



# The Wisconsin Integrated Cropping Systems Trial:

## Long-term research for resilient agriculture

**The Wisconsin Integrated Cropping Systems Trial (WICST) was established in 1989** in response to farmers and others making a case for long-term research on low-input farming. WICST set out to investigate both the benefits and limitations of alternative agriculture through replicated research on the productivity, profitability and environmental impacts of both sustainably and conventionally managed production systems.

**Over the past 26 years, the world has changed.** There is growing awareness that sustainable, resilient farming systems are necessary to feed a growing population in the face of increasingly extreme weather and a diminishing resource base. WICST is no longer just an innovative idea, but an invaluable resource for future research on strategies to meet our food needs while protecting natural resources, like soil and water, despite a changing climate.

**WICST offers 60 acres of land** at the UW-Madison Arlington Agricultural Research Station ready for sustainable and organic agriculture research, and 26 years of data available for long-term studies. WICST began with six side-by-side comparisons of conventional and alternative cash grain and dairy forage systems, including organic research. In 1999, the trial was expanded to include native grasses for forage and, in 2007, switchgrass for bioenergy.

**WICST is a collaborative effort** between farmers, businesses, nonprofit organizations and the University of Wisconsin. The team who designed the trial included farmers and other business owners, crop consultants, and representatives from UW-Extension, the Michael Fields Agricultural Institute and the UW-Madison College of Agricultural and Life Sciences (CALs). The project is advised by a board of farmers and other business owners. The Center for Integrated Agricultural Systems (CIAS) is a long-term project partner and the current administrative home for WICST.



## WICST founder Josh Posner

UW-Madison Agronomy professor Josh Posner was the driving force behind WICST. Following Peace Corps service in Cote d'Ivoire and a Ph.D. from Cornell University, Josh embarked on a career helping farmers in developing countries improve crop production through low-input farming. Josh was hired by UW-Madison in 1986 for research in the Gambia. In 1988, he pulled together the team that envisioned and created WICST. While continuing his international agricultural research, he helped WICST grow and thrive until his death in 2012.

Among his many accomplishments, Josh was instrumental in convincing the UW-Madison Arlington Agricultural Research Station to certify 100 acres of land for organic research, providing an invaluable investment for the organic community.

Josh was not only a respected researcher and a tireless advocate for sustainable agriculture; he was also a leader, friend and inspiration to all who continue his work. In the words of his colleague Ken Shapiro, "When I think about Josh now, I think about his enthusiasm, about his optimism, and his good cheer. I think about the warmth of his friendship and his empathy toward others. I think of Josh as a model for how to live one's life."

## Key findings from WICST

### ■ We can achieve food security with organic agriculture.

When WICST began, the debate over the ability of organic agriculture to feed the world was in full swing. More than 15 years of production data demonstrated that the organic systems at WICST produced forage yields equivalent to conventional production, and grain yields that were 90 percent of the WICST conventional grain systems. In two-thirds of the years studied, organic grain yields reached 99 percent of the yields in the conventionally managed plots.

### ■ Sustainable agriculture can boost yields and profits.

A WICST study on long-term yield trends found production benefits of crop rotation in high stress years with adverse growing conditions, and a lack of acceleration in annual yield gains with GMO corn. These results were bolstered by economic analysis showing that organic- and pasture-based farming systems have been the most profitable at WICST.

### ■ Some, but not all, sustainable farming practices may capture and hold atmospheric carbon in the soil.

WICST researchers recognize the role of farming in addressing climate change. Quantifying the capacity of different farming systems to sequester atmospheric carbon in the soil requires observations that span decades, not just years. Analysis of soil samples across 20 years of the WICST trial showed that, contrary to expectations, every cropping system in the experiment except for the grazed pasture had lost significant amounts of soil organic carbon. Ongoing WICST research is looking at the potential for practices like cover cropping and green manure crops to change this dynamic and the biological diversity of our soil.

## The future of WICST

Questions about resilience in agriculture are best addressed through long-term inquiry, as researchers can more effectively pinpoint the weak links in sustainable agriculture and food security with 20+ years of data. WICST research is designed and replicated so that results aren't influenced by seasonal anomalies, making WICST one of the most diverse, statistically robust, long-term cropping systems trials in the United States.

WICST resources are utilized by faculty across CALS, including those researching organic agriculture. CALS partners working to secure the future of WICST include the Departments of Agronomy, Animal Science and Soil Science, and CIAS.

The foundation and federal grants that have supported WICST provide short-term funding. WICST is currently seeking partners who will help establish long-term financial stability for its research, securing the future of this invaluable resource. Contact us to find out how you can be a part of the WICST story.

**Randy Jackson, WICST Director**  
(608) 261-1480  
rdjackson@wisc.edu



CENTER for INTEGRATED  
AGRICULTURAL SYSTEMS