

GRADUATE AG RESEARCH SPOTLIGHT



Heather Pasley

"My experience in Peace Corps introduced me to the importance of finding sustainable solutions regarding food security that conserve natural resources. In evaluating the impact of nitrogen use efficient maize on soil, my research at Purdue addresses the long-term food security and soil fertility in Eastern and Southern Africa."

Heather Pasley, Ph.D. candidate in Ecological Sciences and Engineering, Agronomy

THE RESEARCHER: After studying geology and anthropology at the College of William and Mary, Heather Pasley was torn between going into teaching or research. The Alexandria, Virginia, native decided to explore both avenues in the Peace Corps. Pasley taught secondary school biology and math for two years in northern Uganda. Being surrounded by subsistence farming "introduced me to the world of agriculture in a very real way," she says. She also became involved in two grassroots initiatives: Village Savings and Loan groups of local women; and building fuel-efficient cooking stoves. The stoves not only reduced deforestation in the area but also saved the women hours collecting firewood. That freed up time for Pasley to teach them to make liquid soap or liquid fertilizer. "I used to joke that I had essentially a chemistry lab under my mango tree," she says. She extended her service for a third year to build bigger stoves full time with the non-governmental organization International Lifeline Fund (ILF). "The methodology that made me want to work for ILF is that it's better to manufacture a stove that saves 40 percent of the fuel that everyone can afford, maintain, and use easily than an 80 percent-efficient stove that only a few can access. They do this by using local materials, local labor, and tailoring the product to fit the needs of the community." In Uganda, she met another Peace Corps volunteer who held a Purdue master's degree in an unfamiliar interdisciplinary field—Ecological Sciences and Engineering. Pasley applied to the program, hoping to learn how to make aid work in sub-Saharan Africa more sustainable. Through the U.S. Borlaug Fellows in Global Food Security program, the Purdue Center for Global Food Security awarded her a USAID-funded grant.

THE RESEARCH: As part of a long-term study—Improved Maize for African Soils—by the Mexico-based International Maize and Wheat Improvement Center (CIMMYT), Pasley is investigating the impact of growing nitrogen use efficient corn hybrids on soils in Kenya and Zimbabwe, where farmers grow corn every season but cannot afford fertilizer. Nitrogen use efficient corn increases yield but also may take up more nitrogen from the soil. While effective in fertilized U.S. fields, "in Africa, it can be a detriment because it's decreasing soil's fertility that's already quite poor," she explains. CIMMYT will directly apply the results of Pasley's research into soil-plant nitrogen balance to make sure that their hybrids are both high yielding and environmentally sustainable.

TWO ADVISORS, TWO PERSPECTIVES: Pasley benefits from the viewpoints of the two professors of agronomy guiding her research: "Both look at how we manage agriculture, but they come from very different directions," she says. Jim Camberato is a soil fertility expert, while Tony Vyn has expertise in cropping systems. "Both my advisors do extension work, so they work with farmers looking for practical solutions," she notes.

FUTURE PLANS: After completing her doctoral work in August 2017, Pasley hopes to pursue a career in agriculture that helps raise the level of agricultural research conducted in Africa, primarily through the incorporation of more detailed soil investigations whether it be in the nonprofit world, academia or industry. In her spare time, she enjoys whittling small animal and human figures, a skill she learned from woodcarvers in the North Carolina mountains.