

USDA robotics initiative funds research to reduce chemical application

Agricultural producers annually spray nearly \$15 billion worth of chemicals yet still lose 37 percent of crop yield to pest damage. As the industry moves to sustainably intensify production to feed a growing population, a high priority is to reduce farmers' costs by making fewer, more efficient chemical applications, and at the same time limiting impact on the environment.

This is the focus of research at Kansas State University recently funded by a five-year, \$882,920 grant from the U.S. Department of Agriculture under the National Robotics Initiative 2.0: Ubiquitous Collaborative Robots.

[Ajay Sharda](#), assistant professor of biological and agricultural engineering in the [Carl R. Ice College of Engineering](#), is principal investigator for the project titled "An autonomous insect Sense, Identify, and Manage Platform, or SIMPL, to advance crop protection."

Co-principal investigators are Dan Flippo, assistant professor of biological and agricultural engineering, and Brian McCormick, associate professor of entomology.

The goal of the project is to develop a vision system to sense and identify presence of insects in order to conduct site-specific targeted chemical applications using autonomous robotic systems.

"This research will create a paradigm shift in sustainable crop production and provide new opportunities for using intelligent operating systems to improve pest control applications and reduce yield gaps," Sharda said.

The proposed computer vision approach to locate insect incidence and severity, as well as use of a decision tool to conduct directed spray employing an autonomous robotic system, he said, will be a fundamental change from existing techniques of agricultural chemical spray applications.

"Involving both graduate and undergraduate students in creating this platform to advance crop protection," Sharda said, "will help to make Kansas State University one of the top institutions engaged in the development of smart autonomous systems for agriculture."