

# Winter Wheat Variety Performance Trial at Hayden, Colorado 2009

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## Summary

Each year, small grain variety performance tests are conducted at Hayden, Colorado to identify varieties that are adapted for commercial production in northwest Colorado. Twenty-eight varieties were evaluated in the 2009 winter wheat variety performance test conducted at Hayden. Growing conditions during the 2009 cropping season in Hayden were not as favorable for winter wheat production as other years. Grain yield in the winter wheat variety performance test averaged 2087 lbs/acre (34.8 bu/acre). The highest yielding entry was IDO656 at 2598 lbs/acre (43.3 bu/acre). Several winter wheat varieties were high yielding, with thirteen varieties in the top statistical (LSD) yield group. Protein concentration in 2009 was low compared to many other years and averaged only 8.4%. The range in protein concentration was a high of 9.4% for the variety Hawken to a low of 7.6% for Snowmass.

## Introduction

Small grain variety performance testing has been ongoing in northwest Colorado for many years (Pearson et al., 2008; 2007; 2005; 2004; 2003; Golus et al., 1997). Small grain variety performance tests are conducted in northwest Colorado each year to identify varieties adapted for commercial production in the region. The 2009 winter wheat variety performance test was conducted at Hayden, Colorado.

## Materials and Methods

Twenty-eight winter wheat varieties and breeding lines were evaluated during the 2009 growing season at the Mike Williams Farm near Hayden. The experiment design was a randomized complete block with four replications. Plot size was 4-ft. wide by 40-ft. long with six seed rows

per plot. The seeding rate was 680,000 seeds/acre and planting occurred on 2 Oct. 2008. The elevation at the plot location was 6446 feet above sea level. No fertilizer, herbicides, or insecticides were applied to the plots. Harvest occurred on 27 Aug. 2009 using a small plot combine. Grain samples were cleaned in the laboratory using a small Clipper cleaner to remove plant tissue that remained in the grain sample following threshing. Grain moistures and test weights were determined using a DICKEY-john GAC2100b™ Grain Analysis Computer<sup>3</sup>. Grain yields were calculated at 12% moisture content. Grain protein concentration was determined by whole grain near infrared reflectance spectroscopy with a Foss NIRSystems 6500 (reported on a 12% moisture basis).

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<sup>3</sup> Mention of a trade name or proprietary product does not imply endorsement by the authors, the Agricultural Experiment Station, or Colorado State University.



Planting in the winter wheat variety trial at Hayden, CO occurred on October 1, 2008. Photo by Calvin H. Pearson.

## Results and Discussion

Growing conditions during the 2009 cropping season in Hayden were not as favorable for winter wheat production as other years. The average maximum temperature for July 2009 at Hayden, Colorado was 84.3°F (Fig. 1). Precipitation at Hayden during the 2008-09 winter/spring growing season (September 2008 through August 2009, 12-month period) totaled 21.24 inches. Winter moisture in the Hayden area was good. During September 2008 through February 2009 a total of 10.38 inches of precipitation was received, and from March through Aug 2009 a total of 10.86 inches of precipitation was received at Hayden (Fig. 2).

Precipitation in the Craig/Hayden area varies considerably from month to month and year to year and is a major factor affecting crop production. If timely precipitation occurs, grain yields of winter wheat can be good. If precipitation does not occur in a timely fashion, grain yields of wheat can be low. Because precipitation is so variable during the growing season in the Craig/Hayden area, wheat yields often vary considerably from year to year.

Grain moisture in the winter wheat variety performance test at Hayden averaged 10.0% (Table 1). Grain moisture content ranged from a high of 10.6% for Hawken and Jagalene to a low of 9.6% for IDO656, Fairview, and Golden Spike.

Grain yield for the winter wheat varieties averaged 2087 lbs/acre (34.8 bu/acre). Grain yield ranged from a high of 2598 lbs/acre (43.3 bu/acre) for IDO656 to a low of 1675 lbs/acre (27.9

bu/acre) for NuDakota. Many winter wheat varieties were high yielding, with thirteen varieties having grain yields in the top group according to LSD mean separation. According to the Colorado Agricultural Statistics Service, the average wheat yield in northwest Colorado for 2006 and 2007



Winter wheat plots at Hayden, Colorado at harvest. Aug. 27, 2009. Photo by Calvin H. Pearson.

was 20.5 and 18.0 bu/acre, respectively (Colorado Department of Agriculture, 2008).

Test weights averaged 61.3 lbs/bu. Test weights ranged from a high of 63.8 lbs/bu for Danby to a low of 59.9 lbs/bu for Gary.

There was no lodging in the winter wheat variety performance test in 2009.

Plant height averaged 26.4 inches. Plant height ranged from a high of 34.4 inches for IDO651 to a low of 19.5 inches for NuDakota.

Protein concentration averaged 8.4% and ranged from a high of 9.4% for Hawken to a low of 7.6% for Snowmass. Protein concentrations in 2009 were lower than in many other years.

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Table 1. Winter wheat variety performance test at Hayden, Colorado 2009. Farmer-Cooperator: Mike Williams.

Variety	Market class <sup>1</sup>	Grain moisture	Grain yield		Test weight	Plant height	Protein
		(%)	bu/acre	lbs/acre	lbs/bu	in.	(%)
IDO656	HRW	9.6	43.3	2598	61.4	31.2	8.5
IDO658	HWW	9.8	42.3	2538	61.3	26.7	7.8
UI Darwin	HWW	10.0	40.7	2440	62.9	29.1	8.6
Hatcher	HRW	10.4	40.3	2418	60.5	23.3	8.0
Fairview	HRW	9.6	39.0	2343	60.9	29.0	8.0
Snowmass	HWW	9.9	38.4	2305	61.4	27.9	7.6
Winterhawk	HRW	10.4	38.0	2276	61.8	25.5	8.3
Bond CL	HRW/CL	10.0	37.8	2264	60.1	25.0	8.3
Ripper	HRW	10.0	37.3	2236	61.1	22.6	8.4
Gary	HWW	10.3	36.9	2214	59.9	28.8	8.2
CO03064-2	HRW	10.1	36.2	2170	61.6	25.8	8.1
IDO651	HWW CL	9.7	36.2	2169	60.2	34.4	8.2
UT9325-55	HRW	9.7	36.2	2169	60.8	29.3	8.2
Bill Brown	HRW	10.0	35.1	2106	61.4	23.0	8.1
Above	HRW/CL	10.0	34.7	2081	60.8	24.0	9.0
Hayden	HRW	10.0	34.2	2053	62.6	32.9	8.2
Golden Spike	HWW	9.6	34.2	2054	60.0	27.7	8.0
IDO660	HWW	10.0	33.5	2009	61.2	23.6	8.2
Deloris	HRW	10.2	32.0	1918	60.8	32.4	7.8
Hawken	HRW	10.6	31.7	1904	61.1	22.4	9.4
Keota	HRW	9.8	30.7	1844	60.5	24.9	8.9
Thunder CL	HWW/CL	10.1	30.2	1808	60.9	24.0	8.8
Jagalene	HRW	10.6	30.1	1806	62.0	23.2	8.7
Avalanche	HWW	10.1	29.6	1779	62.9	24.2	9.2
IDO653	HRW CL	9.9	29.5	1770	61.0	30.5	8.8
Danby	HWW	10.3	29.2	1753	63.8	24.7	8.0
TAM 112	HRW	9.9	29.0	1740	62.4	23.2	8.6
NuDakota	HWW	9.8	27.9	1675	60.1	19.5	8.8
Ave.		10.0	34.8	2087	61.3	26.4	8.4
LSD (0.05)		NS	7.5	448	0.8	2.1	
CV (%)		5.2	15.3	15.3	0.9	5.7	

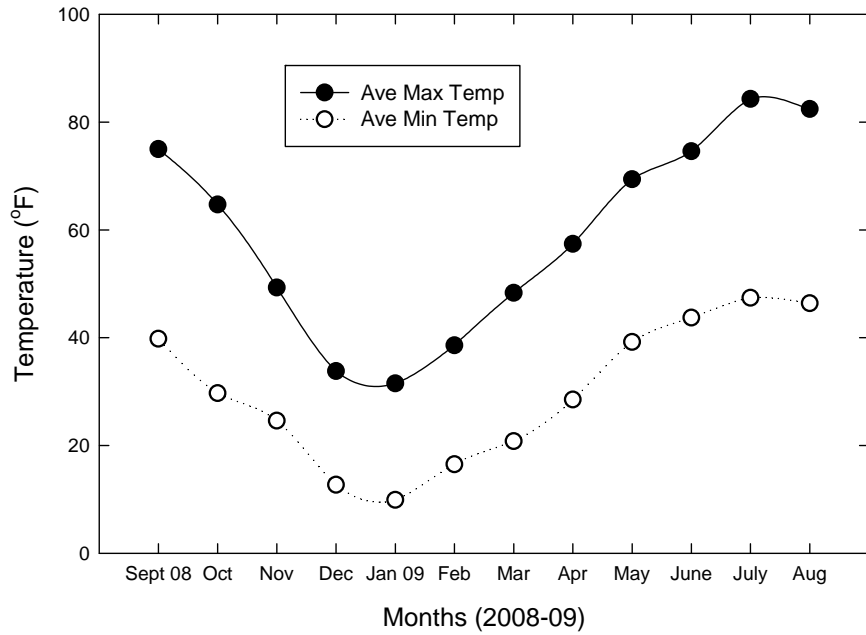


Fig. 1. Average maximum monthly and average minimum monthly temperatures for Sept 2008 through Aug 2009 at Hayden, Colorado.

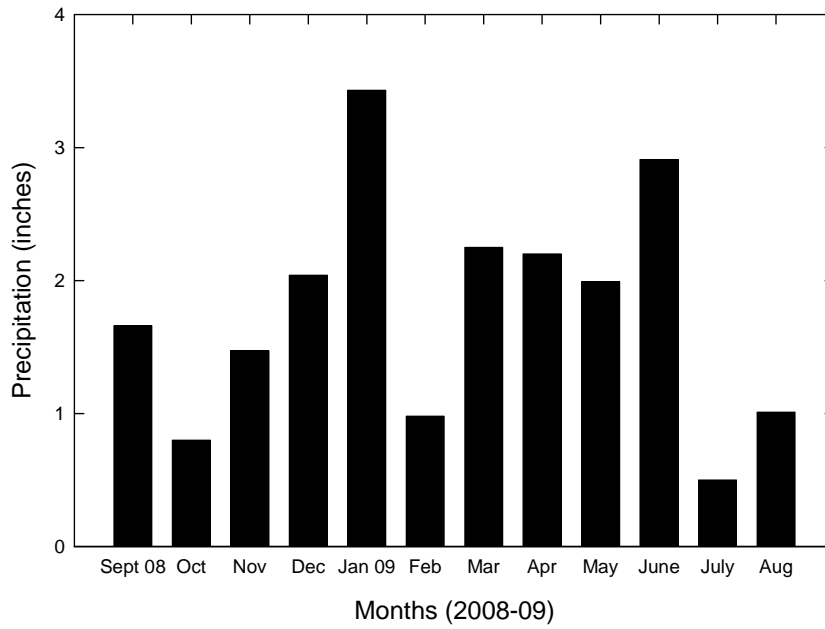


Fig. 2. Monthly precipitation for Sept. 2008 through Aug 2009 at Hayden, Colorado.