



# The Cereal Sentinel

*A newsletter for Treasure Valley cereal producers*

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## Important Dates:

Idaho Grain Producers Annual Meeting

Nov. 18-20, 2002

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](mailto:bradb@uidaho.edu)).** The *Cereal Sentinel* is made possible in part by a grant from the Idaho Wheat Commission.

*Brad Brown*

Brad Brown,  
Extension Crop Management Specialist

# Winter Cereal Variety Performance

## *Irrigated Trials*

The 2002 season marked the 18th 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 2002 season. The earliest trials were planted at the Parma R & E Center on October 11 and at Weiser on October 15. Later planted trials were located at Hammet on November 14 and again at the Parma R & E Center on November 12. The season was characterized as dry in the fall with only the earlier fall plantings germinating, emerging, and tillering in the fall. Later plantings did not emerge until spring. A cool spring delayed plant development and then unseasonably warm temperatures in June and July reduced the grain fill period. Reduced grain fill served to lower yields and test weights from better years.

Despite inclement conditions, production was good in the Parma and Weiser trials but considerably lower in the later Hammett planting. Protein in the early planted Parma and Hammett trials were well above that necessary for maximum yield (10%) and high winds together with high residual available N caused extensive lodging at Parma. Based on the residual N measured prior to planting there was no fertilizer N applied at Parma. There was also hail at Parma. In contrast, protein at Weiser was low and despite very respectable yield, available N very likely limited yield.

## *Soft White Winter Wheat*

The irrigated soft white winter wheat results for the 2002 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). For wheel lines it can be too tall. Protein levels tend to be higher than desirable for many Pacific Rim customers, but it has above average milling and baking quality. It has excellent yield potential and is

**Table 1. Irrigated mid-October Planted Soft White Winter Wheat Performance in the Treasure Valley, 2002**

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>Parma (planted Oct. 11)</i>					
<b>Brundage</b>	135	10.9	60.3	38	75
<b>Brundage 96</b>	128	11.7	59.6	38	65
<b>Hubbard</b>	134	11.4	61.8	45	94
<b>ID87-52814A</b>	127	11.0	58.1	37	100
<b>ID89-17113A</b>	119	12.1	58.9	39	93
<b>ID91-34302A</b>	127	11.9	59.8	42	88
<b>ID0587</b>	134	11.9	57.5	38	90
<b>ID0588</b>	142	11.8	59.6	39	99
<b>KW96019</b>	142	12.2	60.3	36	50
<b>Malcolm</b>	127	12.1	57.0	38	100
<b>OR941904</b>	129	13.7	62.4	40	91
<b>Stephens</b>	141	12.4	58.4	38	98
<b>Ste/Brun Mix</b>	140	12.2	57.4	39	93
<b>Tubbs</b>	133	11.2	57.4	41	93
<b>Weatherford</b>	115	13.5	56.8	41	98
<b>WPB Beamer</b>	129	11.8	59.0	40	95
<b>WPB Mohler</b>	134	11.8	59.6	41	90
<b>WPB 470</b>	139	11.5	63.0	39	83
<b>LSD<sub>.10</sub></b>	14	0.6	1.4	1.6	18
<i>Weiser (planted Oct. 15)</i>					
<b>Brundage</b>	132	8.5	65.4	33	0
<b>Brundage 96</b>	121	8.4	62.4	33	5
<b>Hubbard</b>	131	8.7	64.0	40	0
<b>ID87-52814A</b>	135	7.8	63.4	34	25
<b>ID89-17113A</b>	125	8.4	62.8	35	0
<b>ID91-34302A</b>	134	8.2	63.1	35	15
<b>ID0587</b>	142	8.4	63.6	35	18
<b>ID0588</b>	149	8.8	64.4	36	0
<b>Malcolm</b>	140	8.0	63.1	35	20
<b>OR941904</b>	134	8.9	66.0	36	20
<b>Stephens</b>	141	8.2	62.9	35	0
<b>Ste/Brun Mix</b>	136	8.3	63.8	35	8
<b>Tubbs</b>	141	8.3	62.5	37	0
<b>Weatherford</b>	131	9.4	63.4	36	0
<b>WPB Beamer</b>	135	8.1	63.3	37	20
<b>WPB Mohler</b>	151	8.3	64.1	37	18
<b>WPB 470</b>	140	8.8	67.4	33	0
<b>LSD<sub>.10</sub></b>	11	0.7	0.9	1.3	22

especially appropriate for later (November) plantings (see Table 3).

**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 2. Irrigated mid-November Planted Soft White Winter Wheat Performance in the Treasure Valley. 2002**

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>Parma (planted Nov.12)</i>					
Brundage	124	9.4	62.6	40	65
Brundage 96	113	9.1	59.9	39	45
Hubbard	117	9.0	61.5	44	63
ID87-52814A	126	8.9	60.9	37	98
ID89-17113A	117	9.4	61.3	39	73
ID91-34302A	131	9.7	61.5	42	73
ID0587	122	8.9	59.8	38	65
ID0588	130	9.8	60.5	39	88
Malcolm	120	8.8	60.5	40	68
OR941904	132	10.7	63.8	41	90
Stephens	130	9.2	58.8	38	80
Ste/Brun Mix	135	9.9	60.4	40	83
Tubbs	133	9.2	59.5	40	60
Weatherford	120	9.8	60.3	41	68
WPB Beamer	123	10.1	60.8	41	83
WPB Mohler	125	9.4	60.9	42	83
WPB 470	139	10.1	64.6	39	63
LSD <sub>.10</sub>	10	0.9	1.5	1.2	28
<i>Hammet (planted Nov.14)</i>					
Brundage	99	12.0	62.5	35	0
Brundage 96	103	12.3	59.5	35	0
Hubbard	93	12.3	59.8	42	0
ID87-52814A	84	11.4	58.6	37	0
ID89-17113A	102	11.3	59.6	37	0
ID91-34302A	97	11.8	59.4	38	0
ID0587	98	11.9	58.3	36	0
ID0588	99	12.4	58.3	37	0
Malcolm	96	11.4	57.4	36	0
Stephens	95	11.8	59.0	35	0
Ste/Brun Mix	105	11.6	60.0	35	0
Tubbs	100	11.8	57.8	38	0
Weatherford	88	12.5	57.3	38	0
WPB Beamer	99	11.6	60.4	37	0
WPB Mohler	101	10.8	61.1	36	0
WPB 470	100	11.4	60.0	35	0
LSD <sub>.10</sub>	13	1.1	3.5	1.8	-

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 **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.

**WPB 470**, a Western Plant Breeders release, has excellent yield potential, yielding as well as **Stephens**. **WPB 470** 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.

**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.

**Hubbard**, an Idaho release, tends to be less productive than **Stephens** and will not be further tested. It is taller than **Stephens** by 5-6 inches. It does have excellent milling and baking quality.

**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 are lower than **Stephens**.

**Brundage 96** was released as a replacement for **Brundage** where stripe rust is an issue. It has lower test weight than **Brundage**, does not yield as well, and will not be further tested.

**WPB Mohler** has been 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 milling and baking quality at least as good as **Stephens**.

**WPB Beamer** has been tested for three years in western Idaho and has yielded as well as **Stephens** in early plantings. It is taller than **Stephens** but is comparable in straw strength and higher in test weight.

A couple of UI advanced lines have been evaluated in the past two to three years including **ID87-52814A**, **ID89-17113A**, and **ID91-34302A**. Neither of these averaged higher than **Stephens** in yield when averaged across all early or late planting sites although they have performed well in individual sites. **ID87-52814A** matched **Stephens** yield in early plantings. This line is slightly shorter than

**Table 3. Irrigated Soft White Winter Wheat Performance in the Treasure Valley across all sites combined. 2002**

Entries	Yield	Protein	Test	Height	Lodging
	bu/acre	%	Weight lb/bu	in	%
Brundage	122	10.2	62.7	36	35
Brundage 96	116	10.4	60.3	36	29
Hubbard	119	10.4	61.8	43	39
ID87-52814A	118	9.8	60.3	36	56
ID89-17113A	116	10.3	60.6	37	41
ID91-34302A	122	10.4	60.9	39	44
ID0587	124	10.3	59.8	37	43
ID0588	130	10.7	60.7	38	47
Malcolm	121	10.1	59.5	37	47
Stephens	127	10.4	59.8	37	44
Ste/Brun Mix	129	10.5	60.4	37	46
Tubbs	127	10.1	59.3	39	38
Weatherford	114	11.3	59.4	39	41
WPB Beamer	121	10.4	60.8	38	49
WPB Mohler	128	10.1	61.4	39	48
WPB 470	129	10.5	63.8	36	36
LSD <sub>.10</sub>	11	1.1	1.5	1.4	26

**Stephens** but it may not have **Stephens's** straw strength. Test weight averaged slightly better than **Stephens**. **ID87-52814A** has outstanding flour quality as indicated by cookie diameter and break flour yield.

It has been difficult for breeders to shorten soft white winter wheat below that of **Stephens** without sacrificing

yield. Shorter wheat and better straw strength are desired especially by those moving wheel lines through fully headed wheat. **Basin** and **Brundage** are both examples of shorter wheats that historically have not proven comparable in yield to **Stephens** in western Idaho. Of the shorter varieties extensively tested in western Idaho, **WPB 470** has come the closest to matching **Stephens** in yield, especially when both early and late plantings are considered.

**KW96019**, an advanced line from Matt Kolding, averages 2-3 inches shorter than **Stephens** and in limited testing (only two sites) has equaled **Stephens** in yield. It also has better straw strength than **Stephens** and possibly better even than **WPB 470**. Unfortunately, **KW96019** may not be any more acceptable in milling and baking quality than **WPB 470** which is not recognized by the *Idaho Wheat Commission* as having acceptable quality.

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**

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 less productive if planted in November rather than October. But most varieties appear to be more susceptible to later planting conditions relative to **Stephens**. Notable exceptions include **Tubbs**, **Weatherford**, and especially the **Ste/470 mix**. 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. Over 250,000 acres of mixed plantings were reported in

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

Variety	1996-02	1998-02	2000-02	2001-02
	-----bu/A-----			
Malcolm	129	129	126	109
Stephens	130	130	127	112
Brundage--	122	122	121	109
WPB 470--	129	128	124	111
Hubbard	--	120	120	104
Brundage96	--	122	117	104
Tubbs	--	--	128	114
WPB Beamer	--	--	109	109
WPB Mohler	--	--	126	112
Weatherford	--	--	122	103
ID87-52814A	--	--	125	109
ID89-17113A	--	--	--	107
LSD <sub>.10</sub>	7	8	13	16

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

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

Washington during the 2000 season using 14 different combinations of varieties.

What about mixtures in irrigated wheat systems? 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 better lodging resistance is desirable.

A successful mixture would sacrifice no yield while improving both test weight and lodging resistance. We mixed **Stephens** and **WPB 470** because **WPB 470** has 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. Why yield did not average intermediate between the two varieties, as did test weight, is not clear.

The results show that this mixture is more stable in yield from year to year than either variety planted alone, especially in later plantings. The results also demonstrate the potential for this mixture to improve grain grade and lodging resistance.

Unfortunately we now know that **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.

Given the reservations for **WPB 470** quality we substituted **Brundage** in the mix for 2002 as it is also shorter, earlier, stronger strawed, and higher in test weight than **Stephens**. In contrast to **WPB 470**, **Brundage** has excellent milling and baking quality. The mixture performance in each of the 2002 sites is shown in Tables 1 and 2.

**Table 6. Variety Mixture Performance, 1998-02.**

Entry	Yield	Test Weight	Lodging
	bu/A	lb/bu	%
<b>2002 (4 sites)</b>			
<b>Stephens</b>	<b>127</b>	<b>59.8</b>	<b>44</b>
<b>Brundage</b>	<b>122</b>	<b>62.7</b>	<b>35</b>
<b>Stephens/Brundage</b>	<b>129</b>	<b>60.4</b>	<b>46</b>
<b>LSD<sub>10</sub></b>	<b>11</b>	<b>1.7</b>	<b>27</b>
<b>1998-01 (14 sites)</b>			
<b>Stephens</b>	<b>138</b>	<b>61.1</b>	<b>6</b>
<b>WPB 470</b>	<b>134</b>	<b>64.7</b>	<b>1</b>
<b>Stephens/WPB 470</b>	<u><b>141</b></u>	<u><b>62.9</b></u>	<u><b>2</b></u>
<b>LSD<sub>10</sub></b>	<b>3.6</b>	<b>0.4</b>	<b>4</b>

<sup>1</sup>50% of each variety by weight

Although the mixture in 2002 did not always yield better than **Stephens** alone, across all sites it yielded at least as well. Test weight of the mixture was sufficiently better than Stephens alone to put the mixture into a higher grade. The mixture will be evaluated again in 2003.

**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. Test weight is generally higher with hard red winters.

Results for 2002 testing are shown in Tables 7-9. Hard wheat varieties were managed differently only at

Variety	Yield	Protein	Test Weight	Height	Lodging
	bu/acre	%	lb/bu	in	%
<i>Parma (planted Oct.11)</i>					
<b>Hard Reds</b>					
Columbia-1	132	13.0	61.8	37	93
Falcon	119	12.2	60.6	39	93
Garland	128	13.4	58.9	28	78
Hawk	122	12.8	63.1	40	95
Hoff	119	12.7	60.8	40	93
Meridian	95	13.5	61.0	37	95
<b>Hard Whites</b>					
Golden Spike	97	11.6	59.3	43	100
Ivory	126	12.1	60.0	42	80
OR850513-8	99	12.8	58.4	39	50
NuFrontier	112	11.6	63.5	44	65
NuHorizon	139	11.7	64.3	37	83
LSD <sub>10</sub>	9	0.7	1.6	1.9	19
<i>Weiser (planted Oct.15 )</i>					
<b>Hard Reds</b>					
Falcon	128	10.1	65.9	34	28
Garland	135	11.2	63.5	26	3
Hawk	134	10.8	65.9	37	50
Hoff	125	10.7	65.4	37	25
Meridian	113	11.6	64.6	36	55
<b>Hard Whites</b>					
Golden Spike	102	10.8	62.1	41	73
Ivory	140	9.9	64.1	37	20
NuFrontier	134	9.9	67.5	36	30
NuHorizon	141	10.4	67.9	32	15
OR850513-8	127	10.8	64.1	35	18
LSD <sub>10</sub>	15	1.4	1.3	1.9	29

**Table 8. Irrigated Late Planted Hard Red Winter Wheat Performance in the Treasure Valley. 2002.**

Variety	Yield	Protein	Test Weight	Height	Lodging
	bu/acre	%	lb/bu	in	%
<i>Parma (planted Nov.12)</i>					
<b>Hard Reds</b>					
Boundary	114	11.0	62.1	39	93
Columbia-1	112	11.5	64.1	36	53
Falcon	109	11.8	61.0	37	92
Garland	125	11.4	61.4	29	23
Hawk	128	11.2	63.5	40	75
Hoff	103	11.2	61.9	39	60
Meridian	107	11.5	62.6	38	75
Vandal (HRS)	117	13.3	61.6	38	55
WPB 936 (HRS)	113	12.1	62.9	38	50
<b>Hard Whites</b>					
Golden Spike	110	10.8	61.8	42	80
Ivory	116	10.2	63.5	42	68
ID377s (HWS)	120	11.0	63.9	40	60
OR850513-8	109	12.2	59.8	40	53
NuFrontier	113	11.2	63.6	41	65
NuHorizon	130	10.9	63.9	35	45
LSD <sub>10</sub>	14	1.1	1.9	2	30
<i>Hammett (planted Nov. 14)</i>					
<b>Hard Reds</b>					
Boundary	90	12.6	62.3	39	0
Falcon	101	12.6	63.5	38	0
Garland	117	13.0	61.1	28	0
Hawk	119	12.6	64.8	40	0
Hoff	108	12.8	63.7	38	0
Meridian	108	13.3	63.4	35	0
Nora (HRS)	91	15.0	63.0	33	0
Norpro (HRS)	99	13.5	64.0	38	0
Snstar King (HRS)	121	13.6	66.3	36	0
Vandal(HRS)	107	14.4	63.4	34	0
WPB 936(HRS)	116	14.0	64.0	33	0
W91-233	92	12.8	63.1	33	0
<b>Hard Whites</b>					
Golden Spike	91	13.4	59.0	44	0
Ivory	100	12.7	61.4	38	0
ID377s (HWS)	114	13.3	64.6	40	0
Klasic (HWS)	129	13.7	64.9	31	0
NuFrontier	98	12.4	64.6	40	0
NuHorizon	120	12.8	66.3	35	0
OR850513-8	101	13.3	60.4	35	0
OR948027	86	13.4	58.4	35	0
OR948927	92	14.0	61.9	38	0
OR971897	101	13.6	62.4	33	0
<b>Durums</b>					
Connie	98	14.7	62.6	34	0
Kronos (Sp)	83	15.1	62.9	31	0
LSD <sub>10</sub>	12	0.6	2.3	1	-

Hammet 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. **Garland** yields less than **Hawk**, **Hoff** or **Meridian** unless there is significant lodging.

**Hoff**, an OSU release, has good test weight, straw

strength and lodging resistance. It has good yield potential.

**Meridian**, a UI release tends to lodge more than **Garland** or **Hoff** but less than **Hawk**. It has yield potential comparable to **Hoff** and **Hawk**. Test weight for **Meridian** is lower than **Hoff** and **Hawk**.

**Boundary**, is a 1997 UI release for high rainfall or irrigated conditions. It is an awnless variety with resistance to snowmold and dwarf bunt. **Boundary** does not yield as well as **Meridian**, **Hawk**, or **Hoff**. Its test weight and protein tends to be lower than **Hawk** and **Hoff**.

**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 strength, good protein, and is the shortest of the highest yielding entries.

**Moreland** (previously tested as **ID0517**), an Idaho advanced line, is short with excellent lodging resistance. **Moreland** yielded less than **Declo**, **Hawk** and **Hoff** over three years of testing.

Hard White Winter Wheat

Several hard white winter wheat varieties have been released and provided for our testing over the last three years as a testament to the increasing interest in the hard white class. Hard white wheat is used for noodles and bread making. There is considerable export potential for hard whites with acceptable quality. The new farm bill actually provides an incentive payment for hard white wheat production. Mixing of hard white and soft wheats though is a significant concern in the industry as it will result in poor functionality of the mix when used for traditional baking products.

**Ivory**, the first OSU hard white winter release, is intermediate in height and yield when compared to hard red winters.

**Golden Spike** is a tall USU release that does not appear to be well adapted to our environment. It yielded the poorest of all hard white entries and lodged the most.

**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** was the highest yielding hard white winter grown in 2002 and has exceeded the yield of the better hard red winters. Test weights for both General Mills varieties are better than **Ivory** in early plantings. **NuHorizon** protein is comparable to **Ivory** and the hard red winters **Hawk** and **Hoff**.

**OR850513-8** is an OSU advanced line that is being dropped from a release consideration.

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>2002 (four sites)</i>					
<b>Hard Reds</b>					
<b>Falcon</b>	114	11.7	62.8	37	53
<b>Garland</b>	126	12.2	61.2	28	26
<b>Hawk</b>	126	11.8	64.3	39	55
<b>Hoff</b>	114	11.8	62.9	39	44
<b>Meridian</b>	106	12.5	62.9	37	56
<b>Hard Whites</b>					
<b>Golden Spike</b>	100	11.7	60.5	42	63
<b>Ivory</b>	120	11.2	62.2	40	42
<b>NuFrontier</b>	114	11.3	64.8	40	40
<b>NuHorizon</b>	133	11.4	65.6	35	36
<b>OR850513-8</b>	109	12.3	60.7	37	30
LSD <sub>.10</sub>	8	0.9	1.3	1	24
<i>1999-01 (eleven sites)</i>					
<b>Hard Reds</b>					
<b>Declo</b>	137	11.0	63.7	35	2
<b>Garland</b>	123	11.3	62.2	28	0
<b>Hawk</b>	138	10.5	65.1	41	15
<b>Hoff</b>	139	10.4	64.6	39	1
<b>Moreland</b>	131	11.0	63.2	35	0
<b>Meridian</b>	133	10.6	63.7	38	5
LSD <sub>.10</sub>	5	0.3	0.5	1	6
<i>2000-02 (eleven sites)</i>					
<b>Hard Whites</b>					
<b>Ivory</b>	117	10.4	63.1	37	14
<b>NuFrontier</b>	105	10.0	64.6	37	18
<b>NuHorizon</b>	120	10.4	65.4	33	14
LSD <sub>.10</sub>	14	0.8	0.7	3	11

Several hard spring varieties were evaluated at the late-planted Hammet site. The range in yield of hard spring varieties in this trial matched or exceeded that of the hard winter varieties. Protein in the spring varieties typically ranged higher than for the hard winters.

**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. **Alzo** and **Bogo** exceeded the yield of **Stephens** under western Idaho irrigated conditions when averaged over all 2002 sites. **Alzo** yielded better than **Stephens** across four dryland trials (2000-02).

The triticales, handled by Resource Seeds, Inc., are considerably taller than **Stephens** but have good straw strength. The results from three years of testing suggests that **Alzo**, in particular, has potential for substantially higher production of grain than commonly grown soft wheat. The yield advantage has been especially notable under more stressful dryland conditions. 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 and poultry and hogs the triticale in some studies has been superior to wheat due to better amino acid balance.

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

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodged %
<b>Irrigated</b>					
<i>2002 (4 sites)</i>					
<b>Alzo</b>	135	10.0	55.2	47	29
<b>Bogo</b>	140	10.5	54.2	45	40
<b>Stephens</b>	126	10.4	59.8	36	44
LSD <sub>.10</sub>	7	0.6	1.0	1	9
<i>2000-02 (11 sites)</i>					
<b>Alzo</b>	135	9.2	57.0	44	10
<b>Bogo</b>	133	9.8	55.4	43	14
<b>Stephens</b>	127	9.9	61.4	40	17
LSD <sub>.10</sub>	14	0.8	0.8	2	10
<b>Dryland</b>					
<i>2000-02 (4 sites)</i>					
<b>Alzo</b>	37	9.2	54.6	34	0
<b>Bogo</b>	31	10.2	56.0	30	0
<b>Stephens</b>	27	10.0	57.9	27	0
LSD <sub>.10</sub>	9	1.2	2.4	2	-

**Winter Barley**

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

**Table 11. Irrigated Winter Barley Performance.**

Variety	Yield bu/A	Test Weight lb/bu	Height in	Lodged %	Thins %
<i>2002 Parma (planted Oct.11)</i>					
<b>WPB Sprinter</b>	142	47.5	41	95	5.7
<b>Stab 7</b>	130	45.3	43	90	5.2
<b>Stab 47</b>	140	48.3	47	85	2.0
<b>Stab 113</b>	153	46.4	44	90	3.9
<b>Strider</b>	154	45.3	41	83	4.9
<b>Sunstar Pride</b>	149	46.1	40	78	11.0
LSD <sub>.10</sub>	18	2.0	2	11	2.6
<i>1996-00 (10 sites)</i>					
<b>Boyer</b>	136	49.2	41	26	--
<b>Kold</b>	135	49.3	39	26	--
<b>Strider</b>	151	49.7	41	31	--
<b>Sunstar Pride</b>	152	50.0	38	28	--
<b>WPB Sprinter</b>	138	51.7	40	30	--
LSD <sub>.10</sub>	5	0.4	0.7	6	-
<i>1996-02 (13 sites)</i>					
<b>Strider</b>	142	49.4	40	38	--
<b>Sunstar Pride</b>	138	49.6	37	36	--
<b>WPB Sprinter</b>	128	51.7	39	36	--
LSD <sub>.10</sub>	13	1.4	1.8	15	-

**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** with comparable test weight and straw strength.

**Sunstar Pride** has excellent yield potential but is typically less plump with more thins than **Strider**. **Sunstar Pride** does not have Stripe Rust resistance.

**WPB Sprinter** averaged the highest in test weight but yields less than both **Strider** and **Sunstar Pride**.

Three OSU potential winter malting barley advanced lines were evaluated. **Stab 113** was the highest yielding of the three, comparable to **Strider**. These entries are typically taller than others. Winter malting types, less subject to higher temperatures than spring varieties, could result in better malting quality.

### Dryland Trials

Dryland winter wheat and barley production in southwestern Idaho's outlying areas generally is planted in a wheat fallow rotation.

**Malcolm** averaged the highest in yield among the soft whites over the 1996-2002 period, about 4 bu/A higher than **Stephens**. **MacVicar** also performed well relative to **Stephens**.

**Promontory** and **Buchanan** averaged the highest in yield among the hard red and white winters over the 1996-02 period. **Promontory** and **Buchanan** averaged 2-4 bu/A more than **Malcolm** and 5-7 bu/A higher than **Stephens**.

In the last three years, **Promontory**, **Buchanan**, and **Hawk** were dominant over other hard reds. **Boundary**, **NuHorizon**, and **Utah 100** over the last three years were less productive than **Promontory** but equal to the better soft whites.

Hard winter wheat averaged 7 bu/A or 26% higher than soft white winter wheat over the last three years and 6 bu/A or 15% higher since 1996. In addition, the hard winter class averaged about three pounds per bushel higher test weight. Hard winters appear to provide some distinct advantages over soft whites in this dryland system.

### Cereal Sentinel Internet Access

University of Idaho Cooperative Extension is pleased to provide this information to you and trusts you will find it useful. Producing hard copies of the newsletter is costly. The *Cereal Sentinel*, including issues back to 1996 can be viewed as PDF files on the Southwest Idaho Extension Cereals Homepage at <http://agweb.ag.uidaho.edu/swidaho>. If you could access the newsletter from the website, we would let you know when new issues are available. The advantage for us is that we avoid the costs associated with printing, folding, sealing, labeling, sorting, and mailing a hard copy to you. If you are agreeable to accessing the newsletter from the website, send an e-mail message to me at [bradb@uidaho.edu](mailto:bradb@uidaho.edu).

Table 12. Dryland Winter Wheat Performance in southwestern Idaho.

Variety	Yield			Protein	Test Weight	Height
	96-02	00-02	2002			
<b>Midvale</b>						
<i>Soft Whites</i>						
<b>Brundage</b>	39	27	27	11.5	55.5	27
<b>Brundage 96</b>	--	30	26	12.3	54.5	24
<b>Eltan</b>	39	28	24	11.9	58.9	26
<b>Foote</b>	--	23	22	12.5	55.5	25
<b>Hiller (club)</b>	36	27	25	11.8	54.8	24
<b>Hubbard</b>	--	--	26	11.4	60.4	28
<b>IDO576</b>	--	--	28	10.9	58.3	26
<b>ID87-52814A</b>	--	26	24	11.8	57.5	25
<b>ID91-34302A</b>	--	--	25	10.9	58.0	26
<b>MacVicar</b>	41	30	27	11.8	57.0	26
<b>Madsen</b>	38	24	26	13.0	55.0	28
<b>Malcolm</b>	42	33	25	11.6	56.9	26
<b>Stephens</b>	39	28	25	11.9	55.1	25
<b>Temple (club)</b>	34	26	27	11.4	53.8	23
<b>Weatherford</b>	--	26	22	12.9	56.1	25
<b>Average</b>	39	27	25	11.8	56.5	26
<b>LSD<sub>.10</sub></b>	8	4	3	0.9	1.6	3
<i>Hard Red and Whites</i>						
<b>Boundary</b>	--	35	27	11.6	55.9	25
<b>Buchanan</b>	45	39	20	10.4	59.8	30
<b>Finley</b>	--	28	27	10.3	61.5	31
<b>Gary(HW)</b>	--	34	27	10.8	61.3	28
<b>Golden</b>	--	--	27	10.8	59.3	29
<b>Spike(HW)</b>						
<b>Hawk</b>	--	38	28	11.0	60.5	27
<b>DW</b>		32	28	11.2	60.4	28
<b>IDO571</b>	--	--	27	10.7	60.5	27
<b>Ivory (HW)</b>		27	22	9.9	60.4	26
<b>Moreland</b>	--	--	25	10.7	59.3	25
<b>OR850513-8 (HW)</b>	--	--	25	11.3	59.4	24
<b>Promontory</b>	46	41	31	11.7	61.0	29
<b>Utah 100</b>	43	36	22	11.3	57.3	26
<b>NuFrontier (HW)</b>	--	30	27	10.6	60.9	28
<b>NuHorizon (HW)</b>	--	36	30	10.9	61.4	26
<b>Average</b>	45	34	26	10.9	59.9	27
<b>LSD<sub>.10</sub></b>	8	5	5	0.9	1.6	3

### Soft White Wheat Quality

The Idaho Wheat Commission's list of preferred soft winter varieties for milling and baking is based largely on milling yield, break flour yield and cookie diameter. While **Stephens** and **Brundage** are currently listed as

Quality Plus (Q+), or the most preferred of the varieties currently grown, **Malcolm**, **Madsen**, and **Weatherford** are listed as acceptable (AQ).

Milling and bake quality were determined from soft white winter varieties grown in western Idaho nurseries. Few varieties score high in all quality parameters.

Flour yield is especially important as the miller wants to extract as much flour as possible. **WPB Mohler** ranked the highest in flour yield in the first four years of testing and **WPB Beamer** the highest in the last two. The poorest in flour yield include **WPB 470**, **MacVicar**, **Brundage 96**, and **ID87-52814A**.

Break flour and cookie diameter are softness measures. Higher numbers reflect better quality. **ID87-52814A** had significantly better break flour and cookie diameter than other varieties. Several varieties had break flour yield exceeding **Stephens**, but only **ID87-52814A** and **Hubbard** averaged higher in cookie diameter.

## Acknowledgement

The Idaho Wheat Commission has awarded a grant of \$3000 to subsidize this newsletter. We are pleased to acknowledge their support for this Cooperative Extension educational project.

**Table 13. Milling and Bake Quality of Treasure Valley Soft White Winter Wheat. 1998-2001.**

Varieties	Flour Protein %	Flour Yield & %	Break Flour %	Cookie Diameter cm
<b>1998-01</b>				
<b>Brundage</b>	8.2	65.8	41.9	8.6
<b>Hubbard</b>	8.2	66.0	41.9	8.8
<b>Malcolm</b>	8.0	65.5	38.5	8.5
<b>MacVicar</b>	8.2	65.2	39.1	8.6
<b>Stephens</b>	8.4	66.5	38.3	8.7
<b>WPB 470</b>	8.8	64.5	38.5	8.4
<b>WPB Mohler</b>	<u>8.6</u>	<u>67.1</u>	<u>39.6</u>	<u>8.7</u>
<b>LSD<sub>.10</sub></b>	0.5	1.2	2.6	0.1
<b>2000-01</b>				
<b>Brundage</b>	8.6	64.5	43.0	8.6
<b>Brundage 96</b>	8.6	62.7	43.6	8.7
<b>Hubbard</b>	8.7	64.5	42.2	8.7
<b>ID87-52814A</b>	8.4	63.5	47.6	8.8
<b>Stephens</b>	8.9	65.0	39.2	8.6
<b>Tubbs</b>	8.6	65.0	38.2	8.4
<b>Weatherford</b>	9.2	65.1	39.2	8.5
<b>WPB Beamer</b>	8.8	67.2	40.1	8.6
<b>WPB Mohler</b>	9.2	65.5	40.7	8.6
<b>WPB 470</b>	9.4	63.2	39.5	8.2
<b>LSD<sub>.10</sub></b>	0.5	1.5	3.9	0.2

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