

Forage yield and nutritive value of perennial grain Kernza grown in monoculture and intercropped with red clover

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Abstract

Kernza® is a new perennial grain crop developed with conventional breeding to increase seed yield from the forage grass Intermediate wheatgrass (*Thinopyrum intermedium*). While most of the research focuses on best management practices for grain production, forage production of this species is abundant. Hence, managing Kernza as a dual-purpose crop for grain and forage can greatly increase its productivity, profitability and reliability. The goal of this paper was to characterize the forage nutritive value of Kernza Intermediate wheatgrass grown in monoculture and in mixture with red clover. Experimental plots were established in September 2016 in a randomized complete block design at three locations in Wisconsin: Arlington, Lancaster, and Penninsular ARS. Forage yield at grain harvest in early August was similar across the monoculture and mixture with 6.700 kg.ha⁻¹ of dry matter in Lancaster and Arlington, and 2.850 kg.ha⁻¹ in Penninsular. The mature monoculture forage (straw) had a concentration in ADF, NDF and CP of 41.9, 69.5 and 5.3 %, respectively and across locations. The red clover mixture had an average ADF, NDF and CP concentration of respectively 39.2, 62.5 and 8.8 %, which is consistently superior to the value of the monoculture. The forage at the Lancaster location showed however statistically inferior values. Forage yield of the regrowth in the fall after grain harvest (late October) averaged 1.380 kg.ha⁻¹ of dry matter in the monoculture, with 35.4, 61.1 and 10.9% of ADF, NDF and CP- concentration, respectively. Minor differences were detected across locations. The polyculture produced an average of 3.120 kg.ha⁻¹ of dry matter with a concentration in ADF, NDF and CP of 28.7, 45.1 and 17.5%, respectively, with no statistical differences across locations. Therefore, forage production of Kernza managed for grain is abundant and highly nutritious in the fall, and intercropping red clover increases forage yield and nutritive in this dual-use system.