of New Mexico, Albuquerque, NM, [2]Landcare Research, Auckland, New Zealand

4:50 1839 Tabletop Scanning Electron Microscopy: New Technology for identification of microscopic arthropods. **Gary R. Bauchan**, gary.bauchan@ars.usda.gov, USDA, Agricultural Research Service, Beltsville, MD, Jenny Beard, Queensland Museum, South Brisban, Queensland, Australia and Ronald Ochoa, USDA-ARS-PSI, Systematic Entomology Laboratory, Beltsville, MD

5:05 Discussion

SysEB Section Symposium: SysEB Section Symposium: What Arthropods Reveal about the Biogeography of the American Southwest and Mexico; with a Report on Work from Joshua Tree National Park

Ballroom G (Austin Convention Center)

Moderators and Organizers: Heidi Hopkins, Univ. of New Mexico, Albuquerque, NM

1:30 Introductory Remarks

1:35 1840 Sky islands and *Chrysina* beetles (Coleoptera: Scarabaeidae). **Don Thomas**, donald.thomas@ars.usda.gov, USDA Agricultural Research Service, Edinburg, TX

1:55 1841 Biogeography of the southwest, mayflies (Ephemeroptera) and stoneflies (Plecoptera) as examples. **Boris Kondratieff**, Boris.Kondratieff@Colostate.edu, C.P. Gillette Museum of Arthropod Diversity, Fort Collins, CO

2:15 1842 Biogeography and relationships of the cicadas (Hemiptera: Cicadidae) of southwestern North America. **Allen Sanborn**, asanborn@mail.barry.edu, Barry Univ., Miami Shores, FL

2:35 1843 Biogeography of Odanata of the American southwest and Mexico. **John C. Abbott**, jcabbott@mail.utexas.edu, Univ. of Texas, Austin, TX

2:55 1844 Geographic patterns of North American grasshoppers, crickets, and katydids (Orthoptera). **David C. Lightfoot**, dlightfo@unm.edu, The Univ. of New Mexico, Albuquerque, NM

3:15 1845 Biogeographic-scale patterns of ants of Mexico and Atzlan. **Michael Weiser**, michael.d.weiser@ou.edu, Univ. of Oklahoma, Norman, OK

3:35 Break

3:45 1846 Biogeography of a suprisingly speciose genus, *Arenivaga* (Rehn) (Blattodea: Polyphagidae). **Heidi Hopkins**, hhopkins@unm.edu, Univ. of New Mexico, Albuquerque, NM

4:05 1847 Joshua Tree National Park Biodiversity: A new synergy between the Smithsonion Institution and National Park Service.

Michael W. Gates, michael.gates@ars.usda.gov, USDA-ARS, Washington, DC

4:25 1848 Cynipoid wasp diversity in Joshua Tree National Park. **Matthew Buffington**, matt.buffington@ars.usda.gov, USDA, Agricultural Research Service, Systematic Entomology Laboratory (SEL), Washington, DC

4:45 1849 A million little brown wasps (Hymenoptera: Chyphotidae, Mutillidae, and Tiphiidae): A survey of Joshua Tree National Park. **Emily A. Sadler**, sadler.e@gmail.com, Utah State Univ., Logan, UT

5:05 1850 Citizen science and volunteerism at Joshua Tree National Park: Boots on the ground. **Paul Delaney**, pdelaney@cmccd.edu, Copper Mountain College, Joshua Tree, CA and Andrea Compton, Joshua Tree National Park, Twentynine Palms, CA

5:25 Concluding Remarks

Member Symposium: Forest Entomology Connecting the World

Meeting Room 18 D (Austin Convention Center)

Moderators and Organizers: Kimberly F. Wallin[1], Nathan Havill[2] and Richard W. Hofstetter[3], [1]USDA Forest Service, South Burlington, VT, [2]USDA, Forest Service, Hamden, CT, [3]Northern Arizona Univ., Flagstaff, AZ

1:30 Welcoming Remarks

1:50 1851 Symbiosis in forest science: Partners and pests - resources and issues. **Kier D Klepzig**, kklepzig@fs.fed.us, USDA Forest Service, Asheville, NC

2:15 1852 Connecting research to the 'real world': Helping land managers make informed decisions. **Melissa K. Fierke**, mkfierke@esf.edu, State Univ. of New York, ESF, Syracuse, NY, Mark Whitmore, Cornell Univ., Ithaca, NY and John D. Vandenberg, USDA Agricultural Research Service, Ithaca, NY

2:40 Break

3:00 1853 Impact of an introduced predatory beetle (Laricobius nigrinus) on hemlock woolly adelgid in northwestern North Carolina. **Leah Flaherty**, leahelizabethflaherty@gmail.com and Joseph Elkinton, Univ. of Massachusetts, Amherst, MA

3:25 1854 Variation in Asian Gypsy Moth in the People's Republic of China. **Juan Shi**, shi_juan@263.net, Fang Chen, Fan Yang, Yang Li and You-Qing Luo, Beijing Forestry Univ., Beijing, China

3:50 Break

4:10 1855 Mining historical data: Can we know the influence of climate and forest composition on outbreak dynamics? **David Gray**, david.gray@nrcan.gc.ca, Natural Resources Canada, Fredericton, NB, Canada

4:35 1856 Dieback of southern pines: Etiology, landowner perceptions, and management recommendations. **David R. Coyle**, dcoyle@warnell.uga.edu[1], Kier D Klepzig[2], Frank H Koch[3], Larry Morris[1], John T. Nowak[4], Bill Otrosina[5], Bill Smith[6] and Kamal JK. Gandhi[1], [1]Univ. of Georgia, Athens, GA, [2]USDA Forest Service, Asheville, NC, [3]North Carolina State Univ., Research Triangle Park, NC, [4]USDA Forest Service, Southern Region, Asheville, NC, [5]USDA Forest Service, Athens, GA, [6]USDA Forest Service, Raleigh, GA

5:00 Concluding Remarks

Member Symposium: How Cool is Entomology?

Meeting Room 16 A (Austin Convention Center)

Moderators and Organizers: Brian G. Rector[1] and Theresa L. Pitts-Singer[2], [1]USDA, Agricultural Research Service, Reno, NV, [2]USDA, Agricultural Research Service, Logan, UT

1:30 1857 The Military Entomological Response to 9-11 at the opening of Operation Enduring Freedom. **Daniel A. Strickman**, daniel.strickman@ars.usda.gov, USDA, Agricultural Research Service, Beltsville, MD

1:55 1858 Ant nest architecture: Pioneering your own scientific field. **Walter R. Tschinkel**, tschinkel@bio.fsu.edu, Florida State Univ., Tallahassee, FL

2:20 1859 Drugs, aliens, and bold border crossings. **Lee A. Dyer**, nolaclimber@gmail.com, Univ. of Nevada, Reno, Reno, NV

2:45 1860 Amazing adaptive behaviors of insects in your home: How cockroaches find mates in your kitchen, groom more than you do, and benefit from snubbing sugars. **Coby Schal**, coby_schal@ncsu.edu, Ayako Wada-Katsumata and Jules Silverman, North Carolina State Univ., Raleigh, NC

3:10 1861 What's in 5000 insect genomes? **Susan Brown**, sjbrown@ksu.edu, Center for Genomic Studies on Arthropods Affecting Human Animal and Plant Health, Kansas State Univ., Manhattan, KS

3:35 1862 Can genetically engineered insects save lives, biodiversity, and agriculture? **Fred Gould**, fred_gould@ncsu.edu, North Carolina State Univ., Raleigh, NC

4:00 1863 Bacteria-blow fly interactions: Bridging basic and applied research in forensic entomology. **Jeffery K. Tomberlin**, jktomberlin@tamu.edu, Texas A&M Univ., College Station, TX

4:25 1864 Ant and Honeybee Colonies as Inspiration for Robotic Swarms. **Spring Berman**, spring.berman@asu.edu, Arizona State Univ., Tempe, AZ

Member Symposium: Integrated Insect Omics: From Transcriptomics to Interactomics

Meeting Room 19 A (Austin Convention Center)

Moderators and Organizers: Praveen Mamidala[1], Omprakash Mittapalli[2] and Daniel Doucet[3], [1]The Ohio State Univ., OARDC, Wooster, OH, [2]Ohio State Univ., OARDC, Wooster, OH, [3]Natural Resources Canada, Ontario, ON, Canada

1:30 1865 Understanding the target site of, and mechanisms of resistance to, insecticides acting on the nicotinic acetylcholine receptor. **Jeffrey G. Scott**, jgs5@cornell.edu, Cornell Univ., Ithaca, NY

1:50 1866 Comparative transcriptomics of three ash species. **Praveen Mamidala**, p.mamidala@yahoo.com[1], Xiaodong Bai[2], Loren Rivera-Vega[1], Pierluigi Bonello[3], Daniel A. Herms[1] and Omprakash Mittapalli[4], [1]The Ohio State Univ., OARDC, Wooster, OH, [2]The Ohio State Univ., Wooster, OH, [3]The Ohio State Univ., Columbus, OH, [4]Max Planck Institute for Chemical Ecology, Jena, Germany

2:10 1867 The Interactomics of Host-Plant Resistance to the Soybean Aphid. **Andrew Michel**, michel.70@osu.edu, The Ohio State Univ., OARDC, Wooster, OH

2:30 1868 Genomics of the mountain pine beetle. **Christopher Keeling**, Univ. of British Columbia, Vancouver, BC, Canada

2:50 1869 Genomic and transcriptomic analyses of the galling insect *Mayetiola destructor* (Diptera: Cecidomyiidae). **Richard Shukle**, shukle@purdue.edu, USDA-ARS, Purdue Univ., West Lafayette, IN

3:10 1870 Next-generation digestomics research in termites. **Michael E Scharf**, mescharf@ufl.edu, Univ. of Florida, Gainesville, FL

3:30 1871 Towards intergrative genomics to study phenotypic plasticity in aphids. **Denis Tagu**, denis.tagu@rennes.inra.fr, Univ. Rennes, Le Rheu Cedex, France

3:50 1872 Transcriptomic profile of a novel cell line from the Emerald Ash Borer. **Daniel Doucet**, Daniel.Doucet@nrcan-rncan.gc.ca, Natural Resources Canada, Ontario, ON, Canada

Member Symposium: Stored Product Entomology: Impacts on a Connected World

Meeting Room 9 AB (Austin Convention Center)

Moderators and Organizers: Frank Arthur[1] and Anna Getchell[2], [1]USDA-ARS, Manhattan, KS, [2]McCloud Services, South Elgin, IL

1:30 1873 Introduction. **Frank Arthur**, frank.arthur@ars.usda.gov, USDA-ARS, Manhattan, KS

1:40 1874 The challenges of post-harvest fumigation: Connections among researchers, regulators and industry can facilitate solutions-20 minutes. **Thomas W. Phillips**, twp1@ksu.edu, Kansas State Univ., Manhattan, KS

2:00 1875 Effects of phosphine resistance on fitness in *Rhyzopertha dominica* and *Tribolium castaneun* from Oklahoma. **George P. Opit**, george.opit@okstate.edu, Oklahoma State Univ., Stillwater, OK

2:20 1876 Technology transfer of methyl bromide alternatives. **Ed Hosoda**, ehosoda@cardinalproproducts.com, President, Cardinal Chemical Company, Woodland, CA

2:40 1877 Agronomic practices with post-harvest insect and aflatoxin contamination. **Michael D. Toews**, mtoews@uga.edu, Univ. of Georgia, Tifton, GA

3:00 1878 Field trials with grain protectants. **Keith Haas**, KHaas@central.com, Central Life Sciences, Dallas, TX

3:20 Break

3:30 1879 Aerosol insecticide applications in food facilities: Searching for connections between droplet size, distribution, and efficacy. **James F. Campbell**, james.campbell@ars.usda.gov, USDA-ARS, Manhattan, KS

3:50 1880 Science impacting a connected world: Solving a red flour beetle nuisance in a city neighborhood. **Bhadriraju Subramanyam**, sbhadrir@ksu.edu, Kansas State Univ., Manhattan, KS

4:10 1881 Seasonal and temporal distribution of stored-product insects at a rice mill in northeast Arkansas. **Tanja Mckay**, tmckay@astate.edu, Arkansas State Univ., State Univ., AR

4:30 1882 Nanostructured materials and their potential as pest control tools. **David K. Weaver**, weaver@montana.edu, Montana State Univ., Bozeman, MT

4:50 1883 Predicting outbreaks of stored product pests under field conditions. **Jeffrey A. Weier**, jweier@spraguepest.com, Sprague Pest Solutions, Tacoma, WA

5:10 1884 Closing and selection of chairperson for next year. **Anna Getchell**, AnnaGetchell@mccloudservices.com, McCloud Services, South Elgin, IL

Member Symposium: The Menace of Palm Weevils: Challenges and Strategies

Meeting Room 15 (Austin Convention Center)

Moderators and Organizers: Aziz Ajlan and Khalid Alhudaib, King Faisal Univ., Hofuf, Alhasa, Saudi Arabia

1:30 1885 How far can Red Palm Weevil (*Rhynchophorus ferrugineus*) fly? An examination of field and laboratory flight activity in Al Ahsaa, Saudi Arabia. **Christina D. Hoddle**, Christina.hoddle@ucr.edu, Univ. Of California Riverside, Riverside, CA, H. A. F. El-Shafie, Date Palm Research Centre of Excellence, Al-Hassa, Saudi Arabia, J. R. Faleiro, Ministry of Agriculture, Al-Hassa, Saudi Arabia and Mark S. Hoddle, Univ. of California, Riverside, CA

1:50 1886 Management of Red Palm Weevil with Hook™ RPW. **Agenor Mafra-Neto**, president@iscatech.com, ISCA Technologies, Inc., Riverside, CA, Lyndsie Stoltman, ISCA Technologies, Riverside, CA, Hug Vazquez, Llibreria Arrels C.B., Tortosa, Spain, A. H. Al-Abbad, Directorate of Agriculture, Saudi Arabia, J. R. Faleiro, Ministry of Agriculture, Al-Hassa, Saudi Arabia and H. A. F. El-Shafie, Date Palm Research Centre of Excellence, Al-Hassa, Saudi Arabia

2:10 1887 Genetic control of Red Palm Weevil. **Luke Alphey**, luke.alphey@oxitec.com, Oxford Univ. and Oxitec LTD, Oxford, United Kingdom

2:30 1888 Experience with the Diaprepes root weevil: Implications for mass rearing the red palm weevil. **Stephen L. Lapointe**, stephen.lapointe@ars.usda.gov, USDA, Agricultural Research Service, Fort Pierce, FL

2:50 1889 Genetic Variation Studies on Five *Rhynchophorus* Species and Different *R. ferrugineus* Populations. **Rabab AAM. El-Mergawy**, rababml@yahoo.fr, Minoufia Univ., Sadad city, Egypt

3:10 1890 Successful laboratory culture for the Red Palm Weevil, *Rhynchophorus ferrugineus*, (Coleoptera: Curculionidae) reared on semi-artificial diet. Aziza Sharaby, Professor of Entomology, National Research Center, Cairo, Egypt and **Zamzam M. Al-Dhafar**, Moth158@yahoo.com, Dammam Univ., Dammam, Saudi Arabia

3:30 Break

3:50 1891 Can azadirachtin deter red palm weevil, *Rhynchophorus ferrugineus*, (Coleoptera: Curculionidae) from laying eggs? Abdul Moneim Al-Shawaf[1], Yasser Al-Suleiman[2], Emmad Al-Abdullah[2], Abdullah Al-Shagag[1], Abdel Moneim Al-Dandan[1], Monsour Al-Bagshi[1], Sami Al-Saroj[1], Salim Al-Bather[2], **Abdallah Ben Abdallah**, abdallah.benabdallah@fao.org[3] and J. R. Faleiro[4], [1]National Date Palm Research Centre, Al Hassa, Saudi Arabia, [2]Date Palm Research Centre (DPRC), Saudi Arabia, [3]CTA, FAO Project, Al Hassa, Saudi Arabia, [4]Ministry of Agriculture, Al-Hassa, Saudi Arabia

4:10 1892 Preference of *Rhynchophorus ferrugineus* to date palm cultivars: Olfactometer assays. **J. R. Faleiro**, jrfaleiro@yahoo.co.in, Ministry of Agriculture, Al-Hassa, Saudi Arabia and H. A. F. El-Shafie, Date Palm Research Centre of Excellence, Al-Hassa, Saudi Arabia

4:30 1893 Effect of ethyl acetate and date palm fruits quantity on red palm weevil capture in pheromone traps in UAE. **Ahmad Al-Saoud**, alsaoudahmad@hotmail.com, Al-Ain, United Arab Emirates

4:50 1894 Identification of molecular markers associated with Red Palm Weevil (*Rhynchophorus ferrugineus* (Oliv.) infestation in date palm through differential proteomics approach. **Abdulrahman Saad Aldawood**, aldawood@ksu.edu.sa[1], Khawaja Ghulam Rasool[2], Muhammad Tufail[3], Muhammad Khan[3], Muhammad Mukhtar[4] and Makio Takeda[5], [1]King Saud Univ., Riyadh, Saudi Arabia, [2]Kind Saud Univ., Riyadh, Saudi Arabia, [3]King Saudi Univ., Riyadh, Saudi Arabia, [4]The Islamia Univ. of Bahawalpur, Bahawalpur, Pakistan, [5]Kobe Univ., Japan

5:10 Concluding Remarks

Member Symposium: Urban Pests and Disease Vectors: Sustainable Management and Future Research

Meeting Room 8 C (Austin Convention Center)

Moderators and Organizers: Paul Leisnham[1], Shannon L. LaDeau[2] and Dawn Biehler[3], [1]Univ. of Maryland, College Park, MD, [2]Cary Institute of Ecosystem Studies, Millbrook, NY, [3]Univ. of Maryland Baltimore County, Catonsville, MD

1:30 Introductory Remarks

1:40 1895 Modeling variability in the population of a West Nile virus vector over an urban area. **Corey Morin**, cmorin@email.arizona.edu, Univ. of Arizona, Tucson, AZ

1:58 1896 A tale of two cities: West Nile virus control in Sacramento and Los Angeles, California. **William K. Reisen**, arbo123@pacbell.net[1], P Macedo[2] and S Kluh[2], [1]Univ. of California - Davis, Davis, CA, [2]Univ. of California - Davis, Davis, CA

2:16 1897 Bugs, parasites, and cities: The urbanization of Chagas disease in Peru. **Michael Z. Levy**, mzlevy@gmail.com, Perelman School of Medicine, Philadelphia, PA

2:34 1898 Social and biological determinants of risk and incidence of *Amblyomma americanum*-associated pathogens spanning an urban-to-rural land-use gradient. **Brian F. Allan**, ballan@illinois.edu, Univ. of Illinois, Urbana, IL

2:52 1899 Human and vector interactions affecting urban dengue transmission. **L. Philip Lounibos**, lounibos@ufl.edu[1], Harish Padmanabha[2] and Irka E. Bargielowski[1], [1]Univ. of Florida, Vero Beach, FL, [2]Universidad del Norte, Barranquilla, Colombia

3:10 1900 Everybody knows she's a femme fatale: Larval ecology and vector potential of *Aedes aegypti* females. **Steven A. Juliano**, sajulian@ilstu.edu[1], Gabriel Ribeiro[2], Rafael de Freitas[2], Márcia Castro[2], Claudia Codeço[2], Ricardo de Oliveira[2] and L. Philip Lounibos[3], [1]Illinois State Univ., Normal, IL, [2]Instituto Oswaldo Cruz, Rio de Janerio, Brazil, [3]Univ. of Florida, Vero Beach, FL

3:28 Break

3:38 1901 Knowing community and environmental change through pests: Perceptions of mosquitoes and implications for management. **Dawn Biehler**, dbiehler@umbc.edu[1], Paul T. Leisnham[2], Zara R. Dowling[2] and Shannon L. LaDeau[3], [1]Univ. of Maryland Baltimore County, Catonsville, MD, [2]Univ. of Maryland, College Park, MD, [3]Cary Institute of Ecosystem Studies, Millbrook, NY

3:56 1902 Evaluating the effectiveness of passive education material at increasing reducing urban mosquito habitat and infestation along a socioeconomic gradient. **Paul T. Leisnham**, leisnham@umd.edu[1], Danielle Bodner[1], Shannon L. LaDeau[2] and Dawn Biehler[3], [1]Univ. of Maryland, College Park, MD, [2]Cary Institute of Ecosystem Studies, Millbrook, NY, [3]Univ. of Maryland Baltimore County, Catonsville, MD

4:14 1903 The use of active education and volunteer programs to engage and empower communities to reduce backyard mosquito habitats. **Kristen Healy**, khealy@lsu.edu[1], George C. Hamilton[2], Sean P. Healy[1], Ary Farajollahi[3] and Dina M. Fonseca[2], [1]Louisiana State Univ., Baton Rouge, LA, [2]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [3]Rutgers Univ., New Brunswick, NJ

4:32 1904 The socio-economic influence on mosquito infestations in Baltimore, MD and Washington, DC. **Shannon L. LaDeau**, ladeaus@caryinstitute.org[1], Paul T. Leisnham[2], Dawn Biehler[3] and Danielle Bodner[2], [1]Cary Institute of Ecosystem Studies, Millbrook, NY, [2]Univ. of Maryland, College Park, MD, [3]Univ. of Maryland Baltimore County, Catonsville, MD

4:50 1905 Presentation withdrawn.

5:08 Concluding Remarks

Member Symposium: Youthful Perspectives in Forensic Entomology: Who are These Young Punks?

Meeting Room 18 B (Austin Convention Center)

Moderators and Organizers: Meaghan Pimsler and Charity Owings, Texas A&M Univ., College Station, TX

12:00 Welcoming Remarks

1:30 1906 A brief history of forensic entomology: Where have we been and where are we headed? **Meaghan Pimsler**, mlpimsler@gmail.com and Charity Owings, Texas A&M Univ., College Station, TX

1:45 1907 "Fingerprint" cuticular hydrocarbons for identifying and ageing forensically important blowflies. **Hannah Moore**, h.e.moore@epsam.keele.ac.uk and Falko Drijfhout, Keele Univ., Keele, United Kingdom

2:00 1908 Aging immature Diptera using hyperspectral remote sensing. **Jodie Warren**, jwarren@sfu.ca[1], Margaret Kalacska[2] and Gail Anderson[1], [1]Simon Fraser Univ., Burnaby, BC, Canada, [2]McGill Univ., Montreal, QC, Canada

2:15 1909 Forensic entomology goes mobile with iFLY. **Trevor I. Stamper**, stampert@purdue.edu and Chad Strong, Purdue Univ., West Lafayette, IN

2:30 1910 Forensic investigation of stored products: Infestation in the food industry. **Mahsa Fardisi**, mfardisi@purdue.edu and Linda J. Mason, Purdue Univ., West Lafayette, IN

2:45 1911 Delusional parasitosis and the law. **Matan Shelomi**, mshelomi@ucdavis.edu, Univ. of California, Davis, Davis, CA

3:00 Break

3:15 1912 Investigations of resistance of military meals-ready-to-eat (MRE) to incursion by stored product insect pests. **Robert T. Puckett**, rpuck@tamu.edu and Roger E. Gold, Texas A&M Univ., College Station, TX

3:30 1913 Applications of acarology to decomposition ecology and legal investigations. **Charity Owings**, charityowings@gmail.com and Meaghan Pimsler, Texas A&M Univ., College Station, TX

3:45 1914 The temporal and spatial population structure of *Phormia regina* (Diptera: Calliphoridae). **Christine Picard**, cpicard@iupui.edu, Indiana Univ. Purdue Univ. Indianapolis (IUPUI), Indianapolis, IN

4:00 1915 Puparial remains as historical and forensic indicators. **Jonathan Parrott**, jonathanjparrott@gmail.com[1], Alan Thorne[1], Ian Dadour[2] and Michelle Harvey[3], [1]Univ. of Portsmouth, Portsmouth, England, [2]The Univ. of Western Australia, Crawley, Australia, [3]Deakin Univ. Australia, Geelong, Australia

4:15 1916 Forensic entomology in the medical examiner's office. **Michelle Sanford**, Michelle.Sanford@ifs.hctx.net, Harris County Institute of Forensic Sciences, Houston, TX

Ten-Minute Papers, MUVE Section: Urban Entomology

Meeting Room 18 C (Austin Convention Center)

Moderators: Alvaro Romero[1] and Marc L. Fisher[2], [1]New Mexico State Univ., Las Cruces, NM, [2]Dow AgroSciences, Tampa, FL

1:30 1917 Quantifying reduced cuticular penetration in pyrethroid resistant bed bug (*Cimex lectularius L.*) strains. **Reina Koganemaru**, reinak7@vt.edu and Dini M. Miller, Virginia Tech, Blacksburg, VA

1:42 1918 Pheromone-assisted techniques to improve the efficacy of insecticide sprays against the Argentine ant, *Linepithema humile* (Mayr) (Hymenoptera: Formicidae). **Dong-Hwan Choe**, donghwan.choe@ucr.edu[1], Kasumi Tsai[1], Carlos Lopez[1] and Kathleen Campbell[2], [1]Univ. of California - Riverside, Riverside, CA, [2]Dept. of Entomology, Riverside, CA

1:54 1919 Managing *Linepithema humile* (Mayr) in a South Carolina state park using liquid bait. **Jinbo Song**, sjinbo@clemson.edu, Eric P. Benson, Patricia A. Zungoli, Patrick D. Gerard and Brittany R. Ellis, Clemson Univ., Clemson, SC

2:06 1920 Lessons learned from community wide fire ant managment programming. **Wizzie Brown**, ebrown@ag.tamu.edu, Texas A&M AgriLife Extension Service, Austin, TX

2:18 1921 Potential for the evolution of neonicotinoid resistance: Oops, they (P450s) did it again. **Jennifer Gordon**, jennifer.gordon2@uky.edu, Michael F. Potter and Kenneth F. Haynes, Univ. of Kentucky, Lexington, KY

2:30 1922 Laboratory and field evaluation of an Indoxacarb Gel against two cockroach species (Dictyoptera: Blattellidae) in Lagos, Nigeria. **Joseph Anikwe**, jachuks@yahoo.com, Winifred Ayinke Makanjuola, Kehinde Kemabonta, Joy Anogwih, Fouad Adetoro and Kayode Akinwande, Univ. of Lagos, Lagos, Nigeria

2:42 1923 Species composition and seasonal abundance of cockroaches in an urban area of New Mexico. **Alvaro Romero**, aromero2@nmsu.edu and Manda Sechler, New Mexico State Univ., Las Cruces, NM

2:54 1924 The ability of teneral and sclerotized adult bed bugs (*Cimex lectularius*) to navigate a glass surface. **Kevin Hinson**, krhinso@clemson.edu, Eric P. Benson, Patricia A. Zungoli and William C. Bridges, Clemson Univ., Clemson, SC

3:06 Break

3:21 1925 Bed bug endosymbionts: Should they stay or could they go now? **Mark H. Goodman**, mark.goodman@uky.edu, Michael F. Potter and Kenneth F. Haynes, Univ. of Kentucky, Lexington, KY

3:33 1926 Increasing bed bug (*Cimex lectularius* L.) knowledge and awareness: Impacts of bed bug education for low income housing residents. **Molly L. Stedfast**, msted14@vt.edu and Dini M. Miller, Virginia Tech, Blacksburg, VA

3:45 1927 Effect of feeding on mortality of insecticide-treated bed bugs. **Narinderpal Singh**, nsingh@aesop.rutgers.edu[1], Changlu Wang[2] and Richard Cooper[2], [1]Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, [2]Rutgers Univ., New Brunswick, NJ

3:57 1928 Complete life reproduction study of the common bed bug (*Cimex lectularius*) including behavior, fecundity, and longevity. **Gale E. Ridge**, gale.ridge@ct.gov, Connecticut Agricultural Experiment Station, New Haven, CT

4:09 1929 Behavioral responses of the bed bug (*Cimex lectularius*) to permethrin-impregnated *Active*Guard fabric. Susan C. Jones and **Joshua L. Bryant**, bryant.1310@osu.edu, Ohio State Univ., Columbus, OH

4:21 1930 Evaluation of four bed bug traps with attractant augmentation for capturing brown dog ticks, *Rhipicephalus sanguineus* (Latreille). **Lucas P. Carnohan**, carnohanl@ufl.edu[1], Emma N. I. Weeks[1], Phillip E. Kaufman[1] and Sandra A. Allan[2], [1]Univ. of Florida, Gainesville, FL, [2]USDA, Agricultural Research Service, Gainesville, FL

4:33 1931 Piercing of bed bug (*Cimex lectularius*) cuticle by plant trichomes can be detected electronically. **Catherine Loudon**, cloudon@uci.edu[1], Megan W. Szyndler[1] and Elaine Backus[2], [1]Univ. of California, Irvine, Irvine, CA, [2]USDA San Joaquin Valley Agricultural Research Center, Parlier, CA

4:45 1932 A two-year comparison of house fly and stable fly populations at three different types of dairy facilities in the Texas panhandle. **Sonja L. Swiger**, slswiger@ag.tamu.edu, Texas A&M AgriLife Extension Service, Stephenville, TX

4:57 1933 Electroantennogram and behavioral responses of the species of phorid flies, *Pseudacteon* spp., to alkylpyrazine analogs of alarm pheromone of red imported fire ant, *Solenopsis invicta*. **Esther Ngumbi**, enn0002@auburn.edu and Henry Fadamiro, Auburn Univ., Auburn, AL

Ten-Minute Papers, P-IE Section: Crop Protection: Row Crops

Meeting Room 16 B (Austin Convention Center)

Moderators: Benjamin Thrash[1] and John J. Adamczyk[2], [1]Univ. of Arkansas, Fayetteville, AR, [2]USDA-ARS-Thad Cochran Southern Hort. Lab, Poplarville, MS

1:30 1935 Fly pests of maize in the Americas. **Gregg Nuessly**, gnuessly@ufl.edu, Univ. of Florida, Belle Glade, FL

1:42 1936 Value of neonicotinoid insecticides in the Midsouthern U.S. **Jeffrey Gore**, jgore@drec.msstate.edu[1], Don Cook[1], Angus Catchot[2], Fred R. Musser[2], David L. Kerns[3], Scott D. Stewart[4], Gus Lorenz[5] and Glenn Studebaker[6], [1]Mississippi State Univ., Stoneville, MS, [2]Mississippi State Univ., Mississippi State, MS, [3]Texas Agricultural Experiment Station, Lubbock, TX, [4]Univ. of Tennessee, Jackson, TN, [5]Univ. of Arkansas, Lonoke, AR, [6]Univ. of Arkansas, Kesier, AR

1:54 1937 Dow AgroSciences Transform insecticide: A new tool for managing Southern U.S. cotton pests. **Melissa Willrich Siebert**, mwillrichsiebert@dow.com[1], Larry Walton[2], Andrew Ellis[1], Gary D. Thompson[3], John Richburg[4], James D. Thomas[5] and Robert A. Haygood[6], [1]Dow AgroSciences, Greenville, MS, [2]Dow AgroSciences, Tupelo, MS, [3]Dow AgroSciences, Omaha, AR, [4]Dow AgroSciences, Headland, AL, [5]Dow AgroSciences, Indianapolis, IN, [6]Dow AgroSciences, Memphis, TN

2:06 1938 Is there a landscape effect on abundance and trophic origin of *H.armigera* moth? A case study in the cotton fields in northern Benin. **Noelline Tsafack**, noelline.tsafack@gmail.com, INP-ENSAT, Castanet-Tolosan / Toulouse, France, Philippe Menozzi, CIRAD, Dpt PERSYST, UPR 102 SCA, Cotonou, Benin, Marc Deconchat, INRA, Castanet Tolosan / Toulouse, France and Annie Ouin, INP-ENSAT, Castanet-Tolosan/ Toulouse, France

2:18 1939 Update on the boll weevil eradication program in Texas. **Charles Allen**, ctallen@ag.tamu.edu, Texas A&M Univ., San Angelo, TX and Larry Smith, Texas Boll Weevil Eradication Foundation, Abilene, TX

2:30 1940 Problems and prospects for management of western corn rootworm. **Ram B. Shrestha**, rshrestha68@gmail.com, Texas A&M AgriLife Research and Extension Center, Lubbock, TX and Aaron J. Gassmann, Iowa State Univ., Ames, IA

2:42 1941 Landscape effects on insect community composition and disease spread in an agroecosystem. **Suzi Claflin**, suziclaflin@gmail.com, Jennifer S. Thaler and Alison Power, Cornell Univ., Ithaca, NY

2:54 1942 Dust in the wind: Characterizing honey bee exposure to neonicotinoids at a landscape level. **Elizabeth Y. Long**, eylong@purdue.edu[1], Jeffrey D. Holland[2], Brian D. Eitzer[3] and Christian Krupke[1], [1]Purdue Univ., West Lafayette, IN, [2]Purdue Univ., Lafayette, IN, [3]Connecticut Agricultural Experiment Station, New Haven, CT

3:06 1943 Activities of insecticide seed treatments in rice against fall armyworm. **Srinivas Lanka**, slanka@agcenter.lsu.edu, Louisiana State Univ. Agricultural Center, Baton Rouge, LA and Michael J. Stout, Louisiana State Univ., Baton Rouge, LA

3:18 1944 Impact of thrips on seedling cotton in the Midsouth region. **John North**, jhn39@msstate.edu[1], Angus Catchot[1], Jeff Gore[2], Don Cook[3] and Fred Musser[1], [1]Mississippi State Univ., Mississippi State, MS, [2]Mississippi State Univ., Stoneville, MS, MS, [3]Mississippi State Univ., Stoneville, MS

3:30 Break

3:42 1945 Distribution of wireworm (Coleoptera: Elateridae) in small grains fields in Montana. **Anuar Morales-Rodriguez**, a.moralesrodriguez@montana.edu and Kevin Wanner, Montana State Univ., Bozeman, MT

3:54 1946 Evaluation of new insecticides in selected peanut cultivars: Effects on thrips (*Frankliniella fusca* Hinds) feeding behavior and transmission of tomato spotted wilt virus (TSWV). **Kathleen Marasigan**, kath1290@uga.edu, Rajagopalbabu Srinivasan, Michael Toews and Robert Kemerait, The Univ. of Georgia, Tifton, GA

4:06 1947 Development of a binomial sampling plan for thrips in cotton. **Mark Muegge**, m-muegge@tamu.edu, Texas A&M Univ., Fort Stockton, TX and D. Kerns, Macon Ridge Research Station, Winnsboro, LA

4:18 1948 Taking another look at the threecornered alfalfa hopper (Hemiptera: Membracidae) in Louisiana soybean. **Julien M. Beuzelin**, jbeuzelin@agcenter.lsu.edu[1], David L. Kerns[2], Sebe A. Brown[2] and Jeffrey A. Davis[3], [1]LSU AgCenter, Alexandria, LA, [2]LSU AgCenter, Winnsboro, LA, [3]LSU AgCenter, Baton Rouge, LA

4:30 1949 Determining a treatment threshold for the green stink bug (*Acrosternum hilare*) in edamame soybeans. **Benjamin Thrash**, bcthrash@uark.edu[1], Gus Lorenz[2], Derek Clarkson[1], Mallory Everett[1], Luis Orellana[1] and Sean Flynn[1], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Arkansas, Lonoke, AR

4:42 1950 Rainfastness of selected adjuvants and insecticides for tarnished plant bug (*Lygus lineolaris)* control in cotton. **Sean Flynn**, sflynn@email.uark.edu[1], Gus Lorenz[2], Derek Clarkson[1], Luis Orellana[1], Benjamin Thrash[1] and Mallory Everett[1], [1]Univ. of Arkansas, Fayetteville, AR, [2]Univ. of Arkansas, Lonoke, AR

4:54 1951 Revisiting the economic threshold of the Egyptian alfalfa weevil in the low desert. **Ayman Mostafa**, ayman@cals.arizona.edu, Univ. of Arizona, Phoenix, AZ

Ten-Minute Papers, P-IE Section: Environmental Entomology

Meeting Room 17 B (Austin Convention Center)

Moderators: Katherine Parys[1] and Christopher Sansone[2], [1]USDA - ARS, Stoneville, MS, [2]Bayer CropScience, Research Triangle Park, NC

1:30 1952 Elevated atmospheric CO_2: Effects on interaction between aphid, virus and plant. **Piotr Trebicki**, piotr.trebicki@dpi.vic.gov.au[1], Kevin Powell[2], Nilsa A. Bosque-Perez[3], Angela Freeman[1], Alan Yen[4] and Glenn Fitzgerald[1], [1]Dept. of Environment and Primary Industries, Horsham, Australia, [2]Dept. of Environment and Primary Industries, Rutherglen, Australia, [3]Univ. of Idaho, Moscow, ID, [4]Dept. of Environment and Primary Industries, Bundoora, Australia

1:42 1953 How are lady beetle communities shaped by patch and landscape composition? **Chelsea Smith**, smith.7231@osu.edu, Ohio State Univ., Wooster, OH and Mary M. Gardiner, The Ohio State Univ., Wooster, OH

1:54 1954 Bottom-up effects of conventional and organic soil fertility management on *Ostrinia nubilalis* oviposition response and larval development, and resistance of corn plants to herbivory. **Ebony G. Murrell**, egmurre@ilstu.edu[1], Crystal Hanson[1] and Eileen M. Cullen[2], [1]Univ. of Wisconsin-Madison, Madison, WI, [2]Univ. of Wisconsin, Madison, WI

2:06 1955 Ant-treehopper associations as visual cues for egg-laying *Parrhasius polibetes* (Lycaenidae), a facultative myrmecophilous butterfly. **Luísa L. Mota**, lulismota@yahoo.com.br and Paulo S. Oliveira, Universidade Estadual de Campinas, Campinas, Brazil

2:18 1956 Ecological study of *Tuta absoluta* (Lepidoptera, Gelechiidae) at Doucen, Biskra Oasis, Algeria. **Mohammed Belhamra**, m.belhamra@univ-biskra.dz, Univ. Mohamed Khider, Biskra, Algeria and Tarai Nacer, Université Mohamed Khider, Biskra, Algérie, 07000, Zone Ouest, Algeria

2:30 1957 Crop production in dependence of landscape complexity, herbivore density and plant tolerance. **Katja Poveda**, kap235@cornell.edu, Cornell Univ., Entomology, Ithaca, NY and Maria Diaz, Universidad Nacional de Colombia, Bogota, Colombia

2:42 1958 Time of the season: The effect of photoperiodism on host-mediated cues for diapause induction in an insect herbivore, *Leptinotarsa decemlineata*. **Victor Izzo**, izzovi@gmail.com[1], Yolanda H. Chen[1], Jordan Armstrong[1] and David J. Hawthorne[2], [1]Univ. of Vermont, Burlington, VT, [2]Univ. of Maryland, College Park, MD

2:54 1959 Transcriptomic response to abiotic and biotic stress in aphids. **Laramy Enders**, lenders2@unl.edu[1], Jennifer Brisson[1], Ryan Bickel[1], Tiffany Heng-Moss[1], Blair Siegfried[2], Anthony Zera[1] and Nicholas Miller[2], [1]Univ. of Nebraska - Lincoln, Lincoln, NE, [2]Univ. of Nebraska, Lincoln, NE

3:06 1960 Natural enemy-pest synchrony: Implications of farmscaping for biological control in an organic cucurbit production system. **Jason M. Schmidt**, jason.schmidt@uky.edu, Sarah K. Barney, Mark A. Williams and James D. Harwood, Univ. of Kentucky, Lexington, KY

3:18 Break

3:30 1961 Elevated levels of insect herbivory on an urban-rural gradient reveal species-specific signals of landscape degradation in novel ecosystems. **Dieter Hochuli**, dieter.hochuli@sydney.edu.au, The Univ. of Sydney, The Univ. of Sydney, Australia

3:42 1962 Effects of boron on feeding, survival and immature development of the Tomato Leafminer, *Tuta absoluta*. **Antonios Tsagkarakis**, atsagarakis@aua.gr and Antonios Margiotoudis, Agricultural Univ. of Athens, Athens, Greece

3:54 1963 Temperature and the slow-growth-high-mortality hypothesis: A test using the *Papilio glaucus* group. **Nina K Lany**, Nina.K.Lany@Dartmouth.edu[1], Matthew P. Ayres[1] and J. Mark Scriber[2], [1]Dartmouth College, Hanover, NH, [2]Michigan State Univ., East Lansing, MI

4:06 1964 Climate change: Adaptation by a whitefly, *Bemisia tabaci* . **Alvin M. Simmons**, alvin.simmons@ars.usda.gov, USDA-ARS, Charleston, SC, Levi Curnutte, College of Charleston, Charleston, SC and Shaaban Abd-Rabou, Ministry of Agriculture, ARC, Dokki, Egypt

4:18 1965 Interactive effects of elevated atmospheric CO_2 level and leafhopper injury on host gas exchange rates. **William O. Lamp**, lamp@umd.edu and Bridget D. DeLay, Univ. of Maryland, College Park, MD

4:30 1966 Temporal variability in two Hawaiian floral visitation networks. **Jennifer L. Imamura**, jimamura@berkeley.edu and George Roderick, Univ. of California, Berkeley, CA

4:42 1967 Effects of conservation and conventional tillage on ground beetles and weed seed recruitment. **Jessica Green**, greenje@hort.oregonstate.edu and R.E. Peachey, Oregon State Univ., Corvallis, OR

4:54 1968 Impact of *Hypena opulenta* on invasive swallow-worts (*Vincetoxicum* spp.) under different light environments. **Lindsey Milbrath**, Lindsey.Milbrath@ars.usda.gov and Jeromy Biazzo, USDA - ARS, Ithaca, NY

5:06 1969 Evolution of the phenology of a weed biocontrol agent, the northern tamarisk beetle, *Diorhabda carinulata*. **Dan Bean**, dan.bean@state.co.us[1], Tom Dudley[2], Peter Dalin[3] and Nina Louden[1], [1]Colorado Dept. of Agriculture, Palisade, CO, [2]Univ. of California, Santa Barbara, CA, [3]Swedish Univ. of Agricultural Sciences, Uppsala, Sweden

5:18 1970 Population dynamics of *Jaapiella ivannikovi*, a gall midge introduced for biological control of Russian knapweed. **Timothy Collier**, tcollier@uwyo.edu and Kathleen Meyers, Univ. of Wyoming, Laramie, WY

Ten-Minute Papers, P-IE Section: Pheromones and Attractants

Meeting Room 17 A (Austin Convention Center)

Moderators: Pasco B. Avery[1] and Alton N. Sparks, Jr.[2], [1]Univ. of Florida, Fort Pierce, FL, [2]Univ. of Georgia, Tifton, GA

1:30 1971 Attraction of codling moth neonates to fruit presented on colored surfaces. **Maciej A. Pszczolkowski**, MPszczolkowski@missouristate.edu, Missouri State Univ., Mountain Grove, MO

1:42 1972 Differences in first and second day barley, wheat, and oat induced volatiles in response to fall armyworm (*Spodoptera frugiperda*) herbivory. **Kevin J. Delaney**, kevin.delaney@ars.usda.gov[1], Helton Camara[2], David K. Weaver[3] and Robert KD. Peterson[3], [1]USDA - ARS, Sidney, MT, [2]Sao Paulo State Univ. (UNESP), Jaboticabal, Brazil, [3]Montana State Univ., Bozeman, MT

1:54 1973 Attraction of the redbay ambrosia beetle, *Xyleborus glabratus*, to key fungal and host plant odors. **Emily Kuhns**, emilyhkuhns@gmail.com[1], Yolani Tribuiani[1], Xavier Martini[2], Monique Coy[1], Wendy L. Meyer[1], Jorge Peña[3], Jiri Hulcr[4] and Lukasz Stelinski[1], [1]Univ. of Florida, Lake Alfred, FL, [2]Univ. of Florida Citrus Research and Education Center, Lake Alfred, FL, [3]Univ. of Florida, Tropical Research and Education Center, Homestead, FL, Homestead, FL, [4]Univ. of Florida, Gainesville, FL

2:06 1974 Brown marmorated stink bug emergence from artificial overwintering shelters and response to pheromone traps. **J. Christopher Bergh**, cbergh@vt.edu, Virginia Tech, Winchester, VA and Tracy C. Leskey, USDA, Agricultural Research Service, Kearneysville, WV

2:18 1975 A Japanese beetle by any other name may not smell roses. **Michael G. Klein**, klein.10@osu.edu, The Ohio State Univ., Heber, AZ and Ri-zhao Chen, Jilin Agricultural Univ., Changchun, China

2:30 1976 Developing lures for trapping the goldspotted oak borer. **Yigen Chen**, ygchen2007@gmail.com, Univ. of California, Davis, Davis, CA, Tom W. Coleman, USDA Forest Service, San Bernardino, CA, Damon J. Crook, USDA-APHIS-PPQ, Otis ANGB, MA, Mary Louise Flint, Univ. of California, Davis, CA and Steven J. Seybold, USDA, Forest Service, Davis, CA

2:42 1977 Weathering trials of solid triple lure (trimedlure, methyl eugenol, raspberry ketone, and DDVP) dispensers for detection of fruit flies (Diptera: Tephritidae) in California. Roger I. Vargas, USDA, Agricultural Research Service, Hilo, HI, David R. Haviland, Univ. of California Cooperative Extension, Kern Co, Bakersfield, CA, Ben Faber, UC Cooperative Extension Ventura County, Ventura, CA, John Kabashima, UC Cooperative Extension, Costa Mesa, CA, **Elizabeth Grafton-Cardwell**, eegraftoncardwell@ucanr.edu, Dept. of Entomology, Riverside, CA and Joseph G. Morse, Univ. of California, Riverside, Riverside, CA

2:54 1978 Site-dependent reversal in the activity of a pheromone component of the southern pine beetle: A consequence of dose-dependent multifunctionality? **Brian T. Sullivan**, briansullivan@fs.fed.us, USDA Forest Service, Pineville, LA

3:06 Break

3:18 1979 Repelling *Drosophila suzukii* (Diptera: Drosophilidae) with plant essential oils and potassium metabisulfite. **Justin Renkema**, renkemaj@uoguelph.ca[1], Rebecca Hallett[1] and Rose Buitenhuis[2], [1]Univ. of Guelph, Guelph, ON, Canada, [2]Vineland Research and Innovation Centre, Vineland Station, ON, Canada

3:30 1980 Are Japanese beetles (*Popillia japonica*) attracted to neonicotinoid seed treated soybeans? **Cody D. Kuntz**, cdkuntz@iastate.edu, Michael T. McCarville and Matt O'Neal, Iowa State Univ., Ames, IA

3:42 1981 Novel synthetic compounds enhance the attractiveness of host-plant volatiles: An opportunity to boost detection and monitoring of Asian citrus psyllid? **Joseph Patt**, joseph.patt@ars.usda.gov[1], Daniel Woods[2], Spiros Dimitratos[2], William Meikle[3], Stephen L. Lapointe[1], Dara Stockton[4] and Agenor Mafra-Neto[5], [1]USDA, Agricultural Research Service, Fort Pierce, FL, [2]Inscent, Inc., Irvine, CA, [3]USDA – ARS, Tucson, AZ, [4]Univ. of Florida, Lake Alfred, FL, [5]ISCA Technologies, Inc., Riverside, CA

3:54 1982 Effects of plant volatiles on attraction of cerambycid beetles to sex pheromones. **Joseph Wong**, wong62@life.illinois.edu[1], Jocelyn G. Millar[2] and Lawrence M. Hanks[1], [1]Univ. of Illinois, Urbana, IL, [2]Univ. of California, Riverside, CA

4:06 1983 Seasonal phenology and pheromone trap monitoring of *Pseudococcus maritimus* (Hemiptera: Pseudococcidae) in three wine grape growing regions of Oregon, U.S.A. **Daniel T Dalton**, daltond@hort.oregonstate.edu[1], Vaughn Walton[1], Kent M Daane[2], Clive Kaiser[3] and Richard Hilton[4], [1]Oregon State Univ., Corvallis, OR, [2]Univ. of California, Berkeley, Berkeley, CA, [3]Oregon State Univ., Milton Freewater, OR, [4]Oregon State Univ., Central Point, OR

4:18 1984 (*S*)-fuscumol and (*S*)-fuscumol acetate produced by a male *Astyleiopus variegatus* (Coleoptera: Cerambycidae). **Gabriel Hughes**, ghughes@purdue.edu[1], Yunfan Zou[2], Jocelyn G. Millar[2] and Matthew Ginzel[1], [1]Purdue Univ., West Lafayette, IN, [2]Univ. of California, Riverside, CA

4:30 1985 The effect of bait types, age and location on trap captures of spotted wing drosophila in Blueberries. **Teresia Nyoike**, nyoiket@ufl.edu and Oscar Liburd, Univ. of Florida, Gainesville, FL

4:42 1986 Visilure from Rescue: The science of insect visual attraction. **Qing-He Zhang**, qing-he@rescue.com[1], Rod G. Schneidmiller[1] and Steven Hastings[2], [1]Sterling International, Inc, Spokane, WA, [2]Kent State Univ., Kent, OH

Ten-Minute Papers, SysEB Section: Ecology and Behavior

Meeting Room 5 ABC (Austin Convention Center)

Moderators: Stephen Yanoviak[1] and Clint Penick[2], [1]Univ. of Arkansas, Little Rock, Little Rock, AR, [2]North Carolina State Univ., Raleigh, NC

1:42 1987 Thermotolerance, ecology and biogeography of cold-specialized grylloblattids (Grylloblattidae). **Sean Schoville**, sean.schoville@gmail.com, Univ. of Wisconsin Madison, Madison, WI

1:54 1988 Extended immunity emerging from the fecal nest of a subterranean termite. **Thomas Chouvenc**, tomchouv@ufl.edu, Nan-Yao Su, Caroline Efstathion and Monica Elliott, Univ. of Florida, Davie, FL

2:06 1989 Death recognition and undertaking behavior in termites. **Qian Sun**, qian.sun@uky.edu, Kenneth Haynes and Xuguo Zhou, Univ. of Kentucky, Lexington, KY

2:18 1990 Theft of prey cicadas from Pacific cicada killers (*Sphecius convallis* Patton) by birds. **Joseph R. Coelho**, coelhjo@quincy.edu, Quincy Univ., Quincy, IL, Charles W. Holliday, Lafayette College, Easton, PA and Jon M. Hastings, Northern Kentucky Univ., Highland Heights, KY

2:30 1991 Mandibular gland pheromone of black dwarf honeybee, *Apis andreniformis* Smith, (1858) workers and its olfaction. **Guntima Suwannapong**, guntima@buu.ac.th[1], M. Eric Benbow[2] and Megan Shoda[2], [1]Burapha Univ., Chon Buri, Thailand, [2]Univ. of Dayton, Dayton, OH

2:42 1992 Surface swimming in tropical ants. Dana Frederick, Univ. of Arkansas at Little Rock, Little Rock, AR and **Stephen Yanoviak**, steve.yanoviak@louisville.edu, and Marilyn Feil,Univ. of Louisville, Louisville, KY

2:54 1993 Comparative nesting ecology and behavior of *Camponotus rufipes* and *C. renggeri* (Formicidae: Formicinae) in two physiognomies of Cerrado savanna. **Mariane U. V. Ronque**, marianeronque@gmail.com[1], Vincent Fourcassié[2] and Paulo S. Oliveira[1], [1]Universidade Estadual de Campinas, Campinas, Brazil, [2]Univ. de Toulouse III, Toulouse, France

3:06 1994 Chemical communication in column foraging harvesting ants (Nearctic Messor). **Nicola Plowes**, nicola.plowes@asu.edu, Arizona State Univ., Tempe, AZ

3:18 1995 A simple field-ready method for collecting cuticular hydrocarbons reveals tradeoffs in hydrocarbon compound production in ants (Formicidae). **Virginia Emery**, vj.emery@berkeley.edu[1], Neil Tsutsui[1] and Benjamin Rubin[2], [1]Univ. of California, Berkeley, CA, [2]Field Museum of Natural History, Chicago, IL

3:30 1996 Nutritional ecology of ant communities in New York City. **Clint Penick**, capenick@ncsu.edu, Amy Savage and Rob R. Dunn, North Carolina State Univ., Raleigh, NC

3:42 1997 The spatial ecology of the Comanche harvester ant (*Pogonomyrmex comanche*). **Ann B. Mayo**, amayo@uta.edu, Univ. of Texas at Arlington, Arlington, TX

3:54 1998 First report of the mating behavior of a species of Frog-biting midges (Corethrellidae: Diptera). **Priyanka De Silva**, priyanka.desilva@ttu.edu, Texas Tech Univ., Lubbock, TX

4:06 1999 Life history, host range, and infection behavior of the acoustically-hunting parasitoid fly *Emblemasoma erro* (Sarcophagidae). **Brian Stucky**, stuckyb@colorado.edu, Univ. of Colorado, Boulder, CO

4:18 2000 Exploring prey size and diet breadth of Rafinesque's big-eared bat, a lepidopteran specialist. **Luke E. Dodd**, luke.dodd@uky.edu, Lynne K. Rieske-Kinney and Michael J. Lacki, Univ. of Kentucky, Lexington, KY

4:30 2001 Use of microsatellites to genotype crosses of *Spodoptera frugiperda* and to distinguish isofamilies. **Renee Arias**, renee.arias@ars.usda.gov, USDA-ARS, Dawson, GA, Maribel Portilla, ARS-USDA National Biological Control Laboratory, Stoneville, MS and Carlos A. Blanco, USDA-ARS, Stoneville, MS

4:42 2002 The Temporal Occurrence of *Morpho helenor achillides* and *M. menelaus* (Lepidoptera: Nymphalidae): The Influence of Weather and Food Resources. **Geraldo Freire**, geraldo_freire@yahoo.com.br[1], Ivan Malinov[1], André Nascimento[2], Juliano Carregaro[3] and Ivone Diniz[4], [1]Universidade de Brasília - UnB, Brasília, Brazil, [2]Universidade Federal de São Carlos-UFSCar, São Carlos-SP, Brazil, [3]Universidade de Brasilia - UnB, Brasília, Brazil, [4]Universidade de Brasília - UnB, brasília, Brazil

4:54 2003 Population invasiveness in an insect ectoparasite: The ecological aspects of host-parasite relationship. **Laura Härkönen**, laura.harkonen@oulu.fi, Univ. of Oulu, Oulu, Finland

Ten-Minute Papers, SysEB Section: Systematics of Hymenoptera

Meeting Room 4 ABC (Austin Convention Center)

Moderators: Bonnie Blaimer[1] and Elijah Talamas[2], [1]NMNH, Smithsonian Institution, Washington, DC, [2]USDA, Washington, DC

1:30 Welcoming Remarks

1:32 2004 Phylogenetic shifts in patterns of endoparasitism in the Chalcidoidea. **John Heraty**, john.heraty@ucr.edu, Univ. of California, Riverside, CA

1:44 2005 The current state of knowledge of Palaearctic *E.* (*Eupelmus*) Dalman (Hymenoptera: Eupelmidae). **Gary A. P. Gibson**, gibsong@agr.gc.ca, Agriculture and Agri-Food Canada, Ottawa, ON, Canada and Lucian Fusu, Al. I. Cuza Univ., Iasi, Romania

1:56 2006 Revision of Asian *Trissolcus* (Platygastroidea: Telenominae). **Elijah Talamas**, elijah.talamas@ars.usda.gov, USDA, Washington, DC and Matthew Buffington, USDA, Agricultural Research Service, Systematic Entomology Laboratory (SEL), Washington, DC

2:08 2007 Revision of Nearctic *Dendrocerus* Ratzeburg (Hymenoptera: Ceraphronoidea). **István Mikó**, istvan.miko@gmail.com, Heather M. Hines and Andrew R Deans, Pennsylvania State Univ., Univ. Park, PA

2:20 2008 Phylogenetics, taxonomy and host use of Neotropical *Glyptapanteles* parasitoid wasps. **Diana Carolina Arias Penna**, ariaspe1@life.illinois.edu, Univ. of Illinois, Urbana, IL and James B. Whitfield, Univ. of Illinois at Urbana-Champaign, Urbana, IL

2:32 2009 How social wasps evolved. **James H. Hunt**, jim_hunt@ncsu.edu, North Carolina State Univ., Raleigh, NC

2:44 2010 Phylogenetic relationships of yellowjackets inferred from nine loci (Hymenoptera: Vespidae, Vespinae, *Vespula* and *Dolichovespula*). **Federico Lopez Osorio**, flopezos@uvm.edu[1], Kurt Pickett[1], J. M. Carpenter[2], Bryan Ballif[1] and Ingi Agnarsson[1], [1]Univ. of Vermont, Burlington, VT, [2]American Museum of Natural History, New York, NY

2:56 2011 The evolution of desaturase genes in ants. **Elizabeth Cash**, Elizabeth.Cash@asu.edu, Martin Helmkampf and Jürgen Gadau, Arizona State Univ., Tempe, AZ

3:08 Break

3:18 2012 Uncovering a Cretaceous ant genus. **Phillip M. Barden**, pbarden@amnh.org, American Museum of Natural History, New York, NY

3:30 2013 Phylogenetic structure of arboreal and leaf litter ant communities in Madagascar. **Bonnie Blaimer**, bonnieblaimer@gmail.com, NMNH, Smithsonian Institution, Washington, DC, Ted Schultz, Smithsonian Institution, Washington, DC and Seán Brady, National Museum of Natural History, Washington, DC

3:42 2014 Small but mighty – A Phylogeny of Spilomenina (Hymenoptera: Apoidea: Crabronidae). **Laura Breitkreuz**, l.breitkreuz@gmail.com, Univerisity of Kansas, Lawrence, KS and Michael Ohl, Museum für Naturkunde, Berlin, Germany

3:54 2015 Taxonomic and behavioral components of faunal comparisons over time: The bees (Hymenoptera: Anthophila) of Boulder County past and present (Colorado, USA). **Paul Goldstein**, drpzgoldstein@gmail.com, Univ. of Maryland, College Park, MD and Virginia Scott, Univ. of Colorado Museum of Natural History, Boulder, CO

4:06 2016 New records and a key to the species of genus *Hockeria* Walker (Hymenoptera: Chalcididae) from Khyber Pakhtunkhwa, Pakistan. **Toheed Iqbal**, Toheed.iqbal@aup.edu.pk, Dept. of Entomology, The Univ. of Agriculture, Peshawar, Pakistan, Peshawar, NT, Pakistan

4:18 Concluding Remarks

4:30 - 5:20

Social Hour with Poster Presenters

Exhibit Hall 4 (Austin Convention Center)

12:15 - 1:15

WEDNESDAY, NOVEMBER 13, 2013, EVENING

Closing Plenary Session, Town Hall and 30th Anniversary: Sharpest in the Science Challenge

Ballroom D (Austin Convention Center)

5:30 - 7:30

See page 17 for details regarding the Closing Plenary Session, Town Hall and 30th Anniversary: Sharpest in the Science Challenge.

WEDNESDAY, NOVEMBER 13, 2013, POSTERS

Section Poster Presentations: MUVE 2

Exhibit Hall 4 (Austin Convention Center)

D0483 Nymphal densities and infection rates of *Ixodes scapularis* nymphs collected from residential properties in Lyme disease-endemic areas of Connecticut, Maryland, and New York. Katherine Feldman[1], **Neeta Connally**, connallyn@wcsu.edu[2], P. Bryon Backenson[3], Aimee Geissler[4], Andrias Hojgaard[4], James Meek[5], Jennifer White[3] and Alison Hinckley[4], [1]Maryland Dept. of Health and Mental Hygiene, Baltimore, MD, [2]Western CT State Univ., Danbury, CT, [3]New York State Dept. of Health, Albany, NY, [4]Centers for Disease Control and Prevention, Fort Collins, CO, [5]Connecticut Emerging Infections Program, New Haven, CT

D0484 Spatiotemporal incidence of acaracide resistance in cattle fever tick, *Boophilus spp.*, outbreaks in the United States. **Donald B. Thomas**, donald.thomas@ars.usda.gov[1], Robert J. Miller[2], J. Mat Pound[3], D. M. Kammlah[3], Jason Tidwell[1], Pia Untalan Olafson[4] and Adalberto Perez de Leon[4], [1]USDA-ARS, Edinburg, TX, [2]USDA, Agricultural Research Service, Edinburg, TX, [3]Knipling-Bushland US Livestock Insect Research Laboratory, Kerrville, TX, [4]USDA, Agricultural Research Service, Kerrville, TX

D0485 Comparative analyses of tick organic anion transporting polypeptides. **Zeljko Radulovic**, amulenga@tamu.edu, Lindsay Porter, Tae Kim and Albert Mulenga, Texas A & M Univ., College Station, TX

D0486 Ticks and tick-associated pathogens of livestock in remote villages of central South Sudan. Amanda D. Loftis, Ross Univ. School of Veterinary Medicine, Basseterre, St. Kitts and Nevis, **Chelsea Faircloth**, chelseafaircloth@yahoo.com, Noah's Ark Veterinary Center, Harrisburg, PA and Jason Johnson, Lincoln Memorial Univ., Harrogate, TN

D0487 Role(s) of a blood meal induced salivary gland and midgut serine protease inhibitor (serpin) in *Ixodes scapularis* feeding regulation. **Lauren Lewis**, lspike99@neo.tamu.edu, Texas A&M Univ., College Station, TX and Albert Mulenga, Texas A & M Univ., College Station, TX

D0488 Tick sampling in Manitoba. Diana Dunlop and **Kateryn Rochon**, kateryn_rochon@umanitoba.ca, Univ. of Manitoba, Winnipeg, MB, Canada

D0489 A longitudinal study in central Texas suggests small rodent species are reservoirs for the zoonotic relapsing fever spirochete, *Borrelia miyamotoi*. **Jaime Rodriguez**, jaime.rodriguez@tamu.edu, Adrian Castellanos, Lisa Auckland, Jessica E. Light and Sarah Hamer, Texas A&M Univ., College Station, TX

D0490 Effect of collection method, season, location, and storage time of Formosan subterranean termites on mortality, and weight loss and visual rating of control wood pieces. **Dennis R. Ring**, dring@agctr.lsu.edu[1], Todd Shupe[2], Qinglin Wu[3] and Jay Curole[2], [1]Louisiana State Univ. Agricultural Center, Baton Rouge, LA, [2]LSU Agricultural Center, Baton Rouge, LA, [3]LSU Agricultural Center, Baton Rougel, LA

D0491 Molecular phylogenetic analysis of the termite family Kalotermatidae. **Allen L. Szalanski**, aszalan@uark.edu[1], James W. Austin[2], Rudolph H. Scheffrahn[3] and Amber D. Tripodi[1], [1]Univ. of Arkansas, Fayetteville, AR, [2]BASF, Research Triangle Park, NC, [3]Univ. of Florida, Ft. Lauderdale, FL

D0492 Comparative analysis on esterase activity in *Solenopsis invicta* and *Solenopsis richteri* (Hymenoptera: Formicidae). **Jian Chen**, jian.chen@ars.usda.gov, USDA, Agricultural Research Service, Stoneville, MS, Tahir Rashid, Alcorn State Univ., Alcorn State, MS and Guolei Feng, Alcorn State Univ., Mound Bayou, MS

D0493 The challenge of bait selection and application in the field against the Asian needle ant, *Pachycondyla chinensis* (Emery) (Hymenoptera: Formicidae). **Ying Mo**, moying88@hotmail.com, Patricia A. Zungoli, Eric P. Benson, Patrick D. Gerard and Brittany R. Ellis, Clemson Univ., Clemson, SC

D0494 A preliminary survey on the distribution of field ant mounds (Hymenoptera: Formicidae) in southwestern Minnesota. **Eric Knutson**, knutson75@gmail.com, Glacial Ridge Systems, Minneapolis, MN

D0495 Effect of different typologies of nest management on colonies of the escamole ant, *Liometopum apiculatum,* in urban-rural localities in central Mexico. **Mercy Dinwiddie**, mercydinwiddie@gmail.com, UAQ, Queretaro, Mexico

D0496 Temperature-dependent functional response of *Spalangia cameroni* (Hymenoptera: Pteromalidae), a parasitoid of *Stomoxys calcitrans* (Diptera: Muscidae). **Henrik Skovgård**, henrik.skovgaard@agrsci.dk, Univ. of Aarhus, Slagelse, Denmark

D0497 UT IPM program records decreased volume of indoor pyrethroid applications in Tennessee demonstration schools. **Karen M. Vail**, kvail@utk.edu, Pat A. Barnwell and Jennifer G. Chandler, Univ. of Tennessee, Knoxville, TN

D0498 The Northeast School IPM Working Group: Successful collaborations to support and promote school IPM inplementation. **Kathy Murray**, kathy.murray@maine.gov, Maine Dept. of Agriculture, Conservation and Forestry, Augusta, ME, Lynn Braband, Cornell Univ., Rochester, NY and Carol Westinghouse, Informed Green Solutions, Inc., East Burke, VT

D0499 Lepidoptera - Not! A survey of mottephobia incidence and attitudes towards moths and butterflies. **Whitney Cranshaw**, Whitney.Cranshaw@ColoState.EDU and Mathew Camper, Colorado State Univ., Fort Collins, CO

D0500 Showcasing the role of charismatic micro-fauna in tourism, recreation and education. **Harvey Lemelin**, harvey.lemelin@lakeheadu.ca, Lakehead Univ., Thunder Bay, ON, Canada

D0501 Delusory parasitosis: Reports, reality, and rationalizations. Devon Rogers[1], **Barbara Bloetscher**, bloetscher.1@osu.edu[2] and David Shetlar[1], [1]The Ohio State Univ., Columbus, OH, [2]Ohio State Univ., Columbus, OH

D0502 The washing away of wrongs: Validation of the bloody scythe and fly. **Natalie K. Lindgren**, NKL003@shsu.edu, James R. Willett and Sibyl, R. Bucheli, Sam Houston State Univ., Huntsville, TX

D0503 The effect of ivermectin on the duration of the decomposition stages of goats (*Capra aegagrus hircus*) and on the developmental rate of scavenger insects. Daniel Brancoli, André Savino and **Aricio Xavier Linhares**, aricio@unicamp.br, State Univ. of Campinas, Campinas, Brazil

D0504 Do grain supplements for grazing cattle affect their face fly and horn fly populations? **Roger D. Moon**, rdmoon@umn.edu[1], Marcia Endres[1] and Bradley Heins[2], [1]Univ. of Minnesota, St. Paul, MN, [2]Univ. of Minnesota, Morris, MN

D0505 Selection for improved virulence in a horn fly-collected strain of *Beauveria bassiana* . **Phillip E. Kaufman**, pkaufman@ifas.ufl.edu and Lois Wood, Univ. of Florida, Gainesville, FL

D0506 Laboratory methods for maggot debridement therapy research. **Rae Heitkamp**, rae.heitkamp@gmail.com, Sylvia Cheng, Micah Flores and Benjamin Kirkup, Walter Reed Army Institute of Research, Silver Spring, MD

D0507 The implementation of a bed bug managment policy in schools. **Jennifer Andon**, andon.1@osu.edu[1], Barbara Bloetscher[2], David Shetlar[1] and Susan C Jones[1], [1]The Ohio State Univ., Columbus, OH, [2]Ohio State Univ., Columbus, OH

D0508 Demographics of bed bug, *Cimex lectularius* L., aggregations collected from field populations. **Margie P. Lehnert**, melehne@clemson.edu, Eric P. Benson, Patricia A. Zungoli, Peter H. Adler and Patrick D. Gerard, Clemson Univ., Clemson, SC

D0509 Does sugar consumption attract bed bugs and/or increase bed bug fertility? **Nancy Ralph**, nlralph@gmail.com, Formerly Hunter College, New York, NY and Heidi Jones, CUNY School of Public Health, Hunter College, New York, NY

D0510 *Trypanosoma cruzi* prevalence and genetic strain diversity in kissing bug vectors (*Triatoma spp.*, Reduviidae) across the southern United States. **Rachel Curtis**, rcurtis@cvm.tamu.edu[1], Gabriel Hamer[1], Edward Wozniak[2], Karen Snowden[1] and Sarah Hamer[1], [1]Texas A&M Univ., College Station, TX, [2]Texas Dept. of State Health Services, Uvalde, TX

D0511 Update on seroprevalence of anti-*Trypanosoma cruzi* antibodies among blood donors in northeast Mexico. Lucio Galaviz-Silva, Universidad Autonoma de Nuevo León, San Nicolas de los G, Nuevo León, Mexico, **Zinnia Molina-Garza**, molinazinnia@hotmail.com, Universidad Autonoma de Nuevo León, San Nicolas de los Garza, NL, Mexico, Maria Molina-Garza, Instituto Mexicano del Seguro Social (IMSS), Monterrey, NL, Mexico and Jose Rosales Encina, Instituto Politécnico Nacional, Distrito Federal, Mexico, Mexico

D0512 Prevalence of anti-*Trypanosoma cruzi* antibodies among blood donors in Monterrey, an urban city of Mexico. **Zinnia Molina-Garza**, molinazinnia@hotmail.com, Universidad Autónoma de Nuevo León, San Nicolas de los Garza, Mexico

D0513 Is there any alternative insecticide to control pyrethroid-resistant *Triatoma infestans* populations (Hemiptera: Reduviidae) in the Gran Chaco ecoregion? Guillermo Carvajal[1], Maria I. Picollo[2] and **Ariel C. Toloza**, atoloza@conicet.gov.ar[2], [1]Centro de Investigaciones de Plagas e Insecticidas, Villa Martelli, Argentina, [2]Centro de Investigaciones de Plagas e Insecticidas, Villa Martelli, Buenos Aires, Argentina

D0514 *Triatoma pintodiasi* (Hemiptera: Reduviidae: Triatominae), new cryptic species vector of the Chagas' disease from southern South America. José Jurberg[1], Vanda Cunha[1], Solange Cailleaux[1], Raquel Raigorodschi[1], Michele Lima[2], Dayse Rocha[1] and **Felipe Moreira**, felipe.moreira@ioc.fiocruz.br[1], [1]Fundação Oswaldo Cruz, Rio de Janeiro, Brazil, [2]Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

Section Poster Presentations: PBT 2

Exhibit Hall 4 (Austin Convention Center)

D0515 Insects did it first. Can engineers do it better? **Marianne Alleyne**, vanlaarh@life.illinois.edu, Univ. of Illinois, Urbana, IL

D0516 New technologies for insect control trait discovery. **Jonathan D. Giebel**, jonathan.giebel@bayer.com, Bayer CropScience, Morrisville, NC

D0517 Peroxidase response of three switchgrass populations to injury by the yellow sugarcane aphid (Hemiptera: Aphididae). **Jacqueline Barbosa Nascimento**, nascimentojb@hotmail.com, Universidade Federal de Goias, Goiania, Brazil, Tiffany Heng-Moss, Univ. of Nebraska - Lincoln, Lincoln, NE, Gautam Sarath, USDA, Agricultural Research Service, Lincoln, NE, José Alexandre Barrigossi, Embrapa Arroz e Feijão, Santo Antônio de Goiás, Brazil, Travis J. Prochaska, Univ. of Nebraska, Lincoln, NE and Teresa Donze, Univ. of Nebraska, Kearney, NE

D0518 Effects of X-ray irradiation on sterilization and reproduction of the navel orangeworm, *Amyelois transitella*. **Douglas Light**, doug.light@ars.usda.gov, USDA-ARS, Albany, CA and Ron Haff, USDA-ARS-WRRC, Albany, CA

D0519 RNAi of two chitin-binding protein genes disrupts peritrophic matrix barrier function in the larval midgut of *Tribolium castaneum*. Marco Kelkenberg[1], Sinu Jasrapuria[2], Subbaratnam Muthukrishnan[2] and **Hans Merzendorfer**, hans.merzendorfer@biologie.uni-osnabrueck[1], [1]Univ. of Osnabrück, Osnabrück, Germany, [2]Kansas State Univ., Manhattan, KS

D0520 The effects of in-hive miticides on honey bee, *Apis mellifera*, queen retinue response. **Liz Walsh**, walshe@ripon.edu, Student, Ripon, WI and Juliana Rangel-Posada, Texas A&M University, College Station, TX

D0521 Considerations for risk management of RNAi technology and pollinators. **Christina Mogren**, christina.mogren@ars.usda.gov and Jonathan G. Lundgren, USDA - ARS, Brookings, SD

D0522 Biological validation of enzyme-linked immunosorbent assays for detection of Cry proteins in the environment. **Vurtice Albright**, valbrigh@iastate.edu[1], Richard L. Hellmich[2] and Joel Coats[1], [1]Iowa State Univ., Ames, IA, [2]USDA - ARS, Ames, IA

D0523 Toxicity of non-ionic surfactants against *Bemisia tabaci* biotype B by direct spray contact. Nilce Kobori[1], **Gabriel Mascarin**, gmmascar@gmail.com[1], Eliane Quintela[1], Steven P. Arthurs[2] and Italo Delalibera Jr[3], [1]Embrapa Rice and Beans, Santo Antonio de Goias, Brazil, [2]Univ. of Florida, Apopka, FL, [3]ESALQ-USP, Piracicaba, Brazil

D0524 Acute toxicity of fenpyroximate to *Amblyseius swirskii* (Acari: Phytoseiidae). **Lorena Lopez**, lorelopezq.257@ufl.edu, Univ. of Florida, Gainesville, FL

D0525 The resistance of the lady beetle, *Eriopis connexa,* to lambda-cyhalothrin enhance tolerance to other pyrethroids. **Jorge Torres**, jtorres@depa.ufrpe.br[1], Agna Rodrigues[1], Eduardo Barros[1] and Djison Santos[2], [1]Universidade Federal Rural de Pernambuco, Recife, Brazil, [2]Universidade Federal de Alagoas, Rio Largo, Brazil

D0526 Resistance to lambda-cyhalothrin in the lady beetle *Eriopis connexa* (Germar) affects its longevity and reproductive output. Djison Santos[1], Agna Rodrigues[2], **Jorge Torres**, jtorres@depa.ufrpe.br[2] and Rogério Lira[2], [1]Universidade Federal de Alagoas, Rio Largo, Brazil, [2]Universidade Federal Rural de Pernambuco, Recife, Brazil

D0527 Evaluating the effects of a grass-specific herbicide on oviposition and larval survivorship of the silvery blue butterfly, *Glaucopsyche lygdamus columbia*, in an Oregon prairie. **Rachel Glaeser**, rachel.glaeser@wsu.edu, Washington State Univ. Vancouver, Vancouver, WA

D0528 Evaluating the potential effects of a mosquitocide on federally listed species. **Ashlea Frank**, arives@complianceservices.com, Compliance Services International, Lakewood, WA

D0529 Antagonistic regulation, yet synergistic defense: Effect of bergapten and protease inhibitor on development of cowpea bruchid . **Keyan Zhu-Salzman**, ksalzman@tamu.edu, Texas A&M Univ., College Station, TX

D0530 Tissue and life stage specific alternative splicing of a Kir channel in mosquitoes. **Matthew Rouhier**, rouhier.3@osu.edu and Peter M. Piermarini, The Ohio State Univ., Wooster, OH

D0531 Transcriptomics of *Spodoptera frugiperda* (J. E. Smith) (Lepidoptera: Noctuidae): Identifying candidate genes potentially involved in Bt toxicity and resistance mechanisms. **Rosane Bezerra da Silva**, robsl.bio@gmail.com[1], Chitvan Khajuria[2], John Wang[2] and Blair Siegfried[3], [1]Univ. of Lavras - Brazil/ Univ. of Nebraska - Lincoln, Lincoln, NE, [2]Univ. of Nebraska-Lincoln, Lincoln, NE, [3]Univ. of Nebraska, Lincoln, NE

D0532 The N1575Y mutation in the sodium channel of *Anopheles gambiae* synergizes the effect of L1014F/S mutations on pyrethroid resistance. **Lingxin Wang**, wangli13@msu.edu, Yoshiko Nomura and Ke Dong, Michigan State Univ., East Lansing, MI

D0533 Recombinant expression of Cry1Ac *Bacillus thuringiensis* protein in *Yarrowia lipolytica* and biological characterization against Lepidopteran pests. **Erick De Luna_ Santillana**, ericklusan@yahoo.com[1], Cristian Cabrales_Arellano[2], Mario Rodriguez Perez[1] and Raymundo Rosas_Quijano[3], [1]Instituto Politecnico Nacional, Reynosa, Mexico, [2]Instituto Politécnico Nacional, Reynosa, Mexico, [3]Plant Biotechnology Lab, Reynosa, Mexico

D0534 Non-target effects of organic insecticides on *Podisus maculiventris* (Hemiptera: Pentatomidae). **Sunghoon Baek**, shbaek007@hotmail.com[1], Matthew I McKinney[1], Jakob Goldner[1], Chang-Gyu Park[2], Boyun Seo[2] and Yong-Lak Park[1], [1]West Virginia Univ., Morgantown, WV, [2]National Academy of Agricultural Science, Suwon, South Korea

D0535 Impact of the irradiation of bee equipment on honey bee health and *deformed wing virus* levels. Thomas Rinderer, **Matthew Tarver**, matt.tarver@ars.usda.gov, Lilia de Guzman and Beth Holloway, USDA-ARS, Baton Rouge, LA

D0536 Preliminary expression profile of western corn rootworm, *Diabrotica virgifera virgifera*, neonates challenged with Cry34Ab1 and Cry35Ab1 by next-generation sequencing. **Haichuan Wang**, hwang4@unl.edu[1], Seong-il Eyun[1], Kanika Arora[2], Sek Yee Tan[2], Premchand Gandra[2], Etsuko Moriyama[1], Chitvan Khajuria[1], Jessica D. Jurzenski[3], Huarong Li[2], Maia Donahue[2], Kenneth Narva[2] and Blair Siegfried[3], [1]Univ. of Nebraska-Lincoln, Lincoln, NE, [2]Dow AgroSciences LLC, Indianapolis, IN, [3]Univ. of Nebraska, Lincoln, NE

D0537 Effects of DWV and temperature on the metabolic rate of honeybees, *Apis mellifera*. **Elizabeth Evans**, ecapaldi@bucknell.edu, Leah Bettner, Faria Sanjana, Shannon Scott, Lauren Sigler, Marie Pizzorno and Mark Haussmann, Bucknell Univ., Lewisburg, PA

D0538 Withdrawn

D0539 Expression and biochemical properties of a recombinant acetylcholinesterase 1 of the sand fly, *Phlebotomus papatasi* (Scopoli), insensitive to organophosphate inhibition. **Kevin B. Temeyer**, kevin.temeyer@ars.usda.gov, Alexander P. Tuckow, Andrew Y. Li and Adalberto A. Perez de Leon, USDA, Agricultural Research Service, Kerrville, TX

D0540 Cry toxins from *Bacillus thuringiensis* subsp. *israelensis* (Bti) have multiple targets in *Aedes aegypti* mosquitoes. **Jianwu Chen**, jwchen97@yahoo.com, Karlygash G. Aimanova, Su-Bum Lee and Sarjeet S. Gill, Univ. of California, Riverside, Riverside, CA

D0541 Latest genotype of cotton plant resistance on the basis of its biochemical analysis against aphids. **Nasir Masood**, nasirmasood2004@yahoo.com, Dept. of Environmental Sciences,Comsats Institute of information Technology, Punjab,Vehari, Pakistan

D0542 Evaluation of insecticides effectiveness on kudzu bug, *Megacopta cribraria*, at various developing stages. **Xing Ping Hu**, huxingp@auburn.edu, Auburn Univ., Auburn, AL and Xiangli Dong, Qingdao Agricutlure Univ., Qingdao, China

D0543 Comparative effectiveness of the powders of some underutilised botanicals for the control of *Callosobruchus maculatus* (F.) (Coleoptera: Bruchidae). Folake Ogunleye and Folake Ogunleye, Ekiti State Univ., Ado Ekiti, Nigeria

D0544 Characterization of two distinct acetylcholinesterases possessing almost identical catalytic activity in a damselfly, *Vestalis gracilis*. **Young-Ho Kim**, bioman05@snu.ac.kr, Deok-Ho Kwon and Si-Hyeock Lee, Seoul National Univ., Seoul, South Korea

D0545 Insecticidal activity and behavioral disorders by pyrifluquinazon against *Trialeurodes vaporariorum* and *Bemisia tabaci*. **Seon-Woo Lee**, lsw0090@google.com, Kwang-Soon Choi, Seung-Hwan Yun, In-Hee Lee, Jun-Won Park, Hyun-Na Koo, Hyun-kyung Kim and Gil-Hah Kim, Chungbuk National Univ., Cheong-ju, South Korea

D0546 A novel *Aedes aegypti* cadherin is a functional receptor of the Cry11Aa toxin from *Bacillus thuringiensis* subsp. *israelensis* . **Su-Bum Lee**, slee071@ucr.edu, Karlygash G. Aimanova, Jianwu Chen and Sarjeet S. Gill, Univ. of California, Riverside, Riverside, CA

D0547 Effect of electron beam irradiation to pest according to packaging box position for exported cut flower. **Seung-Hwan Yun**, sph5500@naver.com, Sang-Eun Park, Kwang-Soon Choi, Seon-Woo Lee, In-Hee Lee, Hyun-Na Koo and Gil-Hah Kim, Chungbuk National Univ., Cheong-ju, South Korea

D0548 Beyond selectivity: Are behavioral avoidance and hormesis likely causes of pyrethroid-induced outbreaks of the southern red mite, *Oligonychus ilicis*? Erick Mauricio Cordeiro[1], Isabela Lelis Moura[1], Marcos Antonio Fadini[2] and **Raul Narciso Guedes**, guedes@ufv.br[3], [1]Federal Univ. of Vicosa, Vicosa, Brazil, [2]Federal Univ. of Sao Joao del-Rei, Sete Lagoas, Brazil, [3]Federal Univ. of Vicosa, Viçosa, Brazil

D0549 Effects of atrazine herbicide on aquatic insects of the Rio Grande Valley. **Denise Martinez**, mtzdenise@aol.com, Univ. of Texas-Pan American, Edinburg, TX

D0550 Pesticides, pollinators, and pathogens: Linking bee health deficiencies to agrochemical exposures at the colony level. **Alison M. Reeves**, ralison5@vt.edu[1], Brenna E. Traver[1], Madhavi L. Kakumanu[1], Jennifer R. Williams[1], Mark A. Williams[1], Michael J. Lydy[2], Carlyle C. Brewster[1], Richard D. Fell[1] and Troy D. Anderson[1], [1]Virginia Tech, Blacksburg, VA, [2]Southern Illinois Univ. Carbondale, Carbondale, IL

D0551 Screening novel toxins for hemipteran activity. **Tim Eberle**, tim.eberle@bayer.com[1], Logan Hux[2], Kimberly Sampson[2], Razvan Dumitru[2] and Leonardo Magalhaes[2], [1]Bayer CropScience, Morrisville NC, NC, [2]Bayer CropScience, Morrisville, NC

D0552 Transcriptomics of selected insecticide-resistant strains of the fall armyworm, *Spodoptera frugiperda* (J. E. Smith) (Lepidoptera: Noctuidae). **Pablo Fresia**, pfresia@gmail.com, Felipe Antonio Domingues, Fernando L. Cônsoli and Celso Omoto, Univ. of Sao Paulo/ESALQ, Piracicaba, Brazil

D0553 Effects of organic pesticides and repellents on *Trichogramma* parastoid wasps and on the convergent lady beetle, *Hippodamia convergens*. **Brian Schultz**, bschultz@hampshire.edu, Alessandro Bartolo and Michael Fizdale, Hampshire College, Amherst, MA

D0554 Chemical class rotations for control of *Bemisia tabaci* (Hemiptera: Aleyrodidae) on poinsettia and their effect on cryptic species population composition. **Cindy L. McKenzie**, Cindy.McKenzie@ars.usda.gov[1], Vivek Kumar[2], Cristi L. Palmer[3], Ron D. Oetting[4] and Lance Osborne[2], [1]USDA - ARS, Fort Pierce, FL, [2]Univ. of Florida, Apopka, FL, [3]Rutgers, The State Univ. of New Jersey, North Brunswick, NJ, [4]Univ. of Georgia, Griffin, GA

D0555 Residual effects of three neonicotinoids commonly used to control Asian citrus psyllid, *Diaphorina citri*. **Rachid Bouharroud**, bouharroud@yahoo.fr, Institut National de la Recherche Agronomique d'Agadir, Agadir, Morocco and Mamoudou Setamou, Texas A&M Univ., Weslaco, TX

D0556 Insecticide resistance status of Colorado potato beetle in northern Xinjiang Uygur Autonomous Region. **Jiang Weihua**, jwh@njau.edu.cn, author, Nanjing, China

D0557 Postharvest *Azadirachta indica* (A. Juss) biofumigant for *Trichoplusia ni* (Hübner) larvae control. Mayela Castañeda-Ramírez[1], **Gricelda Núñez-Mejía**, grisnzm@hotmail.com[1], Alberto Valadez-Lira[1], Alonso Orozco-Flores[1], Karen Martínez-Trejo[1] and Patricia Tamez-Guerra[2], [1]Universidad Autonoma de Nuevo Leon, San Nicolás de los Garza, NL, Mexico, [2]Universidad Autonoma de Nuevo Leon, San Nicolás de los Garza, NL., Mexico

D0558 Laboratory evaluation of the susceptibility of *Megacopta cribraria* (Hemiptera: Plataspidae) to selected insecticides. **Gregory Payne**, gpayne@westga.edu and Stephanie Piper, Univ. of West Georgia, Carrollton, GA

D0559 Mutations in the transmembrane segment 6 of domain I regulate differential sensitivities of insect and mammalian sodium channels to pyrethroid insecticides. **Eugenio Eduardo Oliveira**, eugenio@ufv.br[1], Yuzhe Du[2], Yoshiko Nomura[2] and Ke Dong[2], [1]Federal Univ. of Viçosa, Viçosa, Brazil, [2]Michigan State Univ., East Lansing, MI

D0560 Selection and characterization of a fall armyworm strain with resistance to Bt Cry1F corn. Natália Leite[1], Simone Mendes[2], Thaís Teixeira[3] and **Eliseu Pereira**, eliseu.pereira@ufv.br[1], [1]Universidade Federal de Viçosa, Viçosa, Brazil, [2]Embrapa Milho & Sorgo, Sete Lagoas, Brazil, [3]Univ. of Nebraska- Lincoln, Lincoln, NE

D0561 Toxicity of pyrifluquinazon to a broad range of hemipteran pests of agricultural importance. **James McKee Wilson**, jamesmw3@vt.edu[1], James Adams[2], Douglas G. Pfeiffer[3], Troy D. Anderson[3] and Thomas P. Kuhar[3], [1]Virginia Polytechnic Institute and State Univ., Blacksburg, VA, [2]Nichino America, Inc, Wilmington, DE, [3]Virginia Tech, Blacksburg, VA

D0083 RNA interference using dsRNA-*awd* distorts adult wings and causes nymphs mortality in *Diaphorina citri* Kuwayama, the vector of citrus greening disease. Ibrahim El-Shesheny, ishento@yahoo.com[1], Subhash Hajeri[1], Ibrahim El-Hawary[2], Siddarame Gowda[1] and **Nabil Killiny[1]**, nabilkilliny@ufl.edu, [1]Univ. of Florida, Lake Alfred, FL, [2]Tanta Univ., Tanta, Egypt

Section Poster Presentations: P-IE 2

Exhibit Hall 4 (Austin Convention Center)

D0562 Preliminary results on insecticidal and repellent activity of ProAlexin™ on Mediterranean fruit fly, *Ceratitis capitata* (Wiedemann), and citrus mealy bug, *Planococcus citri* (Risso). **A. Georgoulas**[1], Antonios Tsagkarakis[2], G. P. Polychronopoulos[3], Ch. Rokkas[4], D. Mitsopoulos[3] and J. Katsimboulas[3], [1]Agricultural Univ. of Athens, Athens, Greece, [2]Institute of Agronomical Sciences (I.G.E.), Kifissia, Greece, [3]Citrox Technologies, Moschato - Athens, Greece, [4]Citrox Technologies, Athens, Greece

D0563 *Helicoverpa armigera* (Lepidoptera: Noctuidae) in Brazil? First molecular detection report. Wee Tek Tay[1], **Miguel Soria**, miguelsoria@imamt.com.br[2], Tom Walsh[3], Danielle Thomazoni[2], Pierre Silvie[4], Gajanan Behere[5], Craig Anderson[1] and Sharon Downes[6], [1]Biosecurity Flagship, CSIRO Ecosystem Sciences, Canberra, Australia, [2]Mato Grosso Cotton Institute - IMAmt, Primavera do Leste, Brazil, [3]Sustainable Agricultural Flagship, CSIRO Ecosystem Sciences, Canberra, Australia, [4]IRD/CIRAD, Montpellier, France, [5]Division of Crop Improvement, ICAR Research Complex for North Eastern Hill Region, Meghalaya, India, [6]Sustainable Agriculture Flagship, CSIRO Ecosystem Sciences, Narrabri, Australia

D0564 Performance of single gene and stacked gene Bt sweet corn in South Georgia. **Alton N. Sparks, Jr.**, asparks@uga.edu, Univ. of Georgia, Tifton, GA

D0565 Multi-year efficacy and grain yield of single and stacked insect control traits deployed in a blended refuge against western corn rootworm, *Diabrotica virgifera virgifera* . **Murdick J. McLeod**, murdick.mcleod@pioneer.com[1], Roxanne Fegley[1] and Steven R. Paszkiewicz[2], [1]Pioneer Hi-Bred International, Inc, Windfall, IN, [2]Pioneer Hi-Bred International, Inc., Johnston, IA

D0566 Multi-year efficacy and grain yield of single and stacked insect control traits deployed in a blended refuge against lepidopteran pests of maize. **Roxanne Fegley**, roxanne.fegley@pioneer.com, Pioneer Hi-Bred International, Windfall, IN, Murdick J. McLeod, Pioneer Hi-Bred International, Inc, Windfall, IN and Steven R. Paszkiewicz, Pioneer Hi-Bred International, Inc., Johnston, IA

D0567 Efficacy of Bt corn against natural infestations of the Mexican rice borer (Lepidoptera: Crambidae) in Louisiana. **Julien M. Beuzelin**, jbeuzelin@agcenter.lsu.edu, LSU AgCenter, Alexandria, LA, Blake E. Wilson, Louisiana State Univ., Baton Rouge, LA, Matthew T. VanWeelden, LSU AgCenter, Baton Rouge, LA and Allan T. Showler, USDA-ARS, Kerrville, TX

D0568 Transgenic Bt corn resistance against Mexican rice borer, *Eoreuma loftini*, and implications to sugarcane. **Allan Showler**, allan.showler@ars.usda.gov, USDA-ARS, Kerrville, TX and Steven Cook, USDA-ARS, Beltsville, MD

D0569 Understanding Bt trait resistance in Minnesota through bioassays of field-collected western corn rootwom, *Diabrotica virgifera virgifera*. **Elizabeth Schacht**, schac064@umn.edu[1], Ken Ostlie[1], Megan E. Carter[1] and Michele Majeski[2], [1]Univ. of Minnesota, St. Paul, MN, [2]Univ. of Minnesota, Saint Paul, MN

D0570 Monitoring the effectiveness of three Bt corn hybrids against corn rootworms in South Dakota. **David Ordosch**, david.ordosch@sdstate.edu and Adrianna Szczepaniec, South Dakota State Univ., Brookings, SD

D0571 Survival of western bean cutworm, *Striacosta albicosta*, larvae on various Bt-maize tissues. **Jocelyn L. Smith**, jocelyn.smith@uoguelph.ca, Univ. of Guelph, Ridgetown, ON, Canada and Arthur W. Schaafsma, Univ. of Guelph, Ridgetown Campus, Ridgetown, ON, Canada

D0572 Practical measurement of Bt resistance in heliothines. **Randall Luttrell**, randy.luttrell@ars.usda.gov[1], Nathan Little[2], Kenya Dixon[1] and MIchelle Mullen[2], [1]USDA - ARS, Stoneville, MS, [2]USDA ARS, Stoneville, MS

D0573 Baseline susceptibility of Brazilian populations of *Spodoptera frugiperda* and *Diatraea saccharalis* to Vip3Aa20 insecticidal protein. **Oderlei Bernardi**, oderleibernardi@yahoo.com.br[1], Douglas Amado[1], Renan S. de Sousa[1], Fabiana Segatti[2], Julio Fatoretto[2], Tony Burd[3] and Celso Omoto[1], [1]Univ. of Sao Paulo/ESALQ, Piracicaba, Brazil, [2]Syngenta Proteção de Cultivos Ltda., São Paulo, Brazil, [3]Syngenta, Greensboro, NC

D0574 Field evaluations of corn expressing RNAi-based insect protected trait on non-target organisms. **Aqeel Ahmad**, aqeel.ahmad@monsanto.com[1], Kwame Adu-Tutu[1], Damian Grimi[2], Ignacio Negri[2], Christopher R. Brown[3], Bernard Sammons[1] and Michael Horak[1], [1]Monsanto Company, St. Louis, MO, [2]Monsanto Argentina SAIC, Buenos Aires, Argentina, [3]Monsanto Company, Creve Coeur, MO

D0575 Exposure to multiple Bt proteins through resistant hosts demonstrates no effects on a suite of their natural enemies. **Anthony M. Shelton**, ams5@cornell.edu, Cornell Univ., NYSAES, Geneva, NY, Junce Tian, Zhejiang Univ., Hangzhou, China, Liping Long, Guangxi Academy of Agricultural Sciences, Nanning, Guangxi, China, Xiangping Wang, Yangtze Univ., Jingzhou, Hubei, China, Steven Naranjo, USDA Agricultural Research Service, Maricopa, AZ, Jörg Romeis, Agroscope Reckenholz, Tänikon Research Station ART, Zurich, Switzerland, Richard L. Hellmich, USDA - ARS, Ames, IA, Elizabeth Earle, Cornell Univ., Ithaca, NY and Ping Wang, Cornell Univ. NYSAES, Geneva, NY

D0576 A first glimpse of non-target impact of the western corn rootworm dsRNA on ladybug using *in vivo* RNAi bioassay. Xiaowei Yang[1], **Huipeng Pan**, huipengpan@uky.edu[2], Blair Siegfried[3] and Xuguo Zhou[2], [1]Dept. of Entomology Univ. of Kentucky, Lexington, KY, [2]Univ. of Kentucky, Lexington, KY, [3]Univ. of Nebraska, Lincoln, NE

D0577 Environment risk assessment of transgenic *Nicotiana tabacum*: Assessing non-target effects of bioreactor crops. **Ian Scott**, ian.scott@agr.gc.ca, Rima Menassa and Igor Kolotilin, Agriculture and Agri-Food Canada, London, ON, Canada

D0578 Efficacy of novel insecticidal proteins in controlling lepidopteran pests in corn, cotton and soybean. **Leonardo Magalhaes**, leonardo.magalhaes@bayer.com[1], Amanda Riggs[1], Deepa Balasubramanian[2], Kimberly Sampson[1] and Maria Stauffer[1], [1]Bayer CropScience, Morrisville, NC, [2]Bayer Cropscience, Morrisville, NC

D0579 Two wheat curl mite, *Aceria tosichella* Keifer, biotypes have different responses on wheat. **Wen-Po Chuang**, wenpo@ksu.edu, Kansas State Univ., Manhattan, KS

D0580 Importance of inter- vs. intra-specific variation in host quality on an herbivore: Testing non-wheat host grass species with wheat stem sawfly, *Cephus cinctus*. **Kevin J. Delaney**, kevin.delaney@ars.usda.gov, USDA - ARS, Sidney, MT, Joel Perez-Mendoza, USDA-APHIS-PPQ, Laredo, TX and David K. Weaver, Montana State Univ., Bozeman, MT

D0581 Induced host plant resistance: Jasmonic acid effect on soybean loopers, *Chrysodeixis includens*. **Abigail Cox**, acox21@tigers.lsu.edu and Jeffrey A. Davis, Louisiana State Univ., Baton Rouge, LA

D0582 Effect of soybean leaf position on the antibiosis expression to *Anticarsia gemmatalis* and the relation with nutrients and trichomes. **Bruno Sardinha de Souza**, souzabhs@gmail.com[1], Eduardo Costa[1], Zulene Ribeiro[1], Michael J. Stout[2] and Arlindo Boiça Junior[1], [1]FCAV/UNESP, Jaboticabal, Brazil, [2]Louisiana State Univ., Baton Rouge, LA

D0583 Inheritance of resistance in soybean PI165673 to Dectes stem borer, *Dectes texanus* LeConte (Coleoptera: Cerambycidae). **Lina Aguirre-Rojas**, liaguiro@ksu.edu, William T. Schapaugh and C. Michael Smith, Kansas State Univ., Manhattan, KS

D0584 Screening of soybean genotypes for resistance to soybean aphid and soybean mosaic virus . **Edson L. L. Baldin**, elbaldin@fca.unesp.br[1], Luis Posadas[2], Lia Marchi-Werle[1], Tiffany M. Heng-Moss[1], George Graeff[2] and Thomas E. Hunt[3], [1]Univ. of Nebraska, Lincoln, NE, [2]Univ. of Nebraska-Lincoln, Lincoln, NE, [3]Univ. of Nebraska, Concord, NE

D0585 Constitutive and induced resistance to *Helicoverpa armigera* in grain legumes. **H. C. Sharma**, h.sharma@cgiar.org, International Crops Research Institute for the Semiarid Tropics, Andhra Pradesh, India and Abdul Rashid War, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India

D0586 Differences in susceptibility of zoysiagrasses, *Zoysia* spp., to the fall armyworm, *Spodoptera frugiperda*. **Shaku Nair**, nair.shaku@gmail.com, Kris Braman and Paul Raymer, Univ. of Georgia, Griffin, GA

D0587 Host plant resistance and tolerance of bentgrass species and cultivars (*Agrostis* spp.) to annual bluegrass weevil, *Listronotus maculicollis* Dietz. **Olga Kostromytska**, kolgaent@rci.rutgers.edu, Rutgers Univ., New Brunswick, NJ, Stacy Bonos, Rutgers university, New Brunswick, NJ and Albrecht M. Koppenhöfer, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

D0588 Improved specimen preparation and SEM imaging reveal the morphology of a west African sorghum resistant to storage insects. Michael W. Pendleton[1], **Bonnie B. Pendleton**, bpendleton@wtamu.edu[2], E. Ann Ellis[1] and Niamoye Diarisso[3], [1]Texas A&M Univ., College Station, TX, [2]West Texas A&M Univ., Canyon, TX, [3]Institut D'Economie Rural, Bamako, Mali

D0589 Insect responses to sorghum with enhanced lignin biosynthesis. **Patrick F. Dowd**, dowdpf@ncaur.usda.gov[1], Scott E. Sattler[2], Zhengxiang Ge[3] and Thomas Clemente[3], [1]USDA, Agricultural Research Service, Peoria, IL, [2]USDA, Agricultural Research Service, Lincoln, NE, [3]Univ. of Nebraska, Lincoln, Lincoln, NE

D0590 Reproductive and damage potential of greenbug, *Schizaphis graminum*, biotypes E, I, and K in the wheat-sorghum cropping system of the central Great Plains. **J. Scott Armstrong**, scott.armstrong@ars.usda.gov, USDA, Agricultural Research Service, Stillwater, OK and Gary J. Puterka, USDA, ARS, Stillwater, OK

D0591 Wind induced mechanical stress on rice increases plant resistance against fall armyworm, *Spodoptera frugiperda*, but not rice water weevil, *Lissorhoptrus oryzophilus*. **Joshua Campo**, jbc124@bellsouth.net, Louisiana State Univ. Agricultural Center, Baton Rouge, LA and Michael J. Stout, Louisiana State Univ., Baton Rouge, LA

D0592 *Vat*-mediated resistance to *Aphis gossypii* in melon: Key transcription factors and diurnal effects. **James Anstead**, jaa25@psu.edu, Sampurna Sattar and Gary A Thompson, Pennsylvania State Univ., State College, PA

D0593 Does pecan population structuring predict resistance to pecan aphids? Aphid performance and plant physical defenses across a broad sample of native pecans. **Gerardo Garcia-Nevarez**, geranevarez1@gmail.com[1], Larry Grauke[2], Marvin K. Harris[3] and Julio S. Bernal[3], [1]Texas A&M Univ., College station, TX, [2]USDA ARS, Somerville, TX, [3]Texas A&M Univ., College Station, TX

D0594 Laboratory evaluation of sweetpotato germplasm for resistance to sweetpotato weevil. **M. J. Murray**, mmurray@agcenter.lsu.edu[1], Jeffrey A. Davis[2] and D. R. LaBonte[1], [1]Louisiana State Univ. AgCenter, Baton Rouge, LA, [2]LSU AgCenter, Baton Rouge, LA

D0595 Response of *Bombyx mori* L. to leaf nutrition of Nepalese *Morus g*enotypes. **Narahari P. Ghimire**, np2a_ghimire@yahoo.com, Institute of Agriculture and Animal Science, Rampur, Chitwan, Nepal

D0596 Bad vibrations: Plants respond to leaf vibrations caused by insect herbivore chewing. **Heidi Appel**, appelh@missouri.edu and Reginald Cocroft, Univ. of Missouri, Columbia, MO

D0597 Disrupting host selection behavior of a phytopathogen vector by broadcasting a synthetic version of a pathogen-induced, plant defense volatile. **Emily Kuhns**, emilyhkuhns@gmail.com[1], Xavier Martini[2], Yolani Tribuiani[1], Monique Coy[1], Dara Stockton[1], Lukasz Stelinski[1] and Kirsten P Stelinski[3], [1]Univ. of Florida, Lake Alfred, FL, [2]Univ. of Florida Citrus Research and Education Center, Lake Alfred, FL, [3]Univ. of Florida, Citrus Research and Education Center, Lake Alfred, FL

D0598 Insecticide and acaricide resistance monitoring: Harmonisation and coordination of susceptibility bioassay methods. Tatjana Sikuljak, BASF Corporation, Dinumba, CA, Harald Koehler, Bayer CropScience AG, Monheim, Germany, Magali Gravouil, Du Pont de Nemours, Nambsheim, France, Lixin Mao, BASF Corporation, Research Triangle Park, NC, Alan Porter, IRAC International, Pitlochry, United Kingdom, Russell Slater, Syngenta Crop Protection AG, Basel, Switzerland and **Frank Wessels**, fjwessels@dow.com, Dow AgroSciences, Indianapolis, IN

D0599 Acaricide resistance of the twospotted spider mite, *Tetranychus urticae*, in Washington hops. **Tara Piraneo**, tara.piraneo@wsu.edu, Washington State Univ., Pullman, WA

D0600 Geographic variation and mode of inheritance of resistance to spinosad in Colorado potato beetle, *Leptinotarsa decemlineata* (Say). **Mitchell Baker**, Mitchell.Baker@qc.cuny.edu[1], Coby Klein[2], Saidan Qi[3], David Mota-Sanchez[4], Andrei Alyokhin[5] and Mark E. Whalon[4], [1]The City Univ. of New York - Queens College, Flushing, NY, [2]Graduate Center of CUNY, Flushing, NY, [3]Queens College CUNY, Flushing, NY, [4]Michigan State Univ., East Lansing, MI, [5]Univ. of Maine, Orono, ME

D0601 Relative influences of the landscape and bees on crop yield. Jessica D. Petersen and **Brian A. Nault**, ban6@cornell.edu, Cornell Univ., Geneva, NY

D0602 Launch of the USDA, ARS Coordinated Project on Minimizing the Exposure of Honey Bees to Pesticides Applied to Southern Row Crops. **John J. Adamczyk**, John.Adamczyk@ars.usda.gov[1], Kevin Hackett[2], Thomas E. Rinderer[3], Robert G. Danka[4], Matthew Tarver[3], Yu Cheng Zhu[5], Clint Hoffmann[6], Gretchen Jones[7], Steve Thomson[8], William Meikle[9], James Ottea[10], Kristen Healy[10], Jeff Gore[11], Donald Cook[12], Scott D. Stewart[13], John A Skinner[14], Gus Lorenz[15] and Angus Catchot[16], [1]USDA-ARS-Thad Cochran Southern Hort. Lab, Poplarville, MS, [2]USDA-ARS, Beltsville, MD, [3]USDA-ARS, Baton Rouge, LA, [4]USDA, ARS, Baton Rouge, LA, [5]USDA–ARS Jamie Whitten Delta State Research Center, Stoneville, MS, [6]USDA, ARS, Areawide Pest Management Research Unit, College Station, TX, [7]USDA-ARS, College Station, TX, [8]USDA, ARS, Crop Production Systems Research Unit, Stoneville, MS, [9]USDA – ARS, Tucson, AZ, [10]Louisiana State Univ., Baton Rouge, LA, [11]Mississippi State Univ., Stoneville, MS, MS, [12]Mississippi State Univ., Stoneville, MS, [13]Univ. of Tennessee, Jackson, TN, [14]The Univ. of Tennessee, Knoxville, TN, [15]Univ. of Arkansas, Lonoke, AR, [16]Mississippi State Univ., Mississippi State, MS

D0603 Preliminary comparison of traps collecting propolis by honey bees. **Georgios Balotis**, geompal@hotmail.com[1], Nikolaos Koutsianas[2], Athanassios Koutsianas[2], Tatiani Katsikogianni[2], Anagnosti Choukalas[2] and Antonios Tsagkarakis[1], [1]Institute of Agronomical Sciences (I.G.E.), Kifissia, Greece, [2]Apivita S.A., Markopoulo Mesogaias, Greece

D0604 Assessment of pollinator floral preferences with phylogenetic random utility models. **Nathaniel Pope**, npope@coa.edu, Univ. of Texas at Austin, Austin, TX and Shalene Jha, Univ. of Texas, Austin, TX

D0605 The pollination and distribution of the rare desert lily *Calochortus striatus*. **David A. Tanner**, david.tanner@unt.edu[1], Catherine M. Clark[2] and James P. Pitts[2], [1]Univ. of North Texas, Dallas, TX, [2]Utah State Univ., Logan, UT

D0606 Developing floral provisioning plantings for the enhancement of pollinators: A case study in Pennsylvania apple orchards. **Amanda Ritz**, amanda.ritz@gmail.com[1], David J. Biddinger[2], David Mortensen[3], Mace Vaughn[4], James Gillis[5], Edwin Rajotte[6], Neelendra K. Joshi[2] and Timothy W. Leslie[7], [1]Pennsylvania State Univ., Biglerville, PA, [2]Pennsylvania State Univ., Fruit Research & Extension Center, Biglerville, PA, [3]Penn State Univ., Univ. Park, PA, [4]The Xerces Society, Portland, OR, [5]USDA-NRCS, Gettysburg, PA, [6]Pennsylvania State Univ., State College, PA, [7]Long Island Univ., Brooklyn, NY

D0607 *Osmia ribifloris*, the best little orchard bee in the West. **Blair Sampson**, blair.sampson@ars.usda.gov, USDA, Agricultural Research Service, Poplarville, MS, Chris Werle, Louisiana State Univ., Baton Rouge, LA, Timothy Rinehart, USDA-ARS Thad Cochran Southern Horticultural Research Lboratory, Poplarville, MS and John J. Adamczyk, USDA-ARS-Thad Cochran Southern Hort. Lab, Poplarville, MS

D0608 Multiple infections in bees: Chalkbrood in managed *Megachile rotundata*. **Rosalind James**, rosalind.james@ars.usda.gov and Ellen Klinger, USDA - ARS, Logan, UT

D0609 Comparison of bee diversity in a burned and unburned restored prairie. Jens Hulden, Jonathan Tetlie, Ross Thompson and **D. Bryan Bishop**, bishop@cord.edu, Concordia College- Moorhead, Moorhead, MN

D0610 Characterizing a plant-pollinator network for Plummers Island. **Robert Oppenheimer** and John T. Lill, George Washington Univ., Washington, DC

D0611 Complex effects of urban land use on native bee communities in a rapidly growing metropolis. **Kimberly Ballare**, kim.ballare@gmail.com, Univ. of Texas at Austin, Austin, TX and Shalene Jha, Univ. of Texas, Austin, TX

D0612 Influence of fungicides and adjuvants on blue orchard bee, *Osmia lignaria*, learning and memory. **Cory Stanley-Stahr**, coryss@ufl.edu, Utah State Univ., Logan, UT and Theresa L. Pitts-Singer, USDA, Agricultural Research Service, Logan, UT

D0613 Influence of endosymbionts in mediating plant defense responses to herbivory by the pea aphid, *Acyrthosiphon pisum*. **Jill Piorkowski**, jmp0047@tigermail.auburn.edu, Simon Zebelo and Henry Fadamiro, Auburn Univ., Auburn, AL

D0614 '*Candidatus* Liberibacter solanacearum' titer over time in the psyllid *Bactericera cockerelli*, following acquisition from infected plants. **Joseph E. Munyaneza**, joseph.munyaneza@ars.usda.gov, USDA - ARS, Wapato, WA, Venkatesan Sengoda, USDA-ARS, Wapato, WA and Donald C. Henne, Texas A&M AgriLife Research, Weslaco, TX

D0615 Plant infection and nutrition affect host preference behavior of Asian citrus psyllid: Laboratory and field experiments. **Xavier Martini**, xmartini@ufl.edu[1], Emily Kuhns[2], Kirsten P Stelinski[3] and Lukasz, L. Stelinski[2], [1]Univ. of Florida Citrus Research and Education Center, Lake Alfred, FL, [2]Univ. of Florida, Lake Alfred, FL, [3]Univ. of Florida, Citrus Research and Education Center, Lake Alfred, FL

D0616 Dynamics of a bacterial endosymbiont within its insect host population: Distribution of *Wolbachia* in *Diaphorina citri* Kuwayama (Hemiptera: Psyllidae) populations in Florida. **Mark Hoffmann**, mark.hoffmann@ufl.edu[1], Heather Kingdom Gibbard[1], Monique Coy[2], Timothy Ebert[2], Michael Rogers[3] and Kirsten S Pelz-Stelinski[1], [1]Univ. of Florida Citrus Research and Education Center, Lake Alfred, FL, [2]Univ. of Florida, Lake Alfred, FL, [3]Univ. of Florida-IFAS, Citrus Research and Education Center, Lake Alfred, FL

D0617 Characterization of *Wolbachia* infecting *Pentalonia* aphids. **Clesson Higashi**, clessonh@hawaii.edu, Univ. of Hawaii Manoa, Honolulu, HI, Alberto Bressan, Univ. of Hawaii, Honolulu, HI and Kerry M. Oliver, Univ. of Georgia, Athens, GA

D0618 Spatial analysis of occurrence of PRSV and ZYMV, two aphid-transmitted viruses, in *Momordica charantia* in Puerto Rico. **Isis J. López Quintero**, lopez84isis@gmail.com[1], Carolina Monmany[1] and José Carlos V. Rodrigues[2], [1]Univ. of Puerto Rico-Rio Piedras, San Juan, PR, [2]Univ. of Puerto Rico, Center for Excellence in Quarantine & Invasive Species, San Juan, PR

D0619 Transmission potential of the zebra chip disease pathogen "*Candidatus* Liberibacter solanacearum" by whitefly and thrips on potato. **Xiangbing Yang**, xiang.yang@ag.tamu.edu[1], Manuel Campos[1], Joseph E. Munyaneza[2] and Donald C. Henne[3], [1]Texas A&M Agrilife Research and Extension Center, Weslaco, TX, [2]USDA - ARS, Wapato, WA, [3]Texas A&M AgriLife Research, Weslaco, TX

D0620 Waveform library for sharpshooters (Hemiptera: Cicadellidae: Cicadellinae): Characterization of EPG waveforms at various input impedances. **Elaine Backus**, Elaine.Backus@ARS.USDA.gov, USDA San Joaquin Valley Agricultural Research Center, Parlier, CA

D0621 Comparing three approaches to behavioral analysis of EPG Waveforms. **Timothy Ebert**, tebert@ufl.edu, Univ. of Florida, Lake Alfred, FL, Elaine Backus, USDA San Joaquin Valley Agricultural Research Center, Parlier, CA, Alberto Fereres, Instituto de Ciencias Agrarias, Centro de Ciencias Medioambientales (CCMA-CSIC), Madrid, Spain and Michael Rogers, Univ. of Florida-IFAS, Citrus Research and Education Center, Lake Alfred, FL

D0622 Epidemiology and management of Pierce's disease in Arizona vineyards. **S. J. Castle**, steven.castle@ars.usda.gov, USDA, Agricultural Research Service, Maricopa, AZ and Paul Merten, USDA-ARS, Maricopa, AZ

D0623 Effects of endophytic fungi on western tarnished plant bug, *Lygus hesperus*, and fall armyworm, *Spodoptera frugiperda*, host plant use. **Maria Julissa Ek-Ramos**, ekramos@neo.tamu.edu, Weidong Pan, Carrie Deans, Cesar Valencia and Gregory Sword, Texas A&M Univ., College Station, TX

D0624 Effect of Plant Growth Promoting Rhizobacteria (PGPR) on larval development and adult ovipositional choices of fall armyworm, *Spodoptera frugiperda*. R. Murphey Coy, **David Held**, dwh0004@auburn.edu and Joseph Kloepper, Auburn Univ., Auburn, AL

D0625 Interactions between the *Matsucoccus* scale insect/pathogen complex and eastern white pine health in the southern Appalachian Mountains. **Kamal JK. Gandhi**, kgandhi@warnell.uga.edu[1], Christopher Asaro[2], David R. Coyle[1], Michelle Cram[3] and Angela M. Mech[1], [1]Univ. of Georgia, Athens, GA, [2]Virginia Dept. of Forestry, Charlottesville, VA, [3]USDA, Forest Service, Athens, GA

D0626 Non-target effects of transgenic blight resistant American chestnut, *Castanea dentata* (Marshall), on a seasonal guild of lepidopteran folivores. Dylan Parry and **Georgia R. Keene**, grkeene@syr.edu, State Univ. of New York, Environmental Science and Forestry, Syracuse, NY

D0627 The effect of age on mating success of the gypsy moth, *Lymantria dispar* (L.). **Patrick Tobin**, pc.tobin@gmail.com, USDA, Forest Service, Morgantown, WV, Joshua Bolyard, USDA Forest Service/West Virginia Univ., Morgantown, WV, Andrea Hickman, Virginia Tech, Lexington, VA and Ksenia S. Onufrieva, Virginia Polytechnic Institute and State Univ., Blacksburg, VA

D0628 Adaptive shifts in the phenology of egg hatch across the latitudinal range of gypsy moth, *Lymantria dispar*, in North America. Dylan Parry[1], **Kristine Grayson**, kdattelbaum@vcu.edu[2] and Derek Johnson[2], [1]State Univ. of New York, Environmental Science and Forestry, Syracuse, NY, [2]Virginia Commonwealth Univ., Richmond, VA

D0629 Local adaptation in larval performance across the latitudinal range of the gypsy moth, *Lymantria dispar*, in North America. **Kristine Grayson**, kdattelbaum@vcu.edu[1], Dylan Parry[2], Derek Johnson[1], Nora Krajah[1] and Dominique Grim[1], [1]Virginia Commonwealth Univ., Richmond, VA, [2]State Univ. of New York, Environmental Science and Forestry, Syracuse, NY

D0630 Multi-scale patterns of predation on *Lymantria dispar* pupa. **Derek Johnson**, dmjohnson@vcu.edu[1], Stephanie Roddy[1], Brett Butler[2] and Kristine Grayson[1], [1]Virginia Commonwealth Univ., Richmond, VA, [2]Univ. of California, Berkeley, Berkeley, CA

D0631 The interaction between two invasive herbivores, hemlock woolly adelgid, *Adelges tsugae*, and elongate hemlock scale, *Fiorinia externa*, on a shared host. **Mauri Hickin**, mhickin@my.uri.edu, Evan L. Preisser, Sara Gomez and Liahna Gonda-King, Univ. of Rhode Island, Kingston, RI

D0632 Abundance and diversity of woodboring beetles (Cerambycidae) in burned or unburned hardwood and conifer forests in Michigan. **Therese M. Poland**, tpoland@fs.fed.us[1], Deborah G. McCullough[2] and Elizabeth Graham[2], [1]USDA Forest Service, East Lansing, MI, [2]Michigan State Univ., East Lansing, MI

D0633 Ceramybycids captured at hardwood and conifer sites identified as high risk for exotic forest insect introductions in Michigan. **Sara Tanis**, tanissar@msu.edu[1], Deborah G. McCullough[1] and Therese M. Poland[2], [1]Michigan State Univ., East Lansing, MI, [2]USDA Forest Service, East Lansing, MI

D0634 Mother knows best: Emerald ash borer oviposition host preference corresponds with larval performance. **Chad M. Rigsby**, rigsby.7@wright.edu[1], Vanessa Muilenburg[2], Thaddeus Tarpey[1], Daniel A. Herms[2] and Don Cipollini[1], [1]Wright State Univ., Dayton, OH, [2]The Ohio State Univ., OARDC, Wooster, OH

D0635 Emerald ash borer and thousand cankers disease in Tennessee: Double the trouble. **Jerome F. Grant**, jgrant@utk.edu[1], Steve D. Powell[2], Kenneth J. Copley[3], Gregory J. Wiggins[1], Paris L. Lambdin[1] and Mark T. Windham[1], [1]Univ. of Tennessee, Knoxville, TN, [2]Tennessee Dept. of Agriculture, Nashville, TN, [3]USDA APHIS, Murfreesboro, TN

D0636 Are black walnuts in forests at risk from thousand cankers disease? **Gregory J. Wiggins**, wiggybug@utk.edu, Jerome F. Grant, Paris L. Lambdin, Katheryne Nix, Mark T. Windham and Denita Hadziabdic, Univ. of Tennessee, Knoxville, TN

D0637 Trapping for walnut twig beetle, *Pityophthorus juglandis*, in east Tennessee: What worked and what failed. **Alicia Bray**, abray@tnstate.edu[1], Jason B. Oliver[1], William Klingeman[2], Nadeer Youssef[1], Sharon E. Reed[3] and Jennifer Juzwik[4], [1]Tennessee State Univ., McMinnville, TN, [2]Univ. of Tennessee, Knoxville, TN, [3]Univ. of Missouri, Columbia, MO, [4]USDA, Forest Service, St. Paul, MN

D0638 Evaluation of tree bolt baits treated with attractants for wood-boring insects. Karla Addesso, **Alicia Bray**, abray@tnstate.edu and Jason B. Oliver, Tennessee State Univ., McMinnville, TN

D0639 Further exploration of host terpenoids as attractants for invasive insect pests. **Jerome Niogret**, jerome.niogret@ars.usda.gov, Paul E. Kendra and Nancy D. Epsky, USDA-ARS, Miami, FL

D0640 Predation, competition, and regulation of endemic populations of southern pine beetle, *Dendroctonus frontalis*. **Carissa Aoki**, carissa.f.aoki.gr@dartmouth.edu, Rebecca Novello and Matthew Ayres, Dartmouth College, Hanover, NH

D0641 Movement of *Xylosandrus germanus* (Coleoptera: Scolytinae) from woodlots into nurseries in Ohio. **Michael Reding**, mike.reding@ars.usda.gov[1], Chris Ranger[1], Jason Oliver[2], Peter B. Schultz[3], Chris Werle[4] and Blair Sampson[5], [1]USDA Agricultural Research Service, Wooster, OH, [2]Tennessee State Univ., McMinnville, TN, [3]Virginia Tech, Virginia Beach, VA, [4]Louisiana State Univ., Baton Rouge, LA, [5]USDA, Agricultural Research Service, Poplarville, MS

D0642 Utilizing artificially flood-stressed trees to manage ambrosia beetles in commercial nurseries. **Peter B. Schultz**, schultzp@vt.edu, Virginia Tech, Virginia Beach, VA, Christopher M. Ranger, USDA, Agricultural Research Service, Wooster, OH, Michael Reding, USDA Agricultural Research Service, Wooster, OH and Jason Oliver, Tennessee State Univ., McMinnville, TN

D0643 The mites associated with bark beetles in Finland's Koli National Park. **John C. Moser**, jmoser@fs.fed.us, USDA, Forest Service, Pineville, LA, Ritva Penttinen, Zoological Museum, Furkuy, Finland and Heli Viiri, Finnish Forest Research Institute, Joensuu, Finland

D0644 Effects of laurel wilt disease on two native bay trees (*Persea borbonia* and *P. palustris*) in northeast Florida. **Anthony Rossi**, arossi@unf.edu, Univ. of North Florida, Jacksonville, FL and Chris Bentzien, Dept. of Biology, Jacksonville, FL

D0645 Comparison of seven essential oils identifies cubeb oil as an improved attractant for redbay ambrosia beetle, *Xyleborus glabratus* (Coleoptera: Curculionidae: Scolytinae). **Paul E. Kendra**, paul.kendra@ars.usda.gov[1], Wayne S. Montgomery[1], Jerome Niogret[1], Elena Q. Schnell[1], Mark A. Deyrup[2] and Nancy D. Epsky[1], [1]USDA-ARS, Miami, FL, [2]Archbold Biological Station, Lake Placid, FL

D0646 A comparison of sampling techniques targeting the brown marmorated stink bug. **George C. Hamilton**, hamilton@aesop.rutgers.edu, Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

D0647 Bermudagrass stem maggot: An exotic pest in the southeast USA. Lisa Baxter, baxterl@uga.edu, **William Hudson** and Dennis Hancock, Univ. of Georgia, Athens, GA

D0648 Sampling techniques and population estimation for *Atherigona reversura* Villenueve (Diptera: Muscidae) in bermudagrass hay fields. **John McCullers**, johnmmccullers@yahoo.com and William Hudson, Univ. of Georgia, Athens, GA

D0649 Insect by-catch from targeted early-detection surveys in alfalfa and corn. **Lori R. Spears**, lori.spears@usu.edu and Ricardo A. Ramirez, Utah State Univ., Logan, UT

D0650 Bait stations for pest tephritid fruit flies. **Nancy D. Epsky**, nancy.epsky@ars.usda.gov[1], Micah Gill[1] and Jonathan H. Crane[2], [1]USDA-ARS, Miami, FL, [2]Univ. of Florida, Tropical Research and Education Center, Homestead, FL 33031, Homestead, FL

D0651 Sampling methodology and approach rates for *Brevipalpus* mites on limes entering the USA from Mexico. **Elma Salinas**, elma.j.salinas@aphis.usda.gov, Daniel Martinez and David W. Bartels, USDA-APHIS-PPQ-CPHST, Edinburg, TX

D0652 Trap design for *Plecia nearctica* (Diptera: Bibionidae). **Nastaran Tofangsazi**, ntsazi@ufl.edu[1], Steven P. Arthurs[1] and Ronald Cherry[2], [1]Univ. of Florida, Apopka, FL, [2]Univ. of Florida, Belle Glade, FL

D0653 Development of lures for emerald ash borer and gold spotted oak borer. **Damon J. Crook**, damon.j.crook@aphis.usda.gov, USDA-APHIS-PPQ, Otis ANGB, MA, Tom W. Coleman, USDA Forest Service, San Bernardino, CA, Nate McCartney, Penn State Univ., Univ. Park, PA, Joseph Francese, USDA APHIS PPQ CPHST Otis Laboratory, Otis ANGB, MA, Steven J. Seybold, USDA, Forest Service, Davis, CA, Yigen Chen, Univ. of California, Davis, CA and Victor C. Mastro, USDA APHIS PPQ CPHST, Buzzards Bay, MA

D0654 Development of a new extended-release pheromone lure for boll weevils, *Anthonomus grandis*. **Charles P.-C. Suh**, charles.suh@ars.usda.gov[1], Amanda Ramsey[2], Gerry Bohmfalk[2] and John K. Westbrook[1], [1]USDA ARS APMRU, College Station, TX, [2]Scentry Biologicals, Inc., Billings, MT

D0655 Secretions from the ventral eversible gland (VEG) of *Spodoptera exigua* elicit activity of defense related enzymes and emission of volatile organic compounds in tomato, *Solanum lycopersicum*. **Simon Zebelo**, saz0002@auburn.edu, Jill Piorkowski, Joseph Disi and Henry Fadamiro, Auburn Univ., Auburn, AL

D0656 Concurrent effects of induced host volatiles and plant-based resources on host plant attraction and predation behaviors in the omnivorous western bigeyed bug, *Geocoris pallens*. **Jia Sun**, jsun008@ucr.edu and J. Daniel Hare, Univ. of California, Riverside, Riverside, CA

D0657 Response of fire ants to extracts of coffee-weed, *Sesbania herbacea* (Mill.) McVaugh. Marian Butner, Tennessee Tech Univ., Cookeville, TN and **Karla Addesso**, kaddesso@blomand.net, Tennessee State Univ., McMinnville, TN

D0658 Difference of aggregation pheromone secretion by feeding conditions in bean bug, *Riptortus pedestris* (Heteroptera: Alydidae). **Hyo-Seob Shin**, sbh1382@naver.com, Sang-Eun Park, Na-Yeon Ko, Tae-Hee Ryu, Jeong-Gon Kim, Hye-Ri Kwon, Mi-Ja Seo, Yong-Man Yu and Young-Nam Youn, Chungnam National Univ., Daejeon, South Korea

D0659 Timecourse of volatile emissions from *Datura wrightii* in response to sustained herbivore damage. J. Daniel Hare and **Aaron Olcerst**, AOlce001@ucr.edu, Univ. of California, Riverside, Riverside, CA

D0660 Induced responses to solar ultraviolet-B radiation and insect herbivory in *Datura wrightii*. **Sean McNamara**, smcna004@ucr.edu, Univ. of California, Riverside, Riverside, CA

D0661 Survey for spottedwing drosophila, *Drosophila suzukii* (Matsumura), in the five-county nursery production region of Tennessee. Garrett Roper[1], **Karla Addesso**, kaddesso@blomand.net[2]

and Jason Oliver[2], [1]Tennessee Tech Univ., Cookeville, TN, [2]Tennessee State Univ., McMinnville, TN

D0662 Evaluating trapping systems for *Drosophila suzukii* (spottedwing drosophila) in Oregon sweet cherry. **Preston H. Brown**, preston.brown@oregonstate.edu[1], Dong H. Cha[2], Peter J. Landolt[2] and Peter W. Shearer[1], [1]Oregon State Univ., Hood River, OR, [2]USDA, Agricultural Research Service, Wapato, WA

D0663 Monitoring spottedwing drosophila, *Drosophila suzukii*, in Ohio. **James Jasinski**, jasinski.4@osu.edu, Ohio State Univ., Extension, Urbana, OH and Celeste Welty, Ohio State Univ., Columbus, OH

D0664 Overwintering of *Drosophila suzukii* in the mid-Willamette Valley, Oregon. **Amy J. Dreves**, Amy.Dreves@oregonstate.edu[1], Amanda Ohrn[1], Jana C. Lee[2] and Adam Cave[3], [1]Oregon State Univ., Corvallis, OR, [2]USDA ARS, Corvallis, OR, [3]USDA - ARS, Corvallis, OR

D0665 Visual ecology of spottedwing drosophila. **Brent Short**, brent.short@ars.usda.gov, USDA, Agricultural Research Service, Appalachian Fruit Research Station, Kearneysville, WV and Tracy C. Leskey, USDA, Agricultural Research Service, Kearneysville, WV

D0666 And then '*some change took place'*: The mysterious origins of the bivoltine Z-pheromone race of European corn borer in North America. **Thomas W. Sappington**, Tom.Sappington@ars.usda.gov, USDA-ARS, Ames, IA

D0667 Changes in an insect-plant interaction under varying water availability: Implications for the cereal leaf beetle, *Oulema melanopus,* and the host plant wheat, *Triticum aestivum*. **Nathaniel E. Foote**, foot2969@vandals.uidaho.edu, Sanford D. Eigenbrode, Nilsa A. Bosque-Pérez and Thomas S. Davis, Univ. of Idaho, Moscow, ID

D0668 Stressed and bitter: The effects of water deficit and pest-induced stress on hop flavor and aroma. **Ruth E. Henderson**, ruthend@wsu.edu, Dan Groenendale and Douglas Walsh, Washington State Univ., Prosser, WA

D0669 Simulated climate warming alters host tree quality for forest tent caterpillar. **Mary A. Jamieson**, maryajamieson@gmail.com[1], Ezra G. Schwartzberg[2], Peter Reich[3], Kenneth F. Raffa[1] and Richard L. Lindroth[4], [1]Univ. of Wisconsin, Madison, WI, [2]Pensylvania State Univ., Univ. Park, PA, [3]Univ. of Minnesota, MN, [4]Univ. of Wisconsin-Madison, Madison, WI

D0670 Prediction of change in the synchronization between the phenology of *Scotinophara lurida* (Hemiptera: Pentatomidae) and rice plants in the context of new climate change scenario. Hyoseok Lee and **Joon-Ho Lee**, jh7lee@snu.ac.kr, Seoul National Univ., Seoul, South Korea

D0671 Bioecological study of *Parlatoria blanchardi* in the southern region of the Aures*,* Algeria. **Tarai Nacer**, tarainacer@yahoo.fr, Univ. Mohamed Khider, Biskra, Algérie, 07000, Biskra, Algeria and Mohammed Belhamra, Université Mohamed Khider, Biskra, Algeria

D0672 What a pest looks like: Morphological differentiation between wild and pestiferous corn leafhoppers, *Dalbulus maidis*. **Milena Chinchilla-Ramirez**, milena111@neo.tamu.edu[1], Amanda Davila-Flores[1], Thomas J. DeWitt[2], Raul Medina[2], Ricardo Ramirez-Romero[3] and Julio S. Bernal[2], [1]Dept. of Entomology, College Station, TX, [2]Texas A&M Univ., College Station, TX, [3]Centro Universitario de Ciencias Biologicas y Agropecuarias, Guadalajara, Mexico

D0673 The grape seed chalcid in western Colorado. **Robert Hammon**, bob.hammon@mesacounty.us, Colorado State Unverisity, Grand Junction, CO

D0674 Influence of energetic state on individual variation in boldness in the jumping spider *Eris militaris* (Araneae: Salticidae). Raphael Royauté, McGill Univ., Ste Anne de Bellevue, QC, Canada, Martin Ballot, École Nationale Supérieure Agronomique de Toulouse, Castanet-Tolosan Cédex, France, **Chris Buddle**, chris.buddle@mcgill.ca, McGill Univ., Ste-Anne-de-Bellevue, QC, Canada and Charles Vincent, Horticultural Research and Development Center, Saint-Jean-sur -Richelieu, QC, Canada

D0675 Host plants of the tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois). **Katherine Parys**, katherine.parys@ars.usda.gov and Gordon Snodgrass, USDA - ARS, Stoneville, MS

D0676 Population dynamics of kudzu bug, *Megacopta cribraria,* in soybean field. **Xiangli Dong**, xldong0326@163.com, Qingdao Agricutlure Univ., Qingdao, China and Xing P Hu, Auburn Univ., Auburn Univ., AL

D0677 Current status, biology and population dynamics of an exotic weevil, *Myllocerus undecimpustulatus*, feeding on ornamental plants in south Florida. **Catharine M. Mannion**, cmannion@ufl.edu, Univ. of Florida, Homestead, FL

D0678 Damage diagnostic of *Sphenophorus incurrens* Gyllenhal (Coleoptera: Curculionidae: Dryophthorinae), in sugar cane in México. **Obdulia Segura-León**, sleon@colpos.mx[1], Marianguadalupe Hernández Arenas[2], Juan Cibrián-Tovar[1] and Jesús Romero Nápoles[1], [1]Colegio de Postgraduados, Texcoco, Mexico, [2]INIFAP, Campo Experimental Zacatepec, Zacatepec, Mexico

D0679 Habitat, body size and reproduction of the leafhopper *Dalbulus elimatus* (Hemiptera: Cicadellidae), during the winter dry season. **Gustavo Moya-Raygoza**, gmoya@cucba.udg.mx, Universidad de Guadalajara (CUCBA), Zapopan, Jalisco, Mexico

D0680 Abundance and diversity of ground beetles and mosquitoes at three southeastern US sites: NEON data in action. **David Hoekman**, davidshoekman@gmail.com, Univ. of Colorado, Boulder, CO and Kali Blevins, National Ecological Observatory Network, Boulder, CO

D0681 Urban edge effects on desert arthropod communities. **Richard A. Redak**, richard.redak@ucr.edu, Thomas Prentice and Kathleen Campbell, Dept. of Entomology, Riverside, CA

D0682 Estimating the influence of plant richness on ground-dwelling invertebrates in restored prairie of central Nebraska. **Grace Williams**, grace.williams@my.simpson.edu, Michael Frank, Hannah Longstreet, Luis Saucedo, Courtney Sherwood, Lauren Tirado, Demetre Van Arsdale, Heidi Berger and Clinton Meyer, Simpson College, Indianola, IA

D0683 Macroinvertebrate composition and utilization within and among mesohabitats of spring-fed and surface-fed Ozark streams. **Rachel L.S. Heth**, rlhtz8@mail.missouri.edu and Robert W. Sites, Univ. of Missouri, Columbia, MO

D0684 Comparison of feeding behavior of the bean bug, *Riptortus pedestris*, on the bean plant and pod using Electrical Penetration Graph (EPG) Technique. **Hye-Ri Kwon**, hr0221@cnu.ac.kr, Sang-Eun Park, Sae-Hee Kim, Na-Yeon Ko, Tae-Hee Ryu, Jeong-Gon Kim, Hyo-Seob Shin, Mi-Ja Seo, Yong-Man Yu and Young-Nam Youn, Chungnam National Univ., Daejeon, South Korea

D0685 Seasonal occurrence of *Riptortus pedestris* on hairy vetch and difference of its development and longevity according to host plants. Hye-Ri Kwon, Sang-Eun Park, Na-Yeon Ko, Tae-Hee Ryu, Jeong-Gon Kim, Hyo-Seob Shin, Mi-Ja Seo, Yong-Man Yu and **Young-Nam Youn**, youngnam@cnu.ac.kr, Chungnam National Univ., Daejeon, South Korea

D0686 Factors influencing ant-mediated seed dispersal of neotropical pioneer tree species on Barro Colorado Island, Panama. **Selina Ruzi**, ruzi2@illinois.edu[1], Daniel Roche[2], Camilo Zalamea[3], James Dalling[1] and Andrew V. Suarez[4], [1]Univ. of Illinois - Urbana-Champaign, Urbana, IL, [2]Smithsonian Tropical Research Intern, Washington, DC, [3]Univ. of Illinois - Urbana-Champaign, Washington, DC, [4]Univ. of Illinois, Urbana, IL

D0687 Female mate preference, longevity, and fecundity in western corn rootworm in relation to male and female genotypes. **Wade French**, wade.french@ars.usda.gov, USDA, ARS, NCARL, Brookings, SD, Leslie Hammack, USDA, ARS, NCARL, Keystone, SD and Douglas W. Tallamy, Univ. of Delaware, Newark, DE

D0688 Host-microbe interactions in the rotation-resistant variant of the western corn rootworm, *Diabrotica virgifera virgifera* LeConte. **Chia-Ching Chu**, cchu9@illinois.edu[1], Joseph L. Spencer[2], Matías J. Curzi[3], Jorge A. Zavala[4] and Manfredo J. Seufferheld[1], [1]Univ. of Illinois, Champaign, IL, [2]Univ. of Illinois, Urbana, IL, [3]DuPont Pioneer, Salto, Buenos Aires, Argentina, [4]Univ. of Buenos Aires-CONICET, Buenos Aires, Argentina

D0689 Feeding and oviposition preferences of *Thaumastocoris peregrinus* (Heteroptera: Thaumastocoridae) Carpintero and Dellape. Marina V. Santadino[1], Gerardo Liljesthröm[2] and **Carlos Eduardo Coviella**, carlosecoviella@yahoo.com[1], [1]Universidad Nacional de Lujan, Lujan, Buenos Aires, Argentina, [2]Universidad Nacional de La Plata, La Plata, Buenos Aires, Argentina

D0690 Remote sensing of hemlock woolly adelgid infestations in southern New Hampshire and Maine. **Justin Williams**, justinwilliams@fs.fed.us, US Forest Service, Durham, NH, Ryan Hanavan, USDA Forest Service, Durham, NH and Barrett Rock, Univ. of New Hampshire, Durham, NH

D0691 Hyperspectral remote sensing techniques to assess a decade of hemlock mortality in the Catskills Mountains. **Ryan Hanavan**, rhanavan@fs.fed.us, USDA Forest Service, Durham, NH, Rich Hallett, US Forest Service, Durham, NE and Jen Pontius, Univ. of Vermont, Burlington, VT

D0692 Quantification of in situ root herbivory using remote sensing technology. **Matthew O'Neill**, monei003@ucr.edu and Michael Allen, Center for Conservation Biology, Riverside, CA

D0693 Looking for the code: Symbiosis between California grey ants, *Formica aerata*, and mealybugs, *Pseudococcus maritimus* and *Planococcus ficus*, on grapes. **L. P. S. Kuenen**, Bas.Kuenen@ars.usda.gov, USDA, Agricultural Research Service, Parlier, CA and Donald Thomas, AASI, Fowler, CA

D0694 Impact of the invasive European fire ant, *Myrmica rubra*, and their management treatments on non-target arthropods within Acadia National Park. **Elissa S. Ballman**, elissa.ballman@maine.edu and Eleanor Groden, Univ. of Maine, Orono, ME

D0695 Comparative analysis of western corn rootworm, *Diabrotica virgifera virgifera*, in T0 and T1 maize root trainer assays relative to time after infestation. **Amanda Riggs**, amanda.riggs@bayer.com[1], Deepa Balasubramanian[2], Heather Furcillo[1], Kimberly Sampson[1], Lacey Warrick[1], Leonardo Magalhaes[1], Maria Stauffer[1], Nathan Clements[3], Seth Levkoff[3] and Tim Eberle[4], [1]Bayer CropScience, Morrisville, NC, [2]Bayer Cropscience, Morrisville, NC, [3]Bayer CropScience, RTP, NC, [4]Bayer CropScience, Morrisville NC, NC

D0696 Arizona to Idaho on the tongue of a moth: Geographic trends of floral form and scent in *Oenothera caespitosa* ssp. *marginata*. **Rong Ma**, rong.ma@utexas.edu, Univ. of Texas at Austin, Austin, TX and Robert Raguso, Cornell Univ., Ithaca, NY

D0697 Ecological tradeoffs in host plant use by the silver-spotted skipper, *Epargyreus clarus*. **Martha R Weiss**, weissm@georgetown.edu[1], Lauren Peterson[2] and John T. Lill[2], [1]Georgetown Univ., Washington, DC, [2]George Washington Univ., Washington, DC

D0698 Why has a population of the Massachusetts state-listed butterfly *Pieris oleracea* prospered using the invasive form of cuckoo flower, *Cardamine pratensis*? **Megan Herlihy**, megan.herlihy@ars.usda.gov, USDA ARS, Beltsville, MD, Roy G. Van Driesche, Univ. of Massachusetts, Amherst, MA and David L. Wagner, Univ. of Connecticut, Storrs, CT

D0699 Tethered flight of the goldspotted oak borer, *Agrilus auroguttatus*. **Erica C. Nystrom Santacruz**, nyst0065@umn.edu, Univ. of Minnesota, Saint Paul, MN, Robert Venette, U.S. Forest Service, St. Paul, MN, Brian Aukema, Univ. of Minnesota, St. Paul, MN, Steven J. Seybold, USDA, Forest Service, Davis, CA and Tom W. Coleman, USDA Forest Service, San Bernardino, CA

D0700 Patterning male Hessian fly, *Mayetiola destructor*, flight in Oklahoma wheat-growing regions. **Nathan Bradford**, nathan.bradford@okstate.edu, Oklahoma State Univ., Stillwater, OK

D0701 Evaluation of flight capacity of foraging and overwintering brown marmorated stink bug using flight mill studies. **Doo-Hyung Lee**, dl343@cornell.edu and Tracy C. Leskey, USDA, Agricultural Research Service, Kearneysville, WV

D0702 Introduction of a simulator, PopModel 1.0 BASE. **Kyung San Choi**, mutant8@korea.kr, Rural Development Administration, Jeju, South Korea and Dong-Soon Kim, Cheju National Univ., Cheju, South Korea

D0703 Expanding Scientific Investigation Through Entomology – the Texas A&M University REU Site. **Kevin Heinz**, kmheinz@tamu.edu and Rebecca Hapes, Texas A&M Univ., College Station, TX

Section Poster Presentations: SysEB 2

Exhibit Hall 4 (Austin Convention Center)

D0704 Systematics and biodiversity: An international peer-reviewed journal. **Elliot Shubert**, e.shubert@nhm.ac.uk, The Natural History Museum, London, United Kingdom

D0705 2013 FMC Fellow poster presentation - Exciting young people about science through insects (FMC Fellowship). **Tim Anderson**, Timothy_Anderson@princetonk12.org[1], Bruce Black[2], Thomas Anderson[2] and Thomas A. Green[3], [1]FMC Fellow, Princeton, NJ, [2]FMC Corporation, Ewing, NJ, [3]IPM Institute of North America, Madison, WI

D0706 2013 FMC Fellow poster presentation - Exciting young people about science through insects (Entomological Foundation). **Richard Shevalier III**, rshevalier@nhvweb.net[1], Bruce Black[2], Thomas Anderson[2] and Thomas A. Green[3], [1]FMC Fellow, Glen Gardner, NJ, [2]FMC Corporation, Ewing, NJ, [3]IPM Institute of North America, Madison, WI

D0707 Local-scale processes influencing the distribution of velvet ants (Hymenoptera: Mutillidae) along a Cerrado gradient in central Brazil. **Cecília Vieira**, ceciliavieira@me.com, Universidade de Brasília, Brasília, Brazil

D0708 Ant diversity of the William L. Giles Bur Oak Preserve. **JoVonn Hill**, jgh4@entomology.msstate.edu, Mississippi State Univ., Msu, MS

D0709 Ants in the city: Can community gardens and citizen scientists help preserve insect biodiversity? **Amy Mertl**, amertl@lesley.edu, Lesley Univ., Cambridge, MA

D0710 Regulation of defensive behavior by *for* gene expression and juvenile hormone in the little fire ant, *Wasmannia auropunctata*. **Carlos A. Ortiz-Alvarado**, cortiz3515@gmail.com, Inter American Univ. of Puerto Rico, Bayamón, PR, PR

D0711 From a colony to an empire! Population structure of the little fire ant, *Wasmannia auropunctata*, in ecological life zones of Puerto Rico. **Emily Díaz-Iglesias**, ediaz5459@gmail.com, Inter American Univ. of Puerto Rico, Bayamón, PR, PR

D0712 Levels of *JHbp* expression and its relationship to behavioral plasticity in workers of the little fire ant *Wasmannia auropunctata*. **Angel Rivera-Colon**, arcolon14@gmail.com, Inter American Univ. of Puerto Rico, Bayamon, PR, Bert Rivera-Marchand, Univ. of Puerto Rico, San Juan, PR, PR and Yarira Ortiz-Alvarado, Inter American Univ. of Puerto Rico, Bayamón, PR

D0713 Nasty neighbors: The effect of cuticular hydrocarbons and prior experience on nestmate recognition behavior in the red harvester ant, *Pogonomyrmex barbatus*. **Elizabeth Cash**, Elizabeth.Cash@asu.edu and Jürgen Gadau, Arizona State Univ., Tempe, AZ

D0714 Gone to Texas: Comparative phylogeography of two North American *Trachymyrmex* species. **Jon Seal**, trachymyrmex@gmail.com, Univ. of Texas at Tyler, Tyler, TX

D0715 Disentangling ant and fungal genetic components of the asexual fungus-farming ant *Mycocepurus smithii*: A cross-fostering experiment. **Katrin Kellner**, antkatrina@gmail.com, Univ. of Texas at Austin, Austin, TX, Timothy A. Linksvayer, Univ. of Pennsylvania, Philadelphia, PA and Ulrich G. Mueller, The Univ. of Texas-Austin, Austin, TX

D0716 Zombie ants and puppeteer flies: Host manipulation in phorid fly parasitoids of fire ants. **Edward G. LeBrun**, elebrun@mail.utexas.edu[1], Jerod Romine[2] and Lawrence E. Gilbert[1], [1]Univ. of Texas, Austin, TX, [2]Univ. of Texas at Austin, Austin, TX

D0717 Evidence of cryptic species and a novel genetic sex determination mechanism in the gall wasp, *Belonocnema treatae.* **Carl Hjelmen**, cehjelmen09@ole.augie.edu[1], James R. Ott[2], Scott P. Egan[3] and J. Spencer Johnston[1], [1]Texas A&M Univ., College Station, TX, [2]Texas State Univ. - San Marcos, San Marcos, TX, [3]Univ. of Notre Dame, Notre Dame, IN

D0718 Species of the colorful genus *Chromoteleia* Ashmead (Hymenoptera: Platygastroidea, Platygastridae s.l.). **Alejandro A. Valerio**, aavalerio@gmail.com[1], Luciana Musetti[2] and Norman F. Johnson[2], [1]The Ohio State Univ., Columbus, OH, [2]Ohio State Univ., Columbus, OH

D0719 World genera of aquatic Platygastridae (Hymenoptera: Platygastroidea). **Norman F. Johnson**, johnson.2@osu.edu and Luciana Musetti, Ohio State Univ., Columbus, OH

D0720 Conservative estimates of hunting distance in *Cerceris fumipennis* Say (Hymenoptera: Crabronidae). Christine A. Nalepa[1], **Whitney Swink**, whitney.swink@ncagr.gov[1], Paul Merten[2] and Jason Moan[3], [1]North Carolina Dept. of Agriculture, Raleigh, NC, [2]USDA, Forest Service, Asheville, NC, [3]North Carolina Forest Service, Clayton, NC

D0721 *Tamarixia radiata* (Waterston) (Hymenoptera: Eulophidae) haplotypes from two Mexican citrus regions. Kenzy Peña-Carrillo, Campo Experimental Gral. Teran, General Teran, N.L., Mexico, Alejandro González-Hernández, Universidad Autonoma de Nuevo Leon, San Nicolas de los Garza, Mexico, Sostenes Varela-Fuentes, Universidad Autonoma de Tamaulipas, Victoria, Mexico and **J. Isabel López-Arroyo**, lopez.jose@inifap.gob.mx, Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias, Nuevo León, Mexico

D0722 Genetic variation in insectary-produced and wild-caught biological control species *Diglyphus isaea* (Hymenoptera: Eulophidae) and *Chrysoperla rufilabris* (Neuroptera: Chrysopidae). **Dianna Krejsa**, dianna.krejsa@my.simpson.edu, Simpson College, Indianola, IA

D0723 Molecules and morphology reveal unexpected cryptic diversity in the genus *Necremnus* Thomson (Hymenoptera: Eulophidae). **Marco Gebiola**, marco.gebiola@gmail.com[1], Umberto Bernardo[1], Paolo Navone[2], Antoni Ribes[3] and Gary Gibson[4], [1]Consiglio Nazionale delle Ricerche, Portici, Italy, [2]Università degli Studi di Torino, Grugliasco, Italy, [3]Italy, [4]Canadian National Collection of Insects, Ottawa, ON, Canada

D0724 Coevolution, phylogeography and haplotype diversity in a species complex of parasitoid wasps, their polydnaviruses and caterpillar hosts. **Kate Muirhead**, katherine.muirhead@adelaide.edu.au[1], Peter Allsopp[2], Nader Sallam[2] and Andrew D. Austin[3], [1]The Univ. of Adelaide, Adelaide, Australia, [2]Australia, [3]Univ. of Adelaide, Adelaide, SA 5005, Australia

D0725 Beekeeping in ancient Egypt: The lost scene from Saqqara. **Gene Kritsky**, cdarwin@aol.com, College of Mount St. Joseph, Cincinnati, OH

D0726 Constructing artificial nest sites for ground nesting native bees. **John Wenzel**, WenzelJ@CarnegieMNH.Org, Carnegie Museum of Natural History, Rector, PA

D0727 Genetic diversity populations of the blue orchard bee, *Osmia lignaria*, in eastern and western North America. **Richard Roehrdanz**, richard.roehrdanz@ars.usda.gov and Sheila Sears Wichmann, USDA, Agricultural Research Service, Fargo, ND

D0728 Interactions between *Varroa* mites and their honey bee hosts. **Olav Rueppell**, olav_rueppell@uncg.edu and Kaira Wagoner, Univ. of North Carolina at Greensboro, Greensboro, NC

D0729 The Bees' Needs: A citizen science project. **Virginia Scott**, Virginia.Scott@colorado.edu[1], Alexandra Rose[1] and M. Deane Bowers[2], [1]Univ. of Colorado Museum of Natural History, Boulder, CO, [2]Univ. of Colorado, Boulder, CO

D0730 Bee diversity and functional composition in grassland habitats of the tallgrass prairie. **Bethany S. Teeters**, bsteeters@huskers.unl.edu, Univ. of Nebraska-Lincoln, Lincoln, NE

D0731 Bees inhabiting a residential lot in a small midwestern town: Species, floral relationships, and nesting sites. **David Gordon**, dgordon@pittstate.edu, Pittsburg State Univ., Pittsburg, KS

D0732 Some biological aspects of Neotropical genus *Caenohalictus* Cameron, 1903 (Hymenoptera: Halictidae) in the Andes of Colombia. **Cindy Celis**, cindy.celis1@gmail.com[1], Marlene Lucía Aguilar[2] and Jose Ricardo Cure[1], [1]Nueva Granada Military Univ., Bogota, Colombia, [2]São Paulo Univ., Ribeirão Preto, Brazil

D0733 Activation and viability of the ovaries and mating effect in the development of the spermatheca of females of *Bombus* (*Fervidobombus*) *morio* (Hymenotera: Apidae). **Marlene Lucía Aguilar**, maluaguilarb@gmail.com[1], José Eduardo Serrão[2] and Lucio Antonio de Oliveira Campos[2], [1]São Paulo Univ., Ribeirão Preto, Brazil, [2]Universidade Federal de Viçosa, Viçosa, Brazil

D0734 The beetle families of Peru. Matthew L. Gimmel, Louisiana State Univ., Baton Rouge, LA and **Caroline S. Chaboo**, cschaboo@ku.edu, Univ. of Kansas, Lawrence, KS

D0735 Inventory of the carabid beetles (Coleoptera: Carabidae) of the Gaoligong Mountains, western Yunnan Province, China: Species of genus *Omophron* Latreille, 1802. **David H. Kavanaugh**, dkavanaugh@calacademy.org and Roberta L. Brett, California Academy of Sciences, San Francisco, CA

D0736 Beetle (Coleoptera: Carabidae) and ant (Hymenoptera: Formicidae) diversity in urban and forest islands in the agricultural landscape of central Illinois. **Leah Benuska**, benuska2@illinois.edu[1], Andrea Walker[2] and Andrew V. Suarez[2], [1]Univ. of Illinois Champaign-Urbana, Elmhurst, IL, [2]Univ. of Illinois, Urbana, IL

D0737 The cyclosomine ground beetles (Coleoptera: Carabidae: Cyclosomini) of the Gaoligong Mountains, western Yunnan Province, China. **Mollie Cueva-Dobkoski**, mcueva-dobkoski@calacademy.org, Johns Hopkins Univ., Baltimore, MD and David H. Kavanaugh, California Academy of Sciences, San Francisco, CA

D0738 Courtship flash communication in two *Photuris* fireflies. **Lawrent Buschman**, lbuschma@ksu.edu, Kansas State Univ., Bailey, CO

D0739 Biodiversity of water beetles assembled by light trapping in Malaysia. **Fauziah Abdullah**, q5fauzi@yahoo.com, Univ. Malaya, Kuala Lumpur, Malaysia

D0740 Results from the Regional Identification Center of the USDA-APHIS (Eastern Region) for the 2013 Wood Boring Beetle Surveys. **Jennifer Seltzer**, jls30@entomology.msstate.edu, Terence Schiefer and Richard L. Brown Brown, Mississippi Entomological Museum, Mississippi State, MS

D0741 Genetic identification of shot hole borers, *Euwallacea fornicatus*, associated with fusarium dieback in California. Paul F. Rugman-Jones and **Richard Stouthamer**, richard.stouthamer@ucr.edu, Univ. of California, Riverside, CA

D0742 Comparison of purple vs clear sticky traps for the capture of buprestid and cerambycid beetles. **Nadeer Youssef**, nyoussef@blomand.net, Jason B. Oliver, Joshua P. Basham and Joseph Lampley, Tennessee State Univ., McMinnville, TN

D0743 Interactive key and Illustrated guide to *Agrilus planipennis* Fairmaire and related species (Coleoptera: Buprestidae). **Maria Lourdes Chamorro**, lourdes.chamorro@ars.usda.gov[1], Eduard Jendek[2], Robert A. Haack[3], Mark G. Volkovitsh[4], Toby R. Petrice[5], Alexander S. Konstantinov[6], Norman E Woodley[1], Therese M. Poland[5], Xing-Ke Yang[7] and Steve W. Lingafelter[1], [1]USDA, Systematic Entomology Laboratory (SEL), Washington, DC, [2]Canadian Food Inspection Agency, Ottawa, ON, Canada, [3]USDA - Forest Service, East Lansing, MI, [4]Zoological Institute of the Russian Academy of Sciences, St.Petersburg, Russia, [5]USDA Forest Service, East Lansing, MI, [6]Systematic Entomology Lab. USDA, Washington, DC, [7]Institute of Zoology, Chinese Academy of Sciences, Beijing, Beijing, China

D0744 Systematics of *Aegialites* in the Alaskan Pribilof Islands (Coleoptera: Salpingidae). **Casey Bickford**, cebickford@alaska.edu, Univ. of Alaska Museum, Fairbanks, AK

D0745 Identification of the American burying beetle, *Nicrophorus americanus*, through image processing. **Bo Li**, bo.li@okstate.edu, Oklahoma State Univ., Stillwater, OK

D0746 Morphological analysis of three North American species of *Oiceoptoma* (Coleoptera: Silphidae) with implications for forensic science. **Brent C. Rahlwes**, STDBCR16@SHSU.EDU[1], Christopher M. Wilson[1], Natalie K. Lindgren[1], Alan D. Archambeault[1], Melissa S. Sisson[1], Timothy Campbell[2] and Sibyl, R. Bucheli[1], [1]Sam Houston State Univ., Huntsville, TX, [2]Texas A&M Univ., College Station, TX

D0747 Molecular analysis of three carrion feeding species of *Oiceoptoma* (Coleoptera: Silphidae) for species delineation. Natalie K. Lindgren[1], **Alan D. Archambeault**, alan_archambeault@yahoo.com[1], Christopher M. Wilson[1], Brent C. Rahlwes[1], Melissa S. Sisson[1], Timothy Campbell[2] and Sibyl, R. Bucheli[1], [1]Sam Houston State Univ., Huntsville, TX, [2]Texas A&M Univ., College Station, TX

D0748 Biodiversity of stag beetles (Lucanidae) in a temperate deciduous forest: Results of a five-year study. **Marlin E. Rice**, marlinrice@gmail.com, none, Ames, IA

D0749 Morphology, molecules, and *Mimeoma* scarabs: Evolutionary and ecological implications for a palm-associated scarab group (Coleoptera: Scarabaeidae: Dynastinae). Matthew Moore, Cristian Beza-Beza, David Wickell, James Beck and **Mary Liz Jameson**, maryliz.jameson@gmail.com, Wichita State Univ., Wichita, KS

D0750 Rarity and endemicity on the edge: The dynastine scarab beetles of the West Indies. **Ronald Cave**, rdcave@ufl.edu, Univ. of Florida, Ft. Pierce, FL and Brett C. Ratcliffe, Univ. of Nebraska, Lincoln, NE

D0751 Microbial symbionts of the red palm weevil, *Rhynchophorus ferrugineus*: Insights from 16S rRNA pyrotag studies. **Bessem Chouaia**, bessem.chouaia@unimi.it[1], Matteo Montagna[1], Violetta Vacchini[1], Sara Epis[2], Giuseppe Mazza[3], Erica Prosdocimi[1], Elena Crotti[1], Santi Longo[4], Luciano Sacchi[5], Annamaria Giorgi[1], Rita Cervo[6], Daniele Daffonchio[1], Giuseppe Lozzia[1] and Claudio Bandi[2], [1]Univ. of Milan, Milan, Italy, [2]Univ. of Milan, Milano, Italy, [3]Agricultural Research Council, Florence, Italy, [4]Università degli Studi di Catania, Catania, Italy, [5]Università degli Studi di Pavia, Pavia, Italy, [6]Università degli Studi di Firenze, Sesto Fiorentino, Italy

D0752 Identification, sequencing and analysis of candidate receptor genes to *Bacillus thuringiensis* (Bt) Cry toxin from western corn rootworm. **Kyung Seok Kim**, kyungkim@snu.ac.kr[1], Ronald D. Flannagan[2] and Brad Coates[1], [1]USDA-ARS, Ames, IA, [2]Monsanto Company, Chesterfield, MO

D0753 Comparison of mitochondrial genome sequences from northern and western corn rootworms. **Brad Coates**, Brad.Coates@ARS.USDA.GOV, USDA-ARS, Ames, IA

D0754 Population genetics of *Cryptocephalus barii* (Coleoptera: Chrysomelidae), a species endemic to the Orobie mountains (Alps, Italy). **Matteo Montagna**, matteo.montagna@unimi.it, Annamaria Giorgi, Edoardo D'angelo, Davide Sassi and Giuseppe Lozzia, Univ. of Milan, Milan, Italy

D0755 Molecular phylogeny of the shining leaf beetles (Chrysomelidae: Criocerinae) with special focus on *Lema* (Fabricius, 1798). **Sofia Muñoz**, simunoz@ku.edu, The Univ. of Kansas, Lawrence, KS, Fred Vencl, Stony Brook Univ., Stony Brook, NY and Caroline S. Chaboo, Univ. of Kansas, Lawrence, KS

D0756 WoNA - Weevils of North America: A virtual, specimen-based platform using Symbiota. **Nico M. Franz**, nico.franz@asu.edu[1], Charles W. O'Brien[2], Sarah Shirota[1] and Michael Shillingburg[1], [1]Arizona State Univ., Tempe, AZ, [2]Univ. of Arizona, Retired, Visiting Scholar, Tucson, AZ

D0757 A survey of the primitive weevils of Wisconsin (Coleoptera: Orthoceri). **Julia Janicki**, jhjanicki@gmail.com, UW-Madison, Madison, WI

D0758 Native and exotic bark and ambrosia beetles (Coleoptera: Curculionidae: Scolytinae) in northeastern Illinois, with new distributional records. **Charles Helm**, cghelm@comcast.net and Brenda Molano-Flores, Illinois Natural History Survey, Champaign, IL

D0759 Beta diversity of Curculionoidea (Insecta: Coleoptera) along an altitudinal transect in Huasalingo, Hidalgo, Mexico. **Javier Obregón**, chaos_857@hotmail.com[1], Robert Jones[1] and Santiago Niño[2], [1]Universidad Autónoma de Querétaro, Santiago de Querétaro, Mexico, [2]Universidad Autónoma de Tamaulipas, Cd. Victoria, Mexico

SUNDAY, NOVEMBER 10, 2013
TUESDAY, NOVEMBER 12, 2013
WEDNESDAY, NOVEMBER 13, 2013

VIRTUAL POSTERS

Meeting Room 11 AB (Austin Convention Center)

VP01 Combined effect of some bio agents against the grasshopper *Hetiracris littoralis* under semi-field condition. **Aziza Sharaby**, sharaby.aziza@yahoo.com, Professor of Entomology, National Research Center, Cairo, Egypt

VP02 *Triatoma mexicana* Herrich-Schaeffer (Hemiptera: Reduviidae: Triatominae): Description of the external male genitalia and external morphology of the female. **Paz Salazar-Schettino**, pazmar@unam.mx, Gloria Rojas-Wastavino, Mauro Vences-Blanco and Margarita Cabrera-Bravo, Facultad de Medicina, Universidad Nacional Autónoma de México, Distrito Federal, Mexico

VP03 Indian spider wasps (Hymenoptera: Vespoidea: Pompilidae): After a century . **Samrat Bhattacharjee**, samrat.scc@gmail.com, Scottish Church College, Kolkata, India

VP04 Functional trophic guilds in a subtropical arid agroecosystem: Which is the most beneficial? **Norma Mujica**, nmujica@cgiar.org and Jürgen Kroschel, International Potato Center (CIP), Lima, Lima, Peru

VP05 Managing mosquito-borne disease risk in response to weather, wetlands and wildlife in coastal Australia. **Cameron Webb**, cameron.webb@swahs.health.nsw.gov.au, Univ. of Sydney, Pathology West – ICPMR Westmead, Westmead, Australia

VP06 A review of distributional data on Colombian entimine weevils (Coleoptera: Curculionidae: Entiminae). **Jennifer Girón**, entiminae@gmail.com, Universidad Santo Tomás - Sede Villavicencio, Villavicencio, Colombia and Nico M. Franz, Arizona State Univ., Tempe, AZ

VP07 Independent evolving lineages within an asexual weevil: Is *Naupactus cervinus* a complex of species? **Marcela Rodriguero**, rodriguero@ege.fcen.uba.ar[1], Agustín Elías Costa[1], Analía Lanteri[2] and Viviana Confalonieri[1], [1]Univ. of Buenos Aires, Buenos Aires, Argentina, [2]Univ. of La Plata, La Plata, Argentina

VP08 The use of DNA barcode to identifying Sarcophagidae species (Diptera: Muscomorpha) of forensic importance from Brazil. **Carina Mara Souza**, mara@yahoo.com.br, State Univeristy of Campinas, Campinas, São Paulo, Brazil, Patrícia J. Thyssen, Universidade Federal de Pelotas (UFPel), Capao do Leao, RS, Brazil and Roseli Tuan, Superintendency for Endemic Diseases Control, São Paulo, Brazil

VP09 Invasive species of insects in the ecosystems of the Aspromonte Mountain, Italy. Antonino Siclari[1], Elvira Castiglione[2], Francesco Manti[2] and **Carmelo Bonsignore**, cbonsignore@unirc.it[2], [1]Ente Parco Nazionale d'Aspromonte, Santo Stefano d'Aspromonte, Italy, [2]Università degli Studi Mediterranea di Reggio Calabria, Calabria, Italy

VP10 Preference-performance in polyphagous *Copitarsia decolora* and *Peridroma saucia*: Are mothers or larvae right? **María Gómez-Jiménez**, m.i.gomez@cgiar.org[1], Carlos Sarmiento[2], María Díaz[3], Alexander Chautá[4], Andrés Peraza[3], Augusto Ramírez[3] and Katja Poveda[5], [1]International Center for Tropical Agriculture, Entomology, Cali, Colombia, [2]Universidad Nacional de Colombia, Instituto de Ciencias Naturales, Bogotá, Colombia, [3]Universidad Nacional de Colombia, Facultad de Agronomía, Bogotá, Colombia, [4]Universidad Nacional de Colombia, Departamento de Biología, Bogotá, Colombia, [5]Cornell Univ., Entomology, Ithaca, NY

VP11 Mortality of emerald ash borer in urban populations in Ontario, Canada. **Chris J K MacQuarrie**, cmacquar@nrcan.gc.ca, Natural Resources Canada, Sault Ste. Marie, ON, Canada and Roger Scharbach, Natural Resources Canada, Sault Ste Marie, ON, Canada

VP12 Distribution of cutaneous leishmaniasis in southwestern Iran during 2007-2012. **Gholam Hossein Shahraki**, Shahraki.gh@gmail.com, Yasuj Univ. of Medical Sciences, Yasuj, Iran

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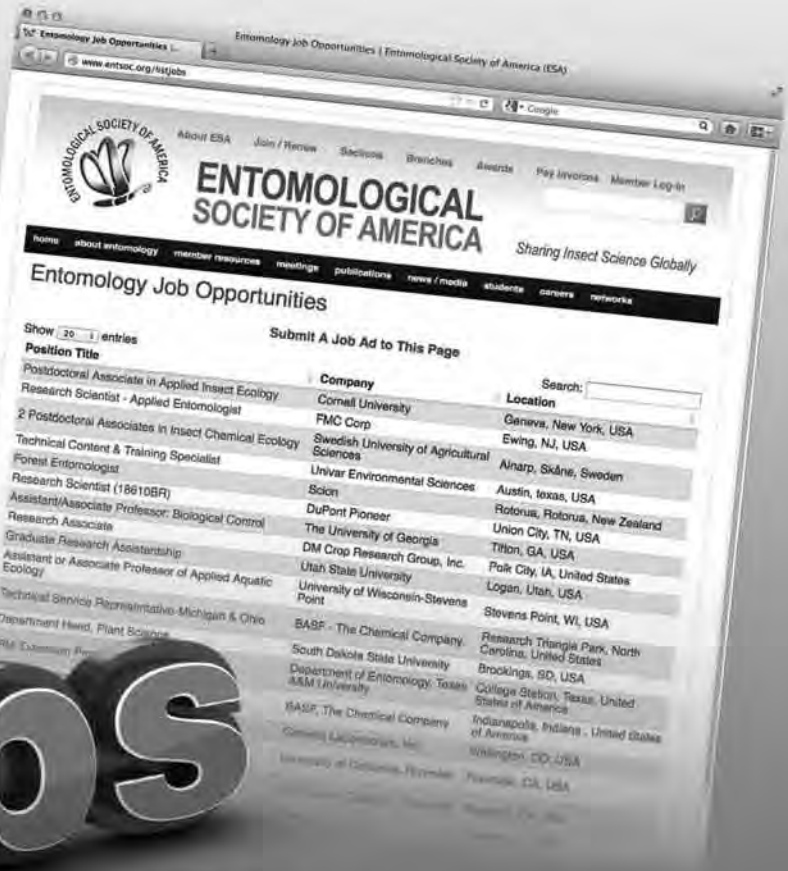

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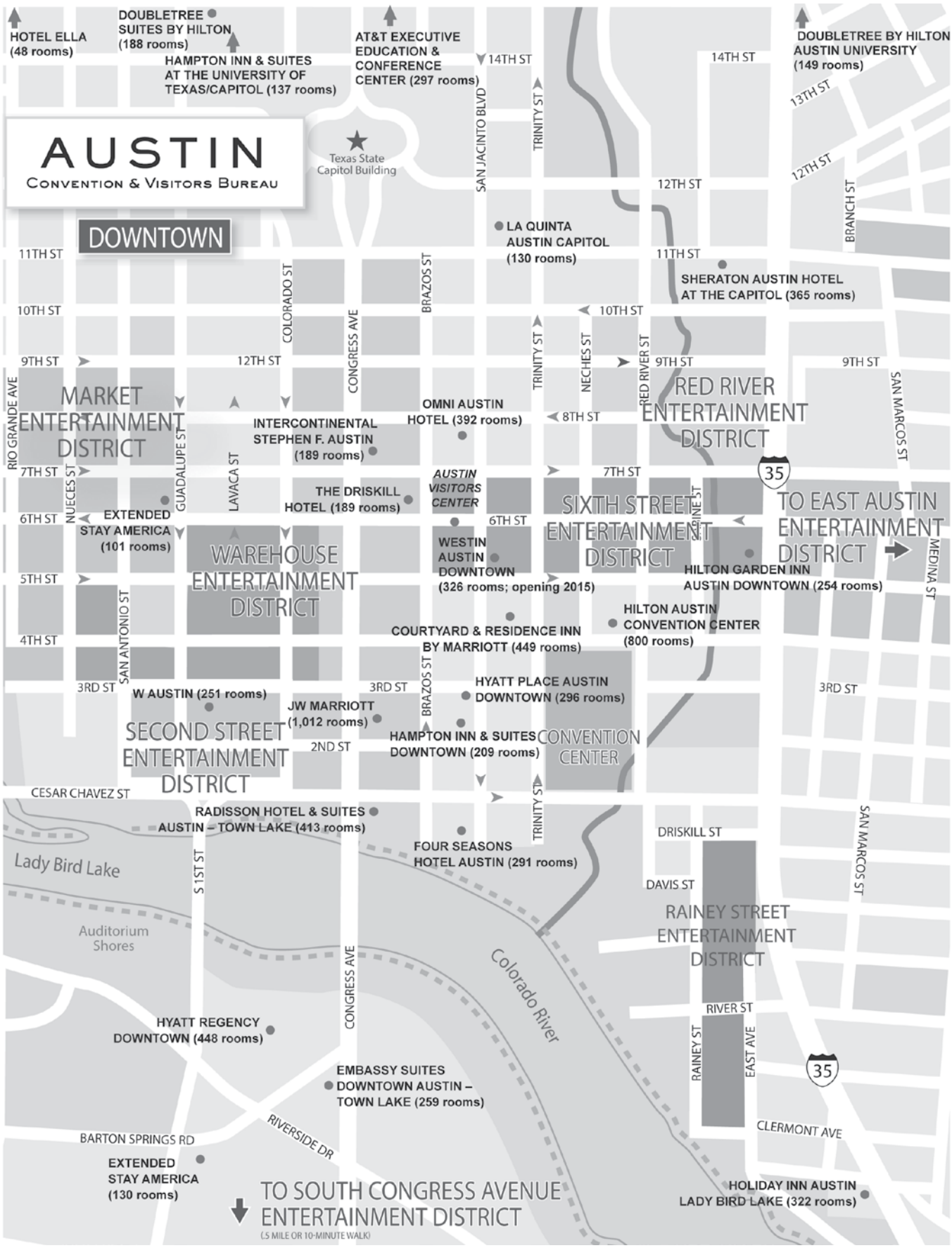
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DOUBLETREE SUITES BY HILTON (188 rooms)
HAMPTON INN & SUITES AT THE UNIVERSITY OF TEXAS/CAPITOL (137 rooms)
AT&T EXECUTIVE EDUCATION & CONFERENCE CENTER (297 rooms)
DOUBLETREE BY HILTON AUSTIN UNIVERSITY (149 rooms)
Texas State Capitol Building
LA QUINTA AUSTIN CAPITOL (130 rooms)
SHERATON AUSTIN HOTEL AT THE CAPITOL (365 rooms)
OMNI AUSTIN HOTEL (392 rooms)
INTERCONTINENTAL STEPHEN F. AUSTIN (189 rooms)
THE DRISKILL HOTEL (189 rooms)
AUSTIN VISITORS CENTER
EXTENDED STAY AMERICA (101 rooms)
WESTIN AUSTIN DOWNTOWN (326 rooms; opening 2015)
HILTON GARDEN INN AUSTIN DOWNTOWN (254 rooms)
HILTON AUSTIN CONVENTION CENTER (800 rooms)
COURTYARD & RESIDENCE INN BY MARRIOTT (449 rooms)
W AUSTIN (251 rooms)
JW MARRIOTT (1,012 rooms)
HYATT PLACE AUSTIN DOWNTOWN (296 rooms)
HAMPTON INN & SUITES DOWNTOWN (209 rooms)
RADISSON HOTEL & SUITES AUSTIN – TOWN LAKE (413 rooms)
FOUR SEASONS HOTEL AUSTIN (291 rooms)
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(.5 MILE OR 10-MINUTE WALK)
Lady Bird Lake
Auditorium Shores
Colorado River
14TH ST
13TH ST
12TH ST
11TH ST
10TH ST
9TH ST
8TH ST
7TH ST
6TH ST
5TH ST
4TH ST
3RD ST
2ND ST
CESAR CHAVEZ ST
BARTON SPRINGS RD
SAN JACINTO BLVD
TRINITY ST
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LAVACA ST
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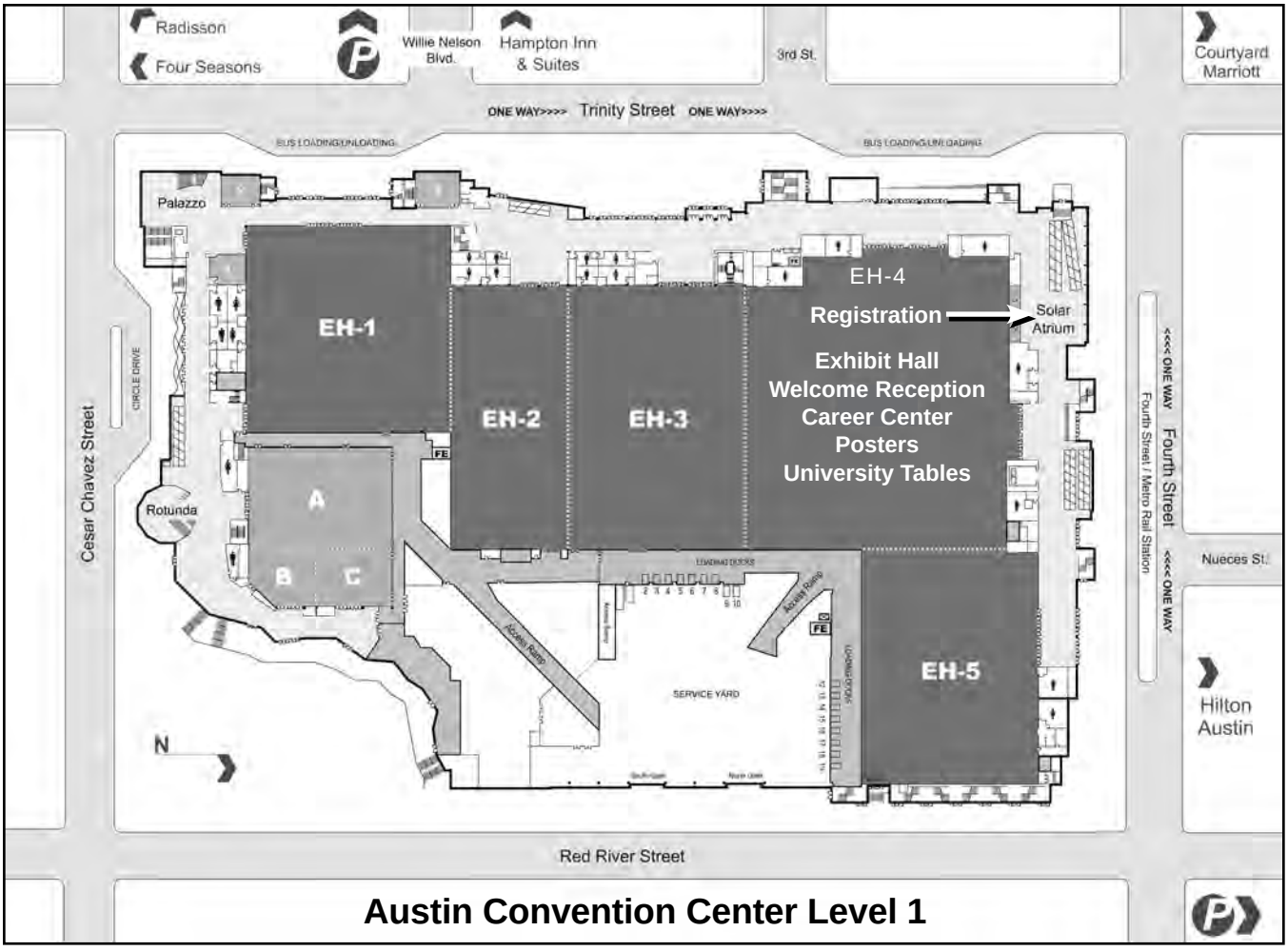
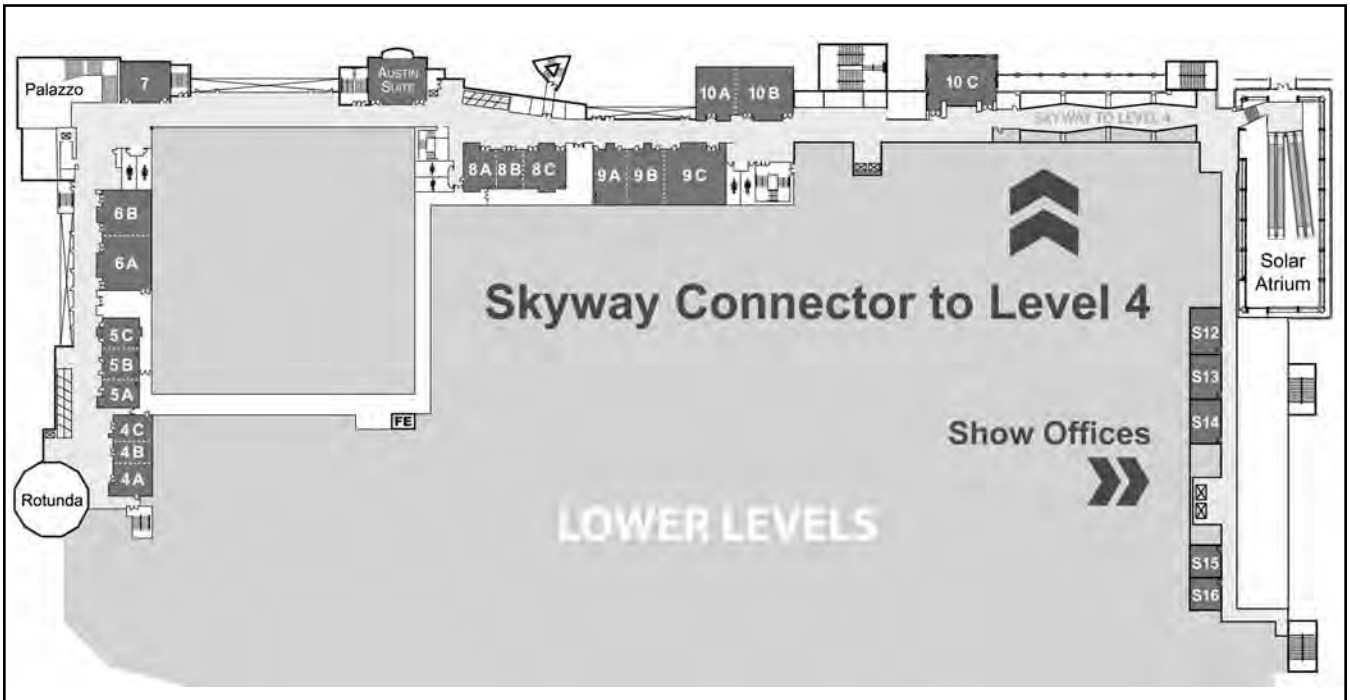
SAN ANTONIO ST
S 1ST ST
DRISKILL ST
DAVIS ST
RIVER ST
RAINEY ST
EAST AVE
CLERMONT AVE
RIVERSIDE DR
35



Austin Convention Center Level 1



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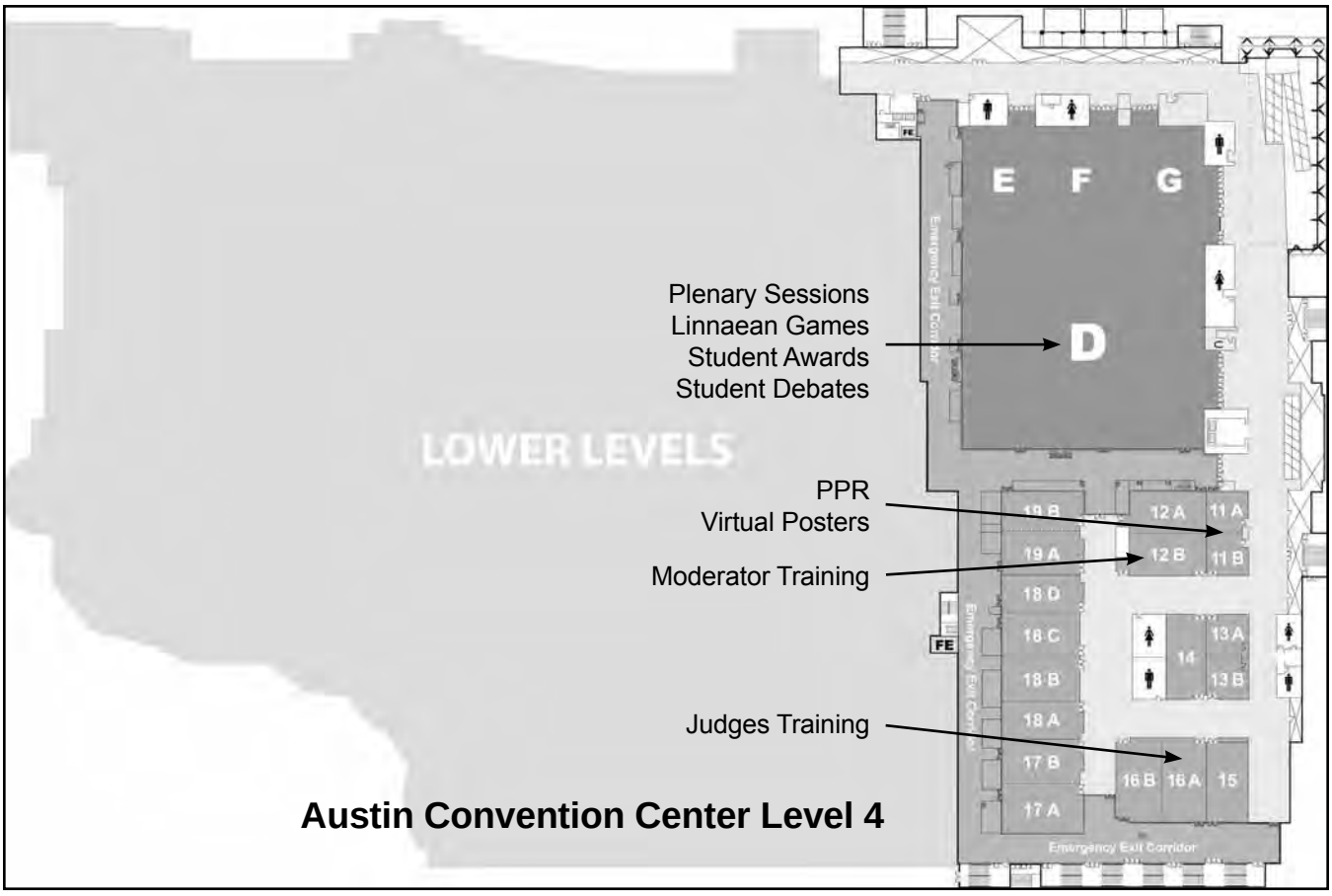

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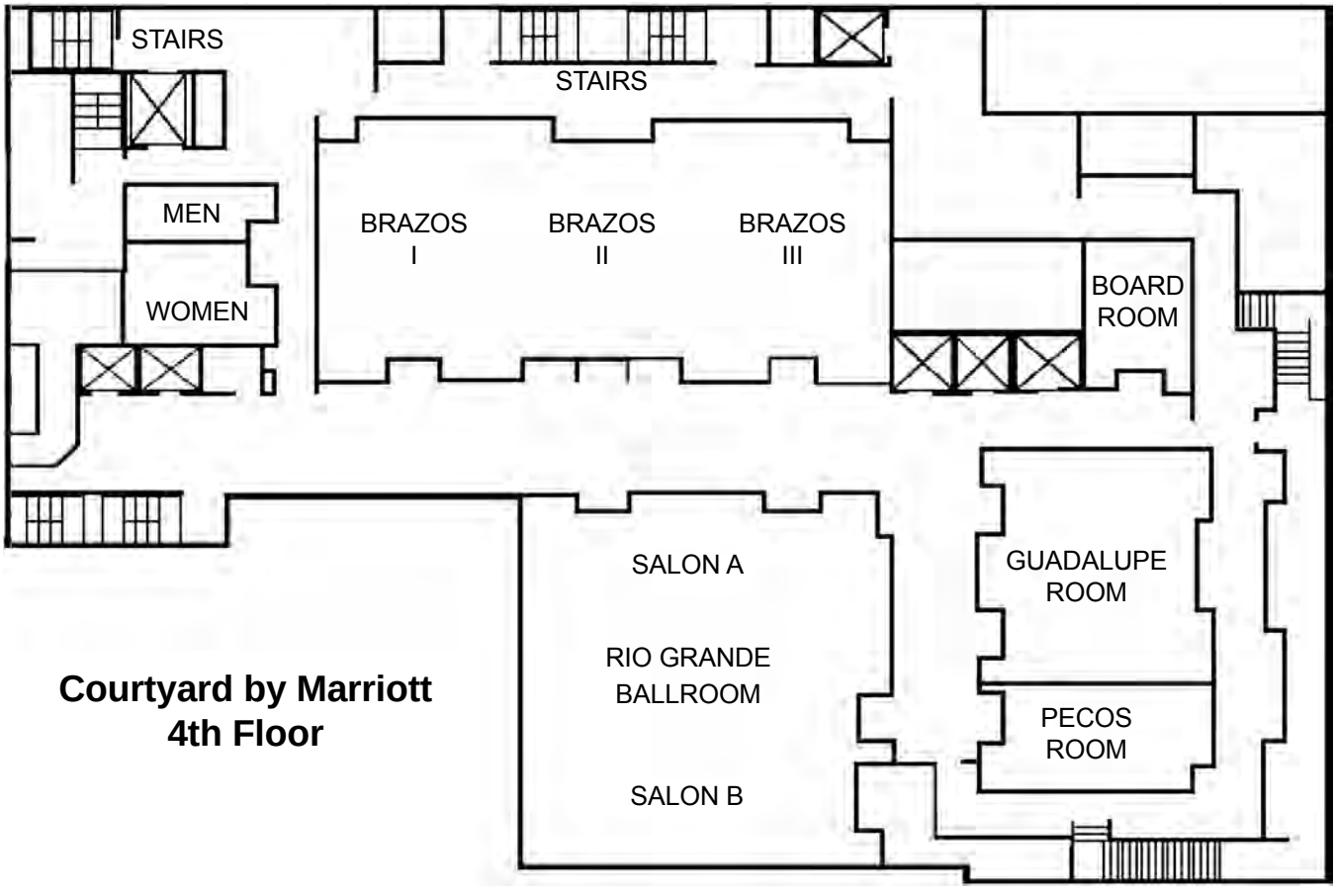

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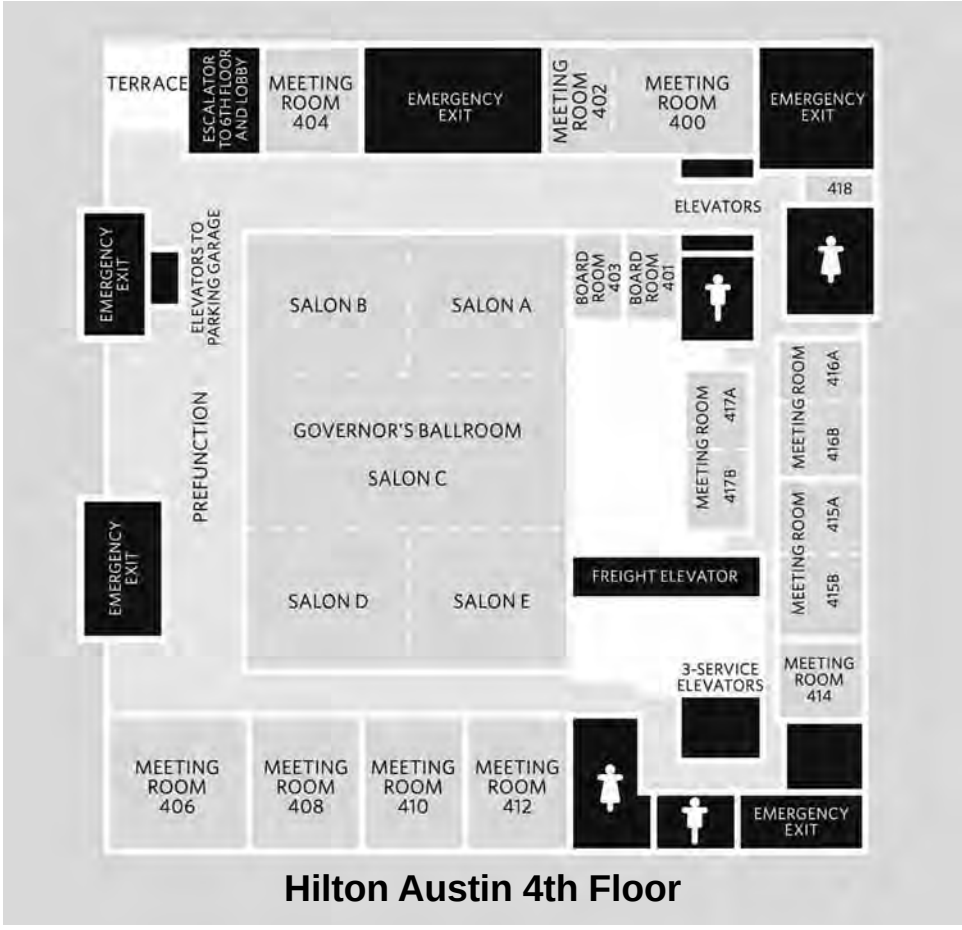
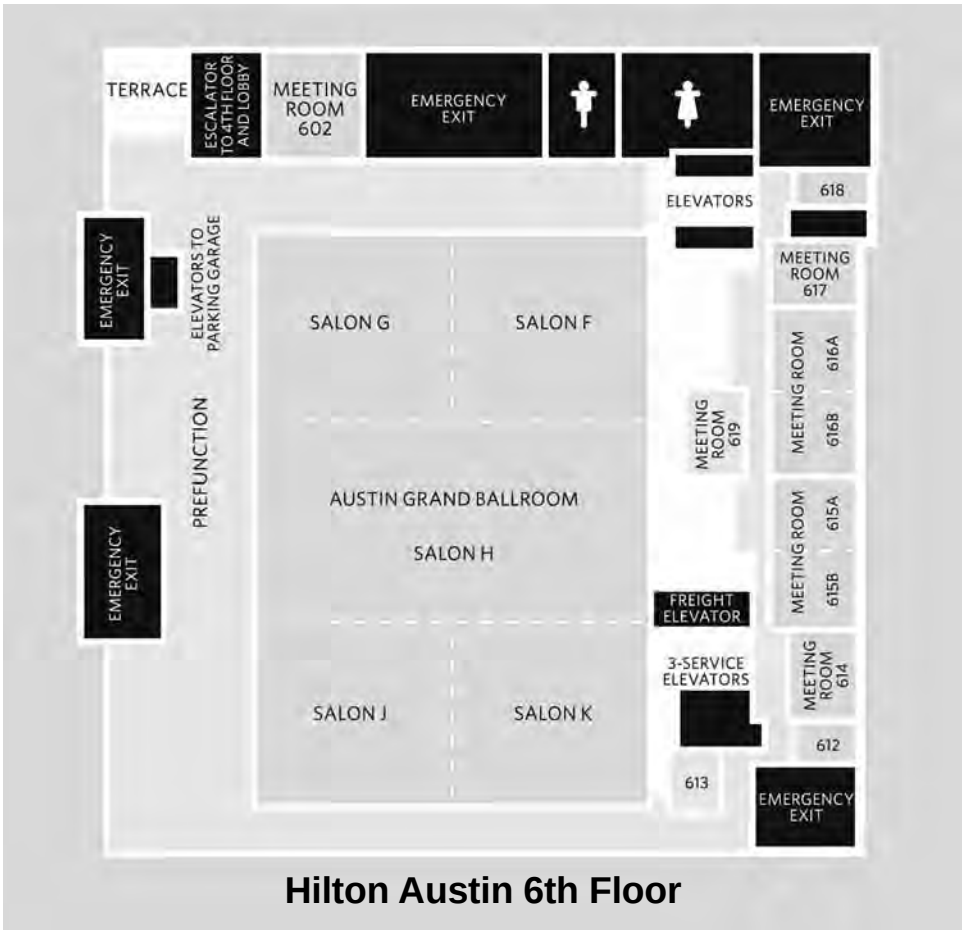


Hilton Austin 4th Floor



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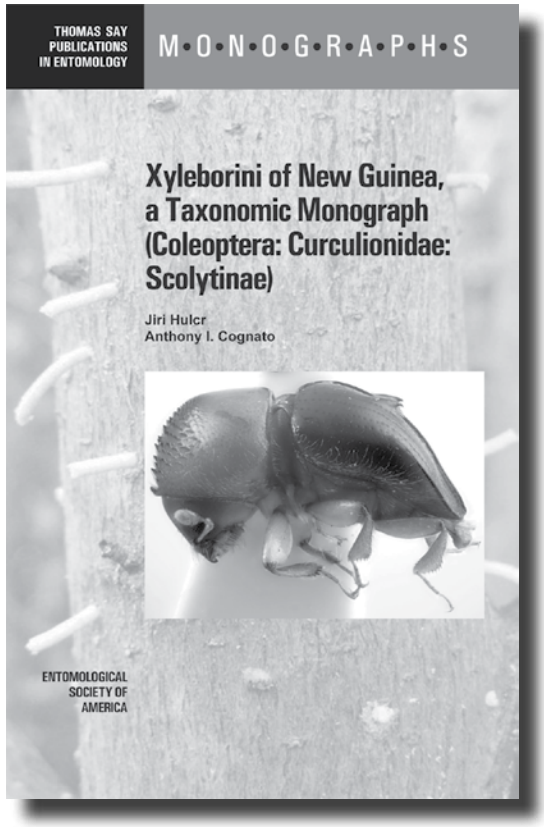

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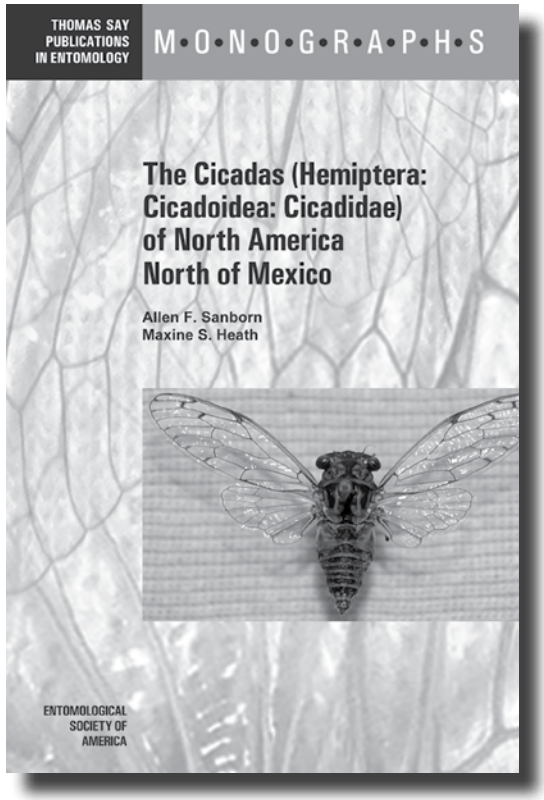

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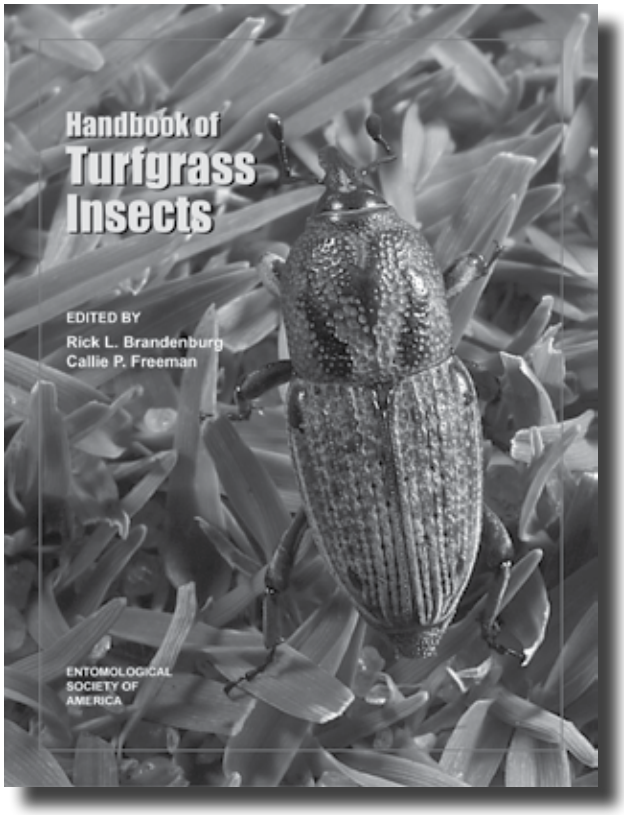
Handbook of Turfgrass Insects, Second Edition

Edited by Rick L. Brandenburg and Callie P. Freeman



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144 pages, softcover, 2012
ISBN 978-0-9776209-4-4

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