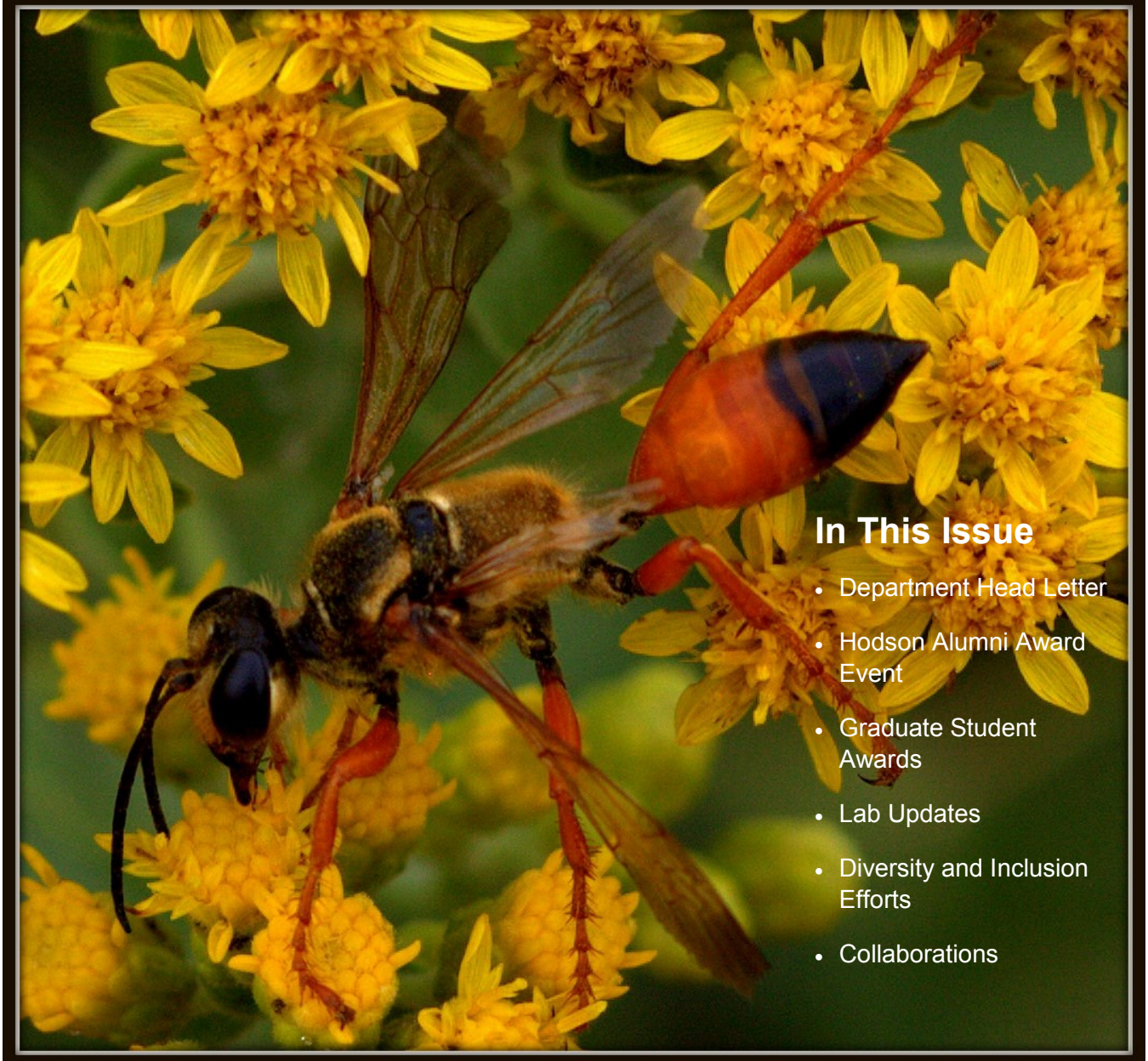
ENTOMOLOGY

Alumni & Friends Newsletter
UNIVERSITY OF MINNESOTA

Entomology Department Newsletter **2016-2017**



In This Issue

Photo by Mark Ascerno 2016

UNIVERSITY OF MINNESOTA
Driven to Discover℠

Interim Department Head Letter *Passing of the Torch*

Dr. Stephen Kells, Department Head (Interim) and Associate Professor

For the past 22 months, I have had the unique opportunity to lead the Entomology Department while we looked for a permanent Department Head (DH). This interim position afforded me valuable insights into the leadership of both our department as well as the college as a whole. I have a number of people to thank for their support and input during my term as Interim DH, starting with our faculty, staff and students. The performance and excellence of our department as a comprehensive research and education program in all aspects of insects and arthropods made it easy for me to concentrate on developing additional opportunities to enhance our core mission. The guidance and mentorship from Dean Brian Buhr, the College Executive, and College Staff, was particularly invaluable as I looked to support both our departmental core mission and respond to challenges encountered at the College level.

I have several individuals in the department who I would like to recognize. I thank our previous Department Heads, Drs. Mark Ascerno and Bill Hutchison for their guidance through my term as interim DH. They provided perspectives on past departmental leadership activities that greatly reduced the "guesswork" that I otherwise would have employed with some of the leadership decisions. I would like to take the opportunity to welcome Dr. Sujaya Rao to the department as our new Department Head. I have heard Dr. Rao speak on a number of topics at Entomology meetings, including particular leadership challenges as a Department Chair, as well as elements in undergraduate education. Through these presentations, and her work with undergraduate research experience programs, I am excited about the new and unique directions open to our department that will further strengthen what is already a strong program in entomology.

Dr. Sujaya Rao, Department Head and Professor

Greetings from the New Department Head

I am honored to have been selected as the DH for Entomology! I have received the torch from Steve Kells, and I am enjoying my interactions with faculty, staff, students, alumni, stakeholders, and administrators. I look forward to working together to maintain the department's stellar national and international reputation in research and graduate education while developing opportunities for increasing undergraduate engagement in entomology – in courses and in research. I have been fortunate to have had opportunities over the course of my career to conduct basic and applied IPM (field and horticultural crops) and pollinator (native bees) research, teach diverse graduate and undergraduate courses, interact with stakeholders and the public through extension and outreach programs, lead NSF- sponsored graduate and undergraduate training programs, and to take on leadership positions in ESA. The Department Head position gives me an opportunity to build on these experiences while giving back to the institution that provided me my initial training in the US. I am a proud alumnus of the Entomology Department at UMN! Thank you Steve Kells for stepping in as the Interim Department Head when Bill Hutchison decided to pass the baton, so that he could focus on research. Under Steve's leadership, he re-connected with our graduate students to ensure a strong Frenatae and also provided the groundwork for a new faculty position. We wish Steve success in his resumed research and extension endeavors! Finally, I look forward to reaching out to our numerous Alumni and Friends of the department. For those who can join us, please plan to attend the Annual Hodson Alumni and Graduate Awards event, which will be in late April this year (watch for the specific dates). In the meantime, when you have a chance, please do stop by and say hello.

2017 Hodson Alumni Award Recipient

Dr. Marc E. Epstein

from Frenatae to below the Fish tanks: HOW HANGIN' AROUND HODSON HALL HELPED MY ENT CAREER @ SI & CDFA

•Author of "Moths, Myths, and Mosquitoes: The Eccentric Life of Harrison G. Dyar Jr.", published in 2016 by Oxford U Press. The biography explored Dyar's extraordinary contributions to entomology, as well as his legendary personal life. Unbeknownst to Epstein, his research on Dyar began at Hodson Hall Library, University of Minnesota in 1984

•Senior Insect Biosystematist at the California Department of Food and Agriculture for Lepidoptera –moths and butterflies

•Dr. Epstein's has worked for the last thirteen years at the Plant Pest Diagnostics Center in South Sacramento. The modern lab includes dozens scientists and support staff for entomology, plant pathology, seeds, nematology, and botany, all whose mission is critical for protecting California agriculture from plant pests. While identifying Lepidoptera of potential threat to agriculture, he researches their evolution, classification, and larval behaviour, and the history of entomologists who were his predecessors

•He is also a Research Associate at the Smithsonian Institution's National Museum of Natural History, where he was a postdoc and on staff for 15 years. He co-founded the Entomology Department's Illustration Archives and Archives, and was the lead in moving the Department's Lepidoptera, Hemiptera, Hymenoptera, and Arachnida collections to the East Wing and East Court

•He received a Ph.D. and M.S. in Entomology at the University of Minnesota, 1988 and 1982, and a B.S. in Entomology at Colorado State while on a music scholarship in 1977. Outside of work Marc continues to perform and teach clarinet around Sacramento, performing klezmer , classical, and Latin Jazz

•Was a guest on NPR's Fresh Air" with Terry Groos in 2004 about his work on the book "Night Visions: the Secret Design of Moths"

•Produced a CD that included two of his original tunes The Frelichmakers Klezmer String Band's "Klezmer at the Confluence" in 2010.

Hodson Award Event

2016 FAME Award

Dr. Roger Moon , and Graduate Student, Ahn Tran

Graduate Student, **Ahn Tran**, presented **Dr. Roger Moon** with the 2016, **Faculty Award for Mentorship in Entomology** (FAME). This award is provided by our graduate students, and is presented to the faculty member, who receives the highest number student votes, for their mentorship activities throughout the year.

Congratulations Roger!

2016 Graduate Student Awards

Director of Graduate Studies, **Dr. Tim Kurtti**, presented the departmental scholarships/fellowships to the winning graduate students.

Tavvs Alves, Ph.D. (Koch) was awarded the **Lugger-Radcliffe Fellowship**. This fund supports full-time prospective or current graduate students working toward Master of Science or Doctoral Degrees in the Department of Entomology.

The **Allan G. Peterson Fellowship** was awarded to **Ian Lane, M.S. (Spivak Lab)**. This fellowship provides support for master's degree students in the Department of Entomology at the University of Minnesota .

Petra Kranzfelder, Ph.D. (Ferrington) won the **Morris and Elaine Soffer Rockstein Fellowship.**This fellowship supports graduate students in the University of Minnesota's Department of Entomology, which provides research and education that inspires society to value the environmental contributions of insects and their relatives.

The Marion-Brooks Wallace Graduate Fellowship, was awarded to **Hannah Gray, Ph.D (Andow/Heimpel)**. This fellowship supports graduate students in the Department of Entomology at the University of Minnesota Twin Cities.

The first recipient, of the **Robert C. Hodson, Undergraduate Stipend** was awarded to **Undergraduate, Lea Graber.**

2017 FAME Award

Dr. George Heimpel and Graduate Student Dylan Tussey

Graduate Student, **Dylan Tussey**, presented **Dr. George Heimpel** with the 2017, **Faculty Award for Mentorship in Entomology** (FAME). This award is provided by our graduate students, and is presented to the faculty member, who receives the highest number student votes, for their mentorship activities throughout the year.

Congratulations George!

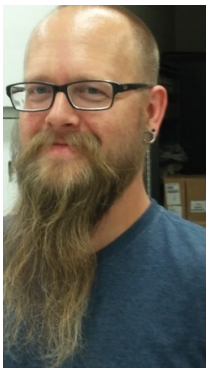
2017 Graduate Student Awards

Daniela Pezzini received the **Allan Peterson Graduate School Fellowship-** This fellowship provides support for master's degree students in the Department of Entomology at the University of Minnesota.

Theresa Cira was awarded the **Lugger-Radcliffe Graduate Fellowship** This fund supports full-time prospective or current graduate students working toward Master of Science or Doctoral Degrees in the Department of Entomology.

Samuel Fahrner Ward received the **Marion Brooks Wallace Graduate Fellowship**. This fellowship supports graduate students in the Department of Entomology at the University of Minnesota Twin Cities.

Anthony Auletta was awarded the Morris and Elaine Soffer Rockstein Graduate Fellowship**-** This fellowship supports graduate students in the University of Minnesota's Department of Entomology, which provides research and education that inspires society to value the environmental contributions of insects and their relatives.



James Menger was awarded the **Robert C. Hodson Memorial Undergraduate Stipend**

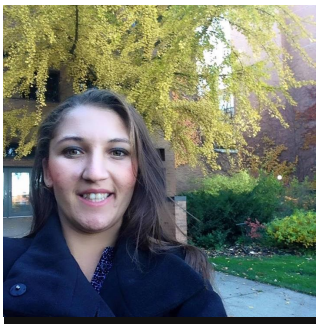
Welcome to the Department

New Graduate Students 2016

Correy Hildebrand
Thomson Lab

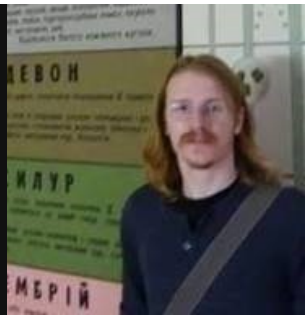
Dominique Ebbenga
Hutchison Lab

Alan Ritchie
Cariveau Lab



Obiratanea da Silva
Queiroz , Koch Lab

James Miksanek
Heimpel Lab



Corrie Nyquist, Ferrington Lab

Jake Wittman , Aukema
Lab

James Wolfin,
Spivak Lab

Ismael Ramirez
Heimpel Lab

Check out our graduate student profiles at
www.entomology.umn.edu/students/graduate-student-profiles

New Graduate Students 2017

Marie Hallinen
Aukema Lab

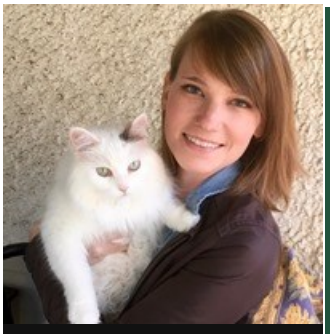
Dora Mwangola
Aukema Lab

Cody Thorpe
Krischik Lab

Michelle Boone
Cariveau Lab

Maggie Shanahan
Spivak Lab

Hailey Shanovich
Koch Lab



Mary Marek-Spartz
Heimpel Lab

Julia Brokaw
Cariveau Lab

Hollie Wall Dalenberg
Spivak Lab

Welcome to the Department

Welcome to the Department

New Staff 2016

Rebecca Boulton, Post Doc
Heimpel Lab

Kevin Chase, Post Doc
Aukema Lab

Aaron Irber, Researcher, Cariveau Lab

Byju Nambidiyattil
Govindan, Post Doc
Hutchison Lab

Tammi Pekkala-Matthews,
Executive Assistant

Kelton Welch, Post Doc
Heimpel Lab

New Staff 2017

Kiley Friedrich, Pollinator Crew Leader Cariveau Lab

Christina Herron-Sweet, Pollinator Crew Leader Cariveau Lab

Debora Pires Paula, Visiting Scientist Andow Lab

James Walker, Asst Curator Thomson Lab

Garett Slater, Bee Informed Partnership Spivak Lab

Michael Wilson, Researcher 6 Spivak Lab

Erin Treiber, PostDoc Spivak Lab

Welcome to the Department

New Emeritus Faculty

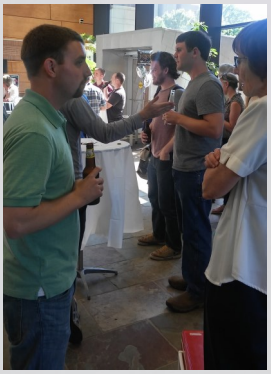
Moon Enters a New Phase 2016

After 36 years of research, teaching and outreach in Veterinary Entomology, **Roger Moon** officially retired from the departments faculty on June 10, 2016. He no longer teaches classes, but still inhabits his "corner" office and lab on 4th floor, where he continues ongoing research projects and consults with colleagues and graduate students. Stop in for a visit and ask how his band is doing and where he will be performing his next gig! Don't forget to ask him about how his new found home brewing hobby is coming along.

Thank you Roger for your many years of service!

Welcome to our

Emeritus Faculty!

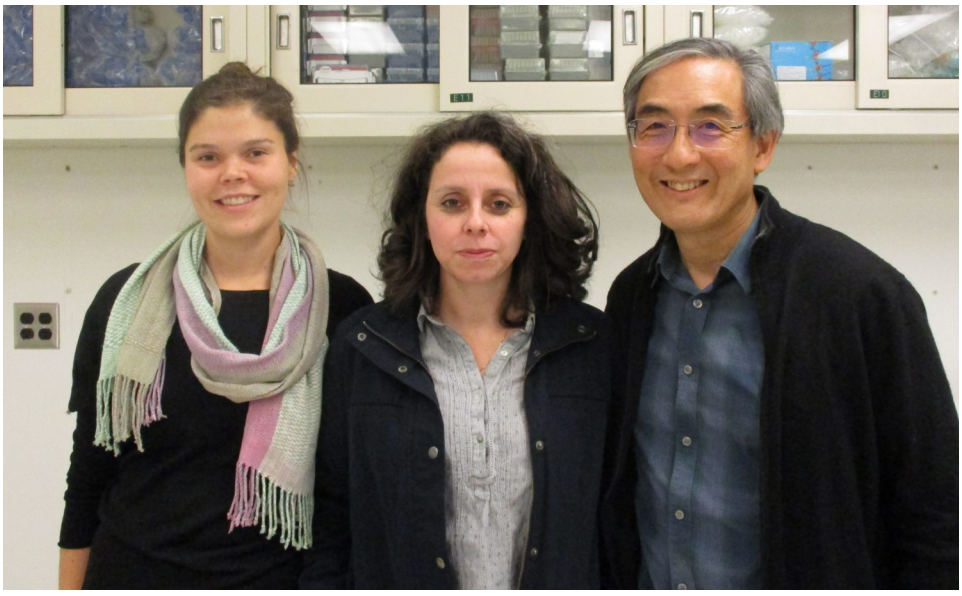


Andow Lab 2016

Andow Lab. Dave just returned from an exciting two-year leave and sabbatical in Brazil. During this time, he published 27 peer-reviewed papers and has 9 more in review (they are listed on his Department web page). His PhD student Hannah Gray spent several months in Brazil studying biological control in organic vegetable crop production systems for her thesis. Pictured is Hannah having a fun visit to Iguaçu Falls in Paraná.

Andow Lab 2017

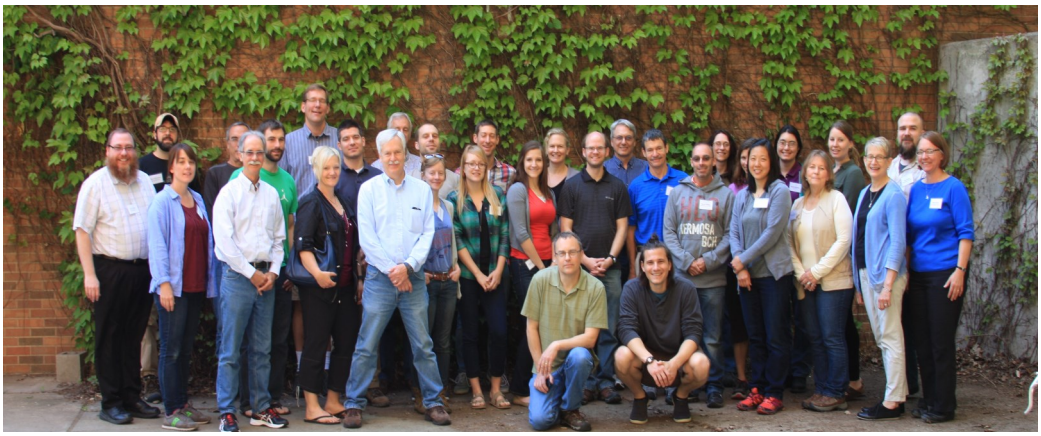
Since returning from a sabbatical in Brazil, the lab has undergone a major transformation. We received a significant Grant-in-aid from the graduate school to purchase equipment to conduct research in molecular ecology. With Dr. Debora Pires Paula as a co-PI, we are finishing up work funded by a USDA Exploratory Research Grant on "Revealing complex predatory trophic interactions: Development of a marker-free method for prey identification", and joint with Drs. Pires Paula and Cariveau, we have recently been awarded another exploratory research grant "Developing an innovative method to unravel pollen use by native bees". Dr. Pires Paula is a molecular entomologist researcher from the Department of Biological Control at the Brazilian Enterprise for Agricultural Research (Embrapa), Brazil, and will be conducting research on the interdisciplinary project that she directs "Impact of the introduction of the harlequin ladybird beetle on the natural biological control of pests in vegetable ecologically based produced in Brazil" during the next 2+ years. Hannah Gray (PhD student) was awarded a prestigious three-year EPA-STAR fellowship, just completed an intensive double season of field work in Brazil and the US, and is presenting some of her work at the International Entomophagous Insects Conference in Kyoto, Japan. My technician, Elise Rosengren, recently left the lab shortly after completing work on the Poweshiek skipperling, and we wish her the best in her future.



Aukema Lab 2016

Boring Workshop

Each year, many states participate in monitoring programs designed to detect new, invasive bark and wood-boring beetle threats. Screening the samples requires a rudimentary level of training, however. Brian Aukema and the Forest Entomology lab hosted the first ever "Midwestern Bark Beetle Identification Workshop" from May 17-19 this past year. It was co-organized by department alumni Val Cervenka from the Department of Natural Resources and Steve Katovich from the US Forest Service. Thirty-six participants from several agencies and states came to Hodson Hall to learn how to identify bark beetles for regulatory work, socialize, and hear presentations on advances in monitoring, trapping, and survey techniques.



Because the nation's forests deserve better than the expertise of Aukema, who can confidently identify any specimen down to Kingdom, the organizers were pleased to host two expert instructors: Bob Rabaglia, entomologist with the US Forest Service, and Rick Hoebeke, entomologist with the Georgia Museum of Natural History. Participants left with many good memories and reference collections for their home bases.

Aukema Lab 2017

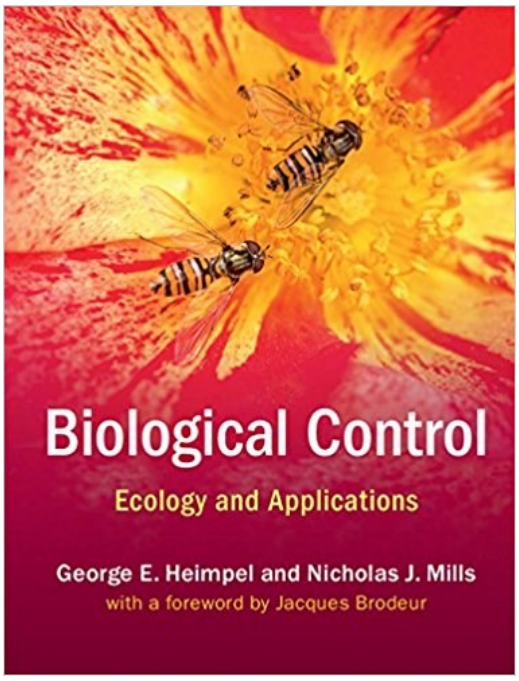
Forest Entomology Lab Goes Up the Creek

A highlight of 2017 was a fall lab retreat to the Itasca Biological Station in Itasca State Park, Minnesota's oldest state park (1891). The lab sampled casebearer from tamaracks at the headwaters of the Mississippi and visited the largest red and white pines in the state. The lab also enjoyed killing each other playing the board game "One Night Ultimate Werewolf" (above) and carving pumpkins (below). Designs ranged from maps of Minnesota and Kenya to more terrifying c objects such as cats and bats and the dreaded P=0.06.

Heimpel Lab 2017

The Heimpel lab experienced a pleasant European invasion during 2017 with 3-6 month visits by some very talented and hard-workiing young scientists. These included Alejandro Tena, a visiting scholar from a well-known citrus research institute in Valencia, Spain. Alajandro brought his lovely family along as well and it was a pleasure to get to know them. We also hosted three visiting graduate students - Michele Ricupero from the University of Catania in Sicily, Lucie Monticelli from the University of Nice in southern France and Maxime Damien from the University of Rennes - also in France but the northern part. Alejandro, Lucie and Maxime all worked on various aspects of aphid-parasitoid interactions and Michele worked on *Dinocampus coccinellae* - a parasitoid of coccinellid beetles. Of the four, all but Maxime got out of Minnesota before the snow started to fall - we told him that he's in for a special treat! This picture is from a lab/family party held in summer 2017. Also pictured are (more permament) grad students Jonathan Dregni, Ismael Ramirez and James Miksanek and post-docs Becky Boulton and Kelton Welch along with undergraduate assistants Elsa Ubel and Jacqueline Nuzzo and some family and friends.

George Heimpel has written a new book on biological control with co-author **Nick Mills**, who is a professor at the University of California, Berkeley. The book is called **'Biological Control: Ecology and Applications'** and it started as graduate-level classes in biological control taught by both authors. While there are some good introductory texts for Biological Control, George and Nick felt that a more advanced treatment of the subject, suitable for advanced undergraduates, graduate students and researchers in general, was neeed. Thus, the book includes sections on theoretical population ecology, invasion biology and evolutionary biology that explain how the process of biological control can be used to address fundamental hypotheses as well as how it can be used to suppress populations of harmful organisms. The authors also felt that it was important to cover not only biological control of insect pests and weeds (in which entomology figures prominently) but also biological control of plant pathogens, a field of study that has a rich history all its own. The reason is that many of the ecological processes that are relevant to the biological control of insects and weeds are relevant to the biological control of plant pathogens as well. The result is a comprehensive text on biological control that takes a fundamental as well as an applied outlook. It has been out since March 2017 and has received some favorable reviews so far - hopefully it will come to be viewed as the go-to text for advanced topics in biological control!



Holzenthal Lab - Lucas Camargos

As counterintuitive as it may sound, we biodiversity scientists can be really narrow-focused on a small portion of biodiversity phylogenetically related to our favorite taxonomic group. However, being the modern take of 19th Century naturalists, taxonomists acquire their primary set of data from the natural world, where many species co-exist and partake in complex ecological processes. With the spirit of the past naturalists in mind, the Field Studies Council have organized another edition of the annual **Darwin Scholars Programme: Monitoring and Communicating Biodiversity** (from 17th to 27th of August) in the United Kingdom, and I had the opportunity to attend with a fellowship awarded to me and nearly 20 other students from many other countries.

The workshop had charming facilities in the countryside of Shropshire and London area, at Preston Montford and Juniper Hall Field Centers, respectively. These centers facilitated the fieldwork with many different taxa (small mammals, bats, birds, plants, and of course, insects), but they also had infrastructure to host introductory lectures, discussions about citizen science, biodiversity communication and projects from the worldwide attendees.

We had the opportunity to visit important sites to the history of biology, such as the house where Charles Darwin was born and first collected his invertebrates and plants, in Shrewsbury. In Wales, we went to Cwm Idwal, in Snowdonia National Park, a beautiful landscape even in the rainy Welsh summer where the famous naturalist used to go to study geology of Britain. Later on the workshop, we visited his famous Down House, where he wrote *The Origin of Species* and conducted many experiments in his field yard and greenhouse. And no taxonomist visits London without taking a nice walk through the Museum of Natural History to look at insects collected by Victorian naturalists.

These visits to sites important on Darwin's life were insightful to understand how he used to look at the natural world. Additionally, listening to the others attendees from all over the world and different academic backgrounds was very inspirational and instructive. From preserving sea turtles from poachers in Cape Verde through community participation, to understanding the effects of climate change on cnidarians in Palau, working with local government to protect elephants in Nigeria and uncovering the hidden biodiversity of caddisflies in the threatened Amazon basin, we all have learned about the challenges we face to keep the biodiversity crisis at bay in many areas of the globe, and how to better communicate our data and engage our communities in participating in this effort.

Cwm Idwal is a hanging valley in the Glyderau range of mountains in northern Snowdonia, the national park in the mountainous region of North Wales.

Darwin Library

Hutchison Lab 2016 - 2017

This past year (2016) was a transition experience for Bill, **Eric Burkness**, and his students, as he dispersed from the Dept. Head office, returned to his lab in January, and resumed full-time responsibilities in Research & Extension. Overall, we think the transition has gone well! Here we provide some updates for each of our primary research and outreach projects, including invasive species, Bt resistance, and the MN IPM program.

Invasive Species: Papaya Mealybug & Brown Marmorated Stink Bug—We are pleased to report that former PhD student Theresa Cira successfully transitioned to **Dr. Theresa Cira** in 2017! During her PhD on the cold hardiness of BMSB, *Halyomorpha halys*, she received numerous awards and fellowships for her research. In addition to her PhD work, she found time to complete a 5-month research trip to Hanoi, Vietnam where she worked with the Centro Internacional de Agricultura Tropical (CIAT) and the Plant Protection Research Institute (PPRI). Cassava is an important staple and cash crop for resource poor farmers across Southeast Asia. Recently, several invasive species from South America, where cassava is native, have increasingly caused major crop losses. Two of the main pests include the papaya mealybug (*Paracoccus marginatus*) and a plant pathogenic phytoplasma, cassava witches' broom (CWB). Theresa investigated the role that invasive mealybugs play in the spread of CWB, and generated lab/field data indicating that mealybugs do impact the occurrence of CWB. We are excited to have "TC" continue as a Post-doc in our lab (while also sharing time with Bob Koch's lab)!

Invasive Species: BMSB—We were also pleased to recruit Post-doc **Dr. Byju Govindan** to our lab via southern India, Purdue University (PhD), and a post-doc at Washington State University. Byju comes to us with an outstanding background in applied ecology and an interest in arthropod adaptation to climate change. He is also working on BMSB population dynamics, funded by the recently created MN Invasive Terrestrial Plant & Pest Center (MITPPC). Byju is developing a process-based phenology model for BMSB to forecast pest dynamics under current and future climate scenarios. Mounting evidence of detection of nymphs in urban "hot spots" and in soybean at Rosemount in 2016 confirms that BMSB is in the early establishment phase. We are also collaborating with climatologists at UMN to better understand current population and generational dynamics as the pest continues to establish in MN. Data from our phenology & life table studies with MN acclimated bugs in protected cages under natural conditions, will be used to develop and validate temperature-dependent models to characterize its response to climate change.

BMSB 1st instars hatching from an egg mass (Byju G.)

Invasive species: Spotted Wing Drosophila— SWD continues to be one of the most damaging and challenging invasive species in MN, affecting nearly all segments of the fruit industry, particularly small berries (e.g., raspberry, strawberry, blueberry, & some grape varieties). Since 2013, we have maintained a SWD colony that continues to thrive under the care of lab tech **Sarah Holle**, and graduate students **Dominique Ebbenga (MS)** and **Anh Tran (PhD)**.
Dominique is evaluating the potential for Exclusion Netting as a control strategy for SWD in wine grapes. The primary goal of Anh's research is to better understand the relative importance of local overwintering vs. long-distance migration on SWD population dynamics in Minnesota. We also provide SWD adults to other labs including Horticulture (**Dr. Mary Rogers**), & Metropolitan State University (**Dr. Mark Asplen**). Field research continues to focus

continued next page

Hutchison Lab 2017 *continued*

on non-insecticidal approaches to manage SWD in Minnesota. For example, under the supervision of **Eric Burkness**, we have found that high tunnel structures for exclusion and manipulation of micro-climate can significantly reduce SWD population growth, and several effective management options have been identified for use by growers. Future research projects will examine overwintering strategies and long-distance potential of SWD.

Corn Earworm Resistance to Bt, Pyrethroids—**Dr. Carrie Deans** completed her PhD at Texas A&M University and joined our lab in 2015. She studied the nutritional ecology of *Helicoverpa zea* (corn earworm). As a MN native, Carrie was excited to return to the Midwest. With increasing concerns about Bt and pyrethroid resistance in *H. zea*, we discussed collaborative ideas with her A&M advisor, Dr. Greg Sword. Carrie is studying the nutritional ecology of protein/carbohydrate ratios on susceptibility to *Bt* endotoxins (e.g., Cry1Ac and Cry1Ab). The development of resistance to *Bt* endotoxins has been increasing in CEW populations in recent years. So far, they have confirmed two putative resistant populations of CEW; one from Texas and the other from Minnesota. The next step will be rearing larvae from each population on diets that differ in their macronutrient profile to see how nutrition impacts susceptibility to *Bt*. When not working on CEW, she is playing guitar and singing in several (now 5!) different bands in the Cities.

MN Extension IPM Program—In addition to research, Bill has served as coordinator of the MN Extension IPM Program since 2015. The program has a long history of support within Entomology (e.g., previous leadership via Ken Ostlie and Ian MacRae). This year we have been busy meeting with growers and crop consultants, as well as submitting new grant proposals to maintain a research-based program and funding for critical issues. The USDA-NIFA funding is targeted to support ongoing Extension IPM programs, and address invasive species research, pollinator protection concerns, and the Bed Bug IPM program (via **Dr. Kells**). Program funding also supports two Extension IPM Specialists, **Bruce Potter** (SW MN, & dept. alumnus), and **Fritz Breitenbach** (SE MN; Fritz retired in Sept. 2017) and **Eric Burkness**. In 2016, a new *MN Extension IPM web site* was completed by IPM Associate, **Suzanne Burkness** (www.mnipm.umn.edu), along with new enhancements to the *FruitEdge* and *VegEdge* web sites. Finally, Bill also keeps busy with a US-AID funded project in East Africa (Kenya, Ethiopia, Tanzania), looking at strategies to increase the use of the "push-pull" system in maize, as an alternative to insecticidal control, for the stem borer complex, *including Chilo partellus.*

SWD trap, high-tunnels, and damaged berry (E. Burkness)

Current Hutch Lab crew (L-R): Eric Burkness (Researcher), Dominique Ebbenga (MS Student), Theresa Cira (Post-doc, IPM Research & Extension), Anh Tran (PhD Student), Byju Govindan (Post-doc, BMSB population dynamics), Bill Hutchison (Professor, motivational speaker), Carrie Deans (Post-doc, Nutritional Ecology, H. zea), Suzanne Burkness (IPM Communications Specialist), and Sarah Holle (Technician), October, 2017.

Koch Lab 2016 – 2017

The Koch lab continues to address research and extension needs related to integrated pest management and ecology of pests that really 'suck' (i.e., soybean aphid and stink bugs). The last two years have been particularly eventful with several staffing changes. Four graduate students successfully defended and graduated (Erica Nystrom Santacruz, MS 2016; Anh Tran, MS 2016; Tavvs Alves, PhD 2017; and Anthony Hanson, PhD 2017). Two new MS students have joined the lab (Obiratanea da Silva Queiroz and Hailey Shanovich). Dr. Theresa Cira and Lindsey Christianson joined the lab as post-doctoral associate and scientist, respectively. Zach Marston transitioned from pursuing an MS to PhD and is making nice progress. Rafael Aita will be spending several months in the lab as a visiting scholar. Daniela Pezzini (MS student) and James Menger (technician) continue to do great work. In addition, multiple undgraduate research assistants have helped over the last two years.

All of these students and staff continue to make Dr. Koch's program look good. The team published 14 peer-reviewed articles from 2016-2017. They also received numerous awards…

Dr. Bob Koch

Dean's Award for Distinguished Campus-based Faculty, University of Minnesota Extension. (2016). ["To recognize excellence of an individual Extension faculty member in performing the work of Extension education."]

James Menger

1st Place, M.S./Undergraduate Student Poster Competition, Meeting of the North Central Branch of the Entomological Society of America, Indianapolis, IN. (2017)

Robert C. Hodson Scholarship for Undergraduates, Department of Entomology, University of Minnesota. (2017)

continued next page

Back Row : Bob Koch, James Menger, Zach Marston, Anthony Hanson Front Row: Walter Rich, Dani Pezzini, Tavvas Alves, Anh Tran 2016

Koch Lab 2016 - 2017 *continued*

Daniela Pezzini

Master's Student Achievement in Entomology Award, Plant-Insect Ecosystems (P-IE) Section, Entomological Society of America. (2017)
Hueg-Harrison Fellowship (recognition of student/mentor relationship), College of Food, Agriculture, and Natural Resource Sciences (CFANS), University of Minnesota. (2017)
Allan G. Peterson Fellowship for M.S. Students, Department of Entomology, University of Minnesota. (2017)
2nd Place, M.S. Student 10-minute Paper Competition, Meeting of the North Central Branch of the Entomological Society of America, Indianapolis, IN. (2017)
Travel Scholarship, North Central Branch of the Entomological Society of America, Indianapolis, IN. (2017)
Chiang Travel Grant, Department of Entomology, University of Minnesota. (2017)

Anthony Hanson

1st Place, PhD. Student Poster Competition, Meeting of the North Central Branch of the Entomological Society of America, Indiana, IN. (2017)
Doctoral Dissertation Fellowship Conference Presentation Grant, University of Minnesota. (2017)
Doctoral Dissertation Fellowship, University of Minnesota. (2016-2017)
3rd Place, Ph.D. Student 10-minute Paper Competition, Meeting of the North Central Branch of the Entomological Society of America, Cleveland, OH. (2016)North Central Branch Graduate Student Scholarship, North Central Branch of the Entomological Society of America. (2016)Presidential Travel Scholarship, North Central Branch of the Entomological Society of America, Cleveland, OH. (2016)

Anh Tran

1st Place, Ph.D. Student 10-minute Paper Competition, Meeting of the North Central Branch of the Entomological Society of America, Cleveland, OH. (2016)

Tavvs Alves

Lugger-Radcliffe Fellowship, Department of Entomology, University of Minnesota. (2016)
2nd place, Student Poster Competition. University of Minnesota Production Agriculture Symposium, St. Paul, MN. (2016)

Left to Right: Rafael Aita, Lindsey Christianson, Daniela Pezzini, Theresa Cira, Hailey Shanovich, Bob Koch, Tracy Eicholz, Claire Lotzer, James Menger, Obirataena DaSilva Querioz, Zach Marston 2017

Mesce Lab 2016

If it's creepy and crawly, you can bet that we've been busy dissecting its brain over in the Mesce Lab! **Dr. Karen Mesce** and her research group study the neurobiology of invertebrate behavior, and sometimes things can get weird--and wonderful-- in our lab!

This past year has been a big one for the lab! We have continued to make great strides in understanding how nervous systems respond to and recover from traumatic injuries, using the medicinal leech as a model organism. This project is highly collaborative and is the combined effort of PI **Karen Mesce**, Postdoctoral Researcher **Joshua Puhl**, PhD Student **Morgan Newhoff**, and lab technicians **Tony Bigelow** and **Mara CP Rue**. Most recently, the results of this work have been presented at the 2016 Annual Meeting of the Society for Neuroscience in San Diego, CA, as well as at the 12th Congress of the International Society for Neuroethology in Montevideo, Uruguay.

The lab also has some new eight-legged visitors! PhD Candidate **Anthony Auletta** brought spiders with him when he joined the lab in 2013, and his doctoral research focuses on understanding the distribution and role of DA in arachnid nervous systems. Most recently, though, we've added scorpions to the mix as we begin to branch out into scorpion neurobiology & physiology. This new project is in its infancy, but we are very excited to see it evolve as a complement to Anthony's thesis work. Earlier this year, Anthony received the prestigious **Laudier Histology Student Travel Grant** from the Laudier Histology Co., which allowed him to present some of the preliminary results of this research at the 20th International Congress of Arachnology in Golden, CO. This ICA was the largest gathering of professional arachnologists the world has ever seen, and Anthony's poster won **1st place in the "Morphology, Physiology, & Silk" section** of the Graduate Student Poster Competition.

PhD Student **Morgan Newhoff** has been hard at work as well, developing her doctoral research project on the effects of ultrasound on neuronal signaling in the leech. Morgan's work will be some of the first to explore the cellular mechanisms underlying the effects of ultrasound on neurons, and already her project is getting a lot of great press! Morgan recently took home the gold at the Institute for Engineeringin Medicine Annual Conference, where her poster on the effects of ultrasound on neural activity won **1st place in the Student Poster Competition**.

Top Left: Zoe Matticks, Anthony Auletta, Josh Puhl, Morgan Newhoff, Tony Bigelow, Bottom Left: Michael Batzely, Karen Mesce and Mara Chin-Purcell

This year also saw some big changes to the makeup of our lab. This summer, we had to bid a fond farewell to lab technician **Mara CP Rue**, who joined the Graduate Program in Neuroscience at Brandeis University as a new PhD Student. Former undergraduate researcher **Tony Bigelow** has since taken over as the lead technician in the lab. Tony received his B.S. in Neuroscience this past spring, and most recently worked as a course assistant for the renowned Neural Systems & Behavior course at the Marine Biological Lab in Woods Hole, MA. We were also very fortunate to have two outstanding visiting scholars in the lab this past summer-- **Dr. Michael Baltzley**, Assistant Professor of Biology at Western Oregon University, and **Zoe Matticks**, a visiting undergraduate from Wellesley College.

All in all, it has been a fantastic year for us, full of big changes, big discoveries, and exciting new projects. We can't wait to see what 2017 has in store for us! Be sure to check out our new and improved lab website (http://mescelab.cfans.umn.edu/) for updates along the way!

Lab Updates

Spivak Lab 2016

Bee Lab Grand Opening- The Bee Lab saw record attendance by bee supporters for both the groundbreaking in 2015 and ribbon cutting event this year..

Entomology has a proud addition: a new, state-of-the-art Bee and Pollinator Research Lab. The new Bee Lab is on 1634 Gortner Ave, a short walk away from Hodson Hall. In celebration of this accomplishment, over 500 people attended the ribbon cutting ceremony and Grand Opening open house on October 29. The event provided an opportunity for the public to tour the facility, talk with researchers, and learn more about the importance of pollinators to our world food safety.

The Bee and Pollinator Research Lab, a part of the College of Food, Agricultural and Natural Resource Sciences (CFANS), will centralize and facilitate the important bee research projects currently underway. The facility expands and enhances the Bee Lab group's internationally recognized research and teaching program and provides opportunities for enhanced interdisciplinary and international collaborations.

The 10,000-square foot laboratory consolidates lab space, honey extraction, observation hive space, offices and equipment space for 36 employees including two professors and their graduate students, scientists and outreach professionals. The cost of the facility reached $6.4 million, with state-funded bonds covering two-thirds of the cost of the project and the balance being funded through private gifts.

Bee and Pollinator Research Lab: The new facility

The Bee Lab research team is driven by the research of Dr. Marla Spivak, Distinguished McKnight Professor in Entomology, who conducts research on honey bees with support from Gary Reuter and graduate students; and Dr. Dan Cariveau who conducts research on the ecology and habitat needs of native bees.

The new facility also serves as a home for the Bee Squad, an outreach arm of the Bee Lab. Through Extension, outreach, and collaboration, the Bee Squad inspires beekeepers and the public to do their part to keep bees healthy. The Bee Squad looks forward to teaching hands on beekeeping classes in the Brian and Patti Smith Teaching Apiary located on the site of the new building.

In addition to the teaching apiary, several other opportunities to support the new facility were made available to donors. From the engraved hexagonal pavers that will be installed in the spring of 2017 to the naming of several rooms and apiaries, supporters of the Bee Lab have not only helped to fund it, but they added to the character of the building through naming opportunities.

Bee Lab Grand Opening- The Bee Lab saw record attendance .

Please visit the Bee Lab web site for more information about research, Extension and outreach activities underway: www.beelab.umn.edu

Due to continued interest, free Bee Lab tours are being offered available for the public and can be reserved here: https://www.eventbrite.com/d/mn--minneapolis/bee-lab

Frenatae Update

2016-17 Frenatae Executive Officers
President: Anthony Auletta
Vice President: Dylan Tussey
Treasurer: Eric Middleton
Secretary: Daniela Pezzini
Outreach Coordinator: Julia Leone
Honey Sale Coordinator: Morgan Carr Markell

2016-17 Frenatae Representatives
Faculty Meeting Rep: Edwin Benkert
CFANS Student Board Rep: Ian Lane
COGS (Council of Grad Students) Rep: Jake Wittman
Entomology Seminar Rep: Alan Ritchie Jr.
Entomology Curriculum Committee Reps: Theresa Cira & Anh Tran

Frenatae's been very busy this year, and 2016 is shaping up to be one of the most successful years for our group yet! The newly elected Frenatae officers, led by President **Anthony Auletta** and Vice President **Dylan Tussey**, have hit the ground running and are very excited to continue the excellent work carried out by former President **Erica Nystrom**, former Vice President **Anh Tran,** and all of the other previous officers in 2015.

Among the most exciting new projects for our group in 2016 was the establishment of **Bugs 'n Brews**, a monthly social hour open to all students, staff, and faculty in the Department of Entomology and sponsored by Frenatae. This idea was conceived by student leaders in Frenatae as a way to increase communication and camaraderie among all members of our department, and by all accounts it has been a huge success! Frenatae hosted the first ever Bugs 'n Brews this past June, and since then the event has been co-sponsored by many Entomology lab groups (including the Mesce, Kells, Koch, and Spivak labs), as well the Natural Resources Library staff. We here at Frenatae look forward to continuing this great new departmental tradition, and we are excited to have the chance to work with other lab groups who will be co-hosting Bugs 'n Brews in 2017.

It has also been a time of great success for Frenatae's **Public Outreach Program**, which is now in its third year of operation. Through the combined efforts of current Outreach Coordinator **Julia Leone**, past Outreach Coordinators **Allie Gebauer** and **Anthony Auletta**, and our many enthusiastic student volunteers, Frenatae was able to deliver over two dozen interactive entomology presentations to audiences of all ages throughout the Twin Cities metro area, including our ever-popular exhibit at the **Minnesota State Fair**. All in all, we estimate that we have brought insects-- and smiles-- to several thousand people this year, and we are very proud of that. We feel especially fortunate to have had opportunities this year to continue strengthening our partnerships with many of the outstanding outreach institutions in the area, including the Bell Museum of Natural History, the UMN Extension Office, the Minnesota 4-H Program, the Stakman-Borlaug Center for Sustainable Plant Health, UMN Market Science, as well as numerous schools, nature centers, and other partners throughout the community.

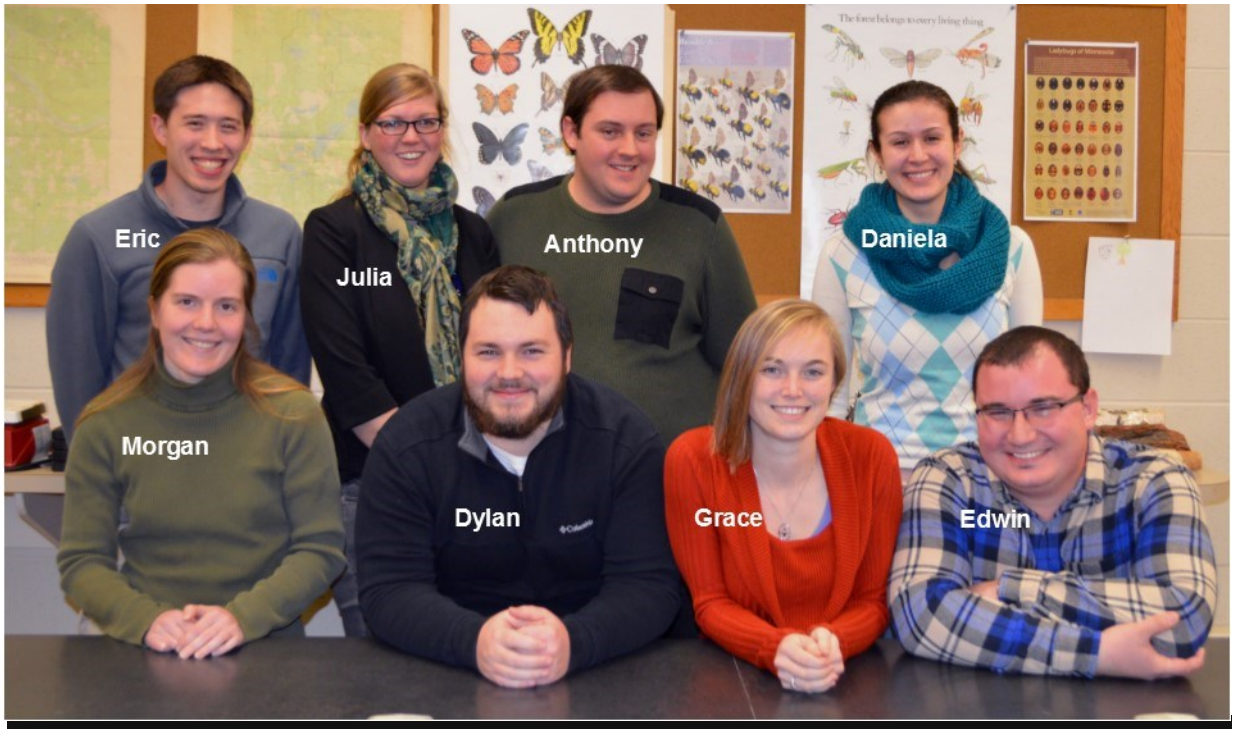
And as the end of the year approaches, we are once again busily preparing for the annual **Frenatae Honey Sale**, to be held on November 30th - December 2nd here on the Saint Paul Campus. As in years past, we will be selling not just delicious, locally-sourced honey, but also a variety of beautiful beeswax candles, a fantastic array of student illustrations, and the much-anticipated 2017 Frenatae calendar. Our mealworm lollipops, which debuted at last year's sale and proved to be an enormous hit-- are back this year as well! The profits from this year's Honey Sale will help us accomplish the many exciting plans that we have for 2017, including the annual Frenatae Guest Lectureship in Entomology. Our

Frenatae Update 2016 continued

next invited guest speaker, as selected by our students, will **Dr. Robert Holt** (University of Florida), who is scheduled to come to the department during Spring 2017. We are very excited to host him during his visit, and look forward to his public seminar! We also have many other great activities planned for the coming year, including skill-building workshops for entomology students (including opportunities for students interested in non-academic careers), a summer insect collecting trip, and a large-scale entomology outreach extravaganza hosted here at Hodson Hall.

And finally, what would a student group be without stellar students? We are very proud of the numerous professional accomplishments that the students in Frenatae have achieved in 2016. Over the past year, our students have received many prestigious fellowships and grants, as well as awards from the Entomological Society of America, the American Arachnological Society, and other professional groups. This is, of course, in addition to the many great publications, presentations, teaching accomplishments, and outreach/extension activities that our students have produced this year. And let us not forget that our students also excel outside of the workplace-- a special mention must also go out to current Frenatae Treasuer and "Human Dung Beetle" **Eric Middleton** for successfully making it to the national finals of the American Ninja Warrior challenge! Frenatae is honored to have so many excellent young entomologists in its ranks, and we look forward to continuing to foster student success and well-being into 2017 and beyond.

With such an exciting and successful year behind us, we here at Frenatae are eagerly looking to the future and all of the great things that 2017 will bring. And we are incredibly thankful to all who continue to support Frenatae and our dual mission of promoting entomology student success and fostering a better understanding & appreciation of insects in our community. To stay informed of the latest news about Frenatae, please be sure to follow us on social media-- we are on Facebook (**UMN Frenatae**), Twitter (**@umn_frenatae**), and Instagram (**@umn_frenatae**).



Frenatae Officers 2016

Frenatae Update 2017

2017-2018 Frenatae Executive Officer Team:

President: Edwin Benkert

Vice President: Daniela Pezzini

Secretary: Anh Tran

Treasurer: Patrick Pennarola

Outreach: Jake Wittman

Faculty Rep: Sam Fahrner

Honey Sale Reps: Morgan Carr-Markell & James Wolfin

2017 was another successful year for Frenatae! Our outreach program continues to grow, with our volunteers giving over 60 engaging and educational presentations to a variety of groups ranging from kindergarten and high school classes, to boy and girl scout groups. Our insect display at the Minnesota State Fair was a popular addition to the CFANS exhibit, and our presence at both the Monarch Festival and Pollinator Party enabled us to educate and share our love of insects with hundreds of people.

In May, Frenatae hosted Dr. Robert Holt (University of Florida) for our Frenatae Lecture-ship in Entomology. Dr. Holt shared insight into his research on competition and habitat fragmentation, as it relates to population and community ecology. His visit provided an excellent opportunity for members of Frenatae and the campus community to interact with a leader in the field of ecology.

The future looks bright for Frenatae in 2018. We are excited to continue the growth of our outreach program, and increase opportunities for student development. Thank you for you continued support. Without it, we would not be able to provide these events for the benefit of Frenatae, the Entomology Department, and the wider community as a whole.

Entomology Outreach Program by Frenatae

The University of MN Entomology Graduate Student Association

Fostering a better understanding & appreciation of insects in the greater Minnesota community!

To learn more or schedule an event, visit:
www.frenatae.umn.edu/public-education-page

frenatae@umn.edu facebook.com/umnfrenatae @umn_frenatae

Restroom Project

November 4, 1987, an employee from the Physical Planning Building Official's Office, sent a memo to his supervisor, SUBJECT: Water Closet Requirements for Hodson Hall. In this memo he stated "I found this five-story building has a toilet room on floors one, three and five for use by men. They each contain one water closet and one urinal. "The toilet rooms on second and fourth floor are for women and they each have only one water closet."

"Using today's standards found in the Minnesota Standards in the Minnesota State Building Code and Minnesota State Plumbing Code, this building would require ten water closets, which must be equally divided between men and women."

August 12, 1991, Mark Ascerno, Head of the Department of Entomology, sent a Memo to Richard Jones, Dean, College of Agriculture, SUBJECT: Hodson Hall Women's and Handicap Restroom Facilities. In his memo he stated "The restroom facilities in Hodson Hall are inadequate both from the standpoint of the number of toilet facilities for the female occupants of Hodson Hall and for the handicapped access.

February 11, 1992, Mark Ascerno sent a memo to Assistant VP for Facilities Management in that memo he states "I hope you've had a chance to review the materials I forwarded to you on 3 January 1992 concerning the need to remedy the restroom situation.

April 6, 2015, Felicia Christy, Administrator for the Department of Entomology, came across these documents and began plans to revive the project.

July 20, 2015, Peg Lonnquist, Director, Womens Center, emailed Robert Tunell, Associate Director of Facilities Management, which stated: "A woman with a disability is interested in taking a class in Hodson Hall. Can you tell me how many bathrooms for women are located in that building and if any of them are accessible? " This email was prompted by Ann Fallon, Professor in the department of Entomology, who mentioned this to Peg.

July 22, 2015, Felicia Christy sent an email which stated: "We recently reopened this historical issue, we had a few meetings with Facilities Leads but nothing came of it at the time." "The solution is simple—add a stall in each of the women's restrooms - money has been found to fund lesser things than basic human needs.

September 9, 2015, Robert Tunell, Peg Lonnquist, Felicia Christy, Ben Fink, Campus Operations, Karen Collins, Facilities Team Manager had their first meeting. This meeting revived the project and over the next year many meetings, were held, and the train was back on track. Project managers, construction workers, plumbers, abatement specialists, facilities management, architects, plumbers, electricians all got on board.

December 15, 2016, Felicia Christy Blake Bartelma, Construction Project Manager—FM Central, Bryce Frandrup, Project Coordinator, Christohper Herbst, Facilities Supervisor, Steven Rocco, Project Manager/Carpenter, did the final punchlist walkthrough and our renovated restroom project is now complete. We have double the number of "water closets" for women's use and we have a gender neutral, handicapped accessible restroom as well.

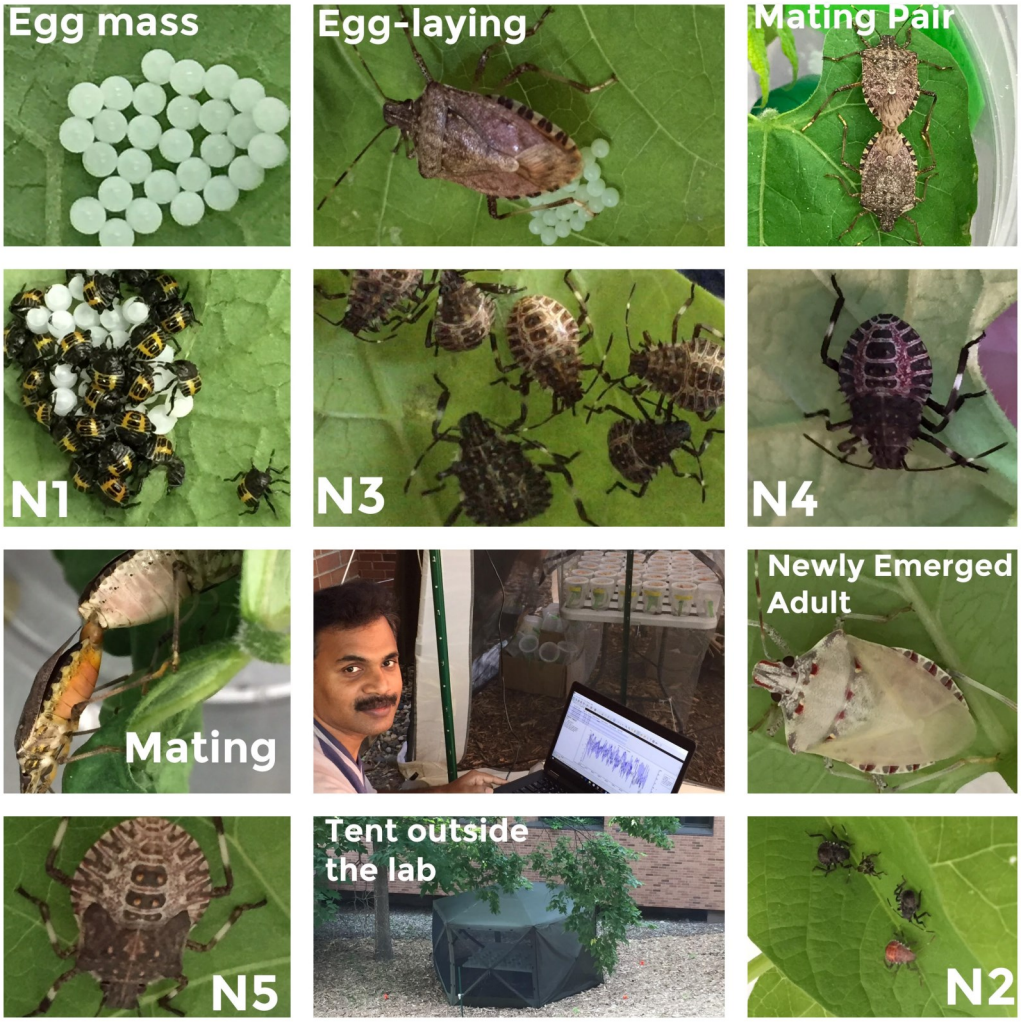
Office Redesign Project

The main office got a new look this past spring, when staffing changes gave us an opportunity to make a few improvements. The Americans with Disabilities Act encourages spatial designs in which everyone feels welcome, able to get to facilities, and maneuver within them. To this end, we took down the cubical walls, removing height barriers and improving sightlines. This makes communication easier throughout the space, and ensures that visitors entering from the east side of the building are now greeted by a friendly face rather than a four foot, fabric barrier.

New Mother's Room

In the interest of inclusion and making everyone feel welcome, we increased the number of mother's rooms on the St. Paul Campus by one third this summer when we kitted out the small conference room to double as a lactation space. The comfy chair and cozy light have been used by three appreciative moms so far, and we hope that it can make the transition from parental leave easier for many families in the future.

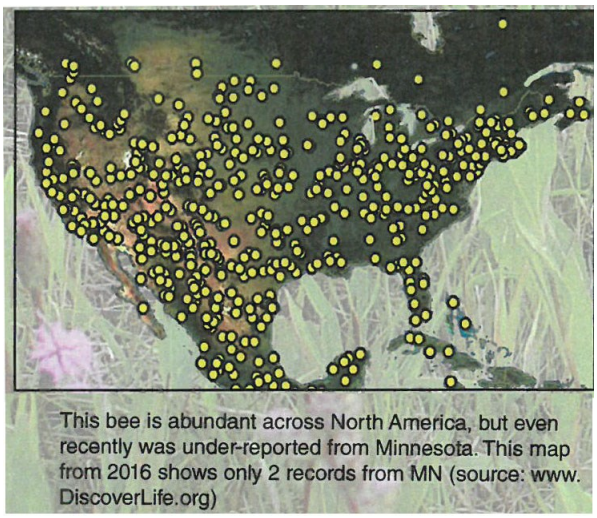
Collage of different stages in the life cycle of **Brown Marmorated Stink Bug (BMSB),** an invasive pest of horticultural and agronomic crops. Byju N. Govindan, postdoctoral research associate in Bill Hutchison's lab, is developing a model characterizing reproduction, phenology and overwinter biology of Minnesota acclimated BMSB using data generated in the tent under natural conditions and in the lab. From left, top row: 1) BMSB egg mass (median # eggs = 28) laid under the leaf surface of snap bean; 2) A female laying eggs; 3) Dorsal view of female (top)-male (bottom) mating pair. Second row: 1) Newly hatched first [N1], 2) third [N3] and 3) fourth instar nymph(s) [N4] of BMSB; Third row: 1) A side view of the mating pair of BMSB; 2) Byju capturing hourly weather information from hobo data loggers (white tent in the background), 3) A newly emerged adult female of BMSB. Last row: 1) Fifth instar nymph [N5] of BMSB, 2) Green tent, 3) Second instar nymphs [N2] of BMSB (reddish upon molting to N2, but turn black in few hours)



Project team members include Dr. Bill Hutchison (Professor), Dr. Bob Koch (Assist. Professor & Extension Entomologist), Chris Philips (Assist. Professor), Dr. Byju Govindan (Post-doctoral Research Associate) and Eric Burkness (Research Fellow) with in **Dept. of Entomology,** and Dr. Peter Snyder (Assoc. Professor), Dr. Tracy Twine (Assoc. Professor) and Dr. Stefan Liess (Research Associate) with **in Dept. of Soil, Water and Climate at UMN**. This project is funded by the Minnesota Invasive Terrestrial Plants and Pests Center, through an appropriation from the Minnesota Environment and Natural Resources Trust Fund, and the University of Minnesota.

More than 400 species of native bees live in Minnesota, yet very little is published about their distribution across the state. **Species like this common sweat bee, *Halictus ligatus***, have been under-surveyed for more than a century. Thanks to new collaborations, however, these data gaps are starting to close.

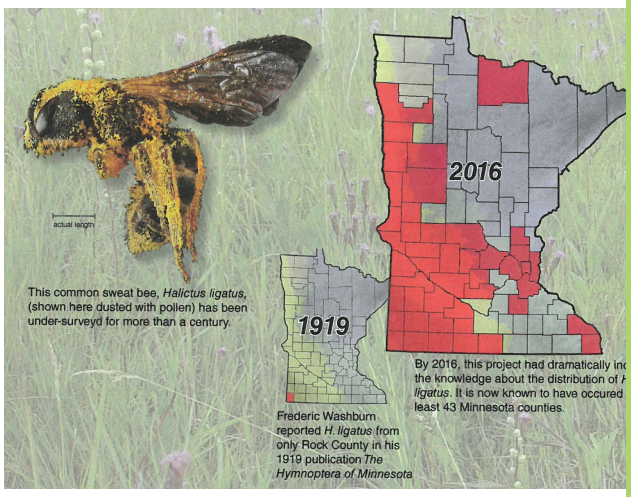
Since 2014, the **Minnesota Department of Natural Resources (DNR)** has contributed more than $14,000 in equipment and supplies to the University of Minnesota Insect Collection. DNR staff and volunteers have databased over 10,000 historic museum specimens, and the University of Minnesota Bee Lab has databased an additional 12,000 specimens.



This bee is abundant across North America, but even recently was under-reported from Minnesota. This map from 2016 shows only 2 records from MN (source: www.DiscoverLife.org)

"It's been wonderful to preserve our specimens in the museum and to work with such great partners at the University of Minnesota," said Crystal Boyd, a bee researcher with the DNR.

By conducting field surveys, examining historic specimens, and collaborating across projects, the DNR and University of Minnesota are working together to improve the Minnesota state species list of bees. The list was recently updated for the first time since 1919.



Funding for this project was provided by the Minnesota Environment and Natural Resources Trust Fund as recommended by the

Awards and Honors

Tavvs Alves– 2016: Alexander Goetz Instrument Support Program. ASD Inc. Travel Scholarship, NCB-ESA, Manhattan, KS. 2nd Place, Student 10-minute Paper Competition, Meeting of the NCB-ESA, Manhattan, KS. 2nd place, Student Poster Competition. UMN Production Agriculture Symposium, St. Paul, MN.

Lucas Camargos – 2017: Culture Corps Award; Science Without Borders Fellowship, Brazilian Ministry of Education **2016:** Thesis Research Travel Grants - Field trip grant by Graduate School, UMN, MN. Darwin Scholars Programme: Monitoring and Communicating Biodiversity - Workshop in London, UK.

Theresa Cira-2016: Doctoral Dissertation Fellowship. Thesis Research Travel Grant. Hueg-Harrison Fellowship and the ESA and Monsanto Student Activity Award.

Anthony Hanson–2017: Doctoral Dissertation Fellowship, 2016-2017. University of Minnesota Graduate School. 3rd place PhD 10-minute oral presentation. ESA: North Central Branch Meeting. 2016. Cleveland, OH. **2016:** Lugger-Radcliffe Fellowship, Dept. of Entomology, UMN Travel Scholarship, Operation Student Connection Team, 132nd Convention of the American Seed Trade Association (ASTA), Washington, D.C. Travel Scholarship, NCB-ESA, Manhattan, KS. Kenneth and Barbara Starks Plant Resistance to Insects Graduate Student Award. Plant-Insect Ecosystems (P-IE) Section, ESA. President's Prize (1st Place), Student 10-minute Paper Competition, Meeting of the ESA, Minneapolis, MN. North Central Branch Graduate Student Scholarship, NCB-ESA.

Petra Kranzfelder – 2016: Doctoral Dissertation Fellowship Conference Presentation Grant, UMN. Doctoral Dissertation Fellowship Presentation Grant, UMN. **2015:** Systematics Fund Award, Society for Freshwater Science; H.C. Chiang Travel Award, Dept. of Entomology, UMN.

Anh Tran-2016: CFANS Graduate Student Fellowship, CFANS, UMN. 2nd Place, Student 10-minute Paper Competition, Meeting of the NCB-ESA, Manhattan, KS; Alexander Goetz Instrument Support Program. ASD Inc.

Anthony Auletta – 2016: First Place, Graduate Student Poster Competition (Morphology, Physiology, & Silk section) at the 20th International Congress of Arachnology. Laudier Histology Student Travel Grant (via Laudier Histology Co.)

Morgan Carr-Markel-2016: Costco Fellowship

Jake Wittman-2016: MGK Fellowship

Ian Lane-2016: CFANS Excellence in Entomology Fellowship, Peterson Award

Eric Middleton-2016: 2nd place Student Oral Presentation Competition, ICE 2016; NCR-SARE Grant 2016-2019

Ernesto Rázuri-Gonzales – 2016: Doctoral Fellowship, Fondo Nacional de Desarrollo Científico, Tecnológico y de Innovación Tecnológica (FONDECYT), Peru. Systematics Fund Student Endowment Award, Society of Freshwater Science. Walter H. Judd International Graduate and Professional Fellowship from the Global Programs and Strategy Alliance, UMN. Council of Graduate Students Conference Travel Award, UMN.


Jonathan Lundgren

James Miksanek-**2017**: Natural History Award (Frank McKinney Fellowship), Bell Museum of Natural History, UMN; **2016:** CFANS Excellence in Entomology Fellowship

Samuel Fahrner– 2017: Doctoral Dissertation Fellowship, UMN **2016:** 2nd place, PhD Student Poster Competition, North American Forest Insect Work Conference, Washington D.C.; Allen-Abrahamson Award (2nd Place). North American Forest Insect Work Conference. PhD student poster competition.

Hannah Gray–2017: Thesis Research Travel Grant, Graduate School UMN.
2016: EPA STAR Graduate Fellowship, US EPA, Marion Brooks-Wallace Graduate Fellowship, Dept. of Entomology, UMN.
Corrie Hilldebrand – 2017: Chiang Travel Grant, Dept. of Entomology

Correy Nyquist- 2017: Chiang Travel Award, Dept. of Entomology

Daniela Pezzini- 2017: ESA North Central Branch annual meeting travel award
2017 Allan Peterson Graduate School Fellowship, Chiang Travel Grant for Graduate Students in Entomology, 2nd Place, M.S. Student 10-minute Paper Competition, Meeting of the North Central Branch of the Entomological Society of America, Indiana, IN, Hueg-Harrison Fellowship, University of Minnesota College of Food, Agricultural and Natural Resource Sciences (CFANS), **2017** ESA PI-E Graduate Student Achievement in Entomology Award, **2017-18** Monsanto Graduate Student Mentor Program (MGSMP)

Recent Graduates

Tavvs Alves (PhD) Fall 16 Postdoctoral Research Associate Texas A&M University

Trisha Leaf (PhD) Spr 17 Research Scientist II Minnesota Department of Agriculture

Derek Rosenberger (PhD) Spr 16 Assistant Professor of Biology at Olivet Nazarene University

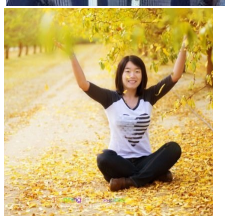
Elaine Evans (PhD) Fall 16 Research Associate University of Minnesota

Petra Kranfelder (PhD) Spr 17 Post Doctoral Associate University of Minnesota

Joe Kaser (PhD) Fall 16 Postdoctoral Researcher Rutgers University

Andrea Hefty (PhD) Spr 16 Forest Entomologist, U.S. Forest Service

Chan Heu (PhD) Spr 16 Post Doctoral Scholar Penn State



Yang "Grace" Li (PhD) Spr 16 Postdoctoral Fellow University of Texas Health Science Center at Houston

Theresa Cira (PhD) Spr 17 Post Doctoral Assocate University of Minnesota

Marissa Striefel (MS) Spr 16 Plant Pest Regulatory Specialist at Minnesota Department of Agriculture

Anna Hansen (MS) Spr 16 Utility Technician Adams Pest Control

Recent Graduates Not Pictured Here:
Dylan Tussey (MS) Sp 17, Grace Sward (MS) Spr 17

Selected Publications

Koch, R.L. and A.C. Costamagna. 2017. Reaping benefits from an invasive species: Role of Harmonia axyridis in natural biological control of Aphis glycines in North America. BioControl xx(x): xx-xx. http://link.springer.com/article/10.1007/s10526-016-9749-9 (in press)

Tran, A.K., T.M. Alves and R.L. Koch. 2016. Potential for sulfoxaflor to improve conservation biological control of Aphis glycines (Hemiptera: Aphididae) in soybean. Journal of Economic Entomology 109 (5): 2105-2114. http://jee.oxfordjournals.org/content/109/5/2105
******Featured in:*** Porterfield, A. 2016. Sulfoxaflor found to be less harmful to beneficial predators of soybean aphids. Entomology Today. August 17, 2016. https://entomologytoday.org/2016/08/17/sulfoxaflor-found-to-be-less-harmful-to-beneficial-predators-of-soybean-aphids/

Koch, R.L., W.A. Rich and T. Pahs. 2016. Statewide and season-long surveys for Pentatomidae (Hemiptera: Heteroptera) of Minnesota wheat. Annals of the Entomological Society of America 109(3): 396-404. http://aesa.oxfordjournals.org/content/early/2016/01/19/aesa.sav157

Roy, H.E., P.M.J. Brown, T. Adriaens, N. Berkvens, I. Borges, S. Clusella-Trullas, R.F. Comont, P. De Clercq, R. Esche, A. Estoup, E.W. Evans, B. Facon, M.M. Gardiner, A. Gil, A.A. Grez, T. Guillemaud, D. Haelewaters, A. Herz, A. Honek, A.G. Howe, C. Hui, W.D. Hutchison, M. Kenis, R.L. Koch, J. Kulfan, L.L. Handley, E. Lombaert, A. Loomans, J. Losey, A.O. Lukashuk, D. Maes, A. Magro, K.M. Murray, G. San Martin, Z. Martinkova, I.A. Minnaar, O. Nedved, M.J. Orlova-Bienkowskaja, N. Osawa, W. Rabitsch, H.P. Ravn, G. Rondoni, S.L. Rorke, S.K. Ryndevich, M.G. Saethre, J.J. Sloggett, A.O. Soares, R. Stals, M.C. Tinsley, A. Vandereycken, P. van Wielink, S. Viglášová, P. Zach, I.A. Zakharov, T. Zaviezo and Z. Zhao. 2016. The harlequin ladybird, Harmonia axyridis: global perspectives on invasion history and ecology. Biological Invasions 18(4): 997-1044. http://link.springer.com/article/10.1007/s10530-016-1077-6

Koch, R.L., W.A. Rich, B.D. Potter and R.B. Hammond. 2016. Effects on soybean of prophylactic in-furrow application of insecticide and fertilizer in Minnesota and Ohio. Plant Health Progress 17(1): 59-63. http://www.plantmanagementnetwork.org/php/elements/sum2.aspx?id=10892

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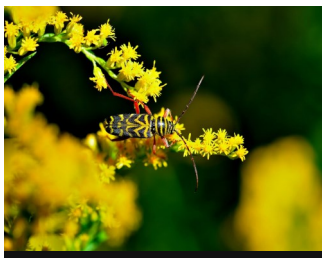

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