

SPRING WHEAT VARIETY PERFORMANCE EVALUATION

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The variety performance evaluations conducted by the Wyoming Agricultural Experiment Station are a continuous and ongoing program. In cooperation with the Uniform Hard Red Spring Wheat Nursery and private seed companies, a wide range of germplasm is evaluated each year.

Advanced yield trials are grown at Research and Extension Centers in Powell, Sheridan and Torrington. During 2004 a trial was also conducted on the Padlock Ranch near Dayton, Wyoming. These trials are situated to best represent the major small grains growing areas in Wyoming.

A preliminary yield trial is conducted at Powell in conjunction with the advanced yield trial. This trial is used to screen the new germplasm received each year. Varieties selected from this trial are then tested in the advanced trials conducted throughout Wyoming.

The objective of these performance evaluations is to evaluate experimental germplasm for release as varieties for production in Wyoming. Growers should identify varieties which perform well in their area and then conduct on-farm variety trial evaluations using their management practices.

MATERIALS AND METHODS

The experimental design of all trials was 3 replications of a randomized complete block. Measurements included heading date, plant height, lodging, grain yield, and test weight. Data were analyzed using SAS procedures for analysis of variance.

UW-REC (POWELL): The experiment was located at the University of Wyoming Research and Extension Center in Powell, Wyoming during 2004. The soil, a Garland clay loam (fine, mixed, mesic; Typic Haplargid), had a cropping history of: 2003, 2002 and 2001 alfalfa. The soil was fertilized for a yield goal of 100 bushels of grain per acre. Fertilizer was applied on 15 March, at the rate of 120 pounds N and 50 pounds P₂O₅, in the form of ammonium nitrate (34-0-0) and diammonium phosphate (11-52-0). The soil in the study area was prepared for planting by fall plowing, roller harrowing and leveling. On 7 April, 43 spring wheat varieties were established in plots 7.3 by 20 feet using double disk openers set at a row spacing of 7 inches. The seeding depth was 1.5 inches, and the seeding rate was 100 pounds of seed per acre. Weeds were controlled by a post application of a tank mixture of bromoxynil and MCPA (Bronate) and tralkoxydim (Achieve) broadcast at 0.50, 0.50 and 0.18 pounds active ingredient per acre on 3 June. Furrow irrigations were 19 April, 05 June, 23 June, and 13 July. Subplots, 5.3 by 8 feet, were harvested on 18 August, using a Wintersteiger plot combine.

PADLOCK RANCH (DAYTON): The experiment was located at the Padlock Ranch near Dayton, Wyoming during 2004. The soil, a Nuncho-Emigrant Association (fine, montmorillonitic, mesic; Aridic Argiustolls), had a cropping history of: 2003, fallow; and 2002, small grains. The soil in the study area was prepared for planting by fall chiseling and rotor-tilling. Fertilizer was applied at the rate of 100 pounds N per acre in the form of ammonium nitrate (34-0-0). Ten spring wheat varieties

were established in plots 5 by 20 feet using double disk openers set at a row spacing of 8 inches on 13 April. The seeding depth was 2 inches, and the seeding rate was 100 pounds of seed per acre. The study site is sprinkler irrigated. Height notes and heading dates were recorded, however the trial was not harvested due to a rain the day other plots at the site were harvested.

UW-REC (SHERIDAN): The experiment was located at the University of Wyoming Research and Extension Center in Sheridan, Wyoming during 2004. The soil, a Wyarno clay loam (fine, montmorillonitic, mesic; Ustollic Haplargid), had a cropping history of: 2003, fallow; 2002, small grains; and 2001, fallow. The soil in the study area was prepared for planting by fall chiseling, followed by spring chiseling and roller harrowing. Ten spring wheat varieties were established in plots 5 by 20 feet using double disk openers set at a row spacing of 8 inches on 25 March. The seeding depth was 2.5 inches, and the seeding rate was 50 pounds of seed per acre. The site is a dry land site with no irrigation. Rainfall during the growing period (1 April -31 July) was 5.65 inches. Subplots, 5 by 15 feet, were harvested using a Wintersteiger combine on 25 August.

UW-REC (TORRINGTON): The experiment was located at the University of Wyoming Torrington Research and Extension Center in Torrington, Wyoming during 2004. Fertilizer was applied at the rate of 100 pounds N and 50 pounds P₂O₅ per acre. Ten spring wheat varieties were established in plots 5 by 20 feet using double disk openers set at a row spacing of 9 inches on 30 March. Weeds were controlled by a post application of bromoxynil and MCPA (Bronate Advanced) broadcast at 0.40 and 0.40 pounds active ingredient per acre. Subplots, 5 by 15 feet, were harvested using an Almaco combine on 11 August. Data was not reported due to poor yields resulting from lack of irrigation water and aphid infestation.

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Table 1. Agronomic performance of hard red spring wheat genotypes grown at University of Wyoming, Powell Research and Extension Center, Powell, WY during 2004.

Variety	Plant height inches	Heading date Days from Jan. 1	Lodging 1-9	Grain yield bu/acre	Test weight lb/bu
WA007931*	36	176	1	152	59
WA007925	37	172	1	142	61
McNeal	36	177	1	137	60
2375	37	180	1	136	60
MN01311-A	37	176	1	135	61
SD3635	37	172	1	132	59
BZ 998-447W*	37	169	1	131	57
96SO356-15	31	169	1	130	62
MT 0249	34	172	1	129	60
ND 801	37	172	1	129	63
Stoa	40	172	1	129	59
96S0404-03	29	172	1	128	62
98S0051-1	34	174	1	128	59
97S0254-8-1	33	176	1	128	58
Verde	33	176	1	127	60
NDSW0347	35	176	1	127	61
SD3687	34	172	1	126	60
BW341	38	176	2	124	61
MN00261-4	36	180	1	124	61
98S0127-06	30	174	1	123	62
ES63	37	179	1	123	61
MN01333-A	31	172	1	123	60
MT 0245	31	176	1	123	57
MN99436-6	32	172	1	122	61
ND 741	36	174	1	122	62
SD3747	35	175	1	121	62
ND 751	36	176	1	121	60
MT9929	33	172	1	121	61
SD3746	36	172	1	120	59
N99-0241	34	174	1	120	60
MN01197	35	180	1	120	61
ND 747	36	172	1	120	63
ND 800	35	174	1	116	60
CA-901-580W *	38	172	1	115	61
NDSW0217*	40	172	1	115	62
Keene	41	180	1	114	61
NDSW0345*	42	181	1	113	57
SD3668	37	172	1	110	58
BW346	38	174	1	109	60
Chris	42	176	4	107	58
SD3618	38	176	1	107	62
CA-902-701	31	169	1	104	62
Marquis	44	179	3	96	58
Mean	36	161	1.2	123	60
LSD _{0.05}	3.3		0.38	17.6	3.5
CV%	5.7		20.2	8.9	3.6

NS=non significant

*hard white spring wheat

Table 2. Agronomic performance of hard red spring wheat genotypes grown at University of Wyoming, Sheridan Research and Extension Center, Powell, WY during 2004.

Variety	Plant height	Heading date	Grain yield	Test weight
	inches	Days from Jan. 1	bu/acre	lb/bu
WA007931*	28	162	33	60
Stoa	26	159	30	59
ND 800	26	159	29	61
McNeal	25	160	29	59
ND 747	23	158	27	60
ND 741	24	159	26	60
96S0356-15	21	159	26	60
MT 9929	23	160	26	57
Verde	22	159	25	59
96S0404-03	17	160	24	60
Mean	23.5	159	27	59.5
LSD _{0.05}	2.2	NS	NS	NS
CV%	6.6	1.1	16.5	2.5

NS=non significant

*hard white spring wheat

Table 3. Agronomic performance of hard red spring wheat genotypes grown at Padlock Ranch, Dayton, WY during 2004.

Variety	Plant height	Heading date
	inches	Days from Jan. 1
WA007931*	37	175
Stoa	40	171
ND 800	38	172
McNeal	37	177
ND 747	38	169
ND 741	36	171
96S0356-15	35	168
MT 9929	34	174
Verde	39	175
96S0404-03	33	170
Mean	37	172
LSD _{0.05}	2.4	2.2
CV%	4.6	0.9

NS=non significant

*hard white spring wheat