Department of Entomology Newsletter

Events from 2017

Wintersteen is 16th Iowa State President

Dr. Wendy Wintersteen (Ph.D. 1988) was selected to serve as ISU's 16th president on October 23, 2017 and assumed the office on November 20. Wendy will be the first woman president in the university's history. Since 2006, Dr. Wintersteen has been dean of the College of Agriculture and Life Sciences (CALS) and the director of the Iowa Agriculture and Home Economics Experiment Station at ISU. She is also the holder of the university's first endowed deanship. During her tenure, CALS has been ranked in the top 10 in the world; experienced record enrollment growth (third largest in the U.S.); established innovative teaching partnerships; expanded student opportunities in entrepreneurship through the Agriculture Entrepreneurship Initiative; enhanced diversity and inclusion efforts; raised nearly $250 million in private support; and completed several major building projects.

Dr. Wintersteen's career at ISU spans nearly 40 years, beginning as an extension specialist in IPM. After completing her doctorate, she served as a professor of entomology with a brief stint in Washington DC, and then assumed a number of administrative roles in extension and CALS.

Wendy Wintersteen. Photo courtesy of ISU-CALS Communications Service.

Wendy Wintersteen. Photo by Christopher Gannon.

Dr. Wintersteen represents ISU on many state, national and international boards. She currently serves as president of the Charles Valentine Riley Memorial Foundation, which has worked in support of greater funding for food, agricultural and natural resources research through a unified message to meet global challenges of a growing population, limited arable land, climate change and new pest and disease pressures. In 2013, she was appointed by U.S. Secretary of Agriculture Tom Vilsack to the board of directors of the U.S.-Israel Binational Agricultural Research and Development Fund. Her past service includes terms on the boards of the Farm Foundation and the Council for Agricultural Science and Technology. Wintersteen also serves as past chair of the Administrative Heads Section of the Association of Public and Land-grant Universities' Board on Agriculture Assembly.

Wendy was the 2016 recipient of the Carl F. Hertz Distinguished Service to Agriculture Award from the American Society of Farm Managers and Rural Appraisers. In 2007, she was honored as a Kansas State University Alumni Fellow for professional accomplishments and distinguished service.

BugGuide Gets an Upgrade from Crowdfunding

BugGuide is an incredibly popular website hosted by ISU Entomology. It has even been described as the most important resource created for the field of entomology. However, the project has no paid staff and the code that runs the website has gotten long in the tooth. **Dr. Laura Jesse Iles**, **Ann Greazel** and **Dr. John VanDyk** worked with the ISU Foundation to have BugGuide featured on FundISU, a crowdfunding platform, to garner support for an upgrade.The group set an initial goal of $15,000. That goal was exceeded and the fundraiser brought in $22,471 from 311 donors. While falling short of the $90,000 needed to support one year of a systems analyst staff position, it is enough for a short-term contract with a software development firm. The goal of the contract will be to relaunch BugGuide on a new codebase which supports many of the features people expect from modern web applications, including mobile-friendly navigation, county-level mapping capabilities, and the ability to tag images and taxa. For example, **Dr. Greg Courtney** would like to tag certain taxa as aquatic. Others may want to tag insects with certain behaviors or characters. Hopefully the site upgrade will be done in time for the Basic and Advanced BugGuide Workshops to be held at the 2018 Day of Insects which will take place at Reiman Gardens the third week of March (see page 13).

BugGuide maintainer, John VanDyk

Jurenka and O'Neal Receive Pollinator Patent

Drs. Russell Jurenka and **Matt O'Neal** have discovered novel, plant-based feeding inhibitors that repel honey bees and other *Apis* species. These inhibitors are steroids that can be applied to flowers, preventing visitation and feeding by honey bees. They received a patent for using their inhibitor in combination with pesticides. Farmers often need to prevent insect pest outbreaks during flowering. Although farmers are recommended to spray insecticides at dusk to limit bee exposure to insecticides, there is growing evidence that honey bees are exposed to multiple insecticides which they bring them back to their hives. Russ and Matt hope these plant steroids can be added to insecticides, limiting exposure and contributing to bee conservation. If used commercially, there may be additional benefits as Russ and Matt have demonstrated that these plant-extracts also repel herbivorous pests, like the Japanese beetle, in a paper recently published in Pest Management Science with co-author Kathryn Russell (see page 27).

Honey bees and other pollinators may benefit from a new antifeedant patent. Photo by David Cappaert, www.ipmimages.org.

New Midwestern Center for Disease Vectors

Terry Devitt, UW News writes: The Centers for Disease Control and Prevention (CDC) has awarded $10 million to a consortium of Midwestern universities to establish a new research and training program for diseases carried by vectors like ticks and mosquitoes. The Upper Midwestern Center of Excellence in Vector-Borne Diseases, led by University of Wisconsin–Madison medical entomologists **Dr. Lyric Bartholomay** and Dr. Susan Paskewitz, is aimed at understanding vector borne diseases and improving public health response to diseases like Zika, West Nile and Lyme disease. The consortium includes public health entomologists, epidemiologists, virologists and vector control experts from UW–Madison, the University of Illinois, ISU (**Drs. Joel Coats** and **Ryan Smith**), Michigan State University and the Minnesota Department of Health.

There are likely a number of reasons why new vector-borne diseases are on the rise in the Midwest. Changes to the landscape such as deforestation and urbanization, shifts in animal populations such as white-tailed deer, and changes in climate all are likely contributors, according to the Wisconsin scientists. Another possibility is that scientists are simply getting better at finding new invasive species of mosquitoes and ticks and their bacterial and viral pathogens. The new CDC-supported center will have three primary objectives:

1) Grow the number of public health entomologists by increasing graduate training and offering a new certificate program that will equip students to better identify vectors, conduct disease surveillance and use the appropriate tools to reduce insect populations.

Lyme disease vector, blacklegged tick. Photo by Scott Bauer, www.ipmimages.org.

2) Create a network of scientists, mosquito control, and public health experts at the local and state levels to better facilitate surveillance and response to outbreaks of disease.

3) Conduct research to improve methods to predict disease emergence and outbreaks as well as to optimize surveillance and pathogen detection. Research will also focus on improving methods for controlling disease vectors with the ultimate goal of reducing human exposure.

The new center will also have an outreach component. Outcomes will provide the public access to region-specific information about tick and mosquito activity, ways to accurately identify vectors, and information about the pathogens transmitted by ticks and mosquitoes.

Keep in Touch and Stay Connected!

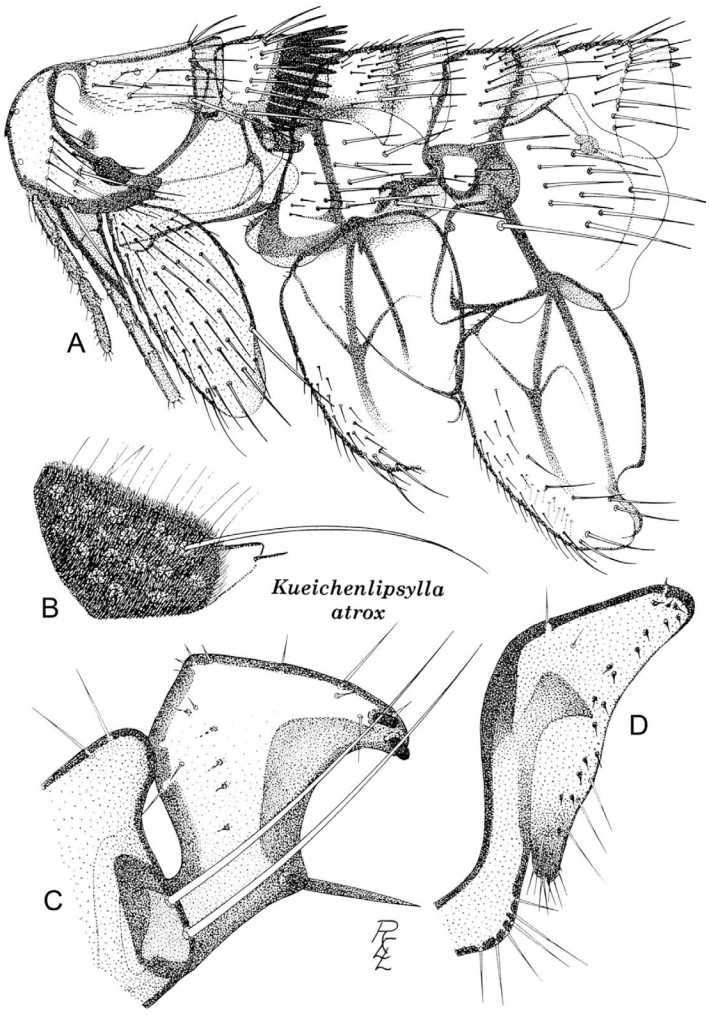
We have more departmental news to share with our alumni and friends! Visit the ISU Entomology website, *www.ent.iastate.edu*, to see our seminar schedule, research news, and social events. Also, find updates and hear about fun entomological news by "liking" us on our departmental Facebook page, *www.facebook.com/ISU.Entomology*.

Please let us know if you have information to share with Department of Entomology friends and alumni. Items could include job changes, honors and awards, and personal notes. Kindly direct information to the newsletter editor, Erin Hodgson, Iowa State University, Department of Entomology, 103 Insectary, Ames, IA 50011-3140 or via email: ewh@iastate.edu.

The ISU Department of Entomology Newsletter is for alumni and friends, and is produced by ISU Entomology faculty, staff, and students. This newsletter and previous issues are available online at *www.ent.iastate.edu/alumni*.

Faculty of Distinction: Robert Lewis

Dr. Robert E. Lewis was an entomology faculty member at ISU for 30 years starting in 1967 and retiring in 1997. Robert passed away on January 18, 2017. He is most noted for his studies on fleas (Siphonaptera). He was born in 1929 in Richmond, IN and attended Earlham College. After graduation in 1952, he enlisted in the army and was the entomologist at Fort Leonard Wood, MO. After the army, he began graduate work at the University of Illinois at Urbana-Champaign completing an M.S. (1956) and a Ph.D. (1959). The title of his dissertation was "The thoracic musculature of the Indian rat flea, *Xenopsylla cheopis,* its function and implications in the phylogeny of the order Siphonaptera." This was also published in the Annals of the Entomological Society of America in 1961. However, it was not his first publication; it was on bats and bat fleas in 1956.



Drawing from Robert Lewis' last publication on fleas.

Robert Lewis

Dr. Lewis and his wife Joanne moved to Beirut, Lebanon in 1956 where he taught at the American University of Beirut. He continued working on bats but mostly fleas and traveled extensively in the middle east. Dr. Lewis has many publications on fleas from countries including Lebanon, Syria, Jordan, Israel, Saudi Arabia, Turkey, Egypt, Nepal, India, and Afghanistan.

Due to the unstable situation in Lebanon, Lewis returned to the US in 1967 and became a faculty member in the then Department of Entomology and Zoology at ISU. He taught several courses, including Systematic Entomology. As a student you had to be on time because he would start teaching promptly on the hour whether or not students were ready. Another interesting fact is that Dr. Lewis was a guest on the Tonight Show starring Johnny Carson in 1982.

After retirement in 1996, Dr. Lewis continued to work on flea systematics publishing 22 papers after retirement, including several editions of "Flea News" which he started in 1980. In the last years of his life, Dr. Lewis was working on a book, 'The Siphonaptera of North America,' which will be published by the Carnegie Museum of Natural History.

2017 IWGO Conference Meets in China

The 26th International Working Group on *Ostrinia* and other maize pests (IWGO) Conference took place in the National Agricultural Library of the Chinese Academy of Agricultural Sciences (CAAS) in Beijing, China in April 2017. It was organized by Dr. Wang Zhenying from the Institute of Plant Protection (IPP) of CAAS and **Dr. Tom Sappington** (USDA-ARS). Overall, 98 experts from 11 countries participated. The program featured 11 scientific sessions with 52 oral presentations and 9 poster presentations covering a range of interrelated topics. Eight of the participants were young researchers who received the IOBC (International Organization for Biological Control) Global Travel Award and each of them presented excellent overviews of their research. Several people provided a welcome, including: Dr. Ulrich Kuhlmann, CABI, Switzerland; Dewen Qiu, Deputy Director General of IPP-CAAS; and Dongxing Feng, Director General, Department of International Collaboration of CAAS.

IWGO Co-Organizers: Ulli Kuhlmann, Victor Clottey, Tom Sappington, and Wang Zhenyeng

PIDC Gets Ready to Move

Laura Jesse Iles writes: As we close out 2017, the Plant and Insect Diagnostic Clinic (PIDC) is preparing for the big move into the new ATRB (see page 26). We are excited to move because we will have facilities specifically designed for a diagnostic laboratory and we get to be physically closer to entomologists. In the meantime, we are packing and cleaning!

This year was a notable year for its soil! The PIDC processes soil for growers, companies and researchers that need to evaluate nematode populations. This past year we received over 1,700 soil samples (three times our normal number of samples). The vast majority of the soil samples were for evaluation of soybean cyst nematode (SCN), the most serious disease of soybean in Iowa. Populations are managed by rotation to non-host crops, growing SCN-resistant varieties of soybeans and using seed treatments. Most SCN-resistant varieties possess the same set of genes and the varieties are becoming less effective as SCN populations overcome or become resistant to the resistance. Consequently, it is increasingly important for farmers to get SCN egg counts from soil samples collected from their fields in order to determine if their SCN management methods are effective.

Hafizi Rosli, Lina Rodriguez Salamanca, Laura Jesse Iles, Edward Zaworski, Chelsea Harbach, and Valeria Velasquez-Zapata

In 2017, we processed a total of 2,551 physical samples. The most commonly diagnosed insects were emerald ash borer, spruce spider mites, bed bugs, and American dog ticks. We continued to partner with other state agencies to track and report invasive species in Iowa, like emerald ash borer (EAB). Tracking the spread of EAB helps landscapers and homeowners assess risk to ash trees and determine treatment options.

For more information about what we do, please visit our website: *www.ipm.iastate.edu*.

USDA-NIFA Challenge Grant Awarded to ISU

Matt O'Neal writes: Hey, do you like bees? Not just honey bees, but all bees, native, wild and solitary? A group of entomologists at ISU do, and now with nearly $1 million, they are developing ways to improve bee abundance and diversity in the farm landscapes of Iowa. In April 2017, **Drs. Amy Toth, Matt O'Neal, Erin Hodgson** and **Adam Dolezal** received a Pollinator Challenge Grant from USDA-NIFA for a project titled "Impact of Prairie on Reducing Interacting Stressors on Pollinator Health." This is an integrated project that combines research and extension. The ultimate goal is to determine if the availability of late summer and fall flowering plants commonly found in prairies can act as a rescue for honey bees that are kept in and around soybean fields.

Research on honey bee health is going strong!

Previous research conducted by this team identified a lack of forage beginning in August that resulted in declining honey bee hive weight. This weight loss is due to bees eating their stored honey well before the start of winter. When hives were removed from a farm and placed next to a prairie, not only did the weight loss stop, the hives gained weight. This project will help the team determine if prairie can also rescue hives from exposure to sub-lethal exposure to insecticides commonly used in soybean.

In an effort to quickly apply these findings to beekeeping and soybean production, this project has allowed the team to hire an extension specialist, **Randall Cass**, to share these results with stakeholders. Randall is the only person at ISU

Harmen Hendriksma and Randall Cass

with an extension appointment that is focused solely on pollinators, both honey bees and native pollinators. Look for changes to our website (*www.ent.iastate.edu/pollinators/*) devoted to this topic as Randall becomes more integrated into ISU .

One of the original PIs, Adam Dolezal, was a Postdoc when the project was developed. Since receiving the grant, Adam has taken a tenure track position at the University of Illinois. In his place, the team hired **Dr. Harmen Hendriksma** to help determine if exposure to honey bees results in negative impacts to wild bees in both soybean and prairie fields. Furthermore, this project will support Ph.D. candidate, **Ashley St. Clair**, whose preliminary work helped support this project. Combined, this team will conduct research to determine if the diverse mix of forages available in prairies can rescue bees from the stressors experienced in a landscape devoted to annual crop production.

Do you know about 4K?

The entomology teaching lab in 433 Science II has been upgraded with new microscopes, cameras and a 4k screen and 4k projector thanks to a grant written by Greg Courtney and John VanDyk. The higher resolution of the screen and projector will allow entomology students to see specimens in greater detail.

Holscher Retires in 2017

Dr. Ken Holscher retired in the summer of 2017 after working at ISU for 35 years, receiving emeritus status after working at ISU for 35 years. Ken had sole leadership for the development of extension education programs pertaining to livestock and poultry pest management, public health pest management, and stored grain pest management. He also provided major assistance in support of extension education programs related to urban pest management, the Plant and Insect Diagnostic Clinic, Iowa Agricultural Aviation Association Fly-In Clinics, and the Pesticide Applicator Certification Program.

Ken earned his Ph.D. from Oklahoma State University in 1981 and held a short postdoctoral appointment at the University of Florida before starting at ISU in 1982. He was often recognized for his teaching efforts, including numerous Outstanding Faculty Recognition awards from the Greek Community. Ken also received the James Huntington Ellis Award for Excellence in Undergraduate Introductory Teaching, Recognition of Outstanding Contributions to Distance Education for the College of Agriculture and Life Sciences, and the Walnut Grove Award for Excellence in Extension Achievements Relating to Swine and/or Cattle Industries.

Ken Holscher

Bonning Moves to Florida

Dr. Bryony Bonning moved to the University of Florida in February 2017 where she accepted an endowed professorship in the Entomology and Nematology Department. She is now an Eminent Scholar and Professor of Entomology overseeing research on developing novel, environmentally benign alternatives to chemical insecticides for insect pest management. She will continue to be the Director of the Center for Arthropod Management Technologies (CAMTech). **Dr. Sijun Liu** and **Janice Seibel** will continue at ISU through 2018 while the rest of the lab personnel moved to Florida with Dr. Bonning.

Bryony earned her Ph.D. in Entomology from the London School of Hygiene and Tropical Medicine, University of London, UK, and then held postdoctoral appointments at the Natural Environment Research Council Institute of Virology in Oxford, UK and at the University of California, Davis, USA. She started at ISU in 1994 and worked in entomology for 23 years. Recently, she was the recipient of the ISU Outstanding Achievement in Research Award, ISU College of Agriculture and Life Sciences Outstanding Achievement in Research Award, 2015 Rossmann Manatt Faculty Development Award at ISU for an exceptional level of creativity and productivity in scholarship, teaching and research. Bryony is a Fellow of the ESA and Fellow of the American Association for the Advancement of Science.

Bryony Bonning

Faculty and Staff Recognized in 2017

Dr. Joel Coats, Distinguished Professor of Entomology and Toxicology at ISU, received the 2017 John Doull Award in Ames, IA. In recognition of Joel's contritubtion to the discipline of toxicology and the Central States Chapter of the Society of Toxicology (CS-SOT), he was presented the award during the annual meeting in September. Joel's areas of specialization are insect toxicology and environmental toxicology and chemistry of agrochemicals. He served as major professor for 43 graduate students while he has been on the faculty at ISU since 1978.

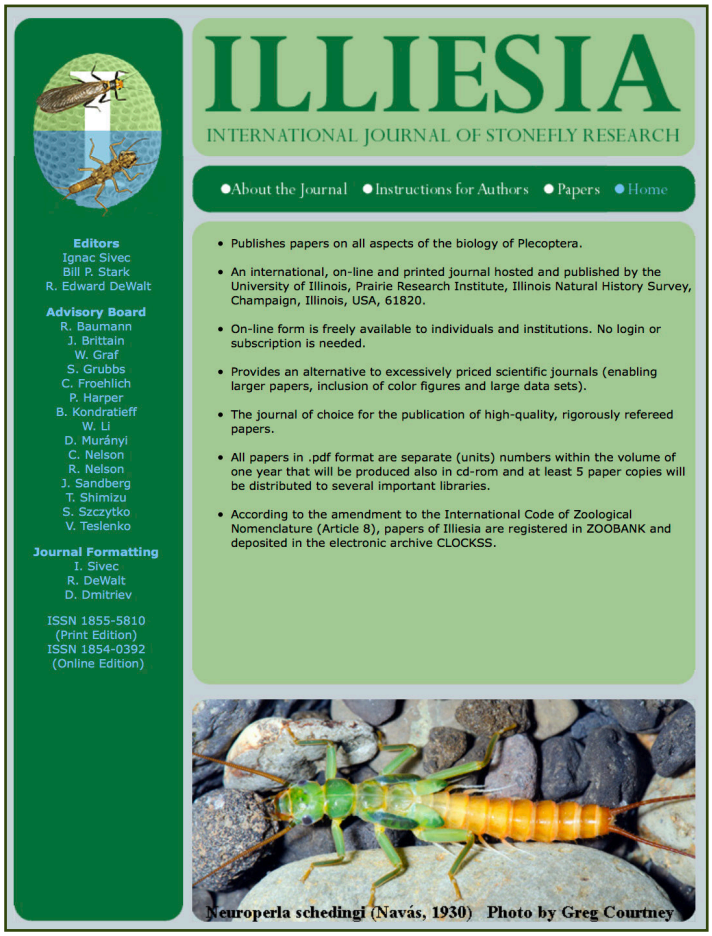
Chapter President Dr. Richard Martin, ISU Veterinary College, presents the award to Dr. Joel Coats.

Betsy Buffington received the American Association of Pesticide Safety Educators (AAPSE) Distinguished Achievement in Pesticide Safety Education Award. Betsy has been instrumental in the development of Worker Protection Standards training materials, online educational resources, and manual development at the national level. She received the award at the national AAPSE conference. Betsy has worked in the Pesticide Safety Education Program at ISU since 2007.

Betsy Buffington

Dr. Aaron Gassmann received the 2017 University Mission Award in Research from the ISU chapter of Gamma Sigma Delta, an Honor Society of Agriculture. Aaron is an associate professor in entomology, with research and teaching responsibilities in integrated pest management, insect resistance management, and plant-insect interactions. His research focuses on interactions between insect pests and corn.

Aaron Gassmann



Greg Courtney's picture of Plecoptera: Eustheniidae: Neoperla used for cover of Illiesia. International Journal of Stonefly Research. Volume 13, 2017.

Newsletter Celebrates Milestone Birthday

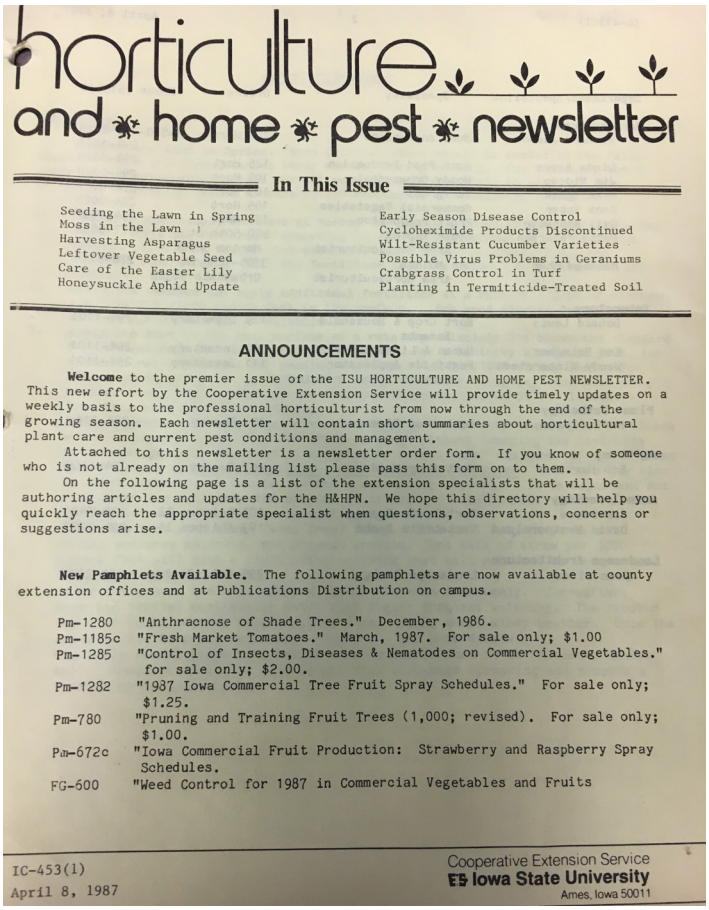
Donald Lewis writes: The ISU Department of Entomology has a long history of using newsletters to provide timely and accurate information about insect pests and pest management to the county extension offices, field specialists, farmers, growers, and the general public. Some early examples (and dates of publication) are: Corn Borer Information (1949 to 1954); Insect Information (1954 to 1973); and Insect, Weed and Plant Disease Newsletter (1973 to 1987).

Early newsletters were a few hundred mimeographed or printed paper "hard copies" mailed to county extension offices, farmers and growers around Iowa. By 2005, rising printing and postage costs lead to adoption of the new technologies and newsletters are now delivered digitally to a world-wide audience.

In 1987 the Insect, Weed and Plant Disease Newsletter, which included both agronomic crops and horticultural crops information, was split into two separate newsletters. Horticulture and Home Pest News (HHPN) was created to convey information on horticultural crops and household insect pests. Insect, Weed and Plant Disease Newsletter remained the agronomic crops newsletter but was revised and renamed to the Integrated Crops Pest Newsletter in 1993.

HHPN Editor, Donald Lewis

2017 marked the 30th anniversary of the HHPN. The first issue was mailed on April 8, 1987 with a promise to provide "timely updates on a weekly basis to the professional horticulturist from now through the end of the growing season" and would contain "short summaries about horticulture plant care and current pest conditions and management." HHPN started and remains



horticulture and home pest newsletter

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Moss in the Lawn
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Wilt-Resistant Cucumber Varieties
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Crabgrass Control in Turf
Planting in Termiticide-Treated Soil

ANNOUNCEMENTS

Welcome to the premier issue of the ISU HORTICULTURE AND HOME PEST NEWSLETTER. This new effort by the Cooperative Extension Service will provide timely updates on a weekly basis to the professional horticulturist from now through the end of the growing season. Each newsletter will contain short summaries about horticultural plant care and current pest conditions and management.

Attached to this newsletter is a newsletter order form. If you know of someone who is not already on the mailing list please pass this form on to them.

On the following page is a list of the extension specialists that will be authoring articles and updates for the H&HPN. We hope this directory will help you quickly reach the appropriate specialist when questions, observations, concerns or suggestions arise.

New Pamphlets Available. The following pamphlets are now available at county extension offices and at Publications Distribution on campus.

Pm-1280 "Anthracnose of Shade Trees." December, 1986.
Pm-1185c "Fresh Market Tomatoes." March, 1987. For sale only; $1.00
Pm-1285 "Control of Insects, Diseases & Nematodes on Commercial Vegetables." for sale only; $2.00.
Pm-1282 "1987 Iowa Commercial Tree Fruit Spray Schedules." For sale only; $1.25.
Pm-780 "Pruning and Training Fruit Trees (1,000; revised). For sale only; $1.00.
Pm-672c "Iowa Commercial Fruit Production: Strawberry and Raspberry Spray Schedules.
FG-600 "Weed Control for 1987 in Commercial Vegetables and Fruits

IC-453(1)
April 8, 1987

Cooperative Extension Service
Iowa State University
Ames, Iowa 50011

The first issue of the Horticulture and Home Pest Newsletter was released on April 8, 1987.

an interdisciplinary effort involving the departments of Horticulture, Entomology (including PSEP), Plant Pathology, and Natural Resource Ecology and Management.

Thirty years after that first issue was released, the HHPN is still providing timely information to horticulturalists, though in a different format. In 2005, a free electronic version of HHPN began to accompany the printed newsletter. A short time later it became a strictly electronic newsletter that today has over 2,100 subscribers.

Most recently HHPN was redeveloped into a website, *https://hortnews.extension.iastate.edu,* that provides a one-stop location for yard, garden, landscape and household pest information. The website carries the current newsletter and archives more than 2,400 HHPN articles from the past 30 years, along with an online database of approximately 300 articles (Encyclopedia), over 1,000 Frequently Asked Questions (FAQ), podcasts, and news releases. In 2017, the HHPN website recorded 1,056,664 page views by 782,894 unique visitors who downloaded 2,700 articles.

Resistance Management Plan for Iowa

Evan Sivesind writes: The Iowa Pest Resistance Management Plan (IPRMP), a voluntary, statewide effort to slow the development of pest resistance, was publically unveiled in January 2017. The IPRMP involves broad participation from all sectors of Iowa agriculture to promote voluntary adoption of resistance management practices (RMPs). Through successful implementation of voluntary efforts, we hope to minimize the need for additional regulatory intervention. By engaging communities and including all sectors of agriculture, cohesion and consistency can be improved, maximizing the likelihood for success. While there are similarities in the general principles of resistance management for weeds, insects, and pathogens, each pest complex possesses unique challenges. Differences between pests in biology, mobility, current resistance profile, and diversity of available management tactics all have to be taken into consideration. For mobile pests with the ability to cross field borders, cooperation between neighboring farmers is necessary to manage resistance effectively.

IPRMP members

Communication is key to this project's success. Clear, consistent messaging from all stakeholders is crucial to raising awareness and increasing understanding of pest resistance and the factors that contribute to its development. Certified Crop Advisers, independent crop consultants, agriculture retailers and other agronomic and farm advisers are key collaborators in this effort. Partnering organizations, including commodity groups and coops, will utilize existing partnerships and networks to reach out to farmers and landowners about adopting resistance management practices on their farms. The IPRMP website, *www.ProtectIowaCrops.org*, serves as a central hub for news, progress, information, announcements, and other relevant resources. Communication efforts in the summer and fall of 2017 have included press releases and newspaper articles to increase exposure for the IPRMP and local pilot projects, video and presentations, and a farmer survey and field day.

Four projects are in various stages of development. One project is focused on Palmer amaranth and other resistant weeds in Harrison County. A second project targets western corn rootworm resistance to Bt traits and in northcentral and northeastern Iowa. The third project concerns herbicide-resistant waterhemp in central Iowa. Finally, a project will focus on soybean aphid resistance to pyrethroids in northwestern Iowa.

For each pilot project, we are assembling teams with representation from all sectors of agriculture, including farmers, crop advisers, commodity groups, agricultural retailers, seed dealers, lenders, university research and extension, and representatives from seed and chemical companies. Project plans are being developed from the "ground-up," with extensive input from farmers and other local stakeholders. Despite strong evidence supporting RMPs, adoption has been low. A broad cross-section of stakeholders is vital as each brings unique viewpoints and valuable insights into barriers to adoption of RMPs and potential solutions. By increasing adoption of RMPs, we hope to slow the development of resistance, protect management technologies, and preserve long-term farm profitability.

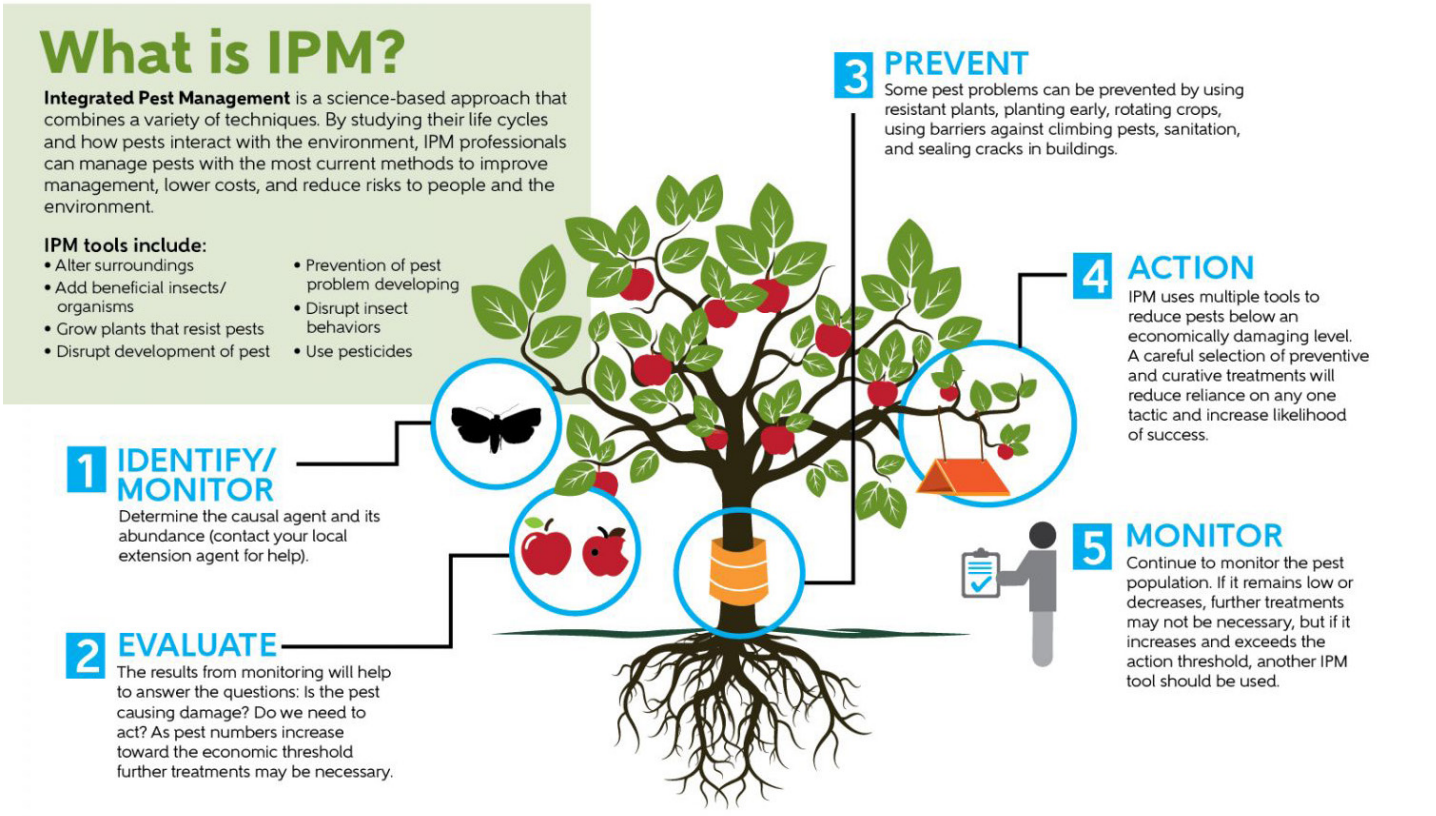
Soybean Pest Podcast Has New Widget

In 2009, **Matt O'Neal** and **Erin Hodgson** started a podcast to promote IPM concepts (e.g., identification, sampling and economic thresholds), and provide updates on invasive pests, regulatory news and translate research. For the first few years, they did weekly episodes in the summer, but recently expanded to more episodes in the winter.

In 2017, they recorded the 100th episode and also got a new widget to support the podcast files. The widget features links and photos for more information and embedded conversation chapters. Most of the time, Matt and Erin have a freeform discussion on pest activity and management recommendations. But Matt recently incorporated a FIT segment (fun insect trivia) into the conversation.

Anyone can listen to the episodes by visiting this website: *http://bit.ly/1UjOHvq*. You can also subscribe to the podcast via iTunes, Stitcher, and Google Play.

ESA Infographic: What is IPM?



Isman Gives the Dahm Lecture for 2017

In April, we held the Paul Dahm Memorial Lecture. The lecturer was Dr. Murray Isman, who is Professor of Entomology and Toxicology at the University of British Columbia, Vancouver, Canada and former Dean of the Faculty of Land and Food Systems (2005-2014). He has performed extensive research for over 35 years in the areas of insect toxicology and behavior, with particular emphasis on the discovery and development of botanical insecticides. He made important discoveries of the insecticidal, antifeedant, and repellent activity of neem oil and its component chemicals. In 2011, he received the Gold Medal for outstanding achievement from the Entomological Society of Canada and was elected a Fellow of both the ESA and the Royal Entomological Society in 2014. Murray was the first international Paul Dahm Lecturer. **Dr. Paul Dahm** was a faculty member of Entomology at ISU for 34 years (1953 to 1987) in insecticide toxicology. He was conferred the Charles F. Curtiss Distinguished Professor of Agriculture in 1969, and served as Chairman of the Department of Entomology from 1975 to 1982.

Murray Isman and Joel Coats

Support the Gunderson Memorial Lectureship

Since 1983, students and faculty at ISU have benefited from a gift by the estate of Harold "Tiny" Gunderson. This support allowed us to invite eminent scholars to speak as part of the Harold Gunderson Memorial Lectureship. The focus of these lectures is to provide applied research and extension updates, honoring the contributions that Tiny made during his 32-year career at ISU.

Tiny was a graduate of ISU, completing his Ph.D. in 1939. He quickly joined the Entomology faculty to work on applied pest management. Like many of our graduates, Tiny received national acclaim for his extension efforts and was recognized by USDA with a Superior Service Award (1954) and with an Outstanding Performance Award (1960). In many ways, he started a tradition of addressing agricultural pest management at ISU. Tiny and many members of our department have leadership roles in industry, government and within the ESA.

Some of you knew Tiny personally, and experienced his dedication to extension and pest management. There are also many of you that did not know Tiny, but do remember participating in the Gunderson Memorial Lectureship while at ISU. Please join us in contributing to the Tiny Gunderson Memorial Fund, paying forward benefits you have received through your association with ISU Entomology; a donation will support future lectures. Please consider supporting the Gunderson Memorial Lectureship by contributing online: *www.foundation.iastate.edu/gunderson*.

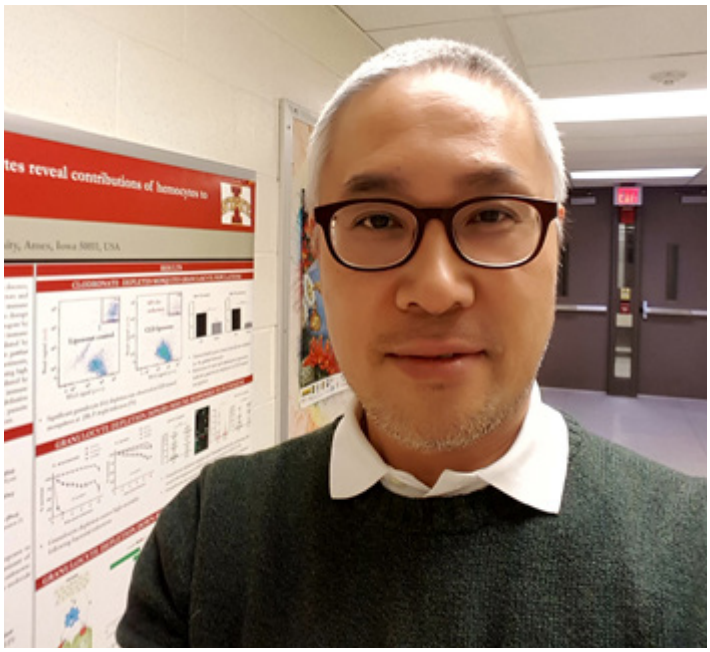
Harold "Tiny" Gunderson

Featured Staff: Hyeog-Sun Kwon

Dr. Hyeog-Sun Kwon is a postdoctoral research associate with **Dr. Ryan Smith**, where his research interests examine the role of cellular immunity in response to malaria parasite development in the mosquito host. Specifically, his research has focused on how mosquito phagocytic immune cells initiate immune responses that kill malaria parasites at multiple life stages in the mosquito, *Anopheles gambiae*. In addition to his research, Hyeog-Sun plays a vital role in mentoring undergraduate and graduate students in the lab with their own research.

Recently, Hyeog-Sun won second place in the Young Investigators competition at the 66th Annual American Society of Tropical Medicine and Hygiene Meeting. The 2017 meeting was in Baltimore in November.

Hyeog-Sun received his B.S. in Agricultural Biology from Korea University in South Korea and an M.S. in Biological Sciences from Western Illinois University. After receiving his master's degree, he joined the Ph.D. program in Biological Sciences at Northern Illinois University where he soon developed an interest in insect immunity. After a few years at Northern Illinois University, Hyeog-Sun transferred to the Department of Entomology at Texas A&M University to better his understanding of the immunological mechanisms mediated by lipids in the insect host. During his Ph.D., Hyeog-Sun focused his research on functional characterization of the G protein-coupled receptors (GPCRs) in maintaining water balance following a blood meal in *Aedes aegypti* mosquitoes. After receiving his Ph.D., Hyeog-Sun continued to study lipid immunity as well as the behavioral processes mediated by GPCRs in mosquitoes. From this research, he discovered a novel mosquito repellent able to manipulate mosquito feeding behavior through the activation of a GPCR expressed in the legs and mouthparts of *A. aegypti*.



Hyeog-Sun Kwon

In the future, Hyeog-Sun hopes to continue to pursue his interests in investigating the contributions of mosquito neuropeptides and their cognate GPCRs in establishing innate immunity to pathogen infections. Outside of his research, Hyeog-Sun and his family (wife Hee-Jung and son Ethan), are avid outdoor enthusiasts in which they spend most of their time camping, biking and playing tennis.

Do you know about Day of Insects*?*

Reiman Gardens at ISU is so enthusiastic about insects that they set aside a special day to celebrate them every year with an event called Day of Insects. This annual event brings together professionals, academics, advocates and enthusiasts of all levels from across the country to explore and celebrate entomology.

Topics include insects native to Iowa, exotic insects, endangered insects, conservation efforts and new educational programs aimed at advancing the appreciation of all invertebrates.

Day of Insects is open to anyone interested. Additional events include informal time for food and socialization on the night before presentations, and snacks and lunch during the day.

The 2018 event will be in March and features four workshops on invertebrate-related topics. Individuals can participate in the workshops regardless if they are attending any of the other event activities. Find out more about the event and registration details here: *www.reimangardens.com/collections/insects/day-of-insects/.*

Whitford Writes About Honey Bee Colony Health

Dr. Frederick Whitford, Director of Purdue Pesticide Programs, recently published a publication titled "The complex life of the honey bee: environmental, biological and chemical challenges to colony health." He works for the Purdue Cooperative Extension Service in the College of Agriculture. Fred received a B.S. in wildlife management from Louisiana Tech University, and an M.S. (1983) and Ph.D. (1989) in entomology from ISU. He has authored more than 250 research, extension, and regulatory publications, and has delivered at least 4,000 presentations. He has written several other books about the history of Indiana agriculture. Find his new honey bee publication online here: *https://ppp.purdue.edu/wp-content/uploads/2017/PPP-116.pdf.*

Cover photo from Fred's new honey bee publication.

New Editor for American Entomologist

Kevin Steffey

The next editor-in-chief of American Entomologist, the quarterly magazine of the Entomological Society of America, will be **Dr. Kevin Steffey** (Ph.D. 1979), retired professor of entomology and extension educator at the University of Illinois, as well as retired technology transfer leader with Dow AgroSciences. Steffey's five-year term as American Entomologist editor-in-chief will begin January 1, 2018.

Kevin will carry the experience of a nearly 40-year career devoted to teaching insect science in academic, extension, and industry settings into his role at the helm of American Entomologist. He has also previously served in editorial and publishing roles at ESA, other scientific societies, and the University of Illinois—including several years as a contributing editor to American Entomologist and the past eight years as founding co-editor-in-chief of ESA's Journal of Integrated Pest Management (JIPM).

Richtman Recognized with Two Awards

Nina Richtman (M.S. 2006 and M.S. 2009) was named Working Mother Magazine's 2017 Working Mother of the Year. She was also selected as a finalist for the 2017 Inspiring Women of Iowa. This event honors women who demonstrate courage, confidence or character in their daily lives. Nina is a Senior Research Associate with the Discovery RNAi Lab with DuPont Pioneer in Johnston, IA. She helped establish the Pioneer Employees with Disabilities and Allies Employee Resource Group, which seeks to increase awareness, empathy and opportunities for those living with disabilities.

Nina Richtman and her two sons. Photo by DuPont.

Madriz is National Geographic Fellow

Dr. R. Isaí Madriz (Ph.D. 2017, Courtney Lab) was awarded the 2017-2018 Fulbright-National Geographic Storytelling Fellowship, a component of the Fulbright U.S. Student Program. This program provides opportunities for U.S. citizens to participate in an academic year of overseas travel and storytelling on a globally significant theme. This Fellowship is made possible through a partnership between the U.S. Department of State and the National Geographic Society.

Psychodidae pupae breaking out of their larval skin (left and right) with an older larva in the center. Photo by Isaí Madriz.

Isaí is an entomologist with expertise in freshwater aquatic insects of Patagonia. As a Fulbright-National Geographic Digital Storytelling Fellow, he is telling the story of deglaciation of the Northern Patagonia Ice Field, focusing on its vanishing aquatic insect diversity through images and stories of exploration, science and human connections. He combines hiking, bikepacking and packrafting to transect unexplored areas and secluded fjords in search of some of the rarest insects on the planet. This low-carbon footprint approach utilizes renewable energy sources to capture never-before-seen footage of remote glacial outlets and hidden valleys of wild Patagonia. Madriz is documenting the largely unknown endemic aquatic insect fauna of this vital region before Chile's Aysén region's biodiversity is transformed forever.

Follow Isaí's entomological journey as a National Geographic Fellow by visiting his website, *www.isaimadriz.com/*, or blog: *https://blog.nationalgeographic.org/author/rimadriz/*.

Shapiro-Ilan Elected Society Fellow

Dr. David Shapiro-Ilan (Ph.D. 1994) was selected as a Fellow for the Society of Nematologists in 2017. David is a Research Entomologist with the USDA-ARS at the Southeastern Fruit and Tree Nut Research Laboratory in Byron, GA. His research program focuses primarily on entomopathogenic nematodes and their use in biological control. David conducts research on all aspects of entomopathogenic nematodes, including improvement of mass production systems (in vivo and in vitro), enhancing formulation and application technology, and elucidating fundamental aspects of behavioral ecology and infection dynamics. Through his research endeavors, Dr. Shapiro-Ilan has published more than 150 peer-reviewed journal articles plus 21 book chapters, more than 40 trade journal/extension articles, co-edited 3 books and is inventor on seven patents.

David Shapiro-Ilan at the Great Wall of China.

Fuerst Promoted to Director

Emily Fuerst has been working for Kemin Industries in Des Moines, IA since graduation (M.S. 2005, Jurenka Lab). She started as a senior research associate conducting research on molecular engineering of bacteria and yeast for the production of small metabolites for potential products. It was really different than her master's thesis on "The isolation, functional expression, and peptide selectivity of PBAN-like receptors in neural tissues of the corn earworm (*Helicoverpa zea*) with comparison to two Drosophila melanogaster G Protein-coupled receptors".

Recently, Emily was promoted to R&D Director for Kemin CropTechnology where she is in charge of a group focusing on products for greenhouse and specialty crop growers for enhancement and protection of crops. This includes finding new control technologies for insect pests. So she has come back to entomology within the company. Along the way she was the interim R&D Director for Kemin Animal Nutrition and Health in Brazil for two years with frequent travel to Brazil. Emily developed the product TetraCURB Concentrate which is a rosemary oil based miticide. She has 5 patent applications, won numerous awards for white papers and presentations within Kemin Industries, and most recently finished a master's degree in business from the University of Iowa. Working for Kemin Industries for the past 13 years has been a very rewarding and successful experience for her. Emily still lives in Ames with her husband Greg (who is still working with Dr. Wise on campus) and their two lovely daughters.

Emily Fuerst

Krell Organizes Pollinator Tour in Mississippi

In late 2016, **Rayda Krell** (Ph.D. 2002) started a new position at Western Connecticut State University as a Study Coordinator for a CDC-funded integrated tick management research project with Dr. Neeta Connally. Concurrently, she teaches a scientific communication class at the same institution as an adjunct professor. In August of 2017, she worked with ESA P-IE President, Dr. Melissa Siebert, to co-organize the first-ever P-IE Science Policy Field Tour, "Balancing Pest Management and Pollinator Health" in Mississippi. The goal was to learn about the Honey Bee Stewardship Program, which has been a successful example of balancing the needs of beekeepers and farmers. Participants represented 19 stakeholder organizations and ESA members from 21 affiliations. During the tour, she was thrilled to have the opportunity to do some sweep-net sampling in soybeans (not a frequently-encountered crop in Connecticut!) and even find her favorite insect, the bean leaf beetle. The next few years will include additional ESA service for Krell when she co-chairs the Student Competition at the ESA Annual Meeting with **Patti Prasifka** (Ph.D. 2004) and their counterparts in Canada. In 2019 she and Patti will serve as Program Co-Chairs for the ESA Annual Meeting when **Bob Peterson** (B.S. 1987) is ESA President.

Rayda Krell sweeping in soybean.

Featured Student: Coy St. Clair

Coy St. Clair writes: When I was in the fourth grade I went to 4-H camp over the summer. They had a whole list of classes that we could take. There were the usual suspects, like canoeing and archery, but I remember one of them on the list was called "Entomology." There was no description and I had never seen that word before in my life. So I asked one of the counselors about it and they described it to me: we would go out into the woods and catch insects and make a collection. Sounded great to me, so I signed up. Over the course of the summer we (myself, and the two other kids that signed up) used butterfly nets to capture insects and learn their names, and I put together a collection of which I was quite proud. I greatly enjoyed the endeavor, even if my friend Nathan called me a "total nerd."

Coy St. Clair

Ashley, Coy IV, Evangeline and Coy St. Clair

Fast forward to present day, and my interest in entomology is still in full swing. After receiving my B.S. in Biology from Georgetown College in Kentucky, I accepted a position as a master's student at Murray State University. There I studied the effects of agricultural runoff on aquatic insects in wetland ecosystems. It was my first foray into the challenges associated with agriculture and its intersection with entomology.

The pursuit of examining these challenges led me to Iowa State, where I am advised by **Dr. Aaron Gassmann**. I study the development of resistance to transgenic Bt corn by western corn rootworm, a very practical problem for farmers in the Midwest. My hope is to pursue a career in entomology that continues to address such practical issues in agriculture.

My wife, **Ashley St. Clair**, is a fellow Ph.D. student and entomologist who studies bees. We have a daughter, Evangeline, and son born just this past December, Coy IV. Whether our children will become entomologists themselves remains to be seen, but I can say with certainty that, if they find themselves at 4-H camp, they won't need to ask a counselor what "Entomology" means.

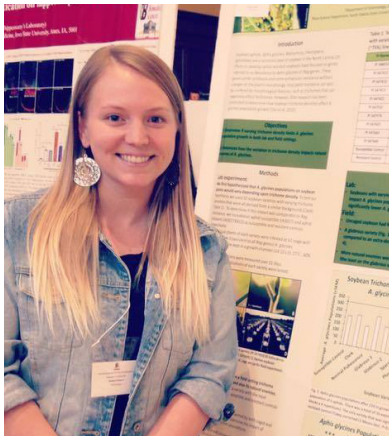
Coats Lab Alum Updates

Todd Anderson

Dr. Todd Anderson (Postdoc, Coats Lab) is the Chair of the Department of Environmental Toxicology and interim Director of the Institute of Environmental and Human Health at Texas Tech University. Todd spent part of 2017 at Erzincan University in Erzincan, Turkey. **Dr. Aaron Gross** (Ph.D. 2014, Coats lab) accepted a tenure-track position as Assistant Professor in the Department of Entomology at Virginia Tech, in Blacksburg, Virginia. **Dr. Dingfei Hu** (Ph.D. 2007, Coats Lab) accepted a position as Manager, Bioanalytical Chemistry, Medpace Bioanalytical Laboratories, Cincinnati, OH. **Dr. Chris Peterson** (Ph.D. 2001, Coats Lab) accepted a position as International Program Specialist with the USDA Foreign Agricultural Service.

2017 Graduations

Shelby Pritchard received her M.S. in Entomology with Dr. Matt O'Neal in the spring of 2017. Her thesis was titled "Impact of soybean aphid trichomes on *Aphis glycines* (Hemiptera: Aphididae) and their natural enemies." She now works near Yellowstone National Park at Montana Sky Guest Ranch, MT.



Shelby Pritchard

Dr. Eric Clifton received his Ph.D. in Entomology with Drs. Aaron Gassmann and Erin Hodgson in the summer of 2017. His dissertation was titled "Pest management of soybean aphid and soybean cyst nematode: host plant resistance, entomopathogens, and seed-applied pesticides." Eric is now a Postdoc at Cornell University working on entomopathogens of Asian longhorned beetle.

Eric Clifton

Shunji Li received her M.S. in Entomology in the summer of 2017 with Dr. Bryony Bonning. Her thesis was titled "Putative receptor for Israeli acute paralysis virus of honey bee (*Apis mellifera*).

Dr. Isaí Madriz received his Ph.D. in Entomology with Dr. Greg Courtney in the fall of 2017. His dissertation was titled "The primitive crane flies (Diptera: Tanyderidae). Isaí is now a Fulbright fellow with National Geographic (see page 15).

Isaí Madriz

Undergrad Club Hosts Bee Hotel Workshop

The ISU Undergraduate Entomology Club worked with the Memorial Union Workspace to host a Bee Hotel Workshop in February 2017. The event promoted bee conservation and provided supplies for participants to build a structure for solitary nesting bees. In addition, the club toured Reiman Gardens with **Nathan Brockman** (B.S. 2000), and hosted a few insect curation and storage events. The current officers are: Elizabeth Maack (President), Sarah May (Vice President), Olivia Parks (Secretary), and Aleksi Saarinen (Treasurer).

Club tours the Christina Reiman Butterfly Wing at Reiman Gardens.

Amy Geffre and JaVon Latimore at the Bee Hotel Workshop.

EGSO Was Active in 2017

The Entomology Graduate Student Organization (EGSO) elected Eleanor Field (GPSS representative), Caleb Corona (Secretary), Colin Wong (Treasurer), Kelsey Fisher (Vice President), and Rebekah Reynolds (President) as the 2017-2018 officers. Our group was busy in 2017 with several organized events.

In the past year, EGSO organized several events including the faculty vs. student bowling event. Unfortunately, the graduate students were defeated yet again by the faculty but we are hopeful we can win in 2018!

EGSO members using black lights to collect insects.

Participants at the annual EGSO bowling event.

During summer 2017, EGSO organized a graduate student BBQ and black lighting insect collection event. In the Fall 2017, EGSO held the annual Insect Film Festival at Reiman Gardens. The film for this year's film festival was James and the Giant Peach. The ISU Insect Zoo taught the families about insects, EGSO provided insect-related crafts and games, and graduate students gave tours of the Reiman Gardens Butterfly Wing. We are excited for the events in the upcoming year!

EGSO with invited seminar speaker, Sean Schoville.

EGSO Sponsors Schoville Seminar

In the Spring of 2017, EGSO invited Dr. Sean Schoville to talk about his landscape genomics and conservation research. Dr. Schoville is an assistant professor in the Department of Entomology at the University of Wisconsin-Madison. Sean's research is inspired by the natural history of species and how they overcome challenges in the natural world. One of his long-standing interests is how alpine species have evolved to cope with climatic variation and extreme environmental conditions. Sean is also interested in how ecological and evolutionary processes interact to shape biodiversity patterns, particularly during the formation of new species.

Sean Schoville (center) collecting butterflies in Sayan Mountains, Russia.

Student Awards and Scholarships

The Wayne A. Rowley Scholarship in Entomology provides $3,500 to students with preference given to applicants concentrating on medical entomology. **Rebekah Reynolds** was the 2017 recipient and is mentored by Dr. Ryan Smith. Rebekah was also awarded a National Science Foundation Graduate Research Fellowship. The NSF program supports outstanding graduate students in science, technology, engineering, and mathematics who are pursuing research-based master's and doctoral degrees.

Rebekah Reynolds and Wayne Rowley

The Jean L. Laffoon Memorial Scholarship for $1,000 was presented to **Niranjana Krishnan.** This scholarship was established in 2012 in memory of Dr. Laffoon, who was a systematist in entomology from 1946–1973. Niranjana is mentored by Drs. Steve Bradbury and Joel Coats.

Niranjana Krishnan

The Jim Oleson Scholarship in Entomology, which provides $2,000 to students who demonstrate academic promise and initiative, was awarded to **Edmund Norris.** He is advised by Dr. Joel Coats. Edmund also received the Larry Pedigo Graduate Scholarship in Entomology. This scholarship of $2,500, established to honor the many contributions of Dr. Larry Pedigo to the department and college, recognizes scholarly performance.

Ryan Smith and Ed Norris

Ed Norris also won a number of awards and scholarships in 2017. He got the Hollandsworth Prize – 1st place grad student presentation at the national American Mosquito Control Association meeting in San Diego, CA. Ed's poster got 2nd place at Neuroscience Research Day, titled "Exploring the relationship between PaOA1 receptor modulation and the insecticidal character of various terpenoids." He was elected Co-Chair of the American Mosquito Control Association Young Professionals Group. Ed also received the American Mosquito Control Association Young Professionals Industry Shadowing Scholarship; it included $1,000 to attend the American Mosquito Control Association Annual Meeting in Kansas City, MO, and to shadow an industry representative from a mosquito control company. Read more about Ed's adventure to Texas on page 24.

More Student Awards and Scholarships

Kelsey Fisher received a Garden Club of North American Board of Associates Centennial Pollinator Fellowship in 2017. Kelsey will track monarch butterflies with active radio telemetry technology to understand their perception of distance and navigational patterns. She is advised by Steve Bradbury.

Kelsey Fisher

The Entomology Alumni Scholarship for undergraduates or graduates in entomology was presented to **Ashley St. Clair**. This $2,000 scholarship was awarded based on promise for a career in entomology. Ashley is co-advised by Drs. Matt O'Neal and Amy Toth. Ashley also received a $10,000 grant in 2017 from the Eastern Apicultural Societies Foundation for honey bee research. The title of her funded project is "Forage and fecundity: does apiary location affect queen quality and brood production?" She will be working in both soybean and prairie fields in central Iowa to monitor how the landscape, and the forage collected by bees in those landscapes, affects honey bee queen fecundity and the workers response to the queen. Ashley also won the best poster at the 2017 ISU graduate and professional student research conference in Ames, IA.

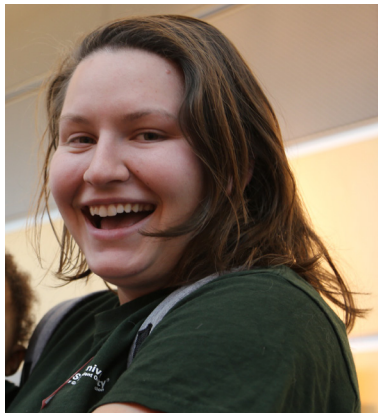
Ryan Smith and Ashley St. Clair

In 2017, the ESA North Central Branch meeting was in June (Indianapolis, IN), and the national ESA meeting was in November (Denver, CO). Many ISU students participated in the ten-minute paper and poster competitions, including three winning presentations:

Ashley St. Clair, second place, for P-IE: Pollination Session paper "Does on-farm diversity affect bee health and communities in highly cultivated landscapes?" Ashley is co-advised by Drs. Matt O'Neal and Amy Toth.

Ashley St. Clair

Teresa Blader, third place, for B.S./M.S. Session poster "Milkweed distribution and effects on monarch butterfly (*Danaus plexippus*) oviposition along Iowa roadsides utilizing GPS and GIS." Teresa is co-advised by Sue Blodgett and Rick Hellmich.



Theresa Blader

Ge Zhang, third place, for Ph.D. Session paper "Does landscape complexity affect honey bee pollen forage?" Ge is co-advised by Drs. Matt O'Neal and Amy Toth.

Ge Zhang

Opportunities to Contribute to Entomology

The Department of Entomology at Iowa State University is increasingly dependent upon the generosity of alumni and friends. To support the department, please fill out this section and return it with your check or money order (made out to The ISU Foundation) to the Department of Entomology, Iowa State University, 114 Science II, Ames, IA 50011. Alternatively, donations can be made online at *www.foundation.iastate.edu/ent.*

My support this year is in the amount of _____

Please designate my gift to the area(s) in the amount(s) shown below:

_____ Biosystematics Travel Fund for travel costs associated with biosystematics research

_____ BugGuide: an online resource for insect identification

_____ Entomology Alumni Scholarship for scholarships

_____ Entomology General Account

_____ Entomology Memorial Fund for various expenses, including graduate student travel

_____ Iowa State University Insect Zoo

_____ Harold "Tiny" Gunderson Memorial Lectureship for Extension

_____ Fred Clute Memorial Entomology Fund for general support for the Department of Entomology, including The Entomology Student Scholarship for Student Excellence

_____ Jean L. Laffoon Memorial Scholarship for graduate students in Entomology

_____ Jim Oleson Scholarship in Entomology for students who demonstrate academic promise

_____ Larry Pedigo Graduate Scholarship in Entomology for scholarly performance

_____ Henry and Sylvia Richardson Research Incentive Grant provides funding for graduate research experiences beyond their degree program

_____ Wayne A. Rowley Scholarship in Entomology for graduate and undergraduate scholarships, with preference given to those with an interest in medical entomology

For more information about these funds, please contact us at the departmental address above or call 515.294.7400. For more information about other gift designations, please contact Ray Klein via phone: 515.294.3303 or e-mail: rklein@iastate.edu.

Photos From the 2017 Holiday Party

Wayne Rowley and Greg Courtney

Xiaoyi Dou

Sue Blodgett and Jacqueline Pohl

Jim Oleson and Edmund Norris

Royce Bitzer

Sue Blodgett and Aaron Gassmann

Hurricane Harvey Mosquito Relief Effort

Ed Norris writes: Many of us have been fortunate enough to have not lived through a hurricane. While we can empathize with those who have lost their belongings or their homes, it is difficult to truly understand the impact of such a devastating storm. Even more difficult to understand is the long-lasting effects that these storms leave behind in their wake. Many people don't think of mosquito-borne disease as a consequence of a hurricane or tropical storm, but the concomitant rise in floodwater associated with these storms make perfect breeding sites for opportunistic mosquito species. A large portion of hurricane relief involves managing these mosquitoes which spike a few weeks after the storm passes.

Floodwater pools were common in Houston and offered perfect mosquitoes breeding locations.

In the weeks following Hurricane Harvey, significant efforts were made by the U.S. Airforce, the Texas Department of Public Health and Sanitation, and neighboring mosquito control companies and districts to monitor and control the rise in mosquito numbers shortly after the storm. Clarke, a mosquito control company based out of St. Charles, IL, did that and more. By working with the newly formed Centers for Disease Control (CDC) Midwest Center of Excellence (see page 3), Clarke offered training opportunities for center trainees by sending them to Houston to aid in Harvey relief efforts. As a trainee of the center and an ISU Ph.D. student, I jumped at this opportunity to assist.

I spent just under a week working with the Clarke team, learning how mosquito control companies and districts work with state agencies to monitor the rise in mosquito numbers after a devastating natural disaster. While I was there, I was in the field working with the personnel who monitor and control mosquitoes. Our days began with counting and identifying mosquitoes caught the night before using carbon dioxide-baited light traps. This involved meticulously separating individual mosquitos, identifying them to species, and noting areas with exceptionally high numbers. The Clarke team would then select locations that would be treated with insecticide the following night. We would end our days by driving to field sites chosen earlier to place equipment for monitoring the efficacy of the aerial insecticide application. This was done by characterizing the amount of insecticide delivered to the location and monitoring the amount of mosquito kill that was observed. It was fun to see all aspects of the relief effort, and Clarke was extremely accommodating in teaching us about the processes they and the state of Texas use to control mosquitoes after a natural disaster.

Mosquitoes collected from one trap before insecticide application (left) and mosquitoes collected from same trap site after insecticide application (right).

Overall, I am extremely grateful for this opportunity provided by both Clarke and the CDC Midwest Center for Excellence, as it will be a huge help to me in my future career. This experience has allowed me to observe the real-world practices that mosquito control technicians use in the field to monitor and control mosquitoes. I am thankful for their training and hospitality during this wonderful experience.

Counting and separating mosquitoes collected from traps.

Insect Zoo Has a Bugtastic Year

Ginny Mitchell writes: Wow! 2017 was a roller coaster ride for the Insect Zoo. We started off the year in Keokuk, IA for the Bald Eagle appreciation days. We spent three glorious days with hundreds of children from the area. We love this yearly tradition.

We said goodbye to several Insect Zoo students in 2017...Josh Byrne and Ashley Reed will be greatly missed. Josh Byrne left his mark on the wall of the 4th floor in the Science II building. He painted a beautiful Giant Malaysian Walking Stick and a Giant Leaf Bug. Stop by and check it out if you haven't seen it! We also introduced our 2017 Insect Zoo t-shirt that features several species of adorable cockroaches. We still have some available if you are interested!

Several new species were welcomed to the Insect Zoo this year. The *Dynastes* Hercules beetle is totally my favorite, but we now also have a colony of the Giant Malaysian walking sticks! We love them just as much as the kids do. We are also working hard on breeding several species of praying mantids and scorpions. We also received several species of beetle grubs and can't wait to start seeing some adults.

Dynastes *Hercules beetle*

Our summer program, The Buildings of Bugs, visited 50 Iowa libraries. This program featured a giant Botswana Chimney Termite mound made by the lovely Insect Zoo students, two aluminum molds of ant colonies, a bald faced hornets nest and honey comb from honey bees. Our program was a success and many children were amazed by our Bugtastic live animal display as a follow-up to talking about how arthropods build their

Jillian Kurovski, Emily Gamble, and Ben White made this large termite mound!

structures. We can't wait for our 2018 summer program, The Song of Bugs, that features an original children's story about 'Unia the Cricket who lost his song. We will follow 'Unia as he listens to the songs of other bugs and tries to figure out why he is different. This story is based on the cricket found in Hawaii who no longer chirps!

We began an Insect Zoo internship for the fall semester. The three interns spent 10 hours a week in the rearing room, went on programs and displays, created their own educational program, logged a weekly journal of activities and submitted a poster project of their choice. Our enrollment for the spring semester was far beyond our limit of 6! We are so sad to have to turn students away, but are grateful for the interest!

We want to give a shout out to all the Insect Zoo student workers who work so hard to keep the animals safe and alive. Jillian Kurovski, Emily Gamble, and Beth Barreto. Thank you for all you do! Check out our Facebook page and you can catch the LIVE unboxing of our animals!

Thank you for your support of the Insect Zoo. We look forward to another Bugtastic year!

Arrivals and Departures

Dr. Joel Coats had several new graduate students join his lab in 2017: **Caleb Corona, Maura Hall** and **James Klimavicz**. Dr. Aaron Gassmann also added some new graduate students: **Abigail Kropf** and **Mattea Allert**. Dr. O'Neal's Lab continues to grow; new arrivals include graduate student **Ashley Dean** (co-advised by Erin Hodgson), and postdocs **Jessica Hohenstein** and **Marina Kaiser**. **Matt Kaiser** and Marina Kaiser left ISU in the fall and moved to California. Dr. Steve Bradbury's program added a new member, **Evan Sivesind**, to help out with the Iowa Pest Resistance Management Plan (see page 10).

Dr. Bryony Bonning resigned in 2017 (see page 7), and several of her lab members moved on, including **Yuting Chen**, **Biviana Flores-Escobar**, **Sehiza Grosic**, **Suyog Kuwar** and **Ruchir Mishra**. Dr. Ryan Smith is adding to his research lab. **Eleanor Field** is a new graduate student. **Brendan Dunphy** (B.S. 2007) left the lab in the summer. Dr. Ken Holscher retired in the summer of 2017 (see page 7).

Look for graduate student graduations on page 18!

Four New Patents for Coats Lab

A group of three members of the Pesticide Toxicology Lab have filed four patents in 2017. **Dr. Joel Coats, Edmund Norris,** and **James Klimavicz** have synthesized and evaluated approximately 300 novel molecules made from monoterpenes found in plant essential oils. Those new biorational molecules were designed around the known terpenes (such as menthol, thymol, and geraniol). Two of the patent applications focus on insecticides that are designed for slow release of the parent terpene insecticides to make them more useful as seed treatments or in baits. One patent application presents biorational monoterpene-based herbicides. The final patent application reports over 200 novel insect repellents that were designed for more similarity to the longer-lasting sesquiterpenes repellents; some are best used as spatial repellents and others are better contact repellents. Kittrich Corporation has the rights to the first three, and ISCA Technologies has the rights to the repellents.

1. PCT/US17/48290 Monoterpenoid/phenylpropanoid containing compounds and methods of their making and use as herbicides. Coats, Klimavicz, Norris, Lindsay and Bessette.
2. PCT/US17/48291 Monoterpenoid/phenylpropanoid containing compounds and methods of their making and use as seed treatments. Coats, Klimavicz, Norris, Lindsay and Bessette.
3. PCT/US17/48291 Monoterpenoid/phenylpropanoid containing compounds and methods of their making and use as insecticidal baits. Coats, Klimavicz, Norris, Lindsay and Bessette.
4. PCT/US17/48259. Insect repellent compounds and compositions, and methods thereof. Coats, Norris, and Klimavicz.

Do you know about ATRB?

In 2015, the Board of Regents approved a $52 million budget for a new project, Advanced Teaching and Research Building (ATRB) at ISU. It will include five entomology faculty (Joel Coats, Matt O'Neal, Aaron Gassmann, Erin Hodgson and Sue Blodgett) on the second floor. The 5-story ATRB will finish construction in the spring of 2018 and include research labs, classrooms and many collaborative spaces. The PIDC will be there, too (see page 5). Yes, there are actually greenhouses on top of the building!

Selected Publications from 2017

Andow, DA, RW Wright, E Hodgson, T Hunt, and KR Ostlie. 2017. Farmers' perspectives on resistance in western corn rootworm to CRW-Bt maize in Midwest USA. Journal of Agricultural Extension and Rural Development. DOI: 10.5897/JAERD2016.0827.

Courtney, GW. 2017. Blephariceridae (net-winged midges or torrent midges), pp. 487-496. *In* A Kirk-Spriggs and B Sinclair (eds.), Manual of Afrotropical Diptera, vol. 2. Nematocerous Diptera and Lower Brachycera. Suricata 5. South African National Biodiversity Institute, Pretoria.

Courtney, GW, T Pape, JH Skevington, and BJ Sinclair. 2017. Biodiversity of Diptera, pp. 229-278 (+ 2 plates). *In* RG Foottit and PH Adler (eds.), Insect biodiversity: science and society, second ed. John Wiley and Sons, Chichester, UK.

Fasbender, A. 2017. Ptychopteridae (phantom crane flies or fold-winged crane flies), pp. 653-658. *In* A Kirk-Spriggs and B Sinclair (eds.), Manual of Afrotropical Diptera, vol. 2. Nematocerous Diptera and Lower Brachycera. Suricata 5. South African National Biodiversity Institute, Pretoria.

Fasbender, A and GW Courtney. 2017. A revision of Bittacomorphinae with a review of the monophyly of the extant subfamilies of Ptychopteridae (Diptera). Zootaxa. 4039: 1-69.

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Photos From the 2017 ESA Meeting in Denver

Patti Prasifka, Paula Davis, Lamar Buckelew, Rayda Krell, Todd DeGooyer, and Brad Coates

Rick Hellmich, Teresa Blader, Colothdian Tate, and Karla Walker Gomez

Sue Blodgett and Bob Peterson

Colin Wong, Erika Rodbell and Eric Yu

Luiz Gomez, Lamar Buckelew, Tom Baker, Todd DeGooyer, and Clint Pilcher

Spence Behmer, Matt O'Neal, Alex Walton, and Amy Toth

Mattea Allert, Niranjana Krishnan, Randall Cass, and Ashley Dean

Marlin Rice, Allen Felsot, and Kevin Steffey