

**Elizabeth Rowen**

elizabethrowen@gmail.com | elizabeth.rowen@mail.wvu.edu  
elizabethkrowen.com

**EDUCATION**

---

- The Pennsylvania State University** *University Park, PA* 2015 – 2020  
Doctor of Philosophy, Department of Entomology  
College of Agricultural Sciences Outstanding Dissertation Award  
Completed Graduate School Teaching Certificate
- Purdue University** *West Lafayette, IN* 2012 – 2015  
Master of Science, Department of Entomology  
Outstanding Masters Student–Entomology Department,
- Wellesley College,** *Wellesley, MA* 2007 – 2011  
Bachelor of Arts, Major in Biology, Minor in Middle Eastern Studies

**GRANTS AWARDED**

---

*Total value of awards: \$110,500*

- USDA NIFA Pre-Doctoral Fellowship (2017) – An appetite for Phosphorus and Zinc? Towards a better understanding of fertilization in agricultural insect pest management
- USDA NE-SARE Graduate Student Grant Proposal (2016): Plant probiotics? Understanding how soil health practices influence plant-insect interactions
- Sigma Xi grant (2016): Plant probiotics: Do soil microbiomes affect plant-insect interactions

**PUBLICATIONS**

---

- Sub. Rowen, E,** Tooker, J. *Stacked cow manure and wheat cover crops in no-till corn augment resources for predators but only weakly affect predator activity-density and predation rates.* Environmental Entomology
- 2020 Rowen, E,** Regan K, Barbercheck M, Tooker J. *Tillage in agriculture: Is it costly or beneficial for pest management?* Agriculture, Ecosystem and Environment, 294: 106849
- Rowen, E,** Tooker, J. *Fertilizing corn with manure decreases caterpillar performance but increases slug damage.* Environmental Entomology, 49:141–150.
- 2019 Rowen E,** Tooker J, and Blubaugh C. *Soil fertility management to promote arthropod pest suppression.* Biological Control 134: 130–140.
- 2017 Rowen E,** Gutensohn M, Doudareva N, Kaplan I. (2017) *Carnivore attractant or plant elicitor? Multifunctional roles of methyl salicylate lures on tomato (Solanum lycopersicum) defense.* Journal of Chemical Ecology. 43: 572–585
- 2016 Rowen E,** & Kaplan, I (2016). *Eco-evolutionary factors drive induced plant volatiles: a meta-analysis.* New Phytologist. 210: 284–294

## RESEARCH EXPERIENCE

---

- 2015 – 2020**      **Soil management changes biological control and plant resistance to insect herbivores**  
*Advisor: John Tooker*      The Pennsylvania State University  
The objectives of my dissertation are to understand how soil management practices contribute to pest suppression, including tillage, cover cropping, pesticide applications, and fertility regimes. Using meta-analysis, I have found intensive tillage decreases soil-associated herbivores and predators, but increases abundance of herbivores that do not spend part of their life-cycle in the soil. Using a combination of greenhouse and field experiments, I have found manure decreases herbivore performance, and that zinc increases plant susceptibility by increasing protein concentrations in corn.
- 2012 – 2015**      **Biochemical mechanisms and ecological significance of plant defense priming to insects**  
*Advisor: Ian Kaplan*      Purdue University  
My masters research in Dr. Kaplan's lab focused on potential mechanisms for priming tomato defenses against the specialist herbivore *Manduca sexta*. I exposed tomato plants to several herbivore-induced plant volatiles, and characterized their subsequent defense responses to an artificial herbivore attack. Additionally, I conducted a meta-analysis of ecological influences on herbivore-induced plant volatiles.
- 2010 – 2011**      **Transgenerational plasticity in *Persicaria lapathifolia***  
*Advisor: Alden Griffith*      Wellesley College  
As an independent study, I looked at whether trans-generational plasticity was an adaptive response to intraspecific competition in a primary succession species, *Persicaria lapathifolia*. I found that resource allocation and seed provisioning were affected by the interaction of parental conditioning and current density.

## TEACHING EXPERIENCE

---

- Guest Lecturer**      2017, 2018  
AGECO 419: Crop Scouting  
*Pennsylvania State University*  
I was invited as a guest lecturer, and prepared a combination of classwork (materials I prepared) and a hands-on field experience scouting for field crop insect pests.
- Organizer/Teacher**      2016–2018  
“Bug camp for kids”  
*Pennsylvania State University*  
Bug camp is a 1-week kids' day camp for children 8-12, organized by Entomology graduate students. In 2016, I introduced children to the important role that beneficial insects play and led

an activity. In 2017 and 2018, I was a day leader for the beneficial arthropod day, which involved developing and organizing curriculum and teaching hands-on activities.

**Graduate Teaching Assistant** 2016, 2017

ENT 313: Introduction to Entomology

*Pennsylvania State University*

I co-taught the laboratory with another TA (supervised by Michael Saunders) for this half semester course. We taught insect physiology, taxonomy and ecology with hands-on activities such as dissection and identifying insects.

**Graduate Teaching Assistant** 2016, 2017

ENT 316: Field Crop Entomology

*Pennsylvania State University*

I updated lectures for the class and, with another TA, lectured and ran laboratories (supervised by John Tooker). I revised the syllabus and updated rubrics for an in-class debate and the final Integrated Pest Management project.

**Visiting GK-12 Scholar** 2014

7<sup>th</sup> grade science, Tecumseh Jr. High School

*Purdue University*

I served as a ‘visiting scholar’ in a local middle school classroom for 10 weeks through the university’s GK12 program. I was paired with a 7<sup>th</sup> grade science teacher whom I observed and assisted for the first few weeks. In the second half of the program, I designed and executed four connected lesson plans about the scientific method and nitrogen-fixation, where the students grew bean plants with and without rhizobia and observed changes to plant growth and root structure. To aid in these lesson plans, I was awarded a service-learning grant (\$500). As a visiting graduate scholar, I also participated in bimonthly trainings in teaching.

**Supplementary Instruction Leader** 2008–2009

PHYS 104: Introduction to Mechanics for Non-Majors

*Wellesley College*

Through Wellesley’s teaching and learning center, I worked as a supplemental instruction leader for Wellesley’s physics department. I attended class and designed curriculum aimed at students struggling with an introductory mechanics course. I also monitored online forum to answer specific questions from students. In training for this position I participated in two 3-day workshops on metacognition.

Relevant Training

Course in College Teaching *Pennsylvania State University (2017)*

6 week course in college teaching hosted by the Schreyer Institute at Penn State Course, where we covered topics from syllabus creation to dealing with difficult students, to types of assessment. I also presented 2 short lessons and received feedback to improve my teaching style.

College Teaching Workshop 1 *Purdue University (2013)*

10-week series of teaching workshops, on topics ranging from creating a syllabus to objective and subjective grading, to engaging student. During this workshop, I presented a short lesson to get feedback on my teaching.

## RESEARCH PRESENTATIONS

---

### *Invited Presentations*

- Rowen, E, Regan, K, Barbercheck, M, Tooker, J. *Mar 2020* Soil and nutrient management practices promote pest suppression in the Mid-Atlantic. *Clemson Department of Plant and Environmental Sciences, Blackville SC*
- Pearsons, K, Rowen, E, Wickings, K, Smith, R, Tooker, J. *Mar 2019*. Unintended consequences of pest management on soil ecosystems. *ESA Eastern Branch Meeting, Blacksburg VA.*
- Rowen, E, Tooker, J. *Nov 2018*. Bull manure increases corn resistance to some lepidopteran herbivores *ESA National Meeting, Vancouver Canada*

### *Submitted Presentations*

- Rowen, E, Tooker, J. *Nov 2019*. Getting more Zs: Can zinc fertilizer boost corn resistance to chewing herbivores? *ESA National Meeting, St. Louis, MS. **Oral competition PhD 2<sup>nd</sup> place***
- Rowen, E, Tooker, J. *March 2018*. Manure: friend or foe? Plant susceptibility to lepidopteran larvae under manure fertilization. *ESA Eastern Branch Meeting, Annapolis, MD.*
- Rowen, E, Tooker, J. *November 2017*. Do soil health practices mitigate or magnify pest outbreaks? *ESA National Meeting, Denver, CO. **Oral competition PhD 1<sup>st</sup> place***
- Rowen, E, Tooker, J. *March 2017*. Does tillage mitigate or magnify pest outbreaks? *ESA Eastern Branch Meeting, Newport, RI. **Oral competition PhD 2<sup>nd</sup> place***
- Rowen, E, Tooker, J. *September 2016*. Do biotic components of healthy soils increase plant resistance to herbivores? *International Congress of Entomology, International Meeting, Orlando, FL.*
- Rowen, E, Kaplan I. *November 2015*. Eco-evolutionary factors drive induced plant volatiles: a meta-analysis' *Entomological Society of America, National Meeting, Minneapolis, MN.*
- Rowen E, Gutensohn M, Doudareva N, Kaplan I 'Tomato (*Solanum lycopersicum*) volatiles prime defenses against *Manduca sexta* in the field' *Entomological Society of America, National Meeting, Portland, OR. November 2014*
- Rowen E, Gutensohn M, Doudareva N, Kaplan I. 'Impacts of methyl salicylate volatile cues on tomato (*Solanum lycopersicum*) defense against specialist *Manduca sexta*', *ISCE-CSIV Conference, Urbana-Campaign, IL. July 2014*
- Rowen E, Gutensohn M, Doudareva N, Kaplan I 'Schadenfreude: Tomatoes (*Solanum lycopersicum*) eavesdrop on the misfortune of neighbors to prepare for herbivore attack', *Entomological Society of America, National Meeting, Austin, TX. November 2013*
- Rowen E, Griffith, A. *May 2011*. 'Transgenerational plasticity in *Persicaria lapathifolia*: Lamarkian ideas within Darwinian evolution', *Ruhlman Conference, Wellesley College, MA.*

### *Posters*

- Rowen, E, Tooker, J. *Feb 2019*. Manure increases corn resistance to some lepidopteran herbivores. *Plant-Herbivore Interactions Gordon Conference, Ventura CA*
- Rowen E, Kaplan I. *November 2014*. ‘A meta-analytical evaluation of ecological factors driving induced expression of plant volatiles’, *Entomological Society of America, National Meeting, Portland, OR*.
- Rowen E, Gutensohn M, Doudareva N, Kaplan I. *January 2014*. ‘Effects of methyl salicylate volatile cues on tomato (*Solanum lycopersicum*) defense’, *Plant Volatiles Gordon Conference, Ventura, CA*.
- Rowen E, Kaplan I. *January 2014*. ‘Phylogeny, herbivore identity, and environment mediate plant volatile responses to insect damage’, *Plant Volatiles Gordon Conference, Ventura, CA*.
- Rowen E, Griffith, A. *August 2010* ‘Transgenerational plasticity in *Persicaria lapathifolia*: an example of Lamarckian evolution?’ *Summer Research Joint Poster Session, Wellesley College, MA*.

### **EXTENSION ACTIVITIES**

---

- Rowen, E, Pearson, K. *July 2019*. Soybean Sentinel Plot Report, Penn State Field Crop Newsletter
- Baniszewski, J, Rowen, E. *Dec 2017*. Highlights for management of three field crop pests. Webinar to Penn State Extension Educators
- Baniszewski J, Rowen, E. *Nov 2017*. Western Bean Cutworm. Penn State Extension Educator in-service.
- Rowen, E, Pearson, K. *Sept 2017*. Soybean Sentinel Plot Report, Penn State Field Crop Newsletter

### **MENTORING**

---

#### **Undergraduate Mentoring – Penn State University** 2017 – 2020

I have co-supervised nine undergraduate research interns in field and laboratory work. This included teaching pitfall trapping, identifying carabid beetles, scouting for pest insects in corn and soybeans, detecting and identifying entomopathogens, creating mixtures of fertilizers for Hoagland solutions, and collecting plant samples into liquid nitrogen.

#### **Undergraduate Mentoring – Purdue University** 2013 – 2015

I mentored a biochemistry undergraduate (Reilly Snider) in laboratory techniques, particularly protein assays, volatile collections, and lab safety. While learning these skills, he assisted me in my research, but at the end of the year, he had developed enough independence to undertake a project of his own looking at the spatial distribution of tomato defense.

#### **High School Student Mentoring – Purdue University** 2014

I mentored high school students participating in an entomological science fair project at a local high school, and served as a judge for the fair. This included meetings to discuss developing questions and hypotheses, and consulting on experimental design.

### **SERVICE**

---

#### **Symposium Organizer – Entomological Society of America** 2018

I co-organized a popular symposium at the National Meeting in Vancouver Canada titled “The dirt on plant-insect interactions”.

**Instructional Committee** – PSU Entomology Department 2018–2019

I served as a student representative to the department’s instructional committee, responsible for overseeing the overall curriculum for the department.

**Candidacy Committee** – PSU Entomology Department 2017–2018

I served as a student representative to the department’s candidacy committee, responsible for administering the candidacy exam for graduate students in the program.

**Great Insect Fair** – PSU Entomology Department 2016–2019

In 2016, created a “Friends and Foes of Agriculture” display at the annual departmental “Great Insect Fair”. In 2017, created a popular “Haunted Soils” exhibit to introduce children to the world of insects beneath their feet, which included a painted ‘tunnel’ for children to crawl through and live insect demos.

**BExME workshop** – PSU Entomology Department 2017

Co-organized the Behavioral Ecology Experimental Methods workshop in March 2017. This involved inviting and hosting speakers from around the world, advertising and registering attendees from around Penn State, facilitating a poster session, organizing catering for the event, and reconciling budgets.

**President of EGSA** – PSU Entomology Department 2016–2017

President of the Entomology department graduate student association. Organized meetings, facilitated graduate student participation in outreach events, liaison between students and faculty.

**Journal Club** – PSU Entomology Department 2016–2017

Led Entomology graduate student journal club, re-focusing this group to give feedback on manuscripts written by graduate students, and having students demonstrate their research techniques.

**Osmun Award Committee** – Purdue Entomology Department 2014

Reviewed applications and helped select winner of the prestigious professional achievement award given annually by the Purdue Entomology Department.

**Outreach** – Purdue Entomology Department 2012–2015

I have served the department’s outreach team in a number of capacities: volunteered at the Indiana State Fair in August of 2012 and 2013, and at the annual Entomology outreach fair Bug Bowl in 2013 and 2014.

**OTHER EXPERIENCE**

---

**Conservation and Land Management Intern**

Bishop, CA

2011 – 2012

*Bureau of Land Management*

My main responsibility was to collect seed for the national Seeds of Success program, used for national restoration projects. Using a dichotomous key, I identified populations of critical species, and collected seeds. Additionally, I helped monitor rangelands using a variety of ecological field measures, and managed all the data from that monitoring

### **PROFESSIONAL SOCIETIES**

---

Entomology Society of America (2012 – present)