

# AG RESEARCH SPOTLIGHT



## Matthew Ginzel

*"I am fascinated by the diversity of chemical signals produced by these beetles and the array of behaviors they regulate. The goal of my research program is to identify those signals that influence the host finding, courtship and mating behavior of beetles that damage hardwood trees."*

The Ag Research Spotlight shines each month on an individual whose work reflects our commitment to the six strategic themes that guide Agricultural Research at Purdue. Our spotlight for June 2013 underscores the theme, "Strengthening ecological and environmental integrity in agricultural landscapes."

**THE RESEARCHER:** Matthew Ginzel characterizes his younger self as "one of those kids who was outside all the time," as his father's work took the family from Illinois to Switzerland and back again. While majoring in biology at Beloit College, Ginzel was introduced to entomology and chemical ecology while conducting independent research on a mound-building prairie ant species. This newfound interest, combined with his long-held enthusiasm for forest ecology, led him to pursue master's and doctoral degrees at the University of Illinois at Urbana-Champaign focused on the behavioral chemicals of forest beetles. After a post-doctoral fellowship at the University of Nevada-Reno, Indiana's forests and Purdue's facilities drew him back to the Midwest in 2006.

**THE RESEARCH:** Wood-boring beetles, both native and invasive, threaten the long-term health of North American hardwood forests; however, living beneath the bark of trees protects them from many sprayed insecticides. Key to Ginzel's research is the idea that olfactory signals orchestrate much of the beetles' behavior in finding a mate or choosing a host plant. "These structurally diverse behavioral chemicals broadcast a spectrum of information and can be exploited as a biorational means to manage insects," he explains. He works in the field, especially in the summer, collecting volatile

compounds from beetles and trees. Then he moves to the forest entomology lab, where he and his student researchers analyze and identify these compounds using state-of-the-art instrumentation.

**RESOURCES AT HAND:** Ginzel cites his partnership with Purdue's Hardwood Tree Improvement and Regeneration Center as central to the applicability of his research. HTIRC is a regional research, development and technology transfer effort among industry, university, private, state and federal entities. "That's where much of outcomes of my work reach stakeholders," he says. "A lot of collaborative work also happens here, and they're very supportive of young researchers."

**NEW OPPORTUNITIES:** Insects have a highly tuned olfactory system capable of detecting vanishingly small amounts of odorants. However, the identification of these compounds involves testing them in lengthy behavioral studies with live insects. Ginzel and his colleagues were recently awarded a grant from the Purdue Office of the Vice President for Research to build an electroantennogram detector—the first in the state. "This instrument will allow us to use odors derived directly from natural sources to characterize specific compounds that an insect can smell," Ginzel says.

**GROWING FUTURE SCIENTISTS:** Ginzel and his collaborators eagerly engage students in writing and publishing. "One of the most rewarding aspects of my job is to see my students grow as independent scientists," he says, and publishing shows them how they can have impact. "That's the excitement— sharing your results. If you don't share, it's as if you didn't do the work."