

**SOUTH DAKOTA– South Dakota Winter Wheat Forage Trial**

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The 2021 growing season in central SD was very dry, resulting in harvesting of substantial amounts of winter wheat for hay. Due to farmer and industry inquiries about potential forage yields and quality of winter wheat, a trial was planted on the SDSU research farm in Brookings in the fall of 2021.

Winter wheat hay can be a high-quality, palatable feed source when harvested at the right growth stage, typically a 7-10 day window prior to grain formation (milk to early dough stage). Forage quality declines rapidly once plants reach dough stage, as nutrients are pulled out of the leaves/stem and transferred to the grain. Also, most winter wheat varieties have awns that become brittle as the plant matures. These may cause discomfort or even injury to livestock mouths, lowering feed intake. Alleviate this by planting an awnless variety.

The trial included 8 winter wheat varieties from public and private entities. Plots were harvested on 6/23/2022, with all varieties at the milk stage. A Swift LTD forage plot harvester was used to harvest and weigh plots, and bulk forage samples were sub-sampled and dried at 140°F for 72 hrs. Dried hay samples were sent to Dairyland Labs (Arcadia, WI) for NIR analysis. Nearly all varieties tested were statistically the same for yield, ranging 3.8-4.3 tons/DM/ac. The exception was ‘Willow Creek,’ yielding 3.0 tons/DM/ac. While yields were mostly the same, there were significant differences in all the other nutritional performance characteristics. Despite the differences, all forages evaluated would meet or exceed CP requirements of beef cows in mid-to-late gestation. The same is true for energy needs in mid-gestation, and only minimal energy supplementation would be needed for late-gestation cows. These feedstuffs would also be well-suited in diets for growing or finishing cattle.

Results confirm past SDSU research. High-yielding, grain-producing winter wheat varieties are also good forage producers. The trial will be continued in 2022-2023, with plots planted at Brookings and Dakota Lakes Research Farm near Pierre.

**Table 1.** 2022 winter wheat forage trial results (average of 3 replications) at Brookings.

Variety Information				Yield & Nutritional Performance						
Variety	Origin†-Year	Height (inches)	Heading (days)‡	DM <sup>1</sup> (tons/ac)	CP <sup>2</sup> (%DM)	NDF <sup>3</sup> (%DM)	NE L <sup>4</sup> (Mcal/cwt)	NE G <sup>5</sup> (Mcal/cwt)	NEM <sup>6</sup> (Mcal/cwt)	RFV <sup>7</sup>
980980-4 <sup>awnless</sup>	AP-exp	37	163	3.9	11.4	53.3	60.0	32.3	58.2	110.8
LCS Chrome	LCS-15	41	163	4.1	11.6	57.4	56.9	28.6	54.2	99.3
MTF 1435 <sup>awnless</sup>	MT-18	42	167	3.8	10.6	61.7	54.9	25.8	51.2	89.7
Oahe	SD-16	41	163	4.3	10.3	59.4	55.9	26.9	52.3	94.5
SY Monument	AP-15	37	163	4.2	10.1	59.0	54.6	25.2	50.5	94.2
T173 <sup>awnless</sup>	LCS-12	44	164	4.1	9.8	61.6	53.6	23.8	49.0	88.5
Willow Creek <sup>awnless</sup>	MT-09	44	168	3.0	10.9	65.5	51.6	21.9	46.9	80.5
Winner	SD-19	39	163	4.0	12.1	54.2	59.6	32.1	58.0	108.6
<b>Trial Average</b>	-	41	-	3.9	10.9	59.0	55.9	27.1	52.5	95.8
<b>LSD (0.05)§</b>	-	-	-	0.5	1.6	5.2	3.6	4.7	5.1	12.7

†AP - AgriPro; ALS - LCS - Limagrain Cereal Seeds; MT - Montana; SD - South Dakota; and year of release.  
‡Julian days, Note: for reference, in 2022, June 1 is 152 days Julian.

§Value required (≥LSD) to determine if varieties are significantly different from one another.

<sup>1</sup>Tons/ac DM; <sup>2</sup>CP as a percentage of DM; <sup>3</sup>NDF as a % of DM. Generally samples with lower NDF are considered higher quality; <sup>4</sup>Net energy, lactation – estimate of energy value for dairy cattle diets (Mcal/cwt, DM basis); <sup>5</sup>Net energy, gain – estimate of energy value to support beef cattle growth (Mcal/cwt, DM basis); <sup>6</sup>Net energy, maintenance – estimate of energy value for meeting beef cattle maintenance needs (Mcal/cwt, DM basis); <sup>7</sup>Relative feed value – a value representing how well a forage will be consumed and digested.

**Figure 1.** Winter wheat forage plot harvest with a Swift LTD harvester.

