

Bugged

FROM
MSU DEPARTMENT
OF ENTOMOLOGY

FALL 2016



Image: Bill Ravlin, MSU Entomology

FROM THE CHAIR

November 11 was Veterans Day and as the day drew near, it had me thinking about Entomology's student veterans and how we've interacted with them over the years. Recently, MSU has made significant moves to bring military veterans onto campus and as a result the university earned "gold status" in the Veteran-Friendly School Program created by the Michigan Veterans Affairs Agency. This program recognizes Michigan colleges and universities for their efforts to better serve veterans and their families.

In addition to university-wide programs, the [Department of Entomology](#) has had many

successes with student veterans and I'm actively looking for ways to enroll more. A real attraction to recruiting vets into entomology is the unique skills and experiences they bring to the table. Their work ethic, drive and maturity fit well with our Entomology graduate programs and this often allows them to serve as role models for other students. Here are a few outstanding examples.

- **Lt. Col. Jamie A. Blow** earned her doctorate in 1998 and was promoted to the rank of colonel in the U.S. Army this past winter.
- **Chris Sebolt** received a master's degree in 2000 studying biological control. After working with researchers on campus for several years, he returned to military service with the U.S. Marines.

- **Erik Foster** has a master's degree in medical entomology (2003) and went into the U.S. Army.
- **Jaree Johnson-Owens** graduated with a master's in aquatic entomology in 2008 and is a medical veterinary entomologist for the U.S. Army.
- **Nick Babcock**, retired from the U.S. Army as a Sergeant First Class, is a master's student in forensic entomology, and expects to graduate in 2018.
- **Joseph Lonchar**, who served in the Marine Corps, is an Entomology undergraduate student who expects to graduate in 2018 and continue on to graduate school.

Most recently, **Adam Ingrao** caught my attention with his whirlwind of activity. In addition to being an Entomology doctoral candidate, he was awarded a Plant Science Fellowship from MSU; he successfully competed for a prestigious National Science Foundation Graduate Student Fellowship; is the co-founder of the Michigan Chapter of the Farmer Veteran Coalition of Michigan; and is an active member of the Michigan Beekeepers Association.



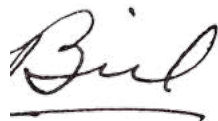
Adam Ingrao and farmer/veteran collaborator Dylan Thomas testified about veterans' needs and interests to the Michigan House of Representatives in a joint session of the Military and Veterans Affairs Committee and the Agriculture Committee. Left to right: Rep. Aaron Miller (Dist. 59), Thomas, Ingrao, and Rep. Tom Barrett (Dist. 71).

Going forward, the Department of Entomology seeks to provide opportunities for student vets

interested in gaining a master's or doctorate in entomology. This year we cost-shared on stipend, tuition and fees for Nick Babcock to earn a master's with [Eric Benbow](#) and we plan to continue recruiting veterans into our graduate programs using this model. This is an excellent opportunity for vets and a real win for the Department of Entomology.

Vets are prepared to apply their unique skills and experiences in a challenging academic environment leading to graduate degrees. They can supplement their GI Bill and other resources with Department of Entomology Investment Fund dollars. And, MSU Entomology gains top quality students who have a strong sense of mission, are oriented to defined outcomes, and have the discipline to complete advanced degrees.

Thank you for your service!



Bill Ravlin,
Chairperson

RESEARCH & PROJECTS

[Zsafia Szendrei](#) is leading a research team in developing new nutrient and pest management approaches for organic cucurbit growers with a nearly \$1 million grant from the [USDA NIFA](#). Cucurbits include the top five organically produced vegetable crops in the country. Szendrei and her team of research and extension experts from MSU, Purdue and the University of Wisconsin will be advised by a panel of growers in developing an integrated production system that enhances farm profitably while reducing environmental risks. Read the MSU AgBioResearch

story: "[MSU scientists will lead new effort to help organic cucurbit growers.](#)"

A team led by [Matt Grieshop](#) will test the effectiveness of a canopy delivery system for fruit trees with a \$1.47 million [USDA-Specialty Crop Research Initiative](#) (SCRI) grant. The delivery system was developed and refined through a 2012 SCRI grant. The team includes scientists from MSU and Washington State University, as well as private consultants from the spray technology and irrigation industries. Read more in MSU Today story: "[MSU to Use \\$1.47M USDA Grant to Advance a Fruit-Tree Canopy Delivery System.](#)"

[David Smitley](#) and [Zachary Huang](#) are helping the greenhouse industry protect pollinators by joining a team of scientists led by Rutgers University in a \$2.8 million [USDA SCRI grant](#) to provide safer plants for pollinators. The team will design best management practices for growers and landscape professionals to deal with pest problems while protecting pollinators. In Michigan, Smitley and Huang will focus on evaluating attractiveness of the most popular annual and perennial flowers to pollinators, and determining if systemic insecticides used during produc-

tion move into the pollen and nectar. Read more in MSU Today story: "[MSU Helps Protect Pollinators.](#)"

The National Science Foundation (NSF) is funding a \$3.2 million effort to digitize millions of butterfly and moth specimens within the Lepidoptera of the North American Network. The **grant was awarded to 27 institutes including MSU's [A.J. Cook Arthropod Research Collection](#)** led by [Anthony Cognato](#). The specimens aid research into pest management as well as evolutionary and ecological studies. Read the full MSU AgBioResearch story: "[MSU joins \\$3.2 million effort to digitize butterfly and moth research collections.](#)"

[Zsafia Szendrei](#) is part of a multi-state research team awarded a **\$3.6 million [USDA SCRI grant](#)** to examine how neonicotinoid pesticides are used by growers of cucurbits. The project is led by Purdue University insect ecologist Ian Kaplan. Szendrei is receiving \$330,000 for three years for her research on pickling cucumbers in Michigan, which ranks No. 1 in the U.S. for the amount produced. The goal of the project is to find ways for farmers to achieve effective pest control in cucumbers while protecting the health of honey bees and other beneficial pollinating insects.



Zsafia Szendrei's lab will work on two of the new grants featured in this issue.

NEW FACULTY ENTOMOLOGY WELCOMES WILL WETZEL

This fall, [William “Will” Wetzel](#), is setting up his lab and bringing his research to MSU as Entomology’s new quantitative insect ecologist. Previously a postdoctoral fellow at Cornell University, Wetzel earned his PhD at the University of California, Davis. His appointment is 75 percent research and 25 percent teaching. His lab is in the Center for Integrated Plant Systems (CIPS).



plants with the wrong nutrient levels than they are benefited by high-quality plants with high nutrient levels.

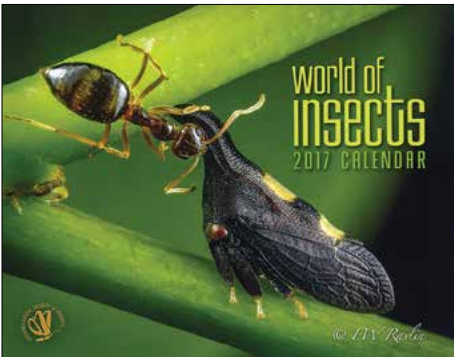
Wetzel notes, “Farm fields can create monocultures where pests may find the perfect nutrition to be healthy and reproduce. Planting fields with higher plant nutrient variability could contribute to sustainable pest control.”

Wetzel is off to a strong start as the lead author in a recent study on why a field with a variety of plants seems to attract fewer plant-eating insects than farm land with just one type of crop. Scientists and farmers have puzzled over this pattern that makes protecting crops from pests a challenge. Wetzel’s research, [published in a recent issue of “Nature,”](#) is shedding light on this interaction.

Plants suppress their insect enemies by being variable, not just by being low quality on average as is typically thought. After studying 53 species of insects, the researchers found that bugs have narrow ranges of nutrient levels where they flourish. If the plants being fed on are too nutrient rich or poor, the insects are less likely to thrive. Insects surrounded by diverse plants are harmed much more by low-quality

At MSU, he intends to take this research to the next level. His program is using modern genetic resources to develop a model system for manipulating plant trait diversity in field populations and measuring the effects on insect populations and plant damage. Read more about Wetzel’s research in the MSU Today article: [“Plant Diversity Could Provide Natural Repellent for Crop Pests.”](#)

PEOPLE



When the Entomological Society of America (ESA) hosted the International Congress of Entomology meeting in September, they included a calendar of lively insect images as a gift for each of the nearly 7,000 attendees from around the globe. **Chairperson Bill Ravlin’s photography was selected for the calendar cover** and for the month of August. Ravlin is an avid photographer and specializes in insect and bird photography. The

featured image shows a winter ant tending a two-marked treehopper feeding on an Eastern redbud tree. View more of his images at [Bill Ravlin Photography](#).

A crowd celebrated with Jim Miller on the eve of his retirement in the Red Cedar Room at the Kellogg Center on Nov. 7. Over 20 people were on the program, many of them former students who talked about scientific studies



Jim and Naomi Miller with family. Many students noted the generous welcome they received at the Miller home and enjoying his children.

conducted out of the Miller lab that lead to significant results and patents or taught them the steps to succeed in their own careers. Several students cited him as their favorite classroom teacher, noting he would grab their attention with activities that mimicked scientific processes. He was known to be quick to ask thought-provoking questions and was an optimist when facing the challenges of working with mosquitoes capable of transmitting malaria. Some had humorous stories while many thanked him for continuing to be a mentor and friend.

It’s not every day your class project is featured in the world’s leading scientific journal, but it can happen. Just ask MSU Entomology graduate students **Liz Davidson-Lowe, Bahodir Eschanov, Sara Hermann, Andrew Myers, Logan Rowe** and Plant, Soil, and Microbial Sciences student Saisi Xue.



For the class “Open Science and Reproducible Research” taught last fall by entomology research associate Christie Bahlai (currently with MSU Integrative Biology), students analyzed a 12-year long dataset on the activity peaks of the Eastern firefly (*Photinus pyralis*) across 10 plant communities in southern Michigan. They found firefly activity peaks typically around 800 degree-days (base 10 degrees Celsius) except in years with precipitation extremes—high or low rainfall—which significantly delayed firefly activity. Their findings have implications for how climate change may alter insect phenology.

An advocate of open science, Bahlai posted the resulting [manuscript](#) on the preprint archive bioRxiv, where it was noticed by a senior correspondent for “Science” who interviewed Bahlai about the project. The story, “[How climate change may affect fireflies](#),” appeared in the online version of [Science News](#) on Sept. 14, 2016, and in print on Sept. 23, 2016.

Tree Fruit Integrator Julianna Wilson reports that interest in the brown marmorated stink bug went “viral” again this fall. During the first week of October, MSU Extension articles on the stinkbug received nearly a half million pageviews with half of

(Continued on page 5.)



Ernest Delfosse with May Berenbaum



Doug Landis and Berenbaum

Two ESA Fellows and an Honorary Member

MSU entomologists Ernest “Del” Delfosse and Doug Landis have been named fellows of the [Entomological Society of America \(ESA\)](#) for their outstanding contributions to entomology and career achievements that inspire others.

They were recognized Sept. 25 in Orlando, Florida, during the International Congress of Entomology Conference by ESA President May Berenbaum. Up to 10 ESA fellows are named each year. Recipients may be researchers, teachers or those working in extension/outreach, administration or the military.

“This is a highly unusual achievement for a university to have more than one individual selected as an ESA fellow in a given year,” said Bill Ravlin, chairperson of the [MSU Department of Entomology](#). “Both Del and Doug serve as exemplary researchers, teachers and mentors, and are very deserving of this prestigious distinction.”

Delfosse and Landis join only two other MSU entomologists to receive the same distinction: Jim Miller and Curt Sabrosky.

Landis, a professor and former interim chairperson of the MSU Department of Entomology, is internationally known for his research on the role of agricultural landscape

structure in shaping patterns of insect biodiversity and in regulating arthropod-mediated ecosystem services. He served as associate director of the MSU Center for Integrated Plant Systems and has held leadership positions in the Kellogg Biological Station Long-Term Ecological Research project and the Great Lakes Bioenergy Research Center.

Delfosse, professor and former chairperson of the Department of Entomology, is internationally known for research on biological control, integrated pest management (IPM), risk analysis, science-based biological control regulations and administrative leadership. He has held various administrative positions, including research leader for the Commonwealth Scientific and Industrial Research Organization in Canberra, Australia, director of the National Biological Control Institute in Hyattsville, Maryland, and senior national program leader with the USDA Agricultural Research Service in Beltsville, Maryland.

A former ESA president, Delfosse was also inducted as an honorary member of the ESA. This distinction goes to individuals who have at least 20 years of exemplary involvement with ESA. Candidates are selected by a governing board and then voted on by ESA members.

ALUMNI PROFILES: INDIVIDUAL STRENGTH, EXTRAORDINARY IMPACT

Dora Carmona (MS, Landis) of Balcarce, Argentina, has been selected to be the chief coordinator of the Integrated Agronomy Area of INTA, Mar del Plata University and CONICET. Carmona wrote it is an honor to be selected by the chief head of INTA, but also there was a vote by all the people—professionals, technicians and the farm workers—which she especially values. She will lead 270 people in research, teaching and extension.

Ashley Bennett (Postdoc, Isaacs) is New Mexico State University's new urban and small farm integrated pest management specialist.

Lt. Col. **Jamie A. Blow** (PhD 1998, Walker) received a promotion to the rank of Colonel in the U.S. Army at a ceremony at the American Legion in Frederick, Maryland, Feb. 3. Blow serves as the military deputy to the Principal Assistant for Research and Technology at the U.S. Army Medical Research and Materiel Command (USAMRMC) in Frederick. As the Army's medical materiel developer, USAMRMC focuses on medical research, development and acquisition, and medical logistics management.

Brett Blaauw (PhD, Isaacs) is an assistant professor

and peach entomologist at the University of Georgia.

Rob Morrison (PhD, Szendrei) was awarded the ESA's Henry & Sylvia Richardson Research Grant for postdoctoral ESA members who have at least one year of promising work experience, and have demonstrated a high level of scholarship. He is currently a postdoctoral research entomologist at USDA-ARS working at the Appalachian Fruit Research Station in Kearneysville, West Virginia.

Tom Dudek, senior Extension educator, will retire in December from MSU Extension. Dudek's Extension career began in 1978. He has worked with vegetable growers and most recently,

the nursery and greenhouse industries in west Michigan. Dudek has been the recipient of many honors and awards, including the prestigious MSU Distinguished Academic Staff Award in 2011.

Jason Gibbs (Postdoc, Isaacs) is an assistant professor in Insect Taxonomy and Systematics at the University of Manitoba.

Yuzhe "Kathy" Du is now employed as an entomologist with the USDA's biological control of pests research unit in Stoneville, Mississippi. In her letter of resignation, she noted, "I am very thankful for the amazing opportunities at MSU and the great people like Ke Dong, Suzanne Thiem, Zachary Huang, Larry Gut and William Ravlin who have supported me over the years."

Ashley Leach (BS, 2013) was honored with the ESA's Larry Larson Graduate Student Award for Leadership in Applied Entomology. She is currently in her second year of an MS degree at Cornell University's Department of Entomology.



those occurring on a single day. The information has been shared on Facebook 97,000 times. Perhaps most importantly, people have gone to the MISIN website and mapped 7,000 locations where the stinkbug was sighted and Wilson is using the data to help fruit farmers scout the pest. **Entomology**



is a perfect fit for MSU's new program fostering art and science collaborations. Kuai Shen describes himself as a "naturalist" with one foot in art, the other in science, and a deep love of leafcutter ants. Entomology Chairperson Bill Ravlin has a passion for insect photography. The two collaborated over a few months resulting in an Abrams

Planetarium evening devoted to insects, ants and the intersection of art and science. The partnership is a result of Dr. Adam Brown's BRIDGE program at MSU featuring an "Artists in Residency" program that facilitates art/science collaborations. Ravlin and Shen share the perspective that through studying ant behavior, a common ground for interspecies-communication may be established, which could help us understand emergent phenomena and the biological relevance of social networking.

AWARD-WINNING DEPARTMENT

Karim Maredia received the **International Leadership Award from the Indian Council of Food and Agriculture (ICFA)** for his pioneering contributions in food and agriculture, particularly in India-Africa partnerships. This national award was presented to Maredia in September in New Delhi, India, by governors of two Indian states and the ICFA chairman. More than 200 senior officials, scientists, farmers and other dignitaries from public and private organizations in India and

the international community were present at the award ceremony, including MSU International Studies and Programs Dean Steven Hanson. Maredia was selected for his leadership and contributions to international human resources development, global linkages and network building for agricultural research, education and outreach. Read more at "[MSU agricultural scientist earns international leadership award in India.](#)"

Barry Pittendrigh was awarded **Purdue University's 2016 John V. Osmun Alumni Professional Achievement Award in Entomology.** The award nomina-

tors note that Pittendrigh has been highly productive in entomology and many areas beyond. While at Purdue, Pittendrigh saw the need to understand the genome of the human body louse, *Pediculus humanus*, which is a carrier of relapsing fever, trench fever and typhus. Pittendrigh wrote the white paper necessary to obtain funding from the [National Institutes of Health](#) (NIH) to sequence the louse genome, and organized the project that led to the successful analysis of the sequenced body louse genome.

Congratulations to Heather Leach (MS, Isaacs) who won first place in the ESA Graduate Student Oral Competition: Invasive and Exotic Entomology: *Drosophilids*.

Joy Landis was recognized by the **Michigan Association of Agricultural Extension Agents** with their 2016 Outstanding Academic Specialist award. Landis was honored for her collaborations with the MSU Extension field staff in delivering their information to growers throughout the state.



Karim Maredia receives his award from Ram Naik, Hon. Governor of Uttar Pradesh State; K.S. Solanki, Hon. Governor of Haryana State in India; and Indian Council of Food and Agriculture (ICFA) Chairman M.J. Khan.

SCIENCE INSIDE ENTOMOLOGY



Sara Tanis runs the exotic forest pest trapping network in the McCullough lab.



Sara Hermann (Landis lab) sets up her research on herbivores response to the threat of predators in their environment.



Peng Xu prepares to observe mosquito olfactory response in the Dong lab.

FEATURED STUDENTS



LIDIA KOMONDY
FEATURED
UNDERGRAD STUDENT

Hometown: Grand Rapids, Michigan
Future study or career plans: Obtain a PhD in some form of entomological or ecological field of research.

What is the best selling point about an entomology major that you would like others to know? For entomologists, there are a variety of different jobs to get involved with. The opportunities are endless, and depending on the career path you decide to take, it can have serious implications for the environment, economy, public health, etc.

What has been your best experience with entomology? Presenting research at the annual Entomological Society of America conference, and meeting other entomologists who study different fields of entomology.

What is your favorite insect? My favorite insects are honey bees. They are so cute, they pollinate our food, they produce honey and have the remarkable capacity to learn and remember things like locations and distances!

Do you have advice for anyone interested in an entomology major? Take Fundamentals of Entomology (ENT404) with Dr. Chris DiFonzo. I guarantee you'll fall in love with entomology and change your major within weeks!

What is your favorite activity/way to spend your time outside of Entomology? I enjoy hiking, traveling, reading, and in the winter I enjoy snowboarding. I also love playing with my pet rabbit.

Visit MSU Entomology's web:

www.ent.msu.edu

For news, interviews, photos, Bug House events and to give.



DANIELLE KIRKPATRICK
FEATURED
GRADUATE STUDENT

Hometown: Grass Lake, Michigan
Major professor: Larry Gut
Future career plans: To continue researching pest insects and communicating what we learn to growers to improve IPM programs.

What are you researching? My project is looking at behavior and biology of an invasive fly, spotted wing *Drosophila* (*Drosophila suzukii*), with a goal of improving monitoring tools, such as trapping in Michigan fruit crops.

Why study entomology? Insects are everywhere and can live in just about any situation or climate. By studying insects, we can learn through research about beneficial insects such as pollinators, and about pest insects such as those that attack crops and livestock. We can use this knowledge to understand how insects impact the environment and implement control measures.

What or who inspired your interest in entomology? I worked in the lab as an undergraduate summer research assistant with Chris Adams and Pete McGhee, who were doing research for their PhDs. While working on their projects, I worked a lot in the field in orchards with a pest of apples, and I experienced firsthand how our work impacts growers in a positive way. That experience, along with the influence of Chris and Pete, inspired my interest in entomology and graduate school here at MSU.

What is your favorite activity or responsibility as part of your graduate studies? My favorite part of being a graduate student is doing fieldwork and research. I love setting up experiments out in the field early in the season when the weather starts warming up, and I love collecting and analyzing the data we get from the experiments to see what it will tell us so that we can apply it in a practical way that will help growers protect their crops from pest insects.

What is your favorite way to spend time outside of your studies? I run, work out and stay active. I enjoy running obstacle course races like the Tough Mudder and Spartan races, half-marathons, and I am training for my first marathon that I will run in January at Walt Disney World.

MSU Department of Entomology

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COLLECTIVE POWER BEEKEEPING EMPOWERS VETERANS IN CIVILIAN LIFE

A new initiative, [Heroes to Hives](#), aims to empower veterans in agriculture through beekeeping. This hands-on beekeeping education course for military veterans is designed to address the financial and personal wellness of veterans through professional training and community development.

Entomology doctoral student Adam Ingrao and his wife Lacey launched the pilot program with five combat vets at their farm in 2016. The two trained the vets in everything from bee biology and behaviors to pest management and honey harvesting. The Ingraos are joining with MSU's [Michigan Pollinator Initiative](#) and the [Kellogg Biological Station's Bird Sanctuary](#) to host the program in 2017.

Fifteen veterans will meet two to three times per

month for nine months to learn the profession of beekeeping and to work with other veteran beekeepers. Instructors will cover a broad range of topics from bee biology to business plan creation through in-class and online lectures, hands-on learning, reading and managing bee colonies.

The Heroes to Hives program is funded entirely through donations. Thanks to the generous support of the AT&T Foundation and private donors, Heroes to Hives will be offered at no cost to the veteran class of 2017. Veterans will be selected through a competitive application process that is open through **Dec. 15, 2016**. Apply at [Heroes to Hives Program Application 2017](#). For more information on the Heroes to Hives program, see the [Heroes to Hives](#) webpage.

