

2006 Winter and Spring Wheat Variety Trials

Rhonda Simmons, Mylen Bohle, Mark Larsen,
Mary Verhoeven, and Jim Petersen

Introduction

Cereals are an important rotational crop for central Oregon. Soft white wheat, historically until the recent past, has been the most important class for grain production. Wheat accounted for 65 percent of the acreage grown in 1998, the hard red wheat class has accounted for 60-70 percent of the total acreage grown in 4 years out of 6 years, and 42-44 percent in the two other years, including 2005. Since 1998, wheat acreage grown has ranged from a high of 13,955 acres in 1998 to a low of 6,100 acres grown in 2006, in Crook, Deschutes, and Jefferson counties. The percentage of wheat grown in 2006 was 37% hard red spring wheat, 48% soft white winter wheat, and 15% soft white wheat.

Central Oregon is well situated to the markets in Portland, Oregon. Public and private Pacific Northwest plant breeders release new cereal varieties each year. To provide growers with accurate, up-to-date information on variety performance, a statewide variety-testing program was initiated in 1993 with funding provided by the Oregon State University (OSU) Extension Service, OSU Agricultural Experiment Station, Oregon Wheat Commission, and the Oregon Grains Commission. Central Oregon Agricultural Research Center (COARC) has participated in the program every year since 1993. The Oregon Grain Commission budget no longer allows them to contribute to the statewide Oregon Elite Yield Trials, and Oregon Wheat Commission contributions to the trial have diminished because of their budget constraints.

Yield, height, lodging, and heading dates were recorded for Madras, which is one of 9 locations around Oregon that participate in the statewide trials. Results are summarized and extended through extension publications, county extension newsletters such as the Central Oregon Ag Newsletter, as well as in other popular press media. Data are also summarized for all trials and are available on the OSU Cereals Extension web page (<http://cropandsoil.oregonstate.edu/wheat/>). For future reference, use the web page for earliest access to data, as trial results are posted as soon as they are available. Previous cereal variety and other production trial data (1993-2002) are available at the following web site: <http://cropandsoil.oregonstate.edu/cereals/>. Due to budget constraints, this web site is no longer updated, but the information is still available.

Materials and Methods

The entries were planted into plots, 4.5 ft by 20 ft, at the rate of 30 seeds/ft², in 6-inch rows, 8-inch row spacing, with an Oyjord plot drill in a randomized block design, with 3 replications. The winter wheat trial was planted on September 22, 2005 and the spring wheat trial was planted on April 13, 2006.

Soil samples were taken to a depth of 14 inches. The samples were analyzed by the Agri-Check Laboratory at Umatilla, Oregon. Soil test results are presented in Table 1. The nitrogen supply

goal for winter wheat was 200 lb N/acre and for spring wheat was 160 lb N/acre.

Table 1. Soil test results from samples taken on September 14, 2006, for the statewide Oregon Elite Wheat Variety Trials at the Central Oregon Agricultural Research Center, Madras, Oregon.

Soil depth (in)	pH	NO ₃ (lb/acre)	NH ₄ (lb/acre)	P (ppm)	K (ppm)	S (ppm)
0-13	7.2	29	12	26	366	14.7

The winter wheat variety trial was fertilized with 550 lb/acre of 30-10-0-7 (165 lb N, 55 lb P₂O₅, 0 lb K₂O, 38.5 lb S/acre) on March 23, 2006. Estimated total nitrogen (soil + fertilizer N) available to the plants was 194 lb/acre. The spring wheat variety trial was fertilized with 450 lb/acre of 30-10-0-7 (135 lb N, 45 lb P₂O₅, 0 lb K₂O, 32 lb S/acre) on March 23, 2006. Estimated total nitrogen (soil + fertilizer N) in the top 13 inches of soil available to the plants was 164 lb/acre.

Weeds were controlled in winter wheat with an application of 1.5 pt/acre 2,4-D and 1.5 oz/acre of Banvel[®] product, and 2pt/100gal non-ionic surfactant on April 21, 2006. Weeds were controlled in spring wheat using 1.5 pt/acre Bronate[®], 3 oz/acre Banvel[®], and 2pt/100gal non-ionic surfactant on May 31, 2006.

The trials were irrigated as needed with a 30- by 40-ft spacing, solid-set sprinkler (9/64th- inch Rainbird nozzles) irrigation system. First irrigation for the winter wheat variety trial occurred on April 28, 2006 and the last irrigation occurred on June 30, 2006. First irrigation for the spring wheat variety trial occurred on May 3, 2006 and the last irrigation was applied on July 27, 2006.

Heading dates were recorded when 50 percent heading occurred. Just prior to harvest, lodging scores (percent plot) and plant height (inches) measurements were taken. Harvested area was approximately 10 by 4.5 ft to 15 by 4.5 ft for the winter wheat variety trial and 15 by 4.5 ft for the spring wheat trial. Each plot length was measured and a Hege plot combine was used to harvest the entries. Harvest date for the winter wheat trial was August 8, 2005 and August 26, 2005 for the spring wheat trial. The grain samples were shipped to the OSU Hyslop Farm at Corvallis, Oregon where they were processed. Statistical analyses were by analysis of variance (ANOVA) using general linear model, PROC GLM, of SAS version 9.1 (SAS Institute, Inc., Cary, North Carolina).

Results and Discussion

Winter Wheat Trial

The winter wheat trial yield average was slightly more than 120 bu/acre, and the yields ranged from 105.7 to 131.2 bu/acre (Table 2.). For the top-yielding 34 entries, 'Rod' to 'Masami', there were no significant differences between varieties and experimental lines, with a yield range of 131.2 bu/acre to 115.3 bu/acre (PLSD 0.05, 16.9 bu/acre).

Average test weight for the trial was 58.2 lb/bu. Test weight ranged from 60.7 (BZ 6W99-456) to 56.1 lb/bu (Rod). The four top-yielding varieties all had test weights between 56.1 to 59.9 lb/bu.

Heading date average was 155 days and ranged from 149 days after January 1st (day of year [doy]) to 160, or a range of 11 days. Oregon line ORH010920 was the earliest to head at 148.7 doys and ARS97135-9 was the last entry to head at 160 doys.

Average plant height was 37 inches for the trial. Heights ranged from 34 inches (ORH010920) to 42 inches (ARSC96059-1).

Lodging average was a bit higher than in previous years with 34.9 percent for the trial. Lodging ranged from 0 percent (4 entries) to 93.3 percent (ARSC96059-1). There were 11 entries with lodging scores of 10 percent or less.

Protein average was 10.5 percent and ranged from 9.3 to 11.7 percent, which suggests that maximum average yield was achieved.

Spring Wheat Trial

The spring wheat trial average yield was 120.1 bu/acre and yields ranged from 76.9 to 122.6 bu/acre (Table 3). For the top-yielding seven entries, 'Alpowa' to ML107-11A, 99 (a range of 122.6 to 110.1 bu/acre), there was no significant differences (PLSD 0.05, 12.7 bu/acre) between entries.

Heading date average was 174 doys with a range from 168 'Buck Pronto' to 183 doys 'ML03-409-BK4' which was a range of 15 days.

Average plant height for the trial was 36.0 inches, with a range of 31.3 inches (OR4201262) to 45.9 inches (Hollis). (Nick and Blanca Grande), two relatively new releases were the two of the highest yielding varieties in the trial and had plant heights of 35.3 and 30.9 inches.

Lodging was very minimal this year. Average lodging for the trial was 4.1 percent, and ranged from 0 percent (28 varieties) to 40 percent (ML03-409-BK4).

Protein average was 13.6 percent and ranged from 11.5 to 15.9 percent. The eleven hard red spring wheat varieties protein ranged from 13.6 to 16.1 percent, with only two entries not achieving 14% protein.

Table 2. Statewide variety testing program for winter wheat at the Central Oregon Agricultural Research Center, Madras, Oregon, planted September 2006.

Variety or line	Class	Yield bu/acre	Test weight (lbs/bu)	Heading (doy)	Height (in)	Lodging (%)	Protein (%)
Rod	SWW	131.2	56.1	157	38	53	10.1
OR2020787	SWW	129.6	58.5	150	37	25	10.6
Weatherford	SWW	127.6	58.8	156	39	7	10.5
ORH010083	SWW	127.5	59.9	157	36	3	10.3
ARS97135-9	CLUB	127.4	58.3	160	37	32	9.6
OR9901619	SWW	127.2	58.6	157	42	15	9.9
ORH010920	SWW	126.8	57.8	149	34	20	11.0
Simon	SWW	126.0	58.8	157	40	43	10.6
ORH010085	SWW	125.4	59.6	157	37	7	10.8
OR9900553	SWW	125.3	58.2	156	35	30	10.9
ORCF-102	SWW	124.9	59.3	156	40	33	10.3
Brundage96	SWW	124.1	57.9	155	37	0	10.4
ORH010837	SWW	124.0	56.8	149	35	30	10.6
OR2010239	SWW	123.7	58.3	153	37	20	10.5
Tubbs-06	SWW	123.7	57.4	156	39	38	10.3
OR2030554	SWW	122.6	58.8	155	36	28	10.5
OR2030237	SWW	122.1	56.5	153	37	27	10.9
OR2030239	SWW	122.0	57.8	154	37	0	9.9
Westbred 528	SWW	121.9	59.2	149	35	57	10.5
Stephens	SWW	120.6	57.6	153	35	82	11.0
Madsen	SWW	120.3	58.9	159	38	3	10.4
Tubbs	SWW	120.2	57.2	156	38	77	10.5
Chukar	CLUB	119.7	58.9	155	39	68	10.3
OR2010241	SWW	119.5	60.2	158	40	7	9.7
ID99-419	SWW	118.7	57.7	157	38	57	9.3
ORI202183C	SWW	118.7	58.8	157	37	38	11.3
BZ 6W99-456	SWW	118.1	60.7	151	37	13	11.2
Idaho 587	SWW	118.0	58.1	153	34	0	11.1
OR2030411	SWW	117.1	56.8	152	34	15	10.3
ARS99123	CLUB	117.1	59.0	155	38	67	9.9
ID92-22407A	SWW	116.9	59.1	158	40	73	10.2
ORCF-101	SWW	116.8	58.7	156	38	10	11.2
ORH010918	SWW	116.6	57.2	149	34	0	10.8
Masami	SWW	115.3	56.8	159	40	55	9.9
Coda	CLUB	113.6	60.5	159	44	63	10.1
ORSS-1757	SWW	112.5	57.9	155	37	70	10.2
ID99-435	SWW	110.9	56.3	155	40	55	10.7
ORI2042037	SWW	110.5	56.7	159	37	93	10.4
ARSC96059-1	CLUB	107.0	59.9	156	42	78	11.1
Gene	SWW	105.7	56.5	152	35	3	11.7
Mean		120.4	58.2	155	37	35	10.5
PLSD (0.05)		16.9	1.1	2.0	9.1	36	0.9
CV %		8.6	0.9	0.8	5.8	5.8	4.4

Table 3. Statewide variety testing program for spring wheat at the Central Oregon Agricultural Research Center, Madras, Oregon, 2006.

Variety or line	Class	Yield bu/acre	Test weight (lbs/bu)	Heading (doy)	Height (in)	Lodging (%)	Protein (%)
Alpowa	SWS	122.6	62.3	176	40.2	0	12.4
Nick	SWS	115.2	62.0	172	35.3	0	12.2
WA007964	SWS	114.5	59.8	178	38.6	0	11.5
Alturas	SWS	111.6	60.4	176	37.3	0	11.6
Blanca Grande	HWS	110.7	63.1	169	30.9	0	13.8
Lolo	HWS	110.4	61.4	174	37.6	0	14.2
ML107-11A, 99	HWS	110.1	60.0	177	36.9	0	12.8
ML042-37, A	SWS	108.3	58.9	177	35.9	0	12.9
Petit	SWS	107.6	62.3	169	30.6	0	11.7
UI Lochsa	HWS	107.1	59.7	173	37.3	0	14.1
UI Alta Blanca	HWS	106.1	61.3	176	40.2	0	14.2
ML455-17-OR81-2	HWS	106.1	58.8	176	36.9	0	13.5
Louise	SWS	103.7	60.8	176	38.6	0	11.8
Hank	HRS	103.4	59.2	171	33.6	0	14.8
OR4201261	HWS	102.9	60.8	178	33.3	0	13.0
UI Winchester	HRS	102.7	61.7	171	33.3	20	14.4
OR4201019	HRS	102.3	62.4	175	33.6	0	13.6
Macon	HWS	101.9	60.9	171	36.6	29	13.4
IDO630	WXY	101.7	61.2	176	34.3	0	12.4
Jefferson	HRS	101.5	60.4	173	35.9	0	14.9
OSU Check	SWS	101.3	61.1	177	35.6	13	12.6
ID0377S	HWS	101.3	60.4	174	37.9	0	14.3
Jerome	HRS	100.5	60.5	169	34.9	3	13.9
IDO629	WXY	100.0	60.7	176	37.9	0	11.7
Otis	HWS	99.9	60.4	174	38.6	0	14.2
Tara 2002	HRS	99.7	60.3	170	36.3	0	14.9
Buck Pronto	HRS	97.3	61.4	168	34.3	0	16.1
WA007998	HRS	94.6	58.8	172	37.6	0	15.9
BORL95/RABE	HRS	93.3	60.2	175	35.3	0	14.7
OR4201027	HRS	92.8	59.0	175	29.3	0	14.1
Winsome	HWS	90.8	59.2	177	32.3	0	13.0
OR4201262	HWS	87.0	60.6	178	31.3	0	12.9
Hollis	HRS	86.3	59.5	174	45.9	33	15.9
ML03-409-BK4	SWS	76.9	54.1	183	37.9	40	13.4
Mean		102.1	58.2	174	36.0	4.1	13.6
PLSD (0.05)		12.7	1.1	1.9	6.6	18.9	0.6
CV %		7.6	0.9	2.0	4.4	2.0	2.2