

STATEWIDE CEREAL VARIETY TESTING PROGRAM

Ernie Marx, Russell S. Karow,
Karen J. Morrow, and Richard Smiley

Introduction

This article reports results from cereal variety trials conducted in the Columbia Basin during 1998. These trials were conducted as part of an Oregon statewide testing program initiated in 1992 to provide growers with local data on performance of cereal varieties. The statewide program is coordinated by Russ Karow, Extension Cereals Specialist and Ernie Marx, Research Assistant, Department of Crop and Soil Science, both of Oregon State University. Karen Morrow was the trial coordinator for the Columbia Basin sites. Seed was packaged in Corvallis and distributed to trial coordinators. Coordinators planted, managed, and harvested trials on the station or in cooperation with growers. Information on trial locations, coordinators, and grower-cooperators is given in Table 1. The Corvallis research team processed harvested grain, analyzed results, and provided summary data to extension agents, seed dealers, agricultural field representatives, and growers across the state and region.

Winter and spring barleys, triticales, and wheats of several market classes were tested at ten sites statewide, including five in the Columbia Basin. When the program began in 1992, five Columbia Basin sites were selected to represent a range of growing conditions found in the region. Pendleton, Moro, and Heppner are dryland sites. The Pendleton site has the highest rainfall (17 in) and relatively moderate temperature extremes. The Moro site represents the low-rainfall (12 in) areas of the region. Heppner has shallow soils and a cool season. Irrigated trials are conducted at Hermiston and La Grande. Hermiston is an early season site with sandy

soils. La Grande is at a higher elevation with cold winters that sometimes cause crop damage, and it has a long, cool growing season.

This article reports data on yield for the Columbia Basin. More complete data, including test weights and protein, can be found on the Internet (www.css.orst.edu/cereals/) or in *Winter cereal varieties for 1999* (Special Report 775R, Oregon State University Extension Service) and *Spring grain varieties for 1999* (Special Report 986, Oregon State University Extension Service).

The statewide variety testing program is a grower-driven program. If you have ideas about varieties to be included in your area or have suggestions for program improvement, contact Russ Karow, OSU Extension Cereals Specialist (541-737-5857).

Materials and Methods

Dryland plots (5 ft × 20 ft) at Heppner, Pendleton, and Moro were seeded at 20 seeds/ft². Irrigated plots (5 ft × 20 ft) at LaGrande and Hermiston were seeded at 30 seeds/ft². Seeding rates for dryland plots ranged from 68 to 134 lb/acre, depending on variety, to attain the desired rate of 20 seeds/ft². Irrigated plot seeding rates ranged from 98 to 201 lb/acre. All trials were arranged in a randomized complete block design with three replications. Plots were seeded using small plot drills. Seeding, harvest, and production practices were typical for each location. Spring grain trials at Heppner were lost in 1998.

Harvested grain was cleaned with a Pelz rub-bar cleaner. Plot yield, test weight, protein, and moisture were determined on cleaned grain samples. Yields are reported on a 10% moisture basis and in 60-lb per bushel for wheat and triticale and in pounds per acre for barley. Protein is reported on a 12% moisture basis and was determined using a Tecator Infratec 1225 whole grain analyzer.

In addition to small-plot variety trials, large-scale winter wheat drill-strip trials have been conducted across the state for the past five years. Cooperating growers were provided with 50 to 80 lb seed of each variety to be tested. The seed for 1998 trials was donated by Eric and Marnie Anderson and Pendleton Grain Growers. Cooperators, often with assistance of local county agents, established single-replicate drill-strip plots on their farms. These drill strips were managed and harvested by the cooperating grower with standard field equipment. Weigh wagons or weigh pads were used to obtain yield data. Two-quart grain samples were saved from some plots and used for test weight and protein analyses. Yield data for 1998 drill-strip trials is listed in Table 2.

Results and Discussion

The tables at the end of this report contain yield information from 1998 trials as well as compilations of data from 1996–1998. Because year-to-year variability is often high, conclusions should not be made from a single year's data. Three-year averages are a better indication of how well a variety is suited to a location. For newer lines that have not been tested multiple years, the 1998 data may help identify lines to watch in the future.

Winter Trials

Winter wheat (soft white common) (Tables 3 and 5). Stephens, Madsen, and Rod

continue to be among the highest yielding varieties. Weatherford (OR898120) is a new release that has yielded as well as current varieties during the past two years of trials. Weatherford is later maturing than Stephens, with a heading date similar to Madsen. It is slightly taller than most widely grown varieties. Weatherford is resistant to moderately resistant to stripe rust, leaf rust, common bunt, powdery mildew, *Septoria tritici*, foot rot, and eyespot. It appears to have tolerance to *Cephalosporium* stripe. Winter hardiness is similar to Stephens. Grain quality is similar to current varieties for most attributes. Foundation seed for Weatherford will be available in fall 1999.

Brundage, released by Idaho in 1997, is another new line that has performed well in the Columbia Basin. Brundage is earlier than Stephens and tends to have slightly lower protein. Seed is available in Idaho.

Winter wheat (club) (Tables 3 and 5). Coda, Hiller, and Temple are three new club lines that have performed well for three years. Yields for these varieties have consistently matched or exceeded yields of Rely and Rohde. The new lines have stripe rust and foot rot resistance. Hiller has been the most consistent in our trials and may be the most widely adapted of the three. There is still some concern about Hiller not grading as club wheat, but trial samples have consistently graded as club.

Winter barley (Tables 4 and 6). Strider and Kold continue to be the recommended winter barleys in the Columbia Basin. Both varieties have barley stripe rust resistance. Foundation seed of Strider and Kold will be available in fall 1999. Registered and certified seed is available for Kold. Scio has had above average yields at many sites, but tends to have lower test weights. Scio is also susceptible to scald and barley stripe rust.

Steptoe has had below average yields and is susceptible to barley stripe rust.

Spring Trials

Spring wheat (Tables 7 and 9). Spring wheat yields at most Columbia Basin sites were lower in 1998 than 1996 and 1997, but were similar to long term averages observed since the statewide variety trials began in 1992. Rankings of soft white wheats remained similar, with Alpowa, Penawawa, and Pomerelle performing well. Several new lines had high yields in 1998, including IDO505 and IDO506 from Idaho and WA7850 from WSU. Additional years of data are needed to make final evaluations of these newer lines.

Relative yields of hard white spring variety IDO377S were down in 1998, but the three year average shows IDO377S yielding as well as or better than most soft white varieties. The grower cooperative Pro-Mar holds an exclusive license to production and should be contacted by interested growers.

Winsome is a new hard white spring release from Oregon State University. Heading date for Winsome is several days later than IDO377S and yields are similar to slightly lower. The Wheat Marketing Center's 1995 collaborative foreign testing teams identified Winsome as a superior cultivar for Asian noodle production. Seed for Winsome production should be available in 2001.

Among hard red spring wheats, Jefferson (IDO462) is a recent release which has performed well at dryland sites over a three-year period. Jefferson is slightly taller and more likely to lodge than WPB936. Idaho breeders intended Jefferson for dryland sites. It has performed well at Pendleton and Moro in our trials. Jefferson has also yielded well at the irrigated Hermiston site. Protein levels are

comparable to existing hard red varieties. Foundation seed is available for Jefferson.

Spring barley (Tables 8 and 10). Baronesse continues to be a top performer at all sites except La Grande where yields are near average. The small number of varieties that have been grown in the spring barley trials for at least three years reflects a change in direction of spring barley breeding programs. Barley stripe rust (BSR) resistance has become a primary focus of breeding programs in the Pacific Northwest. Many BSR resistant lines have been developed and have been in the statewide trials for two years (1997 and 1998). Orca (2RF/M) and Montana's Chinook (2RM) are among the more promising BSR resistant spring varieties. These lines will appear in the three-year summaries next year, after data for the 1999 trials data is collected.

Seed Treatments

Imidacloprid (marketed by Gustafson as Gaucho) is an insecticidal seed treatment used to control aphids and Hessian fly in wheat. Stephens soft white winter and Alpowa soft white spring wheats were grown with and without imidacloprid treatments for three consecutive years. There was no apparent advantage to using the insecticide in the winter trials. For the spring trials, seed treatment increased yields by about 6 bu/acre. The difference between the winter and spring responses may be explained by the length of the growing season. During the long winter season the effectiveness of the insecticide dissipates. During the shorter spring season, the insecticide remains effective for a greater portion of the plant life cycle. Different pest populations in the two seasons could also contribute to the different yield responses. Currently, Gaucho treatment costs approximately \$12 to \$15/100 lb seed. Novartis is developing a similar insecticidal

seed treatment.

Conclusions

While many varieties may excel in a given location in a given year, differences between widely grown varieties are often negligible when data from multiple years is examined. When selecting a variety, growers should consider disease resistance, hardiness, or other factors pertinent to the site where the crop is grown. Before switching to a new variety, small acreages should be grown for comparison to old varieties, preferably for more than one year, before making shifts in large acreages.

Acknowledgements

We thank Charlie Anderson, John Cuthbert, Norm Goetze, and Carl Haugerud for their donations of land, time, and effort to the statewide variety testing program.

Without their contribution of resources, this program would not be possible. Cash funding for the statewide variety testing program is provided by the OSU Agricultural Experiment Station, Oregon Wheat Commission, and Oregon Grains Commission. The OSU Extension Service provided the project coordinator's salary and the clerical support funding. Without the support of these organizations, this program would not be feasible.

References

Karow, R., and E. Marx. 1999. *Winter cereal varieties for 1999*. Special Report 775R. Oregon State Univ. Ext. Serv., Corvallis, OR.

Karow, R., E. Marx, K. Morrow, M. Bohle, G. Chilcote, R. Dovel, E. Eldredge, S. James, G. Reed, C. Shock and D. Smiley. 1999. *Spring grain varieties for 1999*. Special Report 986. Oregon State Univ. Ext. Serv., Corvallis, OR.

Table 1. Oregon statewide cereal variety testing program, trial locations, site coordinators, and grower-cooperators, 1998.

Trial name	Trial type	Trial location	Trial coordinator	Grower cooperators
Corvallis	all grains—dryland	Hyslop Farm	Russ Karow, Ernie Marx	
Morrow Co. (Heppner)	all grains—dryland	Anderson Farm	Karen Morrow	Charlie Anderson
Hermiston	all grains—irrigated	Hermiston Exp. Stn.	Karen Morrow	
Klamath Falls	all grains—irrigated	Klamath Exp. Stn.	Randy Dovel	
LaGrande	all grains—irrigated	Cuthbert Farm	Karen Morrow	John Cuthbert
Madras	all grains—irrigated	Central OR Exp. Stn.	Steve James, Mylen Bohle	
Moro	all grains—dryland	Sherman Exp. Stn.	Karen Morrow	
North Valley (Cornelius)	winter grains—dryland	Goetze Farm	Russ Karow, Ernie Marx	Norm Goetze
North Valley (Scio)	spring grains—dryland	Haugerud Farm	Russ Karow, Ernie Marx	Carl Haugerud
Ontario	all grains—irrigated	Malheur Exp. Stn.	Clint Shock, Eric Eldredge	
Pendleton	all grains—dryland	Pendleton Exp. Stn.	Karen Morrow	

Table 2. Grower drill-strip, winter wheat variety tests across Oregon and southeast Washington, 1998. Sites are listed in order of descending average yield.

Variety	Kaseberg Wasco	Newton S. Reservation	Miller Dufur	Nichols Dayton, WA	Hales Midway	Starvation Farms Lexington	Buether Kent	Reeder Pendleton	Rietmann Condon	Stonebrink Enterprise	Klages Joseph	Hoelt Spring Hollow	Average
	-----Yield (bu/acre)-----												
Gene	126	86	94	95	89	75	60	61	61	54	71	42	76
MacVicar	96	85	88	92	78	77	60	60	50	47	35	46	68
Madsen	105	85	93	82	80	73	65	—	56	46	72	31	72
Madsen/Stephens	107	95	84	84	81	67	62	—	66	52	67	40	73
Rod	100	89	88	76	73	76	68	53	48	64	43	47	69
Rohde	81	87	78	72	66	77	56	63	62	51	35	40	64
Stephens	95	98	94	82	78	75	59	64	63	61	50	35	71
7 way mix	108	—	—	—	—	—	—	—	—	—	—	—	—
Connie	—	—	—	—	64	—	—	—	—	—	—	—	—
Crew/Hyak	—	—	79	—	—	—	—	—	—	—	—	—	—
Eltan	—	83	—	—	88	—	—	59	—	54	38	38	—
Hiller	—	95	87	—	81	73	59	64	—	—	—	42	—
ID 485	—	83	—	—	57	61	—	62	64	—	—	42	—
Mac 1	—	87	—	—	67	70	—	53	63	—	—	35	—
MacVicar (high seed rate)	—	—	—	—	—	—	56	—	—	—	—	—	—
Madsen control	—	—	—	—	—	—	—	60	—	—	—	—	—
Madsen w/treatment	—	—	—	—	—	—	—	62	—	—	—	—	—
Madsen/Rod	—	—	90	—	—	—	—	—	—	—	—	—	—
Rod & Madsen	—	89	—	—	—	—	—	—	—	—	—	—	—
WB 470	—	95	—	—	66	—	—	—	—	—	—	41	—
WB 471	—	—	—	—	—	—	—	62	—	—	—	—	—
WB 472	—	—	—	93	—	—	—	—	—	—	—	—	—
Average	102	89	87	85	74	72	60	60	59	53	51	40	72

Table 3. Oregon statewide variety testing program, winter wheat yield data across five Columbia Basin locations, 1998.

Variety or line†	Market class	-----Yield (60 lb bu/acre; 10% moisture)-----					5-site	5-site
		Heppler	Hermiston	LaGrande	Moro	Pendleton	average	percent of average‡
<i>Winter wheat</i>								
Brundage (ID14502B)	SW	62	90	99	80	95	85	105
Coda (WA7752)	Club	60	95	86	71	83	79	98
Eltan	SW	48	108	82	56	66	72	89
Foote (OR880172)	SW	47	80	58	50	97	66	82
Gene	SW	55	117	82	66	89	82	101
Hiller	Club	61	106	81	75	93	83	103
Hybritech 1017	SW	61	103	82	62	100	81	101
Hybritech 1019	SW	63	100	97	82	102	89	110
ID467	HR	64	100	80	67	74	77	95
ID86-10420A	SW	50	95	85	63	96	78	96
Ivory (OR850513)	HW	66	96	77	64	104	81	100
Lambert	SW	49	101	92	64	105	82	102
MacVicar	SW	54	99	93	73	80	80	99
Madsen	SW	81	102	90	76	106	91	112
Madsen+Stephens	SW	65	101	95	86	103	90	111
OR939515	SW	62	108	88	73	112	89	109
PureSeed Durum	Durum	53	67	75	55	71	64	79
Rely	Club	54	95	76	70	91	77	95
Rod	SW	55	117	78	67	80	79	98
Rohde	Club	65	104	70	66	85	78	97
Stephens-Dividend+Gaucho	SW	78	118	89	86	102	95	117
Stephens-Raxil+Gaucho	SW	60	111	83	80	85	84	104
Stephens-Vitavax+Gaucho	SW	65	113	83	82	97	88	109
Stephens-Vitavax, no Gaucho	SW	56	105	95	83	92	86	106
Temple (ORCL0054)	Club	68	95	85	71	92	82	102
WA7834	Club	36	89	54	61	50	58	71
Weatherford (OR898120)	SW	73	92	77	80	107	86	106
Average		60	100	83	71	91	81	—
PLSD (5%)		15	15	16	14	11	—	—
PLSD (10%)		13	12	13	11	9	—	—
CV		16	9	12	12	8	—	—
P-value		0.00	0.00	0.00	0.00	0.00	—	—

†All seed was treated with fungicide and Gaucho insecticidal seed treatment unless otherwise noted.

‡Percent of average is the average yield of each variety as a percentage of the average yield of all varieties (in this case, 81 bu/acre).

Table 4. Oregon statewide variety testing program, winter barley yield data across five Columbia Basin locations, 1998.

Variety or line†	Market class	Heppler	Hermiston	LaGrande	Moro	Pendleton	5-site average	5-site percent of average‡
<i>Winter barley</i>		-----Yield (lb/acre; 10% moisture)-----						
Kold	6RF	5807	4754	4841	5904	5972	5456	107
OR1957369	6RF	6870	5148	5106	4450	5416	5398	106
ORW10	6RF/M	5296	3221	4775	4201	4570	4413	86
ORW11	6RF/M	6137	5500	4672	5721	5909	5588	109
Scio	6RF	5893	5402	4199	5444	5241	5236	103
Steptoe	6RF	4204	4320	4729	4375	2867	4099	80
Strider	6RF	5565	4654	5906	5793	5866	5557	109
Average		5682	4714	4890	5127	5120	5107	—
PLSD (5%)		653	1312	NS	1105	1230	—	—
PLSD (10%)		534	1073	NS	904	1006	—	—
CV		6	16	13	12	14	—	—
<i>P</i> -value		0.00	0.03	0.14	0.01	0.00	—	—

†All seed was treated with fungicide and Gaucho insecticidal seed treatment unless otherwise noted.

‡Percent of average is the average yield of each variety as a percentage of the average yield of all varieties.

Table 5. Oregon statewide variety testing program, winter wheat yield data across five Columbia Basin locations, 1996–1998.

Variety/line	Market class	Heppner	Hermiston†	LaGrande‡	Moro	Pendleton	All sites Average
		-----Yield (60 lb bu/acre; 10% moisture)-----					
1996							
Brundage (ID8614502B)	SW	52	90	36	67	84	66
Coda (WA7752)	Club	54	97	23	63	92	66
Gene	SW	37	86	11	76	86	59
Hiller	Club	58	93	20	75	89	67
ID467	HR	49	86	36	59	84	63
MacVicar	SW	38	95	34	74	72	63
Madsen	SW	57	93	51	70	81	70
Madsen+Stephens	SW	49	99	34	69	76	65
Rely	Club	51	90	40	59	78	64
Rod	SW	57	108	63	79	89	79
Rohde	Club	55	94	19	67	71	61
Stephens-Dividend	SW	43	89	43	73	78	65
Stephens-Raxil	SW	43	90	35	82	76	65
Stephens-Vitavax+Gaucho	SW	45	97	36	77	76	66
Stephens-Vitavax, no Gaucho	SW	46	100	36	76	75	66
Temple (ORCL0054)	Club	55	68	16	61	70	54
1996 trial average (bu/acre)		53	97	36	67	80	66
1997							
Brundage (ID8614502B)	SW	68	77	—	94	71	—
Coda (WA7752)	Club	74	93	136	81	94	96
Gene	SW	49	96	103	81	61	78
Hiller	Club	60	103	135	93	79	94
ID467	HR	—	—	—	—	—	—
MacVicar	SW	58	94	135	70	40	79
Madsen	SW	61	88	128	78	76	86
Madsen+Stephens	SW	58	86	116	82	70	82
Rely	Club	58	95	127	81	79	88
Rod	SW	58	97	125	81	76	87
Rohde	Club	57	85	124	83	73	84
Stephens-Dividend	SW	62	83	120	87	64	83
Stephens-Raxil	SW	62	87	121	90	65	85
Stephens-Vitavax+Gaucho	SW	54	80	137	78	63	83
Stephens-Vitavax, no Gaucho	SW	58	86	126	71	62	81
Temple (ORCL0054)	Club	61	90	135	83	90	92
1997 trial average (bu/acre)		57	89	126	79	70	84

Table 5 (continued). Oregon statewide variety testing program, winter wheat yield data across five Columbia Basin locations, 1996–1998.

Variety/line	Market class	Heppler	Hermiston	LaGrande	Moro	Pendleton	All sites Average
-----Yield (60 lb bu/a; 10% moisture)-----							
1998							
Brundage (ID8614502B)	SW	62	90	99	80	95	85
Coda (WA7752)	Club	60	95	86	71	83	79
Gene	SW	55	117	82	66	89	82
Hiller	Club	61	106	81	75	93	83
ID467	HR	64	100	80	67	74	77
MacVicar	SW	54	99	93	73	80	80
Madsen	SW	81	102	90	76	106	91
Madsen+Stephens	SW	65	101	95	86	103	90
Rely	Club	54	95	76	70	91	77
Rod	SW	55	117	78	67	80	79
Rohde	Club	65	104	70	66	85	78
Stephens-Dividend	SW	78	118	89	86	102	95
Stephens-Raxil	SW	60	111	83	80	85	84
Stephens-Vitavax+Gaucho	SW	65	113	83	82	97	88
Stephens-Vitavax, no Gaucho	SW	56	105	95	83	92	86
Temple (ORCL0054)	Club	68	95	85	71	92	82
1998 trial average (bu/acre)		60	100	83	71	91	81
1996–1998 average							
Brundage (ID8614502B)	SW	60	86	—	80	83	—
Coda (WA7752)	Club	63	95	82	72	89	80
Gene	SW	47	100	65	74	79	73
Hiller	Club	60	101	79	81	87	81
ID467	HR	—	—	—	—	—	—
MacVicar	SW	50	96	87	72	64	74
Madsen	SW	66	94	90	74	87	82
Madsen+Stephens	SW	57	95	82	79	83	79
Rely	Club	54	94	81	70	83	76
Rod	SW	57	107	89	75	82	82
Rohde	Club	59	95	71	72	76	75
Stephens-Dividend	SW	61	96	84	82	81	81
Stephens-Raxil	SW	55	96	80	84	76	78
Stephens-Vitavax+Gaucho	SW	55	97	86	79	79	79
Stephens-Vitavax, no Gaucho	SW	53	97	86	76	76	78
Temple (ORCL0054)	Club	61	85	79	72	84	76
Average yield (1996–1998)		57	95	82	72	80	77

Table 5 (continued). Oregon-wide variety testing program, winter wheat yield data across five Columbia Basin locations, 1996–1998.

Variety/line	Market class	Heppner	Hermiston†	LaGrande‡	Moro	Pendleton	All sites Average
-----Percent of average-----							
1996–1998 percent of trial average							
Brundage (ID8614502B)	SW	107	90	—	111	104	—
Coda (WA7752)	Club	111	100	100	99	112	104
Gene	SW	83	105	80	103	98	94
Hiller	Club	105	106	97	112	109	106
ID467	HR	—	—	—	—	—	—
MacVicar	SW	89	101	107	100	80	95
Madsen	SW	117	99	110	103	109	107
Madsen+Stephens	SW	101	100	100	109	103	103
Rely	Club	96	99	99	96	103	99
Rod	SW	100	113	109	104	102	106
Rohde	Club	105	99	87	100	95	97
Stephens-Dividend	SW	107	101	103	113	101	105
Stephens-Raxil	SW	97	101	98	116	94	101
Stephens-Vitavax+Gaucho	SW	96	102	105	109	98	102
Stephens-Vitavax, no Gaucho	SW	94	102	105	105	95	100
Temple (ORCL0054)	Club	108	89	96	99	104	99

†Hermiston had hail damage in 1996.

‡LaGrande had frost damage in 1996.

Table 6. Oregon statewide variety testing program, barley yield data across five Columbia Basin locations, 1996–1998.

Variety	Market class	Heppner	Hermiston†	LaGrande‡	Moro	Pendleton	All sites average
-----Yield (lb/acre; 10% moisture)-----							
1996							
Kold	6RF	5470	5186	4153	4357	5940	5021
Scio	6RF	5180	4715	2599	4575	5131	4440
Steptoe	6RF	5226	3456	2080	3486	4492	3748
Strider	6RF/M	4928	4990	3272	3623	6252	4613
1996 trial average (lb/acre)		5350	4088	2881	4186	5417	4384
1997							
Kold	6RF	4271	4052	7564	3683	4067	4728
Scio	6RF	4507	4980	8980	4232	3860	5312
Steptoe	6RF	2378	5227	4858	3976	3285	3945
Strider	6RF/M	5003	5424	8470	4659	3717	5454
1997 trial average (lb/acre)		3961	4518	7138	3942	3802	4672
1998							
Kold	6RF	5807	4754	4841	5904	5972	5456
Scio	6RF	5893	5402	4199	5444	5241	5236
Steptoe	6RF	4204	4320	4729	4375	2867	4099
Strider	6RF/M	5565	4654	5906	5793	5866	5557
1998 trial average (lb/acre)		5682	4714	4890	5127	5120	5107
1996–1998 average							
Kold	6RF	5183	4664	5520	4648	5326	5068
Scio	6RF	5193	5032	5260	4751	4744	4996
Steptoe	6RF	3936	4335	3889	3946	3548	3931
Strider	6RF/M	5165	5022	5882	4692	5278	5208
Average yield (lb/acre)		4998	4440	4970	4418	4780	4721
1996–1998 percent of trial average							
Kold	6RF	100	93	105	98	112	102
Scio	6RF	100	100	100	100	100	100
Steptoe	6RF	76	86	74	83	75	79
Strider	6RF/M	99	100	112	99	111	104

†Hermiston had hail damage in 1996.

‡LaGrande had frost damage in 1996.

Table 7. Oregon statewide variety testing program, spring wheat yields across four Columbia Basin locations, 1998.

Variety/line†	Market class	Hermiston	LaGrande	Moro	Pendelton	4-site average	Percent of trial average
<i>Spring wheat</i> -----Yield (60 lb bu/acre; 10% moisture)-----							
Alpowa	SW	36	67	54	47	51	107
Alpowa w/o Gaucho	SW	36	60	51	39	47	97
IDO377S	HW	42	49	50	44	46	97
IDO505	SW	45	58	52	51	51	108
IDO506	SW	46	58	51	57	53	111
IDO523	HW	49	56	46	43	48	101
IDO533	HW	49	54	51	47	50	105
Jefferson (IDO462)	HR	41	58	57	60	54	113
OR3900362	HR	43	58	54	47	50	106
OR4870255	HW	38	58	44	40	45	94
OR4920307	HW	39	53	49	46	47	98
OR942845	SW	47	55	44	44	48	100
Penawawa	SW	46	54	53	43	49	103
Pomerelle	SW	46	44	46	44	45	94
Scarlet (WA7802)	HR	38	63	50	54	51	107
WA7850	SW	44	53	58	60	54	113
WPB 936	HR	24	55	45	54	44	93
WPB BZ 897-331	HR	23	47	45	44	40	83
WPB BZ 992-108	SW	44	50	56	43	48	101
Wawawai	SW	42	50	51	49	48	100
Whitebird	SW	41	48	43	41	43	91
Winsome (OR4870453)	HW	45	52	47	42	46	97
Yecora Rojo	HR	21	70	41	53	46	97
WPB 881	Durum	20	48	39	54	40	84
WPB YU 894-15	Durum	28	52	43	56	45	94
ML107-455	HW	38	—	—	—	—	—
ML042-115A	SW	42	—	—	—	—	—
ML057-32A	SW	51	—	—	—	—	—
Average		39	55	49	48	48	—
PLSD (5%)		10	11	9	9	—	—
PLSD (10%)		8	9	8	8	—	—
CV		16	12	12	12	—	—
<i>P</i> -value		0.00	0.00	0.00	0.00	—	—

†All seed was treated with fungicide and Gaucho insecticidal seed treatment unless otherwise noted.

Table 8. Oregon statewide variety testing program spring barley yields across four Columbia Basin locations, 1998.

Variety/line†	Market Class	-----Yield (lb/acre; 10% moisture)-----					3-site average	Percent of trial average
		Hermiston	LaGrande	Moro‡	Pendelton			
Bancroft (78AB10274)	2RM	3936	4086	—	3894	3972	104	
BZ 594-19	2RF	3474	3981	—	4099	3851	101	
Baronesse	2RF	4147	4070	—	3414	3877	101	
Chinook	2RM	3873	3299	—	3773	3648	95	
Gallatin	2RF	3866	3978	—	3511	3785	99	
H3860224	2RF	4238	3704	—	3613	3852	101	
MT920073	2RF	4243	4319	—	4228	4263	111	
Orca	2RF/M	3071	3557	—	4320	3650	95	
Steptoe	6RF	3349	3903	—	3946	3732	97	
Tango	6RF	3212	3519	—	3572	3434	90	
UC958	2RF	3118	3860	—	4072	3683	96	
Idagold	2RF	3428	—	—	—	—	—	
C32	2RM	3609	—	—	—	—	—	
Galena	2RM	3536	—	—	—	—	—	
BCD 12	2RF/M	3414	3996	—	4190	—	—	
BCD 22	2RF/M	3448	4543	—	4587	—	—	
BCD 47	2RF/M	3273	4180	—	4215	—	—	
Average		3602	3928	—	3959	3830	—	
PLSD (5%)		591	NS	—	541	—	—	
PLSD (10%)		492	NS	—	449	—	—	
CV		10	12	—	8	—	—	
<i>P</i> -value		0.00	0.16	—	0.00	—	—	

†All seed was treated with fungicide and Gaucho insecticidal seed treatment.

‡Moro spring barley trials had high variability, making variety comparisons meaningless.

Table 9. Oregon statewide spring grain yields across four Columbia Basin locations, 1996–1998.

Variety/line†	Market	Hermiston	LaGrande	Moro	Pendleton	All sites average
	Class					
1996		-----Yield (60 lb bu/acre; 10% moisture)-----				
Alpowa with Gaucho	SW	83	84	55	45	67
Alpowa w/o Gaucho	SW	68	84	54	39	61
IDO377S	HW	81	75	48	41	61
Jefferson (IDO462)	HR	83	65	—	—	—
Penawawa	SW	84	67	54	39	61
Pomerelle	SW	81	80	44	43	62
WPB 936	HR	72	60	49	43	56
Wawawai	SW	80	61	50	43	58
Whitebird	SW	76	79	52	39	62
Yecora Rojo	HR	73	24	50	38	46
1996 trial average yield (bu/acre)		78	67	48	39	58
1997						
Alpowa with Gaucho	SW	60	113	96	54	81
Alpowa w/o Gaucho	SW	55	102	87	47	73
IDO377S	HW	50	106	86	62	76
Jefferson (IDO462)	HR	55	86	77	48	67
Penawawa	SW	49	86	79	63	69
Pomerelle	SW	54	102	80	58	74
WPB 936	HR	45	98	88	45	69
Wawawai	SW	47	94	72	49	65
Whitebird	SW	37	82	80	45	61
Yecora Rojo	HR	42	86	54	31	53
1997 trial average yield (bu/acre)		47	95	75	49	67
1998						
Alpowa with Gaucho	SW	36	67	54	47	51
Alpowa w/o Gaucho	SW	36	60	51	39	47
IDO377S	HW	42	49	50	44	46
Jefferson (IDO462)	HR	41	58	57	60	54
Penawawa	SW	46	54	53	43	49
Pomerelle	SW	46	44	46	44	45
WPB 936	HR	24	55	45	54	44
Wawawai	SW	42	50	51	49	48
Whitebird	SW	41	48	43	41	43
Yecora Rojo	HR	21	70	41	53	46
1998 trial average yield (bu/acre)		39	55	49	48	48

Table 9 (continued). Oregon statewide spring grain yields across four Columbia Basin locations, 1996–1998.

Variety/line†	Market class	Hermiston	LaGrande	Moro	Pendleton	All sites average
-----Yield (60 lb bu/acre; 10% moisture)-----						
1996–1998 average						
Alpowa with Gaucho	SW	60	88	69	49	66
Alpowa w/o Gaucho	SW	53	82	64	42	60
IDO377S	HW	58	77	61	49	61
Jefferson (IDO462)	HR	60	70	67	54	63
Penawawa	SW	60	69	62	48	60
Pomerelle	SW	60	75	57	48	60
WPB 936	HR	47	71	60	47	56
Wawawai	SW	56	68	57	47	57
Whitebird	SW	51	70	58	42	55
Yecora Rojo	HR	45	60	48	40	48
Average yield 1996–1998 (bu/acre)		55	72	57	45	57
1996–1998 percent of trial average						
Alpowa with Gaucho	SW	109	122	120	108	115
Alpowa w/o Gaucho	SW	96	113	112	92	104
IDO377S	HW	105	106	107	108	107
Jefferson (IDO462)	HR	109	96	117	119	110
Penawawa	SW	109	96	108	107	105
Pomerelle	SW	110	104	99	107	105
WPB 936	HR	86	98	106	104	98
Wawawai	SW	103	94	100	103	100
Whitebird	SW	93	96	102	92	96
Yecora Rojo	HR	83	83	84	89	85

†All seed was treated with fungicide and Gaucho insecticidal seed treatment unless otherwise noted.

Table 10. Oregon statewide spring barley yields across four Columbia Basin locations, 1996–1998.†

Variety/line	Market class	Hermiston	LaGrande	Moro	Pendleton	All sites average
-----Yield (lb/acre; 10% moisture)-----						
1996						
Baronesse	2RF	5443	4028	3700	3523	4174
Step toe	6RF	4526	2774	3777	3287	3591
1996 trial average yield (lb/acre)		4251	4234	3512	2839	3709
1997						
Baronesse	2RF	2985	5801	6496	4177	4865
Step toe	6RF	2042	6574	6044	4157	4704
1997 trial average yield (lb/acre)		2505	6349	4943	3700	4374
1998						
Baronesse	2RF	4147	4070	—	3414	3877
Step toe	6RF	3349	3903	—	3946	3732
1998 trial average yield (lb/acre)		3602	3928	—	3959	3830
1996–1998 average						
Baronesse	2RF	4191	4633	5098	3705	4407
Step toe	6RF	3306	4417	4911	3796	4108
Average yield 1996–1998 (bu/acre)		3453	4837	4228	3499	4004
1996–1998 percent of trial average						
Baronesse	2RF	121	96	121	106	111
Step toe	6RF	96	91	116	108	103

†The small number of varieties that have been grown in the spring barley trials for at least three years reflects a change in direction of spring-barley breeding programs. Barley stripe rust (BSR) resistance has become a primary focus of breeding programs in the Pacific Northwest. Many BSR-resistant lines have been developed and have been in the statewide trials for two years (1997 and 1998). These lines will appear in the three-year summaries next year, after data for the 1999 trials has been collected.