

VARIETAL EVALUATION OF IRRIGATED CEREAL GRAINS  
IN CENTRAL OREGON IN 1988

D. Dale Coats and Frederick J. Crowe  
Central Oregon Experiment Station  
Oregon State University  
Redmond, Oregon

ABSTRACT

Six replicated yield trials were conducted at two sites of the Central Oregon Experiment Station in 1988. Two new releases of soft white winter wheat, 'Hyak' and 'Madsen', and several other advance lines performed better than the standard varieties, including 'Stephens' and 'Malcolm'. 'ORCR8313' has continued to outperform the standard and looks very promising for release as a new hard red winter wheat. Winter barleys had good yields in 1988 with 'Showin' and 'Boyer' having the greatest yields. 'Scio', however is still the best choice for central Oregon and has had the best performance and quality over a number of years.

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Central Oregon is currently and will continue to be a major cooperator with the OSU breeding programs for wheat (Dr. Warren Kronstad) and barley (Dr. Pat Hayes). The spring and durum wheats originate in Mexico and are initially planted and evaluated in Madras. The spring barley program also uses Madras as a major site for initial evaluation. Results from these programs will not be reported here.

Winter Cereals are evaluated for yield, test weight, maturity, height, lodging, winter hardiness and disease resistance. Six replicated yield trials were established in 1988 at two sites in central Oregon. A summary of the trials grown, location, and number of lines investigated in each trial can be seen in Table 1.

METHODS

Cereal plots (5 feet wide by 20 feet long) were seeded at a rate of 100 pounds/acre using an Oyjord plot planter. Fertilizing was accomplished by a Barber metered feed fertilizer spreader. Overhead irrigation was used on either 40 x 40' spacing (Powell Butte) or 40 x 30' spacing (Madras). Harvest was accomplished with a Hege plot combine. Cultural data for the different experiments are summarized in Table 2.

Table 1. Cereal grain variety trials planted in central Oregon in 1987

Location	Trial	No. Entries
Madras	Hard Red Winter Wheat Elite	26
Madras	Western Reg. H.R. Winter Wheat	38
Madras	S.W. Winter Wheat Elite	44
Madras	Western Reg. S.W. Winter Wheat	36
Madras	Western Reg. Winter Barley	30
Powell Butte	S.W. Winter Wheat Elite	44

Table 2. Cultural data for 1988 variety trials at Madras and Powell Butte, Oregon

Trial	Location	Lbs. N/Ac	Date of planting	Date of first irrig.	Date of last irrig.	Date of harvest
HRWWE	Madras	162	10-27-87	4-14-88	7-19-88	8-10-88
WRHRWW	Madras	162	10-27-87	4-14-88	7-19-88	8-10-88
SWWWE	Madras	162	10-27-87	4-14-88	7-19-88	8-9-88
WRSWWW	Madras	162	10-27-87	4-14-88	7-19-88	8-9-88
WRWB	Madras	80	10-28-87	4-14-88	7-4-88	8-8-88
SWWWE	P. Butte	162	10-28-87	4-13-88	8-1-88	8-26-88

  

HRWWE	-	Hard Red Winter Wheat Elite
WRHRWW	-	Western Regional Hard Red Winter Wheat
SWWWE	-	Soft White Winter Wheat Elite
WRSWWW	-	Western Regional Soft White Winter Wheat
WRWB	-	Western Regional Winter Barley
SWWWE	-	Soft White Winter Wheat Elite

#### RESULTS AND DISCUSSION

Unusually low yields were observed in Powell Butte, mainly due to abnormal frost pockets in the critical stages of growth early in the summer. The 1987-1988 winter was mild and abnormally dry.

Diseases were absent in 1988, therefore none will be noted. Little or no insect damage was observed throughout the season.

#### Soft White Winter Wheat

Cereal evaluations have been done for a number of years in central Oregon. Results from the 1988 trials are shown in Tables 3 and 6. Table 4 and 5 shows some of the most common

varieties of soft white winter wheats averaged since 1979 for comparison.

Performance of soft white wheats at Madras was especially good compared to years past. Refer to Table 3. Although Lodging was more than average, it did not seem to lower the yields. ORCW8632 and OR830211 both out performed the standards. Long term performance data is shown in Table 4 for the Madras plots. Long term performance data for Powell Butte is shown in table 5 where Dusty still out performs the other standards.

Table 3. Agronomic data for select soft white winter wheat lines grown at Madras, OR in 1988

Treatment	Yield bu/a	Test wt lbs/bu	Height in	Hd date days	Lodging %
STEPHENS	134.8	59.57	33	167	45
HILL	120.4	59.50	38	169	14
MALCOLM	139.5	57.82	35	170	29
OVESON	127.7	60.90	35	169	63
DUSTY	120.0	59.78	35	172	53
TRES	107.8	61.74	37	170	100
FLORA	123.7	45.15	37	165	0
OR 855	128.4	62.72	37	167	66
BASIN	125.2	62.16	29	168	0
CASHUP	132.8	61.81	35	171	46
OSU-21	113.0	58.87	37	166	78
OSU-28	118.2	60.48	35	169	0
OR CW8314	131.2	60.34	36	165	28
OR CW8519	120.4	60.69	40	168	41
OR CW8627	127.9	61.25	39	168	3
OR CW8632	141.8	58.59	36	165	6
OR CW8635	127.5	60.34	41	167	80
OR CW8724	131.0	57.96	38	165	41
OR CW8725	132.5	57.96	36	166	29
OR 830211	143.8	63.28	37	164	3
OR 830801	128.1	58.10	35	165	5
OR 833765	129.1	60.20	37	165	3
OR 834686	138.9	59.92	36	167	29
OR 840813H	137.6	62.23	37	167	0
OR 840814H	134.8	61.11	37	165	0
OR 840815H	137.0	62.37	38	165	13
OR 840836S	134.4	59.64	41	166	6
OR 841073H	135.0	58.03	41	167	4
OR 833649	132.6	60.34	39	167	5
LSD(5%)	12.2	7.60	3	3	40

Table 4. Soft white winter wheat varieties grown at Madras, 1979-1988 (1983 trials destroyed by hail)

Variety	Yield	Test Wt. <sup>4</sup>	Head Date <sup>3</sup>	Lodging	Height <sup>2</sup>
Hyslop <sup>6</sup>	103.3	56.5	167	16	37
Daws <sup>6</sup>	106.1	57.3	168	14	36
Dusty <sup>1</sup>	103.4	58.9	165	49	36
Hill 81	105.0	57.3	168	10	38
Malcolm	120.6	56.7	166	15	35
McDermid <sup>5</sup>	95.4	59.2	158	48	36
Nugaines	107.4	59.3	167	19	34
Stephens	110.8	56.3	165	11	36

- 1 1986-1988 data only  
2 1980, 1981 data missing  
3 1979, 1980 data missing  
4 1980 data missing  
5 1981 and 1988 data missing  
6 1988 data missing

Table 5. Soft white winter wheat varieties grown at Powell Butte, OR 1979-1988

Variety	Yield	Test Wt.	Head Date <sup>3</sup>	Lodging	Height <sup>2</sup>
Hyslop <sup>4</sup>	107.6	56.2	177	18	35
Daws <sup>4</sup>	111.9	57.2	179	9	35
Dusty <sup>1</sup>	118.9	58.8	175	8	35
Hill 81	112.1	58.0	180	9	37
Malcolm	116.7	56.1	178	4	35
McDermid <sup>4</sup>	107.8	54.7	176	0	25
Nugaines <sup>4</sup>	108.4	58.0	179	15	33
Stephens	108.6	55.3	178	6	34

- 1 1986-1988 data only  
2 1980 data missing  
3 1982, 1983 data missing  
4 1988 data missing

Soft white winter wheat grown at Powell Butte had a much lower yield in 1988 than in the past. Refer to Table 5. This is due to abnormal frost early in the season. Advance line ORCW8632 performed much better than the standards despite the extreme conditions.

Table 6. Agronomic data for soft white winter wheat lines grown at Powell Butte, OR in the 1988 elite trial

Treatment	Yield bu/a	Test wt lbs/bu	Height in	Hd date days	Lodging %
STEPHENS	90.3	57.81	35	173	0
HILL	84.5	60.27	37	175	13
MALCOLM	76.4	59.28	36	174	0
OVESON	50.9	61.54	33	169	15
DUSTY	78.7	60.60	36	173	23
TRES	50.5	59.57	35	174	69
CREW	63.0	58.01	35	173	68
FLORA	67.6	45.49	35	170	25
OR 855	55.3	61.55	33	177	48
BASIN	55.9	60.27	29	169	9
CASHUP	73.2	61.11	32	168	3
TRES+TYEE	54.6	59.02	33	171	64
OSU-21	50.4	58.75	35	170	18
OSU-28	69.9	59.10	34	171	0
OR CW8314	58.6	59.00	36	175	10
OR CW8519	93.5	58.45	39	167	8
OR CW8626	71.4	59.33	36	171	11
OR CW8627	87.6	61.27	36	172	8
OR CW8631	67.1	59.71	36	177	59
OR CW8632	104.5	58.46	35	174	23
OR CW8635	86.1	60.24	37	174	11
OR CW8724	70.5	59.80	30	170	10
OR CW8725	59.1	59.28	35	176	0
OR 830211	89.9	60.53	33	172	10
OR 830801	69.6	57.00	31	171	0
OR 833725	91.9	60.22	36	169	9
OR 833765	65.6	59.59	38	171	16
OR 834686	81.9	60.82	37	170	33
OR 840813H	92.6	61.45	35	170	0
OR 840814H	89.9	60.33	36	172	3
OR 840815H	83.6	60.98	36	170	4
OR 840836S	100.7	58.86	37	170	0
OR 841073H	95.5	59.49	39	170	0
OR 841386P	93.6	59.32	33	176	6
OR 841438P	94.0	60.64	38	173	0
OR 833649	77.6	58.03	36	172	0
LSD(5%)	23.0	6.69	5	1	28

The Western Regional trials are set up in cooperation with other experiment stations in the Pacific Northwest to give an overall performance of advance lines before release as a variety. In the soft white winter wheat trial two new releases are available to the farmer, WA7163 as Madsen and WA7166 as Hyak. Stephens and Nugaines performed very well this year of the standard however advance line ID0329 was better than the standards in yield and test weight. Refer to Table 7.

Table 7. Select Soft white wheat lines from the western regional nursery grown at Madras, OR in 1988

<u>Treatment</u>	<u>Yield</u> bu/a	<u>Test wt</u> lbs/bu	<u>Height</u> in	<u>Hd date</u> days	<u>Lodging</u> %
KHARKOF	60.9	63.42	42	166	98
ELGIN	74.7	61.95	41	170	75
MORO	91.5	59.50	40	173	98
NUGAINES	134.4	63.00	34	167	0
STEPHENS	131.5	60.83	35	168	4
TRES	109.0	62.58	39	170	69
WA 7163	118.5	60.55	37	171	13
WA 7166	103.9	61.88	38	165	96
OR CW8416	111.7	61.95	37	166	50
OR CW8517	100.3	61.18	40	168	25
ID 0329	138.4	61.18	38	165	29
ID 0330	123.6	60.34	37	170	19
OR 0843	121.0	61.81	41	169	0
OR 0842	120.9	60.97	32	169	0
OR 0845	125.1	60.69	37	164	38
ORF 75336	129.4	60.48	37	167	28
WA 7529	125.9	57.19	36	170	41
OR 855	107.8	57.33	39	169	99
OR CW8632	133.5	60.27	38	165	28
OR CW8633	112.2	60.48	36	170	3
OR CW8635	114.7	57.12	39	168	58
OR CW8724	130.0	59.57	39	169	45
OR 8300801	120.6	57.82	35	165	35
WA 7621	118.9	59.99	37	170	66
WA 7623	127.2	58.80	38	166	0
WA 7625	126.9	58.38	38	171	3
WA 7627	113.3	56.98	37	172	41
LSD(5%)	20.1	5.85	4	4	50

#### Hard Red Winter Wheat

Different wheat classes are continually being tested to give the farmer the most possible options for crop selections. Hard red winter wheats are improving every year for agro-

onomic qualities. Several advanced lines are performing better than the standards promising several future for the upcoming releases of new lines as varieties. Refer to Tables 8 and 9.

Table 8. Agronomic data for select hard red winter wheat lines grown in the 1988 elite trial, Madras, OR

<u>Treatment</u>	<u>Yield</u> bu/a	<u>Test wt</u> lbs/bu	<u>Height</u> in	<u>Hd date</u> days	<u>Lodging</u> %
WASNER	87.6	63.35	44	165	43
STEPHENS	109.3	59.43	36	165	63
FEDERATION	100.3	60.83	45	162	78
HATTON	97.6	64.47	44	167	74
BANTUM	99.9	58.59	36	169	90
ANDREWS	111.5	62.09	35	163	100
SURVIVOR	59.6	61.04	40	170	100
OR CR8313	119.9	62.58	39	162	100
OR CR8414	106.7	61.25	40	163	76
TSN-B2	101.4	61.74	39	167	78
OR CR8601	108.6	61.74	39	165	45
OR CR8602	125.4	60.90	34	163	69
OR CR8603	113.0	59.99	37	163	20
OR CR8604	108.5	61.18	36	165	74
OR CR8608	119.4	62.65	38	168	68
OR CR8718	122.6	61.11	40	166	53
OR 830027	100.0	61.60	43	165	74
OR 830282	137.6	61.46	40	165	25
OR 831134	108.0	63.35	39	167	24
OR 831455	111.8	59.01	34	170	23
OR 832306	110.5	58.59	38	165	95
OR 840027P	103.9	58.59	36	160	98
OR 840157P	121.7	60.48	43	170	66
OR 840214H	106.5	63.98	38	163	15
OR 841708P	116.7	56.42	41	169	20
OR CR8617	123.2	60.69	34	168	56
LSD(5%)	17.7	5.23	3	4	49

Table 9. Select hard red winter wheat lines grown in Madras, OR for the 1988 Western Regional trial

Treatment	Yield bu/ac	Test wt lbs/bu	Height in	Hd date days	Lodging %
KHARKOF	60.2	60.6	43	168	93
WANSER	86.8	62.7	44	173	95
OR CR8313	121.8	62.2	40	169	83
ID 0331	75.1	62.5	37	163	58
SURVIVOR	70.4	61.4	41	170	93
ID 0333	74.8	60.6	45	172	93
ID 0335	74.4	62.0	37	168	60
ID 0336	98.7	62.9	39	170	90
OR CR8414	106.9	63.0	38	169	98
WA 7522	101.3	62.9	41	169	93
OR CR8601	117.1	63.5	38	166	98
UT 156751	118.7	63.2	41	166	90
UT 156775	117.6	62.8	37	165	65
UT 156516	126.5	63.9	39	164	80
ID 0353	98.7	62.2	42	168	95
ID 0354	99.5	61.9	42	166	78
MT 8039	113.1	60.9	37	167	68
UT 157140	121.4	60.6	36	166	50
OR CR8602	117.9	60.7	40	165	70
OR CR8603	116.5	61.7	44	169	83
OR CR8608	120.1	63.7	44	167	65
OR 830282	119.1	62.6	47	171	88
OR 832306	117.4	59.8	43	167	95
WA 7626	96.9	62.7	36	169	80
OR 8522	118.6	56.8	39	167	63
ID 0323	104.3	59.8	36	166	50
ID 0356	112.6	60.0	39	166	83
LSD(5%)	14.7	4.1	6	4	39

### Winter Barley

The yields and test weights for the Western Regional Barley Nursery were much higher in 1988 than 1987. The variety Showin out performed all the standards and the advanced lines for yield, however, the test weight of Showin was low. Scio was not the top performer this year, however its consistency over a number of years shows it to be the variety of choice for central Oregon. Table 10 shows the agronomic data for the 1988 winter barley nursery.



Table 10. Agronomic data for select varieties grown in the Western Regional winter barley nursery at Madras, OR in 1988

Treatment	Yield bu/a	Test wt lbs/bu	Height in	Hd date days	Lodging %
KAMIAK	97.8	51.59	67	134	70
SCHUYLER	110.5	53.06	42	152	36
BOYER	139.3	52.36	42	149	0
WINTERMALT	108.1	51.38	41	150	76
HESK	137.3	51.52	40	150	18
MAL	126.6	50.54	44	152	43
SCIO	123.0	51.87	40	150	23
79AB812	133.3	53.48	44	149	38
SHOWIN	143.3	49.14	35	151	19
OR FB75075	124.7	50.82	38	149	46
OR WF8328	121.5	50.75	36	150	36
OR WF8411	119.2	52.08	41	149	5
OR WM8406	133.1	52.78	41	147	30
OR WF8422	119.2	50.96	42	149	36
OR WF8410	137.8	53.06	35	150	38
OR WM8407	132.3	52.71	40	151	45
WA 2607-80	141.5	49.77	41	150	20
WA 2554-81	119.4	51.17	39	150	76
OR FB763167	127.3	51.66	40	149	3
OR FB77796	115.8	52.22	43	147	31
86AB445	125.9	52.15	39	150	34
WA 3035-84	141.8	50.54	33	149	28
LSD(5%)	26.0	4.74	15	6	46

#### SUMMARY

With cereals being an important crop for the region, one of Central Oregon Experiment Station's objectives is to give the farmer up-to-date information on released varieties as well as advanced lines. Yield, test weights, plant height, lodging, winter hardiness, head date and disease/insect resistance are checked for all the cereals grown.