



The Cereal Sentinel

A newsletter for Treasure Valley cereal producers

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Important Dates:

Idaho Grain Producers Annual Meeting, Boise

Nov. 15-17, 2004

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 2004 season marked the 20th 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 2004 season. The earliest trials were planted at Weiser on October 15 and at the Parma R & E Center on October 8. Later planted trials were located at Hammett on November 6 and again at the Parma R & E Center on November 5. The season was characterized as dry in the fall, winter temperatures that did not freeze soils to the four inch depth, and abnormally high temperatures in late winter and early spring that allowed above normal tillering, early heading and an extended period for grain fill. All plantings at Parma germinated and emerged in the fall.

Plant heights were shorter at Weiser and Hammett than at Parma and may have been drought stressed during stem extension in April. There was also considerable gopher damage at Weiser. Production was good at Parma but lower in the off-station trials.

Soft White Winter Wheat

The irrigated soft white winter wheat results for the 2004 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 southwestern Idaho. Its primary weaknesses are test weight (it's only fair) and straw strength (good but not great). It is too tall for some wheel lines. It has above average milling and baking quality. It has excellent yield potential for both early and late plantings (see Table 5).

Malcolm has performed at least as well as **Stephens** in high yield environments, particularly with mid October or earlier plantings. **Malcolm** does not have the milling and baking quality of **Stephens** although it is acceptable.

Brundage is shorter than **Stephens**, 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

Table 1. Irrigated mid-October Planted Soft White Winter Wheat Performance in the Treasure Valley, 2004

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>Parma (planted Oct.8)</i>					
Brundage	123	10.8	60.4	36	0
BZ6W98-528	167	11.5	60.9	37	3
Dune	174	10.5	60.4	37	0
ID0587	152	10.7	58.6	36	3
KW9016	159	11.4	59.6	36	0
Malcolm	159	10.9	60.0	38	0
ORCF-101	148	11.7	58.2	36	0
OR2010007	157	10.6	59.2	39	0
OR9900553	152	11.3	58.9	37	0
Simon	155	10.8	59.2	38	0
Stephens	159	10.9	59.1	39	5
Ste/Brun Mix	151	11.0	59.7	37	3
SX1401W	139	10.3	57.3	31	0
Tubbs	170	10.6	58.7	38	3
LSD_{.10}	13	0.5	1.3	1.4	4
<i>Weiser (planted Oct. 15)</i>					
Brundage	52	13.5	58.6	29	0
BZ6W98-528	74	13.7	60.1	31	0
Dune	89	12.2	60.7	31	0
ID0587	90	13.0	57.2	32	0
KW9016	68	12.6	60.5	30	0
Malcolm	103	12.6	58.7	34	0
ORCF-101	94	12.6	57.1	32	0
OR2010007	100	12.7	58.2	35	0
OR9900553	98	13.1	58.4	31	0
Simon	80	13.1	58.1	32	0
Stephens	96	12.3	58.0	33	0
Ste/Brun Mix	84	12.5	57.8	32	0
Tubbs	102	12.8	56.8	35	0
LSD_{.10}	19	1.3	2.4	2	--

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

WB 470, a Western Plant Breeders release, yields almost as well as **Stephens** and has outstanding test weight. However, **WB 470** is a poor milling wheat, is not preferred by millers, and is better suited for feeding cattle.

Table 2. Irrigated mid-November Planted Soft White Winter Wheat Performance in the Treasure Valley. 2004

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>Parma (planted Nov. 5)</i>					
Brundage	144	10.5	59.3	37	18
BZ6W98-528	159	10.8	60.0	37	18
Clear First	136	11.2	58.9	38	5
Dune	163	10.8	61.5	38	23
ID0587	144	10.4	57.9	39	30
KW9016	166	10.9	59.7	35	0
Malcolm	158	10.7	57.4	39	15
Mel	134	10.6	59.6	35	50
ORCF-101	146	11.1	57.9	38	0
OR2010007	147	10.5	58.3	39	23
OR9900553	143	11.2	57.4	36	55
Simon	148	10.5	58.2	39	20
Stephens	157	10.6	58.4	37	25
Ste/Brun Mix	153	10.7	59.1	37	18
Tubbs	151	10.7	56.5	39	28
LSD _{.10}	8	0.4	2.1	1.7	24
<i>Hammitt (planted Nov. 6)</i>					
Brundage	116	10.7	57.6	34	0
BZ6W98-528	124	10.8	57.6	37	0
Clear First	106	10.5	56.3	35	0
Dune	132	11.1	57.2	35	0
ID0587	118	10.6	55.2	35	0
KW9016	119	11.5	56.2	33	0
Malcolm	109	10.5	55.9	35	0
Mel	95	10.0	58.4	35	0
ORCF-101	114	11.4	54.8	35	0
OR2010007	118	11.5	58.0	38	0
OR9900553	112	12.2	54.2	34	0
Simon	104	10.6	56.7	35	0
Stephens	122	11.6	55.3	35	0
Ste/Brun Mix	115	11.4	56.3	36	0
Tubbs	114	11.2	53.9	38	0
LSD _{.10}	22	1.8	2.3	2.1	--

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 **Stephens**. **WPB Mohler** has good milling and baking quality.

(Dune), and **(Simon)**. Two of these, **Simon** and **Dune** have been or will be soon released. and over two years of testing **Simon** has not differed significantly from **Stephens**.

Simon (ID91-34302A) is the latest UI soft white winter release for irrigated systems. **Simon** has comparable test weight and similar straw strength to **Stephens** but has not always matched the yield of **Stephens**. **Simon** has excellent milling and baking quality.

Dune (ID91-20503A), a UI advanced line, has been evaluated for two years now in southwestern Idaho and will probably be proposed for release in 2005. **Dune** has excellent yield potential in both early and late plantings, yielding at least as well as and in some cases higher than **Stephens**. It is slightly shorter than **Stephens**. The baking quality for **Dune** is acceptable.

KW96019, an advanced line from Matt Kolding, averages 2-3 inches shorter than **Stephens** and in limited testing has equaled **Stephens** in yield. It has better straw strength than **Stephens** and possibly better test weight. **KW9016** may be less acceptable for milling and baking quality than **Stephens**. **KW9016** was formerly listed as **KW96019**. With similar height, it would be a more productive option than **Brundage** under wheel lines that are difficult to move with **Stephens**.

WB 528 (BZ6W98-528) is a Westbred variety evaluated over the last two seasons. It yielded comparable to **Stephens**, is similar in height, but has significantly better test weight. **WB 528** has excellent milling and baking quality

Varieties with tolerance to the herbicide **Beyond**® are called Clearfield varieties. **ID0587** is a UI Clearfield variety with **Stephens** parentage and has been evaluated the last three seasons. It has tended to yield slightly less than **Stephens** in some trials. **ORCF-101**, an OSU Clearfield tolerant line also tended to perform less well than **Stephens** in two years of testing. **Clearfirst** is a Pacific Northwest Plant Breeders Clearfield variety with **Madsen** parentage that did not perform as well as **Stephens** in limited testing this past year. **Mel** is a winter club wheat from Pacific Northwest Plant Breeders that was tested only at two locations. It is lower yielding than **ORCF 101** or **ID 587**.

Performance in any given trial is not as reliable as the combined performance over several sites and years. The yield results for several periods of testing are shown in Tables 4-5.

Planting Dates and SWWW Variety Performance

Table 3. Irrigated Soft White Winter Wheat Performance in the Treasure Valley across all sites combined. 2004

Entries	Yield	Protein	Test Weight	Height	Lodging
	bu/acre	% (4 sites)	lb/bu	in	%
Brundage	109	11.4	59.0	34	4
BZ6W98-528	131	11.7	59.7	35	5
Dune	140	11.2	59.9	35	6
ID0587	126	11.2	57.2	36	8
KW9016	128	11.6	59.0	33	0
Malcolm	132	11.2	58.0	37	4
ORCF-101	126	11.7	57.0	35	0
OR2010007	131	11.3	58.4	38	6
OR9900553	126	12.0	57.3	34	14
Simon	122	11.3	58.1	36	5
Stephens	134	11.3	57.7	36	8
Ste/Brun Mix	126	11.4	58.2	35	5
Tubbs	135	11.3	56.5	37	8
LSD _{.10}	19	0.8	1.3	1.6	11

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 better lodging resistance is desirable.

A successful mixture for southwestern Idaho would be as productive as **Stephens** 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. The **Stephens** and **WPB 470** mixture over this four year period averaged 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 mixture was more stable in yield from year to year than either variety planted alone.

Unfortunately **WPB 470** has relatively poor milling and baking quality. 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

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. Some varieties such as **Malcolm** appear to be more susceptible to later planting relative to **Stephens**. 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. Testing the past two years shows several new varieties or lines that compare favorably with **Stephens** when late planted. Late planted **Tubbs**, **WB528**, and **Dune** all matched or exceeded the yield for **Stephens** over two years of testing.

Mixed Variety Performance

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

Table 4. Irrigated Soft White Winter Wheat Long Term Yield Performance, 1996-04.

Variety	1996-02	1998-02	2000-02	2002-04	2003-4
	-----bu/A-----				
Malcolm	129	129	126	130	135
Stephens	130	130	127	132	134
Brundage	122	122	121	122	122
WPB 470	129	128	124	--	--
Hubbard	--	120	120	--	--
Brundage96	--	122	117	--	--
Tubbs	--	--	128	133	136
WPB Beamer	--	--	109	--	--
WPB Mohler	--	--	126	--	--
Weatherford	--	--	122	--	--
ID0587	--	--	--	127	129
Simon (34302A)	--	--	--	126	128
Dune	--	--	--	--	141
WB 528	--	--	--	--	133
KW9016	--	--	--	--	134
ORCF-101	--	--	--	--	126
LSD _{.10}	7	8	13	8	11

Table 5. SWWW Variety Performance as Affected by Planting Dates. 1996-04

Entries	October Planted	November Planted
	-----bu/A-----	
	1996-04	
	(18 sites)	(16 sites)
Brundage	125	127
Malcolm	137	131
Stephens	<u>135</u>	<u>132</u>
LSD _{.10}	7	11
	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
	2000-04	
	(10 sites)	(9 sites)
Brundage	124	128
Malcolm	140	130
Stephens	138	132
Tubbs	<u>141</u>	<u>132</u>
LSD _{.10}	11	9
	2003-04	
	(4 sites)	(4 sites)
Brundage	134	111
Dune	144	138
IDO587	131	127
KW9016	140	128
Malcolm	133	137
Simon	130	127
Stephens	134	133
Tubbs	134	138
WB 528	<u>130</u>	<u>136</u>
LSD _{.10}	14	18

contrast to **WPB 470**, are that it is awnless and **Brundage** has excellent milling and baking quality, better than **Stephens**. The mixture performance in each of the 2004 sites is shown in Tables 1 and 2 and the overall performance is in Table 6.

The **Stephens-Brundage** mixture in 2003-2004 frequently was more productive than **Brundage** alone and

Table 6. Variety Mixture Performance, 1998-04.

Entry	Yield	Test Weight	Lodging
	bu/A	lb/bu	%
	2002-04 (12 sites)		
Stephens	132	58.9	22
Brundage	122	61.0	17
Stephens/Brundage	<u>130</u>	<u>59.4</u>	<u>23</u>
LSD _{.10}	9	1.0	11
	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

did not differ from **Stephens** by itself. Test weight of the mixture was intermediate between **Stephens** and **Brundage**. The mixture provided no advantage in reducing lodging.

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 or premiums for high protein. Test weight is generally higher with hard red winters.

Hard wheat varieties at each site received an extra 50 lb N/A at the heading to flowering stage for protein enhancement. Results for 2004 testing are shown in Tables 7-9.

Hard Red Winter Wheat (HRWW)

Although a low percentage of the wheat grown in southwestern Idaho is HRWW, most of that grown has been varieties such as **Garland**, **Sunstar Declo**, or **Columbia -1** which were identified as having questionable baking quality for higher end export markets. Japan has requested that these varieties not be included in their shipments. The position of the **Idaho Wheat Commission** is available on their website (<http://www.idahowheat.org-click> on "preferred varieties").

Table 7. Irrigated Early Planted Hard Winter Wheat Performance in the Treasure Valley. 2004.

Variety	Yield	Protein	Test Weight	Height	Lodging
	bu/acre	%	lb/bu	in	%
<i>Parma (planted Oct. 8)</i>					
Hard Reds					
Falcon	149	12.0	61.7	38	15
Hoff	133	12.4	61.5	40	8
Moreland	149	13.4	61.7	38	5
Hard Whites					
Golden Spike	148	11.8	61.1	43	100
Ivory	152	11.5	60.5	39	0
NuHorizon	155	12.5	63.2	36	15
LSD ₁₀	9	0.3	1.3	1.7	17
<i>Weiser (planted Oct. 15)</i>					
Hard Reds					
Falcon	115	12.8	62.3	32	0
Hoff	100	13.3	61.9	31	0
Moreland	90	14.4	60.3	27	0
Hard Whites					
Golden Spike	129	11.8	60.9	34	0
Ivory	113	12.2	60.2	33	0
NuHorizon	115	13.1	63.3	31	0
LSD ₁₀	15	0.5	0.8	1.4	--

Garland, a USU release, is the shortest of all entries with excellent lodging resistance, and this accounts for its popularity under low profile sprinklers. But **Garland** yields less than **Hawk**, **Hoff** or **Meridian** unless there is significant lodging.

Sunstar Declo, a release from Sundermann Breeding, has only been tested in October planted sites in 1999-2001. It has good yield potential, good straw strength, good protein, and is shorter than **Hoff**.

Hoff, is an older OSU release, with good test weight, straw strength and lodging resistance. It has good yield potential but is taller than **Moreland** and **Sunstar Declo**.

Moreland (ID0517), a recent Idaho release, is as short as **Declo**. **Moreland** has excellent lodging resistance and its baking quality is good, unlike most all other hard red winters adapted to irrigation. **Moreland** yielded relatively well in 2003 and 2004 but less than **Declo**, **Hawk** and **Hoff** over three earlier years of testing (1999-01).

Falcon is a Westbred release. In limited testing (only one year) it appears to be competitive with other varieties in yield in earlier plantings but less adapted to

Table 8. Irrigated Late Planted Hard Red Winter Wheat Performance in the Treasure Valley, 2004.

Variety	Yield	Protein	Test Weight	Height	Lodging
	bu/acre	%	lb/bu	in	%
<i>Parma (planted Nov. 5)</i>					
Hard Reds					
Falcon	140	11.1	60.6	36	98
Hoff	147	11.4	60.4	40	28
Moreland	151	12.1	59.5	36	28
Vandal	136	14.1	60.4	36	18
WB936	144	13.0	58.8	36	5
Hard Whites					
Golden Spike	138	11.1	58.9	39	98
IDO 377s	142	12.0	62.7	41	98
Ivory	148	10.9	59.2	41	38
NuFrontier	143	11.0	62.2	39	80
NuHill	146	12.1	63.5	38	28
NuHorizon	165	11.4	62.8	36	28
LSD ₁₀	10	0.4	1.8	1.8	60
<i>Hammett (planted Nov. 6)</i>					
Hard Reds					
Falcon	106	9.9	59.5	36	0
Hoff	134	11.6	59.9	39	0
Moreland	138	12.1	58.6	35	0
Vandal	123	13.1	60.2	36	0
WPB936	125	12.3	60.9	33	8
Hard Whites					
Golden Spike	127	12.1	58.5	42	18
Ivory	133	11.4	57.7	39	0
IDO 377s	132	10.3	62.4	40	0
NuFrontier	132	10.8	61.3	40	10
NuHill	132	12.2	61.6	37	3
NuHorizon	130	11.6	61.0	36	0
LSD ₁₀	16	1.1	1.0	1.9	13

later plantings. It may also lack the straw strength of other varieties. **Falcon** had significantly lower protein than **Moreland**.

Two hard red spring varieties, **Vandal** and **WB 936**, were planted with the late planted hard red winters. While not consistently as productive as the winter varieties, they normally command higher prices than the hard red winters.

Hard White Winter Wheat (HWWW)

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.

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>2004 (4 sites)</i>					
Hard Reds					
Falcon	127	11.5	61.0	35	28
Hoff	128	12.2	60.9	37	9
Moreland	132	13.0	60.0	34	8
Hard Whites					
Golden Spike	135	11.7	59.8	40	54
Ivory	136	11.5	59.4	38	9
NuHorizon	142	12.1	62.6	35	19
LSD _{.10}	13	0.6	0.8	2.1	19
<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

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, when four shipments were rejected for inferior quality.

Ivory, the first OSU hard white winter release, is intermediate in height and yields slightly less than

NuHorizon over several years of testing. It is taller than **NuHorizon** and test weight for **Ivory** is lower.

Golden Spike is a tall USU release that is the least adapted to our environment of the current entries. It is taller and lacks the straw strength of either **Ivory** or **NuHorizon**.

NuHorizon is a short General Mills variety with excellent yield potential. **NuHorizon** was the highest HWWW yield over four years of testing. It matched the more productive HRWW varieties grown in the same trials. **NuHorizon** protein is comparable to **Ivory**.

NuFrontier is a General Mills variety slightly taller than **Ivory**, but lower yielding.

Triticale

We evaluated two Polish triticale 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 and are used strictly for feed.

Alzo and **Bogo** both averaged 6 bu/A higher in yield than **Stephens** under western Idaho irrigated conditions when averaged over all 15 sites. This amounts to about a 4 % yield advantage over **Stephens** under irrigation.

Alzo and **Bogo** yielded 3 to 4 bu/A better than **Stephens** across six dryland trials (2000-04), over 8%

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

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodged %
Irrigated					
<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>	<u>10.1</u>	<u>61.0</u>	<u>37</u>	<u>17</u>
LSD _{.10}	9	0.6	0.9	1	9
Dryland					
<i>2000-04 (6 sites)</i>					
Alzo	39	9.1	54.8	34	0
Bogo	38	9.9	55.5	31	0
Stephens	<u>35</u>	<u>10.0</u>	<u>59.0</u>	<u>26</u>	<u>0</u>
LSD _{.10}	9	0.4	1.5	2.4	--

higher than **Stephens**. Since the proportional advantage is greater under dryland conditions, the varieties will continue to be evaluated in that system.

The triticales are handled by Resource Seeds, Inc. 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.

Winter Barley

Winter barley in 2004 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 to **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.

YU599-006 is a Westbred waxy 6-row spring barley line evaluated in 2003 for the first time. **Idagold** is an Adolph Coors 2-row feed barley. Spring barley overwintered this year with minimal winter damage.

Idagold this year was as productive as most of the winter barleys evaluated.

88Ab536 is a USDA winter barley line that has malting quality. It is taller and lower yielding than all other winter barleys evaluated.

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, **Eltan**, and **Stephens** did not differ in yield over several years of dryland testing (1996-2004). Eltan had lower test weight than Stephens in 2004. **Tubbs** averaged about 3 bu/A higher than **Stephens** in the last two years of testing (not shown in table) but is lower in test weight.

Promontory and **Buchanan**, both hard red winter wheats, averaged 5-6 bu/A higher than **Stephens** over the 1996-04 period.

Hard winter wheat averaged 2 bu/A more than soft white winter wheat in 2004. Over the longer term (96-03) hard winter wheat averaged 4 bu/A or 10% higher than

Table 11. Irrigated Winter Barley Performance.

Variety	Yield bu/A	Test Weight lb/bu	Height in	Lodged %	Thins %
<i>2004 Parma (planted Oct. 8)</i>					
Idagold	219	53.9	28	5	0.5
Kab 47	165	51.6	30	0	0.8
Stab 113	169	54.0	38	0	0.5
Strider	211	51.4	35	0	0.5
Sunstar Pride	233	51.8	37	0	1.7
YU599-006	174	50.8	30	0	0.2
88Ab536	<u>134</u>	<u>52.7</u>	<u>41</u>	<u>0</u>	<u>0.8</u>
LSD _{.10}	18	0.5	13	5	0.2
<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>1996-04 (15 sites)</i>					
Strider	144	49.5	40	39	3.0
Sunstar Pride	<u>141</u>	<u>49.1</u>	<u>37</u>	<u>37</u>	<u>7.0</u>
LSD _{.10}	15	1.4	2	14	1.5
<i>2002-04 (3 sites)</i>					
Strider	158	46.8	41	59	5.7
Sunstar Pride	156	48.2	39	54	8.8
Stab 113	<u>155</u>	<u>49.5</u>	<u>43</u>	<u>58</u>	<u>5.6</u>
LSD _{.10}	17	2.6	3	31	3.9
<i>2003-04 (2 sites)</i>					
Kab 47	146	47.9	35	46	7.5
Strider	160	47.5	41	48	6.1
Sunstar Pride	160	49.2	39	43	7.6
Stab 113	156	51.0	43	43	6.4
88AB536	<u>134</u>	<u>49.7</u>	<u>46</u>	<u>48</u>	<u>7.5</u>
LSD _{.10}	20	3.3	4.7	43	6.1

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 whites.

Table 12. Dryland Winter Wheat Performance in Southwestern Idaho.

Variety	Yield			Protein	Test Weight	Height
	96-04	00-04	2004			
Washington County						
<i>Soft Whites</i>						
Brundage 96	--	--	33	9.0	55.5	28
Dune	--	--	35	8.9	59.3	26
Eltan	39	37	33	9.6	57.6	28
Foote	--	--	30	9.8	58.2	29
Hubbard	--	--	36	9.3	59.4	32
IDO587	--	--	33	10.5	57.3	27
MacVicar	--	--	11	9.9	55.7	23
Malcolm	40	38	33	9.0	58.5	29
OR9900553	--	--	32	10.5	56.1	25
ORCF-101	--	--	34	10.1	56.8	27
OR2010007	--	--	33	9.4	57.9	27
Simon	--	--	35	8.8	58.0	27
Stephens	38	35	35	10.1	59.6	28
Tubbs	--	--	39	9.3	57.2	30
Weatherford	--	34	35	10.1	59.9	28
Average	39	38	32	9.6	57.8	28
LSD _{.10}	8	9	5	0.6	1.8	1.7
<i>Hard Reds</i>						
Boundary	--	--	38	9.4	58.8	29
Buchanan	43	41	32	9.2	58.4	33
Finley	--	36	35	9.6	62.4	37
DW	--	36	32	9.5	61.1	31
IDO571	--	--	35	9.3	62.2	32
ID0575	--	--	32	10.8	61.4	42
Moreland	--	--	36	9.6	60.1	27
Promontory	44	43	37	9.7	63.2	34
Utah 100	42	41	34	10.0	59.5	34
<i>Hard Whites</i>						
Gary (HW)	--	--	39	9.3	60.7	34
Ivory (HW)	--	33	33	9.8	60.6	30
<i>Triticale</i>						
Alzo	--	39	27	10.2	52.0	36
Bogo	--	38	32	10.3	52.9	34
Average	43	38	34	9.7	59.5	33
LSD _{.10}	7	8	5	0.4	1.0	2.0

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>.

Idaho Preferred Mix

All PNW Wheat Commissions have listed varieties according to their end use milling and baking performance. The Idaho Wheat Commission has categorized current wheat varieties as follows:

- **Quality Plus** (those with above average milling and baking quality)
- **Acceptable Quality** (those with acceptable but not above average quality)
- **Limited Markets** (those with serious defects for milling and baking and detrimental to the quality and consistency of Idaho's soft white wheat available for high end export markets)

Currently grown winter and spring soft whites adapted to southwestern Idaho in each category are listed below.

Quality Plus

Brundage, Brundage 96, Hubbard, Stephens, Alturas, Treasure, Jubilee, Whitebird.

Acceptable Quality

Malcolm, Madsen, Weatherford, Rod, Pomerelle

Limited Markets

WB470, Daws, Penawawa, Alpowa

The list presented here is not all-inclusive as some newer releases are still being evaluated for their quality. It is noteworthy that seven of the eight **Quality**

Plus varieties are from UI winter or spring breeding programs where there has been a focus on quality for some time. Idaho breeders are certainly doing their part in developing releases with comparable if not higher yield

potential while simultaneously improving the overall quality of Idaho irrigated wheat.

In southwestern Idaho we are already growing *Quality Plus* winter wheat over 92% of our winter wheat acreage (in 2004) with the planting of **Stephens**, **Brundage** and **Brundage 96**. Another 3.6% was planted to *Acceptable Quality* varieties **Malcolm** and **Madsen**. In contrast, 78% of the soft white spring wheat acreage was planted in 2004 with *Limited Markets* varieties **Penawawa** and **Alpowa**.

Our soft white spring production for the most part is reducing the overall quality of the mix of soft white wheat originating in southwest Idaho. Fortunately, only 15% of our total wheat acreage was planted to spring soft whites and some of this was fed to cattle or grown for seed. A shift from these spring varieties to those with proven higher quality and comparable or higher yield potential (namely **Jubilee** or **Alturas**) would further improve the quality stature of southwestern Idaho wheat available for domestic or export milling and baking.

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