IRRIGATED WINTER WHEAT VARIETY TRIALS FOR 1990

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Abstract

A variety trial for soft white wheat and triticale along with one for hard red and white elite winter wheat was planted at Madras in 1989. At the Powell Butte site a winter soft white and hard red wheat and triticale variety trial was established.

Introduction

Depending upon the year, the commercial acreage of winter cereals varies because of water availability, markets, and crop rotations, etc. COARC continues to test cultivars and lines without any outside resource funding because of the importance of cereals in central Oregon. As a result of dwindling resources, this will probably be the last year for the elite trials, and there will be more emphasis placed on testing released or near release cultivars.

Materials and Methods

A winter soft white wheat and triticale variety trial, and a hard red and white elite winter wheat variety trial were planted at Madras in October, 1989 and a soft white and hard red winter wheat and triticale variety trial was established in October, 1989 at Powell Butte. The experimental design was randomized block with four replications for all the trials. The 5 x 20 foot plots were planted at the rate of 96 lb/ac with a cone type experimental drill with 8 inch row spacing. The Madras trials had 150 pounds of N and 60 pounds of S applied in April, 1990, and the Powell Butte trial had 150 pounds of N and 60 pounds of S applied in April, 1990. The first date of irrigation for Madras was April 13 and the last date irrigation was July 16. At Powell Butte, the first irrigation date was May 5 and the last irrigation occurred on July 26. The plots, 5 x 15 feet, were harvested with a Hege plot combine on September 5 at Madras and September 6 at Powell Butte.

Data collected from the trials included yield, percent relative yield of Stephens (Powell Butte only), test weight, percent protein, hardness factor, flowering date, height, and

lodging. Percent protein and hardness factor was predicted with near infrared reflectance spectrometry (NIRS) by the Oregon State University Crop and Soil Science Dept.

Results and Discussion

The data for the Powell Butte winter soft white and hard red wheat and triticale trial are presented in Table 1. Malcolm was the highest yielding cultivar (120.4 bu/ac), 15 percent better than Stephens. Gene SW and Hoff HR, new releases, yielded 88 and 69 percent of Stephens. Experimental line OR CW8314 yielded 18 percent better than Stephens. Test weights and percent protein were low in general for the trial. The soft white wheats were very low in protein, while some of the hard red cultivars were higher in protein content. There was only one replication used to test for protein and hardness factor, and to record flowering date. The range of heights was 32 to 44 inches and lodging was mostly a problem for the hard red varieties and lines. Wanser and Hatton lodged greatly, as did Hoff.

The data for the Madras soft white and triticale trial are in Table 2. The yields were low this year. Stephens was the top yielding cultivar at 89.9 bu/ac, while OR 860302 was the highest yielding experimental line at 105.6 bu/ac. Lodging was high for the trial, averaging 85 percent, which may have contributed to the low yields. Stephens and OR 860302 were two of the least lodged entries. Test weight was also low, averaging 51.5 lb/bu. There was a great deal of stress that occurred.

The data for the Madras hard red and white elite trial are listed in Table 3. Stephens was again among the top yielders at 105.3 bu/ac with a number of experimental lines yielding over 100 bu/ac. Hoff, a new hard red release, yielded 96.1 bu/ac which was 30 and 18 bu/ac greater than Batum and Wanser, respectively. Test weights were low in general for this trial and lodging was high, averaging 72 percent, but lower than the soft white trial at Madras. The mean percent protein was 0.4 percent higher in this trial. The majority of the cultivars and lines had acceptable protein levels based on tests from one replication.

Comparing the trials at Madras, the hard red and white wheat trial was at 50 percent flowering three days earlier than the soft white and triticale trial. The mean yield, test weight, and lodging for the hard red and white trial was 8.0 bu/ac and 2.7 lb/bu greater, while lodging was 13 percent less than in the soft white and triticale trial.

Table 1. 1990 agronomic data for the soft white and hard red winter wheat varieties planted in the fall of 1989 at COARC Powell Butte, OR.

Variety	Yield lb/a	% Rel. Yield of Stephens	Test Weight lb/bu	Protein %	Hardness Factor	Flower Date	Height in	Lodging %
Stephens	104.2	100	54.7	9.0	24.1	182	37	4
Hill 81	112.7	108	56.9	8.9	4.4	175	41	6
Malcolm	120.0	115	55.2	8.1	12.4	178	37	6
OSU-21	90.9	87	54.0	9.0	17.5	178	37	6
OR CR8603	86.6	83	53.7	11.5	53.1	177	37	0
OR CW8314	123.4	118	53.2	8.3	6.0	179	38	0
OR CW8519	102.8	99	55.8	9.0	15.5	176	43	18
OR CW8521	84.4	81	55.9	8.5	14.9	177	42	11
Wanser	62.8	60	56.6	8.6	28.7	182	44	93
Hatton	61.0	59	58.3	10.6	55.1	179	42	76
Batum	83.0	80	55.2	12.5	62.6	181	40	25
Hoff	72.4	69	55.6	13.6	48.7	177	37	73
OR CR8601	87.3	84	58.6	122	77.7	176	39	8
OR CR8602	85.0	82	55.6	12.7	70.9	176	32	56
OR CR8718	95.2	91	59.0	12.4	70.1	179	39	1
OR CR8619	95.8	92	57.9	11.2	60.8	180	34	18
OR CR8608	93.0	89	58.7	11.5	76.1	179	36	26
Gene	91.3	88	53.2	11.5	35.0	179	34	0
Mean	91.8	88	56.1	10.5	40.8	178	38	24
PLSD .05	13.6		1.1	one	one	one	2	32
PLSD .01	18.2		1.5	rep	rep	rep	3	42
CV%	10.5		1.4	only	only	only	4.0	94

Table 2. 1990 agronomic and quality data for the soft white winter wheat and triticale variety trial established in 1989 at COARC, Madras, OR.

Variety	Yield lb/a	Test Weight lb/bu	Protein	Hardness Factor	Flower Date	Height in	Lodging
Stephens	89.9	51.9	14.1	28.6	164	39	66
Hill 81	74.0	54.6	122	16.9	167	41	76
Malcolm	78.9	51.2	11.0	16.9	169	37	85
Oveson	72.0	52.9	103	6.2	163	36	96
Dusty	78.0	52.7	10.8	13.6	175	38	96
Tres	71.7	52.5	11.7	23.3	169	43	93
Rhode	783	52.8	11.9	15.5	171	39	95
Daws	83.7	52.3	12.0	17.0	169	38	90
Hyalc	64.0	49.8	12.1	27.1	164	39	98
Madsen	83.6	52.5	13.2	13.6	167	37	89
Whitman Trit.	74.6	47.0	13.4	45.4	161	52	65
OSU-21	72.4	50.6	12.4	18.8	162	38	94
MacVicar	82.9	50.4	10.9	20.0	163	38	80
Flora Trit.	75.4	38.3	11.3	14.9	161	39	70
OR CW8632	892	52.4	12.2	22.5	162	38	79
Gene	832	492	123	133	165	35	89
OR 8302665	74.0	51.3	12.6	8.9	170	39	84
OR 8303765	79.0	52.9	10.9	9.8	172	42	89
OR 8400838H	75.1	50.6	11.0	17.5	173	40	91
OR CW8626	87.3	54.6	12.3	26.0	164	38	86
OR CW8629	80.2	52.1	11.9	15.5	169	39	93
OR 8303725	93.0	52.2	11.5	10.1	171	41	95
OR 840815	71.8	53.4	10.9	21.6	163	40	86
OR 8400814H	83.9	51.6	11.8	15.4	164	38	69
OR 8303734	77.6	51.7	12.8	28.2	167	38	80
OR 8501005H	78.3	52.0	12.5	20.1	169	42	88
OR 8500933H	97.8	51.1	11.9	14.4	166	38	80
OR 8500594H	94.9	50.5	123	15.9	165	35	86
OR 8501048P	80.7	48.5	122	27.9	165	38	86
OR 8401074P	77.0	52.4	12.5	20.2	164	41	83
OR 84019525	63.8	50.9	12.1	19.7	174	40	86
OR 8501139H	72.3	54.9	12.2	29.8	175	42	95
OR 8507847P	80.8	52.0	12.5	23.5	171	40	85
OR 8505311P	66.5	51.9	13.0	34.8	169	39	89
OR 860754	78.1	55.5	12.6	25.8	165	37	78
OR 860297	86.5	512	12.1	13.0	162	37	95
OR 860302	105.6	52.4	11.1	20.1	163	35	56
OR 860303	94.8	52.7	11.7	21.2	163	33	91
OR 860576	79.8	51.6	12.6	21.1	174	35	85
OR 860827	76.8	49.3	13.8	7.2	166	37	74
Mean	80.2	51.2	12.1	19.5	167	39	85
PLSD .05	20.8	1.6	one	one	11	3	21
PLSD .01	27.5	2.2	rep	rep	15	4	28
CV%	18.5	2.3	only	only	5.0	5.0	18.0

Table 3. 1990 agronomic and quality data for the hard red and soft white winter wheat elite variety trial established in 1989 at COARC, Madras, OR.

Variety	Yield lb/a	Test Weight lb/bu	Protein %	Hardness Factor	Flower Date	Height in	Lodging
Wanser	78.5	55.5	12.5	46.5	165	50	91
Stephens	105.3	53.5	12.4	22.9	164	39	64
Hoff	96.1	56.6	13.0	46.4	163	41	94
Federation	65.2	53.6	12.5	16.6	162	45	93
Batum	65.7	52.3	12.3	54.7	166	42	94
OR8602	106.3	54.8	13.5	63.8	162	33	81
OR 83011034	80.5	56.1	12.3	61.4	162	42	94
OR 840157	87.2	57.4	13.4	63.9	161	44	85
OR 841708	84.5	54.2	13.2	75.2	166	44	58
OR 8303372	84.7	52.4	13.1	53.8	162	40	94
OR 8400161P	95.1	58.3	12.9	62.8	166	43	95
OR 860247	100.9	56.0	13.0	55.5	165	36	61
OR 860342	99.1	54.9	12.4	50.4	163	37	66
OR 860455	85.1	50.0	12.7	64.3	166	41	94
OR 860612	82.4	53.6	10.8	20.4	162	38	79
OR 860937	83.6	51.7	12.9	30.3	162	40	54
OR 861202	83.4	53.8	12.7	48.0	161	39	99
OR 861555	103.8	53.5	10.9	35.7	160	39	79
OR 8500701P	87.5	56.1	13.5	66.2	160	42	96
OR 8503882P	78.4	53.0	11.9	18.0	164	37	90
Filler	112.4	53.1					-
Filler	94.4	55.8					
Filler	87.5	50.8					
Monopole	67.4	55.5	14.2	65.3	169	41	71
OR 8500513H	103.6	57.4	12.2	45.8	165	34	26
OR CW8632	79.4	52.7	12.1	68.2	164	38	80
OR 8400115H	84.8	50.4	12.4	60.7	165	36	81
OR 860126	104.8	55.5	11.2	61.0	161	39	85
OR 860764	90.7	52.3	122	68.4	162	38	68
OR 8500519P	85.1	55.3	12.5	46.6	163	37	78
Mean	88.2	54.2	12.5	50.8	164	40	72
PLSD .05	16.2	1.3	one	one	one	3	23
PLSD .01	21.4	1.8	rep	rep	rep	3	31
CV%	13.0	1.8	only	only	only	5.0	23.0