

**Forage Yield and Quality of 'Willow Creek' Forage Winter Wheat**  
Dennis Cash ([dcash@montana.edu](mailto:dcash@montana.edu)), Ron Carlstrom, Lisa Surber and Aimee Hafla

Cereal crops are widely used in Montana as a source of winter roughage. Recently, producers have hayed over 300,000 acres of cereal forages each year. When harvested under good conditions, cereals produce good tonnage and provide a very nutritious roughage source for livestock winter maintenance rations. Cereal forages are also very useful in perennial forage crop rotations to reduce weed and disease complexes before re-seeding alfalfa or permanent pastures.

Most spring and winter cereals have been evaluated for their suitability as forages in Montana. For dry hay production, awnless varieties are desired. In 2005, the Montana Agricultural Experiment Station (MAES) released 'Willow Creek' - a new awnless variety of winter wheat that is tall, late-maturing, fine-stemmed and has other good forage characteristics. In 2004, 5 to 10-acre demonstration strip trials were established at sites in seven Montana counties. In 2005, Extension Service and MAES researchers monitored the growth and forage production of Willow Creek winter wheat. Producer tours were provided during crop growth and at a confined feeding operation.

Forage samples were clipped at three dates during the late spring for estimates of dry matter yield, forage quality and forage nitrate concentrations. Willow Creek winter wheat has very rapid growth – ¾ inch in height or 140 pounds of dry matter accumulation per day (Table 1). At most locations, the forage winter wheat was in the late boot or early heading stages on June 21, and at haying in early July it had yields ranging from 2.2 to 4.1 tons per acre.

Table 1. Forage yield and quality of Willow Creek winter wheat across 10 Montana locations in 2005.

Date	Height (in.)	Forage DM (lb/A)	% Protein	%ADF	%NDF	%Digestible DM	%NO <sub>3</sub>
24 May	17.9	1040	25.4	22.5	42.9	87.9	0.296
7 June	26.4	2540	19.4	25.8	50.1	72.3	0.192
21 June	38.7	4980	14.2	39.9	60.2	61.7	0.182
<i>Change per day</i>	<i>+0.75</i>	<i>+140</i>	<i>-0.4</i>	<i>+0.6</i>	<i>+0.6</i>	<i>-0.9</i>	<i>-0.004</i>

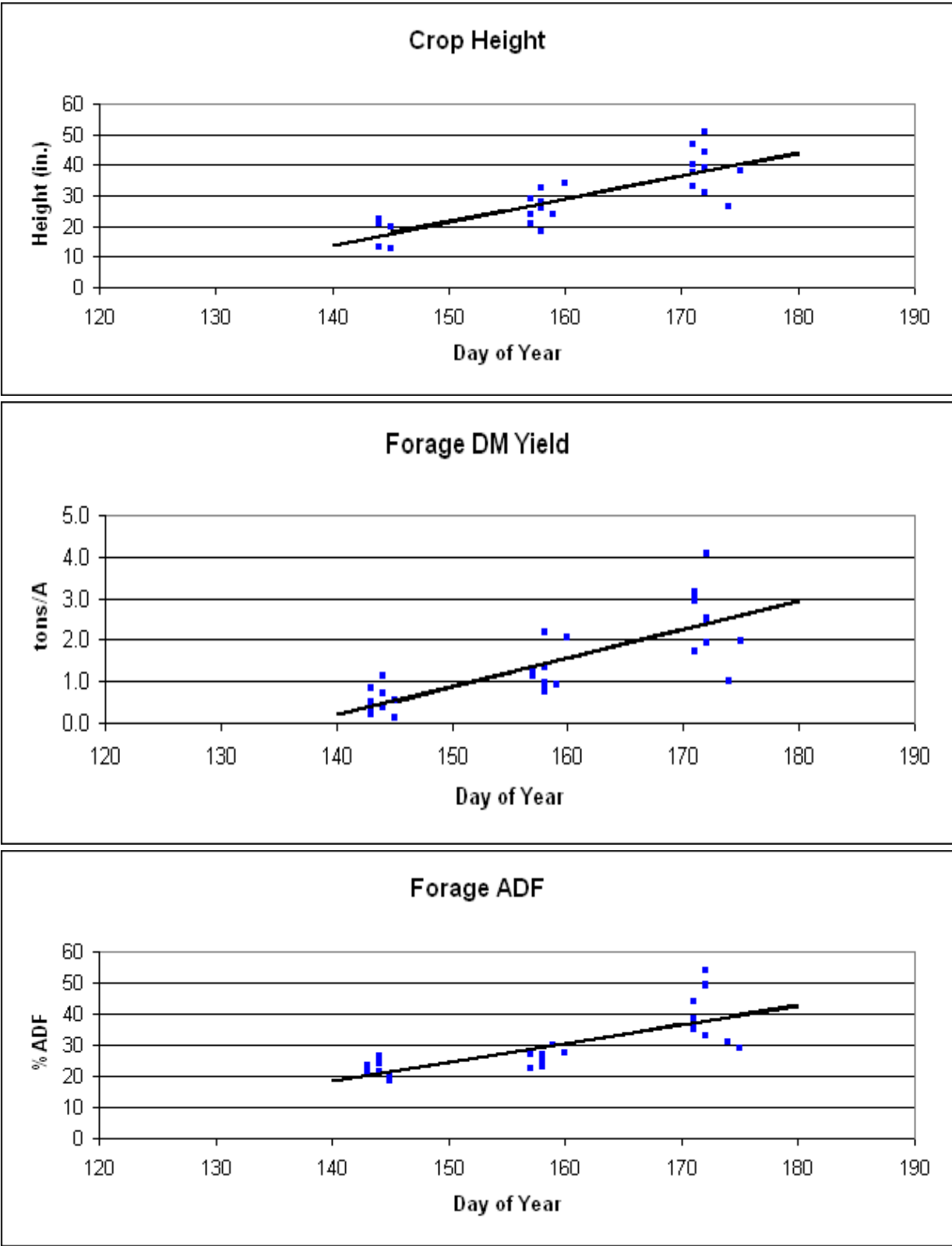
A major advantage of winter cereals over spring-seeded cereals for forage is early capitalization of winter and spring precipitation. Willow Creek could potentially be used as a nutritious pasture resource to delay turnout on native or seeded pastures. For example by June 7, this forage wheat was over two feet tall, and had produced over 2500 pounds of dry matter. On June 7, the forage had high levels of crude protein (19.4%) and digestibility (72.3%), with fairly low risk of nitrate toxicity (0.15 to 0.5% NO<sub>3</sub> is considered safe for non-pregnant livestock). Interestingly, when the wheat is clipped to a stubble height of 4 inches at this vegetative stage on June 7, it regrows very quickly. In recent grazing trials, forage yield is not detrimentally reduced – it is only delayed by 10 to 14 days.

In backgrounding trials, cattle gained about 2.5 pounds per day on high roughage diets comprised of Willow Creek winter wheat hay. In grain yield trials, Willow Creek is inferior to conventional hard red winter wheat varieties, so its primary use is as a forage crop. Other agronomic and grazing trials are ongoing. In field tours and surveys, producers made several consistent comments about Willow Creek:

1. Winter cereals are widely adapted in Montana, an awnless hay variety would be a plus
2. In most years, winter cereals out-produce spring-seeded cereals for forage
3. The spring grazing potential of Willow Creek would be a major advantage
4. Workload distribution (fall planting) fits most livestock operations
5. The fine stems and forage quality characteristics are very attractive
6. If seed were available, I would try some immediately

Currently limited commercial seed of Willow Creek winter wheat is available. Numerous other varieties of awnless triticale or spelt are available for forage production.

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**Fig. 1.** Forage yield and quality of 'Willow Creek' winter wheat at 10 Montana locations in 2005. Dry matter (DM) forage yield, acid detergent fiber (ADF), neutral detergent fiber (NDF), nitrate (NO<sub>3</sub>), in situ dry matter disappearance (ISDMD), day of year 140 = May 20.

