Celebrating 40 Years

The Story of Kernza[®] Perennial Grain in 40 Milestones







This timeline highlights key milestones in the development of Kernza perennial grain. It was created to spotlight and celebrate the past 40 years of work in the United States. Launching a new perennial grain crop requires agronomic, genetic, environmental, food science, and social research with a network of community-based expertise in farmer adoption, policy, supply chain development, and commercialization. This effort is only possible through the collaboration of dozens of researchers, farmers, business partners, policy advocates, and more.

This timeline provides a sense of the efforts and meaningful moments that mark Kernza's history through 2022. However, it cannot fully capture the extensive work that went into each achievement, nor many other important milestones that were not included due to space considerations. This timeline focuses on US work, but Kernza research and production have expanded to multiple countries, including Australia, Canada, France, Sweden, Ukraine, the United Kingdom, and Uruguay. Collaborators on KernzaCAP, a multidisciplinary research project funded by the US Department of Agriculture, compiled these milestones in 2022.

SEVERAL THOUSAND YEARS AGO

Humans began using intermediate wheatgrass as a forage crop for livestock. It grew on rangelands in its native region of western Asia.

1932 US

USDA

Intermediate wheatgrass was first introduced to the US through the United States Department of Agriculture (USDA) plant collections system. In the 1950s and 1960s, forage varieties were developed, laying essential groundwork for the development of the

grain crop. The USDA made more collections over the following decades.

1976



Wes and Dana Jackson founded The Land Institute, a non-profit research organization dedicated to developing polyculture-based perennial grain agriculture, in Salina, Kansas. In 1980, Wes Jackson published *New Roots for Agriculture*, describing many problems associated with contemporary industrial agriculture and outlining his vision for a different system. This book inspired many.

1982



Exploration of perennial grain breeding began at The Rodale Institute after Wes Jackson's book inspired Bob Rodale. In 1984, researcher Peggy Wagoner selected intermediate wheatgrass as the most promising species for development into a perennial grain crop based on its harvestability, food use potential, and good nutritional profile. Starting in 1989, Wagoner collaborated extensively with the Big Flats Plant Materials Center in New York on selection and seed increase.



The Land Institute launched its Natural Systems Agriculture Fellowship

program. The program trained many of today's Kernza researchers and was critical to developing the Kernza network.

2003



The Land Institute began its intermediate wheatgrass breeding program with seeds from the Big Flats Plant Materials Center. Over the next two decades, The Land Institute's program would interact with dozens of researchers and collaborate with institutions worldwide.

2006

The Land Institute received the first Sustainable Agriculture Research and Education (SARE) grant for Kernza, "Domesticating IWG for sustainable grain production," which supported research to increase seed size, establish on-farm trials, and carry out milling and baking tests. SARE grants would fund several other important breeding and agronomic research projects in future years.



The Land Institute filed for the trademark "Kernza," which was officially registered in May 2011. The name "Kernza" was selected as a memorable twist on the word "kernel," emphasizing the new role that intermediate wheatgrass would have in providing edible grain for human diets. "Kernza" was also chosen because it sounded like "Konza" from the **Konza Prairie Biological Station**, which inspired Wes Jackson, co-founder of The Land Institute, to create an agriculture that mimicked natural systems. It is essential to acknowledge that **Konza Prairie is named for the Kaw Nation, whose homelands are the prairies**.

2010



The Land Institute appointed Lee DeHaan as Lead Scientist for Kernza domestication, establishing a full-time program dedicated to the genetic improvement of intermediate wheatgrass for grain production. From July 2010 through November 2011, DeHaan held the School of Agriculture Endowed Chair in Agricultural Systems at the University of Minnesota (a program of the Minnesota Institute for Sustainable Agriculture), strengthening connections among The Land Institute, researchers at the University of Minnesota, and Minnesota growers.



The first large-scale harvest of Kernza took place on a 30-acre farm field in Kansas, using a regular combine. It produced a semi-truck load of grain, providing proof of concept for Kernza as a new crop.



2011



Using germplasm from The Land Institute breeding program, the University of Minnesota began Kernza research focused on agronomy, environmental quality, and plant breeding. A grant from the University of Minnesota Initiative for Renewable Energy and the Environment (IREE) supported the work, which was led by Don Wyse. Several other universities launched programs in the following years, including the University of Manitoba in 2011, the University of Wisconsin -Madison in 2015, and Cornell University in 2016. New collaborators also began work at the USDA Agricultural Research Service.

Food science research, also supported by the IREE grant, commenced at the University of Minnesota. Building on early work done by The Rodale Institute in the 1980s, the University of Minnesota published key research that contributed to product development by food companies, including work on nutritional and functional properties, storage conditions, and processing methods.



In October, The Wall Street Journal published one of the first public press articles on Kernza. Media coverage started to appear occasionally after that, with a jump in attention in 2016 after the first packaged Kernza product was released.

2013



The first water quality research was published, documenting rapid improvements in soil and water quality under Kernza fields relative to wheat. Several more key papers followed over the next decade. Water quality research was vital in encouraging plantings on land vulnerable to nitrate leaching and attracting agency and policy support.

Kernza first appeared on a restaurant menu at the Birchwood Cafe in Minneapolis, MN. The savory Kernza, kale, and fontina waffles (topped with apple shallot compote, cinnamon honey butter, pepitas, bacon lardons, a sunny-side-up egg, and maple syrup) were popular with customers. Birchwood Cafe used Kernza in many forms in the following years, helping create demand and introduce it to consumers.





Patagonia Provisions, the food division of parent company Patagonia, established the first grower contracts for commercial production with grass seed growers in Roseau, Minnesota. Until this point, Kernza was only available to end users through informal channels on an experimental basis.

The Estes Park Ecological Intensification meeting in Estes Park, Colorado, brought together four dozen researchers from five continents to explore how to speed development of perennial grains.

This meeting helped define the future direction for Kernza and catalyzed many projects and international partnerships.



The University of Minnesota Forever Green Initiative (FGI), in partnership with the Minnesota Department of Agriculture, received Minnesota state legislative funding for the first time. FGI was funded multiple times through the Clean Water Fund, and in 2022, the state included FGI in its base budget. Over the years, the Legislative-Citizen Commission on Minnesota Resources provided support for many other individual Kernza research and demonstration projects from the Environment and Natural Resources Trust Fund.

2015



A multi-state Kernza research project led by The Ohio State University began, ultimately providing the first information about grain and forage yields across sites in the US and Canada. This project was instrumental in establishing a network of Kernza sites through collaborations and efforts from multiple institutions.

Kernza genome sequencing, a collaborative effort supported by The Land Institute, the Malone Family Land Preservation Foundation, HudsonAlpha, and the US Department of Energy's Joint Genome Institute (JGI), was started. Sequencing facilitated advanced breeding techniques that let scientists predict which seedlings would perform best based on their genetics (rather than waiting a year to measure seed yields and other characteristics of mature plants), without using gene modification techniques.

2016



The Land Institute hosted the first Kernza Conference in Kansas in July, beginning an annual tradition of convening researchers, farmers, food companies, and more to network, strategize, and share information.

An early draft of the Kernza Grower Guide was released for use by and feedback from farmers and technical assistance providers. Over the following years, multiple organizations and individuals collaborated to refine and update the guide. Since Kernza was a novel crop, having accurate, clear information was vital for providing technical assistance to farmers. The guide was released more widely for the first time in 2019.



In October, Patagonia Provisions launched Long Root Ale, the first packaged Kernza product on the market. The beer launch resulted in a jump in consumer and media interest. Patagonia released two more beers in the following years. Other brewers soon joined the pack, including Bang! Brewing in St. Paul, MN.

The Minnesota Clean Water Council included Kernza in their annual policy recommendation report to the Minnesota state legislature, titled "Living Cover for Drinking Water Protection." Kernza appeared in many subsequent reports and recommendations, including the State Water Plan and Board of Water and Soil Resources recommendations. Kernza's appearance in these official reports helped demonstrate the grain's legitimacy as a crop with meaningful environmental benefits.



The Perennial Grain Story Project (PGSP) brought together food businesses, researchers, and other Kernza partners to help shape and advance a strategic public-facing narrative around Kernza. The goal of the PGSP was to excite, motivate, and invite people to 'join us on the journey' to move Kernza forward, while managing expectations around the research and supply chain development timeline.





Education (SARE) grant for research on grazing Kernza helped create foundational knowledge for dual production of grain and forage. This project, carried out at sites in Minnesota and Wisconsin, was critical for providing dual-use management information to farmers. Use of Kernza for grain and forage supports the economic viability of the crop by providing an additional income stream to growers.

A Sustainable Agriculture Research and

KRAUS, CLEAN RIVER PARTNERS



General Mills committed to trialing Kernza for product development, ultimately launching two limited-run Kernza cereals from Cascadian Farm. General Mills contributed funding for Kernza research at the University of Minnesota and The Land Institute, as well as towards the development of a Kernza processing line.

2017

One of the first large-scale water quality plantings was established in Lincoln County, Minnesota, on a state wellhead protection area.

This 54-acre planting provided an opportunity for community engagement and farmer collaboration, including several field days. It also enabled drinking water protection research and provided grain for product testing and recipe development.





Birchwood Cafe's Kernza Sweet Corn Blueberry Eclair debuted at the Minnesota State Fair Farmers Union Coffee Shop. The Kernza BLT followed in 2018-2021, made with focaccia from Baker's Field Flour & Bread. Both items were a hit with fairgoers and helped generate media interest and public excitement around Kernza.

2018

Sustain-A-Grain was founded in Kansas and started selling seed. Its

mission is to introduce consumers to Kernza perennial grain and to support family farms growing Kernza.





The Land Institute and the University of Minnesota Forever Green Initiative each launched new commercialization teams and hired full-time staff. As production and demand grew, the commercialization teams became essential to facilitate continued farmer adoption and market development.



The first commercial Kernza variety, MN-Clearwater, developed by the University of Minnesota in collaboration with The Land Institute, was released to twelve growers. A broader public release occurred in February 2020, along with improved grower vetting, priorities, and a trademark licensing process. In 2021, MN-Clearwater was licensed to three regional seed companies — Albert Lea Seed, Minnesota Native Landscapes, and Brownseed Genetics.





In March, Perennial Pantry launched as the first dedicated Kernza processor and food brand. After a crowdfunding campaign in the spring, direct-toconsumer online Kernza flour sales began in August 2020.

The \$10 million USDA KernzaCAP grant began in September, marking the biggest federal investment in Kernza to date. The grant facilitates collaboration and integration of Kernza knowledge and research across disciplines and institutions along with many individual farmers, businesses, and partners beyond the academic environment.

Kernza®CAP A multi-disciplinary research project funded by the US Department of Agriculture

2021



The Economic and Environmental Clusters of Opportunity (EECO) Implementation Program launched in Minnesota, providing a state-funded financial de-risking opportunity and coordinated technical assistance for early-adopter Kernza growers. By providing incentive payments to growers in specific

regions of Minnesota, this program encourages Kernza production in areas that would benefit most from drinking water protection. It also enables increased efficiency of supply chain development and technical support.

The Perennial Promise Grower's Cooperative was founded in July 2021. The goals of this Minnesota-based, grower-owned and -led co-op are to provide direction and assistance to farmers across the US interested in growing and marketing Kernza, including assisting with on-farm adoption, logistics, and processing, and providing expertise for scaling Kernza.





The Natural Resources Conservation Service (NRCS) formally added perennial grains to the national Conservation Practice Standard Code 328, Conservation Crop Rotation. This opened the doors for potential cost-share opportunities and national recognition of Kernza as an important tool to promote ecosystem services. This policy win was preceded by years of sustained relationship-building between Kernza network partners and NRCS staff.



The Minnesota Legislature approved a Continuous Living Cover Value Chain Development Fund to facilitate state funding for Kernza supply chain partners. The Minnesota Legislature also provided long-term Forever Green Initiative funding in its base budget for the first time, helping permanently secure research funds for Kernza and other crops. These efforts may inspire similar policy models in other US states.



The first Kernza Extension Cohort meeting brought together Extension educators from the Kernza-growing states of Kansas, Minnesota, North Dakota, and Wisconsin to help build formal Extension capacity around Kernza and continuous living cover agricultural systems.

Development of the Kernza Stewards Alliance

(KSA) began. The Land Institute, the Forever Green Initiative, and Kernza licensees engaged in a series of educational sessions and strategic planning to explore alternatives to a traditional business association for Kernza. The KSA aims to manage the Kernza trademark and advance the growth of the industry in a way that equitably shares decision-making power with those actively using the crop.



Learn more at **kernza.org/kernzacap**

KernzaCAP is supported by AFRI Sustainable Agricultural Systems Coordinated Agricultural Project (SAS-CAP) grant no. 2020-68012-31934 from the USDA National Institute of Food and Agriculture.