MICHIGAN STATE UNIVERSITY

DEPARTMENT OF ENTOMOLOGY

SMALL ORGANISMS: EPIC POSSIBILITIES
Ecological, behavioral and evolutionary questions related to arthropod pests of vegetables. Our goal is to provide vegetable growers with new and improved IPM tools.
Grad student Nicole Quinn and a team of undergrads measure cucumber yield in cover crop intercropping experiment.
Jason Schmidt, Jemma Flood and Jessica Kansman caught in the rain during data collection day.

Jason Schmidt and Ari Grodes sorting through suction samples.
Jeremy Jubenville implementing a mark-capture experiment in a celery field.

Undergrad Gabriel King in the field.
Ecology and management of native and exotic forest insects
James Wieferich scrubs beech scale off an infested tree to evaluate control methods for beech bark disease.

Molly Robinett measures diameter of a tree.
Kyle Redilla and Molly Robinett set up a trap for woodborers.

Tree planting – Deb McCullough
The Forest Ent crew looking good - Christmas 2013.

Sara Tanis evaluates hemlock condition.
Understanding the unique activity characteristics and performance boundaries of new insecticide chemistries on Michigan’s fruit insect pests
Linda Raja Jamil using Potter Spray Tower to conduct predatory mite bioassays at the TNRC.

Tony VanWoerkom conducting trunk injection research on apples (Michigan Farmer magazine front page).

By JENNIFER WAGNER

This year Michigan State researchers are connecting the dots between their field studies and on-farm decision making. The goal is to provide farmers with the information they need to make informed decisions.

Trey Pence, an agricultural economist at Michigan State University, says that the key to successful on-farm research is to ensure that the results are relevant to the farmers who will be using the information. He adds that the research should be conducted in collaboration with farmers to ensure that the results are useful.

Key Points:
- Researchers need to be more involved in the decision-making process of farmers.
- The research should focus on solving real-world problems.
- Farmers are open to new technologies and practices if they are beneficial to their operations.
- The research should be conducted in collaboration with farmers to ensure that the results are useful.

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John Wise, Trevor Nichols Research Complex

Michigan State University

Entomology
Dan Hulbert conducting research with TNRC’s rainfall simulation chamber.

Abdulwahab Hafez welcomes the Green Shaikh to MSU’s recycling center.
Berry crops entomology: pest phenology, pheromone mating disruption, pollination, biological control, selective insecticide evaluations
Bee Patrol picking up bumblebee research colonies for analysis in the lab.
Emily May, Clara Stuligross, Julianna Wilson and Rufus Isaacs evaluate the success of wildflower restorations at fruit farms.
Undergrad Kari Grebe on the hunt for bees in a mature tallgrass prairie.

Kari Grebe and Clara Stuligross setting up emergence traps to collect insects.
How does landscape structure influence insect ecology and management?
GLBRC Intensive Plots at Kellogg Biological Station are an excellent way to study multiple bioenergy crops in one place. We are studying how beneficial predator communities respond to winter cover crops preceding corn.

Gathering preliminary data in native prairie sites. Insects collected using pitfall traps, sticky traps and sweep netting. Native prairie is a candidate bioenergy crop.

Post-doc Aaron Fox vacuuming for insects in GLBRC intensive plots at KBS.

Student research assistants collecting data for GLBRC experiments.
Technician Julia Perrone and grad student Marissa Schuh trying to see over the tall switchgrass so they can sweep for natural enemies.
Working the KBS outreach table at the Southwestern Michigan Harvest festival.

Landis lab student research assistants taking measurements in the GLBRC intensive plots at KBS.

Doug Landis
Insects & Landscape Ecology Lab
Grad student Marissa Schuh setting up aphid cages in switchgrass.

Post-doc Aaron Fox and his crew mixing ant baits in the lab.

Doug Landis
Insects & Landscape Ecology Lab
Turf, Landscape, Nursery Pest Management
Collecting foliage from ash trees near St. Johns, MI for a laboratory assay.

Jen Michalski rating flower damage.
Rachel Pierce weighing chemical for an insecticide trial.

Dave Smitley teaching lab personnel how to identify a Malpighian tube parasite of Japanese beetles.
Washing turf root samples to count white grubs.

Removing foliage from the tops of ash trees by the easiest method.

Chelsea Rawe watering plants that are in a neonicotinoid insecticide on bees experiment.

Dave Smitley
Turf & Landscape Pest Management
Insect Toxicology and Neurobiology
(Back row, left to right) Peng Xu, Ke Dong, Frank Rikevich,
(Front row, left to right) Yuzhe Du, Yoshiko Nomura, Lingxin Wang
**Kdr** mutations that reduce sodium channel sensitivity to pyrethroids in diverse insects

Do **kdr** mutations define the pyrethroid binding site?
Dual pyrethroid receptor sites on the sodium channel
Developing economically viable pest management tactics for organic farming through better understanding of agroecosystem dynamics, pest natural history and behavior
Krista Buerher working with hogs as a pest management tool in an organic orchard.
Anne Nielsen flaming the orchard floor.

Matt Grieshop applying MycotrolO® to combat the apple flea weevil.
Emily Pochubay using a mite brush to count beneficial mites.

Atheta coriaria, a greenhouse natural enemy.
Tree fruit entomology: Researching novel mating disruption technologies
The tree fruit entomology program is a team effort and a lot of fun!
Research work in the orchard.
Tree fruit research work in the lab.
Exploring aspects of vector (mosquitoes, ticks) biology and insect-microbe interactions
Katie Demeuse deploys a CDC trap for mosquito surveillance at an emu farm.

Field trip to the Grand Canyon during the Society for Vector Ecology annual meeting.
Collecting larvae of the invasive mosquito species, Aedes japonicus, from an artificial habitat near MSU’s campus.

Taking tissue samples from wild rodents to assay for Lyme disease.
Preparing experimental larval habitats for *Anopheles gambiae* studies (left) and sampling natural larval habitats (right) in Kenya.
Researching innovative arthropod pest management strategies, tactics and tools to help agricultural producers transition to more economic and environmentally friendly, reduced-risk and organic pest management.
Mark Whalon conducting maximum residue level research in cherries.
Insecticide maximum residue level research in cherries.

Ph.D. student Duncan Selby in the field conducting a study in pest insect ethology.
Our goal is to improve insect systematics, taxonomy and phylogenetics. We specialize in bark beetle (Scolytinae) biodiversity and molecular systematics.
Students travel the world to study a variety of taxa and produce award-winning monographs.
The museum houses 2 million world-wide specimens with significant holdings of Lepidoptera and Coleoptera from the Great Lakes region.
The research collection was established in 1867. Search our database at:
http://www.arc.ent.msu.edu/holdings.php

Current NSF funded activities:
• Physical renovation of storage
• Specimen level data basing
• Imaging of specimens
Research and extension on impacts of pesticide use, development of user-friendly training materials on pesticide safety and regulations, and measuring and reducing worker exposure to pesticides.
Larry Olsen discussing flea beetle damage on young potato foliage with educators at the Marco Institute in Peru.
Larry Olsen discussing improved potato variety qualities at a farmer field school in Peru.
Classical Biological Control of the Brown Marmorated Stink Bug (BMSB)  
*Halyomorpha halys* Stål (Hemiptera: Pentatomidae)  

Ernest S. Delfosse, Gary L. Parsons, Patricia M. Samota, Ryan L. Paul and Heather L. Leach
Lab members of the Classical Biological Control of BMSB.

Trissolcus emergence.

BMSB wasp emerging from eggs.
Trisha Samota posing with cicadas.

Lab members in the field at Rose Lake.
The MSU Classical Biological Control of BMSB team members Gary Parsons, Ryan Paul and Trisha Samota (left to right) prepare native pentatomid eggs for physiological host-specificity testing of the scelionid egg parasitoid, *T. halyomorphae*. 
Studying new frontiers in aquatic ecosystem entomology and disease ecology
Research associate Dr. Jen Pechal swabbing a dead salmon as part of a larger study in Alaska and Michigan addressing insect-microbe interactions with decomposing carrion in stream and riparian habitats.

The Benbow lab sampling invertebrates from vernal pools in Okemos, MI.

Eric Benbow
Aquatic entomology
Grad students Courtney Larson and Courtney Weatherbee sampling aquatic insects and microbial biofilms from a Michigan stream.
Decomposing salmon carcasses play an important role in providing nutrients to streams in the Pacific Northwest, such as changing insect communities and the bacteria associated with the insects.

Dr. Jen Pechal and colleague taking a break in Juneau, Alaska.
International training and capacity building related to:

- Integrated Pest Management
- Agricultural biotechnology
- Food safety
- Biosafety
- Intellectual property rights
- Technology transfer
Participants in recent international IPM shortcourse.
Intellectual Property Rights shortcourse.

Karim Maredia
International IPM and training
MSU faculty visit to Nepal.

Central Asia IPM CRSP field training in Tajikistan.
Graduate and Undergraduate Entomology Student Society

G.U.E.S.S.
Graduate & Undergraduate Entomology Student Society
G.U.E.S.S. is a service-oriented, student organization in Michigan State University’s Department of Entomology, raising money annually to support a variety of causes.
Entomology student Rebeca Gutierrez during the annual G.U.E.S.S. camping trip.
Award winners at the 2014 G.U.E.S.S.-hosted spring picnic.
Students at the G.U.E.S.S.-hosted department picnic.
Students and staff volunteer at MSU’s popular Bug House

Julia Perrone and Mitch Lettow with Rosie, the rose-haired tarantula.
Roughly 7,000 visitors tour the Department’s Bug House each year.
Display drawers, posters and live insects make the experience visual and exciting.
Halloween at the Bug House
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. We offer B.S., M.S., and Ph.D. degrees in entomology and consider graduate student education and postdoctoral experience to be one of our highest priorities. Many of our undergraduates further enrich their studies through working in research labs, volunteering in the Bug House and taking entomology or related study abroad courses.

**NEWS**

**MSU researchers earn $7.7 million in specialty crop grants from USDA**

Three Michigan State University AgBioResearch scientists have netted more than $7.7 million in grants from the U.S. Department of Agriculture National Institute of Food and Agriculture to address the critical needs of the specialty crop industry through research and education.

*Read more*

**Jim Miller and team improve methodologies for better pest population measurements**

Entomologist Jim Miller has been leading a team that is publishing a book and securing a grant for additional research toward better pest monitoring.

*Read more*