Intercropping Kernza(R) Perennial Grain with Legumes: Results from On-Farm Studies

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Potential benefits of legume intercropping

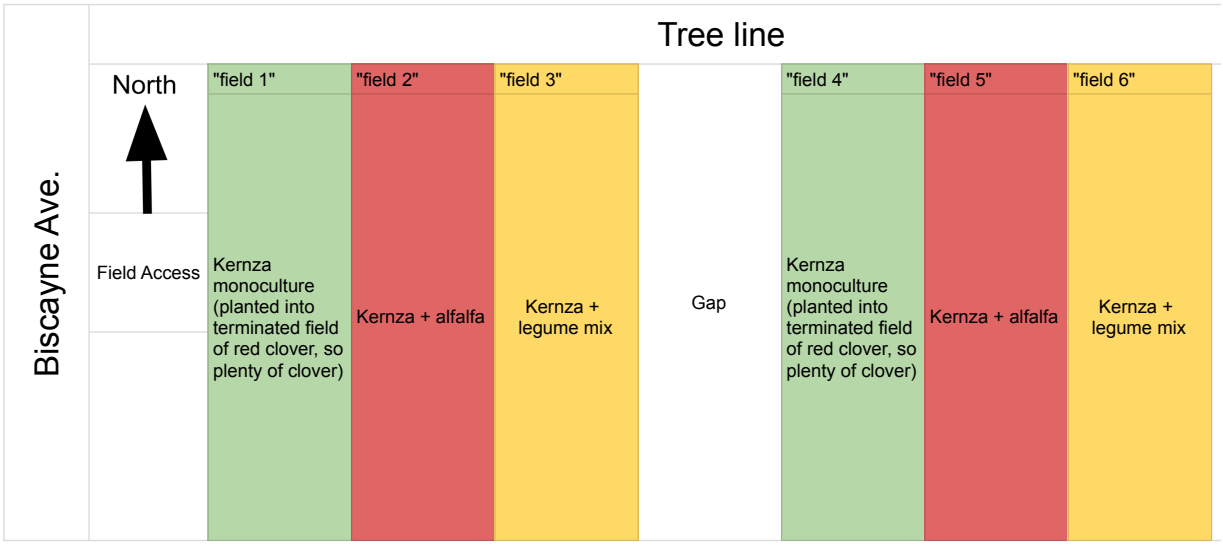
Intercropping the practice of growing two plant species in a single field. Intercropping legumes and cereal grains can be especially beneficial for productivity and environmental outcomes. Benefits include:

1. *Legumes can fix and transfer nitrogen to grain crops*
2. *Legumes can improve soil health*
3. *Legumes can suppress weeds*
4. *Legumes can provide floral resources for pollinators*
5. *Legume biomass or grain can be harvested and sold or utilized*

On-farm Kernza/legume intercropping trials

On-farm trials were conducted to determine agronomic and environmental outcomes of intercropping legumes with Kernza. The study was established in the fall of 2019 at the Goplen Farm in Canby, MN and Kimber Contours Farm in Farmington, MN. Three treatments were tested:

1) Kernza monoculture; 2) Kernza + alfalfa; 3) Kernza + 3 species legume mix: Alfalfa, Red Clover, and White Clover (3:2:1 ratio)



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Preliminary Results

Table 1. Kernza grain, intermediate wheatgrass (IWG) straw, and total straw (IWG plus legume biomass) yields for each treatment at the Goplen Farm and Kimber Contours Farm in 2020 (Year 1).

Farm	Treatment	Kernza grain	IWG straw	Total straw
Goplen	Kernza	1217	4648	4648
	Kernza + Alfalfa	726	3515	5695
	Kernza + Legume Mixture	687	3342	5865
Kimber	Kernza	702	2450	3601
	Kernza + Alfalfa	512	1973	3691
	Kernza + Legume Mixture	414	1937	2557

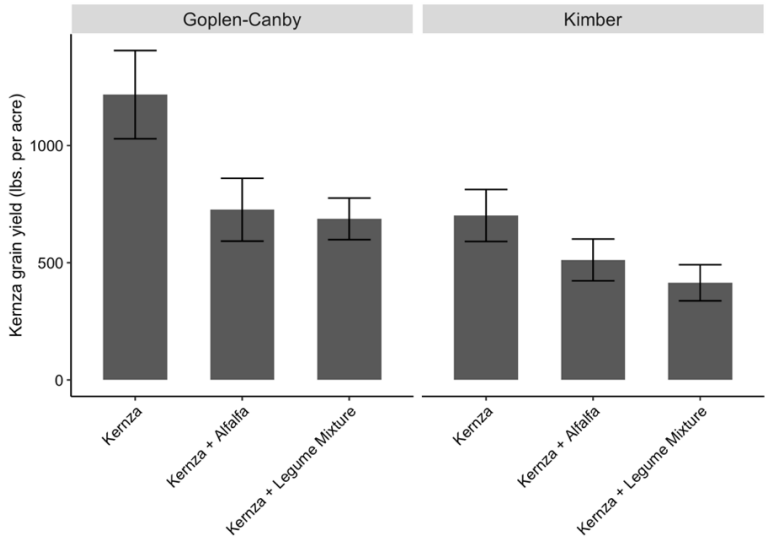

Figure 1. Kernza grain yield by treatment at the Goplen Farm and Kimber Contours Farm in 2020 (Year 1). Kernza monocultures were planted into an existing stand of red clover at the Kimber farm, which persisted into the first year.

Table 2. Alfalfa, red clover, and white clover biomass yield and percent of total biomass by intercropping treatment at the Goplen Farm and Kimber Contours Farm in 2020 (Year 1).

Farm	Treatment	Alfalfa yield	Percent alfalfa	Red clover yield	Percent red clover	White clover yield	Percent white clover
		lbs./acre	%	lbs./acre	%	lbs./acre	%
Goplen	Kernza						
	Kernza + Alfalfa	2180	40%				
	Kernza + Legume Mixture	1812	32%	686	12%	25	0%
Kimber	Kernza			1150	30%	0	0%
	Kernza + Alfalfa	743	20%	926	25%	50	1%
	Kernza + Legume Mixture	1616	33%	1479	28%	80	2%

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