University of Idaho
Cooperative Extension System

The Cereal Sentinel

A newsletter for Treasure Valley cereal producers

October 1, 2008 Issue No. 49

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Important Dates:

Idaho Grain Producers Association Annual Conference, Couer D 'Alene, ID
December 10-12, 2008

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 2008 season marked the 24th 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.

Four irrigated winter trials were planted for the 2008 season. The earliest trials were planted at the Parma R &E Center on October 11 and at Weiser on October 17. Later planted trials were located at the Parma R & E Center on November 13 and Bruneau on November 9.

The season was characterized by a dry fall, a moderately wet winter, and a cool dry spring. Grain filling temperatures were normal. Stripe rust occurred at Parma late in the season on only one susceptible variety of wheat.

Grain protein for soft white wheat ranged widely across 2008 irrigated sites. Protein averaged the lowest of all sites at Parma (8.6%) which was also the most productive, and protein averaged the highest at Bruneau (13.1%). Despite the high yield at Parma, higher yield may have been possible with more available N. For the soft whites the protein concentrations are greater than what most export customers would like. There was minimal lodging at any of the irrigated winter trials.

Plant heights were near normal at Parma but lower than normal at Weiser and especially Bruneau. As usual, early plantings at Parma yielded better than the later planting.

Soft White Winter Wheat

The irrigated soft white winter wheat results for the 2008 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. 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 good milling and baking quality and excellent yield potential for both early and late fall plantings. **Malcolm** is similar to **Stephens** in yield potential, but does not have the milling and baking quality of **Stephens**.

Tubbs06, an OSU release, yields comparable to **Stephens** in both early October and November plantings.

Table 1. Irrigated Early October Planted Soft White Winter Wheat. 2008

Entry	Yield[1]	Protein	Test Wt.	Height	Lodging
	bu/A	%	lb/bu	in	%
		Parma (planted Oct. 11)			
Bitterroot	155	8.8	59.0	42	0
CF-Lambert	156	8.3	58.7	41	0
Goetze	153	9.3	57.8	33	0
ID00-475-2dh	161	8.9	61.2	38	0
ID02-859	145	8.7	57.3	35	0
ID93-64901A	163	7.9	58.9	39	0
ID98-19010A	160	8.4	59.4	36	0
ID99-419	155	8.2	59.5	38	0
ID-D-05	152	8.6	60.9	36	0
Malcolm	150	8.3	59.4	38	0
ORCF102	143	8.8	59.5	38	0
Stephens	157	8.8	58.1	37	0
Tubbs06	155	8.4	58.3	40	0
WB 528	159	8.8	60.1	34	0
Average	155	8.6	59.1	38	0
$LSD_{.10}$	9	0.5	0.4	2	0
		Weiser (planted Oct. 17)			
Bitterroot	117	10.5	58.7	36	1
CF-Lambert	122	12.1	57.9	38	0
Goetze	131	11.7	57.7	31	0
ID00-475-2dh	122	10.0	60.4	34	0
ID02-859	124	12.1	56.2	32	0
ID0655	115	12.9	59.1	39	14
ID93-64901A	140	11.4	59.0	36	4
ID98-19010A	130	10.8	60.0	29	0
ID99-419	133	11.0	57.8	36	0.3
ID-D-05	124	12.0	61.1	33	0
Malcolm	125	11.2	56.4	34	3
ORCF102	127	12.1	59.0	36	0
Stephens	132	12.9	57.7	33	0
Tubbs06	117	11.5	55.9	37	1
WB 528	122	11.5	60.6	33	0
Average	125	11.6	58.5	34	2
$LSD_{.10}$	15	2.2	1.4	2	6

Tubbs06 is taller than **Stephens**. It is a re-selection of **Tubbs** and has yielded as well as **Stephens** and better than **Tubbs** in western Idaho, particularly in later fall plantings. **ORCF-102** is the second OSU Clearfield release and has a yield advantage over **ORCF-101**, especially in later plantings.

Table 2. Irrigated November Planted Soft White Winter Wheat. 2008

Entry	Yield[1]	Protein	Test Wt.	Height	Lodging
	bu/A	%	lb/bu	in	%
			Parma (planted Nov. 13)		
Bitterroot	**143**	**10.4**	**60.3**	**42**	**0**
CF-Lambert	**143**	**10.4**	**59.6**	**42**	**0**
Goetze	**134**	**10.3**	**58.7**	**34**	**0**
ID00-475-2dh	**144**	**9.7**	**61.6**	**37**	**0**
ID02-859	**124**	**9.9**	**57.5**	**34**	**0**
ID0655	**131**	**10.4**	**60.5**	**44**	**0**
ID629	**131**	**10.8**	**61.7**	**41**	**0**
ID630	**128**	**10.8**	**61.7**	**36**	**0**
ID93-64901A	**149**	**9.3**	**59.9**	**38**	**0**
ID98-19010A	**146**	**9.7**	**60.0**	**35**	**0**
ID99-419	**139**	**9.0**	**59.4**	**37**	**0**
ID-D-05	**142**	**10.7**	**61.5**	**37**	**0**
Malcolm	**128**	**9.4**	**59.9**	**38**	**0**
ORCF-102	**135**	**10.5**	**59.7**	**38**	**0**
Stephens	**142**	**9.8**	**59.0**	**36**	**0**
Tubbs06	**143**	**9.3**	**59.0**	**41**	**0**
WB 528	**129**	**10.3**	**60.7**	**36**	**0**
Average	**137**	**10.0**	**60.0**	**38**	**0**
$LSD_{.10}$	**10**	**0.7**	**0.7**	**1**	**0**
			Bruneau (planted Nov. 9)		
Bitterroot	**125**	**13.0**	**60.0**	**33**	**0**
CF-Lambert	**116**	**14.1**	**57.7**	**35**	**0**
Goetze	**122**	**12.9**	**58.1**	**29**	**0**
ID00-475-2dh	**137**	**13.3**	**61.6**	**32**	**0**
ID02-859	**116**	**12.9**	**56.4**	**30**	**0**
ID0629	**107**	**13.1**	**61.1**	**33**	**0**
ID0630	**107**	**13.9**	**61.0**	**30**	**0**
ID0655	**117**	**13.4**	**60.0**	**36**	**0**
ID93-64901A	**124**	**12.4**	**59.6**	**32**	**0**
ID98-19010A	**126**	**12.3**	**60.4**	**28**	**0**
ID99-419	**130**	**12.6**	**60.5**	**32**	**0**
ID-D-05	**124**	**13.7**	**62.0**	**31**	**0**
Malcolm	**112**	**13.3**	**57.9**	**31**	**0**
ORCF-102	**119**	**12.9**	**58.7**	**32**	**0**
Stephens	**121**	**13.1**	**59.0**	**30**	**0**
Tubbs06	**134**	**13.2**	**58.1**	**35**	**0**
WB 528	**119**	**13.4**	**60.7**	**31**	**1**
Average	**121**	**13.1**	**59.6**	**32**	**0.1**
$LSD_{.10}$	**16**	**0.7**	**0.6**	**2**	**1**

Table 3. Irrigated Soft White Winter Wheat Performance in the Treasure Valley across all 2008 sites.

Entry	Yield	Protein	Test Wt.	Height	Lodging
	bu/A	%	lb/bu	in	%
			(4 sites)		
Bitterroot	**135**	**10.6**	**59.5**	**38**	**0**
CF-Lambert	**134**	**11.2**	**58.5**	**39**	**0**
Goetze	**135**	**11.0**	**58.1**	**32**	**0**
ID-D-05	**136**	**11.2**	**61.4**	**34**	**0**
ID00-475-2dh	**141**	**10.5**	**61.2**	**35**	**0**
ID02-859	**127**	**10.9**	**56.8**	**33**	**0**
ID93-64901A	**144**	**10.3**	**59.4**	**36**	**1**
ID98-19010A	**140**	**10.3**	**60.0**	**32**	**0**
ID99-419	**140**	**10.2**	**59.3**	**36**	**0**
Malcolm	**129**	**10.6**	**58.4**	**35**	**1**
ORCF-102	**131**	**11.1**	**59.2**	**36**	**0**
Stephens	**138**	**11.2**	**58.4**	**34**	**0**
Tubbs 06	**137**	**10.6**	**57.8**	**38**	**0**
WB 528	**132**	**11.0**	**60.5**	**33**	**0**
Average	**136**	**10.8**	**59.2**	**35**	**0.2**
$LSD_{.10}$	**10**	**1.3**	**0.6**	**2**	**1**

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. 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 over the last five years, especially in later plantings.

ID629 and **ID630** are waxy spring soft white genotypes that have been tested for three years in fall plantings. They are less productive than released varieties of soft white winter wheat.

Bitterroot (ID9922407A) is a taller recent Idaho soft white winter release that occasionally yields as well as **Stephens**, but is inconsistent. Several other advanced lines (**ID99-419** and **CF-Lambert**) have been evaluated over the last three seasons. Of these, **ID99-419** over three years came the closest to **Stephens** in yield. **ID99-419** was lower in protein than **Stephens**, **WB 528**, **Tubbs 06**, and **Goetze** entries across all sites in 2008 but has been dropped by the breeder. Both **ID99-419** and **CF-Lambert** are imazamox tolerant Clearfield lines.

Table 4. SWWW Variety Performance as Affected by Planting Dates. 1996-08

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)
Dune	139	137
Simon	133	129
Stephens	139	137
Tubbs	138	131
WB528	136	137
$LSD_{.10}$	6	5
	2006-08	
	(6 sites)	(6sites)
Bitterroot	139	119
CF-Lambert	136	117
Goetze	142	113
ID0629		111
ID0630		107
ID99-419	144	123
Malcolm	143	113
ORCF-102	142	115
Stephens	146	122
Tubbs 06	143	127
WB 528	145	116
$LSD_{.10}$	5.4	4.0

More recent advanced lines evaluated included **ID93-64901A** and **ID98-19010A ;**both performed well in 2008 compared to **Stephens**. **ID98-19010A** is as short as **Goetze** and **ID93-64901A** is taller than **Stephens**.

Goetze is an OSU release that has been tested for at least four years in western Idaho. It is 2 to 4 inches shorter than **Stephens** with better lodging resistance. **Goetze** may not be appreciably different in yield from **Stephens** in early fall plantings but it has not compared favorably to **Stephens** in late fall plantings.

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

Table 5. SWWW Long Term Variety Performance.

Variety	96-05	03-06	04-08	06-08
	----------bu/A----------			
	37 sites	15 sites	19 sites	12 sites
Malcolm	136	134	132	128
Stephens	138	138	138	134
Brundage	129			
Tubbs		135		
Simon		131		
Dune		138		
ORCF-101		126		
WB528		136	135	131
ORCF-102			132	128
Goetze				128
Tubbs 06				135
Bitterroot				129
ID99-419				134
CF-Lambert				126
$LSD_{.10}$	7	4	3	3

Tables 4 and 5 that enable direct comparison among the varieties shown.

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 necessitated by late harvested crops of potatoes, corn, or sugarbeets. Several varieties such as **Malcolm, ORCF-102, Tubbs** and **Goetze** that are comparable to **Stephens** in yield in early plantings appear to be more susceptible to later plantings than **Stephens**. Exceptions include late planted **Dune**, **WB528,** and especially**Tubbs 06**.

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 protein premiums. Test weight is generally higher with hard winters if stripe rust is not present. Results for 2008 testing are shown in Tables 6-8.

Few irrigated hard red winters have acceptable milling and baking quality for export according to the Idaho Wheat Commission. Japan has requested that specific varieties not be included in their shipments. The position of the **Idaho Wheat Commission** is available on their website at http://www.idahowheat.org, click on "preferred varieties".

Table 6. Early October Planted Irrigated Hard Winter Wheat Performance in the Treasure Valley, 2008.

Variety	Yield	Protein	Test wt	Height	Lodging
	bu/A	%	lb/bu	in	%
			Parma (planted Oct. 11)		
Hard Reds					
Hoff	**141**	**9.7**	**61.7**	**38**	**0**
ID0621	**146**	**9.5**	**61.0**	**36**	**0**
ID0653	**137**	**9.7**	**62.2**	**49**	**5**
Moreland	**141**	**10.0**	**59.5**	**37**	**0**
WB936 (s)	**130**	**9.8**	**62.4**	**33**	**0**
Hard Whites					
Darwin	**129**	**10.3**	**62.5**	**46**	**10**
Gary	**132**	**9.8**	**59.7**	**46**	**15**
Ivory	**149**	**9.4**	**60.2**	**40**	**0**
NuHorizon	**149**	**9.7**	**62.1**	**35**	**0**
Average	**140**	**9.8**	**61.3**	**40**	**3**
$LSD_{.10}$	**11**	**0.4**	**0.7**	**1**	**9**
			Weiser (planted Oct. 17)		
Hard Reds					
Hoff	**129**	**12.9**	**61.1**	**35**	**1**
ID621	**124**	**12.7**	**60.4**	**34**	**4**
ID653	**105**	**13.6**	**60.7**	**51**	**28**
Moreland	**126**	**12.9**	**59.2**	**32**	**0**
WB 936 (s)	**128**	**13.3**	**60.5**	**36**	**10**
Hard Whites					
Darwin	**112**	**13.8**	**60.4**	**43**	**30**
Gary	**108**	**13.2**	**57.0**	**42**	**48**
Ivory	**131**	**12.6**	**59.8**	**37**	**5**
NuHorizon	**139**	**13.2**	**62.5**	**33**	**1**
Average	**122**	**13.1**	**60.2**	**38**	**14**
$LSD_{.10}$	**9**	**1.1**	**1.2**	**1**	**16**

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** and may have lower protein.

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 stripe rust resistance. There has been significant stripe rust in **Moreland** at Parma in three of the last four years (2005, 2007, and 2008).

Two Idaho advanced lines were evaluated in 2007 and 2008 at all locations. **ID0621** averaged the highest in yield across all sites including a stressed trial at

Table 7. Mid November Planted Irrigated Hard Winter Wheat Performance in the Treasure Valley, 2008.

Variety	Yield	Protein	Test wt	Height	Lodging
	bu/A	%	lb/bu	in	%
			Parma (planted Nov. 13)		
Hard Reds					
Esparia	**123**	**11.7**	**61.1**	**32**	**0**
Hoff	**111**	**12.2**	**61.7**	**37**	**0**
ID621	**139**	**12.1**	**62.5**	**36**	**0**
ID653	**113**	**12.8**	**62.6**	**49**	**0**
Moreland	**129**	**12.5**	**61.1**	**35**	**0**
KW70521(s)	**112**	**12.6**	**63.0**	**36**	**0**
Sagittario(s)	**118**	**12.7**	**60.7**	**29**	**0**
WB 936(s)	**129**	**11.7**	**62.8**	**35**	**0**
Hard Whites					
Darwin	**115**	**12.8**	**63.4**	**44**	**0.3**
Gary	**119**	**12.0**	**61.4**	**43**	**0.3**
Ivory	**139**	**11.8**	**61.6**	**39**	**0**
Mieti	**115**	**12.2**	**61.0**	**27**	**0**
Mol	**95**	**14.1**	**60.8**	**30**	**0**
NuHorizon	**129**	**12.1**	**63.6**	**34**	**0**
Vailoet (s)	**115**	**12.7**	**61.6**	**27**	**0**
Average	**120**	**12.4**	**61.9**	**36**	**0.03**
$LSD_{.10}$	**8**	**0.6**	**0.5**	**2**	**0.2**
			Bruneau (planted Nov. 9)		
Hard Reds					
Hoff	**115**	**13.8**	**60.9**	**32**	**0**
ID0621	**124**	**13.0**	**61.7**	**30**	**1**
ID0653	**110**	**14.5**	**61.9**	**40**	**8**
Moreland	**126**	**14.3**	**59.8**	**27**	**0**
WB 936 (s)	**103**	**15.6**	**61.2**	**29**	**0**
Hard Whites					
Darwin	**114**	**13.8**	**62.7**	**36**	**5**
Gary	**112**	**13.4**	**60.3**	**34**	**6**
Ivory	**122**	**12.9**	**60.7**	**33**	**0.3**
NuHorizon	**107**	**13.8**	**62.8**	**28**	**0**
Average	**115**	**13.9**	**61.3**	**32**	**2**
$LSD_{.10}$	**19**	**2.9**	**0.4**	**3**	**9**

Grandview in 2007. It is comparable in height and protein to **Hoff**. Test weight for **ID0621** is comparable to **Hoff** in early plantings but lower than **Hoff** in later plantings. **ID0653** is very tall and lower yielding, and will not be further evaluated.

Esperia is an AllStar Seed variety that was the shortest of all the hard red winters. It was evaluated in only one trial (Parma late planted).

Table 8. Irrigated Fall Planted Hard Winter Wheat Long Term Yield Performance, 2003-08.

Variety	2003-08	2007-08	2008
	----------------bu/A-------------		
	23 sites	8 sites	4 sites
<u>Hard Reds</u>			
Hoff	123	120	124
ID621		129	133
ID653		106	117
Moreland	122	122	131
WB 936 (s)			122
<u>Hard Whites</u>			
Darwin		112	118
Gary		112	118
Ivory	133	129	135
NuHorizon	132	128	131
$LSD_{.10}$	2.4	3.4	8

Hard White Winter Wheat

A number of hard white winter wheat varieties have been released but their quality may not be desirable for export. The domestic market for southern Idaho hard white wheat has improved dramatically since 2005. Western Idaho production of hard whites is limited in part because it requires segregation from soft whites. The segregated wheat in western Idaho is primarily hard red spring and soft whites. Although it is contracted in southcentral and southeast Idaho, the contracts typically don’t extend into western Idaho due to the cost of hauling and lack of facilities capable of segregating an additional market class of wheat. The southern Idaho production is marketed primarily in domestic markets.

Mixing of hard white and soft wheats remains a significant concern as it will result in poor functionality of the mix when used for traditional baking products. However, south central Idaho elevators seem to be able to segregate the market classes successfully.

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.

NuHorizon is a short General Mills variety with yield and protein comparable to **Ivory**. **NuHorizon** has better straw strength and is less susceptible to lodging than **Ivory** and other hard white entries.

Gary and **Darwin** are relatively new hard white winter wheats released from the UI Aberdeen breeding program. Both are relatively tall and more susceptible to lodging. The test weight for **Gary** was significantly lower than other hard white entries. Both varieties yielded less than **Ivory** or **NuHorizon** hard white winters and will be dropped from further western Idaho testing.

Mol and **Mieti** are hard white varieties from AllStar seed. Both are particularly short and yielded lower than than **Ivory** and **NuHorizon** in limited testing.

Fall Planted Hard Spring Wheat

We have fall planted spring genotypes for the last seventeen 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 all trials in 2008 (Table 6-8). **WB 936** yield is sporadic, sometimes doing as well as **Moreland**, a hard red winter, sometimes yielding considerably less. **Sagittario**, the shortest of the hard reds did not yield as well as **WB 936** at the one location evaluated.

Fall planting spring genotypes comes with some risk. Winterkill is a risk particularly 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.

Fall Planted Barley

Winter barley in 2008 was evaluated in the earliest planted trials at Parma and Weiser . Winter barley performance in 2008 or over several years is shown in Tables 9 and 10. Relatively few winter barley varieties were evaluated in the recent past as few new entries were

Table 9. Irrigated Winter Barley Performance in the Treasure Valley, 2008.

Variety	Yield	Test wt	Height	Lodging	Thins
	bu/A	lb/bu	in	%	%
		Parma (planted Oct. 11)			
Winter					
Charles	173	52.1	33	2	0.8
Maja	194	53.6	41	3	1.9
Strider	200	51.3	39	10	1.2
Sunstar Pride	212	52.7	34	0	1.9
Average	195	52.4	37	4	1.5
$LSD_{.10}$	10	0.4	2	14	0.7
		Weiser (planted Oct. 17)			
Winter					
Charles	122	48.2	24	14	2.7
Maja	140	51.9	25	0	1.8
Strider	154	49.8	24	3	1.3
Sunstar Pride	180	48.4	27	25	6.1
Average	149	49.5	25	10	3.0
$LSD_{.10}$	30	2.1	4	24	1.9

released and barley acreage in western Idaho has significantly declined. Excellent yields were achieved at the two sites in 2008, especially at Parma.

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

Sunstar Pride has excellent yield potential but does not have stripe rust resistance. Barley stripe rust has occurred only once at Parma since **Sunstar Pride** was released by Sundermann Breeding.

Maja (**Stab 113**) is a potential winter malting type from OSU. It has not yielded quite as well as **Strider** or **Sunstar Pride** over five years of testing. 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 winter barley with malting quality. It is shorter and lower yielding than **Maja** but may lack straw strength. It also has lower test weight than **Maja**.

Table 10. Irrigated Fall Planted Barley Long Term Yield Performance, 1996-07.

Variety	2004-07	2004-07	2006-07	2008
	----------------bu/A--------------			
	6 sites	6 sites	4 sites	2 sites
Strider	186	188	166	177
Sunstar Pride	190		176	196
Maja	175		163	167
Idagold (s)	167	171	147	
YU599-006 (s)	138	132	113	
Merlin (s)		136	117	
WB Salute (s)		127	103	
Charles			146	147
Herald (s)			109	
02AH684 (s)			109	
$LSD_{.10}$	10	10	13	27

Several spring genotypes were evaluated for a time also (Table 9). They are less productive generally because they are less cold tolerant than winter genotypes.

Dryland Trials

Dryland winter wheat in southwestern Idaho's outlying areas generally is planted in a wheat fallow rotation. Among soft white winter wheats, **Malcolm, Eltan,** and **Stephens** did not differ in yield over several years of dryland testing (1996-2006). In recent testing (five site years) several other varieties including **Tubbs**, **Simon, ID587,** and **Hubbard** have done at least as well as **Stephens,** with **Simon** yielding higher than **Stephens.**

Hard red winter wheats **Promontory, Buchanan**, and **Utah 100** have all yielded as well as **Stephens** over the 1996-08 period. In more recent testing other varieties have also matched **Stephens** in yield. The average yield for the hard winter wheats was 6 bu/A higher than the soft white winters in the the dryland trial. Dryland test weights are typically higher for hard red winters than soft white winters.

Hard white winter wheats have been evaluated for the last five years in the dryland trial. **Gary** and **Ivory** yielded as well as the hard red winters during this time.

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

Table 11. Dryland Winter Wheat Performance in Southwestern Idaho.

Variety	Yield 96-06	Yield 04-08	Yield 2008	Protein 2008	Test Weight 2008	Height 2008
	bu/A	bu/A	bu/A	%	lb/bu	in
Soft Whites						
Eltan	43	44	24	12.4	54.0	22
Goetze			25	12.9	53.9	19
Hubbard		43	22	13.3	54.8	22
ID0587		43	23	13.7	53.4	20
ID0620			30	11.4	55.5	22
ID-D-05			24	13.2	56.5	20
Malcolm	44	42	24	12.1	54.6	22
ORCF-102			21	13.7	54.8	18
Simon		48	24	12.0	53.8	21
Stephens	42	42	25	12.2	54.1	20
Tubbs		46	26	12.3	53.0	22
Tubbs06			28	10.9	54.3	23
WB528			28	12.4	56.9	21
Average	43	44	25	12.5	54.6	21
$LSD_{.10}$	2	3	5	1.2	0.8	3
Hard Red and White						
Hard Reds						
Boundary		40	28	13.0	54.7	22
Buchanan	44	39	33	12.1	55.0	28
Finley		41	27	12.6	59.3	25
Hoff			32	11.9	58.6	25
ID0653			33	12.3	57.7	29
Juniper		40	31	13.0	58.2	33
Moreland		42	28	13.1	56.9	19
Promontory	45	44	35	12.4	60.0	25
Utah 100	44	42	31	13.1	53.5	28
Hard Whites						
Darwin			33	12.7	58.7	28
Gary		41	28	13.2	57.9	26
Ivory		40	35	12.2	56.7	27
Average	44	41	31	12.6	57.3	26
$LSD_{.10}$	2	3	7	1.0	1.9	4

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.

Slow Release N for Winter Wheat

Late winter top-dressed urea N is more effective than early fall preplant incorporated urea for winter wheat in 2 out of 3 years, based on local research. This is due either to less leaching, denitrification, or immobilization with the late winter topdress. While preplant urea is occasionally as effective as late winter top-dressed urea, it is seldom more effective. In part because of this research, the current NRCS 590 Standard discourages early fall preplant applied N unless the N can be maintained in the ammonium form going into winter, the period of maximum precipitation and nitrate leaching potential.

Despite the relative effectiveness of winter top-dressed urea N, this N fertilizer is subject to volatile losses when it hydrolyzes at the soil surface. Preplant N incorporated was historically favored by the industry and growers as it helped distribute the workload in addition to minimizing volatile N losses from the soil surface. There is need for a dry preplant N fertilizer that can be incorporated without the limitations of conventional dry N sources (immobilization; rapid nitrification and subsequent leaching or denitrification; and phytotoxicity).

Polymer coated urea such as ESN®, with controlled N release, has potential for significantly delaying N release and reducing N losses, as well as phytotoxicity and excessive growth of wheat. Research trials were conducted in 2006, 2007, and 2008 to complete three years of study at Parma comparing the relative performance of ESN® and dry urea fertilizers for both preplant and later top-dressed applications to furrow irrigated winter wheat.

Treatments included ESN®, urea, or a 50-50 mixture applied preplant incorporated or topdessed in late fall or late winter at rates of 60, 120, or 180 lb N/A. An untreated control was included. The results for 2008 are shown in Table 12. Results for 2006 and 2007are available in ***Cereal Sentinel*** newsletter issues 43 and 46 respectively, available on the website.

Plant height, yield, protein, and grain protein N all increased with added N. Preplant urea was not as effective as late winter urea topdressed, consistent with

Table 12. Irrigated soft white winter wheat response to N source, rate, and timing. Parma, 2008.

N Fertilizer	Application Timing: Preplant	Application Timing: Fall	Application Timing: Spring	Yield bu/A	Protein %	Test Weight lb/bu	Height in	Grain N lb/A
Control	--	--	--	81	6.9	57.2	31.8	60.2
Urea	60	--	--	121	7.7	57.8	35.3	100.8
ESN	60	--	--	126	7.8	58.1	35.9	104.5
Urea/ESN Mix (50-50)	60	--	--	121	7.8	58.0	35.0	100.7
Urea	120	--	--	133	8.3	58.5	36.0	118.1
ESN	120	--	--	145	9.2	59.2	36.8	144.9
Urea/ESN Mix (50-50)	120	--	--	145	8.8	58.6	36.3	136.0
Urea	180	--	--	155	9.2	58.9	37.6	151.9
ESN	180	--	--	156	10.4	59.8	37.4	172.3
Urea/ESN Mix (50-50)	180	--	--	152	9.8	59.3	37.2	158.9
Urea	--	60	--	118	7.4	58.0	35.3	93.6
ESN	--	60	--	122	8.6	58.3	34.3	112.1
Urea/ESN Mix (50-50)	--	60	--	122	7.9	58.3	34.9	101.4
Urea	--	120	--	141	8.8	58.8	36.5	132.0
ESN	--	120	--	139	8.7	59.2	35.3	127.7
Urea/ESN Mix (50-50)	--	120	--	146	9.0	58.9	36.2	140.7
Urea	--	180	--	148	9.5	59.2	36.6	149.9
ESN	--	180	--	149	9.2	59.7	34.9	145.2
Urea/ESN Mix (50-50)	--	180	--	156	9.9	59.2	35.2	164.2
Urea	--	--	60	128	7.6	57.7	34.6	104.4
ESN	--	--	60	122	8.1	58.4	33.7	105.3
Urea/ESN Mix (50-50)	--	--	60	127	7.6	58.2	36.6	98.1
Urea	--	--	120	155	9.2	58.6	37.7	151.3
ESN	--	--	120	143	9.2	59.5	35.4	139.5
Urea/ESN Mix (50-50)	--	--	120	143	8.8	58.8	35.4	134.5
Urea	--	--	180	161	9.6	58.8	36.9	164.5
ESN	--	--	180	154	10.3	59.9	35.7	168.8
Urea/ESN Mix (50-50)	--	--	180	154	9.4	59.0	36.8	155.2
			CV	8	6.2	0.5	3.5	11.8
			$LSD_{.10}$	14	0.6	0.4	1.5	17.9

our previous research. Among preplant incorporated treatments, the ESN® averaged 5-12 bu/A higher yielding than preplant urea at rates that were limiting to yield. Protein concentrations were also higher for preplant ESN than for preplant urea at the two highest N rates. The total protein N in harvested grain ranged from 17 to 20 lb/A higher for ESN® than preplant urea at the two highest N rates. For both urea and ESN® the highest N rate was necessary to maximize yield.

In contrast to preplant incorporated N, late winter topdressed ESN tended to be lower yielding than topdressed conventional urea. The mixture of fertilizers was typically no better than ESN® when late winter topdressed. Top dressed ESN® at low N rates may not release sufficient N during early vegetative growth to promote adequate tillering.

The difference in available N release can be seen also in the plant heights. Plants tended to be taller the later the urea application but the trend for ESN® was just the opposite. Test weights with urea tended to be lower than with ESN® at the higher N rates. Protein concentrations were typically as high or higher for ESN® than for urea.

Although this trial involved a soft white winter wheat variety, the results have implications for hard red or hard white winter wheat and possibly fall planted hard spring wheat. Winter genotypes in other market classes would likely respond similar to **Stephens** wheat with the same treatments. Considering that the protein for preplant ESN® ranged up to 1.2% protein higher than for preplant urea, ESN® would seem particularly appropriate for irrigated hard winters that may receive a premium for higher protein or a discount for lower protein.

The results for 2008 were quite similar to 2006 and 2007. The slow release ESN® was the superior preplant choice for yield and urea was the better topdressing in late fall or late winter.

Given the results for the late fall applications, there would be little advantage for early fall planted wheat to be fall topdressed with ESN®. However, we did not evaluate late fall preplant applications for late planted wheat. Based on our research experience with preplant incorporated ESN® for spring wheat, it is likely that preplant ESN® for late planted wheat would be as effective as preplant urea. The reduced effectiveness of topdressed ESN® may be related to rapidly drying soil surfaces that reduce the diffusion of urea from the ESN® granule.

The cost of ESN® one to three years ago was only 12 cents more a pound for ESN® N than urea N. At that price difference, ESN® was more competitive as a preplant application as compared to later todressed urea. Unfortunately, the cost has spread to almost 50 cents a pound this fall, and the economics are much less favaorable. The additional $60 to $90 for ESN® per acre for 120 to 180 lb N/A rates would not be justified when growers have the proven option of topdressing conventional urea in late winter/early spring. Early fall preplant ESN® was no more effective for soft white winter wheat yield than late winter topdressed urea.

This was our third year of research in western Idaho with a slow release N used to provide season long N for winter wheat.

Improved Topdressed N??

Ammonia volatilization can occur with topdressed urea, in which case it is not available for use by plants. It occurs when urea is topdressed to high pH soils that are wet on the surface or wetted with a light shower that is enough to solubilize the granules but not enough to move it into the soil. Urea granulesa are also wetted by furrow irrigation without providing an effective incroporation. Relatively new N fertilizer products are available to address some of the issues with N volatilization.

Urease inhibitors are compounds that prevent the hydrolysis of urea to ammonia gas that escapes into the atmosphere. SuperU® (Agrotain Company) is a compound containing a nitrification inhibitor used to treat urea. Two trials were conducted at Parma during 2008 to evaluate the relative effectiveness of urea and urea impregnated with SuperU® applied at dfferent N rates. The results for topdressings applied to furrow irrigated soft white winter wheat in two separate 2008 trials are shown in Table 13.

The soil surface was dry when the topdressings occurred in both trials. Rainfall after the March 5 topdressing included 0.03, 0.10, 0.02, and 0.18 inches on March 7, 12, 13, and 14 respectively. Rainfall after the March 27 topdress included 0.18 inch on March 28. The wheat was furrow irrigated the first time on April 16 in

Table 13. Comparison of spring topdressed dry N sources for furrow irrigated winter wheat in two separate trials. Parma, 2008.

N rate	N Source	Yield	Test weight	Height	SPAD
lb/A		bu/A	lb/bu	in	
		Topdressed March 5, 2008			
0	none	81	57.2	31.8	33.9
60	Urea	128	57.7	34.6	40.8
60	SuperU	123	57.7	35.2	42.5
120	Urea	155	58.6	37.7	46.1
120	SuperU	147	58.6	36.8	44.8
$LSD_{.10}$		14	0.4	1.5	3.0
CV		8	0.5	0.4	5.8
		Topdressed March 27, 2008			
0	none	109.9	56.9	33.3	47.8
50	Urea	135.5	58.5	34.6	50.4
50	SuperU	138.3	58.5	35.5	50.1
100	Urea	152.0	58.1	36.5	51.7
100	SuperU	143.3	58.3	35.9	50.8
150	Urea	148.7	57.9	36.3	52.5
150	SuperU	153.3	57.7	35.9	51.3
$LSD_{.10}$		16.4	0.6	1.2	2.6
CV		9.5	0.9	2.9	4.2

both trials. The conditions were not unusual for topdressed N in the area.

Topdressed N increased yield, plant height, test weight, and the chlorophyll meter reading (SPAD). The results were a bit mixed for the two N sources. Statistically, urea and SuperU® did not differ significantly in any of the parameters in 2008. Conditions were apparently not condusive for significant N loss from urea since SuperU® provided no additional benefit. Evaluations of alternative late winter/early spring topdressed N sources will continue in 2009 thanks to support from the Idaho Wheat Commission.

Wheat after Wheat

As expected, due to excellent forward contracts last fall and the uncertainty of irrigation water for full season crops there was a significant increase in fall planted wheat acreage in 2008. Acreage increased throughout the state, but nowhere as much as in western Idaho where total wheat acreage jumped a whopping 48%. A significant amount of this acreage was replanted wheat. Forward contracts currently are not what they were last year at this time, but are still attractive. Wheat after wheat will be tempting for some.

While two years of wheat before potatoes is more common in eastern Idaho, wheat after wheat occurs much less frequently in western Idaho, at least until this past season. Since replanted wheat may still be of interest to some, many of the same concerns will be related as were related last year in this space.

The biggest risks to wheat after wheat are diseases. The worst possible re-planting is probably volunteer wheat removed in late summer/early fall just prior to the next wheat planting. Soil borne pathogens bulding up in the previous crop, are promulgated even more in the volunteer wheat, and then are poised to infect the newly planted wheat for 2009. The volunteer wheat basically serves as a “green bridge” for pathogens, providing a host from the first wheat crop to the second.

Volunteer wheat also is a reservoir for insects that affect newly planted wheat. Aphids carrying barley yellow dwarf virus, or the wheat curl mite carrying wheat streak mosaic can all be harbored in the volunteer wheat host. The Russian wheat aphid can also move to new wheat from volunteer wheat.

These risks of soil borne or insect vectored diseases can be minimized. The more time separating the removal of volunteer wheat from the next planting, the less incidence of disease we can expect. Ideally, volunteer wheat would be watered up soon after the crop harvest and disposed of once established. That could leave several weeks time before a timely wheat planting in late September or early October. Other grass hosts for diseases would also need to be controlled. Disposing of volunteer wheat as early as possible after establishment will provide less time for pathogens to promulgate on the roots and less of a green bridge for the next planting.

The time required for straw removal can delay watering and the regrowth of volunteer wheat. To minimize effects of the green bridge this may delay the planting of wheat beyond optimum planting dates. Fortunately, the period of fallow before watering up the volunteer wheat may serve to reduce pathogen populations. Removal of some of the residue may also reduce hosts for some pathogens. Many soil borne pathogens affecting roots require living root tissue to survive.

Research indicates that planting after mid October in western Idaho sacrifices yield in the absence of diseases. The average yield loss from mid October to mid November has averaged from 5 to 15% in our trials. For volunteer wheat disposed of by October 1, the yield sacrifice of waiting 3 weeks to plant new wheat is minimal in most years.

The situation may be different for those that don’t have water for post-harvest irrigation but want to plant wheat for the following year, a likely scenario with favorable wheat contracts. Some may choose not to use short water supplies in order to save them for helping to establish a new wheat planting. The inability to water will effectively delay germination of leftover wheat seed until sufficient rainfall occurs. In western Idaho this may provide a several week to several month period of non-living wheat tissue for pathogens requiring living tissue to survive on. The difficulty is the uncertainty of moisture for germination of leftover seed and timely establishment of the next wheat crop.

If our wheat ever required seed treatment, it would be after a previous wheat crop. Variety selection also may be more critical. Varieties with foot rot resistance may have an advantage when wheat follows wheat. **Stephens** does not have foot rot resistance but **Tubbs 06** and **Goetze** do.

Using Volunteer Wheat

It may be tempting, even if water is available, to use late volunteering wheat for the next wheat crop, saving seed and establishment costs. We have little experience with this practice.

One concern would be the adequacy of the stand. Modern combine headers are larger, and effective residue spreading behind the combine over the header width is challenging. Furthermore, if the residue is not distributed, to accommodate straw removal, the stand variability is worse.

Another concern may be the quality of the seed that goes through and out the back of the combine. This seed is conceivably lighter than seed purchased. And, there is no opportunity for seed treatment. Seed lying on or in dry soil is also subject to infection by fungal pathogens.

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://www.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. You may also have electronic access earlier than those receiving the hard copy. If you are agreeable to accessing the newsletter from the website, send an e-mail message to me at bradb@uidaho.edu.

Acknowledgement

The Idaho Wheat Commission has awarded a grant of $3500 to subsidize this newsletter. We are pleased to acknowledge their support for this Cooperative Extension educational project.

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