Agriculture plays a major role in the economy of the Midwest. However, the grain and horticultural crops in both commercial and organic production systems are particularly susceptible to biotic and abiotic stress, due to changes in weather and climatic patterns. The Midwestern states have experienced more erratic and extreme weather in terms of: increased average annual temperatures, late arrival and early departure of snow, higher frequency of heat waves, torrential rains, groundwater recharge, soil moisture deficit, and droughts. Future climate projections show that the Midwestern states are likely to experience an increase in total annual rainfall from wetter winters, springs and falls, drier and hotter summers, and longer growing seasons.

Our current research is focused on developing water and nutrient management solutions for climate-smart agriculture. We incorporate principles of conservation, agronomic management, and scientific innovation to enhance the climate resiliency of agro-ecosystems. The seminar will showcase some of our field- and laboratory research relating to water and nutrient management for climate-smart agriculture. A case study will feature a newly developed precision irrigation and fertigation system (iCAST) for commercial production of grain- and horticultural crops. The seminar will also include an overview of our extension activities and international collaborative efforts focused on water, soil, and nutrient management.