IRRIGATED SPRING WHEAT AND TRITICALE VARIETY TRIALS FOR 1990 AND 1991

Mylen Bohle and D. Dale Coats
Central Oregon Agricultural Research Center, Madras, OR
Russ Karow
OSU Crop and Soil Science Department, Corvallis, OR

Abstract

Irrigated spring wheat and triticale variety trials were planted in 1990 at Madras. A demonstration trial (1 replication) was planted at Powell Butte. In 1991, a demonstration variety trial (1 replication) was planted at Madras, OR.

Introduction

Spring cereals for grain are planted in central Oregon, but the acreage is not as great as winter cereals. The cereal acreage varies from year to year due to availability of water, markets, rotations, and other cash crops. Cereal variety evaluations have been conducted over the years, but the spring cereals have had less emphasis. The future of spring cereal cultivar evaluation will have more emphasis. Beginning in the fall of 1993, the State-wide Variety Testing Program will evaluate winter and spring varieties at 11 or more sites, including Madras, in the state of Oregon. The Oregon State University Experiment Station, Oregon Grains Commission and Oregon Wheat Commission will be funding the program.

Data from one replicated trial and two demonstration trials are presented in this paper.

Materials and Methods

An irrigated spring wheat and triticale variety trial (randomized block design with four replications) was planted at COARC, Madras, OR, and a demonstration trial (one replication) was planted at Powell Butte. The seeding rate was 96 lb/ac and the planting dates were April 6 and April 13, 1990, respectively, for Madras and Powell Butte. Fertilizer applied was 150 pounds of N and 60 pounds of S per acre in April. The plot size was 5 x 20 feet. The first irrigation started on May 2 and 5 and the last irrigation date was July 27 and August 4 at Madras and Powell Butte, respectively. The data recorded were yield, test weight, percent protein on one replication, hardness factor on one replication, height, and lodging. Flowering date was recorded at Powell Butte. The Madras and Powell Butte plots were harvested on August 27 and September 6, respectively. The plots (5 x 15 feet) were harvested with a Hege plot combine. Percent protein

and hardness factor were predicted with near infrared reflectance spectrometry (NIRS) at the Oregon State University Crop and Soil Science Dept.

In 1991, a spring wheat, triticale, and rye variety demonstration trial (1 replication only) was planted on April 23 at Central Oregon Agricultural Research Center Madras site. The 5 x 20 feet plots were planted with a cone type experimental plot drill with 8-inch row spacing at the rate of 96 lb/ac. The trial was fertilized with 52 pounds of N and 60 pounds of sulfur. The soil test revealed a high soil nitrate nitrogen level in the top 1-foot (101 lb N/ac). The first irrigation date was April 24 and the last irrigation date was July 27. A 5 x 15 feet area was harvested with a Hege experimental plot combine on September 23. Data collected included yield, test weight, percent protein, hardness factor, height, and lodging. The percent protein and hardness factor was predicted with near infrared reflectance spectrometry (NIRS) at the OSU Crop and Soil Science Dept.

Data are reported on an air dry moisture basis.

Results and Discussion

In the 1990 replicated trial at Madras (Table 1), there were only three spring wheat and two triticale varieties, with the rest being experimental lines. Juan triticale was the highest yielding cultivar. Two experimental lines yielded slightly over 100 bu/ac. Yecora Rojo outyielded Borah but not significantly. Two experimental lines (4870400 and OR 8501) had test weights above 60 lb/bu. Protein levels from one replication revealed that adequate fertility existed, especially for the hard red spring wheats and triticale, but was over-fertilized for the soft white lines. Lodging was not much of a problem for the trial in general, especially under fairly high fertility conditions.

In the 1990 non-replicated trial at Powell Butte (Table 2), Juan triticale was the top yielder in the trial. The same two experimental lines, (as in the Madras trial), had the best test weights, above 60 lb/bu. Fielder test weight was above 60 lb/bu. Protein percentages revealed that the fertility was adequate for the soft white wheat and triticale varieties but not for the hard reds in general. There were 10 days difference in the flowering dates, The earliest and latest happened to be the two triticale varieties. No lodging occurred.

In the 1991 non-replicated trial at Madras (Table 3), the trial was set out to take an initial look at some new cultivars and increase seed supplies. Klasic, a hard white cultivar, and Westbred Express, a hard red, yielded almost 100 bu/ac, better than the other cultivars. The hard reds, in general, were the highest yielders. There was a rye and triticale variety that yielded the least. Grace triticale is a forage type with what appears to be poor grain reproducing capability. Some of the other varieties at the bottom of the list have yielded better in other trials in previous years. Test weights were good in general. The percent proteins revealed that there was adequate fertility for the hard reds, but the soft whites would have been over-fertilized based on their protein levels. There was a large variation in heights as well as lodging, but lodging was not a problem in general. Seeding rates that would have been planted at 30 seeds/ft^2 from the original

seed source and the seeding rate from the seed harvested are in Table 4.

It is important to note that the last two trials discussed had only one replication and great care should be exercised in interpreting the data. It was an initial look at a large number of cultivars.

Table 1. 1990 spring wheat and triticale variety trial agronomic and quality data for plots established at COARC, Madras, OR.

Variety	Yield bu/a	Test Wt. lb/bu	Protein	Hardness Factor	Height In.	Lodging
4870279	97.5	58.5	14.8	70.2	32	2
4870249	90.0	57.3	15.4	71.7	32	2
4870332	89.1	55.9	13.9	64.1	33	33
4870355	80.1	57.9	15.8	70.2	36	25
4870456	84.1	58.6	13.9	60.1	33	3
4870400	96.1	602	14.7	76.8	36	10
OR 484013	95.4	543	13.9	77.4	35	2
OR 487316	92.2	56.9	122	22.0	33	22
OR 8501	88.5	60.6	12.5	20.1	36	35
OR 487381	96.4	56.6	14.7	79.8	33	13
OR 58427	75.1	56.9	13.7	25.4	38	3
OR 487462	86.5	57.1	15.2	73.8	33	18
OR 487380	101.2	57.0	15.4	62.9	27	8
OR 487453	102.9	57.1	145	83.7	34	3
Yecora Rojo	86.8	56.5	15.7	67.9	26	5
Fielder	83.9	57.5	12.1	14.0	35	28
Borah	77.7	56.5	15.0	61.9	32	12
Yecora Rojo	90.4	57.5	16.1	67.9	27	0
Juan Trit.	97.1	47.4	12.4	423	49	23
Karl Trit.	87.4	48.9	11.9	10.4	37	22
Mean	89.9	56.5	142	56.1	34	14
PLSD .05	14.4	2.5	one	one	3	35
PLSD .01	19.4	3.4	rep	rep	4	47
CV%	9.7	2.7	only	only	5	158

Table 2. 1990 agronomic and quality data for the spring wheat and triticale variety demonstration trial (1 rep) established at COARC Powell Butte, OR.

Variety	Yield bu/a	Test Wt. lb/bu	Protein %	Hardness Factor	Flower Date	Height In.	Lodging %
4870279	67.0	59.4	103	51.7	181	35	0
4870249	67.2	58.6	10.4	59.6	184	33	0
4870332	78.4	56.6	9.7	59.0	185	37	0
4870355	733	60.0	11.1	53.8	185	40	0
4870456	85.3	59.1	9.9	47.6	180	43	0
4870400	62.9	60.9	11.5	69.6	184	37	0
OR 484013	79.1	57.6	9.8	583	185	34	0
OR 487316	67.9	563	9.0	1.2	180	34	0
OR 8501	70.1	61.1	9.6	13.5	181	39	0
OR 487381	68.2	57.8	10.9	65.1	180	35	0
OR 58427	76.7	59.4	10.9	20.6	185	39	0
OR 487462	84.4	58.6	12.9	76.9	180	38	0
OR 487380	82.5	57.6	11.9	36.4	179	28	0
OR 487453	93.7	59.0	11.0	70.0	186	38	0
Yecora Rojo	72.9	58.3	11.6	67.0	179	28	0
Fielder	92.2	60.1	10.4	8.8	178	42	0
Borah	80.6	59.0	12.0	54.4	179	35	0
Yecora Rojo	79.8	58.2	11.4	68.4	178	28	0
Juan Trit.	94.1	52.7	9.2	33.8	187	52	0
Karl Trit.	71.3	50.7	9.2	23.4	177	36	0
Mean	77.4	58.1	10.6	47.0	182	37	0

Table 3. 1991 Agronomic and quality data spring wheat, triticale and rye variety demonstration (1 rep) trial established at COARC, Madras, OR.

Variety	Yield bu/a	Test Wt. lb/bu	Protein %	Hardness Factor	Height In.	Lodging %
Klasic	99.9	60.0	14.0	66.8	33	0
Westbred Express	99.6	58.6	15.1	105.7	33	0
Yecora Rojo	93.5	60.4	15.0	84.1	28	0
Borah	91.6	59.0	13.9	86.1	34	10
Yolo	90.6	58.1	13.6	93.1	35	0
Victoria[1]	90.4	60.3	12.3	52.8	50	0
Wampum	90.1	59.6	13.1	101.5	40	0
ORS 8413	88.2	57.5	14.7	102.5	37	90
Alamos 83[1]	87.8	52.0	123	35.5	41	0
ORS 8501	87.6	59.1	12.4	27.6	39	0
Waduel	87.4	58.1	14.3	363	41	75
ORS 8510	82.6	59.6	14.2	89.7	37	0
Westbred 906	82.4	57.9	14.8	84.6	40	0
Pennawawa	81.9	58.4	13.2	29.5	39	65
Eronga 83[1]	80.5	48.0	14.0	59.4	48	0
Fieldwin	765	593	12.9	37.9	40	0
Wakan7	75.2	582	12.1	37.7	40	35
Karl[1]	73.3	48.8	12.6	34.4	41	0
Spillman	71.5	54.7	14.2	92.3	37	15
Fielder	70.6	57.4	12.5	33.7	41	0
Bronze Chief	70.2	56.5	165	94.1	38	0
Copper	70.0	58.9	13.9	82.9	37	10
Juan[1]	70.0	44.0	11.9	44.1	54	25
McKay	68.8	57.0	13.1	85.8	39	0
Blanca	68.8	58.0	13.1	333	42	0
Bliss	67.4	57.4	12.2	35.1	38	0
Frank[s]	66.2	485	13.6	513	54	0
Owens	662	57.4	133	26.1	40	0
Westbred 926	64.9	55.9	15.1	71.6	40	0

Table 3. (continued)

Variety	Yield bu/a	Test Wt. lb/bu	Protein	Hardness	Height In.	Lodging
Treasure	61.6	51.6	11.6	22.6	36	80
Dirkwin	54.1	53.4	12.6	42.0	39	0
ORS 8427	52.8	56.6	13.1	28.9	38	0
Twin	51.8	54.9	12.6	30.9	40	80
Gazelle[2]	46.7	52.7	13.2	22.0	60	60
Grace[s]	45.6	423	15.0	43.5	57	40
Mean	75.0	55.7	13.5	57.3	41	17

[1] Triticale
[2] Rye

Table 4. The seeding rates in pounds per acre that should have been planted (seed rate 2) for 30 seeds/ft[2], instead of the 96 lb/ac rate, and the future seeding rate (seed rate 1) for the harvested seed of the 1991 spring wheat. triticale and rye demonstration trial (1 rep) established at COARC, Powell Butte, OR.

Variety	Seed Rate (1)	Seed Rate (2)	Variety	Seed Rate (1)	Seed Rate (2)
Klasic	112	123	Spillman	110	85
Westbred Express	97	120	Fielder	91	127
Yecora Rojo	111	126	Bronze Chief	102	121
Borah	92	99	Cooper	100	94
Yolo	78	99	Juan Trit.	115	171
Victoria Trit.	98	125	McKay	86	94
Wampum	92	126	Blanca	93	96
ORS 8413	88	83	Bliss	81	111
Alamos 83 Trit.	103	138	Frank Trit.	88	119
ORS 8501	79	100	Owens	83	121
Waduel	102	88	Westbred 926	88	117
ORS 8510	87	107	Treasure	89	127
Westbred 906	103	127	Dirkwin	104	103
Pennawawa	92	80	ORS 8427	94	93
Eronga 83 Trit.	102	104	Twin	81	107
Fieldwin	86	112	Gazelle Rye	75	93
Walca-nz	95	119	Grace Trit.	90	133
Karl Trit.	99	118			