

# FACT SHEET

## Getting Diversity into Kernza using Pasture Cropping

Advice from FARMS producers



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Spring '21



### What is Kernza?

Kernza® perennial grain is harvested from domesticated forms of intermediate wheatgrass and is undergoing ongoing breeding and development by The Land Institute (Salina, KS).

### What is Pasture Cropping?

Planting an annual crop or cover crop into an established perennial field, during the perennial's dormant season.

### Region & Context

This Kernza field is in Rush County, central KS (24" precipitation). We are in the first D4 drought since 2012 and are at 50% normal precip for the last 15 months.

### Why pasture crop into Kernza?

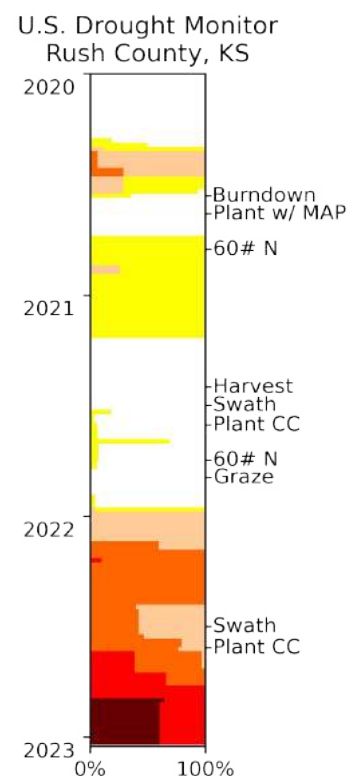
I'm becoming convinced that in our brittle environments, **perennials are possibly the only way to keep year-long living roots and covered soil**. None of my other perennial experiments are monocultures, so I decided to try **pasture cropping into the established Kernza**, in order to get diverse and high-quality forage for cattle to graze while they're trampling the Kernza straw (this also gets light on the crowns of the Kernza). I also want to get away from synthetic fertility, instead planting legumes to provide N.

### Establishment and Results

Prior to the Kernza, this field had multiple years of grazed cover crops. I planted in late Aug 2020, blending 7:1 with MAP fertilizer to get it to flow through our air seeder. I applied 60#N in Oct. In summer 2021, 550# of grain was harvested (265# after cleaning), and 2.5T of hay. Mix A was pasture-cropped into the Kernza stubble, and 60#N was applied in Oct. The covers did not do well, except for a sprinkling of sorghum sudan. The cattle grazed in Nov, and **net enterprise return was \$439 per acre**. Spring '22 saw D2 drought, and the Kernza did not make grain. 0.9T of hay was swathed in July, Mix B was pasture-cropped into the stubble in Aug, and none emerged. There was not enough forage to graze again. Without insurance, net enterprise return was -\$14 per acre.

**Mix A:** \$28/ac. 6# Spring forage pea, 5# sorghum sudan, 4# cowpeas, 3# pearl millet, 2# each Sunn hemp, buckwheat, and flax, and 1# each collards, radish, sunflowers, and okra (to see what did well!)

**Mix B:** \$14/ac. 10# sorghum sudan, 3# sunn hemp, 2# black oil sunflower.

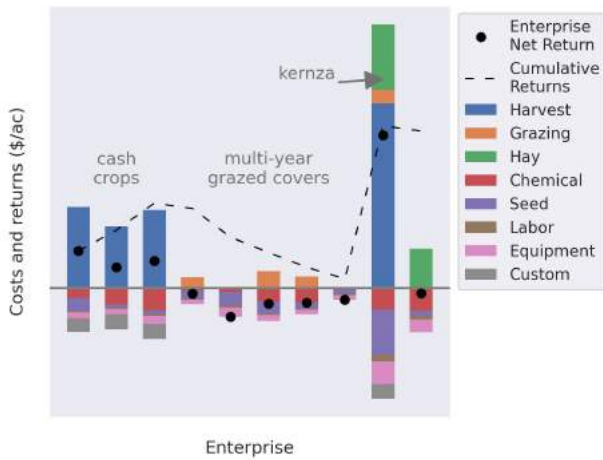


# Observations on Kernza

During the drought in 2022, the Kernza did poorly compared to nearby annual wheat crops and diverse perennials. The annual wheat crops produced grain. The perennials flourished with the sparse rains and produced a lot of forage. **I don't think long-term dryland pasture cropping annual covers into Kernza would be viable in our area.** There's not enough precip in our area to consistently get the warm season covers up and healthy, especially the last two summers.

## Economics

The market is still being developed for Kernza, so contract prices may vary widely. My field was contracted for \$2/lb, and the net return per acre was excellent (more than \$400/acre). If bigger players get into the market, the price may drop, possibly to \$1.20 - \$1.80. The breakeven price in Year 1 was \$1/lb (including seed but not including hay sales, the cost of land, insurance, or the multiple years of cover crops preceding Kernza).



D2 drought (May '22)



Kernza



Diverse perennials

## Next Ideas

I would try planting Kernza as part of a diverse perennial mixture primarily for grazing, and possible grain production second. It would add uncertainty to economic potential, but may leave the door open as markets get established. There are some other growers with Sustain-A-Grain that have experimented with Kernza and alfalfa perennial mixtures south of Canton, KS. Also, newer varieties are already available, with 25-50% greater yields.

## Is it right for me?

It's tough to get a Kernza contract still, and here are some things to think about before committing:  
**Operational risk:** if you have a debt load or are depending on an operating note, this might not be the crop for you. There is **real risk** in Kernza, especially in the establishment year. Yields can range from 0-350#/ac, with 0 being a real possibility. After that, there can be a long delay between harvest and receiving your check.  
**Tricky crop:** This is a finicky, specialty crop. This means you must have the time and desire to really do it right, to fuss with manually calibrating your equipment, get seeding rates and depths just right, and set the combine up just right. You'll also need a small grain combine and planter.



Nov '21 grazing

