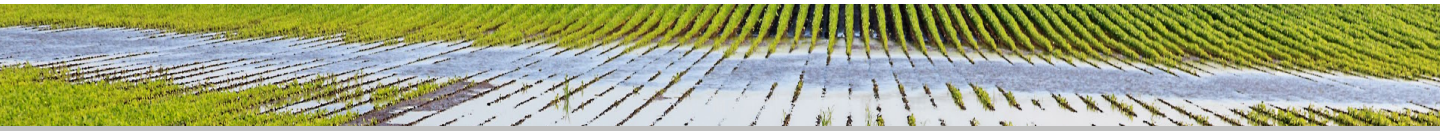
Agricultural Climate Resiliency Program
(formerly SEEDSS)
&
Michigan Alliance for Animal Agriculture

March 19, 2025

Agricultural Climate Resiliency Program

- Established in 2024 through MDARD's budget.
- Partnership among the Plant Coalition, MSU AgBioResearch, MSU Extension and MDARD to address long-term climate- and water-related issues in Michigan plant agriculture.
- Supports research and outreach focused on resiliency in the face of extreme weather and protection of Michigan's water resources.
- Recurring $1 million to support key faculty and MSU Extension positions in FY 24 and FY 25.
- One-time funding in 2024 of $5 million for a competitive grants program supporting four projects.
- Funding of $5.1 million was provided in 2025 to support four additional projects.



Agricultural Climate Resiliency Program

Competitive Grants: $5 million in 2024

Four projects funded for three years, $1.25 million each.

- **A holistic approach to increasing climate resilience of tree fruit production** – Aims to develop a climate-smart technology that optimizes irrigation and fertilizer management. Principal investigator is Assistant Professor Younsuk Dong.
  - Currently testing technologies at the West Central Michigan Research and Extension Center and the Northwest Michigan Horticulture Research Center.
  - Three commercial orchards for on-farm demonstration in 2025.
- **Building resilience in agriculture through climate-smart practices and socioeconomic evaluation** - Developing a statewide tool that integrates socioeconomic analysis, groundwater flow, nutrient/pollutant fate and transport modeling, and field observations. Principal investigator is MSU Research Foundation Professor Pouyan Nejadhashemi.
  - So far, an automated system has been designed to generate groundwater models for Michigan's Lower Peninsula at any desired spatial resolution.
  - A partnership has been established with 40 farmers across Michigan to facilitate the collection of daily groundwater data.

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- **Using linkages between soil health and greenhouse gas emissions to enhance the resilience of Michigan field crops** – Exploring how regenerative agriculture practices enhance soil health and yield stability. Principal investigator is Assistant Professor Christine Sprunger.
  - So far, 182 fields on 91 farms have been sampled across 39 Michigan counties.
  - In 2025, a smaller cohort of 25 farms will undergo a more intensive process with questionnaires on greenhouse gases, soil health, soil carbon, yield monitoring and social science.
- **Integrated and innovative pest management for sustainable perennial fruit crop production in a rapidly changing environment** - Addressing specific pest management concerns regarding the effects of erratic weather on early season management, bloom prediction and late-season management in apple, blueberry, cherry and grape production systems. Principal investigator is Assistant Professor Julianna Wilson.
  - A postdoctoral scholar was recently hired, and equipment was purchased that will be used during the 2025 season.

Agricultural Climate Resiliency Program

Competitive Grants: $5.1 million in 2025

Four projects funded for three years, $1.275 million each.

- **Pathways to sustainability and climate resilience of Michigan commodities** - Developing a modeling platform that will equip farmers, as well as food producers and government agencies, with data and predictions to inform management practices and reduce inputs. Principal investigator is Bruno Basso, John A. Hannah Distinguished Professor.

- **Empowering Michigan Farmers: An AI-based forecasting and management system for building resilient agriculture** - Creating an artificial intelligence-based forecasting platform in the face of extreme weather events for four major agricultural production systems in the southern portion of Michigan's Lower Peninsula: corn, potatoes, soybeans and wheat. Principal investigator is Professor Jiquan Chen.

Agricultural Climate Resiliency Program

Competitive Grants: $5.1 million in 2025

Four projects funded for three years, $1.275 million each.

- **Climate-smart practices for agricultural industry in Michigan to enhance environmental sustainability and economic benefits** - Working with corn and soybean growers, researchers will develop leading-edge tools to prevent nutrient loss and lessen the environmental consequences. Principal investigator is Assistant Professor Subhasis Giri.

- **Soil Health Advancement for Agricultural Resilience Enhancement** - Using modeling approaches that simulate the impacts of various practices under projected climate scenarios, researchers are seeking to quantify and predict how regenerative agriculture can enhance soil health and hydrological function. Principal investigator is Jeremiah Asher, assistant director of the MSU Institute of Water Research.

Agricultural Climate Resiliency Program

Cluster Hire Initiative

Thus far, four of six faculty with research and MSU Extension appointments have been hired to add expertise in strategic areas related to climate resiliency.

- Subhasis Giri – Department of Biosystems and Agricultural Engineering. Specializes in hydrology and water quality, working to advance understanding of hydrological processes and the flow of water in natural and human systems.

- Mohammad Reza Alizadeh – Department of Biosystems and Agricultural Engineering. Specializes in analysis of climate extremes such as heatwaves, droughts and wildfires, as well as the development of climate models integrating climatology, hydrology and remote sensing that model water availability and use.

Agricultural Climate Resiliency Program

Cluster Hire Initiative

- Tor Tolhurst – Department of Agricultural, Food and Resource Economics. Specializes in economic impacts of climate change on farms and accompanying programs.

- Anders Huseth – Department of Entomology. Uses landscape-level research approach that unifies fundamental concepts of insect life history with landscape ecology and climate variability to understand complex communities of pests and beneficial insects. Reducing negative environmental impacts of pest management practices.

Agricultural Climate Resiliency Program

Cluster Hire Initiative

The Department of Horticulture and Department of Plant, Soil and Microbial Sciences are in the interview process for the remaining two positions.

- Life cycle assessment of agricultural systems – Four candidates interviewed via Zoom. Two candidates have been selected for on-campus interviews in April.

- Geospatial climate modeling of agricultural systems – Seven candidates interviewed via Zoom. Four candidates have been selected for on-campus interviews in April.

Agricultural Climate Resiliency Program

Cluster Hire Initiative

In addition to the six faculty positions, MSU Extension has hired two educators who will work directly with growers and commodity groups.

- Richard Price – Conservation systems agronomist with a background in precision agronomy. Expert in the use of remote sensing and satellite imagery to provide prescriptive recommendations to growers for planting and fertilizer rates that improve profitability and nutrient management.

- Korede Olugbenle – Conservation agronomist with a background in the use of annual and perennial cover crops to enhance soil health and reduce nutrient runoff. Working primarily in the Western Lake Erie Basin.

Michigan Alliance for Animal Agriculture (M-AAA)

- Established in 2014 through a partnership among MSU, Michigan animal agriculture industries and MDARD.
- Research and extension to advance the Michigan animal agriculture economy by addressing issues such as animal disease, animal welfare and environmental sustainability.

Michigan Alliance for Animal Agriculture (M-AAA)

- Funded at $3 million through the MDARD budget for research and outreach projects, as well as infrastructure support.
- Last year, $2.5 million supported 23 new projects covering a wide range of topics, including management of dairy cattle diseases, improving dairy cattle fertility, controlling tar spot and vomitoxin in silage corn, and developing honeybee health protection tools.
- Along with M-AAA support, capacity funding from USDA NIFA is supporting a project to study the effects of the highly pathogenic avian influenza virus on dairy cattle reproduction and milk production, as well as transmission of the disease and ways to mitigate it.
- Currently reviewing project proposals for 2025.