1996 SMALL GRAIN VARIETY TRIALS

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Purpose

The purpose of these trials was to evaluate the performance of newly released and commercially available small-grain cultivars under local cultural practices and environmental conditions. Data obtained from these trials provide local producers with area-specific information for cultivar selection. The data also provides public and private plant breeders with site-specific performance information for advanced lines and newly released varieties.

Six small grain variety trials were conducted at the Malheur Experiment Station during the 1995-96 crop year. The OSU statewide winter cereal, winter barley, spring cereal, and spring barley trials were conducted as part of a statewide small-grain variety testing program. For the fifth year, fall-planted fall-emergence and fall-planted winter-emergence wheat trials were conducted at the Malheur Experiment Station. The purpose of these trials is to develop a database to help local growers decide when to stop planting winter types and start planting spring types.

Procedures

All winter and spring trials were planted in a randomized complete-block design with three replications. Each plot was planted on one or two 60-inch beds (depending on the trial) with seven rows spaced 7 inches apart on each bed. The dimensions of each plot were 5 or 10 feet wide by 15 feet long. All trials were furrow irrigated. At maturity, harvest samples were collected from a 50-inch swath through the center of each plot, an area of 62.5 square feet. All "harvester-run" samples were cleaned with an aspirator cleaner and processed at the Malheur Experiment Station.

Winter Trials

The 1996 winter cereal trials followed the 1995 harvest of sweet corn. No preplant fertilizer was applied. The OSU statewide winter cereal, OSU statewide winter barley, and the fall-planted fall-emergence wheat trials were planted October 10, 1995. All entries were drilled approximately 1 inch deep. The seeding rate for the OSU statewide winter cereal trial and the OSU statewide winter barley trial was 30 seeds per square foot. The seeding rate for the fall-planted fall-emergence wheat was 120 pounds per acre.

The fall-planted winter-emergence wheat trial was planted at 120 pounds per acre on December 4, 1995. The planting procedure was the same as for the previously described fall-planted trials.

On April 10, 1996, all six nurseries were top-dressed with 100 lb/ac N as ammonium sulfate.

To control broadleaf weeds, a tank-mix containing 2.4 pints of Curtail and 0.25 pints (0.125 lb ai/ac) of dicamba (Banvel) in 30 gallons of water per acre was applied by ground-rig over the winter trials on April 14, 1996.

The three wheat trials were furrow irrigated on May 3, June 6, and June 19. The winter barley trial was furrow irrigated on May 3 and June 6.

The trials were harvested on August 1, 1996. Grain yield per acre was calculated based on a plot length of 18 feet for all four trials, due to the growth of the grain plants using space above ground to the east and west beyond the planted edges of the plots.

Spring Trials

The 1996 spring cereal trials were grown in the same field as the winter trials with no preplant fertilizer. All entries in the OSU statewide spring cereal trials and the OSU statewide spring barley trials were drilled approximately 1 inch deep into moist soil on March 15,1996. The seeding rate for both plantings was 30 seeds per square foot.

On April 10 both trials were top-dressed with 63 lb/ac N as ammonium sulfate.

On April 15 a tank-mix containing 1.5 pints per acre (0.75 lb ai/ac) of MCPA (Bronate 4EC), and 0.25 pints per acre (0.125 lb ai/ac) of dicamba (Banvel) in 30 gallons of water per acre was applied by ground-rig over both trials.

Irrigations were applied on May 3, June 4, and June 19.

Both spring trials were harvested July 30, 1996. Grain yield per acre was calculated based on a plot length of 18 feet for both trials, due to the growth of the grain plants using space above ground to the east and west beyond the planted edges of the plots.

Variety performance was compared in each trial using ANOVA and protected least significant differences at the 5 percent level, LSD (0.05).

Results and Discussion

1995-96 Winter Cereal Grain Trials

Good seedling emergence was achieved. Weather during November was unusually warm, and fall planted grain developed more than usual, resulting in many tillers late in

winter and early spring. The well-developed plants helped provide the basis for high yields in 1996.

The OSU statewide winter cereal trial included 14 soft white winter wheats, one hard red winter wheats, one winter club wheat, and four winter triticales (Table 1). Yields for the soft white cultivars ranged from 157 bu/ac for Stephens to 113 bu/ac for Hiller. Test weights for the soft whites ranged from 61.2 lb/bu for ID8614502B to 55.8 lb/bu for Hiller. Protein for the soft white cultivars has not been determined. The average heading date (50 percent headed) for the trial was May 24. Heading dates for soft white wheat cultivars ranged from May 19 for ID8614502B to May 27 for Basin and Daws. At maturity, plant heights within the soft whites ranged from 31 inches for Basin to 39 inches for Hill 81. Lodging was observed mostly in the plots adjoining the onion field on the north side of the grain trial irrespective of variety.

The OSU statewide winter barley trial included 10 six-row feed barley entries (Table 2). Yields ranged from 9,445 lb/ac for SDM 204B to 7,016 lb/ac for Hundred. Test weights ranged from 44.4 lb/bu for Hundred to 48.4 lb/bu for the variety Gwen. Protein levels are yet to be determined. The average heading date (50 percent headed) for the nursery was May 13. Heading dates ranged from May 8 for Gwen to May 18 for SDM 204B. At maturity, plant height ranged from 28 inches for Kold to 37 inches for Steptoe. Lodging was insignificant for all entries in 1996.

Both the fall-planted fall-emergence wheat trial and the fall-planted winter-emergence wheat trial included the same eight soft white and two hard red wheat cultivars (Tables 3 and 4).

Yields in the fall-emergence trial ranged from 157 bu/ac for Stephens to 128 bu/ac for Anza (Table 3). Test weights for the soft white types ranged from 63.7 lb/bu for Alpowa to 59.5 lb/bu for Stephens. The average heading date (50 percent headed) for the fall-emergence trial was May 16. Heading dates ranged from May 12 for Alpowa to May 22 for Malcolm and MacVicar. The difference in the mean heading dates for winter versus spring cultivars was significant. At maturity, plant heights ranged from 34 to 38 inches. At harvest no statistically significant differences in lodging were observed.

In the winter-emergence trial, yields ranged from 149 bu/ac for Penawawa to 115 bu/ac for ID0448 (Table 4). Test weights for the soft white types ranged from 62.3 lb/bu for Alpowa to 57.3 lb/bu for MacVicar. The average heading date (50 percent headed) for the winter-emergence trial was May 28. Heading dates ranged from May 23 for Alpowa to June 6 for MacVicar. At maturity, plant heights ranged from 34 to 38 inches. At harvest, lodging was observed in the plots adjoining the onion field to the north.

Yields of Penawawa were relatively high where the variety was planted on October 14 or December 4. The yields of Stephens, Malcolm, and MacVicar were among the highest when planted on October 14, but they were significantly less than Penawawa when planted on December 4.

1996 Spring Cereal Grain Trials

Considerable heat occurred toward the end of the grain fill period in 1996. The heat apparently was less favorable for the spring grains, reducing their productivity.

Yields for the soft white types in the OSU statewide spring cereal trial ranged from 115 bu/ac for Sunstar Promise to 95 bu/ac for Pomerelle (Table 5). Yields for the hard red types ranged from 106 bu/ac for Yecoora Rojo to 99 bu/ac for WPB 926R. The yield for the triticale TriCal 2700 was 89 bu/ac. Test weights for the spring white wheats ranged from 64.2 lb/bu for ID 377S (a hard white wheat) to 60.0 lb/bu for Pomerelle. Test weights for the hard red cultivars ranged from 63.5 lb/bu for Yecoora Rojo to 61.9 lb/bu for WPB 926R. Heading dates (50 percent headed) for the soft white wheats ranged from May 31 for Centennial to June 5 for ID 448. Heading dates for the hard red types ranged from May 31 for several varieties to June 5 for Pomerelle. At maturity, plant heights for the soft white cultivars ranged from 32 inches for Treasure to 38 inches for Wawawai. No lodging was observed among any of the entries in this trial.

The OSU statewide spring barley trial included nine feed, two malting, and three hulless cultivars (Table 6). Yields ranged from 6,906 lb/ac for Steptoe treated with Baytan to 4,038 lb/ac for Waxbar. Test weights ranged from 62.1 lb/bu for WPB BZ489-74 (a hulless barley) to 46.8 lb/bu for Gustoe. The average heading date (50 percent headed) for the trial was June 1. Heading dates ranged from May 26 for Russell to June 5 for Idagold. At maturity, plant heights ranged from 23 inches for Gustoe to 34 inches for Colter. Waxbar lodged severely with no other variety lodging.

Table 1. Statewide winter cereal trial planted October 14, 1995, and harvested August 1, 1996, at Ontario, Oregon. Malheur Experiment Station, Oregon State University, Ontario, Oregon.

Variety	Market class[1]	Yield[2]	Test weight	Protein	Plant height	Heading date	Lodging
		bu/ac	lb/bu	%	inches	May	%
Daws	SWW	127	59.7	9	36	27	0
Gene	SWW	130	56.8	10.6	34	20	0
Hill 81	SWW	135	59.3	9.6	39	27	0
Hiller	SWW	113	55.8	9.5	37	24	13
MacVicar	SWW	150	60.2	8.9	36	24	0
Madsen	SWW	143	59.1	9.7	36	26	0
Madsen + Stephens	SWW	149	59.4	8.9	36	21	0
Malcolm	SWW	148	58.8	9.6	38	22	13
Rhode	Club	128	60.3	9.5	37	24	30
Stephens	SWW	152	59.7	9.7	36	21	3
Stephens (Gaucho)[3]	SWW	157	59.5	10.1	36	21	0
Celia	Trit	96	53.1	10.2	36	23	0
Rod	SWW	137	58.7	9	37	28	11
ID8614502B	SWW	138	61.2	9.4	34	19	3
ID 467	HRW	134	61. 0	9.2	36	22	2
RS87-123	Trit	131	52.8	8.3	46	15	0
RS87-183	Trit	126	54.1	9	46	15	0
RS87-202	Trit	131	52.1	9.9	47	14	0
W-301	SWW	151	59.6	10.3	38	22	43
Basin	SWW	136	59.7	8.6	31	27	3
Mean		135	58.1	9.5	38	22	6
LSD (0.05)		11	1.6	1	2	2	22

[1] Market classes were soft whit winter wheat, club wheat, triticale, and hard red winter wheat.

[2] Yield reported on basis of 60 lb/bu at 12 percent moisture.

[3] Gaucho seed treatment., all entries were treated with Vitavax RTU.

Table 2. OSU statewide winter barley trial planted October 14, 1995, and harvested August 1, 1996, at Ontario, Oregon. Malheur Experiment Station, Oregon State University, Ontario, Oregon.

Variety	Yield[1]	Test weight	Protein	Plant height	Heading date	Lodging
	lb/ac	lb/bu	%	inches		%
Gwen	6,899	48.4	9.2	30	8	0
Hesk	7,603	44.8	8.3	29	15	0
Hesk (Baytan) [2]	7,479	45.3	8.4	28	13	0
Hundred	7,016	44.4	8.8	31	13	0
Kold	7,164	46.1	8.8	28	13	2
Scio	7,311	45.1	8.9	30	12	0
Steptoe	7,549	48.2	9	37	12	0
ORW 6	7,867	46.7	8.7	29	11	0
SDM 204B	9,445	45.3	7.4	34	18	0
OR81019	7,263	46.9	9.3	29	10	0
Mean	7,560	46.1	8.7	31	13	0
LSD (0.05)	1,071	1.4	0.3	3	3	ns

[1] Yield reported on basis of 10 percent moisture.

[2] Baytan seed treatment. All other entries were treated with Vitavax RTU.

Table 3. Malheur fall emergence wheat trial planted October 14, 1995, emerged late October 1996; harvested August 1, 1996. Malheur Experiment Station, Oregon State University, Ontario, Oregon.

Variety	Market class[1]	Yield[2]	Test weight	Plant height	Heading date	Lodging
		bu/ac	lb/bu	inches	May	%
Penawawa	SWS	151	60.8	36	13	13
Treasure	SWS	138	61.7	36	14	28
Pomerelle	SWS	140	61.1	37	14	25
Alpowa	SWS	141	63.7	38	12	0
Centennial	SWS	128	63. 0	36	13	0
Yolo	HRS	132	62.5	34	14	0
Anza	HRS	122	62. 0	35	13	0
Stephens	SWW	157	59.5	36	21	0
Malcolm	SWW	156	59.9	37	22	0
MacVicar	SWW	156	60.3	38	22	0
Mean		142	61.4	37	16	7
LSD (0.05)		11	0.7	2	1	ns

[1]Market classes were soft white spring wheat, hard red spring wheat, and soft white winter wheat.

[2] Yield reported on basis of 60 lb/bu at 12 percent moisture.

Table 4. Malheur winter emergence wheat trial planted on December 4, 1995, emerged during February, and harvested on August 1, 1996. Malheur Experiment Station, Oregon State University, Ontario, Oregon.

Variety	Market class[1]	Yield[2]	Test weight	Plant height	Heading date	Lodging
		bu/ac	lb/bu	inches		%
Penawawa	SWS	149	61.5	34	May 24	0
Treasure	SWS	126	59.9	36	May 28	37
Pomerelle	SWS	115	59.7	37	May 28	27
Alpowa	SWS	136	62.3	38	May 23	0
Centennial	SWS	134	62.7	37	May 24	0
Yolo	HRS	129	62.8	34	May 24	0
Anza	HRS	135	62.4	34	May 24	0
Stephens	SWW	131	59.9	37	June 3	0
Malcolm	SWW	128	57.9	37	June 5	0
MacVicar	SWW	119	57.3	37	June 6	0
Mean		130	60.6	36	May 28	6
LSD (0.05)		17	2.5	2	0.4 days	ns

[1] Market classes were soft white spring wheat, hard red spring wheat, and soft white winter wheat.

[2] Yield reported on basis of 60 lb/bu at 12 percent moisture.

Table 5. OSU statewide spring cereal trial planted March 15, 1996, and harvested July 30, 1996, at Ontario, Oregon. Malheur Experiment Station, Oregon State University, Ontario, Oregon.

Variety	Market class[1]	Yield[2]	Test weight	Protein	Plant height	Heading date	Lodging
		bu/ac	lb/bu	%	inches		%
Alpowa	SWS	108	63.4	8.5	34	June 3	0
Alpowa (Gaucho[3])	SWS	112	63.7	8.2	35	June 3	0
Centennial	SWS	105	62.2	7.9	34	May 31	0
ID 377S	HW	104	64.2	8.8	35	May 29	0
ID 488	SWS	108	62.1	9.7	34	May 31	0
ID 462	HRS	94	62.9	7.3	34	May 31	0
Klasic	HW	90	63.9	8.8	26	May 28	0
OR 3895181	HW	113	61.4	9.2	34	May 30	0
Penawawa	SWS	110	62.7	8.3	33	June 2	0
Pomerella (ID 448)	SWS	95	60. 0	9.6	34	June 5	0
SDM 405S	SWS	106	61.6	9.6	34	June 3	0
Sunstar Promise	SWS	115	61.9	8.3	36	June 4	0
Treasure	SWS	107	61. 0	8.3	32	June 4	0
TriCal 2700	Trit	89	54.8	7.8	51	June 5	0
WaWaWai	SWS	112	62.9	8.7	38	May 31	0
Whitebird	SWS	100	62.8	8.2	36	June 3	0
WPB 926R	HRS	99	61.9	9.8	35	May 29	0
Anza	HRS	102	62.6	8.7	30	June 4	0
Yecoora Rojo	HRS	106	63.5	11.2	27	May 28	0
Yolo	HRS	105	61.4	8.6	32	June 3	0
Mean		104	62. 0	8.8	34	June 1	0
LSD (0.05)		16	1. 0	1.6	2	2 days	ns

[1] Market classes were soft white spring wheat, hard white wheat, hard red spring wheat, and triticale.

[2] Yield reported on basis of 60 lb/bu at 10 percent moisture.

[3] Gaucho seed treatment. All entries were treated with Vitavax RTU.

Table 6. OSU statewide spring barley trial planted March 15, 1996, and harvested July 30, 1996, at Ontario, Oregon. Malheur Experiment Station, Oregon State University, Ontario, Oregon.

Variety	Market class	Yield[1]	Test weight	Protein	Plant height	Heading date	Lodging
		lb/ac	lb/bu	%	inches		%
Baronesse	2F	6,683	53.1	7.7	27	May 31	0
Colter	6F	5,738	49. 0	7.5	34	May 29	0
Crest	2M	5,572	53.4	8.2	29	May 31	0
Maranna	6F	6,218	48.7	8.5	25	May 29	0
Payette	6F	5,806	48.9	9.1	25	June 1	0
Russell	6M	4,994	48.6	8.2	30	May 26	0
Steptoe	6F	6,358	48.1	8.6	32	May 29	0
Steptoe (Baytan)[3]	6F	6,906	48.6	8.4	33	May 29	0
Bear (WA 11045-87)	hulless	5,531	59.2	8.8	33	June 1	0
Waxbar	hulless	4,038	58. 0	8.6	28	June 4	50
WPB BZ489-74	hulless	4,539	62.1	8.7	28	June 4	0
Galena	2F	5,885	51.6	7.6	24	June 4	0
Idagold	2F	5,315	51.5	7.9	24	June 5	0
Gustoe	6F	6,768	46.8	8.2	23	June 1	0
Mean		5,739	52. 0	8.3	28	June 1	4
LSD (0.05)		962	1. 0	0.6	3	1 day	19

[1] Market classes were two row feed barley, six row feed barley, two row malting barley, six row malting barley, and hulless.

[2] Yield reported on basis of 60 lb/bu at 10 percent moisture.

[3] Baytan seed treatment. All other entries were treated with Vitavax RTU.