

NOVEMBER 2021

KERNZA® PERENNIAL GRAIN FACTS

Updated Nov 4, 2021

Prepared by: Tessa Peters
Director of Crop Stewardship, The Land Institute

In collaboration with: Tim Crews, Lee DeHaan, and Tammy Kimbler
Chief Scientist, Director of Crop Improvement, and Director of Communications at
The Land Institute

01

KERNZA® BREEDING

- Intermediate Wheatgrass (IWG) was first identified and improved as a grain crop by the Rodale Institute.
- USDA's Big Flats Plant Materials Center shared the germplasm with The Land Institute in 2001.
- Lee DeHaan is the lead scientist working to improve IWG for Kernza® perennial grain production at The Land Institute.
- Other breeding programs include:
 - Prabin Bajgain, University of Minnesota
 - Doug Cattani, University of Manitoba
 - Steve Larson, USDA Utah State University
 - Anna Westerbergh, Swedish University Of Ag Sciences

NOTABLE ACHIEVEMENTS:

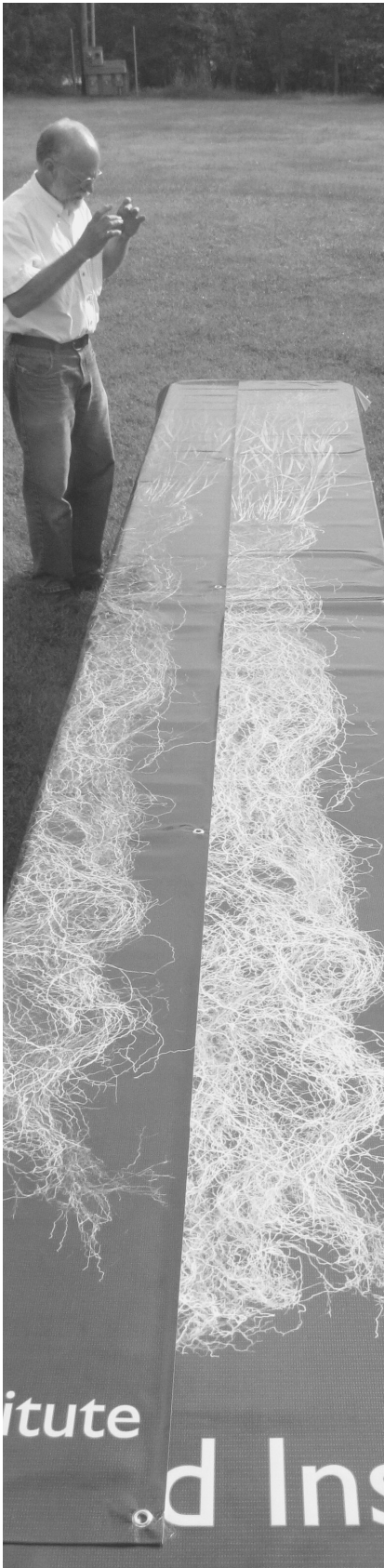
- The first Kernza® perennial grain variety was released in 2019 by University of Minnesota and is named MN-Clearwater. Parents of MN-Clearwater were selected out an improved population developed by The Land Institute.
- The first Consumer Packaged Good (CPG) product was Long Root Ale released by Patagonia Provisions and Hopworks Urban Brewery 2016. The same year saw menu items appear at The Perennial restaurant in CA.
- Birchwood Café in MN had products on its menu in 2013.

02

KERNZA® FACTS

ROOTS

- Intermedia Wheatgrass (IWG) that produces Kernza® perennial grain can produce roots that extend 10 feet into the soil profile.
- Long roots enable the plant to access water and nutrients in deeper soil profiles than shorter-rooted annual plants. This is a function of the plant's perennial lifestyle and its particular physiology—not a product of breeding programs.
- Kernza® perennial grain production increases the amount of soil organic matter (SOM) because of the long, dense root system and reduced tillage.
- Kernza® perennial grain production can benefit from greater nutrient uptake from deep in soil profiles because of the crop's long root system.
 - Kernza® can remove nitrogen, preventing its loss to groundwater at deeper soil profiles.
 - Kernza® can improve soil quality by increasing the supply of stored nutrients at deeper soil profiles.



03

KERNZA® FACTS

GRAIN

- Kernza® perennial grain is 25-50% the size of wheat, but breeding efforts are increasing seed size with new varieties.
- Kernza® perennial grain is in the hull
 - For some applications, the hull must be removed.
 - The hull accounts for ~30% of the weight of the grain.



04

KERNZA® FACTS

NITROGEN AND CARBON

- Kernza® perennial grain production can result in a 95% reduction nitrogen (N) leaching from the soil compared to annual grain production ([Jungers et al. 2019](#)).
- Perennial grass systems like those that produce Kernza® perennial grain have been shown to sequester from the atmosphere between 300# to 1000# of carbon (C) per acre per year for decades in some soils ([Crews and Rumsey 2017](#)).



05

KERNZA® FACTS

PRODUCTION

- Kernza® perennial grain can be produced in many different climates and ecosystems. It requires ~5 weeks of temperatures below 50F to trigger IWG flowering and grain production.
- Kernza® perennial grain yields range from ~200-500 lbs / acre / year of clean, dehulled grain (or saleable grain) for 1-4 years and the IWG can be used for forage for several additional years.
- Grain pricing in 2021 ranges from approximately \$1.00 - \$6.00 per lbs depending on grain condition (farm gate vs. cleaned and dehulled) and organic certification.



06**KERNZA® FACTS****FORAGE AND HAY**

- Kernza® perennial grain production results in additional by-products including straw and hay ([Hunter et al.](#))
- Kernza® perennial grain straw has a RFV of 60-70 and can be used as a low-quality additive to winter rations for ruminant animals.
- Spring cutting of Kernza® perennial grain has RFV of 150 and protein of 20-28% and can be taken without a reduction in grain yield in many cases ([Sakiroglu et al 2020](#)).



07

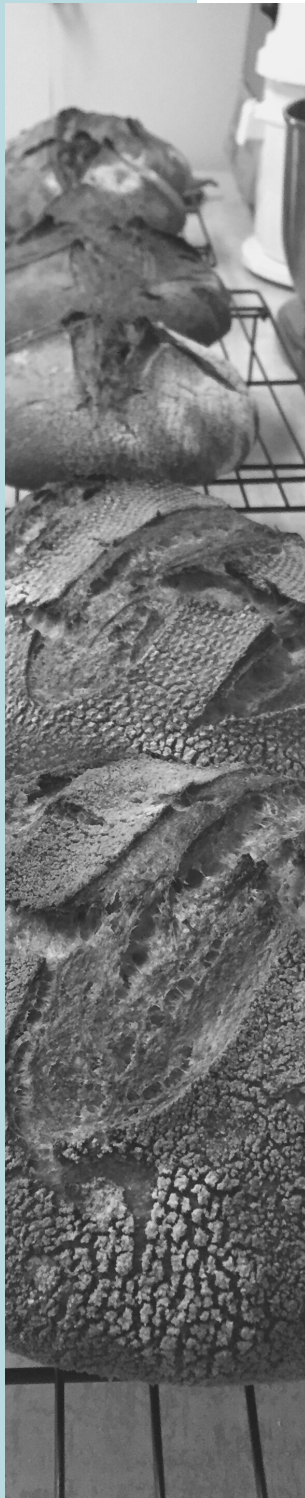
KERNZA® FACTS:

BAKING QUALITY

Kernza® contains GLUTEN

- Though it contains gluten, Kernza® perennial grain lacks high molecular weight gluten ([Marti et al. 2015](#))
 - It performs more like rye in baking applications.
- Kernza® perennial grain contains higher protein, dietary fiber, and bioactive compounds (carotenoids) compared to wheat.
- Kernza® perennial grain has higher fat content, resulting in potentially shorter shelf-life. High antioxidant levels may offer some protection.
- Shelf-life can be extended by storing in low temperature/humidity conditions.

([Mathiowetz 2018](#))



08

TRADEMARK USAGE GUIDELINES

Printed Copy General Guidelines

With regard to the use of the trademark in print, we require the proper designation, “Kernza® perennial grain,” at the most prominent use (usually a headline) and again on the first occurrence in copy.

Thereafter, using “Kernza” is appropriate. The Land Institute requests use of the trade name as a modifier rather than a noun (Kernza® perennial grain) as much as possible or reasonable.

Also, please note, Kernza® is not a type of wheat, but a registered trade name owned by The Land Institute for grain from intermediate wheatgrass (IWG), a perennial relative of annual wheat. Kernza® perennial grain is the trade name we license to retailers of approved intermediate wheatgrass.



09

TRADEMARK USAGE GUIDELINES

Product Labeling

If “Kernza® perennial grain” cannot be used, it is acceptable to use simply, “Kernza®” for product labeling (i.e. - Kernza® Ale or Kernza® Crackers).

Kernza® product labeling should include “Kernza® is a registered trademark of The Land Institute,...” and “For more information, visit landinstitute.org” If this is not feasible due to available space and design, special permission may be granted in writing to forego this requirement.

Photo Captioning

If “Kernza® perennial grain” cannot be accommodated in a photo caption, it is acceptable to use simply, “Kernza®.” The trademark symbol is required for use in photo captions.

For questions or other inquiries, please contact The Land Institute at info@landinstitute.org or 785-823-5376 or Tessa Peters, Director of Crop Stewardship, at peters@landinstitute.org