BRANDON SHANNON

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Education

Doctor of Philosophy in Environmental Sciences **May 2025**
Minor in Entomology
The Ohio State University *Wooster, OH*

Master of Science in Environmental Sciences **May 2023**
The Ohio State University *Wooster, OH*

Bachelor of Science in Chemistry **May 2018**
University of Central Florida *Orlando, FL*

Professional Experience

Auburn University Department of Entomology and Plant Pathology **Auburn, AL**
Postdoctoral Fellow *September 2025 – Present*
Advised by Dr. Geoff Williams
- Research focused on colony-level efficacy of *Varroa* control products

The Ohio State University Department of Entomology **Wooster, OH**
Postdoctoral Researcher *May 2025 – August 2025*
Graduate Research Assistant *July 2021 – May 2025*
Advised by Dr. Reed Johnson
- Research focused on the toxicity of inert ingredients in pesticides to honey bees, decision science for pesticide applicators, and formulation chemistry of miticides used for *Varroa* control

Graduate Teaching Assistant – Beekeeping; Pesticide Science *January 2023 – May 2025*
Mentored by Dr. Reed Johnson

Ambient Air Services, Inc. (Now Alliance Technical Group) **Starke, FL**
Team Leader, Ambient Manager *July 2018 – July 2021*
- Performed environmental testing of industrial gaseous and particulate emissions

University of Central Florida Department of Biology **Orlando, FL**
Undergraduate Teaching Assistant: Honey Bee Biology and Beekeeping *Jan. 2018 – May 2018*
Mentored by Dr. Patrick Bohlen

University of Central Florida Department of Chemistry **Orlando, FL**
Undergraduate Research Assistant *Aug. 2017 – May 2018*
Advised by Dr. Melanie Beazley
- Research focused on toxicology of environmentally relevant bacteria

Honors / Awards

AAPA Exceptional Student Award **January 2025**
$1,000 award stipend
American Association of Professional Apiculturists

First Place, Entomological Society of America Student Competition **November 2024**
10-minute oral presentation, Apiculture section

John T. Ambrose Student Award **July 2024**
$450 travel award and invitation to present at state annual beekeeper's meeting
North Carolina State Beekeepers Association

First Place, Entomological Society of America Student Competition **November 2023**
10-minute oral presentation, PBT: Pollinator Biology section

Delong Poster Presentation Competition Winner **March 2023**
$1,000 travel award
The Ohio State University Dept. of Entomology Spring Delong and Root Awards

Third Place, Hayes Graduate Research Forum **February 2023**
$200 award stipend
The Ohio State University Council of Graduate Students

Foundation for the Preservation of Honey Bees Graduate Scholar **January 2023**
$5,000 award stipend and funded travel to the American Beekeeping Federation Conference
American Beekeeping Federation

Third Place, Ohio State CFAES Annual Research Conference Poster Competition **April 2022**
Master's Category

Delong Oral Presentation Competition Winner **March 2022**
$1,000 Travel Award
The Ohio State University Dept. of Entomology Spring Delong and Root Awards

Dean's List **Fall 2014, Fall 2017, Spring 2018**
University of Central Florida College of Sciences

Peer-Reviewed Publications

Tarpy, D., Rogers, G., Rash, J., **Shannon, B.** (under review). Timing of oxalic acid extender pads is critical for *Varroa* mite control. *Journal of Apicultural Research*.

Shannon, B., Tarver, L., Jeon, H., & Johnson, R. M. (2025). Assessing toxicity of pesticide inert ingredients and spray adjuvant principal functioning agents to honey bees (*Apis mellifera*). *Environmental Toxicology and Chemistry*. https://doi.org/10.1093/etojnl/vgaf283.

Shannon, B., Zhang, R., Marsh, L., & Johnson, R. M. (2025). Adjuvants to improve efficacy of miticides in managed honey bee (*Apis mellifera*) colonies to control Varroa destructor. *PLOS ONE*, *20*(6), e0320037. https://doi.org/10.1371/journal.pone.0320037.

Shannon, B., Jeon, H., & Johnson, R. M. (2023). Review: the risks of spray adjuvants to honey bees. *Journal of Insect Science.* 23(6):20. https://doi.org/10.1093/jisesa/iead100.

Shannon, B., Walker, E., & Johnson, R. M. (2023). Toxicity of spray adjuvants and tank mix combinations used in almond orchards to adult honey bees (*Apis mellifera*). *Journal of Economic Entomology.* 116(5):1467–1480. https://doi.org/10.1093/jee/toad161.

Ranjit, S., Deblais, L., Rotondo, F., **Shannon, B.**, Johnson, R. M., Miller, S. A., & Rajashekara, G. (2023). Discovery of Novel Small Molecule Growth Inhibitors to Manage Pseudomonas Leaf Spot Disease on Peppers (*Capsicum sp.*). *Plant Disease.* 107(11):3560-3574. https://doi.org/10.1094/PDIS-12-22-2976-RE.

Extension Publications

Shannon, B., Zhang, R., Marsh, L., & Johnson, R. M. (2025). Research Brief: Adjuvants to Improve Efficacy of Miticides in Managed Honey Bee (*Apis mellifera*) Colonies to Control Varroa Destructor. *Bee Culture*, *Sept 2025*, 52–53.

Shannon, B. & Johnson R. (2022). Not so "Inert Ingredients" can be Toxic to Honey Bees. *Ohio State Beekeeper's Association Quarterly Newsletter.* 12(1).

Patents

ADJUVANTS TO IMPROVE EFFICACY OF *VARROA* CONTROL ACTIVE INGREDIENTS IN MANAGED HONEY BEE COLONIES **Nov 2024**
Patent WO2025106839: https://patentscope.wipo.int/search/en/WO2025106839
Licensed to Chemicals Laif

Grants

Shannon, B. (2024). Evaluating and Communicating the Risks of Off-Label Amitraz EC Formulations to Control Varroa in Managed Honey Bee Colonies. *USDA NIFA Postdoctoral Fellowship*. $224,148 requested, not funded.

Shannon, B. & Johnson, R. M. (2024). Managing adjuvant risk to honey bees: designing improved risk communication for pesticide applicators. *One Hive Foundation*. Awarded $70,957.

Shannon, B. & Johnson, R. M. (2022). Using adjuvants to improve efficacy of *Varroa* control active ingredients in managed honey bee colonies. *CFAES IGP Graduate Student Proposal*. Awarded $5,000.

Shannon, B. & Johnson, R. M. (2022). Adjuvants to improve efficacy of *Varroa* control active ingredients in managed honey bee colonies. *California State Beekeeper's Association*. Awarded $40,000.

Shannon, B. & Johnson, R. M. (2021). Understanding how pesticide spray adjuvants are toxic to adult worker honey bees (*Apis mellifera*). *CFAES IGP Graduate Student Proposal*. Requested $4,985, not funded.

Johnson, R. M. & **Shannon, B.** (2021). Understanding risks and potential benefits of spray adjuvants for honey bees. *National Honey Board and Project Apis m.* Awarded $36,250.

Certifications

Adult First Aid/CPR/AED — **October 2025**
American Red Cross

Certificate in the Effective Teaching Practice Framework — **May 2025**
The Association of College and University Educators

Human Research: Human Subjects Protection (Biomedical) — **Feb 2024 – Feb 2027**
CITI Program

Professional Presentations and Symposia

Shannon, B., DeMoras, B., Giacobino, A., Williams, G. (2026, January). *Evaluation of newly registered products for Varroa control* [Platform presentation]. American Bee Research Conference, Mobile, AL, United States.

Richard, S., **Shannon, B.**, West, J. D., Johnson, R. M. (2026, January). *Exploring surfactant-based treatments for Varroa mite in honey bee colonies* [Poster presentation]. American Bee Research Conference, Mobile, AL, United States.

Shannon, B. & Johnson, R. M. (2025, May). *Exploring pesticide inert and spray adjuvant toxicity to honey bees* [Platform presentation]. Ohio Valley Chapter Society of Environmental Toxicology and Chemistry (SETAC) Webinar.

Shannon, B. (2025, April). *The risks and benefits of pesticide adjuvants to honey bees* [Platform presentation]. The Ohio State University Department of Entomology PhD Defense, Wooster, OH, United States.

Shannon, B. & Johnson, R. M. (2025, January). *Adjuvants to improve Varroa control: A commercial field study* [Platform presentation]. American Bee Research Conference, Reno, NV, United States.

Johnson, R. M., **Shannon, B.**, French, M. (2025, January). *Effect of foliar micronutrients on the survival of honey bee larvae* [Poster presentation]. American Bee Research Conference, Reno, NV, United States.

Shannon, B., Johnson, R. M., Wilson, R. (2024, November). *Managing adjuvant risk to honey bees: Designing improved risk communication for pesticide applicators* [Platform presentation]. Entomological Society of America Conference, Phoenix, AZ, United States.

Shannon, B. & Melathopoulos, A. [chair]. (2024, November). *Improving communication between researchers and stakeholders to reduce threats to pollinators***.** [PBT Section Symposium]. Entomological Society of America Conference, Phoenix, AZ, United States.

Shannon, B. & Johnson, R. M. (2024, January). *Using low-risk adjuvants to improve Varroa miticides* [Platform presentation]. American Bee Research Conference, New Orleans, LA, United States.

Shannon, B., Tarver, L., & Johnson, R. M. (2023, November). *Characterizing structure-toxicity relationships for alcohol ethoxylate adjuvants to honey bees* [Platform presentation]. Entomological Society of America Conference, National Harbor, MD, United States.

Shannon, B. & Johnson, R. M. (2023, April). *Are inert ingredients really inert? Understanding the toxicity of adjuvants to honey bees* [Platform presentation]. US EPA Webinar.

Shannon, B. & Johnson, R. M. (2023, April). *Toxicity of the not so "inert ingredients" in pesticides to honey bees* [Platform presentation]. Master's Defense Presentation, Wooster, OH, United States.

Shannon, B. & Johnson, R. M. (2023, March). *Toxicity of the not so "inert ingredients" in pesticides to adult worker honey bees* [Platform presentation]. CFAES Annual Research Conference, Wooster, OH, United States.

Shannon, B. & Johnson, R. M. (2023, March). *Toxicity of the not so "inert ingredients" in pesticides to adult worker honey bees* [Platform presentation]. Spring Delong and Root Competition, Wooster, OH, United States.

Shannon, B. & Johnson, R. M. (2023, February). *Toxicity of the not so "inert ingredients" in pesticides applied to almonds during bloom to adult worker honey bees* [Platform presentation]. Hayes Research Conference, Columbus, OH, United States.

Shannon, B. & Johnson, R. M. (2023, January). *Toxicity of the not so "inert ingredients" in pesticides to adult worker honey bees* [Platform presentation]. American Bee Research Conference, Jacksonville, FL, United States.

Shannon, B. & Johnson, R. M. (2022, December). *Toxicity of the not so "inert ingredients" in pesticides to adult worker honey bees* [Poster presentation]. The Almond Conference, Sacramento, CA, United States.

Shannon, B. & Johnson, R. M. (2022, November). *Toxicity of the not so "inert ingredients" in pesticides to adult worker honey bees* [Poster presentation]. Society of Environmental Chemistry and Toxicology (SETAC) Conference, Pittsburgh, PA, United States.

Shannon, B. & Johnson, R. M. (2022, November). *Toxicity of the not so "inert ingredients" in pesticides to adult worker honey bees* [Platform presentation]. Fall Delong and Root Competition, Wooster, OH, United States.

Shannon, B. & Johnson, R. M. (2022, November). *Toxicity of spray adjuvants and tank mix combinations to adult honey bees* [Poster presentation]. Translational Data Analytics Institute Interdisciplinary Fall Forum, Columbus, OH, United States.

Shannon, B. & Johnson, R. M. (2022, April). *Toxicity of spray adjuvants and tank mix combinations to adult honey bees* [Poster presentation]. CFAES Annual Research Conference, Wooster, OH, United States.

Shannon, B. & Johnson, R. M. (2022, March). *Toxicity of spray adjuvants and tank mix combinations to adult honey bees* [Platform presentation]. Spring Delong and Root Competition, Wooster, OH, United States.

Johnson, R. M. & **Shannon, B.** (2022, March). *Effect of adjuvants, pesticides and combinations applied to almonds during bloom on honey bees*. Entomological Society of America North Central Branch, Minneapolis, MN, United States.

Shannon, B. & Johnson, R. M. (2022, January). *Toxicity of spray adjuvants and tank mix combinations to adult honey bees* [Platform presentation]. American Bee Research Conference, Virtual Meeting.

Shannon, B., Letang, B., & Beazley M. (2018, April). *The tolerance and degradation of parabens and their chlorinated derivatives by bacterial isolates* [Platform presentation]. University of Central Florida Undergraduate Research Report Presentation, Orlando, FL, United States.

Extension and Community Service Programs

Mississippi Beekeepers Association — **November 2025**
Primary Author, Two Platform Presentations
(1) Adjuvants to Improve Varroa Control
(2) Auburn Bee Center Update: Monitoring Colony Health and Experimenting with Parasitic Mites

Tallapoosa County, AL Beekeeper Presentation — **September 2025**
Primary Author, Platform Presentation
Chemical Control of Varroa – Research Transition from Ohio State to Auburn

Youth Bee Works Bee Lab Tour and Beekeeping Demonstration — **April 2025**
Program organization, program design, and hands-on beekeeping demonstrations for 30 high school students

Tri-County, Ohio Beekeepers Association — **January 2025**
Primary Author, Platform Presentation
The Risks and Benefits of Pesticide Inert Ingredients to Honey Bees

The Ohio State University Entomological Graduate Student Association Insect Night Walk — **August 2024, August 2023**
Program design, hands-on demonstrations, elementary education, implementation of honey fundraiser

North Carolina Beekeeper's Association Annual Meeting — **July 2024**
Primary Author, Platform Presentation
Low-risk Adjuvants Can Improve Oxalic Acid Extended-Release Strips for Varroa Control

Richland County (OH) Beekeepers Association — **May 2024**
Primary Author, Platform Presentation
Adjuvants to Improve Oxalic Acid for Varroa Control

Tri-County, Ohio Beekeepers Association Annual Conference — **March 2022, 2023, 2024**
Hands on room, OSU Bee Lab demonstrations and lab tours

California State Beekeepers Association Annual Convention — **November 2023**
Primary Author, Platform Presentation
Using Bee-Safe Adjuvants to Improve Varroa Miticides

Ohio State Beekeepers Association Annual Conference — **October 2023**
Primary Author, Platform Presentation
Using Bee-Safe Adjuvants to Improve Varroacides

Portage County, Ohio Beekeepers Association — **October 2023**
Primary Author, Platform Presentation
Are Inert Ingredients Really Inert? Understanding Risk and Benefits of Adjuvants to Honey Bees

Stark County, Ohio Beekeepers Association — **September 2023**
Primary Author, Platform Presentation
Are Inert Ingredients Really Inert? Understanding the Toxicity of Adjuvants to Honey Bees

Wayne County Fair Research — **August 2023**
Research Summary Slide
Are Inert Ingredients Really Inert? Understanding the Toxicity of Adjuvants to Honey Bees

Tri-County, Ohio Beekeepers Association — **July 2023**
Primary Author, Verbal Presentation
Are Inert Ingredients Really Inert? Understanding the Toxicity of Adjuvants to Honey Bees

Entomological Society of America (ESA) Chrysalis Fund Grant Review Panel — **July 2023**
Reviewed 15 of 75 total grants that requested $120,000 of $16,000 funding

Lorain County, Ohio Beekeeper's Association **April 2023**
Primary Author, Platform Presentation
The Not So "Inert Ingredients": Risks and Benefits of Pesticides and Adjuvants to Honey Bees

The Ohio State University United Titanium Bug Zoo Open House **March 2023 – May 2025**
Docent, Hands-on Demonstrations; Recurring monthly all-ages educational event

The Foundation for the Preservation of Honey Bees Luncheon at the American Beekeeping Federation (ABF) 2023 Conference
Primary Author, Platform Presentation
The Risks (and Possible Benefits) of the Not So "Inert Ingredients" in Pesticides to Honey Bees **January 2023**

The American Beekeeping Federation (ABF) 2023 Conference **January 2023**
Primary Author, Poster Presentation
Toxicity of Spray Adjuvants and Tank Mix Combinations to Adult Honey Bees

Knox County, Ohio Beekeeper's Association **January 2023**
Primary Author, Platform Presentation
The Not So "Inert Ingredients": Toxicity of Pesticide Tank Mixes to Honey Bees

The Ohio State University United Titanium Bug Zoo Halloween Event **October 2022**
Program design, Hands-on demonstrations, Elementary Education

Mifflin Elementary Field Trip Presentation and Activity Session **May 2022**
Presenter, Activity Coordination, and Design
Pollination, Honey Bees, and Beekeeping

The Ohio State University Beekeeping Academy **March 2022 – May 2025**
Program name and design, "honey bee swarming" course design and presentation

Ohio State Beekeepers Association Annual Meeting **October 2021**
Presenter, Primary Author
Toxicity of Pesticide-Adjuvant Tank Mix Combinations to Honey Bees

Organizations

American Association of Professional Apiculturists (AAPA)	Dec 2022 – Present
Entomological Society of America (ESA)	March 2023 – Present
Ohio State Entomology Graduate Student Association (EGSA)	August 2021 – May 2025
Seminar Committee Student Representative	*(May 2024 – May 2025)*
American Beekeeping Federation (ABF)	Dec 2022 – Dec 2023
The Ohio State University Graduate Student Advisory Committee (GSAC)	Oct 2022 – Dec 2023
Society for Environmental Toxicology and Chemistry (SETAC)	July 2022 – July 2023

Notable Coursework

Graduate Level

- Mentored Teaching Practices
- Insect Physiology and Molecular Biology
- Pesticide Science
- Integrated Pest Management
- Ecotoxicology
- Experimental Design
- Communicating Environmental Risk
- Environmental Risk and Decision Making
- Intro to Geochemistry
- Soil Chemistry and Remediation
- Graduate Environmental Sciences Seminar

Undergraduate Level

- General Entomology with Lab
- Honey Bee Biology and Beekeeping
- Environmental Chemistry
- Organic Chemistry I, II, III with Lab
- Inorganic Chemistry with Lab
- Physical Chemistry I, II with Lab
- Advanced Analytical Techniques with Lab
- Analytical Chemistry with Lab
- Biochemistry I
- Undergraduate Chemistry Seminar