

# 2008 Winter and Spring Wheat Variety Trials

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## Introduction

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. These variety trials support breeding efforts, end-use quality testing, variety release decisions, variety quality recommendations, and provide important information on variety performance to Oregon wheat growers.

Yield, height, lodging, and heading dates were recorded for Madras, one of nine locations around Oregon that participate in the Oregon Elite Yield Trial. 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 site 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 Due to budget constraints, this web site is no longer updated, but the information is still available.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 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 25, 2007 and spring wheat trials were planted on April 7, 2008.

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.

Table 1. Soil test results from samples taken on October 23, 2007, for the statewide Oregon Elite Wheat Variety Trials, at Central Oregon Agricultural Research Center, Madras, Oregon.

Soil depth (in)	pH	NO <sub>3</sub> <sup>1</sup> (lb/acre)	NH <sub>4</sub> (lb/acre)	P (ppm)	K (ppm)	S (ppm)
0-14	7.1	27	11	31	444	15.9

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

The winter wheat variety trials were fertilized with 550 lb/acre of 30-10-0-7 (165 lb N, 55 lb P<sub>2</sub>O<sub>5</sub>, 38.5 lb S per acre) on March 25, 2008. Estimated total nitrogen (soil plus fertilizer N) in the top 14 inches of soil available to the plants was 192 lb/acre.

Weeds were controlled in winter wheat with an application of 1.5 pt/acre Bronate<sup>®</sup> and 4.0 oz/acre of Banvel<sup>®</sup> product, and 2 pt/100 gal non-ionic surfactant on April 11, 2008. Weed control for the spring wheat trial included the application of 1.2 pt/acre of 24-D Amine and 2 oz/acre of Banvel<sup>®</sup> on May 19, 2008

Cereal leaf beetles were abundant in the spring wheat trial in June and Lorsban<sup>®</sup> was applied through irrigation at 1.0 pt/acre to control them on June 13, 2008.

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 14, 2008 and the last irrigation occurred on July 15, 2008. Date of first irrigation for the spring wheat trial occurred on April 24, 2008 and ended on July 25, 2008. Yield was corrected to 12 percent moisture and protein to 10 percent moisture.

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 date for the winter wheat trial was August 13, 2008 and August 28, 2008 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 127.8 bu/acre, and yields ranged from 103.5 to 142.8 bu/acre (Table 2). For the top-yielding 26 entries, 'Goetze' to 'ORCF-101', there were no significant differences between varieties, with a yield range of 125.6 to 142.8 bu/acre (PLSD 0.05, 18.8 bu/acre). Yield data were corrected to 12 percent moisture.

Average test weight for the trial was 59.6 lb/bu. Test weight ranged from 57.0 ('OR2051126') to 61.7 lb/bu ('Skiles' ORH010085).

Heading dates ranged from 152.7 days from January 1 (day of year, doy) to 167.3, or a range of 14.6 days. Oregon line 'Goetze' was the earliest to head at 152.7 doy; 'Masami' was the last entry to head at 167.3 doy.

Average plant height was 35.8 inches for the trial. Heights ranged from 31.3 inches

(‘Goetze’) to 40.3 inches (‘OR9901619’).

Lodging average was a bit higher than in previous years with 24.8 percent for the trial. Lodging ranged from 0 percent (8 entries) to 73.3 percent (‘OR2050301’); 14 entries had scores of 10 percent or less.

Protein average was 10.4 percent and ranged from 9.4 to 12.2 percent. A protein value of 10.5 is the average goal of the trial and is a benchmark for the correct amount of nitrogen fertilizer.

‘Goetze’ (‘ORH010920’) is a soft white winter wheat and was released in fall of 2007. ‘Goetze’ has a superior grain yield potential in state trials, similar or better than ‘Tubbs’, but is less cold tolerant than ‘Stephens’. ‘Goetze’ matures reasonably early, has short straw, and has shown good disease resistance to stripe rust.

‘ORCF-101’ and ‘ORCF-102’ are soft white winter wheats that possess CLEARFIELD<sup>®</sup> herbicide resistance technology. ‘ORCF-102’ has disease response similar to its parent lines ‘Madsen’ and ‘Weatherford’. Height and lodging are both favorable to central Oregon production under wheel lines. ‘ORCF-102’ yielded in the top five varieties and matures mid to late in the season.

### ***Spring Wheat Trial***

The spring wheat trial yield average was 114.4 bu/acre, and yields ranged from 91.5 to 142.7 bu/acre (Table 3). For the top-yielding five entries, ‘Cabernet’ to ‘Merill’, there were no significant differences between varieties with a yield range of 127.4 to 142.7 bu/acre (PLSD 0.05, 15.6 bu/acre).

Average test weight for the trial was 60.3 lb/bu. Test weight ranged from 56.3 lb/bu (‘77-154-98’) to 63.7 lb/bu (‘B02-0081’).

Heading dates ranged from 170 days from January 1 (doy) to 182, or a range of 12 days. ‘Blanca Grande’ was the earliest to head at 170 do; ‘77-154-098’ was the last entry to head at 182 do.

Average plant height was 36 inches for the trial. Heights ranged from 31 inches (‘Patwin’ and ‘RS150076R’) to 42 inches (‘OR4041451’).

Lodging average was a bit higher than in previous years with 17 percent for the trial. Lodging ranged from 0 percent (3 entries) to 65 percent (‘Louise’); 14 entries had scores of 10 percent or less.

Protein average was 12.1 percent and ranged from 10.5 to 14.0 percent. All of the hard white spring wheat entries had acceptable protein levels of greater than 12 percent. Hard red spring wheat varieties did not reach the acceptable protein goal of 14 percent. ‘Cabernet’, the highest yielding entry, only had 11.4 percent protein. The trial was not fertilized for hard red spring wheat.

Table 2. Statewide variety testing program for winter wheat, Madras, Oregon, 2008.

Variety or line	Class <sup>1</sup>	Yield bu/acre	Test weight (lbs/bu)	Heading (doy) <sup>2</sup>	Height (in)	Lodging (%)	Protein (%)
Goetze (ORH010920)	SWW	142.8	59.5	152.7	31.3	0.0	10.2
ORF2 267-03	SWW	141.0	61.2	158.7	37.7	8.3	9.4
OR2040728	SWW	140.3	59.0	156.0	34.0	10.0	10.7
Tubbs-06/Rod Blend	SWW	139.5	60.4	164.0	39.3	38.3	10.2
ORCF-102	SWW	139.4	60.7	160.3	36.0	0.0	9.9
ID99-435	SWW	139.0	59.9	159.3	38.7	20.0	10.1
BU6W00-523	SWW	138.8	61.8	158.0	34.7	1.7	10.1
OR2040726	SWW	138.3	60.0	155.7	31.7	0.0	10.6
Tubbs-06	SWW	137.5	59.9	157.7	36.7	13.3	10.0
OSUPOP-35-2CL	SWW	136.5	60.4	157.3	36.0	20.0	10.1
Skiles (ORH010085)	SWW	135.9	61.7	162.0	34.0	11.7	10.7
OR2050293	SWW	135.5	59.6	156.7	33.3	11.7	10.6
Salute	SWW	134.5	59.4	157.0	34.7	0.0	10.4
OR2050299	SWW	133.6	59.7	159.3	36.3	10.0	10.9
Tubbs	SWW	132.6	59.7	161.3	37.7	1.7	10.0
OR9901619	SWW	132.5	60.6	165.3	40.3	28.3	10.3
OR2050301	SWW	132.2	58.3	157.7	36.7	73.3	10.6
ID9364901A	SWW	132.0	60.5	162.0	35.7	38.3	10.2
AP700CL	SWW	131.3	59.9	158.3	36.7	16.7	10.8
Idaho 587	SWW	129.5	59.6	154.0	33.3	25.0	11.1
OR2051126	SWW	129.3	57.0	158.7	34.7	23.3	9.9
IDO 0859	SWW	129.0	60.0	158.0	32.7	0.0	10.5
Westbred 528	SWW	128.9	61.5	152.7	35.3	41.7	10.7
Weatherford	SWW	128.3	61.1	165.3	37.0	13.3	10.7
ORSS-1757	SWW	125.9	60.3	162.0	36.7	10.0	9.3
ORCF-101	SWW	125.6	59.7	158.3	34.3	0.0	10.6
OR2050910	SWW	123.3	59.6	166.3	36.3	43.3	10.3
ORH010837	SWW	122.9	57.6	152.7	33.0	66.7	10.6
Cara	CLUB	122.7	60.6	164.7	36.7	0.0	10.7
Stephens	SWW	122.5	60.1	153.0	33.7	40.0	10.3
Masami	SWW	119.6	60.4	167.3	38.0	30.0	10.2
Legion	SWW	119.6	59.4	159.7	36.7	53.3	10.1
Gene	SWW	116.7	58.9	155.0	30.3	0.0	11.7
Madsen	SWW	116.6	60.1	166.7	34.7	13.3	10.5
Bitterroot	SWW	110.3	60.9	163.7	38.0	65.0	10.3
Xerpha	SWW	107.8	60.8	166.7	39.0	48.3	10.7
ORCF-103	SWW	107.7	60.1	165.0	38.7	68.3	9.6
OR2050914	SWW	104.9	59.2	166.3	37.0	65.0	10.4
Coda	CLUB	103.5	61.5	165.7	38.3	56.7	12.2
Mean		127.8	59.6	160.0	35.8	24.8	10.4
PLSD (0.05)		18.8	2.0	3.8	3.2	35.8	1.0
CV%		9.0	7.8	1.5	5.5	88.8	5.6

<sup>1</sup>SWW = soft white winter wheat, Club = club wheat, <sup>2</sup>DOY = day of year from January 1.

Table 3. Statewide variety testing program for spring wheat, Madras, Oregon, 2008.

Variety or line	Class <sup>1</sup>	Yield bu/acre	Test weight (lbs/bu)	Heading (doy) <sup>2</sup>	Height (in)	Lodging (%)	Protein (%)
Cabernet	HRS	142.7	61.0	175	32	2	11.4
RI10348W	HWS	137.8	60.8	171	33	0	12.3
Lassik	HRS	135.3	61.2	179	33	0	11.9
B02-0081	HRS	133.1	63.7	174	34	3	12.5
Merill	SWS	127.4	59.1	180	37	0	11.1
WA008039	SWS	125.5	60.9	176	38	30	10.6
Blanca Grande	HWS	123.0	62.1	170	32	8	13.2
BZ604-008	SWS	122.9	60.8	173	36	45	10.9
Alturas	SWS	121.6	60.7	176	37	13	10.5
OR4990114	HRS	119.9	61.3	174	36	13	12.0
Clear White	HWS	119.9	61.3	170	33	3	12.5
BZ601-002	SWS	119.0	60.2	174	38	30	11.4
Hank	HRS	118.8	60.1	175	36	2	13.1
IDO377S	HWS	117.5	61.8	176	37	7	12.3
RS150076R	HRS	112.1	58.9	174	31	5	12.3
OR4031111	HRS	110.9	59.8	177	39	17	12.0
Alpowa	SWS	109.8	61.0	178	36	36	12.7
77-154-98	SWS	109.6	56.3	182	37	30	10.9
RSI50603R	HRS	108.8	60.2	173	34	3	13.6
BZ901-717	HRS	105.1	61.5	172	40	17	14.0
Nick	SWS	104.5	60.8	172	37	25	11.6
Jefferson	HRS	103.2	61.6	176	38	43	12.4
WA008008	SWS	102.8	59.6	173	38	20	11.4
Patwin	HWS	101.4	58.3	180	31	5	13.7
WA007954	HRS	101.3	60.0	177	37	10	13.0
BZ903-445-WP	HWS	100.4	58.6	176	35	25	14.0
Louise	SWS	99.5	58.3	176	39	65	11.4
37C-3	HWS	93.4	59.1	180	34	3	12.4
OR4041451	SWS	91.5	58.6	181	42	23	11.2
Mean		114.4	60.3	175	36	17	12.1
LSD (0.05)		15.6	1.3	2.3	2.8	38	1.0
CV (%)		8.4	1.3	2.0	2.0	2.0	5.2

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

<sup>2</sup>DOY= day of year from January 1.