

GRADUATE AG RESEARCH SPOTLIGHT



Gabriel Hughes

"My research has been funded by a USDA-NIFA Pre-Doctoral Fellowship, allowing me to finish up my dissertation research using powerful next-gen tools, which is very exciting."

Gabriel Hughes, Ph.D. student, Entomology

THE STUDENT: As a youngster in San Diego, Gabriel Hughes enjoyed gardening with his parents but was easily distracted. "I would always stop weeding to stare at any creepy-crawly up close," he recalls. On his way to achieving the highest Scouting rank of Eagle Scout, Hughes also spent time camping, where he learned to appreciate trees and nature. Graduate study in forest entomology now seems a natural outcome of these early activities. After earning a degree in integrative biology at Brigham Young University, Hughes completed a short internship at the Max Planck Institute for Chemical Ecology in Jena, Germany. This involved collecting insects in southern Utah, securing a permit to transport them to the institute in a small terrarium, and staying for six weeks working on insect genetics. He also carefully observed other researchers' projects to hone his own interests. He then came to Purdue to study under the supervision of Associate Professor of Entomology Matthew Ginzl, whose lab is broadly interested in the chemically mediated host colonization and mating behaviors of wood-boring beetles. Once Hughes completed his master's program, he says, "I thought I had so much more to learn, so I stayed on to pursue my Ph.D."

THE RESEARCH: Hughes studies how native wood-boring insects navigate the world around them by chemical means, whether to feed or to mate. "It's only in the last 15 years that we've understood that long-horned beetles produce these pheromones," he explains. "It's been established that they use them to communicate with members of the opposite sex.

Specifically I'm seeking to understand how small differences in the chemical structure of pheromones influence attraction." Such research could lead to more effective management strategies for invasive species that threaten the health of forests.

WHAT ANTENNAE TELL: Hughes appreciates having access to a variety of interesting research techniques. For example, he uses an electroantennogram detector, which involves hooking up an insect antenna and exposing it to different odors to see which ones trigger a physiological response. "We are essentially answering the question, 'What can this insect smell?'" he says. "This technology approaches chemical ecology from a physiological angle. I am also using a genetic approach to identify genes that are involved in pheromone biosynthesis, so it's like I'm coming full circle to where I started."

FUTURE PLANS: Hughes doesn't mind that his fellow graduate students have good-naturedly called him a "mini-Ginzl," citing his advisor's approachability and tenacity. "He has a real passion for not only the research, but also the way in which he shares the research," Hughes says. After completing his degree, likely in December, he hopes to land a postdoctoral position in a similar field but one that will demand new skills. Although he is leaning toward remaining in academia, he is also open to a USDA position. In his spare time, Hughes is an avid fan of Star Wars, including films, games, and especially LEGO sets.