The Cereal Sentinel

A newsletter for Treasure Valley cereal producers

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Upcoming Events

Tri-State Grain Producers Conference, Spokane, WA. November 16-18, 2011

The goal of this newsletter is to serve the best interests of Treasure Valley cereal producers. It will be issued periodically as information warrants and resources allow. Correspondence and inquiries should be addressed to:

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University of Idaho Extension

Winter Cereal Variety Performance

Irrigated Trials

The 2011 season marked the 27th 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 and dryland conditions of western Idaho.

Two irrigated winter trials were planted at Parma for 2011; an early trial planted October 6 and a later trial on November 17. There were no off-station trials.

Below normal temperatures occurred during vegetative growth and grain filling causing later than normal maturity and harvest, much the same as in 2010. Mild temperatures during grain filling were favorable for yield. There was no lodging in the trials. Cereal leaf beetle was present but not at levels requiring control.

Severe stripe rust infection occurred in 2011 and there was no attempt to control the rust. Cool and wet spring conditions were conducive with the inoculum present and susceptible varieties for stripe rust development. Whereas many varieties have moderate stripe rust resistance under normal growing conditions, the resistance is largely High Temperature Adult Plant (HTAP) resistance. Cooler than normal temperatures precluded HTAP resistance leaving normally resistant varieties more susceptible to disease progression. The HTAP resistance was evident at later growth stages of grain filling, but by then the damage to leaves was done. Consequently, variety performance in 2011 reflects the relative resistance of varieties to the prevalent rust races.

Early Planting- The average yield for the October planting (116 bu/A) was down from previous years when stripe rust was minimal. Yield ranged from 50 to 157 bu/A, a much greater range than normally occurs. The lowest yielding entries (**ID9819010A**, **ID-D-05**, **AP Legacy**) were all very susceptible to stripe rust with 100% of the leaf surface affected. Conversely, the highest yielding varieties (**Bruneau, WBEXP616,** and **AP Legion**) had minimal mid season infection.

Plant heights were nearly normal for the October planting with an average of 42.2". **Stephens** averaged 40.4 inches. Test weight of the most susceptible varieties was significantly reduced with stripe rust, averaging only 54 lb/bu.

Table 1. Irrigated October Planted Soft White Winter Wheat at Parma. 2011.

Entry	Yield[1]	Protein	Test Wt.	Height	Lodging
	bu/A	%	lb/bu	in	%
			Parma (planted Oct. 6)		
AP 700 CL	**129**		**60.5**	**38.6**	**0**
AP Legacy	**61**		**53.0**	**44.2**	**0**
AP Legion	**151**		**59.4**	**46.3**	**0**
AP Salute	**127**		**59.8**	**45.5**	**0**
Bitterroot	**137**		**60.6**	**46.2**	**0**
Bruneau	**154**		**63.1**	**45.2**	**0**
CF Brundage	**116**		**59.1**	**39.5**	**0**
CF Lambert	**99**		**58.3**	**44.8**	**0**
Goetze	**100**		**56.5**	**38.0**	**0**
ID00-475-2dh	**107**		**61.1**	**40.8**	**0**
ID0663	**129**		**60.6**	**41.3**	**0**
ID98-19010A	**50**		**52.2**	**38.6**	**0**
ID-D-05	**59**		**54.4**	**39.0**	**0**
KW08021	**119**		**60.8**	**42.2**	**0**
Mary	**135**		**59.5**	**42.6**	**0**
ORCF102	**113**		**59.1**	**41.4**	**0**
Skiles	**131**		**62.4**	**41.7**	**0**
Stephens	**123**		**59.0**	**40.4**	**0**
Tubbs 06	**82**		**55.3**	**43.6**	**0**
WA8092	**143**		**60.9**	**45.7**	**0**
WB 456	**134**		**63.7**	**40.8**	**0**
WB 528	**124**		**60.6**	**40.0**	**0**
WBExp616	**157**		**62.0**	**42.3**	**0**
WBExp647	**112**		**59.6**	**39.4**	**0**
Average	**116**		**59.2**	**42.2**	**--**
$LSD_{.10}$	**10**		**1.7**	**3.0**	**--**

Late Planting- A six week planting delay resulted in about 17 bu/A lower yield, about 15% less than the October planting. The lowest yielding varieties in the early planting were also the lowest yielding varieties in the November planting, but were not as adversely affected by the later planting date as the more rust resistant and highest yielding varieties. The average yield for the three lowest yielding lines was 55 bu/A and differed less than 2 bu/A from the October planting. In contrast, the average of the two highest yielding varieties was over 26 bu/A less, or about 17% less than the varieties planted in October.

Plant height averaged only 34 inches in the November planting, considerably shorter than the earlier planting. Test weight averaged slightly lower in the later planting; 58.8 vs 59.2 lb/bu.

Table 2. Irrigated November Planted Soft White Winter Wheat at Parma. 2011.

Entry	Yield[1]	Protein	Test Wt.	Height	Lodging
	bu/A	%	lb/bu	in	%
			Parma (planted Nov. 17)		
AP 700 CL	**115**		**61.1**	**37.2**	**0**
AP Legacy	**66**		**57.0**	**33.5**	**0**
AP Legion	**128**		**59.3**	**38.0**	**0**
AP Salute	**107**		**59.4**	**37.6**	**0**
Bitterroot	**108**		**60.0**	**35.2**	**0**
Bruneau	**124**		**60.0**	**36.5**	**0**
CF Brundage	**88**		**57.3**	**32.5**	**0**
CF Lambert	**83**		**57.8**	**38.7**	**0**
Goetze	**83**		**57.7**	**31.4**	**0**
ID00-475-2dh	**92**		**60.0**	**31.4**	**0**
ID0663	**109**		**59.6**	**34.9**	**0**
ID98-19010A	**45**		**53.2**	**28.3**	**0**
ID-D-05	**54**		**56.9**	**33.5**	**0**
KW08021	**119**		**60.8**	**42.2**	**0**
ORCF102	**91**		**58.3**	**33.2**	**0**
Mary	**103**		**60.0**	**33.9**	**0**
Skiles	**115**		**61.7**	**32.9**	**0**
Stephens	**103**		**59.2**	**34.3**	**0**
Tubbs 06	**77**		**58.1**	**34.9**	**0**
WA8092	**110**		**60.2**	**31.9**	**0**
					0
Average	**99**		**58.8**	**34.2**	**0**
$LSD_{.10}$	**11**		**0.9**	**2.1**	**--**

Soft White Winter Wheat

The irrigated soft white winter wheat results for the 2011 trials are given in Tables 1-3.

Stephens is the oldest variety in the trials, and still the most commonly grown winter wheat in southwestern Idaho. Although **Stephens** is a semi-dwarf and shorter than some others, it is still too tall for some wheel lines when grown under good management. Its height makes difficult the movement of wheel lines and can interfere with the sprinkler wetting pattern. It has good milling and baking quality and excellent yield potential for both early and late fall plantings. Its late planting adaptability may account for its longevity in SW Idaho.

Stephens ordinarily has good HTAP stripe rust resistance and has withstood all races in SW Idaho since its release in 1978. With cool and wet conditions **Stephens** is inclined to show physiologic leaf spot, although it does not seem to limit its yield.

Tubbs 06, an OSU release, is one of the few OSU releases since **Stephens** that yields comparable to **Stephens** in both early October and November plantings. It is taller than **Stephens** but has good straw strength and is widely adapted in the PNW. **Tubbs 06** may not have the test weight, milling and baking quality of **Stephens**. **Tubbs 06** has less resistance to stripe rust than **Stephens** as shown in this year's trials**.** It yielded only 66% of **Stephens** in the early planting and 75% of **Stephens** in the November planting. The results are quite different from the past several years.

ORCF-102 is the second OSU Clearfield release. It does not yield as well as **Tubbs 06,** or **Stephens**. It is comparable in height to **Tubbs 06** and has very good straw strength.

WB 528 (BZ6W98-528) is a Westbred variety that yields comparable to **Stephens**, is similar in height, but has significantly better test weight. **WB 528** has excellent milling and baking quality and resistance to stripe rust is similar to **Stephens**. It is the only released variety with milling and bake quality equal to or better than **Stephens** that has also been comparable to **Stephens** in yield potential, especially in later plantings.

Westbred entered several new lines for the early planting in 2011 including **WB 456**, **WBExp616**, and **WBExp647**. Of these **WBExp616** had excellent stripe rust resistance and yielded as well as **Bruneau** and **AP Legion**. It is probably taller than **Stephens** with better test weight. **WB456** was comparable in height to **Stephens** but was more productive with outstanding test weight. **WBExp647** was not as productive as **Stephens**.

Bitterroot (ID9922407A) is a tall Idaho soft white winter release that does not consistently yield as well as **Stephens**. Its test weight is higher than **Stephens** but it is taller and has poorer stripe rust resistance.

Bruneau (**ID93-64901A**) is a recent UI release that has been evaluated for the last four years in western Idaho (2008-11) and longer (since 2006) across all southern Idaho. **Bruneau** is the first Idaho release that matches or exceeds the yield for **Stephens** in both early and late plantings in western Idaho. In addition to the multi-site yields reported in Tables 3-5 for **Bruneau** and **Stephens** (148 vs 140 bu/A), **Bruneau** also yielded higher in the breeder's Idaho Yield Trials conducted from 2006-08 across southern Idaho (145.7 vs 135.0 bu/A). In Magic Valley Extension Nurseries (2007-10), **Bruneau** out yielded **Stephens** at Kimberly (142.6 vs 127.0 bu/A) and Rupert (110.6 vs 105.7 bu/A). **Bruneau** appears to be widely adapted for irrigated production.

Bruneau is slightly taller than **Stephens** but is no more susceptible to lodging. Test weight for **Bruneau** is

Table 3. Irrigated soft white variety performance averaged across both planting dates in 2011.

Entry	Yield	Protein	Test Wt.	Height	Lodging
	bu/A	%	lb/bu	in	%
AP 700 CL	122		60.8	40.4	0
AP Legacy	64		55.1	38.8	0
AP Legion	139		59.3	42.1	0
AP Salute	117		59.6	41.5	0
Bitterroot	123		60.3	40.7	0
Bruneau	139		61.5	40.9	0
CF Brundage	88		57.3	32.5	0
CF Lambert	91		58.1	41.8	0
Goetze	92		57.1	34.7	0
ID00-475-2dh	99		60.6	36.1	0
ID98-19010A	48		52.7	33.4	0
ID-D-05	57		55.7	36.3	0
Mary	117		59.8	37.6	0
ORCF-102	102		58.7	37.3	0
Skiles	123		62.1	37.3	0
Stephens	113		59.1	37.4	0
Tubbs 06	80		56.7	39.2	0
Average	107		59.0	38.6	--
$LSD_{.10}$	8		1.0	1.9	--

better than for **Stephens** and it has equal or better milling and baking quality. **Bruneau** is slightly later heading than **Stephens**. It has excellent stripe rust resistance, much better than **Stephens**. **Bruneau** yielded 31 bu/A and 21 bu/A more than **Stephens** in the two 2011 planting. Foundation **Bruneau** seed is available for the fall 2011 planting.

Shorter varieties have generally failed to match the yield potential of **Stephens** in western Idaho. **ID98-19010A**, a UI line performed well in 2008 and 2009 compared to lodged **Stephens,** less well in 2010, and very poorly in 2011 due to extreme stripe rust susceptibility. It will require fungicides for rust control in years with significant infection. It has not lodged in our trials when **Stephen's** lodging was 85%. In the absence of stripe rust it has been the most productive short variety that we've grown over the previous four years (2007-2010). Across 10 different trials **ID98-19010A** averaged 13 bu/A higher than **Goetze**. Test weight for **ID98-19010A** averages higher than **Stephens.** The **ID98-19010A** has not been released.

CF-Lambert (ID99-435), an imazamox tolerant Clearfield line, has been evaluated over the last six seasons. **CF-Lambert** is taller and not as productive as

Table 4. SWWW Variety Performance as Affected by Planting Dates. 1996-2011

Entries	October Planted	November Planted
	----------bu/A--------	
	1996-05	
	(20 sites)	(17 sites)
Brundage	130	128
Malcolm	140	132
Stephens	139	135
LSD_{10}	3	4
	2003-06	
	(8 sites)	(7 sites)
Simon	133	129
Stephens	139	137
Tubbs	138	131
WB528	136	137
$LSD_{.10}$	6	5
	2006-11	
	(10 sites)	(9 sites)
CF-Lambert	135	126
Goetze	135	122
ORCF-102	138	124
Stephens	142	132
Tubbs 06	139	135
$LSD_{.10}$	9	4
	2008-10	
	(5 sites)	(5 sites)
Bruneau	149	143
Stephens	142	135
Tubbs 06	144	142
ID98-19010A	149	143
$LSD_{.10}$	4	5
	2009-11	
	(4 sites)	(4 sites)
Bitterroot	138	125
Bruneau	149	142
CF Brundage	126	118
CF Lambert	132	122
Goetze	124	119
ID0663	141	131
ID98-19010A	127	123
Legion	144	142
Skiles	137	129
Stephens	136	130
Tubbs 06	132	128
$LSD_{.10}$	6	6

Stephens generally. It is fairly susceptible to stripe rust. **CF Brundage (ID02-859)** is also a UI Clearfield line. It is shorter than **Stephens** and not as productive as **CF Lambert**.

Other UI advanced lines include **ID-D-05**, **ID00-475-2dh**, and **ID0663**. **ID-D-05 i**s a re-selection of the variety **Dune** that has improved stripe rust resistance. With no stripe rust present, all three of these advanced lines have equaled or exceeded the yield of **Stephens**, even in late plantings.

Goetze is an OSU release that has been tested for at least six years in western Idaho. It is 2 to 5 inches shorter than **Stephens** with better lodging resistance. **Goetze** tends to yield less than **Stephens** in early and late fall plantings. **Goetze** test weight is lower than

Table 5. SWWW Long Term Variety Performance.

Variety	96-05	06-10	08-11	09-11
	----------bu/A----------			
	37 sites	16 sites	12 sites	8 sites
Malcolm	**136**			
Stephens	**138**	**140**	**135**	**133**
Brundage	**129**			
ORCF-102		**134**	**128**	**126**
Goetze		**133**	**126**	**122**
Tubbs 06		**144**	**133**	**130**
Bitterroot		**135**	**133**	**132**
CF Lambert		**135**	**130**	**127**
Bruneau			**145**	**146**
ID98-19010A			**130**	**125**
CF Brundage			**124**	**122**
ID00-475-2dh			**134**	**130**
ID-D-05			**126**	**121**
ID0663				**136**
Legion				**143**
Salute				**132**
Skiles				**133**
$LSD_{.10}$	**7**	**4**	**4**	**4**

Stephens and **ID98-19010A**. Among shorter released varieties, **Goetze** was the highest yielding in 2011.

Skiles, an OSU release, is shorter than **Stephens**, but not as short as **Goetze**. It has not yielded as well in limited western Idaho testing in years without significant stripe rust. However, **Skiles** with better stripe rust resistance in 2011 yielded higher than **Stephens**.

Mary (OR2040726) is a new OSU variety that we have very limited data for. It was not entered into the Parma trial until the 2011season. It was more productive in 2011 than **Stephens** when early planted but yielded the same with later planting.

Legion, Salute, Legacy, and **AP 700 CL** are Syngenta Cereals (formerly Agripro) varieties. **Legion** has equaled or exceeded the yield for **Stephens** in western Idaho since it was entered for testing and is similar in test weight. In 2011 **Legion** exceeded the yield of **Stephens** by 23 or 25 bu/A due to better stripe rust resistance. It is several inches taller than **Stephens**

Salute is also taller than **Stephens,** is also productive but has lower test weight. **Legacy** was much more susceptible than **Stephens** to stripe rust in 2011 and yielded considerably less. **AP 700 CL** was entered for testing in western Idaho for the first time in 2011. It has better stripe rust resistance and was comparable in yield to **Stephens** or better.

Planting Dates and SWWW Variety Performance

Variety performance can be affected by planting dates. All varieties are typically less productive if planted in mid November rather than early to mid October (Table 4). The continuing popularity of **Stephens** is due in part to its excellent long-term performance in later plantings.

Several variety releases in the past were comparable to **Stephens** in yield in early plantings but were more susceptible to later plantings than **Stephens**. Fortunately the situation has changed with some of the newer releases. Several varieties are now available, or shortly will be, that are as productive and in some cases more productive than **Stephens** in late plantings, based on three years of testing (08-10). They include **WB528**, and especially **Tubbs 06,** and **Bruneau,** provided stripe rust is not a significant production limitation.

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 3and 4 that enable direct comparison among the varieties shown.

Hard Winter Wheat

Hard red and hard white winter wheat varieties and advanced lines are also evaluated in the Cooperative Extension Variety Performance Trials. Irrigated hard winter wheat is generally less productive than soft white winter varieties but market prices can be higher, especially with higher deficiency payments or protein

premiums. Test weight is generally higher with hard winters if stripe rust is not present. Results for 2011 testing are shown in Tables 6-7.

Table 6. Irrigated October and November Planted Hard Winter Wheat at Parma. 2011.

Variety	Yield	Protein	Test wt	Height	Lodging
	bu/A	%	lb/bu	in	%
			Parma (planted Oct. 6)		
Hard Reds					
Esperia	130		62.9	42.5	0
Hoff	116		62.7	46.7	0
ID0621	105		60.9	42.1	0
Moreland	154		62.4	42.7	0
Norwest 553	150		61.7	38.3	0
WB936	19		52.2	31.5	0
Hard Whites					
ID0660	134		63.8	46.2	0
Ivory	90		56.9	45.8	0
KW90116	137		60.3	50.1	0
NuHorizon	102		59.1	41.6	0
UI Grace	111		61.9	57.2	10
UI Leland	90		62.6	44.9	0
UI Silver	134		62.4	50.3	31
UI Stan	143		63.3	56.0	13
Average	119		61.1	45.3	4
$LSD_{.10}$	10		1.2	2.6	11
			Parma (planted Nov. 17)		
Hard Reds					
Esperia	85		63.5	30.2	
Hoff	94		63.1	36.6	0
ID621	98		61.0	35.1	0
Moreland	97		63.3	31.1	0
Norwest 553	95		62.1	31.4	0
WB936	26		47.7	31.6	0
					0
Hard Whites					0
ID0660	88		64.3	35.7	0
Ivory	83		59.4	38.0	0
NuHorizon	96		63.1	32.9	0
UI Grace	100		62.4	49.7	0
UI Leland	78		60.7	35.5	0
UI Silver	105		62.3	37.5	0
UI Stan	105		63.5	43.2	0
Average	88		61.3	36.0	0
$LSD_{.10}$	13		1.3	1.9	--

Table 7. Irrigated Fall Planted Hard Winter Wheat Long Term Yield Performance, 2003-11.

Variety	2003-09	2007-08	2009,11	2011
	----------bu/A----------			
	27 sites	8 sites	4 sites	2 sites
Hard Reds				
Hoff	127	120	124	104
Moreland	126	122	137	125
ID621		129	117	101
Norwest 553			132	122
Hard Whites				
Darwin		112		
Gary		112		
ID0660				107
Ivory	137	129	120	86
NuHorizon	137	128	133	99
UI Grace			108	105
UI Leland			--	82
UI Silver			118	119
UI Stan			130	124
$LSD_{.10}$	2	3	6	9

Hard Red Winter Wheat

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**.

Moreland (**ID0517),** is an Idaho release, short with excellent lodging resistance and its baking quality is better than most hard red winters adapted to irrigation. But **Moreland** does not have good stripe rust resistance, or so we thought. There has been significant stripe rust in **Moreland** at Parma in 2005, 2007, and 2008. However, stripe rust in **Moreland** at Parma was not as severe in 2011 as many other varieties and it yielded the highest of all varieties in the early planting and among the highest hard wheat entries in the late planting.

Norwest 553 is an OSU release tested in western Idaho for two seasons now. It is short with good lodging resistance. Yield in limited testing has been variable. Test weight is comparable to **Hoff** and slightly better than **Moreland** in some sites.

ID0621, an Idaho HRW advanced line, has good yield potential, averaging as high as **Moreland** in four years of testing. It is comparable in height and protein to **Hoff** and slightly taller than **Moreland**. Test weight for **ID0621** is better than **Moreland**.

Hard White Winter Wheat

Hard white winter wheat varieties have been released and those varieties released for irrigation are frequently more productive than hard red winters. Their quality may not be desirable for export. The domestic market for southern Idaho hard white wheat has increased in recent years and selected varieties are contracted in the Magic Valley east. Hard white wheat is the fastest growing market class in Idaho. Western Idaho production of hard whites is limited in part because most storage elevators do not wish to handle more than one or two market classes. Segregation from soft whites is essential. The segregated hard wheat in western Idaho is primarily hard red spring.

Mixing of hard white and soft wheat remains a significant concern 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 yields similar to **NuHorizon** over several years of testing. It is taller than **NuHorizon** and test weight for **Ivory** is lower. **Ivory** was susceptible to stripe rust in 2011.

NuHorizon is a short General Mills variety with yield and protein comparable to **Ivory** in years with no stripe rust. **NuHorizon** has better straw strength and is less susceptible to lodging than **Ivory** and other hard white entries. **NuHorizon** may have better stripe rust resistance than **Ivory**.

Gary and **Darwin** were hard white winters released from the UI Aberdeen breeding program primarily for dryland conditions. Both are relatively tall and more susceptible to lodging. The test weight for **Gary** was significantly lower than other hard white entries.

Several new UI lines were entered for testing in 2011. **ID0660**, an advanced line**,** is similar in height to **Ivory** but is taller than **NuHorizon**. Its test weight is better than **Ivory**. **ID0660** did not yield as well as **Ivory** or **NuHorizon** in 2010, but better than them in 2011 with stripe rust present. **ID0835** is taller than **NuHorizon** and lower in test weight. **ID0835** was comparable to **Ivory** and **NuHorizon** in the later planting but lower yielding in the earlier planting.

Other UI varieties included **UI Stan**, **UI Leland**, **UI Silve**r, and **UI Grace**. **UI Leland** was as susceptible to stripe rust as **Ivory** in 2011 and yielded less than other new entries. **UI Grace** is a very tall variety that is not well adapted to irrigation. **UI Stan** is also much taller than most entries but is better adapted in stripe rust years. **UI Silver** is moderately tall and also had better stripe rust resistance than **UI Grace** or **UI Leland**.

Fall Planted Hard Spring Wheat

We have fall planted spring genotypes for the last twenty years. **WB 936** is the most commonly planted variety in fall seedings. Spring genotypes survive most winters and while they may not consistently yield as well as winter genotypes of hard red winter wheat, they are typically marketed at higher prices if protein is acceptable. Often, the later the planting, the closer in yield that spring genotypes are to winter wheat of the same market class.

WB 936 was evaluated in the late planted trial in 2011 (Table 5). **WB 936** yield is sporadic, sometimes doing as well as **Moreland**, a hard red winter, sometimes yielding considerably less. It is very susceptible to stripe rust and both yield and test weight were extremely poor in 2011.

Fall planting spring genotypes comes with some risk. Winterkill is a risk for spring genotypes, but re-planting is an option. More serious is the risk of late season frost, since spring genotypes typically head earlier than winters, and there is little you can do to compensate for frost events that affect grain development. For that reason, fields more prone to late frost should be avoided.

Winter Barley

Winter barley was evaluated in two trials conducted at Parma for the 2011 season. Feed and potential malt barley entries were evaluated in one trial (planted Oct. 6, 19) and food barley entries (planted Oct. 6) with elevated soluble fiber were evaluated in a separate trial. A planter malfunction caused most feed and malt entries to be replanted two weeks later. Consequently only results for the second planting (October 19) are shown. The earlier planting averaged 203 bu/a and the planting just two weeks later averaged 163 bu/A. Winter barley performance in 2011 or over several years is shown in Tables 8 and 9. There was little lodging in 2011. Percent plumps was lower than desired for many entries in 2011, especially **Charles**.

The **Idaho Barley Commission** has suggested that for feed rations that could include barley, both beef and dairy may want to consider contracting for winter barley in areas where winter barley is adapted. If corn remains considerably higher relative to barley, barley may be competitive with wheat as a winter cereal. It may be of interest to compare the grain yield of winter barley and winter wheat from the most timely plantings in 2011. The three winter wheat varieties with better resistance to

Table 8. Irrigated Winter Feed and Malt Barley Performance in the Treasure Valley, 2011.

Variety	Yield	Test wt	Height	Lodging	Plumps
	bu/A	lb/bu	in	%	%
		Parma (planted Oct. 19)			
Winter					
Alba	**175**	**49.9**	**44.9**	**2**	**87**
Charles	**158**	**48.9**	**39.6**	**0**	**56**
Endeavor	**136**	**51.4**	**43.0**	**12**	**86**
Maja	**176**	**50.9**	**40.5**	**4**	**74**
Mathias	**158**	**51.1**	**48.4**	**17**	**94**
OR85	**147**	**56.8**	**43.0**	**3**	**41**
OR91	**166**	**50.9**	**40.8**	**1**	**86**
OR92	**173**	**50.5**	**44.3**	**0**	**85**
OR816	**155**	**50.6**	**40.6**	**0**	**83**
OR818	**174**	**49.5**	**45.0**	**3**	**81**
Sprinter	**178**	**50.4**	**40.4**	**4**	**78**
Strider	**172**	**49.1**	**38.5**	**1**	**82**
Sunstar Pride	**153**	**50.1**	**38.8**	**1**	**59**
Average	**162**	**50.7**	**42.4**	**4**	**77**
$LSD_{.10}$	**23**	**1.5**	**2.9**	**9**	**15**

stripe rust in 2011 averaged 154 bu/A or 9240 lb/A. All feed winter barley from the same planting date averaged 203 bu/A or 9744 lb/A, or 5% more weight than the most productive winter wheats.

Strider, an OSU 6-row feed barley release with Barley Stripe Rust resistance has very good yield potential. It is frequently taller than **Sunstar Pride** and frequently higher in test weight but has comparable straw strength.

Sunstar Pride from Sundermann Breeding is a six-row feed barley with excellent yield potential in some years. It does not have stripe rust resistance which has been an issue once in western Idaho since the **Sunstar Pride** release. It is shorter than **Strider** but does not have better straw strength.

A winter barley acceptable for malting could open up more possibilites for contracted malting barley in western Idaho. The advantage of winter barley over spring malting barley is the 25 to 40% greater production due to cooler temperatures during grain fill that promote better malt quality in western Idaho.

Maja (**OR81**) is a potential 6-row winter malting type from OSU. It has not yielded quite as well as **Strider** or **Sunstar Pride** feed barley over six years (2004-09) of testing. However it is considerably more

Table 9. Irrigated Fall Planted Feed or Potential Malting Barley Long Term Yield Performance, 1996-11.

Variety	2004-11	2006-11	2009-11
09-10	----------bu/A----------		
	11 sites	**9 sites**	**3 sites**
Strider	**179**	**168**	**174**
Sunstar Pride	**179**	**170**	**142**
Maja	**173**	**167**	**176**
Charles		**147**	**143**
Endeavor			**128**
$LSD_{.10}$	**9**	**9**	**13**

productive than **Charles** or **Endeavor** winter malting types. The protein in **Maja** may be higher than other barley with comparable yield potential. **Maja** is as tall as **Strider** but has better straw strength and higher test weight.

Charles is a USDA 2-row winter barley release with malting quality. It is shorter and considerably lower yielding than **Maja** and may lack straw strength. It also has lower test weight than **Maja** and lower percent plump grain. **Charles** has been approved for malting by AMBA and is contracted in southcentral and southeastern Idaho.

Endeavor is another USDA 2-row winter barley release with malting quality. It is comparable in height to **Strider** and taller and lodges more than **Charles**. It does not yield as well as **Charles** or **Maja**.

Alba (OR 77) and **Mathias (OR76)** are OSU 6-row

Table 10. Irrigated Winter Food Barley Performance at Parma. 2011.

Variety	Yield	Test wt	Height	Lodging	plumps
	bu/A	lb/bu	in	%	%
		Parma (planted Oct. 06)			
FB2R27-14-2	**149**	**50.9**	**40.4**	**6**	**86**
FB2R28-15-1	**133**	**51.7**	**39.1**	**10**	**89**
FB2R31-5-2	**149**	**51.7**	**40.3**	**4**	**93**
FB2R51-6-1	**163**	**54.1**	**43.1**	**2**	**94**
FB6R01-4-3	**158**	**48.6**	**40.6**	**6**	**74**
FB6R02-22-2	**162**	**50.7**	**39.8**	**2**	**85**
FB6R08-21-2	**154**	**51.2**	**38.3**	**1**	**80**
Average	**153**	**51.2**	**40.2**	**4**	**86**
$LSD_{.10}$	**22**	**2.6**	**3.7**	**10**	**9**

advanced lines being considered for malting. They have undergone only limited testing thus far in southwest Idaho.

OR85 is a hull-less advanced line from OSU. **OR91**, **OR92**, **OR816**, and **OR816** are potential 6-row malt lines from OSU. All were at least as productive as the currently available winter 2-row malting **Charles** and **Endeavor**.

Several OSU advanced food barley lines were evaluated separately from the feed and malting barley. Results are shown in Table 10. Entries all include either 2-row or 6-row crosses with a waxy 2-row hull-less spring food barley. Waxy barley has greater amylopectin and lower amylose starch composition. These advanced lines are some of the first winter genotype food lines to become available for testing. Despite the fact that a spring barley was one of the parents in all crosses, winter suvival ranged from 81 to 98% and did not differ statistically from each other. While these lines are not expected to be comparable in yield to current winter feed barley varieties, they represent considerably greater yield potential than spring barley genotypes contracted for food. The best yielding lines were as much as 30 to 40 bu/A lower yielding than the higher yielding feed barley lines planted at comparable planting dates (data not shown).

Stripe Rust

With one of the worst stripe rust years in memory in the Treasure Valley it is appropriate to recap the season and look ahead to the coming year. As far as we know we did not have infection in fall 2010 that over-wintered on infected seedlings, as other areas have reported, so we assume all the inoculum was blown into the area from either the PNW or California. WSU has suggested that eastern NW infection was late but developed rapidly. That would mirror our experience. A cool and wet spring allowed the inoculum present to infect wheat, and develop particularly on susceptible varieties. With sporulation the disease spread throughout the area.

Some treated early for stripe rust with applications piggybacked with their herbicide application, perhaps before stripe rust was even evident. While these applications may not be cost effective every year, they were very helpful in 2011. They effectively delayed infection in susceptible varieties and reduced the inoculum spreading to other fields. They did not provide season-long control if inoculum was present later after the fungicide activity was exhausted. Many fields required additional fungicide applications.

Table 11. Leaf Area Percentage and Yield of Irrigated November Planted Soft and Hard Winter Wheat at Parma. 2011.

Entry	Leaf Area Infection	Yield
	%	bu/A
Soft White	*Parma (planted Nov. 17)*	
AP 700 CL	**42**	**115**
AP Legacy	**86**	**66**
AP Legion	**20**	**128**
AP Salute	**47**	**107**
Bitterroot	**28**	**108**
Bruneau	**27**	**124**
CF Brundage	**63**	**88**
CF Lambert	**90**	**83**
Goetze	**53**	**83**
ID00-475-2dh	**68**	**92**
ID0663	**63**	**109**
ID98-19010A	**99**	**45**
ID-D-05	**91**	**54**
ORCF102	**80**	**91**
Mary	**47**	**103**
Skiles	**11**	**115**
Stephens	**50**	**103**
Tubbs 06	**87**	**77**
WA8092	**15**	**110**
Average		**99**
$LSD_{.10}$		**11**
Hard Reds		
Esperia	**43**	**85**
Hoff	**40**	**94**
ID0621	**50**	**98**
Moreland	**38**	**97**
Norwest 553	**12**	**95**
WB936	**98**	**26**
Hard Whites		
ID0660	**15**	**88**
Ivory	**72**	**83**
NuHorizon	**25**	**96**
UI Grace	**27**	**100**
UI Leland	**83**	**78**
UI Silver	**20**	**105**
UI Stan	**31**	**105**
Average		**88**
$LSD_{.10}$		**13**

Scheduling the later applications proved frustrating. Poor spraying conditions delayed even timely spray

orders, but with widespread rust development and the sheer number of orders, applicators fell rapidly behind.

Whereas many varieties have moderate stripe rust resistance under normal growing conditions, the resistance is largely high temperature adult plant resistance (HTAP) that occurs under higher temperatures. Persisting cool temperatures reduced the HTAP resistance and prolonged the period for rust to develop and spread. The HTAP resistance was evident during grain filling, but by then the damage to leaves was done.

There were surprising results for varieties in 2011. Some varieties susceptible in years past did surprising well while varieties we normally depend on for resistance, like **Stephens,** were hurt. There were varieties that despite the stripe rust prevalence were largely resistant and did not require a fungicide application to yield 150 bu/A. These included **Bruneau** and **AP Legion**. Conditions that precluded the heat dependent HTAP resistance is one reason why variety performance differed this year. Different rust races also may be responsible. Several rust races exist and they change. Varieties susceptible to some races are resistant to others.

Vatiety selection is still the easiest way to prepare for and reduce the risk of stripe rust infection. The percent leaf infection in the November planted Parma trial is shown in Table 11 for soft and hard wheat varieties.

Looking forward, the immediate concern is the existence of stripe rust inoculum that may infect fall plantings. The rust can infect volunteering wheat which in turn can infect fall planted wheat if there is overlap, or the green bridge. The fungus can overwinter in infected wheat tissue. Infected leaves with sporulating lesions exposed to temperatures below 24°F can reduce rust survival, but insulating snow cover can promote overwintering infections. Also, if infection has not led to sporulating lesions prior to winter, the latent infections may not be as sensitive to the cold.

Juliet Marshall, Extension Cereal Specialist for Eastern Idaho, reminds growers of management decisions now that can reduce the risk of fall infections.

1. Destroy volunteer wheat early enough that it does not serve as a source of rust inoculum for subsequent nearby plantings. The later harvest in some areas may result in a narrower window in which to water and initiate volunteer wheat germination and emergence and still dispose of the volunteer wheat in a timely manner.
2. Plant resistant varieties, at least not the most susceptible varieties. Variety resistance is known for the most part, although changing races make this more problematic. Stripe rust infection levels reported here can be used as a guide and infection levels in other areas are posted for eastern Idaho at http://www.extension.uidaho.edu/scseidaho/disease/disease_index.htm. Different races of stripe rust may be more prevalent in some areas than others. HTAP resistance is generally known for released varieties.
3. Plant later if necessary to avoid the green bridge and related infections. This is probably more critical in shorter growing seasons than the Treasure Valley. But even in western Idaho some volunteer wheat is not disposed of until after the planting of fall wheat. The need to delay planting for reducing fall rust infections needs to be balanced against the normal yield loss occurring from later than optimal plantings.
4. Use seed treatments which can provide some protection for 2 to 3 weeks in situations when the green bridge can't be avoided. Beyond the activity of the fungicide seed treatments, wheat is susceptible to infection. Whereas many varieties have High Temperature Adult Plant (HTAP) resistance, they likely don't have resistance as seedlings. Seed treatments labeled for reducing stripe rust infection include Baytan30 at 1.25 fl oz/100lb seed and Dividend XL RTA at 10 fl oz/100 lb winter wheat seed. Other treatments may also be labeled. Check all labels and follow accordingly.
5. Fall fungicide applications should not be necessary even with fall infection.
6. Scout for infections. Mark areas where infection was greatest and examine living leaves for live rust lesions in the early spring. You may need a magnifying lens to help find orange spores developing.
7. Over-wintering stripe rust infection will require fungicide applications in late winter or spring. Applications with triazole herbicides will be essential in this case. Additional applications may be necessary depending on rust susceptibilty. ALL VARIETIES NEED TO BE SCOUTED, regardless of perceived resistance, because rust races do change and varieteis may gain or lose resistance.

Dryland Trial

The 2011 dryland trial was conducted on the Parma R & E Center. The field was previously in corn. The trial was planted October 22 at the rate of 60 lb/A in four rows spaced 14 inches apart for a distance of 25 feet. Good stands were obtained. Total rainfall received during this trial measured 11.4 inches. Average yield was 72 bu/A for soft white and 81 bu/A for hard winter wheats, yields that would not have been possible in normal years.

Stripe rust was present and affected variety performance in 2011. Variety performance information should be interpreted in that light. Longer term performance may be more useful for variety selection for most years when stripe rust is not a factor.

Among soft white winters, several entries have done as well or better than **Stephens** in multiple year comparisons. **Eltan**, **Tubbs**, **Tubbs 06**, **ID0587, Simon** and **Hubbard** have done at least as well as **Stephens. Eltan** is sometimes used in dryland plantings as it emerges better from deeper depths.

Among hard red winter wheat varieties, **Promontory, Buchanan**, and **Utah 100** have all yielded as well as **Stephens**. In 2011 most hard winter varieties yielded more than **Stephens** due to better rust resistance. **Boundary**, **Ivory**, and **Gary** were among the lowest yielding varieties, primarily from stripe rust susceptibility. Hard white winter wheats have been evaluated for the last six years in the dryland trial. Only **Darwin** matched the yield of the better hard red winters.

Dryland test weights are typically higher for hard winters than soft white winters. **Finley, Promontory,** and **Darwin** have excellent test weight.

Table 12. Dryland Winter Wheat Performance in Southwestern Idaho.

Variety	Yield 04-10	Yield 07-10	Yield 2011	Protein 2011	Test Weight 2011	Height 2011
	-------bu/A-------			%	lb/bu	in
Soft Whites						
Eltan	**37**	**25**	**94**		**59.2**	**36.4**
Goetze			**63**		**54.6**	**33.0**
Hubbard	**35**	**22**	**72**		**58.4**	**40.0**
ID0587	**34**	**22**	**70**		**56.7**	**35.0**
ID0620		**26**	**96**		**58.6**	**35.9**
ID0655			**101**		**62.4**	**41.9**
ID-D-05			**42**		**53.8**	**34.5**
Malcolm	**35**	**25**	**61**		**55.5**	**36.4**
ORCF-102			**73**		**58.5**	**36.7**
Simon	**39**	**27**	**72**		**58.3**	**36.2**
Stephens	**35**	**24**	**73**		**57.3**	**34.8**
Tubbs	**40**	**29**	**52**		**53.0**	**36.0**
Tubbs06		**29**	**55**		**54.7**	**39.0**
WB528			**81**		**60.1**	**37.4**
Average	**33**	**24**	**72**		**57.2**	**36.6**
$LSD_{.10}$	**3**	**5**	**11**		**1.3**	**2.1**
Hard Red and White						
Hard Reds						
Boundary	**33**	**24**	**61**		**59.5**	**32.4**
Buchanan	**33**	**26**	**95**		**61.7**	**44.6**
Finley	**34**	**26**	**89**		**64.5**	**45.0**
Hoff			**78**		**63.1**	**47.5**
ID0653			**94**		**63.8**	**42.7**
Juniper	**32**	**23**	**83**		**63.5**	**51.9**
Moreland	**33**	**23**	**85**		**61.4**	**34.7**
Promontory	**34**	**24**	**87**		**65.5**	**39.8**
Utah 100	**35**	**26**	**96**		**62.4**	**43.9**
Hard Whites						
Darwin		**26**	**86**		**64.2**	**45.0**
Gary	**34**	**21**	**68**		**59.8**	**41.7**
ID0660			**73**		**62.8**	**35.3**
Ivory	**33**	**23**	**63**		**58.7**	**37.6**
Average	**32**	**23**	**81**		**62.4**	**41.7**
$LSD_{.10}$	**3**	**4**	**10**		**1.0**	**2.7**

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 testing results in Washington can be viewed at http://variety.wsu.edu.

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Southwest Idaho Extension Cereals Website

Previous issues of the ***Cereal Sentinel*** newsletter back to 1996 can be viewed as PDF files on the Southwest Idaho Extension Cereals Homepage at http://www.cals.uidaho.edu/swidaho.
If you would like to receive electronic notice of new ***Cereal Sentinel*** newsletter issues posted to the website, rather than the hard copy through the mail, send an e-mail message to me at bradb@uidaho.edu. The advantage for us is that we don't need to produce a hard copy and put it in the mail to you. It saves us the extra expense. Another advantage is that increasingly there will be color photos that will be better viewed with an electronic version. The hard copy will remain a black and white publication. Another advantage to you is that those receiving the newsletter electronically gain access from four to seven days earlier.

The website is still under development but the content is considerably expanded from the initial website published in June 2000. In addition to the ***Cereal Sentinel*** newsletters, variety descriptions and performance are added as well as other topics. I welcome any suggestions you may have for the website.

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