



Green Lands  
Blue Waters



# Project Snapshot: VERDI, MN - Project to Protect Drinking Water with Kernza® Perennial Grain

February 2020 update

**Nitrate from annual row-crop agriculture pollutes groundwater in the U.S. Upper Midwest. A new project in Southwest Minnesota aims to demonstrate that planting Kernza® perennial grain can prevent groundwater contamination in vulnerable wellhead catchment areas and *keep farm fields in production.***

## **The Problem: Nitrate Fertilizers Contaminate Our Groundwater**

Nitrogen fertilizers and other synthetic farm inputs used to grow annual crops like corn, soybeans, and wheat can pollute drinking water when they leach (drain through the soil) into groundwater. In Minnesota, about **75% of residents get their drinking water from groundwater**, and nitrate is one of the biggest contaminants of drinking water systems in the Upper Midwest, especially in agricultural areas.

High nitrate levels are toxic to humans – and **when nitrate seeps into drinking water it can cost millions to remove it.** The problem of nitrate in water systems has been around for decades, with **few practical solutions — until now.**

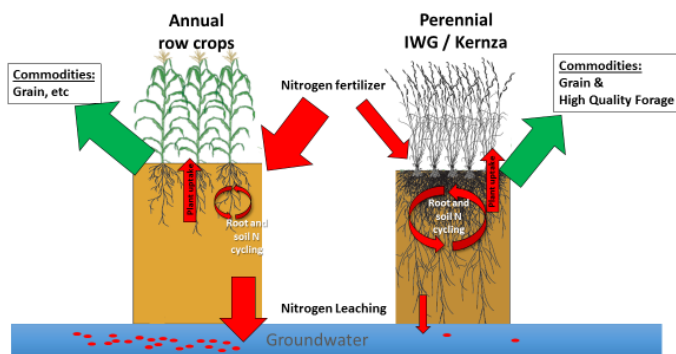
## **The Project: Kernza® Planted and Harvested; Data Gathered**

A two-year project funded by the Minnesota Environment and Natural Resources Trust Fund aims to prevent nitrate contamination of groundwater using Kernza perennial grain.

The site for one part of the project is on recently purchased Lincoln-Pipestone Rural Water (LPRW) land in a “highly vulnerable” wellhead protection area near Verdi, MN, that pumps 1.8 billion gallons of water each year to 36 municipalities and rural residents in a 10-county area.

Although converting row-crop agriculture to perennial cover is rarely an economically viable way to improve water quality, Kernza – a new perennial grain crop developed by the University of Minnesota and the Kansas-based non-profit The Land Institute – is a promising economic alternative to annual grain crops; early markets are developing for human consumption (food and drink), livestock grazing, and forage production.

Kernza has deep roots that filter nitrate from soil, and because it is resistant to most wheat diseases and crop pests it requires fewer pesticides than annual grain crops. Early experiments with Kernza have shown virtually no nitrogen leaching out of Kernza fields, which means the crop is very good at using nitrogen that is applied.



Credit: Dr. Jacob M. Jungers, University of Minnesota.

“This is not just a science project,” says Jason Overby, general manager of the Lincoln-Pipestone Rural Water System. “It’s about finding a solution that is marketable. If this project shows that Kernza works to reduce nitrate in our water and the crop can be worked into land owners’ business plans – it’s huge,” says Overby. “Public waters will be the beneficiary.”

## Goals & Outcome

The first objective of the project was to seed and maintain 54 acres of Kernza near groundwater catchment areas in Pipestone, monitor water quality, and harvest the perennial grain. In August 2018 nearly 10,000 pounds of clean Kernza seed was harvested by local

farmers and the seeds were sold to The Land Institute for testing and distribution. Project partners and researchers hosted a field day attracting forty people, including farmers and other interested parties representing soil water conservation districts, public works, rural water, grain distributors, seed cleaners, and wildlife. The event was covered by local media (Fitzgerald, 2018).

The second objective is to collect and report data on nitrogen use dynamics and hydrology below the Kernza plants and compare those results to common annual row crops. This will be completed in June 2020.

The third objective is to test the harvested grain through the Agricultural Utilization Research Institute to determine the best way to use it.

“By conducting this project at three locations with very different soil types, rainfall patterns, and temperature conditions, we hope to learn how Kernza performs as a nitrate leaching mitigation strategy,” explains University of Minnesota researcher Dr. Jacob M. Jungers. “This project is exciting because it allows a diverse team of water quality stakeholders to work together to study and implement a new crop that can provide new economic opportunities for farmers while protecting drinking water.”



Beer made with Kernza is served up during a Sep 2018 Kernza Field Day by (l-to-r) Laura DeBeer, regional water resources specialist with the Pipestone Soil and Water Conservation District; Dr. Jacob Jungers, University of Minnesota; and Aaron Reser, Green Lands Blue Waters. Pipestone Publishing photo by Debra Fitzgerald.

## Team Partners

Minnesota Department of Agriculture  
Minnesota Department of Health  
Minnesota Rural Water Association  
University of Minnesota – Saint Paul  
Agricultural Utilization Research Initiative  
Lincoln Pipestone Rural Water  
Central Lakes College  
Spronk Seed Farm (2018 seed and grain cleaning)  
The Land Institute (2018 grain purchase)

**Funding for this project** comes from the Minnesota Environment and Natural Resources Trust Fund.

## References

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Visit our website for more information, case studies on two of these project sites, and the paper - *Policies and Programs Supporting Perennial Farming Systems to Protect Drinking Water Sources in Minnesota*.

Green Lands Blue Waters is a vision for productive, profitable agriculture in the Upper Midwest based on the straightforward concept of getting as much value as possible from farmlands by growing crops that keep the soil covered year-round—what we call farming with Continuous Living Cover. The values from the crops we promote can be measured in yields and farm profits; but also as reduced risk, improved outlook for long-term productivity from the soil, more jobs, more wildlife, cleaner water and resiliency in the face of a changing climate.

glbw@umn.edu · 612-625-3709

[www.greenlandsbluewaters.org](http://www.greenlandsbluewaters.org)