

## 2007 Winter and Spring Wheat Variety Trials

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### Introduction

Cereals are an important rotational crop for central Oregon. Until recently, 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 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 10,283 acres grown 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 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, one of 12 locations around Oregon that participate in the statewide trials. Results are summarized and reported 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 Due to budget constraints, this web site is no longer updated, but the information is still available.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/ft<sup>2</sup>, 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 26, 2006 and the spring wheat trial was planted on April 16, 2007.

Soil samples were taken to a depth of 14 inches, the extent of the soil depth. The samples were analyzed by Agri-Check Laboratory at Umatilla, Oregon. Soil test results for winter wheat and spring wheat are presented in Tables 1 and 2, respectively. 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 March 13, 2007, for the statewide Oregon Winter Elite Wheat Variety Trials, at Central Oregon Agricultural Research Center, Madras, Oregon.

Soil depth	pH	NO <sub>3</sub> <sup>1</sup>	NH <sub>4</sub>	P	K	S
(in)		(lb/acre)	(lb/acre)	(ppm)	(ppm)	(ppm)
0-14	6.3	185	15	16	135	12.5

<sup>1</sup>NO<sub>3</sub> = nitrate, NH<sub>4</sub> = ammonia, P = phosphorus, K = potassium, S = sulfur.

Table 2. Soil test results from samples taken on March 13, 2007, for the state-wide Oregon Spring Elite Wheat Variety Trials, at Central Oregon Agricultural Research Center, Madras, Oregon.

Soil depth	pH	NO <sub>3</sub> <sup>1</sup>	NH <sub>4</sub>	P	K	S
(in)		(lb/acre)	(lb/acre)	(ppm)	(ppm)	(ppm)
0-14	6.9	110	13	22	332	10.3

<sup>1</sup>NO<sub>3</sub> = nitrate, NH<sub>4</sub> = ammonia, P = phosphorus, K = potassium, S = sulfur.

The winter wheat was not fertilized; estimated total nitrogen (soil plus fertilizer N) available to the plants was 185 lb/acre. The spring wheat variety trial was fertilized with 250 lb/acre of 16-16-16 (40 lb N, 40 lb P<sub>2</sub>O<sub>5</sub>, 40 lb K<sub>2</sub>O per acre) on April 16, 2007. Estimated total nitrogen (soil plus fertilizer N) in the top 14 inches of soil available to the plants was 150 lb/acre.

Weeds were controlled in winter wheat with an application of 1.5 pt/acre 24-D and 1.5 oz/acre of Banvel<sup>®</sup> product, and 2 pt/100 gal non-ionic surfactant on April 21, 2006. Weeds were controlled in spring wheat using 1.5 pt/acre Bronate<sup>®</sup>, 3 oz/acre Banvel, and 2 pt/100 gal non-ionic surfactant on May 31, 2006.

The trials were irrigated as needed with a 30-ft by 40-ft spacing, solid-set sprinkler (9/64-inch heads) irrigation system. Date of first irrigation for the winter wheat variety trial occurred on April 17, 2007 and the last irrigation occurred on June 2, 2007. Date of first irrigation for the spring wheat variety trial occurred on April 20, 2007 and the last irrigation was applied on July 17, 2007.

Heading dates were recorded when 50 percent heading occurred. Just prior to harvest, lodging scores (percent of plot) and plant height (inches) measurements were taken. Harvested area was approximately 15 ft by 4.5 ft for the winter and spring wheat trial. A Hege plot combine was used to harvest the entries. Harvest dates for the winter wheat trial was August 14, 2006 and August 13, 2006 for the spring wheat trial. The grain samples were shipped to and processed at the OSU Hyslop Farm at Corvallis, Oregon, and percent protein was predicted by NIRS whole grain analyzer. Statistical analyses were by analysis of variance (ANOVA) using general linear model, PROC GLM, of SAS version 9.1 (SAS Institute, Cary, NC, 2002). Treatment means were separated by Fisher's protected least significant difference (PLSD 0.05) test.

## Results and Discussion

### *Winter Wheat Trial*

The winter wheat trial yield average was 149.7 bu/acre, and yields ranged from 113.5 to 172.3 bu/acre (Table 3). For the top-yielding 10 entries, ‘Tubbs’ to ‘Stephens’, there were no significant differences between varieties with a yield range of 157.0 to 172.3 bu/acre (PLSD 0.05, 16 bu/acre).

Average test weight for the trial was 60.5 lb/bu. Test weight ranged from 58.3 (‘Masami’) to 62.9 lb/bu (ARSC96059-1).

Heading dates ranged from 151.3 days from January 1 (doy) to 157.7, or a range of 6.4 days. Oregon line ORH010837 was the earliest to head at 151.3 (doy); ARS97135-9 was the last entry to head at 157.7 (doy).

Average plant height was 40.7 inches for the trial. Heights ranged from 34.0 inches (‘Gene’) to 47.0 inches (ARSC96059-1).

Lodging average was a bit higher than in previous years with 11.1 percent for the trial. Lodging ranged from 0 percent (16 entries) to 66.7 percent (ARSC96059-1); 26 entries had scores of 10 percent or less.

Protein average was 10.2 percent and ranged from 9.4 to 11.0 percent.

### *Spring Wheat Trial*

The spring wheat trial average yield was 102.1 bu/acre and yields ranged from 76.9 bu/acre to 122.6 bu/acre (Table 4.). For the top-yielding seven entries, ML107-11A, 99 to ‘Alpowa’ (a range of 110.1 to 122.6 bu/acre), there were no significant differences (PLSD 0.05, 12.7 bu/acre) between varieties.

Average plant height for the trial was 36.0 inches, with a range of 31.3 inches (OR4201262) to 45.9 inches (‘Hollis’). ‘Jerome’ and OR4201262, one relatively new release and one experimental line, were the two highest yielding varieties in the trial and had plant heights of 35.3 and 34.5 inches.

Average test weight for the trial was 58.2 lb/bu. Test weight ranged from 54.1 (ML03-409-BK4) to 63.1 lb/bu (‘Blanca Grande’).

Lodging was very minimal this year. Average lodging for the trial was 4.1 percent, and ranged from 0 to 40 percent (ML03-409-BK4). Protein average was 13.6 percent and ranged from 11.5 to 15.9 percent.

Table 3. Statewide variety testing program for winter wheat, Central Oregon Agricultural Research Center, Madras, OR, 2007.

Variety or line	Class <sup>1</sup>	Yield bu/acre	Test weight (lbs/bu)	Heading (doy)	Height (in)	Lodging (%)	Protein (%)
Tubbs	SWW	172.3	60.6	154.0	42.0	0.0	9.9
OR2050910	SWW	170.7	60.4	155.0	40.0	13.3	10.5
ID9364901A	SWW	169.0	61.7	155.0	40.0	11.7	9.4
OSUPOP-27-3	SWW	165.8	60.0	153.7	38.7	0.0	10.2
99x1009-23	SWW	163.5	60.0	155.0	42.0	13.3	9.1
Tubbs-06/Rod Blend	SWW	162.7	59.8	153.7	42.7	0.0	9.5
AP 700CL	SWW	160.1	61.4	154.0	43.0	0.0	10.1
Salute	SWW	157.8	60.6	153.7	41.7	0.0	9.6
Simon	SWW	157.5	60.5	154.7	42.0	30.0	11.2
Stephens	SWW	157.0	61.1	152.0	38.7	0.0	10.3
Weatherford	SWW	156.2	60.9	156.0	43.3	3.3	10.2
Tubbs-06	SWW	155.5	59.8	154.0	42.3	3.3	9.9
ID992-22407A	SWW	155.5	61.1	155.3	44.7	1.7	9.4
Brundage 96	SWW	155.3	60.4	154.0	38.7	0.0	10.7
Westbred 528	SWW	154.4	60.9	151.3	37.7	3.3	10.4
ID99-435	SWW	154.1	59.5	154.0	43.7	1.7	10.2
ORCF-102	SWW	153.7	61.4	153.3	42.0	0.0	10.3
ORH010837	SWW	152.3	59.8	151.3	35.7	21.7	10.8
OR2050913	SWW	151.9	59.9	157.3	40.3	0.0	9.7
Madsen	SWW	150.9	60.6	155.7	39.0	6.7	10.7
OR2010239	SWW	150.6	60.3	154.0	38.7	0.0	9.5
Goetze (ORH010920)	SWW	150.4	60.6	151.7	35.7	0.0	10.2
OR2050914	SWW	150.3	59.5	155.3	38.7	0.0	10.0
ORSS-1757	SWW	149.9	59.6	153.7	39.0	13.3	9.8
Xerpha (WA7973)	SWW	148.2	60.8	155.0	41.7	3.3	10.2
BU6W00-523	SWW	148.2	60.9	153.3	37.7	0.0	10.3
OR9901619	SWW	146.3	60.2	155.0	42.3	3.3	9.7
IDAHO 587	SWW	143.6	60.9	152.7	37.7	5.0	10.6
CARA	CLUB	140.5	60.4	157.3	43.7	6.7	10.6
ORH10085	SWW	140.2	61.8	154.3	37.0	0.0	10.7
ARS970278-2	CLUB	138.3	60.9	153.3	45.7	60.0	9.7
Masami	SWW	137.6	58.3	157.0	42.7	23.3	10.5
ORCF-101	SWW	135.9	60.4	153.7	38.3	0.0	10.3
ORI2042037	CLUB	127.0	59.4	157.7	42.0	71.7	10.0
ARS97C96059-1	CLUB	126.1	62.9	155.3	47.0	66.7	10.8
ARS00235	CLUB	116.1	61.1	156.7	47.0	48.3	10.5
Gene	SWW	113.5	59.5	152.7	34.0	0.0	11.0
Mean		149.7	60.5	154.4	40.7	11.1	10.2
PLSD (0.05)		16.0	1.3	1.8	2.2	20.4	0.8
CV%		6.5	1.3	0.7	3.3	112.4	4.8

<sup>1</sup>SWW = soft white winter wheat.

Table 4. Statewide variety testing program for spring wheat, Central Oregon Agricultural Research Center, Madras, OR, 2007.

Variety or line	Class <sup>1</sup>	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
Pettit	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

<sup>1</sup>SWS = soft white spring, HWS = hard white spring, HRS = hard red spring, WXY = waxy.