# Prairie Strips to Combat Field Flooding in the Midwest

Prairie strips are strategically planted strips of native perennial forbs and grasses within or along the edge of a row crop field. These cropland prairies act as biological corridors that enhance farm viability, reduce soil erosion, improve water quality, and support biodiversity—all vital for sustainable agriculture systems.

The Midwest is experiencing increased frequency and intensity of extreme weather events, which can exacerbate water quality problems. **Mitigating these threats is crucial to the long-term resilience of Midwest farming operations and prairie strips can play a critical role.**

With support from North Central Sustainable Agriculture Research & Education (SARE), Sand County Foundation (SCF) is partnering with three innovative Wisconsin farmers with established (more than four years) prairie strips on their land. Our project demonstrates how prairie strips can play a critical role in mitigating environmental and agronomic threats such as flooding and water quality. Data will be collected to compare soil health and hydrology within a prairie strip compared to the adjacent row crop field.

## Objectives:

- Collect real-time soil data to quantify the hydrologic benefits of prairie strips
- Sample soils to quantify the soil health benefits of prairie strips
- Increase the understanding of prairie strips as a water quality and regenerative agriculture practice for farmers, armer-led groups, and Midwest conservation professionals

## Approach

In Spring 2025, SCF installed two CropX soil sensors in each of the three prairie strips and adjacent row crop fields. The row crop field represents the original management and baseline conditions of the land where the prairie strips are located. The sensors record soil moisture and temperature every 30 minutes at depths of 4, 12, and 22 inches. Two solar powered weather stations are measuring precipitation across the study region.

Fall soil samples were collected in October 2025 from both the prairie and adjacent row crop field to evaluate how, after at least four years following prairie strip planting, the physical, chemical, and biological soil health properties change. The measured soil properties and hydrology data collected with the sensors will be evaluated to assess the differences in soil health, nutrient leaching, water infiltration, and water holding capacity.

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## Farmer Highlights

**Ross Bishop,** Washington County, Wisconsin, is president of Cedar Creek Farmers, a farmer-led group working to improve land for cleaner water. Ross owns and operates a beef cattle and cash cropping farm. For more than 25 years he has no-tilled corn, soybeans and wheat. Ross partnered with SCF to install a prairie strip in June 2018 and is interested in exploring water quality and soil health benefits. Ross brought the project idea forward to SCF, as he was interested in studying the prairie strip hydrology to understand the benefit to his row crop system.

**Dan Stoffel** of Stoffel Grain Farms, Washington County, Wisconsin, grows corn, soybeans and alfalfa (and bees!) with his brothers. The Stoffel's farm with no-till and cover crops, but Dan still observed water flow on his fields that concerned him. He decided to try prairie strips both to intercept runoff and provide forage for his bees. In June 2017, Eco-Resource Consulting, Inc. seeded three prairie strips; and in June 2018, SCF seeded a fourth strip. Dan, a biochemist by training, looks forward to collecting on-farm data and sharing results with neighbors.


**Dan Johnson** of GBJF Enterprises LLC, Fond du Lac County, Wisconsin, farms with his son Jake, who works for the USDA-NRCS. They grow corn, soybeans, wheat and alfalfa on extremely steep drumlins. Dan began his conservation journey after watching high intense storms rip his steep slope soils apart. In 2019, SCF assisted Dan install a prairie strip on the edge of a sensitive loss field that drained into the West Branch of the Milwaukee River. Dan was pleased with the strip and requested SCF's help with another strip in 2022 to protect a wetland. Dan looks forward to collecting on-site data to understand how the prairie strips help reduce surface runoff.

## Preliminary Results

The plots compare soil dynamics between crop fields and prairie strips across the 2025 growing season.

**Potentially Mineralizable Nitrogen (PMN):** Prairie Strips showed higher PMN than the crop fields. This indicates that the prairie vegetation supports a more active microbial pool capable of supplying plant-available nitrogen.

**Water Aggregate Stability (WAS):** Prairie strips showed higher aggregate stability percentages (44% and 66%) compared to crop fields (38% and 58%). This suggests that the prairie areas had greater resistance to water erosion and better soil structure that supports infiltration.

Overall, the prairie strips outperformed crop fields in nitrogen mineralization potential and superior soil aggregation stability in these measurements.

**FOR MORE INFORMATION CONTACT:**

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