

VARIETAL EVALUATION OF IRRIGATED CEREAL GRAINS IN CENTRAL OREGON

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Abstract

Irrigated cereal trials were conducted in Powell Butte and Madras, Oregon in 1989. Winter wheat selections OR8300801 and OSU-21 for the soft whites were increased for release in 1990 or 1991. Hard red winter wheat selection ORCR8313 is also being increased for release in the near future. None of these have been named at present. Many of the advanced lines for both hard red and soft white winters outperformed the standards. Spring wheat variety OR8501 has out-yielded the other advance lines as well as the standards, however, it's height is taller than most.

Introduction

In 1989, four replicated yield trials were conducted at two sites of the Central Oregon Experiment Station. Cereals were evaluated for yield, test weight, maturity, height, lodging, winter hardiness, and disease resistance. Table 1 gives a summary of location, trials grown, and number of lines investigated in each trial.

Table 1. Cereal grain variety trials planted in Central Oregon in 1988.

<u>Location</u>	<u>Trial</u>	<u>No. Entries</u>
Madras	Hard Red Winter Wheat Elite	36
Madras	Soft White Winter Wheat Elite	52
Powell Butte	Hard Red and Soft White Winter Wheat	16
Powell Butte	Spring Wheat	16

Methods and Materials

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

Table 2. Cultural data for 1989 variety trials at Madras and Powell Butte, OR.

Trial	Location	Lbs N/Ac	Date of planting	Date of first irrig.	Date of last irrig.	Date of harvest
SWWWE	Madras	162	10-19-88	4-21-89	7-14-89	8-22-89
HRWWE	Madras	162	10-19-88	4-21-89	7-14-89	8-23-89
WWV	Powell Butte	162	10-19-88	5-5-89	7-26-89	8-23-89
SWV	Powell Butte	175.2	4-5-89	5-5-89	8-4-89	8-28-89

SWWWE Soft White Winter Wheat Elite
 HRWWE Hard Red Winter Wheat Elite
 WWV Winter Wheat Varieties
 SWV Spring Wheat Varieties

Results and Discussion

Above normal grain yield was observed at both Madras and Powell Butte, mainly due to a wet spring and optimum temperatures in the early summer. The 1988-89 winter was a normal winter both in temperature and moisture.

Disease and insect damage were absent throughout the season in 1989, therefore, none will be noted here.

Soft white winter wheat

Soft white winter varieties and advance lines performed well in 1989 with advance lines OR8500933H and OR8500594H doing much better than both 'Malcolm' and 'Stephens' varieties. Table 3 and 4 show the agronomic data for the Madras soft white winter wheat trial, and some of the most common varieties of soft white winter wheat averaged since 1979.

Table 3. Soft white winter wheat varieties grown at Madras, OR 1979-1989.

Variety	Yield	Test wt	Head date	Lodging	Height	Years of data
Hyslop	1033	56.5	167	16	37	8
Daws	110.4	57.3	167	18	37	9
Dusty	108.6	58.8	165	48	36	4
Hill 81	105.4	57.3	168	13	38	10
Malcolm	122.2	56.6	166	17	36	10
McDermid	95.4	59.2	158	48	36	7
Nugaines	107.4	59.3	167	19	34	9
Stephens	112.9	56.3	164	18	36	10

Table 4. Agronomic data for selected soft white winter wheat lines grown at Madras, Oregon in 1989.

Variety	Yield bu/ac	Test wt lbs/bu	Hd date days	Height in	Lodging
Stephens	129.7	56.1	161	41	74
Hill	109.2	58.8	164	43	46
Malcolm	136.3	55.9	163	40	31
Oveson	117.4	57.1	162	38	55
Dusty	123.9	58.2	165	39	43
Daws	140.7	57.1	163	42	45
Madsen	130.3	58.0	162	40	46
Whitman	128.2	52.6	157	43	50
OSU-21	116.3	56.8	158	39	56
OR CW8314	149.0	58.0	159	40	5
OR CW8519	130.8	59.4	162	45	40
OR CW8627	124.8	58.3	161	43	30
OR CW8632	134.6	56.7	160	40	46
OR 8300801	131.2	57.4	165	39	33
OR 8302665	123.9	57.8	161	41	88
OR 8302784	125.8	56.2	160	41	48
OR 8303725	124.3	55.2	161	41	70
OR 8303765	138.9	57.5	160	44	60
OR 8400814H	124.1	58.7	159	40	10
OR 8400815H	136.6	58.6	160	42	6
OR 8401073H	126.3	58.5	161	45	28
OR 8401464P	124.4	57.5	162	41	23
OR 8303734	128.6	58.6	164	39	58
OR 8400838H	132.0	56.8	163	42	29
OR 8401389H	131.1	57.3	163	41	26
OR 8401439P	120.3	53.8	166	42	54
OR 8401544P	133.6	56.1	158	37	58
OR 840296111	139.0	55.4	162	40	65
OR 850228811	140.8	59.5	159	37	13
OR 850315711	128.7	56.6	161	41	41
OR 8500583P	137.2	56.8	159	44	50
OR 8500933H	156.0	56.1	159	40	18
OR 8500594H	157.1	57.1	160	40	25
OR 8501048P	137.3	54.7	161	41	48
Mean	131	57	161	41	42

Hard red winter wheat

Advance line ORCW8313 has out-performed the standards as well as the majority of the other lines. ORCW8313 will be released as a variety for the growers in the near future. Hard red winter wheat is still a possible alternative to the soft whites for the farmers. Table 5 shows the performance data for several standards as well as many advance lines.

Table 5. Agronomic data for several hard red winter wheat lines grown at Madras, Oregon in the 1989

<u>O r e g o n E l i t e t r i a l</u>					
Variety	Yield	Test wt	Hd date	Height	Lodging
	bu/ac	lbs/bu	days	in	
Wanser	83.6	57.5	158	50	93
OR CR8313	1253	59.7	158	43	48
Federation	91.7	57.3	156	49	65
Hatton	75.9	60.8	160	49	94
Batum	96.1	56.1	162	44	83
Andrew	1303	58.7	156	36	90
OR CR8601	127.7	60.6	157	47	23
OR CR8602	131.8	58.4	156	39	38
OR CR8718	131.1	60.5	158	46	13
OR 8300282	147.2	59.9	159	43	20
OR 8400214H	121.5	59.2	156	42	13
OR 8401708P	123.2	58.7	162	44	34
OR 8303372	132.4	57.8	162	43	38
OR 8400159P	120.4	60.6	160	47	59
OR 8401707P	141.8	58.1	161	43	58
OR 8401709P	135.2	56.5	163	41	24
OR 8403309H	127.3	59.4	158	41	65
OR 8500509P	120.2	59.2	158	41	59
OR 8500608H	139.4	57.9	162	44	3
OR 8500694P	143.0	58.0	159	44	20
OR 8500695P	134.8	56.9	160	42	33
OR 8500847P	145.2	59.0	161	40	5
OR 8501018P	131.7	58.9	163	44	8
OR 8504896P	148.0	60.9	158	39	3
OR 8505289P	128.3	58.2	158	40	28
OR 8505424P	126.8	58.9	159	42	38
OR CR8617	132.2	56.7	161	37	39
MEAN	125.6	58.7	159	43	41

Winter wheat (Powell Butte)

A combined hard red and soft white winter wheat trial was established in Powell Butte, Oregon in the 1989 growing season. The yields were extremely high as compared to the past for both hard reds and soft wheats, which shows an optimum year for wheat with optimum moisture and temperature. Table 6 shows the agronomic data for the Powell Butte winter wheat trial. Table 7 has the average of 10 years of several varieties of soft white winter wheat grown in Powell Butte.

Table 6. Agronomic data for the soft white and hard red winter wheats grown in Powell Butte, Oregon in 1989

Variety	Yield bu/ac	Test wt lbs/bu	Hd date days	Height in	Lodging
Stephens*	152.7	59.1	168	34	3
Hill**	140.6	59.4	170	41	13
Malcolm	172.5	59.2	169	35	3
OSU-21	128.9	58.9	165	37	28
OSU-28	145.0	60.1	166	34	0
OR CW8314	175.5	59.7	165	37	3
OR CW8519	153.1	60.6	170	39	0
OR CW8521	158.3	60.9	169	44	0
Wanser*	131.8	60.6	166	46	40
Hatton**	130.0	62.8	168	49	75
Batum**	133.7	56.6	170	38	38
OR CR8313	122.3	62.4	166	36	0
OR CR8601	135.1	62.0	165	39	0
OR CR8602**	119.7	60.8	164	27	0
OR CR8718	148.0	62.2	165	40	0
OR CR8617	158.5	62.9	167	32	0
Mean	144.1	60.5	167	38	13

Two replicates.
Three replicates.

Table 7. Soft white winter wheat varieties grown at Powell Butte. 1979-1989.

Variety	Yield bu/ac	Test wt lbs/bu	Hd date days	Height in	Lodging %	Years of data
Hyslop	107.6	56.2	177	18	35	8
Davis	111.9	57.2	179	9	35	8
Dusty	118.9	58.8	175	8	35	3
Hill 81	114.7	58.1	179	10	37	10
Malcolm	121.8	56.4	177	4	35	10
McDermid	107.8	54.7	176	0	25	8
Nugaines	108.4	58.0	179	15	33	8
Stephens	112.6	55.7	177	6	34	10

Spring wheat

Sixteen lines of spring wheat were planted with eight lines of white and eight lines of hard red spring. Several advance lines look very good with OR484013 as the most popular advance line, which will be released as a variety for the hard whites. Table 8 has the agronomic data for the Powell Butte spring wheat trial.

Table 8. Agronomic data for the spring wheat varieties, Powell Butte, OR, 1989.

Variety	Yield	Test wt	Hd date	Height	Lodging
	bu/ac	Ibs/bu	days	in	
OR 487503	118.4	54.4	180	39	0
OR 487570	114.8	55.8	182	38	0
4870279	112.6	62.5	176	37	0
4870249	110.9	62.7	177	37	0
4870332	116.0	60.3	176	38	0
OR 485010	107.0	63.3	175	37	0
4870355	94.8	62.7	176	38	0
4870456	110.9	62.0	177	35	0
4870475	99.4	59.9	178	30	0
4870400	114.5	63.1	176	38	0
OR 484013	115.7	62.0	176	36	0
OR487316	116.1	60.4	176	32	0
ORS 8501	138.2	59.9	176	40	0
Owens	88.7	60.3	174	26	0
Twin	110.6	60.8	175	39	0
Walladay	97.1	60.7	174	36	0
Mean	110.3	60.7	177	36	0

Conclusion

With the price increase for cereal, wheat has been and will continue to be a major crop in central Oregon. A result of the cooperative effort from Oregon State University and Central Oregon Agricultural Research Center, is the release of many new varieties with Hyak and Madsen in 1988, the soft whites OR830801, and OSU-21 in 1989-1990, and ORCR8313, a hard red, also in 1989. These new releases will continue to add to the quality and production of wheat to help keep prices at an optimum level.