

# Grazing management of "Kernza" intermediate wheatgrass as a dual purpose crop

### What is Kernza?



- Kernza<sup>®</sup> is a new perennial, coolseason grain crop developed at The Land Institute, Salina, KS. It is the product of 30 years of conventional breeding of intermediate wheatgrass *(Thinopyrum intermedium)* to increase seed yield.

Similarly to intermediate wheatgrass, forage is abundant and nutritive in the early spring and in the fall, after grain harvest.

- It offers year-round soil cover and deep root structure, providing excellent ecosystem services such as erosion control, carbon sequestration and nitrate catchment.

Kernza is suitable for baking, brewing and distilling. The strong interest from farmers and processors has made it he first commercially available perennial grain.

- Breeding efforts to increase grain yield and ease of harvesting are ongoing.



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# **Our Farms, Our Future**

## SARE PROJECT LNCI6-383

# The project

#### Goal

The project aims to determine the suitability of Kernza to be used as a dual-purpose crop to produce human-edible grain and livestock forage. It was designed to measure the response of seed yield, forage yield and forage nutritive value to the 2 following factors:

A) Grazing timing: 1) sprig, 2) fall, 3) spring + fall and 4) no grazing

B) Vegetation: 1) fertilized monoculture and 2) unfertilized red-clover polyculture

### **Experimental design**

Experimental fields were laid out as randomized split-plot designs at the Lancaster (WI) and Morris (MN) Agricultural Research Stations and as randomized complete block designs at four on-farm locations.



Figure I: Angus steers grazing Kernza at the University of Wisconsin Lancaster Agricultural Research Station in May 2017.



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Figure 2: Spring grazing of vegetative Kernza forage.

**Summer harvest** (August 1) Performed by swathing, combining and baling (Figure 3). No effect of the spring grazing on grain and straw yield was detected.

- Grain yield: 900 kg.ha<sup>-1</sup> in monoculture 780 kg.ha<sup>-1</sup> in polyculture
- Straw yield: 10,000 kg.ha<sup>-1</sup> with 68 RFQ



Figure 4: Monoculture (right) and polyculture (left) paddocks before fall-grazing.







## **Preliminary results**

**Spring grazing** (May 1) Must happen before stem elongation to keep growth points undamaged and guarantee seed formation (Figure 2).

- Forage yield: 500 kg.ha<sup>-1</sup> with 230 relative forage quality (RFQ).
- Increased weed biomass in thin Kernza stands by opening the canopy.



Figure 3: Swathing of Kernza plants before grain harvest

Fall grazing (October 15) Intercropping red-clover increased forage yield and nutritive value. The difference in color also suggests the importance of the red-clover in providing nitrogen (Figure 4).

- Forage yield in monoculture: 760 kg.ha<sup>-1</sup> with 104 RFQ
- Forage yield in polyculture: 2,600 kg.ha<sup>-1</sup> and 140 RFQ

