

# STATE-WIDE CEREAL VARIETY TESTING PROGRAM TRIALS IN CENTRAL OREGON

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## ABSTRACT

Grain variety trials were conducted at Madras, Oregon, as part of the seventh year of the state-wide variety testing program. Winter and spring wheat, triticale, and spring barley were grown. As groups, winter wheats (32 varieties) had the highest average yield (9180 lb/acre) followed by winter triticales (32 varieties) (8940 lb/acre), spring wheats and triticales (31 varieties) (69601b/ac), and spring barleys (16 varieties) (5953 lb/acre). Spring wheat yields were the highest they have been in six years of testing. Lodging was a problem in all trials, though there were differences among varieties within trials. Within each grain class, several varieties appear to be top performers across years. Growers are encouraged to carefully review prospective varieties for both yield and other desirable characteristics, such as grain quality and resistance to disease and lodging. Trial results for 1999 are shown. Results from trials throughout Oregon are on the Oregon State University Cereals Extension web page (<http://www.css.orst.edu/cereals>).

## Introduction

New cereal varieties are released by public and private Pacific Northwest plant breeders each year. To provide growers with accurate, up-to-date information on variety performance, a state-wide 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 Oregon Grains Commission. Ten sites are included in the testing network. More than 50 varieties are tested each year at each site. Height, lodging, yield, test weight, and protein data are determined for all plots in Madras, Oregon. Other information is collected as time and labor allows. Data are summarized in extension publications and county extension newsletters as well as in other popular press media. Data for all trials are on the Oregon State University Cereals Extension web page (<http://www.css.orst.edu/cereals>). For future reference, use the web page for earliest access to data, as trial results are posted as soon as they are available.

## Materials and Methods

Plots (5 ft x 20 ft) were seeded at a rate of 30 seeds/ft<sup>2</sup> using an Oyjord plot drill. Winter trials were planted on October 16, 1998. The nitrogen supply goal for winter wheat and triticale is 200 lb N/acre. Spring trials were planted on April 13, 1999. The nitrogen supply goal for spring wheat and triticale is 160 lb N/acre. The nitrogen target for spring barley is 100 lb N/acre.

Herbicide and irrigation programs were typical for central Oregon production. Plots were harvested with a Hege plot combine and grain was cleaned on a Peitz rub-bar cleaner. Plot yield, test weight, protein, moisture, and seed size were all determined on cleaned grain samples. Wheat and triticale yields are reported on a 10 percent moisture 60 lb/bu basis.

Barley yields are reported as lb/acre at 10 percent moisture. Protein and moisture levels were determined using a whole-grain, near infrared protein analyzer. Proteins are reported on a 12 percent moisture basis.

## **Results and Discussion**

### *Winter Wheat*

**The winter wheat and triticale trial average yield was 153 bu/acre and ranged from 80 to 190 bu/acre (Table 1). MacVicar and Stephens continue to be among the highest yielding varieties in the Madras trials. OR939515 is a Madsen/MacVicar cross that yielded well in 1999 and is being considered for release. Given the similarity in yields for the leading varieties, selections should be made based on traits such as disease and lodging resistance, grain quality, or other desired characteristics.**

**Lodging returned as a problem in the 1999 winter grain trials. Lodging had been a problem from 1993-1995 but had lessened with more careful nitrogen management in 1996-1998. Average plant height was 39 in. in 1999 compared to 45 in. in 1998. Average protein, an indication of nitrogen supply, was 9.5 percent in 1999 compared to 10.5 percent in 1998.**

### *Winter Triticale*

**The winter triticale variety trial average yield was 149 bu/acre and ranged from 116 to 186 bu/acre (Table 2).**

**Bogo, a Polish triticale introduced to Oregon by Dr. Robert Metzger, yielded well for the third consecutive year. Bogo heads about one week earlier than Celia and has slightly lower test weight. Bogo can grow to a height of four feet, which may be a concern for growers with low irrigation wheel lines. Straw strength is good, so lodging risk is low in spite of the tall plants. Bogo is awned and would most likely be grown for grain as opposed to forage.**

### *Spring Wheats and Triticales*

**The spring wheat and triticale trial average yield was 116 bu/acre and ranged from 80 to 144 bu/acre (Table 3). 1999 was the third consecutive year of high spring grain yields.**

**In contrast to the winter trials where soft white varieties dominate, hard white and hard red lines tend to have higher yields in the spring trials. While yields are high for the hard classes, protein levels have been marginal which will make marketing difficult if not economically unviable. Alternate fertilisation strategies were investigated for hard spring wheats in 1999 and a second year is planned for 2000.**

**Among soft white lines there has been high yield variability from year to year. Pomerelle has been among the most consistent of the high yielding varieties. Pomerelle is later than most other soft white lines and has slightly lower test weight and protein. Pomerelle has also shown some susceptibility to lodging. Penawawa and Alpowa are other soft white lines that have good yield**

potential in central Oregon. Multiple seeding rates were evaluated for Penawawa. It appears seeding rate had no significant effect on yield or test weight but did show a slightly higher protein level in the higher seeding rate.

A number of new hard white and soft white lines from Idaho and Oregon yielded well in 1999. The lines performed well and had fairly high protein content in 1999.

### *Spring Barley*

Spring barley data is shown in Table 4. The average yield for spring barleys was 5953 lb/acre and ranged from 4535 to 6921 lb/acre.

Among spring barleys, Idagold (2RF) and Galena (2RM) have had significantly higher yields than other varieties over the past three years. Idagold and Galena have above average test weight and good lodging resistance. Neither variety has stripe rust resistance. Yields for both varieties have been similar to spring wheat yields over the past three years. Both lines are from the Coors Brewing Company. Seed for Idagold is handled by Western Seeds in Burley, Idaho. Local seed dealers may be able to contract with Coors for seed production of these varieties. Contact your county extension office for more information.

Other high yielding varieties in the 1999 trials include C-32 (2RM), Baroness (2RF), Zena (2RF) and WA9504-94. C-32 is a Coors variety. All of the high yielding spring varieties have good lodging resistance, which probably contributes to their yield potential.

Table 1. Statewide variety testing program winter wheat, Madras, OR, 1999.

Variety or line	Market Class	Yield (bu/ac)			1999 Data					
		1999	1998	1997	Test Weight (lb/bu)	Protein (%)	Heading Date (DOY)	Height (in)	Lodging (%)	1000K (g)
Bogo	Triticale	190	151	123	54.8	7.7	153	45	8	41.0
MacVicar	SW	178	147	123	59.7	9.3	163	39	58	37.3
Stephens	SW	178	-	-	60.7	9.5	165	38	17	50.7
ID86-10420A	SW	169	117	111	61.1	9.4	162	44	10	41.9
Hybritech 1021	SW	167	-	-	58.8	9.1	164	38	15	46.3
Madsen+Stephens	SW	166	136	120	60.2	9.9	163	37	26	40.4
OR908387	SW	166	-	-	59.5	9.8	166	39	52	37.8
Rod	SW	165	126	116	60.2	9.1	165	38	50	38.5
Stephens (no Gaucho)	SW	164	-	-	60.3	9.4	163	37	10	49.1
OR939515	SW	162	151	-	59.9	9.7	165	40	40	36.4
OR939528	SW	161	-	-	60.2	9.7	164	40	18	39.2
Stephens (40 seeds/sq. ft.)	SW	160	-	-	59.9	9.0	164	37	9	51.2
OR939526	SW	159	-	-	58.9	9.4	166	41	50	38.5
Stephens (20 seeds/sq. ft.)	SW	158	-	-	60.1	9.2	162	39	5	52.1
Quantum 7817	SW	157	-	-	59.3	8.8	164	41	43	45.4
Celia	Triticale	155	130	-	57.6	8.5	162	40	10	42.5
1D10085-5	SW	153	-	-	60.6	9.5	164	42	70	50.2
Madsen	SW	151	147	104	60.2	9.8	166	38	31	35.8
Weatherford	SW	150	140	108	60.9	9.1	165	39	51	41.3
OR943575	HW	150	-	-	59.6	10.3	163	42	19	35.3
OR3971244	SW	148	-	-	58.9	10.1	164	35	23	36.6
Rohde	Club	147	118	116	61.1	9.3	165	37	63	35.2
Hiller	Club	147	113	-	58.3	9.6	165	39	13	36.8
Ivory	HW	147	133	-	61.7	9.2	164	37	4	40.5
Foote	SW	145	81	103	60.2	9.6	165	41	3	472
Temple	Club	143	98	109	61.0	9.0	163	40	45	37.1
Rely	Club	140	99	116	57.8	9.7	165	42	92	30.5
Coda	Club	139	96	109	60.0	9.9	167	42	56	31.5
ID467	HR	135	97	120	62.7	10.9	163	38	67	46.2
Yamhill	SW	133	-	-	59.0	9.4	166	46	21	45.8
Gene	SW	129	139	102	58.9	10.8	163	33	32	41.2
Connie	Durum	80	-	-	61.9	11.7	164	34	3	532
Average		153	116	112	59.8	9.5	164	39	32	41.6
PLSD (5%)		18	20	17	1.5	1.1	1	3	48	NA
PLSD (10%)		15	13	14	1.3	0.9	1	2	40	NA
CV		7	10	9	2	7	0	4	93	NA
P-Value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NA

Table 2. Statewide variety testing program triticale, Madras, OR 1999

Variety or line	Yield (bu/ac)			1999 Data					
	1999	1998	1997	Test	Protein	Heading	Height	Lodging	1000K
				Weight		Date			
				(lb/bu)	(%)	(DOY)	(in)	(%)	(g)
Titan [191TR2-12]	186	-	-	56.8	8.0	149	43	4	444
Migo	179	-	-	54.4	8.9	153	46	18	45.7
Bogo	175	151	123	54.0	8.4	158	49	39	362
LKOM8	167	-	-	57.7	8.6	157	45	2	40.0
B86-3335*2/Presto[Kar97-359]	165	-	-	57.4	8.2	157	45	1	43.7
UnWin	165	-	-	57.9	9.1	158	43	2	45.0
M94-2082	163	-	-	54.9	8.2	159	42	0	41.1
B86-3335*2/Presto[Kar97-366]	161	-	-	58.3	8.5	158	46	1	44.9
Iceberg	161	-	-	55.4	8.9	165	45	19	43.2
5735TVV3-324	160	-	-	58.4	9.0	151	40	32	45.3
FT31 (Kansas)	158	-	-	59.5	8.9	148	45	32	46.4
Madsen	156	-	-	60.5	9.5	165	38	1	39.0
Alzo	155	-	-	54.8	8.8	159	50	67	36.2
Spiny (KS88032/HeVIV/2*B86-3335)	153	-	-	54.8	9.0	159	37	2	45.3
B86-3335*2/Tatu [Kar97-559]	153	-	-	56.7	9.2	152	46	3	39.3
Parma	153	-	-	54.9	9.0	166	48	0	43.3
Wanad	152	-	-	56.2	8.3	154	45	8	39.4
Kargo	147	-	-	54.9	8.6	153	48	17	39.6
B86-3335*2JTatu [Kar97-558]	145	-	-	56.7	9.0	160	37	6	34.9
FT91-064	144	-	-	52.7	9.1	159	44	1	38.5
Igloo//3*B86-3335[Kar97-660]	144	-	-	56.4	9.1	167	45	5	41.7
Celia	139	130	-	56.0	9.2	162	47	1	38.4
Presto	138	-	-	58.4	8.9	148	49	98	392
Newcale	134	-	-	55.3	9.3	148	44	98	42.0
M94-93	133	-	-	55.0	8.7	163	52	53	41.6
Igloo//3*B81-420, Iceberg	132	-	-	55.8	9.8	163	44	42	44.1
M94-2113	128	-	-	54.3	8.8	160	44	3	38.5
Gabo	126	-	-	53.8	9.7	152	46	82	36.4
1-62 H1031	124	-	-	56.4	8.7	161	46	31	42.3
AC Rifle	119	-	-	55.7	8.2	146	39	2	30.6
88DL01076	119	-	-	54.6	9.6	155	51	95	36.6
FT87-788	116	-	-	49.3	8.8	164	47	5	36.1
Average	149	-	-	55.9	8.9	157	45	24	40.6
PLSD (5%)	19	-	-	1.7	0.9	2	8	29	4.4
PLSD (10%)	16	-	-	0.4	0.8	2	7	24	3.7
CV	8	-	-	2	6	1	11	74	7
P-Value	0.00	-	-	0.00	0.02	0.00	0.02	0.00	0.00

Table 3. Statewide variety testing program spring wheat and triticale, Madras, OR, 1999

Variety or line	Market Class	Yield (bu/ac)			1999 Data					
		1999	1998	1997	Test Weight (lb/bu)	Protein (%)	Heading Date (DOY)	Height (in)	Lodging (%)	1000K (g)
WPB936	HR	144	-	-	61.3	13.3	175	37	37	39.1
Yecora Rojo	HR	143	-	-	62.4	14.1	175	32	4	442
Penawawa (20 seeds/sq. ft.)	SW	136	-	-	61.5	10.9	178	40	57	37
M94-4393	Triticale	135	103	-	58.9	10.8	174	48	6	38.2
Penawawa (30 seeds/sq. ft.)	SW	133	-	-	61.7	10.3	177	41	43	36.6
Winsome	HW	133	-	-	61.4	11.3	179	41	28	37.2
Pomerelle	SW	132	105	123	59.3	11	178	38	60	28.4
Penawawa (40 seeds/sq. ft.)	SW	127	-	-	61	11.2	176	42	55	32.7
OR4920307	HW	126	112	-	61.8	10.8	180	39	35	35.9
ID0525	SW	126	-	-	61.1	11.8	178	38	35	37.4
ID0526	SW	124	-	-	59.9	10.7	175	36	32	29.8
ID0523	HW	122	115	-	61.4	11.8	179	36	23	32.9
Treasure	SW	119	-	-	59.8	11.2	175	39	42	34.8
WPB BZ 992-322	HR	119	-	-	58.8	14.7	175	37	33	38.1
ML 10742-24)	HW	117	-	-	59.8	12	181	37	23	38.5
ID0533	HW	117	113	-	60.9	12.6	175	38	50	35.5
ID0506	SW	115	-	-	59.1	11.6	175	40	38	33.8
OR942889	SW	115	-	-	60.5	12.5	179	40	32	36.4
Jefferson	HR	113	-	-	61.2	13.5	175	40	33	32.4
Alpowa (Adage)	SW	112	-	-	61.4	12.5	175	39	37	41.5
Alpowa (Gaucho)	SW	109	-	-	61.9	12.7	175	40	35	39.5
Alpowa (no Gaucho)	SW	108	103	88	61.8	13.1	179	42	30	42.4
ID0377S	HW	107	-	-	58.9	13.1	175	38	72	34.7
Wawawai	SW	105	-	-	60.4	12.2	176	42	72	43.9
Whitebird	SW	105	107	110	61	11.8	178	41	47	35.4
OR942845	SW	103	106	-	59.8	12.5	177	39	43	32.1
Scarlet	HR	100	-	-	60.6	14.3	177	38	40	39.2
WPB BZ 692-108	SW	100	-	-	59.5	11.5	178	38	30	33.8
ML455	HW	92	-	-	57.8	12.7	176	37	18	35.1
WA7850	SW	90	-	-	58.3	11.9	180	40	68	32.5
ML043-142A	SW	80	-	-	60.3	12	181	35	28	31.7
Average		116	104	99	60.4	12.1	177	39	38	36.2
PLSD (5%)		21	16	23	1.8	1.1	1	2	9	NA
PLSD (10%)		18	13	19	1.5	1	1	1	7	NA
CV		11	9	14	2	6	0	3	13	NA
P-Value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NA

Table 4. Statewide variety testing program spring barley, Madras, OR, 1999.

Variety or line	Market	Yield (lb/ac)			1999 Data					
		Class	1999	1998	1997	Test Weight (lb/bu)	Protein (%)	Heading Date (DOY)	Height (in)	Lodging (%)
Baronesse	2RF	6921	4083		55.1	8.1	176	32	7	49.1
Zena	2RF	6798			55.1	8.1	174	25	2	49.5
Idagold	2RF	6740	6760		54.1	9.1	177	25	0	47.3
WA9504-94		6416			54.1	9.8	174	27	3	44.4
C-32	2RM	6360	6799		54.1	9.4	174	25	0	46.2
Steptoe	6RF	6227	3922	5104	52.0	8.9	170	35	17	50.6
Galena	2RM	6200	6231	5628	53.2	8.8	176	31	1	44.7
Chinook	2RM	6101	3319	4389	55.3	10.0	176	33	14	49.6
MT920073		6036	-	-	55.2	10.6	174	31	65	53.2
Tango	6RF	5984	4022		51.5	9.0	172	32	14	46.6
MT LB30		5972			54.8	9.1	173	34	8	44.8
BCD 47	2RF/M	5768	-	-	55.0	10.1	175	23	5	52.5
BCD 22	2RF/M	5346	-	-	54.1	10.0	178	33	2	46.5
Bancroft	2RM	4946			53.3	10.4	176	35	73	48.8
Orca	2RF/M	4898	2663	3835	54.3	11.0	170	35	8	59.3
BCD 12	2RF/M	4535			53.2	9.7	176	24	3	47.7
Average		5953	4411	4256	54	9.5	174	30	14	48.8
PLSD (5%)		1064	982	813	0.07	0.07	4	8	18	NA
PLSD (10%)		884	815	676	0.05	0.06	4	7	15	NA
CV		11	13	10	1	4	1	17	80	NA
P-Value		0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	NA