



** This news release from K-State Research and Extension is available online at www.ksre.k-state.edu/news/stories/2023/12/agriculture-ffar-grant-sustainable-crop-production.html

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K-State to lead multi-state study to improve crop production practices

\$16.3M project will test effects of management practices on soil, sustainability and crop yields

By Pat Melgares, K-State Research and Extension news service

MANHATTAN, Kan. – Kansas State University has been chosen to lead a five-year study on the effects of several crop production management practices on soil, sustainability and crop yields, a project that one university researcher says could increase crop productivity by “billions of dollars.”

Dorivar Ruiz Diaz said that K-State has received \$7.7 million from the Foundation for Food and Agriculture Research (FFAR) to conduct in-field tests of numerous practices involving cover crops, nitrogen, crop rotations and tillage, among others.

Including matching funds from Bayer Crop Science, LI-COR, LandScan and K-State, the project’s total investment is \$16.3 million. The work will be conducted in seven states.

“This project will generate much-needed knowledge on the synergies and trade-offs of multi-level management factors aimed at improving agricultural production, with conservation management across many soils and environments – including water, nutrient cycling, soil carbon and soil health,” said Ruiz Diaz, a professor and soil fertility specialist with K-State Research and Extension.

Brian Olson, head of the Western Kansas Research-Extension Centers, initiated the project as part of a previous position he held with Bayer.

“Our team will explore links between soil water content and crop and soil health, as affected by landscape settings and management interventions,” Olson said. “The project will advance water management for crop production under dryland and irrigated systems, as well as rain-fed agriculture and the role of water tables.”

Ruiz Diaz added that farmers and the entire agricultural industry often face the challenge of increasing crop yields while enhancing sustainability of farm land, and improving profits.

“These objectives are influenced by the complex interactions of multi-factor cropping components across time and climatic gradients, which highlights the importance of gaining more comprehensive understanding of these dynamics,” Ruiz Diaz said.

K-State leads a team that includes researchers from Iowa State University, LandScan, LI-COR, Bayer, Mississippi State University, The Ohio State University and the University of Kansas.

“During the initial five-year period, this project will implement an integrated systems approach across a wide range of environments to determine the long-term impact of combinations of cover crops, nitrogen, crop rotation and tillage on crop productivity and environmental sustainability,” Ruiz Diaz said.

The researchers will assess how crop production practices affect such sustainability measurements as soil carbon, soil health, soil microbial activity and greenhouse gases. Researchers hope to not only explain the causes, but also predict the potential impact of treatments for future decades.

“The applications we find have the potential to deliver substantial benefits to producers, potentially amounting to billions of dollars in increased crop productivity, reduced environmental impact and enhanced sustainability,” Ruiz Diaz said.

The project will address several challenges associated with water use for agriculture, according to Ruiz Diaz. Sustainable water management, he said, “is crucial for ensuring food security, reducing environmental impacts and increasing crop yields.”

Ruiz Diaz said the work will be carried out at eight research locations in the Great Plains and Corn Belt regions, five of those managed by Bayer Crop Science.

In Kansas, work will be conducted at two locations, including the Harold and Olympia Lonsinger Sustainability Research Farm near Alton; and in irrigated production systems at the Western Kansas Research-Extension Center in Garden City.

“These key locations in Kansas will evaluate water use under dryland and irrigated systems, and include such crops as cotton in southwest Kansas,” Olson said.

The research team includes experts in agricultural engineering, hydrology, irrigation technology, biology, modeling, soil science, agronomy and agricultural economics, among other areas.

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Foundation for Food and Agriculture Research, <https://foundationfar.org>

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