

Improving groundwater quality through on-farm research and partnerships in Wisconsin Central Sands



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OBJECTIVES

1. Work with farmers to conduct applied research on viable solutions that have the greatest potential to improve groundwater quality;
2. Provide local communities with research-based water quality solutions that can readily be adopted on farms.

CLEAN WATER BENEFITS ALL IN WISCONSIN CENTRAL SANDS

- **High Economic Value, High Environmental Impact** (Table 1)
- **Risks of nitrogen loss are high** in Wisconsin Central Sands
- **Rising Nitrate Levels:** Nitrate levels in groundwater have been increasing in Wisconsin Central Sands (30% exceedance in 2015 to 40% in 2020) (Figure 1).
- **Health Consequences:** Excessive nitrate in drinking water leads to millions in medical costs, especially in rural communities.
- **Lack of Practical Solutions:** Wisconsin Central Sands is in dire need of economically viable science-based solutions to improve groundwater quality regionally.

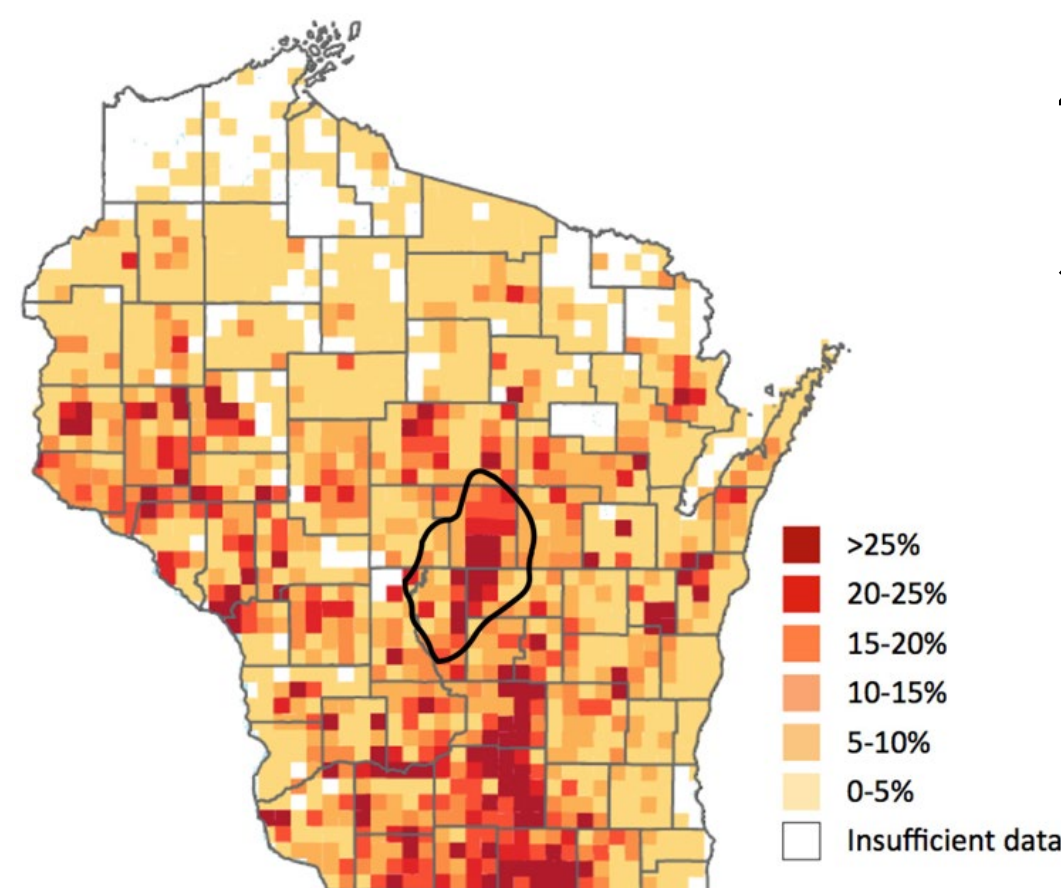


Figure 1: A map of Wisconsin showing the percentage of groundwater samples in each township above the 10 mg/L nitrate-N drinking water standard. (Luczaj & Masarik, 2015)

RESEARCHERS AND GROWERS ARE WORKING TOGETHER TO IMPROVE THE EFFECTIVENESS OF CONSERVATION PRACTICES

1. Retain nitrogen and decrease leaching with intercropping and soil amendments
2. Optimize nitrogen rates in high-value crops
3. Account for irrigation nitrogen credits in real-time
4. Assess community economic and environmental benefits
5. Conduct on-farm trials to test best management practices

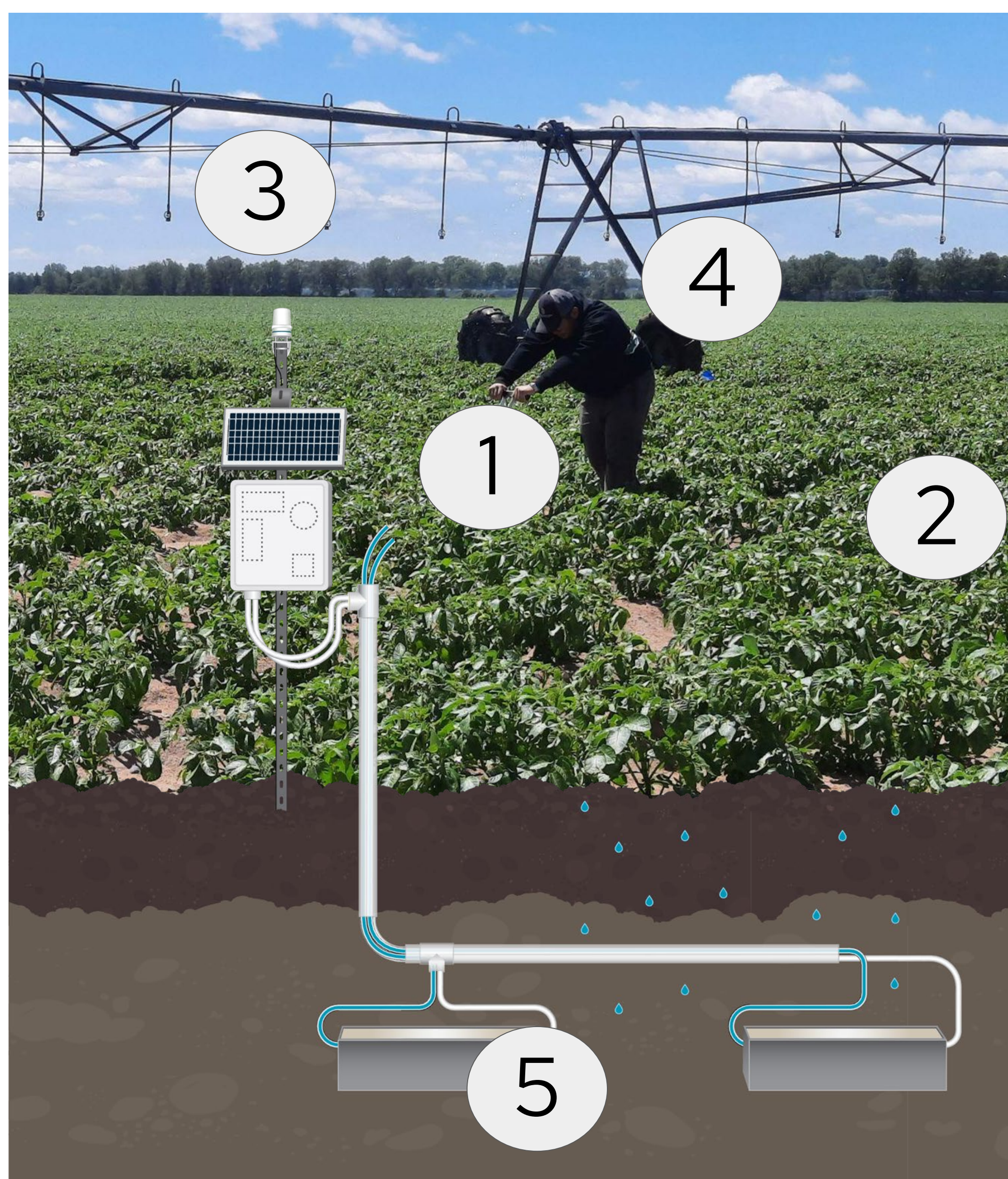


Figure 2: Conservation practices being tested for reducing water quality impacts from specialty crop production in Wisconsin Central Sands. Photo credit: Dr. Kevin Masarik & Discovery Farms

STAKEHOLDER ENGAGEMENT & WATER STEWARDS INNOVATION FARMS



Figure 3: Concept for Water Stewards Innovation Farm Network. This initiative will evolve into place-based labs to evaluate water quality outcomes and economic return. Colored plots represent controlled randomized trials.

- **Central Sands Ag Water Field Day**
 - Hold community conversations for growers, industry partners, researchers, and community stakeholders to connect and discussion practical implementation of research outcomes
- **Central Sands Water Stewardship video series**
 - Watch farmer and researcher interviews by scanning the QR code at the top
- **Water Stewards Innovation Farms**
 - Demonstrate research solutions on commercial farms in collaboration with project partners
 - Use peer-to-peer influence to encourage adoption
- **Develop Partnerships with Rural Communities**
 - Showcase success of farmer-led solutions developed in partnership with University Extension

WISCONSIN RURAL PARTNERSHIPS INSTITUTE
SUPPORTED BY THE USDA NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

Industry	Total Revenue (\$ million)	Total Economic Activity (\$ million)	Total Jobs
Potatoes	\$271	\$413	2,922
Vegetables	\$228	\$348	2,497
Cranberries	\$158	\$241	1,735
Other Fruit	\$38	\$58	413
Specialty Crop Processing	\$2,822	\$4,781	16,981
Total Impacts	\$3,517	\$5,835	24,538

Table 1: Total economic and employment impacts of the specialty crop production and processing in Wisconsin (2013-2015 average). (Adapted from Mitchell, Deller & Smail, 2015)