

2005 Winter and Spring Wheat Variety Trials

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Introduction

Cereals are an important rotational crop for central Oregon. In the recent past, soft white wheat has been the most important class for grain production. Since 1998, when soft white wheat accounted for 65 percent of the acreage grown, the hard red wheat class has accounted for 60-70 percent of the total acreage grown in 4 years out of the last 6, and 42-44 percent in the 2 other years, including 2005. Since 1998, wheat acreage has ranged from a high of 13,955 acres in 1998, to a low of 10,283 acres in 2002, in Crook, Deschutes, and Jefferson counties.

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 Grains 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 nine 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 Due to budget constraints, this web site is no longer updated, but the information is still available.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 4.5-ft by 20-ft plots at the rate of 30 seeds/ft² in 6-inch rows and 8-inch row spacing, with an Oyjord plot drill in a randomized block design, with 3 replications. The winter wheat trial was planted on October 1, 2004 and the spring wheat trial was planted on April 12, 2005.

Soil samples were taken on September 14, 2004 to a depth of 14 inches. The samples were analyzed by 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. The nitrogen supply goal for

spring wheat was 160 lb N/acre.

Table 1. Soil test results from samples taken on September 14, 2005, for the statewide Oregon Elite Wheat Variety Trials, at 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)
0-14	7.2	29	12	26	366	14.7

The winter wheat variety trial was fertilized with 450 lb/acre of 30-10-0-7 (135 lb N, 45 lb P₂O₅, 0 lb K₂O, 31.5 lb S per acre) on March 21, 2005. Estimated total nitrogen (soil + fertilizer N) available to the plants was 176 lb/acre. The spring wheat variety trial was fertilized with 450 lb/acre of 30-10-0-7 (135 lb N, 50 lb P₂O₅, 0 lb K₂O, 32 lb S per acre) on March 29, 2004. Estimated total nitrogen (soil + fertilizer N) in the top 13 inches of soil available to the plants was 176 lb/acre.

Weeds were controlled in winter wheat with an application of 1.3 pt/acre Starane[®] + Sabre[®], 0.4 oz/acre Harmony Extra, and 2pt/100gal nonionic surfactant on April 12, 2005. Weeds were controlled in spring wheat using 1.5 pt/acre Bronate[®] and 2pt/100gal nonionic surfactant on May 29, 2005.

The trials were irrigated as needed with a 30-ft by 40-ft spacing, solid-set sprinkler (9/64th-inch heads) irrigation system. Date of first irrigation for the winter wheat variety trial occurred on April 29, 2005 and the last irrigation occurred on July 14, 2005. Date of first irrigation for the spring wheat variety trial occurred on May 31, 2005 and the last irrigation was applied on August 1, 2005.

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 ft by 4.5 ft to 15 ft by 4.5 ft for the winter wheat variety trial and 15 ft by 4.5 ft for the spring wheat trial. 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 and processed at the OSU Hyslop Farm at Corvallis, Oregon. Statistical analyses were analysis of variance (ANOVA) using general linear model, PROC GLM, of SAS version 9.1 (SAS Institute 2002). Treatment means were separated by Fisher's protected least significant difference (PLSD) test.

Results and Discussion

Winter Wheat Trial

The winter wheat trial yield average was slightly more than 120 bu/acre, and the yields ranged from 106.1 to 135.4 bu/acre (Table 2.). For the top-yielding 16 entries, OR9901619 to Brundage96, there were no significant differences between these varieties with a yield range of 135.4 bu/acre to 123.5 bu/acre (PLSD 0.05, 12.0 bu/acre).

Average test weight for the trial was 62.1 lb/bu. Test weight ranged from 59.5 (ORCF-102) to 63.6 (Tubbs). The three top-yielding varieties all had test weights between 61.2 and 61.4 lb/bu.

Heading dates (day of year [doy] from January 1) ranged from 141 days to 152, or a range of 11 days. Oregon line ORH010920 was the earliest to head at 141 do, and IDO620 was the last entry to head at 152 do.

Average plant height was 37 inches for the trial. Heights ranged from 32 inches (ORH011481) to 41.3 inches (Chukar).

Lodging average was 5.7 percent for the trial. Lodging ranged from 0 percent (13 entries) to 43 percent (BZ 6W93-901a). There were 29 entries with 10 percent or less lodging scores.

Thousand-kernel weight and protein analyses were not performed due to budget constraints. Therefore there are no calculated grain N uptake and grain protein yield data (no protein data), or no calculated future seeding rate data (no 1,000-kernel weight data).

Spring Wheat Trial

The spring wheat trial average yield was almost 79 bu/acre and yields ranged from 29.3 to 106.2 bu/acre (Table 3.). For the top-yielding eight entries, Jerome to Alturas (a range of 106.2 bu/acre to 88.5 bu/acre), there were no significant differences (PLSD 0.05, 17.7 bu/acre) between varieties.

Heading date averaged 173 do, with a range of 170 (Nick) to 179 do (ML042-37A and Alpowa). Interestingly, the highest numerical yielder, Jerome, was one of the earliest heading varieties (171 do).

Average plant height for the trial was 35.5 inches, with a range of 31 inches (ML2-24spc5) to 40.9 inches (BZ998-447W). Jerome, a relatively new release, and OR4201262, an experimental line, were the two highest yielding varieties in the trial and had plant heights of 35.3 and 34.5 inches.

The average lodging was 2 percent for the trial with a range of 0 to 22 percent (Louise).

Average test weight for the trial was 61 lb/bu. Test weight ranged from 54.2 (Jubilee) to 63.4 lb/bu (WA007931). Jerome, OR4201262, WA007931, and Lolo, the top-yielding varieties, had test weights of 61.8, 62.2, 63.4, and 62.9 lb/bu, respectively. Thousand-kernel weight and protein analyses were not performed due to budget constraints.

Table 2. Statewide variety testing program for winter wheat, Madras, Oregon, 2005.

Variety or line	Class	Yield bu/acre	Test weight (lb/bu)	Heading (doy)	Height (in)	Lodging (%)
OR9901619	SWW	135.4	61.2	150	40.4	0
ORH010917	SWW	133.8	61.4	143	36.3	0
Westbrd528	SWW	133.5	61.5	142	38.7	8.3
Tubbs	SWW	131.7	63.6	149	39.9	3.3
ORH010920	SWW	131.6	60.8	141	34.1	0.7
OR3970965	SWW	130.7	62.9	149	37.4	3.3
ORSS-1757	SWW	128.4	62.9	147	37.3	0
OR2010239	SWW	126.9	61.5	148	36.7	0.7
ORH010918	SWW	126.4	62.1	142	34.5	0
Mohler	SWW	126.3	63.1	149	35.4	0
IDO587CL	SWW-CLFD	125.9	62.0	145	35.7	3.3
ORH011481	SWW	125.9	61.9	142	23.3	0
BZ 6W93-901a	SWW	124.4	62.0	146	40.0	43.3
OR941611	SWW	124.3	61.0	145	38.7	23.3
Weatherford	SWW	123.8	62.0	151	37.5	0.7
Brundage96	SWW	123.5	62.4	149	35.4	3.3
ID92-16004A	SWW	121.9	61.4	149	38.5	11.7
Gene	SWW	121.3	61.7	145	34.3	1.7
OR2010241	SWW	121.3	63.2	146	37.1	1.7
Masami	SWW	120.4	61.7	151	38.7	0
Dune	SWW	120.1	62.2	149	37.7	1.7
Finch	SWW	120.0	62.6	151	39.3	0
ORH010085	SWW	119.7	62.8	147	35.3	21.7
ORCF-102	SWW-CLFD	119.6	59.5	149	37.5	5
ORI202183C	SWW-CLFD	119.4	62.4	149	36.3	1.7
Madsen	SWW	118.9	61.2	150	38.2	3.3
ORH010083	SWW	118.8	63.3	149	35.2	0
OR9901887	SWW	118.4	62.9	150	38.2	0
Rod	SWW	117.0	62.9	149	40.0	10
Chukar	SWW	116.9	62.0	151	41.3	0
OR2010007-05C	SWW-CLFD	116.8	62.3	150	39.5	1.7
ORCF-101	SWW-CLFD	116.3	62.8	149	36.9	3.3
Stephens	SWW	114.6	61.5	145	36.9	33.3
Simon	SWW	112.3	62.0	149	38.2	3.3
ID92-22407A	SWW	111.7	61.9	151	35.2	0.7
OR9900553	SWW	110.8	62.8	149	36.5	0
ARS99123	SWW	110.7	62.7	146	37.4	1.7
IDO620	SWW	109.5	63.3	152	38.6	6.7
Coda	SWW	106.5	61.7	151	40.2	30
ORH012183	SWW	106.1	62.7	142	33.7	0
Mean		121.0	62.1	147.7	37.0	5.7
PLSD (0.05)		12.0	2.4	1.6	12.4	19.2
CV%		7.30	1.90	0.8	9.69	245.9

Table 3. Statewide variety testing program for spring wheat, Madras, Oregon, 2005.

Variety or line	Class	Yield bu/acre	Test weight (lb/bu)	Heading (doy)	Height (in)	Lodging (%)
Jerome	HRS	106.2	61.8	171	35.3	0
OR4201262	HWS	100.3	62.2	172	34.5	0
WA007931	HWS	98.2	63.4	172	40.4	2
Lolo	HWS	95.6	62.9	171	36.4	0
ML042-37A	SWS	94.9	61.5	177	35.9	0
Jefferson	HRS	92.0	61.7	174	37.9	2
WA007964	SWS	91.6	60.7	173	37.5	3
Alturas	SWS	88.5	59.9	173	35.2	2
BZ998-447W	HWS	88.1	60.8	172	40.9	5
Nick	SWS	87.1	59.9	170	38.1	15
Louise	SWS	86.7	59.7	171	39.8	22
B. Pronto	HRS	84.9	62.3	174	38.2	0
Hank	HRS	84.2	60.0	172	34.1	0
IDO597	HWS	84.0	61.7	174	35.0	0
IDO377S	HWS	83.9	62.6	171	35.4	0
B. Grande	HWS	83.2	62.7	173	33.0	0
OR4201261	HWS	82.9	61.4	171	34.1	0
OR4201219	HRS	82.3	61.3	172	33.3	0
WA007952	SWS	79.3	56.9	172	35.0	0
Alpowa	SWS	78.8	61.1	177	36.5	3
Macon	HWS	74.4	60.1	173	37.3	13
IDO593	HRS	72.6	60.1	173	34.3	0
ML04115A98	SWS	72.0	61.2	175	33.6	3
IDO632	SWS	68.4	58.8	174	34.4	0
ML1007225	HWS	60.5	59.9	174	33.1	0
OR4870532	SWS	58.3	56.5	171	34.3	0
Winsome	HWS	57.4	59.0	175	31.8	0
OR4990115	HRS	57.0	61.8	172	34.8	0
ML2-24spc5	HWS	46.6	61.0	174	31.0	0
Jubilee	SWS	29.3	54.2	174	36.2	0
Mean		79.0	61	173	35.6	2
PLSD (0.05)		17.7	-	4.5	6.3	-
CV%		13.69	-	1.89	5.12	-