

SPRING WHEAT VARIETY PERFORMANCE EVALUATION

Michael Killen, Powell Research and Extension Center; Roger Hybner, Sheridan Research and Extension Center; Jerry Natchman Torrington Research and Extension Center.

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 2003 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 2003. The soil, a Garland clay loam (fine, mixed, mesic; Typic Haplargid), had a cropping history of: 2002, dry beans; 2001, small grains; and 2000, fallow. The soil was fertilized for a yield goal of 100 bushels of grain per acre. Fertilizer was applied on 10 April, 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 spring leveling. On 15 April, 40 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) broadcast at 0.50 and 0.50 pounds active ingredient per acre on 2 June. Furrow irrigations were 24 April, 03 June, 18 June, 03 July, and 17 July. Subplots, 5.3 by 8 feet, were harvested on 19 August, using a Wintersteiger plot combine.

PADLOCK RANCH (DAYTON): The experiment was located at the Padlock Ranch near Dayton, Wyoming during 2003. The soil, a Nuncho-Emigrant Association (fine, montmorillonitic, mesic; Aridic Argiustolls), had a cropping history of: 2002, fallow; 2001, small grains. The soil in the study area was prepared for planting by fall chiseling and rototilling. 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 11 April. The seeding depth was 2 inches, and the seeding rate was 100 pounds of seed per acre. The study site is sprinkler irrigated. Subplots, 4.5 by 15 feet, were harvested using a Wintersteiger plot combine on 5 August.

UW-REC (SHERIDAN): The experiment was located at the University of Wyoming Research and Extension Center in Sheridan, Wyoming during 2003. The soil, a Wyarno clay loam (fine, montmorillonitic, mesic; Ustollic Haplargid), had a cropping history of: 2002, fallow; 2001, small grains; and 1999, 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 16 April. The seeding depth was 2.5 inches, and the seeding rate was 50 pounds of seed per acre. Subplots, 5 by 15 feet, were harvested using an Almaco combine on 25 July.

UW-REC (TORRINGTON): The experiment was located at the University of Wyoming Torrington Research and Extension Center in Torrington, Wyoming during 2003. 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 17 April. 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.

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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 2003.

Variety	Plant height inches	Heading date days from Jan 1	Grain yield bu/a	Test weight lb/bu
WA007931*	38	176	141	62
Verde	34	179	134	63
96S0356-15	33	172	134	64
2375	37	181	132	60
WA007914	37	177	129	60
N99-0107	35	173	129	63
01M88	29	181	129	62
MT9929	33	175	127	60
ND 741	37	174	125	58
01M96	34	171	122	62
ND 800	34	175	121	57
960404-03	32	174	120	62
CA-901-735	30	172	120	59
ND 747	36	171	119	62
N98-0286	31	175	119	61
BZ 998-447W*	36	171	118	58
NDSW0246	41	175	117	61
N99-0241	35	178	117	60
ND 801	37	174	116	62
N99-2234	41	179	116	61
SD3635	36	174	115	61
MN99436-6	32	175	114	61
BW314a	42	172	112	57
McNeal	36	179	111	61
SD3540	39	172	111	60
SD3641	36	171	109	61
ND 751	37	180	108	62
98S0113-20	30	171	108	63
Entry 264	33	174	108	60
Stoa	38	173	107	60
SD3546	39	171	107	62
SD3618	35	174	107	61
WA007925	38	172	107	63
Entry 221	34	174	106	61
ES54	41	179	106	60
Keene	43	176	103	59
Entry 241	35	175	103	59
BW307	45	181	94	57
Chris	42	177	85	57
Marquis	46	182	84	55
Mean	36	175	115	61
LSD _{0.05}	3.0	2.8	15.6	3.4
CV%	5.1	1.0	8.4	3.5

NS=non significant

*hard white spring wheat

Table 2. Agronomic performance of hard red spring wheat genotypes grown at Padlock Ranch in Dayton, WY during 2003.

Variety	Plant height inches	Heading date days from Jan 1	Grain yield bu/a	Test weight lb/bu
N99-0107	34	172	77	61
ND741	36	174	75	59
Verde	34	174	74	57
SD3641	33	171	74	61
Stoa	37	174	73	59
MT9929	32	174	67	62
NDSW0246	42	175	66	58
WA007914	36	174	65	57
McNeal	35	175	62	60
01M96	35	172	57	64
Mean	35	173	69	60
LSD _{0.05}	4.5	NS	NS	NS
CV%	7.4	1.5	20.2	8.1

NS = non significant.

Table 3. Agronomic performance of hard red spring wheat genotypes grown at University of Wyoming, Sheridan Research and Extension Center, Sheridan, WY during 2003.

Variety	Heading date days from Jan 1	Grain yield bu/a	Test weight lb/bu
SD3641	166	44	62
N99-0107	167	43	62
MT9929	166	43	59
McNeal	167	43	58
Verde	167	42	60
Stoa	166	40	61
WA007914	167	40	57
NDSW0246	168	36	59
01M96	166	36	63
Mean	166	41	60
LSD _{0.05}	NS	NS	1.8
CV%	0.6	9.2	1.8

NS = non significant.

Table 4. Agronomic performance of hard red spring wheat genotypes grown at University of Wyoming, Torrington Research and Extension Center, Torrington, WY during 2003.

Variety	Plant height inches	Heading date days from Jan 1	Grain yield bu/a	Test weight lb/bu
Stoa	32	171	48	58
N99-0107	34	172	45	59
NDSW0246	30	172	45	57
WA007914	29	173	44	54
ND741	28	171	43	56
01M96	27	170	41	59
Verde	26	173	40	57
SD3641	27	167	40	56
MT9929	27	172	40	52
McNeal	28	174	38	53
Mean	29	172	42	56
LSD _{0.05}	2.4	1.1	NS	3.0
CV%	4.9	0.4	11.3	3.2

NS = non significant.