FORAGE RESEARCH UPDATES

WISCONSIN–Forage Yield & Nutritive Value of Perennial Grain Kernza Grown in Monoculture & Intercropped with Red Clover

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Kernza[®] is a new conventionally bred perennial grain crop developed to increase seed yield of Intermediate wheatgrass, a grass introduced in the U.S. from Eurasia in 1934 and now widely grown on western rangelands. As grain yields are still lower than annual cereals and forage is abundant, managing Kernza Intermediate wheatgrass as a dual-purpose crop for grain and forage can greatly increase its productivity and profitability. University of Wisconsin-Madison researchers are working to characterize the forage nutritive value of Intermediate wheatgrass (IWG) grown in monoculture and in mixture with red clover and harvested at different times throughout the year.

Wisconsin research fields were established in September 2016 (Arlington, Lancaster, and Penninsular); first-year yields were recorded with quadrat samples. Forage was first harvested in the early spring before stem elongation. At this time, dry matter yield of IWG-red clover mixture was superior to IWG monoculture and averaged 0.7 tons/ac (Figure 1). This forage had a nutritive value of 26.4% ADF, 44.7% NDF, and 23.2% CP. At the time of grain harvest, in August, forage (straw) yields were similar between the monoculture and mixture and averaged 4 tons/ac (Figure 1). The nutritive value of this summer forage harvested from the biculture plots tested at 39.2% ADF, 62.5% NDF, and 8.8% CP, which was consistently superior to the monoculture forage which averaged 41.9% ADF, 69.5% NDF, and 5.3% CP. Regrowth forage yield following grain harvest, sampled late October, averaged 1.4 tons/ac in

the IWG-red clover biculture (Figure 1) and had a concentration in ADF, NDF, and CP of 28.7, 45.1 and 17.5%, respectively. The IWG monoculture, not fertilized after grain harvest, suffered from a limited nitrogen supply and produced three times less biomass with a lower nutritive value of 35.4% ADF, 61.1% NDF, and 10.9% CP. In Arlington and Lancaster, Kernza grain yields were similar between monoculture and mixture and averaged 807 lbs/ac. They were lower in Penninsular with 107 lbs/ac.

Findings suggest forage can greatly contribute to overall Kernza IWG productivity if managed for dual use. Including red clover in the system also increases forage yield and nutritive value without compromising grain production.



Angus heifers grazing a mixture of Kernza and red clover on May 4, 2017 at the Lancaster Ag Research Station.





Means with same letters for each harvest are not statistically different at p=0.05.