

CONCERNE OF



United States Department of Agriculture National Institute of Food and Agriculture

Climate Change, Mitigation, & Adaptation in Corn-based Cropping systems CAP

Lois Wright Morton, Project Director Iowa State University Drought. Flooding. Extreme spring precipitation and humidity. Prolonged high temperatures. Shifting frost dates. Increased disease and pest pressures.

U.S. agriculture is increasingly impacted by the effects of a changing climate. Recent and projected changes in the volatility and timing of weather events and conditions underscore the urgent need for systematically addressing agricultural vulnerability, risks and adaptation strategies.











Corn is the major cereal crop in the United States, which along with rice, soybean and wheat provides 75 percent of the calories the world consumes. More than 70 percent of the U.S. corn crop is produced in the nine Midwestern states represented by the CSCAP. Climate scientists agree that long-term weather patterns will continue to change; however, there is great uncertainty and little research regarding how these global climate changes will impact local and regional cropping systems.







THE Climate & Corn-based Cropping Systems CAP VISION

The project envisions a region-wide coordinated functional network developing science-based knowledge that addresses climate mitigation and adaptation, informs policy development, and guides on-farm, watershed level and public decision making in corn-based cropping systems. A transdisciplinary project integrates the knowledge of many specializations to make a quantum leap beyond disciplinary sciences to create new collaborative knowledge, leading to new understanding of difficult and complex problems.

A 136-person team of scientists, graduate students and topic-based specialists across more than 19 disciplines

- 10 Land Grant Universities and USDA-ARS
- 26 field research sites in 8 states
- 20 dedicated extension educators
- 35 graduate students
- 20 advisory board members







Objectives

1. Develop standardized methodologies and perform baseline monitoring of carbon, nitrogen and water footprints at agricultural test sites across the Midwest.

2. Evaluate how crop management practices impact carbon, nitrogen and water footprints at test sites.

3. Apply models to research data and climate scenarios to identify impacts and outcomes that could affect the sustainability and economic vitality of corn-based cropping systems.

4. Gain knowledge of farmer beliefs and concerns about climate change, attitudes toward adaptative and mitigative strategies and practices, and decision support needs to inform the development of tools and practices that support long-term sustainability of crop production.

5. Promote extension, outreach and stakeholder learning and participation across all aspects of the program.

6. Train the next generation of scientists, develop science education curricula and promote learning opportunities for high school teachers and students.



Develop standardized methodologies and perform baseline monitoring of carbon, nitrogen and water footprints at agricultural test sites across the Midwest. Evaluate how crop management practices impact carbon, nitrogen and water footprints at test sites.

Integrated Pest Management



Controlled Drainage Management

8-2

Extended rotations Cover Crops N-sensing

Central Database

Systems Analysis & Predictive Modeling

Apply models to research data and climate scenarios to identify impacts and outcomes that could affect the sustainability and economic vitality of corn-based cropping systems.

Social & Economic Research

Gain knowledge of farmer beliefs and concerns about climate change, attitudes toward adaptative and mitigative strategies and practices, and decision support needs to inform the development of tools and practices that support long-term sustainability of crop production.

Survey of nearly 20,000 farmers in top 22 corn-producing HUC6 watersheds in the upper Midwest.

Stratified random sample Co-produced by CSCAP and U2U project

Extension

Promote extension, outreach and stakeholder learning and participation across all aspects of the program.

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Education

A partnership among Iowa State University; Lincoln University; Michigan State University; The Ohio State University; Purdue University; South Dakota State University; University of Illinois; University of Minnesota; University of Missouri; University of Wisconsin; and USDA ARS – Columbus, Ohio.

Leveraged resources in Year One \$731,685 in additional funds Iowa NRCS \$17,000 Iowa State Experiment Station \$17,200 Purdue Agriculture \$17,200 United Soybean Board \$80,285 Supplemental institutional support more than \$600,000

A work-in-progress....to be continued