

2009 Winter and Spring Wheat Variety Trials

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Introduction

Cereals are an important rotational crop for central Oregon. Soft white wheat has been the most important class for grain production over the years, but there have been a few years that hard red spring wheat acres were greater than the soft white wheat acres. Wheat grown in 2009 consisted of about 3,940 acres of hard red wheat (mostly hard red spring) and 10,280 acres of mostly soft white wheat. The acreage in wheat has been approximately 28 percent hard red and 72 percent white wheat since 1998; acreage in wheat has ranged from a high of 14,200 acres in 2009, to a low of 10,283 acres in 2002, in Crook, Deschutes, and Jefferson counties.

Central Oregon is well situated for 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.

Results of the variety trial at Madras are summarized and also 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.

Methods and Materials

The entries were planted into plots, 4.5 ft by 20 ft, at the rate of 30 seeds/ft² in 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 2, 2009 and the spring wheat trial was planted on April 2, 2009. Previous cropping history for both trials was a field with 4 years of alfalfa and 1 year of summer fallow.

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 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 23, 2008 for the statewide Wheat Variety Trials, at Central Oregon Agricultural Research Center, Madras, Oregon.

Soil depth	pH	NO ₃ ¹	NH ₄	P	K	S
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(in)		(lb/acre)	(lb/acre)	(ppm)	(ppm)	(ppm)
0-14	6.3	265	58	35	280	15.2

¹NO₃ = nitrate, NH₄ = ammonia, P = phosphorus, K = potassium, S = sulfur.

The winter wheat and spring wheat trials were not fertilized as estimated nitrate nitrogen (soil plus fertilizer N) available to the plants was 265 lb/acre.

Weeds were controlled in the winter wheat with an application of 1 pt/acre of Bronate[®] Advanced product, and 2 pt/100 gal non-ionic surfactant on April 16, 2009. Weeds were controlled in the spring wheat using 1 pt/acre Bronate Advanced and 2 pt/100 gal non-ionic surfactant on May 27, 2009.

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 20, 2009 and the last irrigation occurred on June 6, 2009. Date of first irrigation for the spring wheat variety trial occurred on April 21, 2009 and the last irrigation was applied on July 17, 2009.

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 11, 2009 and August 18, 2009 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. Yield is presented on a 12 percent moisture basis. 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 139.0 bu/acre, and yields ranged from 112.0 to 160.5 bu/acre (Table 2). For the top-yielding 17 entries, 'OR2060431' to 'Masami', there were no significant differences between varieties with a yield range of 140.0 to 160.5 bu/acre (PLSD 0.05, 20.5 bu/acre). Interestingly, the top nine yielding entries were OSU experimental lines.

Average test weight for the trial was 61.4 lb/bu. Test weight ranged from a low of 58.4 lb/bu (OR2060431) to 63.8 lb/bu ('Skiles').

Heading dates ranged from 147.7 days from January 1 (day of year [doy]) to 154.0, a range of only 6.3 days,. 'Goetze' was the earliest to head at 147.7 (doy); 'Masami' was the last entry to head at 154.0 (doy).

Average plant height was 36.1 inches for the trial. Heights ranged from 30.7 inches ('Gene') to

41.3 inches ('Coda').

The percent lodging average was lower than in previous years, 5.1 percent for the trial. Lodging ranged from 0 percent (24 entries) to 68.3 percent (Coda); only 8 entries had scores of 13 percent or more.

Protein average was 8.4 percent and ranged from 7.4 to 9.3 percent; these numbers indicate the crop was short on nitrogen fertility.

Spring Wheat Trial

The spring wheat trial average yield was 130.1 bu/acre and yields ranged from 87.1 bu/acre to 157.9 bu/acre (Table 2.). For the top-yielding 18 entries, 'IDO377S' to 'IDO599' (a range of 123.9 to 157.9 bu/acre), there were no significant differences (PLSD 0.05, 34.4 bu/acre) between varieties.

Average plant height for the trial was 36.6 inches, with a range of 29.7 inches ('Cabernet') to 41.3 inches ('OR40401451').

Test weights were excellent with an average test weight of 63.5 lb/bu for the trial. Test weight ranged from 61.8 lb/bu ('Cleda') to 65.1 lb/bu ('Bullseye').

Percent lodging was very minimal this year. Average lodging for the trial was 11.2 percent, and ranged from 0 (24 entries) to 88.3 percent ('WA008047').

Protein average was 11.8 percent and ranged from 10.4 ('Alturas' and 'IDO599') to 13.8 percent ('BZ901-717'). All but one variety ('OR4051328') of the hard white spring wheat entries have acceptable protein percentage greater than 12 percent. Two hard red spring wheat varieties, 'Kelse' (13.5%) and BZ901-7171 (13.8%), came close to making acceptable protein of 14 percent. Bullseye, the highest yielding hard red spring entry, made only 12.2 percent protein. The trial was not fertilized for hard red spring wheat—no nitrogen application was made at heading.

Some newly released varieties include 'JD', 'Kelse', and 'Babe'. 'JD' has excellent yield potential across a broad range of production conditions and has exceptional milling and baking quality. 'Babe' is targeted as a high yielding replacement for varieties, such as 'Alpowa', in the intermediate to high rainfall zones. 'Babe' has improved emergence, high test weight, enhanced stripe rust resistance and improved end-use quality for making cookies, cakes, and pastries compared to 'Alpowa'.

Table 2. Statewide variety testing program for winter wheat, Central Oregon Agricultural Research Center, Madras, OR, 2009.

Variety or line	Class ¹	Yield bu/acre	Test weight (lbs/bu)	Heading (doy)	Height (in)	Lodging (%)	Protein (%)
OR2060431	SWW	160.5	58.4	150.7	35.7	0.0	7.9
OR2050853	SWW	160.4	60.8	151.3	39.0	1.7	7.4
OR2050910	SWW	154.7	59.2	152.0	37.0	1.7	8.5
OR2050301	SWW	154.4	59.9	151.3	35.7	7.3	8.1
OR2060926	SWW	154.3	59.0	150.7	37.0	0.0	8.7
OR2040726	SWW	153.7	62.5	151.0	34.0	0.0	8.5
OR2060395	SWW	153.5	60.1	149.7	35.3	0.0	8.0
OR2060324	SWW	153.4	59.5	153.7	34.3	0.0	8.5
OR2060916	SWW	148.5	58.8	152.7	36.0	6.7	8.0
Tubbs	SWW	147.1	61.8	151.7	37.3	0.0	8.0
Westbred 526	SWW	144.9	62.4	149.7	34.7	1.7	8.4
AP100CL	SWW	144.2	62.2	151.7	39.0	0.0	8.5
Legion	SWW	143.9	61.1	151.3	37.3	15.0	7.7
OR2050293	SWW	141.7	62.7	150.7	33.7	0.0	8.2
Tubbs 06	SWW	141.5	61.8	151.3	38.0	13.3	8.3
OR2060181	SWW	140.7	60.0	150.0	35.0	0.0	8.1
Masami	SWW	140.0	61.2	154.0	40.0	5.7	8.3
Goetze/Skiles Blend	SWW	139.8	62.8	148.0	34.0	0.0	8.9
ORI2060306	SWW	137.4	61.5	151.0	35.7	0.0	8.5
AP Legacy	SWW	137.3	62.7	152.0	38.7	0.0	8.1
Stephens	SWW	136.4	61.5	150.0	33.7	2.3	8.6
ORCF-102	SWW	136.1	61.7	152.3	36.7	0.7	8.6
IDO0859	SWW	134.8	61.8	151.7	32.3	0.0	8.8
Cara	CLUB	134.7	60.5	152.3	37.7	0.0	8.5
Brundage 96	SWW	134.4	61.5	151.3	34.3	0.0	8.5
ORCF-101/ORCF-102	SWW	133.5	61.8	151.0	35.3	0.0	8.8
Xerpha	SWW	133.2	61.7	152.3	38.7	0.0	8.0
Madsen	SWW	132.5	61.5	152.3	35.3	0.0	8.7
Skiles	SWW	131.6	62.8	152.0	34.0	2.3	8.9
Skiles/Tubbs 06 Blend	SWW	131.2	62.5	151.7	36.0	0.0	8.6
Gene	SWW	131.1	62.2	150.7	30.7	0.0	8.9
ORCF-101	SWW	130.4	61.8	151.3	35.7	5.7	8.6
ORCF-103	SWW	128.4	61.1	153.0	38.7	0.0	8.3
Goetze	SWW	128.2	62.1	147.7	33.3	0.0	8.7
ID D-05	SWW	128.2	63.4	150.3	33.7	0.0	9.0
ORSS-1757	SWW	124.8	61.1	150.7	34.7	0.0	7.7
Coda	CLUB	123.9	62.4	152.3	41.3	68.3	9.3
Bitterroot	SWW	123.8	61.4	152.3	38.7	20.0	8.1
Salute	SWW	123.3	61.7	150.0	37.0	1.7	8.6
Bruneau	SWW	112.0	62.8	152.3	37.7	48.3	8.5
Mean		139.0	61.4	151.3	36.1	5.1	8.4
PLSD (0.05)		20.6	0.9	1.6	2.3	17.3	0.5
CV%		9.0	0.9	0.7	3.9	210.0	3.9

¹SWW = soft white winter wheat, Club = club wheat.

Table 3. Statewide variety testing program for spring wheat, Central Oregon Agricultural Research Center, Madras, OR, 2009.

Variety or line	Class ¹	Yield bu/acre	Test weight (lbs/bu)	Heading (doy)	Height (in)	Lodging (%)	Protein (%)
IDO599	SWS	157.9	63.1	163.0	37.0	0.0	10.4
OR4051328	HWS	155.6	62.2	166.3	34.0	0.0	11.1
Bullseye	HRS	154.4	65.1	163.0	33.0	1.7	12.2
Alturas	SWS	152.3	62.9	166.7	37.3	6.7	10.4
IDO671	SWS	146.7	63.3	163.7	38.0	20.0	10.5
Whitney	SWS	146.4	63.4	161.0	37.0	15.0	11.1
BZ604-002	SWS	143.7	64.1	162.0	38.7	0.0	10.5
Cataldo	SWS	142.3	63.4	160.3	36.7	0.0	11.1
OR4990114	HRS	142.3	63.5	161.7	35.0	0.0	12.0
Hank	HRS	138.0	62.2	163.7	36.0	0.7	12.8
Nick	SWS	138.0	63.8	163.3	37.0	0.0	11.1
IDO644	SWS	136.1	63.2	163.3	35.3	0.0	10.6
Jefferson	HRS	133.7	63.4	164.3	36.7	0.0	12.4
IDO702	HRS	133.3	63.4	165.3	38.3	0.0	12.5
Babe	SWS	132.1	64.4	166.0	39.7	0.0	10.7
Cabernet	HRS	132.0	64.0	161.3	29.7	0.0	12.7
RSI10348W	HWS	130.9	63.9	161.3	31.7	0.0	12.7
Blanca Grande	HWS	128.6	64.8	160.7	33.0	0.0	13.1
Kelse	HRS	128.1	63.6	165.3	38.7	0.0	13.5
IDO377S	HWS	123.9	63.7	164.7	36.0	38.3	12.2
Merrill	SWS	122.6	62.8	166.0	37.7	0.0	11.1
JD	SWS-CLUB	122.1	64.2	164.7	40.0	88.3	11.3
OR4031177	HRS	118.7	64.7	164.7	38.7	0.0	12.9
Alpowa	SWS	118.6	64.0	164.7	38.3	13.3	10.8
HPBHR 70	HRS	118.1	62.6	158.7	35.3	0.0	13.0
Winchester	HRS	114.0	64.0	162.0	35.0	18.3	12.8
OR40401451	SWS	111.9	62.9	168.7	41.3	5.7	11.0
WA008090	SWS	103.2	62.4	166.3	37.0	61.0	11.8
Cleda	SWS-FORAGE	90.5	61.8	167.7	38.3	63.3	12.3
BZ901-717	HRS	87.1	63.4	161.7	38.7	1.7	13.8
Mean		130.1	63.5	163.7	36.6	11.2	11.8
PLSD (0.05)		34.4	0.9	3.9	2.9	28.2	0.6
CV%		16.2	0.9	1.4	4.9	153.3	3.0

¹SWS = soft white spring, HWS = hard white spring, HRS = hard red spring.