

Bugged

FROM
MSU DEPARTMENT
OF ENTOMOLOGY

SPRING 2016



Images: Bill Ravlin, MSU Entomology

FROM THE CHAIR

During the 2015 National Entomological Society of America meeting in Minneapolis, I was asked to speak about “Challenges, Grand Challenges and Academic Positions in Entomology.” Initially, this seemed to be one of those topics that generate a list of things to do to get a job. But along the way I had opportunity to reflect on some interesting facts and figures.

For example, it’s not surprising that funding from state and federal sources closely follows the U.S. economy (I’ll spare you the regression coefficients). The economy has gone consistently up from 1906, the year MSU formed the Department, to the present, but not without some ups and down along the way. It’s those ups and downs that wreak havoc

with Department of Entomology support and ultimately the degree to which we are able to replace departing faculty members, add new faculty positions and generate new programs. These dynamics were borne out between 2005 and 2013 as we went from 22 tenure system faculty to 16; not a good trend.

However, from 2014 to 2015 we picked up no less than four faculty members including Eric Benbow, Peter White, Jared Ali and myself. Moreover, we are now in various stages of bringing even more new faces to East Lansing. By this time next year, we should have a newly minted insect physiologist, a quantitative ecologist and a nematologist. In addition, Ernest “Del” Delfosse will become Professor Emeritus and the college has graciously agreed to allow us to fill his slot in biological control.

Last but not least, Dr. Barry Pittendrigh (Kearns, Metcalf & Flint Endowed Chair in Insect Toxicology, University of Illinois) will join the department Aug. 16, 2016, as an endowed MSU Foundation Professor. His research in the rapidly growing fields of insect genomics and transcriptomics is noteworthy and his vast experience in working throughout western and southern Africa will provide visionary leadership to MSU’s international programs in general. Welcome, Barry, and thanks to economic upturns!

Investments by the university speak volumes about the productivity of our faculty, students and staff and the degree to which the dean and directors recognize our excellence. Support from AgBioResearch, MSU Extension and CANR academic programs is greatly appreciated. As we move through our 110th year, we indeed live in interesting times!



Eric Benbow, a more recent addition to our faculty, has been named one of MSU’s Academy for Global Engagement Fellows for 2016. The Academy aims to create a new generation of international research experts by offering early- to mid-career faculty the opportunity to expand their scholarship on a global level.



Bill

Bill Ravlin,
Chairperson

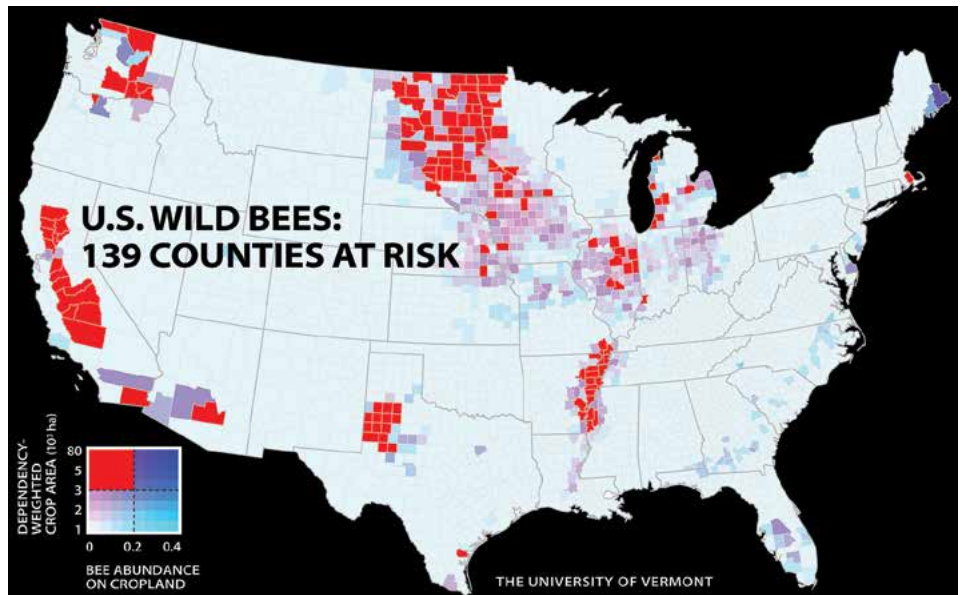
RESEARCH & PROJECTS

Rufus Isaacs, Jason Gibbs, and their collaborators have produced the first national study to map U.S. wild bees, which shows wide variation in their predicted abundance across the country. Declines driven by habitat loss are greatest in the nation's most-important farmlands. If losses of these crucial pollinators continue, the new nationwide assessment indicates farmers will face increasing costs to maintain pollination. The trends should be of greatest concern for fruit and vegetable growers, noted Isaacs, co-author and leader of the [Integrated Crop Pollination Project](#), a USDA-funded effort that supported the new research. The findings were published in the Proceedings of the National Academy of Sciences. Read more at MSUToday: [Wild Bee Decline Threatens U.S. Crop Production](#).

Anthony Cognato reports that an updated database of insect specimens in the A.J. Cook Arthropod Research Collection is now live at [Symbiota Collection of Arthropods Network](#). This new platform allows web-based entry of data and immediate public access to around 77,000 records. The database is continuously updated with specimen records and volunteer opportunities to contribute to this effort are available. Contact Anthony Cognato at cognato@msu.edu if interested.

PEOPLE

Professor Emeritus Mark Scriber is featured in a new book about lepidopterists. The book, entitled "The Lives of Lepidopterists," introduces 22 international lepidopterists with anecdotes, observations and philosophies, including Scriber's personal and academic autobiography.



A map of the abundance of wild bees on cropland indicates they are at risk in 139 U.S. counties.

PODCAST: Unique path through MSU Entomology

Adam Ingrao was recently interviewed by [Spartan Podcast](#) about his varied experiences that led him to be a doctoral entomology student and founder of a new outreach program for veterans. Ingrao arrived at MSU with a Plant Science Recruitment Fellowship. During his first year of study, he identified Zsofia Szendrei's [Vegetable Entomology Lab](#) as the best fit for his interest in sustainable agriculture. Prior to coming to MSU, he served in the Army and remains dedicated to his "brothers" in the service. As a disabled vet, Ingrao felt compelled to bridge his entomology studies with a means to help other vets transition from active duty to new careers. He says many veterans have a viable career option in agriculture and that it is a natural fit for them. "Transitioning from active military personnel to a farmer is not that big of a stretch."

coalition, which has become part of the [Michigan Food and Farming Systems](#) organization. He helps veterans understand why agriculture is a good possibility and how they can explore their options. Listen to the 26-minute podcast to hear why MSU entomology, why the military and how he rolled it all together to be happy and productive preparing for his future in sustainable agriculture research: "[In the field: Fighting for veterans with Adam Ingrao.](#)"



Now Ingrao balances his doctoral studies with his veteran outreach

studies with his veteran outreach studies in the Vegetable Entomology Lab.

ALUMNI PROFILES: David Epstein

When did you arrive at MSU? In 1999, I was hired to coordinate a three-year effort, the Michigan Apple IPM Implementation Project. In 2000, I was hired as the MSU IPM Program Tree Fruit Integrator, with continuing coordination of the apple IPM project a primary responsibility. About four years into that position, I began PhD studies with [Larry Gut](#), graduating in 2010, meeting my goal of achieving my PhD before age 60.

What is your current job? I am the senior entomologist with the [USDA Office of Pest Management Policy \(OPMP\)](#). Our office heads up strategic planning and activities related to pest management for the USDA. We are part of informing the pesticide regulatory process and we promote development of new pest management approaches needed by farmers and others to sustain U.S. agriculture. I work across various USDA agencies and with EPA on pesticide registration issues. I also am a liaison between the research community, farmers and EPA to ensure those voices are heard in the process. I work with universities, growers and others on a variety of pest management issues including invasive species. For example, a multi-state group of researchers, including MSU entomologists [Rufus Isaacs](#) and [Matt Grieshop](#), have a grant investigating efficacious means of controlling spotted wing Drosophila. I organize discussions between EPA and stakeholders so researchers and growers can address pest management issues. If I read about a pest management issue in the paper, I'll probably be working on it that day, literally. I spend 40-50 percent of my time on pollinator health issues.

I'm involved with an educational campaign, the Food Narrative Project of the organization [IPM](#).

Voice. Our goal is to educate the public about what farmers do and why they do it. I feel this conversation is absolutely critical as people know so little about how food is produced, or have never stepped on a farm, and that is a problem, in terms of developing policy and regulation in a political climate informed by the less-than-accurate information spread through social media.

How did entomology contribute to what you do today? I was 48 and working full-time when I started my PhD, so I didn't have the typical student experience. I worked in construction for 17 years between my first stint as an undergraduate and my return to academia at CSUC! [Larry Olsen](#) used to tell me I should just do what I needed to do to get my "union card," which meant get my PhD. Along with the brainstorming process of experimental design, I also truly loved working on farms with growers and learning their challenges. It helped me see that what we did (IPM) was a small part of what they do, and how it fit in with their larger challenge. That is part of the knowledge I bring into discussions with EPA, what makes sense academically may not always apply in the real world of farming.

Any advice for current students? Get out to as many meetings and events as possible so you meet as many scientists as you possibly can. Develop broad networks that you can draw on for the rest of your career. My networks are extremely valuable now as I draw on expertise from across the country. I'm the sole entomologist for this office and have to be the voice for entomology of all crops across all states, and that's impossible without a network.



How does your work impact people's lives? Our work at OPMP is critical to ensure Americans maintain access to

abundant, healthy and affordable food and fiber, that farmers have the tools and knowledge needed to manage pests, and that all is well-balanced with the needs to protect people, environmental resources and living organisms dependent on those resources. I had no idea when hired at USDA that I would spend so much time on pollinator issues. I deal with all aspects of pollinator health, from nutrition to insect and disease pests, genetics, and the effects of pesticides. I have several projects looking at how farmers can mitigate potential harm to pollinators by increasing awareness and adjusting management practices. There are some real tough challenges that require taking into account the competing needs of everyone involved, the beekeepers, the farmers, the public and the policy and rule makers. I was deeply involved in developing the [President's pollinator strategy](#). I worked across 15 different agencies, each with a different perspective and knowledge. It's not about what I think, I have to meld it all together. There are always tradeoffs and we have to be sure to address the needs of pollinator health while providing farmers with the tools they need to feed the nation.

It's all fun in the end. If you are not having fun, go do something else. I'm in the right place at this point in my career. I'm utilizing all of the knowledge I have gained along my journey from business owner to academic to public servant. Can't wait to see what tomorrow brings.

Professor Emeritus Rich Merritt taught forensic entomology at the FBI Recovery of Human Remains School at the University of Tennessee Body Farm. The 40 FBI agents were also introduced to forensic anthropology, zooarchaeology, odontology, botany, decomposition and discovery techniques for human remains.

Facebook brought 663 people to the MSU Bug House on a Monday night. The MSU Bug House learned the power of social media at its Feb. 8, 2016, open house. Typically about 50 visitors attend the monthly Monday night open houses, which are mostly staffed by volunteers. To increase attendance, the new Bug House marketing student, Shelby Komar, suggested creating an “event” on the Bug House Facebook page that would invite the over 900 people who “like” the page.

Amazingly, by the Friday before the event, 450 people responded, indicating they planned to attend, something the Bug House organizers thought could never happen. Event volunteers were surprised when 663 people came through the doors to the Bug House during three hours on a cold Monday night. At one point, people were waiting down the hall to the Dean’s office in the Natural Science Building.

“We had to stay open an extra hour just to get everyone in,” Entomology staffer Carolyn Devereaux said. “Surprisingly, our visitors were not upset at the wait or the crowded conditions. Most people said it was worth the wait and they had a good time.”

Devereaux handles scheduling for the Bug House and can be reached at 517-355-4662 or bughouse@msu.edu.

ESA HONOR: Jim Miller named ESA Fellow

Jim Miller has been named a 2015 Entomological Society of America Fellow for his pioneering research in insect physiology, chemical ecology and behavior that has significantly enhanced insect detection and management. Among his research accomplishments, Miller and collaborators introduced the field of chemical ecology to the internal standard method for accurately quantifying tiny amounts of natural products; made the wind-tunnel accessible to all as the recommended method for quantifying insect orientational behaviors; produced a classic series of papers on onion fly-onion interactions establishing that resource acceptance is strongly influenced by visual and physical cues in addition to chemicals; originated the rolling-fulcrum model of animal decision making and the push-pull tactic of pest management, now of great practical importance to maize production in Africa. These findings have expanded knowledge of what constitutes suitable habitats for African malaria mosquitoes.



Jim Miller (right) and his award with Chris Adams, graduate student and collaborator.

His work has also included discovery that avermectins administered to African cattle just before the rainy season can suppress malaria epidemics.

CANR HONOR: McCullough distinguished faculty

The MSU College of Agriculture and Natural Resources (CANR) Alumni Association has recognized Deb McCullough with its Distinguished Faculty Award. The award recognizes a faculty member who has brought distinction to the college through teaching, research or outreach, and provided leadership that has helped students, faculty members or citizens reach their potential for excellence.



CANR Alumni’s Distinguished Faculty recipient Deb McCullough (right) with long-time collaborator Robin Usborne.

McCullough is dually appointed in the MSU Departments of Entomology and Forestry.

During the past 20 years, she has provided counsel to many forest services in the United States and Canada about forest pests, particularly the emerald ash borer and the gypsy moth. Since its arrival, McCullough has tracked emerald ash borer and introduced several plans for state, regional and national responses to it.

FEATURED STUDENTS



ENTOMOLOGY MINOR UNDERGRADUATE

Name: Justin Louis Baker
Hometown: Okemos, Mich.

Future study or career plans: I'm unsure at this point, still applying for jobs, but I'm ideally looking to work at an agricultural company such as Syngenta, Bayer, Dow or DuPont to name a few.

What is your major and minor? General Management Broad College of Business with minors in Environmental and Sustainability Studies, and Entomology.

Why add a minor in entomology to your major?

I've always had an interest in ecology, but didn't want that to be the focal point of my career, hence the business major coupled with environmental studies minor. Dr. Walt Pett's introductory entomology course was an option for the requirements for Environmental Studies. I really enjoyed that class and after learning the importance of insects to humans, I felt an Entomology minor would make me stand out from others. With this unique skillset I could be a big asset to an agricultural company.

Why study entomology? Entomology is so important to humans. They're the most common animal on our planet, living in nearly any habitat. They're important for pollinating, bio-monitoring and much more. They can do amazing things. Try Googling "fire ant living raft" or "hornet cooked by bees."

What has been your best experience with entomology? I've made friends and met a lot of unique and interesting people through the entomology program.

What has been the most challenging aspect of adding an entomology minor to your degree? By doing a minor it meant I got to skip over required classes such as chemistry, organic chemistry, physics and ecology. I saw it as a good thing because those classes are hard, but there were times where maybe having these classes would have helped me through challenging entomology courses.

GRADUATE STUDENT

Name: Amanda Lorenz-Reaves
Hometown: Plymouth, Mich.
Major professors: Gabe Ording and Julie Libarkin



What are you researching? My research investigates people's attitudes and knowledge of insects so we can improve how we teach entomology.

Future career plans: I would like to teach and do outreach in entomology. I'd also like to continue my research investigating people's ideas about insects.

Why study entomology? I am absolutely fascinated by insects. They are beautiful and we can learn so much from them. They are truly amazing creatures and are tremendously important ecologically as well as economically. One aspect that drew me to entomology is it is an extremely versatile field - there is no end to what you can study or where it can take you.

What or who inspired your interest in entomology?

As an undergrad I worked as a research assistant in Rich Merritt's aquatic entomology laboratory. Dr. Merritt's lab was my first exposure to entomology. What really caught me was seeing insects up close under a microscope. The tiny hairs, spines, brushes and other morphological structures of insects are truly breathtaking in terms of beauty and functionality. Also, Dr. Merritt and his grad students were super fun to work with, which encouraged my interest.

What has been your best experience with entomology? My favorite experiences have been teaching because I get to convey my enthusiasm about insects, and I love showing people how interesting they are and seeing them get excited in turn! I also enjoy being outside and looking for insects.

Was there ever a time when you didn't like insects?

When I was a small child I remember getting a large bee stuck in my hair, and when I tried to pull it out, it stung me in the palm of my hand. After that I spent the next few years very much not liking insects.

What is your favorite way to spend time outside of your studies? Spending time with my husband and stepson, cooking and playing with our three dogs.

AWARD-WINNING

DEPARTMENT

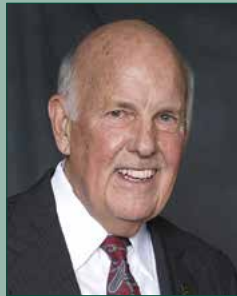
Ari Grode, (MS, Szendrei Lab) won third place with his 10-minute talk in the MSU Plant Science Graduate Student Symposium. His presentation was about the relationship between onion thrips and bacterial leafblight in Michigan onion fields.

Congratulations to the following students who won awards at the 2015 Entomological Society of America annual meeting in Minneapolis, Minnesota.

Graduate Poster Competition:

- **Knute Gundersen** (PhD, Isaacs Lab) second place in the honey bees and related pollinators category.
- **Ari Grode** (MS, Szendrei Lab) first place in the nursery and specialty crops category.
- **Heather Leach** (MS, Isaacs Lab) first place in the invasive species category.

ULTIMATE SPARTAN: Death of Gordon Guyer



With sadness, we announce the death of Dr. Gordon Guyer on March 30, 2016. Guyer was a graduate of our Entomology Department and grew his career as a professor, Entomology chairperson, MSU Extension director and eventually, MSU President. With his strong leadership skills, he quickly became the state's "go-to guy" for leading Michigan into a better future by directing several departments for state government.

Son Dan Guyer wrote to the Department, "He was ever so proud to be an MSU entomologist and as you know carried the banner and was an ambassador for MSU and Entomology all over the country and world."

Read more at: <https://msu-guyer.squarespace.com/>
Memorial gifts can be made to the Guyer aquatic entomology fund at <http://bit.ly/GuyerEntomology>



- **Rachel Osborn** (PhD, Cognato Lab) first place in the phylogeny category.

Graduate Ten-Minute Paper Competition:

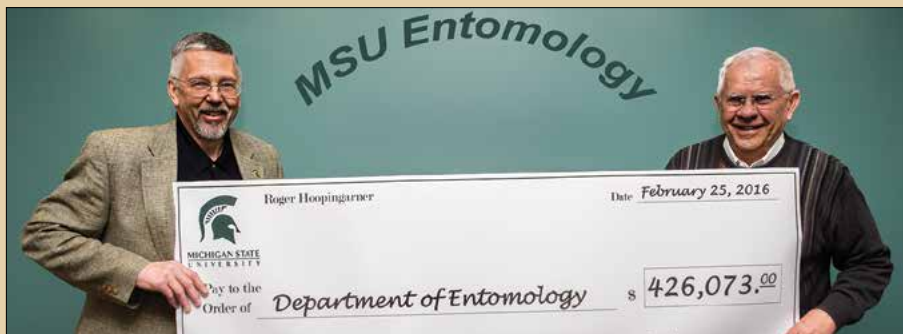
- **Sara Hermann** (PhD, Landis Lab) second place in the biology/behavior category.

- **Jessica Kansman** (undergrad, Szendrei Lab) first place in the IPM category.

Undergraduate Poster Competition:

- **Mike Mueller** (undergrad, Grieshop Lab) second place in the herbivores, invasive species and trapping category.

WHY GIVE? Roger Hoopingartner's response



Entomology chairperson Bill Ravlin with Roger Hoopingartner.

The Roger and Barbara Hoopingartner Endowed Graduate Fellowship in Entomology was initiated in 2004 to support students enrolled in apiculture or honey bee science. Contributions from the Hoopingarners for its support and for other aspects of Entomology recently topped \$425,000. When asked why he repeatedly gives support to the Department, Hoopingartner gave a couple reasons. "I worked for the Department for almost 40 years. It is part of my life and I want to support it." Hoopingartner said. "As a professor, getting money for graduate students to continue their education was always a challenge for me. Professors get a grant with student support, the grant runs out and then they have to scramble to find money for their student's stipend. I thought this graduate fellowship is something a professor would love to have, lessen the worrying."

Sarah Smith was also awarded the Jean Theodore Lacordaire prize from the Coleopterists Society during the ESA meeting.

MSU Entomology students were honored at the 2015 Great Lakes Fruit, Vegetable and Farm Market Expo. They were among 14 students to receive scholarships from Michigan's fruit and vegetable industry.

- **Mitchell Efaw** will graduate May 2016 with a bachelor's degree in Entomology. He would like to work in research or possibly sales, preferably with apples or other tree fruit. Eventually, he would like to pursue his master's degree.
- **Ashley Leach** earned her bachelor's degree in Entomology at MSU in 2013 and is working on a master's in Entomology at Cornell University, where her research focuses on managing thrips in onion cropping systems. She

was a research technician in the Isaacs Lab while at MSU, as well as a field scout for CHS Inc.

- **Jason Matlock** will graduate fall 2018 from MSU with his PhD in Entomology. After graduation, he is interested in working with the agricultural industry,

government and academia. He would like to use the concerns of farmers and the influence of legislators to facilitate agriculture's future.

- **Kristen Poley** will graduate summer 2016 with a master's degree in Entomology. She

would like to use her entomology studies as a tool to understand agricultural ecology in Michigan. She hopes to translate cutting-edge science into practical and realistic methods for growers by writing grants, newsletters and reviews.

The **Michigan State University Department of Entomology** excels in research, extension and teaching to address the issues that confront the people of Michigan, our nation and the world. MSU's entomologists look for systemic solutions across disciplines to address critical issues related to health, natural resources, food production and more.

People

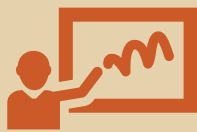
275 faculty, staff, students



9 MSU Distinguished faculty

Teaching

1,400



undergrads take an entomology course each year

Students from
15 countries
since 2009



Research

Multi-year grants with continuous funding (years = length of commitment):

- 15 years National Institutes of Health
- 10 years Bill/Melinda Gates Foundation
- 9 years National Science Foundation
- 10 years U.S. Agency for International Development
- 8 years U.S. Department of Energy
- Continuous funding from USDA including 5 year SCRI

\$10 million annual research expenditures



Outreach & Extension



5,000 visitors to the Bug House each year

\$1.4 million

increased Michigan fruit sales for growers using MSU Enviro-weather's online pest/crop decision tools

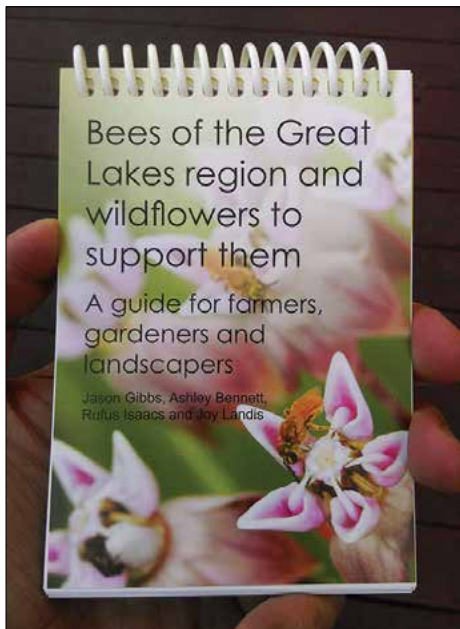
Proud to be a part of AgBioResearch, MSU Extension, College of Agriculture and Natural Resources, and College of Natural Science.

MSU Department of Entomology

Michigan State University
Natural Sciences Building
288 Farm Lane Room 243
East Lansing, MI 48824



RESEARCH AND EXTENSION: Helping pollinators based on MSU research



New!

Bees of the Great Lakes region and wildflowers to support them

A guide for farmers, gardeners and landscapers
By Jason Gibbs, Ashley Bennett, Rufus Isaacs and Joy Landis

The photos and descriptions in this spiral-bound book will help farmers and gardeners identify the many species of bees inhabiting Michigan and surrounding states, and the native plants that can be grown to provide pollen and nectar. The guide's pollinator section offers great photos coupled with tips for identifying bee species, descriptions of their behavior and contribution to pollination. The featured herbaceous plants can be used in farms, gardens and urban landscapes to help conserve bees. Each plant's page describes preferred growing conditions, flower characteristics, common pollinators it attracts and best companion plants. This publication discusses the wider view of bee conservation and various approaches for ensuring a diversity of bees in your landscape. Readers will find useful information for exploring these fascinating and valuable insects and will learn how adding native plant diversity into gardens, fields and other landscapes can provide bees with the resources they need to survive and thrive.

This pocket-sized, 110-page guide costs \$10 and can be ordered at: shop.msu.edu. Enter E3282 in the search box.

