



The Cereal Sentinel

A newsletter for Treasure Valley cereal producers

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Topics:	Page
Winter Cereal Variety Performance	2
Irrigated Trials	2
<i>Soft White Winter Wheat</i>	2
<i>Planting Dates and SWWW Variety Performance</i>	5
<i>Mixed Variety Performance</i>	5
<i>Hard Winter Wheat</i>	5
<i>Triticale</i>	8
<i>Winter Barley</i>	8
Dryland Trials	9
Variety Performance in Other Areas	10
<i>Cereal Sentinel</i> Internet Access	10

Important Dates:

Idaho Grain Producers Annual Meeting, Sun Valley

Nov. 17-19, 2003

The goal of this newsletter is to serve the best interests of Treasure Valley cereal producers. It will be issued periodically as information warrants. Correspondence and inquiries should be addressed to: **Parma Research and Extension Center, 29603 U of I Lane, Parma, ID 83660 (208-722-6701 Ext. 216) (Fax-208-722-6708) (Email bradb@uidaho.edu).** The *Cereal Sentinel* is made possible in part by a grant from the Idaho Wheat Commission.



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Winter Cereal Variety Performance

Irrigated Trials

The 2003 season marked the 19th season of the Southwestern Idaho Cooperative Extension Winter Wheat and Barley Performance Trials. The trials, supported by the *Idaho Wheat Commission* and *Idaho Barley Commission*, enable the testing of public and private varieties and advanced lines under the irrigated conditions of the Treasure Valley and dryland conditions of Washington Co.

Four irrigated winter wheat trials were planted for the 2003 season. The earliest trials were planted at Weiser on October 17 and at the Parma R & E Center on October 25. Later planted trials were located at Grandview on November 15 and again at the Parma R & E Center on November 12. The season was characterized as dry and cool in the fall, mild temperatures in winter that allowed tillering, and high than normal temperatures during late grain filling. Fall plantings at Parma did not germinate and emerge until early or late December due to lack of moisture. The Grandview late planting did not emerge until January and may have been drought stressed during stem extension based on the shorter plant heights.

Despite late emergence conditions, production was good in the Parma trials but lower in the later Grandview planting due in part to lodging and drought stress as suggested by shorter plant heights. Protein in the earlier planted Parma trial was low suggesting that inadequate N may have limited yield. Based on the residual N measured prior to planting, no fertilizer N was applied at Parma.

Soft White Winter Wheat

The irrigated soft white winter wheat results for the 2003 trials are given in Tables 1-3.

Stephens, released in 1978, is the oldest variety in the trials, and still the most commonly grown winter wheat in western Idaho. It's primary weaknesses are test weight (it's only fair) and straw strength (good but not as good as others). It is too tall for some wheel lines. It has above average milling and baking quality. It has excellent yield potential and is especially appropriate for later (November) plantings (see Table 5).

Malcolm has performed at least as well as **Stephens** in high yield environments, particularly with mid October or earlier plantings. It loses any yield advantage over **Stephens** in later plantings. **Malcolm** does not have the

Table 1. Irrigated mid-October Planted Soft White Winter Wheat Performance in the Treasure Valley, 2003

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>Parma (planted Oct. 25)</i>					
Brundage	131	8.0	62.1	38	0
BZ6W98-528	137	8.1	63.9	40	0
Dune	146	8.3	61.6	39	3
ID87-52814A	143	8.2	61.5	40	0
ID0587	141	8.3	60.4	40	0
KW96019	144	8.9	62.4	37	0
Malcolm	153	8.1	62.0	41	0
ORCF-101	126	9.6	59.0	38	0
OR9900553	132	8.7	61.6	36	0
Simon	138	7.8	59.4	41	0
Stephens	135	8.8	59.0	40	3
Ste/Brun Mix	142	8.2	61.0	40	0
SX1401W	132	7.5	59.8	34	0
Tubbs	143	8.5	59.9	41	0
WPB 470	132	9.0	64.0	40	0
LSD_{.10}	11	0.9	1.6	1	2
<i>Weiser (planted Oct. 17)</i>					
Brundage	138	9.2	64.1	40	8
BZ6W98-528	141	9.7	62.9	40	0
Dune	144	10.0	61.3	39	13
ID87-52814A	123	9.2	61.3	39	20
ID0587	124	10.5	60.3	39	43
KW96019	143	10.7	62.1	38	0
Malcolm	135	10.3	59.4	39	23
ORCF-101	124	10.3	60.6	37	0
OR9900553	133	10.4	61.6	36	10
Simon	134	10.0	60.1	41	3
Stephens	142	9.7	62.6	39	0
Ste/Brun Mix	137	9.7	61.4	40	3
SX1401W	141	10.1	62.6	36	3
Tubbs	136	9.4	59.5	41	0
WPB 470	133	9.7	65.4	39	0
LSD_{.10}	11	1.0	2.1	1	20

milling and baking quality of **Stephens** although it is acceptable.

Brundage is shorter than **Stephens** by as much as 7 inches when stressed, but more typically 2-3 inches shorter, a couple days earlier heading, and its test weight is invariably higher than **Stephens** or **Malcolm**.

Brundage protein is typically lower than **Stephens** and the milling and baking quality is excellent. **Brundage** has excellent straw strength and lodges less than **Stephens** where significant lodging occurs. It has yielded less than

Table 2. Irrigated mid-November Planted Soft White Winter Wheat Performance in the Treasure Valley. 2003

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>Parma (planted Nov. 12)</i>					
Brundage	151	9.1	62.4	39	0
BZ6W98-528	148	9.3	63.6	40	0
Dune	157	9.2	60.5	40	13
ID87-52814A	140	7.9	60.5	40	15
ID0587	151	9.2	60.4	40	23
KW96019	149	9.5	62.1	37	3
Malcolm	152	8.4	58.6	41	5
ORCF-101	134	9.7	60.1	38	0
OR9900553	127	8.8	61.6	35	3
Simon	143	8.5	61.0	41	0
Stephens	156	9.1	60.8	40	20
Ste/Brun Mix	154	9.0	61.5	41	5
SX1401W	136	8.2	61.0	34	0
Tubbs	155	9.1	59.8	43	10
WPB 470	152	10.1	64.5	40	0
LSD _{.10}	14	0.8	1.8	1	16
<i>Grand View (planted Nov. 15)</i>					
Brundage	124	12.4	56.1	31	35
BZ6W98-528	113	12.7	56.3	33	70
Dune	124	13.1	56.9	32	33
ID87-52814A	102	12.6	55.9	33	83
ID0587	111	12.8	54.1	33	63
KW96019	126	13.2	56.0	32	38
Malcolm	112	13.0	55.0	34	55
ORCF-101	120	12.2	56.0	35	48
OR9900553	115	13.1	56.5	31	75
Simon	127	12.1	57.6	36	40
Stephens	103	13.5	54.9	31	38
Ste/Brun Mix	107	12.5	54.8	33	70
Tubbs	115	12.8	55.0	34	68
WPB 470	119	13.1	57.5	32	68
LSD _{.10}	17	1.5	2.4	2	31

Stephens across several years of testing in the Treasure Valley, especially in later plantings or when moisture stress conditions during vegetative growth reduce plant height. **Brundage** is awnless and may be the best option available for wheel lines that are difficult to move through taller and awned varieties.

WPB 470, a Western Plant Breeders release, yields as well as **Stephens** and has outstanding test weight, the best of any variety that we have evaluated including **Brundage**. **WPB 470** is shorter than **Stephens** with better straw strength and is less susceptible to lodging.

However, **WPB 470** is a poor milling wheat as compared to **Stephens** and is not preferred by millers. It ranks the lowest in milling and baking quality of all other soft white entries.

Weatherford, a recent OSU release, is taller than **Stephens** but has good straw strength, and comparable test weight and protein. Its yield potential is comparable to **Stephens**. **Weatherford** is acceptable for milling and baking.

Tubbs, the most recent OSU soft white release, has yielded well in both early and late plantings. It is slightly taller than **Stephens** but has not lodged more than **Stephens**. **Tubbs** has comparable protein but flower yield and cookie diameter tend to be lower than **Stephens**.

WPB Mohler was evaluated for five years in western Idaho and equals **Stephens** in yield in earlier plantings. It is slightly taller but equal to **Stephens** in lodging resistance. Test weight is higher than with **Stephens** but lower than **Brundage** and **WPB 470**. **WPB Mohler** has good milling and baking quality.

A number of UI advanced lines have been evaluated in the past few years including **ID87-52814A**, **ID91-20503A (Dune)**, and **ID91-34302A (Simon)**. Two of these, **Simon** and **Dune** have been or will be soon released. Both averaged as high as or better in yield than **Stephens** in 1993 and over two years of testing **Simon** has not differed significantly from **Stephens**.

ID87-52814A has nearly matched **Stephens** yield in early plantings but has tended to produce less under later plantings. This line is slightly shorter than **Stephens** but it may not have **Stephens**'s straw strength. Test weight averaged slightly better than **Stephens**. **ID87-52814A** has outstanding flour quality.

KW96019, an advanced line from Matt Kolding, averages 2-3 inches shorter than **Stephens** and in limited testing has equaled **Stephens** in yield. It also has better straw strength than **Stephens** and possibly better even than **WPB 470**. Unfortunately, **KW96019** may be less acceptable for milling and baking quality than **Stephens**.

Varieties with tolerance to the herbicide Beyond® are called Clearfield varieties. **ID0587** is a UI Clearfield variety evaluated the last two seasons and has performed very similar to **Stephens** as expected with its **Stephens** parentage. **ORCF-101**, an OSU Clearfield resistant line tended to perform less well than **Stephens** in 2003.

BZ6W98-528 is a Western Plant Breeders line evaluated only this past season. It has yielded comparable to **Stephens** in the limited testing with significantly better test weight.

Performance in any given trial is not as reliable as the combined performance over several sites and years. The

Table 3. Irrigated Soft White Winter Wheat Performance in the Treasure Valley across all sites combined. 2003

Entries	Yield	Protein	Test Weight	Height	Lodging
	bu/acre	% (4 sites)	lb/bu	in	%
Brundage	136	8.8	61.2	37	11
BZ6W98-528	135	9.0	61.7	38	18
Dune	143	9.2	60.1	38	15
ID87-52814A	127	8.4	59.8	38	29
ID0587	132	9.3	58.8	38	32
KW06019	140	9.7	60.7	36	10
Malcolm	138	8.9	58.8	39	21
OR2010051	126	9.8	58.9	37	12
OR9900553	127	9.3	60.3	35	22
Simon	136	8.8	59.5	40	11
Stephens	134	9.2	59.3	38	15
Ste/Brun Mix	135	9.0	59.7	38	19
Tubbs	138	9.0	58.5	40	19
WPB 470	134	9.6	62.8	38	17
LSD _{.10}	10	0.8	1.8	1.9	17

yield results for several periods of testing are shown in Tables 4-5.

Planting Dates and SWWW Variety Performance

Variety performance can be affected by planting dates. Variety performance has been measured using both October and November planting dates to document planting date effects on variety performance (Table 5).

All varieties are typically less productive if planted in November rather than October. The 2003 trials at Parma are the exception. Some varieties appear to be more susceptible to later planting conditions relative to **Stephens**. These may include **Malcolm** and **ID87-52814A**. The continuing popularity of **Stephens** is due in part to its excellent long term performance in later plantings necessitated by late harvested previous crops of potatoes, corn, or sugarbeets.

Mixed Variety Performance

Few varieties have the characteristics necessary to maximize yield year in and year out, even in locations where they are best adapted. Climatic and other growing conditions vary from one year to the next and from site to site. Rarely is a variety consistently the highest yielding entry in all trials in all years.

Variety mixtures are sometimes considered to stabilize yield or reduce the risks associated with planting single varieties. Mixed plantings of varieties are common

in the PNW, especially in dryland production systems where winterkill, diseases, or insects can be serious risks.

Two minor weaknesses of **Stephens** that could be addressed by either a variety alternative or a mixed variety planting are test weight and lodging resistance or straw strength. Although **Stephens** has excellent yield potential, it often has less than 60 lb/bu test weight and is therefore frequently graded No. 2 or No. 3. Also, despite good straw strength, **Stephens** can lodge and

Table 4. Irrigated Soft White Winter Wheat Long Term Yield Performance, 1996-02.

Variety	1996-02	1998-02	2000-02	2002-03
	-----bu/A-----			
Malcolm	129	129	126	129
Stephens	130	130	127	131
Brundage	122	122	121	129
WPB 470	129	128	124	132
Hubbard	--	120	120	--
Brundage96	--	122	117	--
Tubbs	--	--	128	132
WPB Beamer	--	--	109	--
WPB Mohler	--	--	126	--
Weatherford	--	--	122	--
ID87-52814A	--	--	125	123
ID0587	--	--	--	128
Simon (34302A)	--	--	--	129
LSD _{.10}	7	8	13	8

better lodging resistance is desirable.

A successful mixture would be as productive while improving both test weight and lodging resistance. We initially mixed **Stephens** and **WPB 470** because **WPB 470** had yielded comparable to **Stephens**, is shorter, has extraordinary test weight, and better straw strength than **Stephens**. The mixture was evaluated in 14 trials over four seasons (1998 –2001). Results are shown in Table 6.

WPB 470 test weight was consistently the highest, **Stephens** the poorest, and the mixture intermediate. Lodging was not appreciable enough in most years for a valid comparison but **Stephens** lodged more than either **WPB 470** or the mixture in 1999.

The **Stephens** and **WPB 470** mixture over this four year period yielded 7 bu/A better than **WPB 470** and 3 bu/A better than **Stephens**. The mixture in every year yielded at least as well as the highest yielding of the two varieties planted alone.

The results show that this mixture is more stable in yield from year to year than either variety planted alone.

Table 5. SWWW Variety Performance as Affected by Planting Dates. 1996-02

Entries	October Planted	November Planted
-----bu/A-----		
1996-03		
	(16 sites)	(14 sites)
Brundage	124	119
Malcolm	132	122
Stephens	130	123
WPB 470	<u>128</u>	<u>122</u>
LSD ₁₀	10	11
1998-02		
	(10 sites)	(8 sites)
Brundage	129	130
Hubbard	135	137
Stephens	139	138
WPB Mohler	139	138
WPB 470	<u>136</u>	<u>136</u>
LSD ₁₀	8	9
2000-02		
	(6 sites)	(5 sites)
Brundage	133	117
Brundage 96	128	116
Hubbard	139	113
ID87-52814A	142	118
Malcolm	142	121
Stephens	142	124
Tubbs	143	124
Weatherford	134	120
WPB Beamer	142	119
WPB Mohler	142	121
WPB 470	<u>137</u>	<u>122</u>
LSD ₁₀	13	12
2000-03		
	(8 sites)	(7 sites)
Brundage	134	129
ID87-52814A	139	123
Malcolm	142	129
Stephens	141	130
Tubbs	142	132
WPB 470	<u>136</u>	<u>130</u>
LSD ₁₀	10	11

Given the reservations for **WPB 470** quality we substituted **Brundage** in the mix beginning in 2002 as it is also shorter, earlier, stronger strawed, and higher in test weight than **Stephens**. Other advantages, in contrast to **WPB 470**, are that it is awnless and **Brundage** has excellent milling and baking quality, better even than **Stephens**. The mixture performance in each of the 2003 sites is shown in Tables 1 and 2 and the overall performance is in Table 6.

Although the **Stephens-Brundage** mixture in 2003 did not always yield better than **Stephens** alone, it yielded at least as well across all sites and years. Test weight of the mixture was intermediate between **Stephens** and **Brundage** and over two years of testing the test weight difference would have made the difference between No 1 and No 2 grade. The mixture will be evaluated again in 2004. The mixture provided no advantage in reducing lodging over two years.

Table 6. Variety Mixture Performance, 1998-03.

Entry	Yield	Test Weight	Lodging
	bu/A	lb/bu	%
2002-03 (8 sites)			
Stephens	131	59.5	30
Brundage	129	61.9	23
Stephens/Brundage	<u>132</u>	<u>60.0</u>	<u>33</u>
LSD ₁₀	8	1.4	16
1998-01 (14 sites)			
Stephens	138	61.1	6
WPB 470	134	64.7	1
Stephens/WPB 470	<u>141</u>	<u>62.9</u>	<u>2</u>
LSD ₁₀	3.6	0.4	4

¹50% of each variety by weight

Hard Winter Wheat

Hard red and hard white winter wheats were also evaluated in the Cooperative Extension Variety Performance Trials. Irrigated hard winter wheats are generally less productive than soft white winter varieties but market prices can be higher, especially with higher deficiency payments. Test weight is generally higher with hard red winters.

The results also demonstrate the potential for this mixture to improve grain grade and lodging resistance.

Unfortunately **WPB 470** has relatively poor milling and baking quality and may not be the most appropriate choice for milling wheat. If sold for animal feed the milling quality is a non-issue.

Results for 2003 testing are shown in Tables 7-9. Hard wheat varieties were managed differently only at Weiser where they received additional N for protein enhancement. Protein values for sites other than Hammett consequently may be lower than if managed for higher protein.

Hard Red Winter Wheat

Hawk, an Agripro variety (North American Plant Breeders, Inc.), has performed well in several years of testing. It is taller and weaker strawed than the other varieties with fair protein but excellent test weight.

Garland, a USU release, is the shortest of all entries with excellent lodging resistance. It is commonly the variety of choice under wheel lines or other low profile sprinklers. But **Garland** yields less than **Hawk**, **Hoff** or

Table 7. Irrigated Early Planted Hard Winter Wheat Performance in the Treasure Valley. 2003.

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>Parma (planted Oct. 25)</i>					
Hard Reds					
Columbia-1	133	9.5	63.6	38	0
Dumas	124	9.2	66.4	39	0
Hoff	131	9.0	63.5	42	0
Moreland	134	9.8	61.9	39	0
Sunstar Declo	138	9.3	61.0	36	0
Hard Whites					
Golden Spike	134	8.5	61.0	43	25
Ivory	150	9.7	62.6	43	5
NuFrontier	135	9.2	63.9	45	20
NuHorizon	138	8.7	64.5	36	0
LSD ₁₀	18	0.7	1.4	1.9	13
<i>Weiser (planted Oct. 17)</i>					
Hard Reds					
Columbia-1	123	11.6	63.8	38	8
Dumas	119	11.1	64.6	42	18
Hoff	111	11.6	63.7	43	18
Moreland	120	11.1	63.5	40	3
Sunstar Declo	104	12.4	58.5	37	3
Hard Whites					
Golden Spike	104	10.7	60.5	46	53
Ivory	119	11.2	60.4	42	23
NuFrontier	101	11.8	63.8	47	60
NuHorizon	123	10.5	64.5	38	3
LSD ₁₀	13	1.0	2.1	1.5	30

Meridian unless there is significant lodging. It has questionable milling and baking quality.

Hoff, an OSU release, has good test weight, straw strength and lodging resistance. It has good yield potential.

Sunstar Declo, a release from Sundermann Breeding, has only been tested in October planted sites in 1999-2001. It has excellent yield potential, good straw

Table 8. Irrigated Late Planted Hard Red Winter Wheat Performance in the Treasure Valley, 2003.

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>Parma (planted Nov. 12)</i>					
Hard Reds					
Columbia-1	139	10.3	63.1	39	13
Dumas	145	10.3	66.0	40	3
Hoff	133	10.5	63.4	42	28
Moreland	141	10.9	61.5	39	10
Sunstar Declo	131	10.0	61.8	37	0
Vandal	131	11.5	63.3	40	0
WB936	133	11.0	64.9	37	0
Hard Whites					
Golden Spike	118	9.6	61.8	47	53
IDO 377s	148	10.2	63.9	43	45
Ivory	137	9.6	62.6	42	8
NuFrontier	120	10.8	65.6	45	40
NuHorizon	139	9.6	65.1	39	5
LSD ₁₀	17	0.8	1.5	1.5	23
<i>Grand View (planted Nov. 15)</i>					
Hard Reds					
Columbia-1	140	12.2	57.9	31	70
Dumas	124	11.2	61.3	30	58
Hoff	125	12.9	60.1	32	63
Moreland	131	11.6	56.6	31	75
Sunstar Declo	127	13.0	57.4	32	70
Vandal	110	14.0	58.6	30	23
WPB936	114	12.5	60.5	32	68
Hard Whites					
Golden Spike	110	10.4	57.6	36	80
Ivory	137	11.4	57.8	35	58
IDO 377s	118	12.0	58.9	32	90
Klassic	128	12.0	59.6	31	13
NuFrontier	120	11.4	59.3	35	83
NuHorizon	131	12.0	60.9	32	75
LSD ₁₀	23	1.4	1.7	3	33

Table 9. Irrigated Hard Red Winter Wheat Long Term Performance in the Treasure Valley.

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>2003 (4 sites)</i>					
Hard Reds					
Columbia-1	134	10.5	62.1	36.6	23
Dumas	128	10.2	64.6	37.5	19
Hoff	125	10.4	62.7	39.8	27
Moreland	132	10.6	60.9	37.2	22
Sunstar Declo	125	10.6	59.7	35.3	18
Hard Whites					
Golden Spike	116	9.6	60.2	42.8	53
Ivory	136	10.2	60.8	40.3	23
NuFrontier	119	10.6	63.1	42.9	51
NuHorizon	132	9.6	63.8	36.5	21
LSD _{.10}	10	0.9	1.5	2.5	20
<i>1999-01 (11 sites)</i>					
Hard Reds					
Declo	137	11.0	63.7	35	2
Garland	123	11.3	62.2	28	0
Hawk	138	10.5	65.1	41	15
Hoff	139	10.4	64.6	39	1
Moreland	131	11.0	63.2	35	0
Meridian	133	10.6	63.7	38	5
LSD _{.10}	5	0.3	0.5	1	6
<i>2000-03 (14 sites)</i>					
Hard Whites					
Ivory	119	10.7	62.2	38	19
NuFrontier	109	10.6	64.1	40	27
NuHorizon	124	10.7	64.7	35	16
LSD _{.10}	11	0.7	0.7	2	11

strength, good protein, and is the shortest of the highest yielding entries. It has questionable milling and baking quality.

Moreland (previously tested as **ID0517**), an Idaho advanced line, is not as short as **Declo** but has excellent lodging resistance and baking quality. **Moreland** yielded relatively well in 1993 but less than **Declo**, **Hawk** and **Hoff** over three earlier years of testing (1999-01).

Columbia -1 has been grown for seed in this area. In 2003 it was severely infected with stripe rust in the commercial plantings. It has good yield potential at sites without stripe rust. **Columbia-1** has questionable milling and baking quality.

Dumas was entered by General Mills. **Dumas** has excellent test weight, the highest of all HRWW entries. It has good yield potential and height similar to **Moreland**.

PNW Hard Red Winter Quality

PNW hard red winter wheat (HRWW) quality was brought into question in 2002 when four shipments to Japan turned out to be considerably less than desirable in quality. PNW exporters in response considered sourcing all their HRWW from states other than ID, WA, and OR.

Eight varieties were identified in the questionable shipments including varieties some times grown in the Treasure Valley. They include **Garland**, **Sunstar Declo**, and **Columbia-1**. The Japanese have requested that exporters exclude the eight varieties from future shipments. The position of the **Idaho Wheat Commission** is available on their website (<http://www.idahowheat.org-click> on "preferred varieties").

This is a concern. Although a low percentage of the wheat grown here is HRWW, most of the HRWW grown in the Treasure Valley has been these three varieties, especially **Garland**. If these HRWW varieties are not desired by our customers, we should not be producing them unless we have domestic markets willing to use them and can be assured they will not enter export markets.

There are alternative HRWW varieties, but none as short as **Garland**, or as productive as **Declo**. **Moreland** is the best alternative irrigated variety for quality but there is only registered seed available as yet. There is of course soft white winter wheat.

There would not be nearly the interest in **Garland** locally were it not for its short height and lodging resistance. The only comparable variety among soft white winters is **Basin** which is not grown much in the area because of its lower yield compared to other soft whites. However, its yield is as good as **Garland**. There is need for more productive short soft white winters or better quality irrigated HRW varieties.

Hard White Winter Wheat

Several hard white winter wheat varieties have been released and provided for our testing over the last few years as a testament to the increasing interest in the hard white class. Hard white wheat is used for noodles and /or bread making. There is considerable export potential for hard whites with acceptable quality. The current farm bill actually provides an incentive payment for hard white wheat production. However, mixing of hard white and soft wheats remains a significant concern in the industry as it will result in poor functionality of the mix when used for traditional baking products. We can ill afford a scenario

for soft wheat that occurred with Japan and hard red winter wheat in 2002.

Ivory, the first OSU hard white winter release, is intermediate in height and yields slightly less than **NuHorizon** over several years of testing.

Golden Spike is a tall USU release that is the least adapted to our environment of the current entries. It did not yield as well and is taller and lacks the straw strength of either **Ivory** or **NuHorizon**.

NuFrontier is a General Mills variety slightly taller than **Ivory**, but lower yielding and lower in protein. **NuHorizon** is a much shorter General Mills variety with excellent yield potential. **NuHorizon** has the highest hard white winter yield average over the four years of testing. Test weights for both General Mills varieties are better than **Ivory** in early plantings. **NuHorizon** protein is comparable to **Ivory**.

Triticale

We have evaluated two Polish varieties (**Alzo** and **Bogo**) for several seasons because of their outstanding performance in OSU trials relative to **Stephens** wheat. These triticales are tall but have excellent lodging resistance. They also have lower test weight than wheat when irrigated. **Alzo** and **Bogo** both averaged 6 bu/A higher in yield than **Stephens** under western Idaho

Table 10. Triticale vs Stephens Winter Wheat Performance in the Treasure Valley.

Variety	Yield	Protein	Test Weight	Height	Lodged
	bu/acre	%	lb/bu	in	%
Irrigated					
<i>2003 (4 sites)</i>					
Alzo	133	9.2	54.8	48	6
Bogo	140	9.6	54.6	46	21
Stephens	<u>134</u>	9.2	<u>59.3</u>	<u>38</u>	<u>15</u>
LSD _{.10}	16	1.2	1.9	3	13
<i>2000-03 (15 sites)</i>					
Alzo	142	9.6	56.5	46	10
Bogo	142	10.1	55.3	45	17
Stephens	<u>136</u>	10.1	<u>61.0</u>	<u>37</u>	<u>17</u>
LSD _{.10}	9	0.6	0.9	1	9
Dryland					
<i>2000-03 (5 sites)</i>					
Alzo	42	8.4	55.4	33	0
Bogo	40	9.4	56.0	31	0
Stephens	<u>35</u>	9.4	<u>58.9</u>	<u>26</u>	<u>0</u>
LSD _{.10}	11	1.2	1.6	3	--

irrigated conditions when averaged over all sites. **Alzo** and **Bogo** yielded 5 to 7 bu/A better than **Stephens** across five dryland trials (2000-03).

The triticales are handled by Resource Seeds, Inc. The results from four years of testing suggests that **Alzo** and **Bogo** have potential for higher production of grain than commonly grown soft wheat. The yield advantage has been especially notable under more stressful conditions such as the dryland environments. While triticale is not marketed for human food it can be substituted to some extent in beef and dairy rations. For mono-gastric animals such as poultry and hogs the triticale in some studies has been superior to wheat due to better amino acid balance.

Table 11. Irrigated Winter Barley Performance.

Variety	Yield	Test Weight	Height	Lodged	Thins
	bu/A	lb/bu	in	%	%
<i>2003 Parma (planted Oct. 25)</i>					
Kab47	127	44.1	41	93	14.2
Kab51	127	47.3	52	100	8.0
Stab 7	142	45.1	50	100	12.4
Stab 113	144	48.0	48	85	12.3
Strider	109	43.7	47	95	11.7
Sunstar Pride	87	46.6	41	85	13.6
88Ab536	<u>134</u>	<u>46.8</u>	<u>50</u>	<u>95</u>	<u>14.1</u>
LSD _{.10}	34	2.3	1	11	3.3
<i>1996-00 (10 sites)</i>					
Boyer	132	48.7	40	34	4.5
Kold	131	49.1	39	37	4.0
Strider	146	49.3	41	41	2.6
Sunstar Pride	139	49.3	37	39	7.1
WPB Sprinter	<u>131</u>	<u>51.7</u>	<u>40</u>	<u>38</u>	<u>1.9</u>
LSD _{.10}	16	1.6	2	16	1.8
<i>1996-03 (14 sites)</i>					
Strider	140	49.0	41	42	3.2
Sunstar Pride	<u>134</u>	<u>49.3</u>	<u>37</u>	<u>40</u>	<u>7.4</u>
LSD _{.10}	14	1.6	2	14	1.6
<i>2002-03 (2 sites)</i>					
Strider	132	44.5	44	89	8.3
Sunstar Pride	118	46.4	40	81	12.3
Stab 113	149	47.2	46	88	8.8
Stab 7	<u>136</u>	<u>45.2</u>	<u>47</u>	<u>95</u>	<u>8.1</u>
LSD _{.10}	27	1.6	3	8	3.7

Winter Barley

Winter barley in 2003 was evaluated only in the earliest planted trial at Parma (Table 11). Winter barley performance over several site years is also shown.

Strider, an OSU release with Barley Stripe Rust resistance, has greater yield potential than **Kold**, **Boyer**, and **WPB Sprinter** and comparable if not better than **Sunstar Pride**. It is taller than **Sunstar Pride** and frequently lower in test weight but has comparable straw strength.

Sunstar Pride has excellent yield potential but typically has more thins than **Strider**. **Sunstar Pride** also does not have stripe rust resistance.

Several potential winter malting types (**Stab 7**, **Stab 113**, **Kab 47**, **Kab 51**) were evaluated from the OSU breeding program. Of these, **Stab 113** has been the highest yielding.

Dryland Trials

Dryland winter wheat in southwestern Idaho's outlying areas generally is planted in a wheat fallow rotation. Timely spring rains boosted production in the 2003 trial to well above normal.

Malcolm averaged the highest in yield among the soft whites over the 1996-2003 period, about 5 bu/A higher than **Stephens**.

ID0575 was the highest yielding hard winter entry in 2003, yielding higher than both **Promontory** and **Buchanan**, the entries with the best long term yield average for hard winters. **Promontory** and **Buchanan**, both hard red winter wheats, averaged 5-6 bu/A higher than **Stephens** over the 1996-03 period.

Hard winter wheat averaged 6 bu/A less than soft white winter wheat with the higher rainfall in 2003. However, over the longer term (96-03) hard winter wheat averaged 4 bu/A or 10% higher than soft white winter wheat. In addition, the hard winter class averaged about three pounds per bushel higher test weight.

Hard winters appear to provide distinct advantages over soft whites in this dryland system. Triticale also appears to have a yield advantage over soft white.

Table 12. Dryland Winter Wheat Performance in Southwestern Idaho.

Variety	Yield			Protein	Test Weight	Height
	96-03	00-03	2003			
Washington County						
<i>Soft Whites</i>						
Brundage	39	35	67	11.5	64.0	30
Brundage 96	--	36	65	11.5	59.1	31
Eltan	40	38	72	11.5	62.6	34
IDO576	--	--	57	12.0	64.3	30
ID87-52814A	--	36	73	11.5	62.1	33
KW96019	--	--	72	11.1	63.6	32
Madsen	39	35	66	12.6	61.4	35
Malcolm	43	40	74	12.2	60.5	33
OR941611	--	--	78	11.3	60.1	36
ORCF-101	--	--	68	12.9	60.1	31
Simon	--	--	74	11.8	61.0	34
Stephens	39	35	69	12.3	60.5	32
Ste / Brun Mix	--	--	59	11.5	61.8	31
Tubbs	--	--	71	12.7	57.8	34
WB 470	--	--	63	11.5	66.9	32
Weatherford	--	33	63	13.0	60.1	32
Average	40	38	68	12.0	61.6	33
LSD_{.10}	9	13	11	1.0	1.8	2
<i>Hard Reds</i>						
Buchanan	45	43	57	12.1	64.0	37
Dumas	--	--	50	12.7	68.0	32
Finley	--	36	59	12.3	66.5	42
DW	--	38	55	12.4	65.6	31
IDO571	--	--	55	12.2	66.4	33
ID0575	--	--	67	12.9	65.6	44
Moreland	--	--	63	11.9	65.1	31
Promontory	44	43	53	12.3	67.6	34
Utah 100	43	43	64	12.3	63.3	37
<i>Hard Whites</i>						
Gary(HW)	--	--	56	12.0	65.3	35
Golden	--	--	69	11.8	65.3	36
Spike(HW)	--	--	--	--	--	--
Ivory (HW)	--	37	67	11.8	65.0	34
NuFrontier (HW)	--	38	63	11.6	67.6	36
NuHorizon (HW)	--	43	64	11.9	67.9	29
<i>Triticale</i>						
Alzo	--	42	69	--	57.6	39
Bogo	--	40	70	--	57.9	40
Average	44	40	62	12.0	64.9	36
LSD_{.10}	8	11	9	0.8	1.0	1

Variety Performance in other Areas

Small grain seed producers may be interested in the performance of varieties used in other production areas. Variety performance in other irrigated and dryland areas of southern Idaho can be found at the University of Idaho Cereals Extension Project website from the Aberdeen Research and Extension Center Home Page on the internet at <http://www.uidaho.edu/ag/extension/>. Variety performance in Oregon production systems can be viewed at the OSU Extension Cereals web site reached at <http://www.css.orst.edu/cereals>. Variety testing results in Washington can be viewed at <http://variety.wsu.edu>.

Cereal Sentinel Internet Access

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