

## WISCONSIN–Spring Grazing on Kernza Intermediate Wheatgrass & Clover for Grain & Forage Stefania Cartoni-Casamitjana, Valentin Picasso, University of Wisconsin-Madison

Intermediate wheatgrass (IWG) is a perennial, cool-season grass that has been widely used as a forage. Its edible grain can be used in baked products or beverages. Breeding efforts have been led by The Land Institute, Kansas, and the grain is trademarked as Kernza. There is growing interest by farmers in this perennial grain, but concerns with establishment practices, forage nutritive value, maintaining constant yields, weed management, and economic assessment have been identified (Lanker et al., 2019). IWG can be grown as a dual-purpose grain and forage crop, with similar yield and quality as other forage cool-season grass crops. Growing IWG in bi-culture with red clover increases forage quality, making it suitable for lactating beef cows, dairy cows, and growing heifers (Favre et al., 2019). Grazing IWG in the spring does not affect grain yield and increases the total amount of utilized forage (Zimbric, 2019).

An on-farm experiment planted in 2017 in Fall River, WI, has helped bring the crop to farmers' attention and broadened the scope of commercially grown perennial grain, moving it closer to a sustainable food system. This project is the first organic perennial grain polyculture commercial field of IWG and red clover. The field is 12.3 acres and was divided into two areas, one grazed by a beef herd in May 2020, and the other not grazed. Biomass samples were taken in both areas, once before the grazing period (Spring 2020) and again before grain harvest (Summer 2020). Biomass was separated into IWG forage, red clover forage, weeds, and dead biomass. For the summer sample, spikes were counted, cut, and threshed.

The results (Table 1) show no differences between grazing treatments, except for IWG dry weight in the spring, when the grazing treatment area was higher than the ungrazed. The sample was taken before the grazing period, so the differences must have been due to natural field conditions. Grazing the IWG and red clover pasture in the spring did not have detrimental effects on grain yields, forage yields, or weed pressure, supporting the use of this species as a dual-purpose grain and forage crop.

This project developed knowledge about Kernza to acquaint farmers with the new crop. We thank the farmers involved in the project, Mike Choudoir and John and Dorothy Priske, and NCR-SARE and CIAS of UW-Madison for providing funding.

### References

- Favre, J.R.; Castiblanco, T.M.; Combs, D.K.; Wattiaux, M.A.; Picasso, V.D. (2019). Forage nutritive value and predicted fiber digestibility of Kernza intermediate wheatgrass in monoculture and in mixture with red clover during the first production year. *Anim. Feed Sci. Technol.* 2019, 258, 114298.
- Lanker, M., M. Bell, and V. Picasso. (2019). Farmer perspectives and experiences introducing the novel perennial grain Kernza intermediate wheatgrass in the US Midwest. *Renewable Agriculture and Food Systems*, 1-10. 1900031 DOI:10.1017/S1742170519000310
- Zimbric, J. (2019). Weed community dynamics and suppression in dual-use intermediate wheatgrass cropping systems. MSc Thesis. University of Wisconsin-Madison.



**Table 1.** Means of IWG, red clover, spikes, and threshed grain yields in the grazed and not grazed areas, for the spring and summer samples in Fall River, WI.

Season	Variable	Units	Grazed	Not grazed
Spring (before grazing)	IWG dry weight	kg ha <sup>-1</sup>	1,210*	905*
	Red clover dry weight	kg ha <sup>-1</sup>	525	610
	Weeds dry weight	kg ha <sup>-1</sup>	65	35
Summer (after spring grazing)	Spike count	ha <sup>-1</sup>	905	855
	Spike dry weight	kg ha <sup>-1</sup>	340	290
	Threshed grain	kg ha <sup>-1</sup>	220	215

\*marked means are different under Tukey test with  $\alpha = 0.05$ .