Kernza®CAP

Year 5 Annual Report

Prepared February 2026

kernza.org/kernzacap

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For more information, visit www.kernza.org/kernzacap

Cover photo: Prabin Bajgain

KernzaCAP year five by the numbers

200-700
kg/ha 3 year mean grain yields across 6 sites

85+
in-person attendees at the 2026 Kernza Con

4x
increase in General Mills use of Kernza in their 1% Kernza initiative

$175+
per acre offered via NRCS CSP

3511
acres of Kernza in the field

20+
presentations by KernzaCAP collaborators

4
Kernza-focused field days

1400
kg/ha: max grain yield in fertilization trials

7
new YouTube videos produced by KernzaCAP

40+
attendees at the 2025 Kernza Growers Conference

6
seminars hosted

9
first ever Kernza malt varieties launched by Sustain-A-Grain & Colorado Malting Comp.

5
peer-reviewed papers published

70%
Kernza cleaning loss based on preliminary tests

112
KernzaCAP collaborators

Key Market Developments

Supply Review 2025

- 3511 acres in the ground as of Jan 1, 2026 (a large portion, 697acres, are considered TBD*) (Fields are considered TBD if they are newly planted acres that are pending overwintering evaluation, or if a grower is considering rotating them out of production).
- Average total cleaning loss of HY2025 was 70% cleaning loss* (according to AMP test on 34 samples)

New Products on the Market

- Deschutes Brewery Kernza beer and non-alcoholic beer continue to see success.
- Perennial Pantry launched an online, subscription-based storefront featuring a variety of perennial products and low direct to consumer costs.
- PCC Community Markets in Seattle added a line of Kernza baked goods.
- General Mills' Cascadian Farm brand began incorporating 1% Kernza in multiple prominent cereals, quadrupling their use of Kernza in products. 1% Kernza Initiative is marketed front-of-pack. The initiative also includes an excellent marketing video on Kernza and soil health.
- Sturdiwheat added 2-4% Kernza to all of their mainstream pancake and bread mixes, using the Perennial Percent label.
- 40 Century Grain launched multiple Kernza products including a Rolled Kernza and Raisin Cookie Mix and a Kernza Rugbrod Nordic Rye Bread Mix.
- Perennial Spirits launched a Kernza vodka.
- Sustain-A-Grain and Colorado Malting Company launched the first ever Kernza malt line with 9 malt varieties.
- Two Minnesota breweries released trial runs of malted Kernza beers using malt from an Agricultural Utilization Research Institute-led malting pilot project.
- Michael Fields Institute has released two Kernza mixes (a pancake and a high protein cookie mix).

Market Observations

- Regenerative Organic Certified and certified organic demand and pricing remain strong.
- Demand for conventional is weaker, but significant product innovation and marketing efforts are underway leading to increased market awareness.
- NRCS Conservation Stewardship Program incentive of $175+/acre is underutilized, due in part to a 1.25 year timeline to enroll ahead of fall planting.

- Additional cleaning, dehulling, and milling options continue to be needed closer to growers. Rooster Milling in East Troy, WI and a few other millers and cleaners have begun experimenting with Kernza.
- Patagonia Provisions nationally-distributed Kernza pasta products were discontinued, due to weak sales. This was a blow to the supplying Kernza distributors.
- KernzaCAP developed a refreshed and improved set of marketing materials for Kernza including an extensive update to Kernza.org, especially to revise the landing page and background information on Kernza, add many technical resources to the Makers & Manufacturers pages, and update all supplier information. The following guides are now a resource to buyers and suppliers: 4 how-to-use-Kernza guides for brewers, distillers, chefs/bakers, and CPG companies; a Kernza general overview, a Kernza nutrition guide, and a Kernza environmental benefits summary. In addition, a new set of Kernza food photos, a brand guide, and ready-made advertising materials are available to anyone by request from jmayer@landinstitute.org.
- Kernza growers met in the spring to discuss best practices for high quality grain production, demonstrating strong attention to continuous improvement.

Key Barriers Identified and Being Addressed

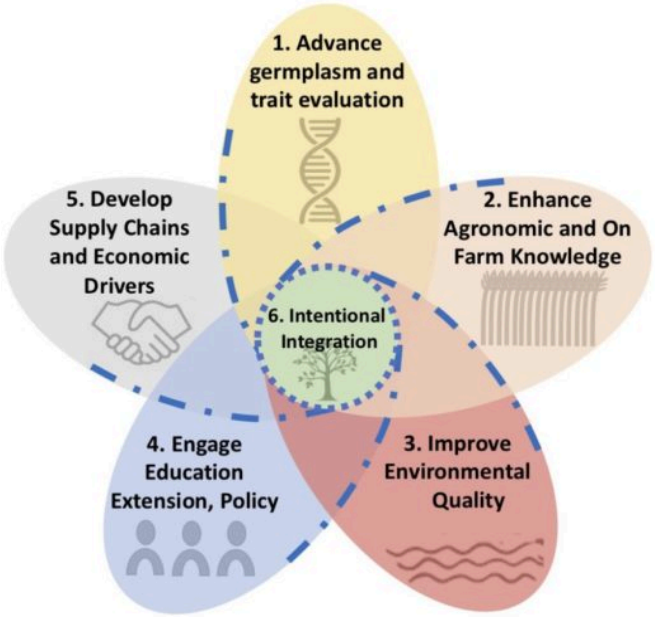
- There remains a mismatch between supply and demand with customers reluctant to sign production contracts and producers reluctant to gamble on production; the two year timeline required to plan a perennial rotation, plant it, and harvest a year later complicates this cycle.
    - The Land Institute, Forever Green, and suppliers continue to advocate for grower contracts.
    - Distributors are working to solidify operational processes for inventory management.
- The early commercial Kernza industry remains undercapitalized, several distributors have no paid employees and cannot offer contracts themselves due to resource limitations. Forever Green and the Land Institute are exploring blended capital pathways to support the growth of the early industry.
- Grain grading and quality standards are still in development
    - Annual Monitoring Program to test Kernza grain for quality and nutrition completed its second year, led by The Land Institute
    - The Land Institute released Kernza grain evaluation procedures in collaboration with the Northern Crops Institute. This is an important first step to consistent quality metrics.
    - The Land Institute and Forever Green formed a grain quality working group to continue research and monitoring of grain quality and identify ways to continue to improve, while recognizing successes, as the Kernza industry grows.

Project Overview

One of humanity's most urgent challenges is to provide food, feed, and fiber for a global population of 10 billion by 2050. This challenge is compounded by the fact that the world's current annual-based cropping systems are damaging the natural resource base necessary for agricultural productivity. In contrast, perennial crops can improve agricultural sustainability because their extensive root systems reduce soil erosion, nutrient runoff, and pesticide requirements, while potentially increasing farmer incomes through decreased annual inputs and costs. The domestication of the world's first commercial-scale perennial grain crop (intermediate wheatgrass), trade named "Kernza®," is underway in the United States. This project is leveraging and expanding a strong network of researchers, educators, farmers, businesses, non-profit leaders, and others to launch a perennial grain crop enterprise based on Kernza.

KernzaCAP was funded by the U.S. Department of Agriculture National Institute of Food and Agriculture (USDA NIFA) in 2020 and runs through August 2026. This project currently supports over 90 researchers, graduate students, business leaders, nonprofit professionals, and farmers across nine states (Appendix A). Collaborators are organized into six objective teams:

1. Advance germplasm & trait evaluation
2. Enhance agronomic & on-farm knowledge
3. Improve environmental quality
4. Engage education, extension, & policy
5. Develop supply chains & economic drivers
6. Intentional integration



Collectively, KernzaCAP aims to activate transformational change in agriculture that improves the environment and rural prosperity. Outcomes will include Kernza variety candidates for various regions of the United States; agronomic recommendations for optimizing yield, profitability, and environmental quality; expanded acreage in ecologically sensitive areas to protect drinking water from nitrate contamination; new Kernza supply chains and products; and an education and extension portfolio of tools and events to educate a broad range of students, agriculture professionals, and the public.

This report summarizes activities and outcomes from Year 5 of KernzaCAP (September 2024 through August 2025).

Project Organization & Management

In Year 5 of the project, the management team continued to meet weekly to ensure smooth grant operations and project execution. The Coordinating Team, made up of the project management team and co-leads of each objective team (Fig. 1), met bi-weekly to encourage integration across teams and provide high-level thinking and decision making for the project.

The 17-person Advisory Committee (Appendix A) is made up of individuals from 9 states and 3 countries. The Advisory Committee convened in November of 2024 to provide feedback and reflect on the first four years of the project and provide insight on what the future of collaborative Kernza work may look like. Advisory Committee members were also invited to the annual all-hands meeting and the KernzaCAP monthly lunchtime seminar series.

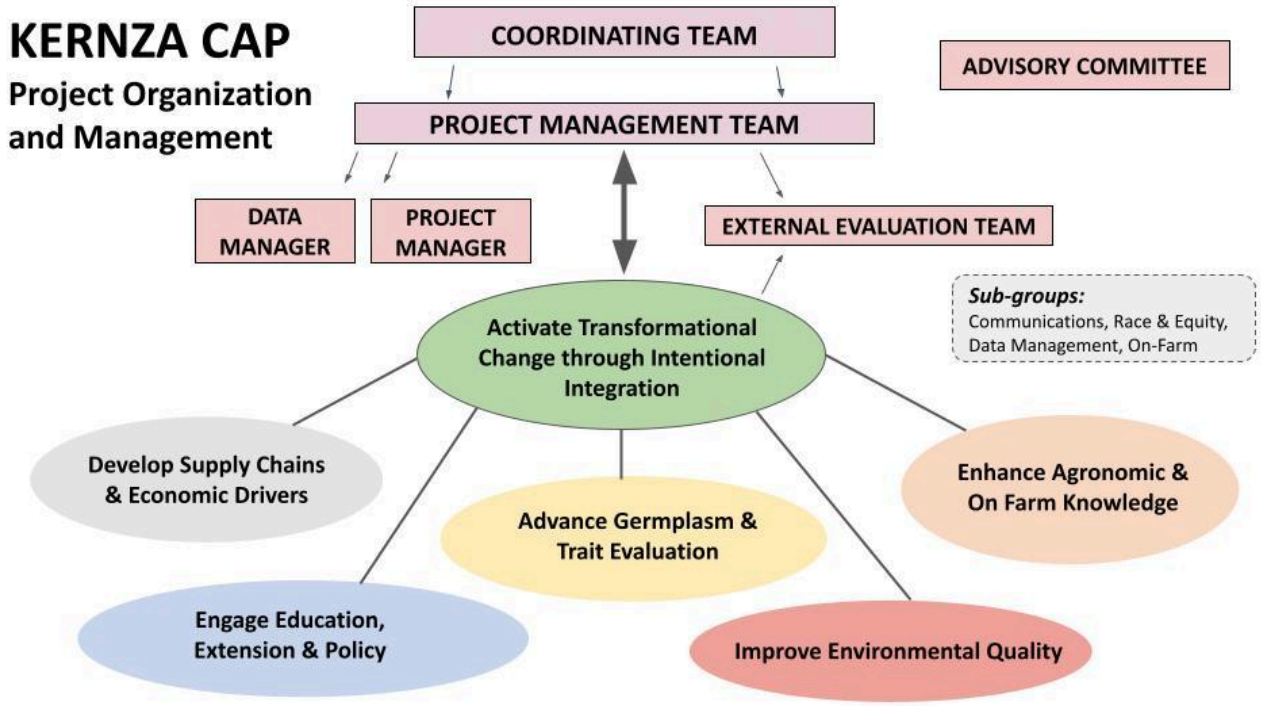


Figure 1: Project organization chart

The fifth and final annual all-hands meeting was hosted on June 9th, 2025 with over 40 collaborators attending in person (Appendix B). It was held in conjunction with the 2025 Kernza Conference hosted by North Dakota State University in Fargo, ND on June 9-11, 2025. The all-hands meetings provide an opportunity for conversation, reflection, and updates across objective teams, which is critical to meet our integration goals.

Collaborators continued to use the reporting system designed at the beginning of the grant to track progress and outcomes across objective teams. All collaborators have access to a project

CV and are responsible for adding their work to the CV on a regular basis. Annually, subaward institutions and objective team co-leads fill out a report that the project manager compiles and submits to USDA. Annual reporting also includes budget checks with objective teams and subaward institutions to ensure spending remains on track.

Project collaborators have access to a private Google Site with quick links to important documents and a project calendar. This internal site also links to the project's Google Drive, which hosts all project documents and objective team folders and allows team members to easily upload, share, and review documents.

To communicate with external stakeholders interested in the project, KernzaCAP sends a quarterly newsletter through MailChimp that had an audience of 211 at the end of Year 5. This newsletter provides project updates, collaborator introductions, and media stories highlighting Kernza. Newsletters are archived online and can be accessed on the project website (www.kernza.org/kernzacap), which is regularly updated to reflect progress.

Kernza and small grains intercropping trial on the North Dakota State University campus. Photo credit: Erin Meier

Germplasm & Trait Evaluation

Advance intermediate wheatgrass (IWG) germplasm and trait evaluation for improving yield, economic viability, and ecosystem services as a perennial grain crop.

Year 5 Team members

- Dr. James Anderson (co-lead) - University of Minnesota
- Dr. George Annor (co-lead) - University of Minnesota
- Dr. Jared Crain (co-lead) - Kansas State University
- Dr. Lee DeHaan (co-lead) - The Land Institute
- Obed Aduama - University of Minnesota
- Dr. Prabin Bajgain - University of Minnesota
- Dr. Pam Ismail - University of Minnesota
- Cecia Flores Sanchez - University of Minnesota
- Coleman Selfridge - University of Minnesota

Team objectives

Objective 1: Improve IWG breeding populations and release varieties adapted to specific regions of the United States.

The University of Minnesota Kernza breeding program collected phenotypic data on the 7th and 8th cycle breeding populations in St. Paul and Becker in Summer 2025, the second year of evaluation for Cycle 7 and the first year of evaluation for Cycle 8. Six new crossing blocks were established in Fall 2025 from Cycle 7 parents to initiate the development of new candidate varieties. The new breeding population, Cycle 9, was selected using genomic prediction models and established at St. Paul and Becker in September 2025. The Cycle 9 population consists of approximately 800 plants as well as the parents of the Cycle 9 genotypes. Formal variety release of MN-Itasca, the 2nd UMN Kernza variety release, was approved by the Crop Variety Review Committee in December 2024, and grower seed will be available in 2026 & 2027.

Objective 2: Develop a low cost genotyping approach that leverages recently completed intermediate wheatgrass genome sequencing to genotype larger breeding populations.

Objective 2 resulted in further implementation and refinement of the skim-seq bioinformatics pipeline. The Land Institute completed 2 additional cycles of selection during the grant period from September 2024 - August 2025. Beyond the grant, another cycle of selection was completed in September 2025.

Kernza seedlings growing on the University of Minnesota's St. Paul campus. Photo credit: Tara Ritter

Objective 3: Expand the database of genotyped plants and associated phenotypes to improve accuracy of genomic selection models and increase breeding efficiency.

As genomic selection creates a set of phenotyped and genotyped plants, the number of plants that have both observed phenotype and genetic data has increased. Within the past year TLI has genotyped over 8,000 plants resulting in a population genome coverage of 400x. The sequence data has been uploaded to public repositories and represents an enormous data source to understand genetic architecture, the domestication process, and how selection is altering the IWG genome. While some of this application extends beyond the KernzaCAP work, the foundation for this data has been generated through support of KernzaCAP.

Objective 4: Evaluate breeding germplasm for the nutritional quality and storage stability of IWG ingredients and food products.

This portion of the grant has been completed leading to one graduate student graduating based on their work in this objective area and two manuscripts having been submitted for publication.

Left: *George Annor talks Kernza and its different food uses.*

Right: *Grad students Hazrat Usman and Cecia Flores Sanchez and Professor Johan Ubbink work on extrusion expanded products with Kernza flour and pea starch flour. Photo credits: Hazrat Usman and Connie Carlson*

Objective 5: Explore the impact of breeding on root architecture and subsequent effects on ecosystem services.

In the coming year, The University of Minnesota Kernza breeding program will conclude the evaluation of a subset of the Cycle 6 breeding population (mini-rhizotron study, Objective 1: Activity 5) at St. Paul, looking at root structure (using machine learning software), grain yield, seed size, shatter resistance, free threshing, plant height, and disease resistance. Cycle 8 will be evaluated for the same aboveground traits in 2026 (second year evaluations) and Cycle 9 will be evaluated for these traits in 2026 and 2027. The best individuals and/or families will be selected as parents of new synthetic cultivars.

Agronomy & On-Farm Knowledge

Enhance agronomic and on-farm knowledge of IWG grain production systems.

Year 5 Team members

- Dr. Valentin Picasso (co-lead) - University of Wisconsin, Madison
- Dr. Nicole Tautges (co-lead) - Michael Fields Agricultural Institute
- Dr. Andrea Basche - University of Nebraska, Lincoln
- Dr. Steve Culman - Oregon State University
- Dr. Julie Dawson - University of Wisconsin, Madison
- Dr. Leonardo Deiss - Colorado State University
- Madeline DuBois - The Land Institute
- Carmen Fernholz - A-Frame Farm
- Dr. Jake Jungers - University of Minnesota
- Dr. Priscila Pinto - University of Wisconsin, Madison
- Dr. Manbir Rakkar - The Ohio State University
- Roberta Rebesquini - University of Nebraska-Lincoln
- Ben Robinson - The Ohio State University
- Dr. Dave Stoltenberg - University of Wisconsin, Madison
- Dr. Laura Van der Pol - The Land Institute

On-farm partners

- Whilden Hughes - W. Hughes Farms, Wisconsin
- Dustin Johnsrud - Johnsrud Farms, North Dakota
- Kurt Kimber - Kimber Farms, Minnesota
- Dorothy and John Priske - Fountain Prairie Farm

Team objectives

Objective 1: Evaluate variety candidates and their response to growing conditions and agronomic practices across the United States.

The fourth year of data collection for the Genotype × Environment × Management (GEM) trial was completed across five locations in the Midwest. A first draft manuscript summarizing the multi-year results is under review by co-authors, with submission to Field Crops Research anticipated in November 2025.

The GEM trial aims to understand how Kernza intermediate wheatgrass varieties respond to environmental and management factors affecting grain and forage productivity. Five breeding

populations—MN-Clearwater, MN1603, MN1802, TLI703, and TLI704—were evaluated under narrow and wide row spacing across diverse environments for three production years. The study found no significant three-way G×E×M interactions, suggesting Kernza performance is primarily driven by individual factors or simpler two-way interactions.

Three-year mean grain yields ranged from 200 to 700 kg ha^{-1} across sites, with yearly variation influenced by stand age and weather (ranging from 94 to 1,140 kg ha^{-1} in the first year and 67 to 912 kg ha^{-1} in the third). Genotypes TLI703 and TLI704 exhibited greater yield plasticity and consistently higher performance under favorable conditions (Figure 1). Management effects were environment-specific, but when significant, narrow row spacing improved grain and forage yields and reduced weed biomass (Figure 2).

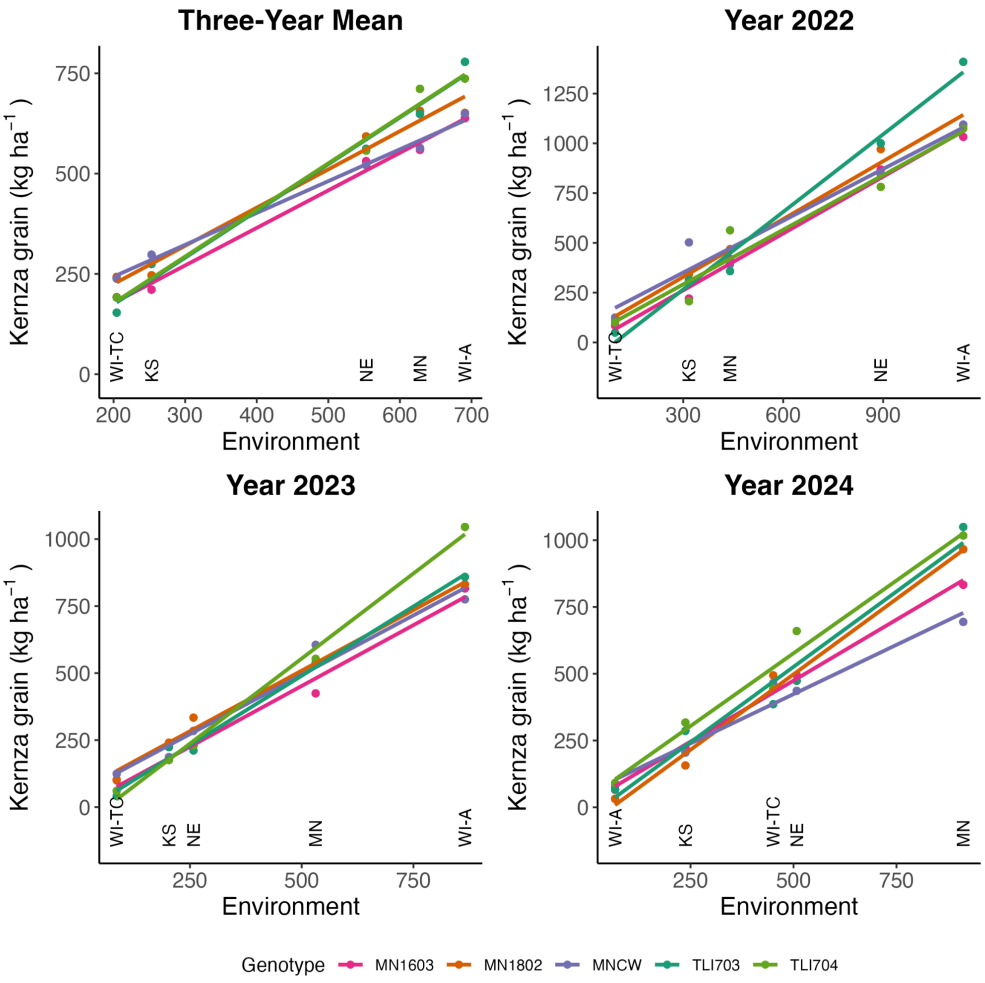


Figure 1: Genotype x Environment interaction on Kernza grain yield. Each panel shows the relationship between the grain yield of individual Kernza genotypes and the environmental index (mean yield across genotypes within each environment). KS (Kansas), MN (Minnesota), NE (Nebraska), WI-A (Wisconsin-A), and WI-TC (Wisconsin-TC).

These findings provide critical guidance for growers and researchers developing regionally adapted Kernza production systems, emphasizing the importance of genotype selection and row spacing decisions made at planting—management factors that cannot be altered once stands are established.

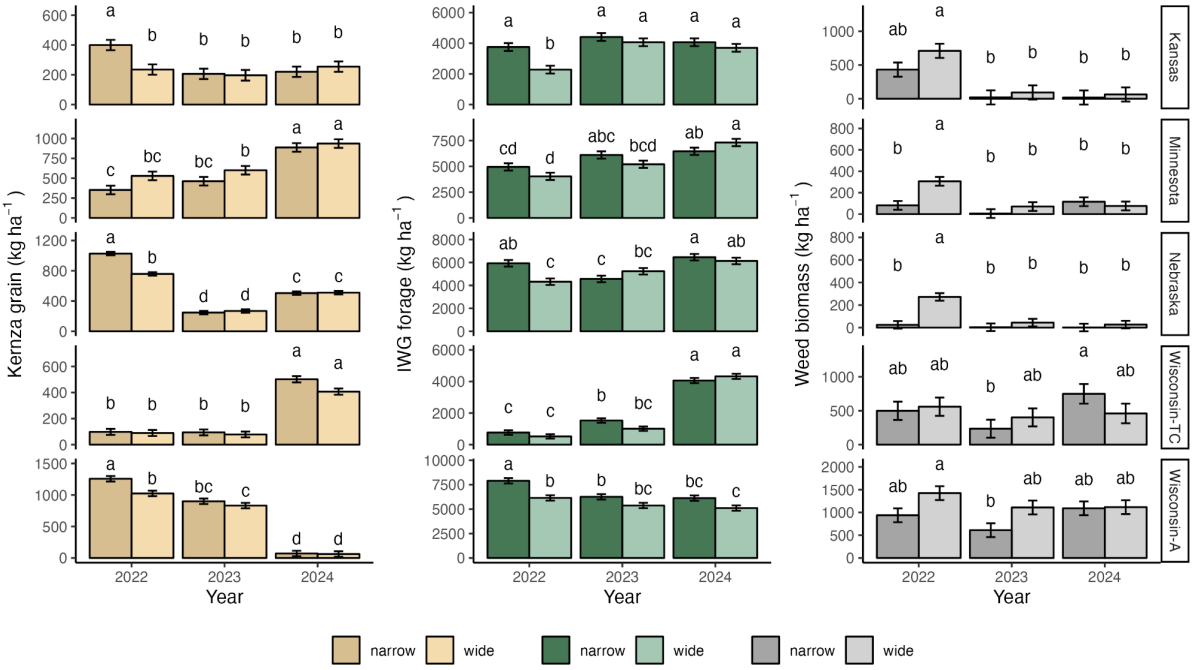


Figure 2: Kernza grain yield, IWG forage yield, and weed biomass in IWG systems planted at narrow and wide row spacing across the first three grain production years (2022, 2023, and 2024) for five different environments. The same letters for each variable indicate no differences at α =0.05 within the environment.

Objective 2: Optimize nitrogen (N), phosphorus (P) and potassium (K) management for Kernza grain and forage production across US environments.

The fourth year of data collection for the FERT trial was completed across six locations in 2025. Preliminary analyses of the first three years of data were presented by Steve Culman at KernzaCon 2025, and three manuscripts are in preparation for submission in the coming months.

The FERT trial aims to refine nutrient management guidelines for Kernza by evaluating the effects of N, P, and K fertilizers on grain and forage yields across contrasting environments. The first manuscript focuses on N fertilization timing, showing that the timing of N application is more critical for grain yield than forage yield. Split applications—half applied in the fall and half in the spring—tended to outperform single seasonal applications, particularly for grain production (Figure 3).

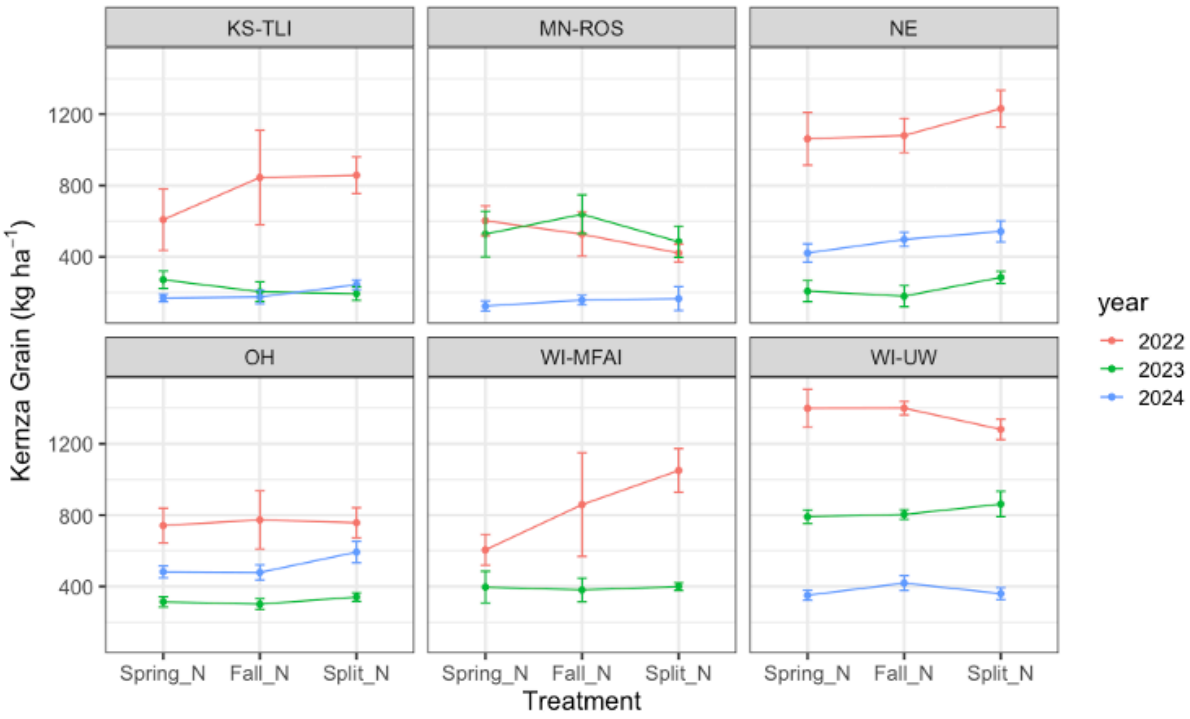


Figure 3: Timing of N fertilization effect on Kernza grain yields.

The second manuscript examines N rate responses using four years of data. Preliminary results indicate that increasing N rates enhanced forage yields more consistently than grain yields, with substantial site-to-site variability suggesting the importance of local soil and climate factors in determining yield responses (Figure 4).

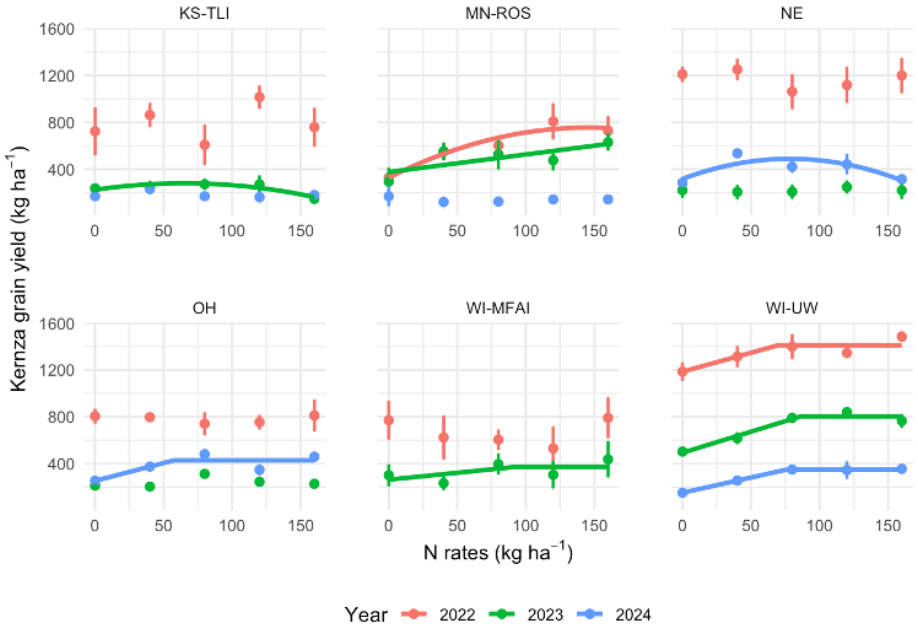


Figure 4: N fertilization rate effect on Kernza grain yield.

The third manuscript evaluates P and K fertilization effects on Kernza productivity. Preliminary findings from the first three years show that responses were inconsistent in the second and third production years and largely limited to sites with lower soil test levels. These results suggest that Kernza is generally unresponsive to P and K additions when soil fertility is already sufficient (Figure 5).

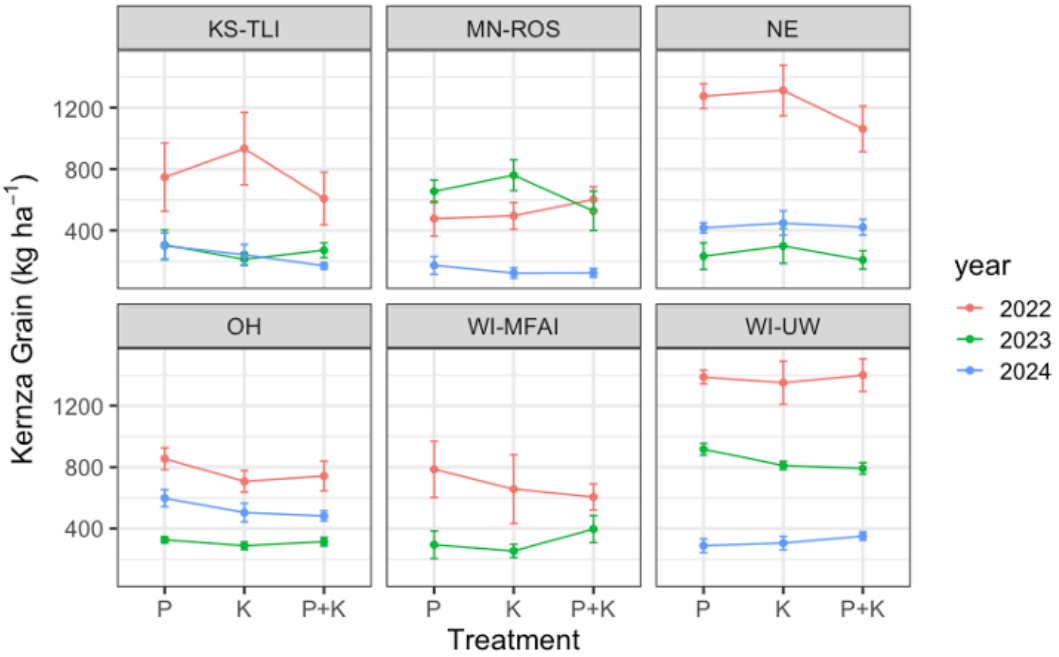


Figure 5: P and K fertilization effect on Kernza grain yield.

Altogether, these studies will help define nutrient management strategies that balance productivity, profitability, and environmental performance in perennial grain systems across diverse U.S. environments.

Objective 3: Conduct participatory on-farm research to leverage grower experience and knowledge to inform research strategies and address regionally specific management practices to support the grower's network.

An on-farm Kernza trial in Janesville, WI, continues to assess nutrient management strategies on coarse-textured soils prone to moisture stress. After drought-limited establishment in 2022, Kernza stands improved in 2023, with the NPK + $CaSO_4$ treatment increasing grain yield by 24% and straw yield by 12% relative to NPK alone. These results suggest that sulfur additions may enhance grain fill and harvest index. The 2024 harvest and grain quality analyses are underway to confirm multi-year effects and refine fertility recommendations for Kernza systems in the Upper Midwest.

Environmental Quality

Measure the environmental outcomes and benefits of IWG production systems for strategic deployment across the US.

Year 5 Team members

- Dr. Jessica Gutknecht (co-lead) - University of Minnesota
- Alyssa Hartman (co-lead) - Artisan Grain Collaborative
- Dr. Nathaniel Brunsell - University of Kansas
- Dr. Laura Van der Pol - The Land Institute
- Soudeh Ghasemian - University of Kansas
- Wonsook Ha - United States Geological Survey
- Siwook Hwang - University of Minnesota
- Gurparteet Singh - University of Minnesota
- Jared Trost - United States Geological Survey

Team objectives

Objective 1: Quantify the potential of Kernza to improve water quality through a combination of field measurements and modeling on plot and landscape scales.

USGS led water quality modeling work has focused on three primary objectives during the past year for simulating water and nitrate fluxes below Kernza and business-as-usual crops: (1) preparing observed experimental data for use with the RZWQM model; (2) literature searches for reasonable parameter values that are not measured in the field; and (3) writing, testing, and debugging scripts and required files for model calibration with automated parameter estimation software (PEST++; White et al., 2020). Weather data is compiled and formatted for all but the Kansas field site. Soil moisture, soil solution nitrogen, biomass, grain yield, and soil physical data sets are prepared for use with the RZWQM model. Scripts are written such that observation data sets can be generated from the master project data sets by field site.

Preliminary runs for the Minnesota site simulate high soil moisture compared to field observations. However, monte carlo simulations in which soil hydrology parameters are varied within reasonable bounds demonstrate that the model can simulate soil moisture near the observed values.

The RZWQM model developer (Dr. Liwang Ma, USDA ARS) is incorporating the new automated parameter estimation routines into the RZWQM graphical user interface based on the methods we are using for this project. The USGS team is taking a stepwise modeling approach and efforts so far have focused on the Rosemount, Minnesota site. Data organization and script

development are being done such that the workflows can be applied to other sites in the project with a goal of having calibrated applications of the RZWQM model at multiple field sites.

Preliminary results from empirical water quality monitoring at the Kernza Fertility trial indicate that fertilization application timing in intermediate wheatgrass cropping system impacted lysimeter nitrate concentrations, with fall-applied fertilizer treatments showing higher nitrate concentrations compared to spring-applied treatments. Across cropping systems, BAU had significantly higher nitrate concentrations than Kernza, although Kernza exhibited some elevated nitrate levels during its establishment year, consistent with previous findings. Over time (2022-2024), nitrate concentrations generally declined across all treatments, suggesting that no-till management reduced nitrate leaching for both cropping systems.

Objective 2: Quantify the potential of Kernza to reduce GHG emissions by reviewing field observation data and by improving models to include parameters specific to Kernza.

Model development is still well underway and we have conducted extensive Noah-MP parameter tuning. Many different variables and their breadth of possible values have been tested within the model structure. We have also begun applying information theory techniques (entropy, KL divergence) and validation metrics to evaluate Noah-MP simulations against historical AmeriFlux tower data at The Land Institute. We have improved pipelines in the statistical program, R, for plotting and unit harmonization (i.e. $gCO_2/m^2/s$ vs $\mu molCO_2/m^2/s$). A roadmap has been systematically prepared for parameter tuning to accelerate progress once we have stable LDASIN and LDASOUT datasets finalized [“Land Data Assimilation Systems (LDAS) aim to produce high quality fields of land surface states (e.g., soil moisture, temperature) and fluxes (e.g., evapotranspiration, runoff) by integrating satellite- and ground-based observational data products, using advanced land surface modeling and data assimilation techniques.” - LDAS NASA]. Finally, we have begun exploring the impact of forcing different data sets on model output, using ERA5-Land forcing data.

A soil core from a Kernza field at The Land Institute. Laura van der Pol

Field measurements being taken during high summer at The Land Institute in Salina, Kansas. Photo credit: Laura van der Pol

Objective 3: Quantify soil health changes under Kernza cropping systems, including soil physical characteristics, as potential drivers of other ecosystem services.

Final soil sampling took place in June and September 2025. The resulting samples are being processed. The soil heath dataset from the previous seasons (2021 - 2024) has nearly been published, with the publication intended in October 2025.

The "Year 1 paper" has been published as a joint product of the Agronomy and EQ teams (see Cassani et al, in the "Products" section below). The 2023 infiltration manuscript is in its final stages of review and will be submitted early in Project Year 6.

The preliminary soil health results show that all Kernza plots receiving some N amendment had greater concentrations of microbial biomass compared to BAU plots. Interestingly, this trend was observed in 2023 only, with the treatment effect dissipating in 2024. We are currently exploring potential explanations for this year by treatment interaction.

Education, Extension, & Policy

Engage education, extension, and policy to deploy Kernza production and support perennial crops.

Year 5 Team members

- Erin Meier (co-lead) - Green Lands Blue Waters
- Dr. Aubrey Streit Krug (co-lead) - The Land Institute
- Amy Bacigalupo - Land Stewardship Project
- Dr. Cynthia Bartel - C. Bartel Inc.
- Dr. Michael Bell - University of Wisconsin, Madison
- Confidence Chimerika John - University of Wisconsin, Madison
- Dr. Clair Keene - North Dakota State University
- Jonathan Kilpatrick - Sustainable Farming Association of Minnesota
- Peter LaFontaine - Friends of the Mississippi River
- Dr. Diane Mayerfeld - University of Wisconsin, Madison
- Steffen Mirsky - University of Wisconsin, Madison
- Steve Morse - Minnesota Environmental Partnership
- Sienna Nesser - University of Minnesota Forever Green Initiative
- Lydia Nicholson - The Land Institute
- Trevor Russell - Friends of the Mississippi River
- Hannah Stoll - University of Minnesota
- Lucinda Winter - Sustainable Farming Association of Minnesota

Team objectives

Objective 1: Develop, deploy, and distribute modular educational curricula targeted at students and teachers from middle school through graduate level education.

The release of the Kernza in Context curriculum continues to be one of the highlights of the EEP team and the materials were successfully disseminated to more collaborators throughout year 5. Curriculum materials are available online. To support those using the Kernza in Context curriculum, the team:

- Supported the network of teachers who use Kernza in Context educational lessons, including engaging with relevant organizations such as high school teachers of agriculture, environmental educators, and science via newsletters, visits to classrooms, hosting field trips, and

participating in community events.

- Surveyed collaborators and companion box recipients for feedback. A group of teachers also participated in a deeper evaluation, including interviews and written descriptions. Ten survey answers were submitted. Four high school teachers (two from Kansas, one from Minnesota, one from Florida) participated in the longer evaluation and received a $100 honorarium.
- Created four new videos in response to evaluation feedback that more visual media would be useful to teachers.
- Collaborated with colleagues at The Land Institute to engage with an estimated 770 students and interested individuals from several area schools and organizations through field trips and activities featuring hands-on activities from the Kernza in Context educational lessons.
- Sent Kernza root banners to eight highly engaged teachers/schools to support future Kernza education.

Collaborator, Lydia Nicholson of The Land Institute, shares about Kernza at a community event in Kansas. Photo credit: Lydia Nicholson

Objective 2: Develop Extension capacity and technical assistance for farmers.

Project work was substantially completed last year, but additional work this year includes the following. A Post Harvest Toolkit for growers and educators was created with partners at the University of Wisconsin-Madison and Clean Wisconsin. Extension educators continue to join the Technical Assistance network and attend monthly meetings. Several Extension educators were able to attend the Kernza Conference held in Fargo, North Dakota and were able to apply conference findings to work in their home states.

A series of video resources on Kernza planting, harvest, and dual use (forage-grain) were developed in partnership with the Land Stewardship Project, UMN Forever Green Initiative, and Greener Pastures. These videos are intended for a farmer audience and are an additional tool in Extension educators toolkit to share with others.

Objective 3: Develop a Kernza Grower-Researcher Network focused on current Kernza growers linked with established markets.

While much of this work was completed in project Year 4, KernzaCAP, in partnership with the UMN Forever Green Initiative, hosted a Kernza Growers Conference in Waseca, MN on March 18th and 19th, 2025. The meeting was attended by over 30 growers, Extension educators, and researchers and provided two days of presentations and hands-on demonstrations covering everything from Kernza planting to marketing and selling your Kernza. Videos of presentations from both days can be found here.

Brandon Schlautman of Sustain-A-Grain leads a presentation during the 2025 Kernza Growers Conference demonstrating appropriate combine settings and factors to consider when making adjustments in the field. Photo Credit: Josh Kielsmeier-Cook

Objective 4: Raise awareness and deepen understanding about the transformative power of perennials with public decision makers.

Completed in previous years.

Objective 5: Construct a national framework for Kernza adoption opportunities through state and federal conservation programs.

Products achieved to support farmer adoption for Kernza include:

- FSA crop/acreage reporting for Kernza grain and forage NRCS working lands incentives

through the Conservation Stewardship Program Perennial grain crop conservation rotation (E328O) and Environmental Quality Incentives Program in MN and MI with >$1.17M delivered to farmers (for Kernza and Alfalfa).

- Developing framework for farmer data sharing to evaluate RMA crop insurance products.
- Achieved Pasture, Rangeland, Forage (PRF) Program for Kernza forage insurance through RMA.
- Noninsured Disaster Assistance Program (NAP) for grain (WI).
- Developed draft of policy roadmap paper to share critical administrative points of entry in the federal farm framework - A Roadmap for Administratively Developing Federal Risk Mitigation Programs for New and Novel Crops: Kernza as a Case Study (work in progress title vs. The Keys to USDA Kernza Incentives: An Administrative Roadmap for Critical Points of Entry in the Federal Farm Framework), Cynthia A. Bartel, Erin M. Meier, Jacob M. Jungers, Hana Fancher.

Left: 2025 Kernza Con attendees visit an Arthur Companies grain elevator in Ayr, ND to learn about the commodity grain market. Photo Credit: Josh Kielsmeier-Cook
Right: Kernza roots visible in an educational soil pit in Williston, ND showing their deep penetration into multiple soil layers. Photo credit: Tara Ritter

Supply Chains & Economics

Develop supply chains and economic drivers for Kernza.

Year 5 Team members

- Colin Cureton (co-lead) - Forever Green Initiative, University of Minnesota
- Jen Mayer (co-lead) - The Land Institute
- Christopher Abbott - Perennial Pantry
- Alicia Baddorf - University of California, Davis
- Christie Biddle - Patagonia Provisions
- Katharine Chute - Forever Green Initiative, University of Minnesota
- Gwenael Engelskirchen - University of California, Davis
- Tannie Eshenaur - Minnesota Department of Health
- Hana Fancher - The Land Institute
- Shawn Gruenhagen - Sustain-a-Grain
- Alex Heilman - Perennial Promise Growers Cooperative
- Dr. Nicholas Jordan - Forever Green Initiative, University of Minnesota
- Andrew Leach - University of Minnesota Forever Green Initiative
- Ben Penner - Penner Farms

Team objectives

Objective 1: Develop a Kernza Business Association to be the voice for Kernza industry partners in a broader Kernza Consortium.

At the end of project Year 3, following the development of a strategic plan for a Kernza Stewards Alliance, Objective 1 has functionally been on hold. Incorporating a perpetual purpose trust entails legal costs, for which USDA funds cannot be used. Additionally, research for Objective 2 has shown that promotion of the grain is the most important work for the coming years, so the team decided not to reallocate funds from that objective to this work. In project Year 5, the team reconvened stakeholders for project and market updates, but no significant progress was made on this objective.

Objective 2: Perform foundational consumer research and market analysis to determine Kernza's profitability for producers, supply chain actors, and end-users.

KernzaCAP provided funding for two Kernza distributors, Sustain-A-Grain (Kansas) and Perennial Pantry (Minnesota), to carry out consumer-insight research on Kernza beers and baked goods/snacks, respectively. Sustain-A-Grain's report found "*...that Kernza is technically compatible with standard brewery workflows and capable of achieving early commercial and*

consumer viability in real market environments. The outcomes, supported by detailed brewer and consumer feedback, validate Kernza's operational performance, confirm strong consumer acceptance, clarify early trial motivators, and identify actionable adoption constraints."

Perennial Pantry's report found that "*even highly motivated consumers who care deeply about regenerative agriculture do not organize their diets around a single grain. Kernza is compelling, but it exists within a broader landscape of crops, ingredients, and foods that all compete for space in a household pantry…Kernza performs best when integrated into familiar food formats rather than positioned as a standalone novelty. While all participants had cooked with Kernza at some point, few continued to purchase pure Kernza flour or whole grain regularly, as these forms were less convenient to integrate into everyday cooking.*"

The full reports are available here (Sustain-A-Grain; Perennial Pantry).

Objective 3: Research, develop, and solidify Kernza supply chains and markets.

In collaboration with UMN Forever Green Initiative and IN Food Marketing & Design, KernzaCAP funded the creation of several industry specific user guides for incorporating Kernza into product streams. These guides were created for companies working in the following industries: consumer packaged goods, brewing, distilling, and baked goods/restaurants. These technical guides can also be found at Kernza.org.

Cover pages from several of the technical guides produced in partnership with Forever Green Initiative (University of Minnesota) and The Land Institute.

Objective 4: Evaluate models for valuing and promoting the diverse environmental, social, and health benefits of Kernza.

An official Kernza nutrition guide was created to highlight Kernza's unique nutritional profile. This work was completed by collaborators at the University of Minnesota and The Land Institute. The guide can be found here.

A few excerpts from the newly released Kernza Nutrition Guide highlighting Kernza's high protein and fiber content.

A screenshot of the Kernza.org resources landing page.

Integration

Activate transformational change through intentional integration.

Year 5 Team members

- Dr. Jacob Jungers (co-lead) - University of Minnesota
- Josh Kielsmeier-Cook (co-lead) - University of Minnesota
- Dr. Tessa Peters (co-lead) - The Land Institute
- Aaron Reser (co-lead) - Green Lands Blue Waters
- Dr. Aubrey Streit Krug (co-lead) - The Land Institute
- Greta Landis - University of Wisconsin-Madison
- Amber Mase - University of Wisconsin-Madison
- Erin Meier - Green Lands Blue Waters
- Evelyn Reilly - University of Minnesota
- Craig See - University of Minnesota
- Dr. Amy Teller - University of Minnesota
- Co-leads of all other objective teams participate on the integration team

Team objectives

Objective 1: Project-wide integration and activity tracking through the design of our objectives and engagement with our project partner network.

The Integration Team continued to use tools and strategies from previous years to support project activities. **Communications, project tools, and tracking infrastructure** built at the start of the project to encourage project norms and cohesion remained valuable, including the collaborator site, project CV, and annual reporting forms, Rules & Tools document, data sharing & co-authorship policy (encouraged use of manuscript proposal form), internal talking points, shared photo album, shared values and principles (no updates, but did refer to them often), and the race and equity framework (updated and referred to the workplan). The team also sent quarterly newsletters and more regular communications to our collaborator listserv.

The team facilitated regular meetings to encourage project-wide integration, including:

- Weekly management team meeting
- Bi-weekly Coordinating Team meeting
- Integration team meeting ad-hoc, between monthly to quarterly
- Evaluation team meeting ad-hoc, between quarterly to bi-annually (currently bi-weekly)
- Shared leadership ad-hoc meetings
- Standing meetings for objective teams
- Monthly seminars with built in Q&A time for collaborators to engage across teams

Biweekly coordination team meetings anchor objective group collaborations, and **outputs from various objective groups continue to serve as inputs for others**, such as market talking points (Supply Chain and Economics team) based on findings from environmental quality team research. In addition, participating in the SAS CAP project managers' community of practice helped KernzaCAP integrate with the broader community of CAPs across the country.

Increasingly in this past year, KernzaCAP leadership **engaged with other SAS CAPs and similar large-scale, transdisciplinary projects** to explore ways to have collective voice and impact and to professionalize and legitimize this work, including through potentially building and piloting a professional development training for transdisciplinarity.

In the coming year, the team will continue effective strategies, including the communication tools, seminars, and meetings. The team will also continue engagement and relationship building with Kernza stakeholders and other leaders across agriculture and food systems beyond project collaborators, including the SAS CAP PMs group, Perennial SAS CAP working group, advisory committee members and other entities. Finally, the team will continue to foster communication and integrative thinking across the project.

Objective 2: Co-create and actualize a Kernza Consortium to serve as a multi-stakeholder leadership body.

Planning and design work around a non-licensee leadership and stakeholder consortium evolved into an initial launch platform, called Kernza Peer Strategy teams. Four disciplinary-focused teams formed with two named, committed co-leads. KernzaCAP's internal planning team will continue to meet as a design, training, and administrative team in addition to the teams described below. KernzaCAP collaborator, The Artisan Grain Collaborative, assisted with encouraging and developing this achievable launch structure and designed and facilitated team topical conversations at the KernzaCAP All Hands meeting in June 2025 and training peer strategy co-leads in August. KernzaCAP collaborator, The Land Institute, is now leading administrative, scheduling, and communications tasks.

Kernza® Non-Licensee Consortium: Peer Strategy Teams

Grounding: Per the KernzaCAP work plan, create a structure to continue momentum on some of the most critical integrative work Kernza CAP has facilitated, specifically in areas where strategic and collaborative effort is impactful and/or essential.

Purpose: Continue and/or improve information flow across non-licensee stakeholder groups for informed decision-making regarding research and outreach to continue to build the Kernza enterprise.

Peer Strategy Team Descriptions:

- **Agroecosystems and Breeding**: Researchers will discuss collaboration opportunities and strategic partnerships, including agronomy, agroecosystems science, ecosystem services, grower production outreach, and breeding-related topics.
- **Products and Markets**: Supply chain specialists, food and feed scientists, forage and grazing specialists, and more will share and plan strategic activities related to food and beverage product development, animal feed, forage, and nutrition, regulatory compliance, marketing and scaling plans, economic considerations, and business development.
- **Stakeholder Engagement and Education**:Technical assistance providers, extension staff, and other educators who facilitate stakeholder outreach and adoption will explore opportunities for partnership and collaboration to strategically improve stakeholder experiences with Kernza..
- **Cross-Sector Support**: Policy experts, researchers, and support organization staff will coordinate their work on cross-sector uptake, implementation, social science, evaluation, values and equity to continue to make Kernza viable for farmers and communities and increase its use.

Kernza Peer Strategy Teams - Responsibilities & Benefits:

Peer Strategy Team Co-Lead Role (2 per Team): The Peer Strategy Team Co-Leads will serve as the lead facilitators for their topical peer strategy team for one year (September ‘25 - September ‘26, training in August ‘25). As facilitators, the primary role is to foster a space that strengthens strategic collaboration, including joint-funding, policy, and outreach initiatives. Each Peer Strategy Group will meet 3x per year. The Land Institute and KernzaCAP will provide administrative support to all of the Peer Strategy Groups for the pilot year. In addition to the 3 meetings each topical peer strategy team Co-Lead will host, Co-Leads are expected to attend one meeting per year with the Co-Leads from the other three topical Peer Strategy Groups. Specifically, the Co-Lead is responsible for the following activities:

- Meet regularly with fellow team co-lead to confirm meeting agenda and facilitation plans
- Develop agenda for 3 Peer Strategy Team meetings/yr using provided agenda template as a guide
- Facilitate 3 Peer Strategy Team meetings/yr (facilitation training provided to co-leads August 2025)
- Take notes or identify notetakers for each meeting, using the provided Running Notes document
- Provide a one-paragraph summary of the meeting for inclusion in the quarterly Peer Strategy Team meeting newsletter
- Participate in one all co-lead meeting per year to support greater project integration

Administrative Support Provided by The Land Institute (TLI) and KernzaCAP includes:

- Schedule and send calendar invitations for meetings
- Provide a Shared Google Drive with a Running Notes framework
- Manage and share distribution lists for Peer Strategy participants
- Provide facilitation training and facilitation framework for Co-leads
- Compile and send a quarterly Peer Strategy Teams newsletter

Benefits of participating in Kernza Peer Strategy Teams:

- Engage with perennial grains professionals across institutions, organizations, geographies
    - Initial KernzaCAP recap in the first meetings for consortium leads
- Potential to be involved and lead joint-funding and outreach initiatives from the start
- Leadership and network/working group practice
- Resume builder
- Working group training from Artisan Grain Collaborative in 2025 for Co-Leads

KernzaCAP collaborators gathered at the 5th Annual All Hands meeting in Fargo, ND.

Objective 3: Lead the way for the next generation of perennial cropping systems.

Team members carried out diverse activities that support ongoing development of perennial crops, particularly from the angle of how large transdisciplinary projects such as SAS CAPs can support the many factors needed to lift perennial ag systems. Data manager Craig See is developing a suite of resources and tutorials regarding KernzaCAP's approach to data management which will be a resource for future perennial crop projects, and is already being

used by international perennial grains collaborators. KernzaCAP collaborators continue to engage on cross-CAP projects with other perennial-focused CAPs. This work includes coalescing around shared impact and voice in academic, policy, and community partner settings, as well as exploration of development of transdisciplinarity training tools, core competencies and other professionalization of the field of transdisciplinarity, systems thinking, and academic to community bridging necessary to the success of SAS CAPs and similar large scale agricultural change initiatives. Two specific projects underway include 1) the development of a perspectives manuscript regarding the role of a strong coordinator-manager in transdisciplinary projects (including fundamental concept outlining, key skills and attributes, perspectives on future work and research needed); and 2) a cross-CAP data collection and analysis project to examine concepts of reciprocity in SAS CAP projects, assessing the experience of various types of collaborators in engaging with large transdisciplinary research projects. It is anticipated that a manuscript will be published following the data collection and analysis, along with conference presentations at both academic and nonacademic events (including the 2026 Agriculture, Food and Human Values Society conference and the 2026 Perennial Farm Gathering).

Objective 4: Catalyze new network reach and effectiveness through accessible data and shared learnings.

The data management team continued to clean, curate, and update incoming KernzaCAP datasets across projects. This included substantial additions from archived soils spanning the first four project years. We now have finalized, fully documented datasets for all experiments through the penultimate year, which will be published this upcoming year with DOIs via the Digital Repository of the University of Minnesota, with DOI links cataloged in USDA Ag Data Commons. To help future multi-institution teams adopt and adapt our approach, the team has also drafted a “How-To” manual for data management that provides generalizable protocols for data collection, merging, and QA/QC using R and Google Suite. To promote integration and interdisciplinary collaboration, the data manager has led cross-team discussions of core datasets and their availablitiy—presenting summaries of agronomic datasets in Environmental Quality meetings and environmental/soils datasets in Agronomy team meetings.

Objective 5: Evaluate for impact, systems change and emergent learning.

The University of Wisconsin Madison evaluation team carried out a second Social Network Analysis (SNA) and is working in collaboration with UMN partners to analyze both the quantitative and qualitative data for this survey. Analyses looking at changes between the first and second SNA are ongoing. Preliminary findings from the second SNA were presented at the 5th Annual KernzaCAP All Hands meeting in Fargo, ND (June 2025). An evaluation products synopsis will be forthcoming in Year 6 and will highlight not only the SNA data but many of the other forms of evaluation that were used throughout the project.

UMN collaborator, Amy Teller, will continue to carry out analyses of SNA data combined with her work from a FFAR (Foundation for Food and Agriculture Research) project. Her unique data set, comprising over 60 interviews, combined with the data generated via the UW-Madison evaluation team, have already led to key insights that the KernzaCAP team will share in the evaluation synopsis mentioned above.

Products

Peer Reviewed Publications

- Cassani, T., Gutknecht, J., Basche, A., Brunsell, N., Crews, T., Culman, S., Deiss, L., Laboski, C., Picasso, V., Pinto, P., Rebesquini, R., Tautges, N., Van Der Pol, L., Jungers, J.. (2025). Productivity of intermediate wheatgrass responds more to local soil and climate factors than fertility treatments in the first establishment year. Frontiers in Agronomy 7:1528534. https://doi.org/10.3389/fagro.2025.1528534
- DeHaan, L. R., Annor, G. A., Duchene, O., Franco, J. G., Gutknecht, J., Jungers, J. M., Peters, T. E., Picasso, V. D., Pinto, P., Turner, M. K., & Van Der Pol, L. (2025). From concept to crop: Kernza perennial grain is a work in progress. In Sparks, Donald L. (Ed.), Advances in Agronomy (Vol. 193, pp. 227–292). Academic Press Inc. https://doi.org/10.1016/bs.agron.2025.05.004
- Aduama, O., N. Tautges, J. M. Jungers, and G. A. Annor. (2025). Effect of Nitrogen Treatment on the Physico-Chemical and Functional Properties Intermediate Wheatgrass (Thinopyrum intermedium) Grown in Different Locations. Cereal Chemistry 0: 1– 11. https://doi.org/10.1002/cche.70023
- Koehle, A., Phillips, K., Chute, K., Gorman, M., Gutknecht, J. (2025). Carbon footprint of Kernza perennial grain in organic and nonorganic production systems. ACS Sustainable Resource Management. https://doi.org/10.1021/acssusresmgt.5c00191
- Bajgain, P., Jungers, J. M., & Anderson, J. A. (2025). Genetic characterization of trait architecture in multi‐population half-sib families of the perennial crop intermediate wheatgrass. Crop Science, 65, e70126. https://doi.org/10.1002/csc2.70126

Conference Papers and Presentations

- Pinto, P., A. Basche, T. Cassani, R.B. Rebesquini, T. Crews, S. Culman, L. Deiss, J.L. Gutknecht, M. Johnston, J.M. Jungers, C.A.M. Laboski, N. Tautges, and V.D. Picasso. Genotype x Environment x Management Interaction on Kernza Perennial Grain Yields in the First Year. Oral Presentation at the Agronomy Society of America annual conference, San Antonio, Texas, November 10-13, 2024. https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/161940
- Stoll, H., Ewing, P.M., Simon, L.M., and J. Gutknecht. Panel Discussion--Barriers and Pathways for Scaling Perennial and Continuous Cover Cropping Systems. Organized panel discussion at the Agronomy Society of America annual conference, San Antonio, Texas, November 10-13, 2024. https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Session/26267
- van der Pol, L., T. Cassani, B. Nester, B. Schalutman, M.F. Cotrufo, J.M. Jungers, A. Basche, N. Tautges, J. Gutknecht, V.D. Picasso, and T. Crews. Early Indicators That Intermediate Wheatgrass Improves Particulate Organic Carbon and Soil Infiltration Compared to Annual Crops. Oral Presentation at the Agronomy Society of America

annual conference, San Antonio, Texas, November 10-13, 2024. https://scisoc.confex.com/scisoc/2024am/meetingapp.cgi/Paper/160368

- Ghasemain, S. and N. A. Brunsell: 2024, Investigating the Impact of Perennial Kernza Intermediate Wheatgrass on Carbon and Water Cycling in Water-Limited Environments Using the NOAH-MP Model. AGU Fall Meeting, 9-15 December, Washington, D.C. https://ui.adsabs.harvard.edu/abs/2024AGUFMGC41M0095G/abstract
- Crain, J. (2025). Genomic selection in intermediate wheatgrass (IWG) and evolving molecular methods for neodomestication. Pathways to a Perennial Future. March 12, 2025. Texcoco, Mexico.
- Gutknecht, J.L., Kernza and Climate Change. Invited talk at the International Perennial Grains conference "Pathways to a Perennial Future", Texcoco, Mexico, March 11-13, 2025.
- Reser, A. and Jungers, J. Developing and Deploying Kernza Perennial Grain Crop. Invited talk at the International Perennial Grains conference "Pathways to a Perennial Future", Texcoco, Mexico, March 11-13, 2025.
- Crain, J. (2025). Evolution and future of the genomics assisted breeding revolution in Kernza. Kernza Conference. June 10, 2025. Fargo, ND, USA.
- Culman, S., de Camargo Santos, A., Robinson, B., Wayman, S., Ryan, M., Bohn, K., Jungers, J., van der Pol, L., DuBois, M., Crews, T., Rakkar, M., Sprunger, C., Smychkovich, A., Deiss, L. (2025) Organic Kernza forage harvest strategies do not impact roots or soil health. KernzaCON. Fargo, USA.
- Gutknecht, J.L., Kernza Soil Health. Invited overview talk to the annual Kernza Conference, Fargo, ND, June 9-11, 2025.
- Robinson, B., de Camargo Santos, A., Culman, S., Wayman, S., Ryan, M., Bohn, K., Jungers, J., van der Pol, L., DuBois, M., Crews, T., Rakkar, M., Deiss, L. (2025) Optimizing harvest strategies for organic Kernza: Grain vs. forage trade-offs. KernzaCON. Fargo, USA.
- Singh, G., J. Jungers, and J. Gutknecht. Kernza water quality benefits. Invited overview talk to the annual Kernza Conference, Fargo, ND, June 9-11, 2025.

Other Publications

- "Kernza Overview" - Overview of this perennial grain's benefits and unique attributes, as well as a list of suppliers: https://drive.google.com/file/d/1VTS-X2_fKj-TEuYPxpK_EA5_m6nr1B9G/view
- "How to Use Kernza for Brewers" - A technical guide for brewers looking to incorporate Kernza in their beers: https://kernza.org/wp-content/uploads/HOWTO_Brewers_Digital.pdf
- "How to Use Kernza in CPGs" - A technical guide for producers using Kernza in consumer packaged goods (CPG): https://kernza.org/wp-content/uploads/HOWTO_CPG_Digital-2.pdf

- “How to Use Kernza in Distilling” - A technical guide for distillers on how to use Kernza in spirits: https://kernza.org/wp-content/uploads/HOWTO_Distillers_Digital.pdf
- “How to Use Kernza in Baking and Culinary Arts” - A technical guide for bakers and chefs on how to use Kernza in baking and cooking: https://kernza.org/wp-content/uploads/HOWTO_ChefsBakerhttps://kernza.org/wp-content/uploads/HOWTO_ChefsBakers_Digital.pdfs_Digital.pdf
- “Kernza Nutrition Guide” - An overview of Kernza’s unique nutritional qualities: https://kernza.org/wp-content/uploads/NutritionalOverview_Digital.pdf
- “Kernza Environmental Benefits Guide” - Resource explaining how Kernza's root system provides ecosystem services for soil, climate, water, and wildlife: https://kernza.org/wp-content/uploads/2.20_EnvrnmntlImpct_FINAL_LR.pdf
- “Reflections from the Kernza Community” - A document outlining lessons learned, advice, and observations from developing the world’s first commercial perennial grain. https://hdl.handle.net/11299/270791

Media

- Kernza Guide for Farmers: Harvesting Video; produced to provide existing and potential Kernza growers with accurate and concise harvest information.
- Kernza Guide for Farmers: Planting Video; produced to provide existing and potential Kernza growers with accurate and concise planting information.
- Kernza Dual Use (Grain/Forage) video; produced to provide existing and potential Kernza growers with accurate and concise information on using Kernza as a dual usage crop.
- Cooking with Kernza®: Explor202ing Gluten Video; created to accompany the Kernza in Context Curriculum.
- What is a Grain? - Staple Grains on Plates Video; created to accompany the Kernza in Context Curriculum.
- Genomic Selection with Kernza® Perennial Grain Video; created to accompany the Kernza in Context Curriculum.
- Measuring Soil Health with Aggregate Stability Video; created to accompany the Kernza in Context Curriculum.

Presentations

- Rakkar, M. Discussion on Kernza' roots, soil health benefits and food products at Farm Science Review, London, OH Sept 17-19, 2024
- Kernza Roundtable – Organic Grain Research and Information Network (OGRAIN) Conference, Monona Terrace, January 24, 2025
- Meier, E. M. and Bartel, C. A., with co-author J. Jungers. KernzaCAP: A platform to increase policy support for perennial grains. 2025 USDA-NIFA Sustainable Agricultural

Systems (SAS) Online Community Meeting & USDA SAS CAP Project Directors Meeting. Lightning talk. Online, July 16, 2025. ~100 attendees.

- Bartel, C.A., Outreach and policy to support perennials breakout session. Invited panelist and oral presentation at the annual KernzaCON (Kernza Conference) in Fargo, ND and online, June 10, 2025. ~20 attendees.
- Bartel, C. A. What does non-advocacy policy work look like? Invited panelist and oral presentation with handout at the Green Lands Blue Waters CLC Conference 2025: How We Come Together for a More Diverse Midwest Ag Landscape. Madison, WI, April 8, 2025. ~25 attendees.
- Bartel, C. A. What does non-advocacy policy work look like? Invited panelist and oral presentation with handout at the Green Lands Blue Waters CLC Conference 2025: How We Come Together for a More Diverse Midwest Ag Landscape. Madison, WI, April 8, 2025. ~25 attendees.
- Bartel, C. A. Opportunities and Barriers to USDA Risk Mitigation for Perennial Crops. Invited panelist and oral presentation at the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America Annual Meeting, Panel Discussion-Barriers and Pathways for Scaling Perennial and Continuous Living Cover Cropping Systems, San Antonio, TX. November 11, 2024. ~60 attendees.
- Bartel, C. A. A step-by-step guide to USDA Kernza incentives. Forever Green Monthly TA providers call. November 7, 2024. ~25 attendees.
- Jungers, J. Kernza Establishment and Fertility. Kernza Growers Conference, Waseca, MN, March 17, 2025.

Field Days

- “Cultivating Curiosity: A Taste of Wisconsin’s Perennial Crops” – EarthFest, Allen Centennial Gardens, UW-Madison; April 24, 2025
- “Look and Learn: Kernza” with the South Kinnickinnic Farmer-Led Watershed Council – River Falls, WI; July 9, 2025
- Intermediate Wheatgrass Kernza. Presented at UW Forage and Cover Crop Field Day by Priscila Pinto. Arlington Agricultural Research Station, Arlington, WI, July 15, 2025.
- Mirsky, S. The WI Kernza Supply Chain Hub – Updates and Future Directions. Presented at UW Organic Research Field Day. Arlington Agricultural Research Station, Arlington, WI, August 26, 2025

Project Meetings

- KernzaCAP All Hands meeting, Fargo, ND on June 9th, 2025 was attended by over 40 official KernzaCAP collaborators. This meeting was the final All Hands meeting of the project and served as an unofficial close of the 5th year of KernzaCAP.

Conferences

- The Kernza CAP management team and collaborative team, including several Agronomy team members, attended this event in International Perennial Grains conference "Pathways to a Perennial Future", Texcoco, Mexico, March 11-13, 2025. The conference was attended by more than 150 perennial grain researchers from 25 countries.
- Kernza Growers Conference, March 18-19, 2025: A farmer-focused conference for current & interested Kernza farmers to discuss all things Kernza agronomy, harvest, and marketing with researchers and industry representation from UMN, UW, NDSU, Michael Fields, The Land Institute, Perennial Promise Growers Cooperative, Arcola Farms, and Sustain-A-Grain. The event had 36 attendees on Day 1 and 40 attendees on Day 2. Attendees consisted of Kernza farmers and technical assistance providers. Videos of presentations can be found here.

Project Tools and Protocols

- KernzaCAP collection on the University of Minnesota Digital Conservancy - Permanent online location for KernzaCAP products. https://conservancy.umn.edu/handle/11299/255777
- Year 5 KernzaCAP Quarterly newsletters https://kernza.org/field-notes/?category=kernza-cap-newsletter
- Kernza in Context monthly newsletters - 12 issues sent to teacher-researchers and others interested in the Kernza in Context curriculum development.
- Kernza Post-Harvest Toolkit developed in a collaboration between the Wisconsin-grown Kernza Supply Chain Hub (a pilot project led by Clean Wisconsin and Michael Fields Agricultural Institute), KernzaCAP and UW-Madison Extension, provides growers with a variety of resources to help them optimize handling, storage, quality testing, transportation, and processing to preserve grain quality.
- Updated policy program information and guides for farmers: The E3280 Perennial Grain enhancement is available to new Kernza producers through EQIP and CSP programs. The enhancement provides a scenario/practice payment to the producer for the time needed to plan and implement changes to crop rotations that effectively add a perennial grain to their cropping system: https://kernza.org/nrcs-programs-available-now-for-perennial-grains-enhancement-e3280/

Appendix A: Collaborator List & Advisory Committee

Collaborator List

- Christopher Abbott, Co-Founder, Perennial Pantry
- Obed Aduama, Masters Student, University of Minnesota
- Jim Anderson, Professor, University of Minnesota
- George Annor, Assistant Professor, University of Minnesota
- Amy Bacigalupo, Program Director, The Land Stewardship Project
- Alicia Baddorf, Sustainable Supply Chain Coordinator, University of California-Davis
- Prabin Bajgain, Research Assistant Professor, University of Minnesota
- Cynthia Bartel, Principal, C. Bartel Inc.
- Andrea Basche, Associate Professor, University of Nebraska-Lincoln
- Michael Bell, Professor, University of Wisconsin-Madison
- Christie Biddle, Supply Chain Manager, Patagonia Provisions
- Nathaniel Brunsell, Professor, University of Kansas
- Katharine Chute, Product & Market Development Specialist, Forever Green Initiative
- Whitney Clark, Executive Director, Friends of the Mississippi River
- Jared Crain, Postdoctoral Fellow, Kansas State University
- Tim Crews, Director of Ecological Intensification, The Land Institute
- Steve Culman, Professor, Oregon State University
- Colin Cureton, Director of Adoption and Scaling, UMN Forever Green Initiative
- Julie Dawson, Professor, University of Wisconsin-Madison
- Lee DeHaan, Lead Scientist, The Land Institute
- Leonardo Deiss, Assistant Professor, Colorado State University
- Natasha Djuric, PhD Student, Cornell University
- Madeline DuBois, Research Technician, The Land Institute
- Gwenael Engelskirchen, Sustainable Supply Chain Analyst, University of California-Davis
- Tannie Eshenaur, Planning Director, Minnesota Department of Health
- Hana Fancher, Market Stewardship Specialist, The Land Institute
- Cecia Flores Sanchez, Masters Student, University of Minnesota
- Soudeh Ghasemian, Masters Student, University of Kansas
- Shawn Gruenhagen, Sales Associate, Sustain-A-Grain
- Jessica Gutknecht, Associate Professor, University of Minnesota
- Wonsook Ha, Hydrologist, United States Geological Survey
- Alyssa Hartman, Executive Director, Artisan Grain Collaborative
- Alex Heilman, Co-Founder & CEO, Mad Markets
- Whilden Hughes, Farmer, W. Hughes Farms
- Siwook Hwang, Postdoctoral Researcher, University of Minnesota
- Pam (Baraem) Ismail, Professor, University of Minnesota

- Dustin Johnsrud, Farmer, Johnsrud Farms
- Madeline Johnston, Graduate Student, University of Nebraska-Lincoln
- Nicholas Jordan, Professor, University of Minnesota, Forever Green Initiative
- Jacob Jungers, Associate Professor, University of Minnesota
- Clair Keene, Extension Specialist, Cropping Systems, North Dakota State University
- Josh Kielsmeier-Cook, KernzaCAP Project Manager, University of Minnesota
- Jonathan Kilpatrick, Soil Health Specialist, Sustainable Farming Association
- Kurt Kimber, Farmer, Kimber Farms
- Tammy Kimbler, Director of Communications, The Land Institute
- Peter LaFontaine, Agricultural Policy Manager, Friends of the Mississippi River
- Greta Landis, Evaluation Specialist, University of Wisconsin-Madison
- Andrew Leach, Sustainable Commercialization Associate, Forever Green Initiative
- Matt Leavitt, Perennial Grains & Winter Annuals Agronomist, Forever Green Initiative
- Amber Mase, Evaluation Specialist, University of Wisconsin-Madison
- Jen Mayer, Director of Crop Stewardship, The Land Institute
- Diane Mayerfeld, Sustainable Agriculture Coordinator, Extension, UW-Madison
- Seamus McCarthy, Soil Ecology Technician, The Land Institute
- Erin Meier, Director, Green Lands Blue Waters
- Steffen Mirsky, Emerging Crops Outreach Specialist, Extension UW-Madison
- Steve Morse, Executive Director, Minnesota Environmental Partnership
- Sienna Nesser, Commercialization Research Specialist, Forever Green Initiative
- Lydia Nicholson, Research Technician, Educational Design, The Land Institute
- Ben Penner, Farmer, Penner Farms
- Justin Peschman, Hydrologic Technician Assistant, United States Geological Survey
- Tessa Peters, Director of Strategy, The Land Institute
- Luke Peterson, Farmer, Peterson Farms
- Valentin Picasso, Associate Professor, Swedish University of Agricultural Sciences
- Priscila Pinto, Postdoctoral Researcher, University of Wisconsin-Madison
- Samuel Pratsch, Evaluation Specialist, University of Wisconsin-Madison
- Dorothy and John Priske, Farmers, Fountain Prairie Farm
- Manbir Rakkar, Assistant Professor, The Ohio State University
- Roberta Rebesquini, Masters Student, University of Nebraska-Lincoln
- Evelyn Reilly, Research Project Specialist, KernzaCAP and Green Lands Blue Waters
- Aaron Reser, Associate Director, Green Lands Blue Waters
- Ben Robinson, Research Assistant, The Ohio State University
- Trevor Russell, Water Program Director, Friends of the Mississippi River
- Craig See, KernzaCAP Data Manager, University of Minnesota
- Coleman Selfridge, Masters Student, University of Minnesota
- Gurparteet Singh, PhD Student, University of Minnesota
- Hannah Stoll, Teaching Specialist, University of Minnesota

- Dave Stoltenberg, Professor, University of Wisconsin-Madison
- Aubrey Streit Krug, Director of Ecosphere Studies, The Land Institute
- Nicole Tautges, Agroecologist, Michael Fields Agricultural Institute
- Amy Teller, Social Sustainability Researcher, University of Minnesota
- Jared Trost, Hydrologist, USGS, Upper Midwest Water Science Center
- Laura van der Pol, Lead Soil Scientist, The Land Institute
- Lucinda Winter, Executive Director, Sustainable Farming Association

Advisory Committee

- Liz Carlisle, Associate Professor, University of California-Santa Barbara
- Constance Carlson, Assistant Statewide Director, UMN RSDPs
- Christophe David, Executive Director, ISARA
- Lydia English, Strategic Initiatives Coordinator, Practical Farmers of Iowa
- Carmen Fernholz, Farmer, A-Frame Farms
- Laura Hansen, Retired Research and Development lead, General Mills
- Mitch Hunter, Co-Director, Forever Green Initiative
- Bonnie Keeler, Assistant Professor, University of Minnesota
- Emily Luscombe, Natural Resources Director, Intertribal Agriculture Council
- Juli Obudzinski, Policy Consultant, Independent Consultant
- Korede Olugbenle, Field Crops Educator, Michigan State University
- Hikaru Peterson, Professor, University of Minnesota
- Matt Ryan, Associate Professor, Cornell University
- Craig Sheaffer, Professor, University of Minnesota
- Rachel Stroer, President, The Land Institute
- Omar Tesdell, Associate Professor, Birzeit University
- Peggy Wagoner, Retired Project Leader, Rodale Institute

Appendix B: Year 5 All-Hands Meeting Agenda

Kernza®CAP

Annual All-Hands Meeting

Monday, June 9th, 2025 // 1:00-5:00 pm

12:30-1:00 Arrival and Registration

- T-shirt/Cap pickup

1:00-1:15 Welcome and announcements - room 118

1:15-2:30 Evaluation Activity - room 118

- Social Network Analysis Presentation
- Kernza Adopter' Entry Pathways and New Relationships
- Social Network Analysis Data Party

2:30-2:45 KernzaCAP Graduation! - room 118

- Celebration of KernzaCAP team and accomplishments

2:45-2:55 Break

2:55-4:15 KernzaCAP All Hands: Peer Strategy Teams - Room 118

***Concurrent Meeting*: NCDC 240 Perennial Grain Systems Development Committee - Room 120**

4:15-4:45 Report Out and Action Items - room 118

- Peer Strategy Teams - 15 minutes
- NCDC 240 - 15 minutes

4:45-5:00 Closing