

MU Scientist Joins 5-Year Project Studying Climate Change, Corn Production In Midwest

COLUMBIA, MO.

The University of Missouri is one of nine land-grant universities participating in a five-year research program focused on keeping Midwest corn-based cropping systems resilient in the face of future climate uncertainties.

Peter Scharf, professor of plant sciences in the University of Missouri College of Agriculture, Food and Natural Resources, will join a team of 42 scientists from the universities and two USDA Agricultural Research Service institutions in an eight-state region. This region produces 8 billion bushels of corn, which is 64 percent of the annual harvest in the United States.

Researchers will begin collecting data on carbon, nitrogen and water movement this spring from 21 research sites in eight states. Special equipment will monitor greenhouse gas emissions at many of the sites.

The project is funded by a \$20 million grant from the U.S. Department of Agriculture's National Institute of Food and Agriculture (USDA-NIFA).

The researchers will integrate field and climate data to create models and evaluate crop management practices, Scharf said. The project will help researchers, educators, producers and industry identify and define corn-based cropping systems that are productive and resilient in the face of weather uncertainties and risks.

Scharf will study innovative soil nitrogen and carbon management strategies to reduce the greenhouse gas "footprint" of corn production and simultaneously optimize the adaptation of corn production to climate change.

"One example would be the need to adapt nitrogen fertilizer management to wet spring conditions, which can cause nitrogen loss and

nitrogen deficiency," Scharf said. "I estimate that nitrogen deficiency has caused the loss of 1.5 billion bushels of corn, worth about \$6 billion, over the past three years due to unusually wet spring weather."

The goal is to create a database of plot, field, farm and watershed data that can be combined with climate data to develop scenarios based on different practices, said Lois Wright Morton, project director and Iowa State professor of sociology. "Farmers in the region will have opportunities to participate in on-farm research and evaluate research models. The project will also offer training for teachers and the next generation of scientists to better understand the relationships among climate shifts and agriculture."

The project's transdisciplinary approach will enable researchers to integrate and coordinate research, extension and education, said Joe Colletti, associate dean at Iowa State's College of Agriculture and Life Sciences. "As we gather data for future weather and cropping models, we'll also be talking to producers and asking if the results are economically viable, socially acceptable and environmentally sensible."

The grant is part of the USDA-NIFA Coordinated Agricultural Program. The program focuses on decreasing greenhouse gas emissions and increasing carbon sequestration. The long-term national goal is to reduce the use of energy, nitrogen and water by 10 percent and increase carbon sequestration by 15 percent through resilient agriculture and forest production systems.

This project's researchers include agronomists, agricultural engineers, environmental scientists, hydrologists, soil scientists, sociologists, watershed engineers and natural resource scientists. △



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