



The Cereal Sentinel

A newsletter for Treasure Valley cereal producers

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Important Dates:

PNW Grains Conference, Spokane, WA

November 28-30, 2007

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 2007 season marked the 23rd 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 2007 season. The earliest trials were planted at the Parma R & E Center on October 2 and at Weiser on October 4. Later planted trials were located at the Parma R & E Center on November 13 and Grandview on November 21.

The season was characterized by freezing and thawing of soils in December and January that reduced late planted wheat stands, especially at Grandview. There was significant winterkill of most fall planted spring barley genotypes. Grain filling temperatures were higher than normal. Stripe rust occurred at Parma late in the season on susceptible varieties of wheat but not barley.

Grain protein across all sites in 2007 was relatively high. High protein resulted from high residual N and N fertilization at most locations and or yields limited by other factors. High temperatures during grain fill may also have increased protein. For the soft whites the protein concentrations are greater than what most export customers would like. High available N and storm activity significantly increased lodging at the early planted Parma site.

Plant heights were particularly short at Grandview in 2007 and tillering was poor, both likely due to dry conditions during stem extension. With poor surviving stands, and limited tillering, the yields were much lower than average. Plant heights at Parma were higher than normal.

Despite lodging at Parma, and higher than normal temperatures, grain yields in both early planted trials were well above average. As usual, early plantings yielded better than later plantings.

Soft White Winter Wheat

The irrigated soft white winter wheat results for the 2007 trials are given in Tables 1-3.

Table 1. Irrigated Early October Planted Soft White Winter Wheat. 2007

Entry	Yield ¹	Protein	Test Wt.	Height	Lodging
	bu/A	%	lb/bu	in	%
<i>Parma (planted Oct. 2)</i>					
Goetze	170	11.7	59.0	37	0
ID-D-05	177	12.0	61.7	39	17
ID02-859	160	12.3	58.4	39	26
ID629	145	11.4	61.2	40	34
ID630	152	11.8	61.3	38	20
ID93-64901A	166	11.2	59.7	42	51
ID99-419	151	11.2	58.7	40	52
ID99-435	155	11.9	58.6	44	24
ID99-22407A	162	11.6	59.7	43	50
KWH4010	178	12.3	62.2	40	5
KW3072	126	12.2	61.0	40	4
KWSW023	163	10.8	57.8	44	22
Malcolm	169	11.1	59.4	41	31
ORCF102	162	12.1	60.1	41	20
Stephens	157	11.9	58.3	39	50
Tubbs	171	11.1	59.6	41	10
Tubbs06	161	11.9	58.7	44	46
WB 528	166	11.8	61.1	39	17
Average	161	11.7	59.8	40	32
LSD _{.10} ²	11	0.6	0.9	2.5	18
<i>Weiser (planted Oct. 4)</i>					
Goetze	163	11.7	59.8	32	0
ID629	151	12.4	62.7	36	0
ID630	126	13.1	63.0	32	0
ID99-419	160	11.8	59.9	36	0
ID99-435	145	12.9	59.1	40	0
ID9922407A	157	11.3	61.0	39	0
Malcolm	169	11.6	61.3	36	0
ORCF102	156	12.4	59.8	38	0
Stephens	164	11.8	60.3	35	0
Tubbs	175	11.4	60.0	39	0
Tubbs06	161	12.6	59.3	38	0
WB 528	166	11.6	62.2	37	0
Average	158	12.1	60.8	37	0
LSD _{.10} ²	16	1.0	0.7	2	2

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

Table 2. Irrigated November Planted Soft White Winter Wheat. 2007

Entry	Yield ¹	Protein	Test Wt.	Height	Lodging
	bu/A	%	lb/bu	in	%
<i>Parma (planted Nov. 13)</i>					
Goetze	144	10.8	58.8	35	0.
ID629 waxy)	147	11.6	62.1	41	10
ID630(waxy)	143	12.2	62.3	37	0
ID99-419	153	10.2	60.0	39	0
ID99-435	146	10.5	59.4	42	0
ID9922407A	144	10.4	59.4	42	0
Malcolm	148	10.7	59.1	40	0
ORCF-102	136	11.2	59.5	39	17
Stephens	159	11.2	58.6	39	2
Tubbs	141	10.9	58.4	39	0
Tubbs06	154	10.8	58.4	41	0
WB 528	149	11.0	60.4	37	0
Average	147	10.9	59.4	40	2
LSD _{.10} ²	9	0.4	0.6	1.1	13
<i>Grandview (planted Nov. 21)</i>					
Goetze	60	11.4	57.2	24	0
ID0629(waxy)	55	11.7	59.2	25	0
ID0630(waxy)	48	12.7	58.7	24	0
ID99-419	67	10.2	59.7	26	0
ID99-435	58	10.9	59.0	29	0
ID99-22407A	55	10.7	59.5	28	0
Malcolm	57	11.2	60.0	27	0
ORCF-102	57	11.6	58.4	27	0
Stephens	64	11.2	57.8	27	0
Tubbs	49	11.3	57.4	25	0
Tubbs06	59	11.2	58.7	27	0
WB 528	52	11.7	59.5	24	0
Average	57	11.3	58.8	26	0
LSD _{.10} ²	7	0.6	0.7	2	0

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**. Similarly, **Tubbs**, an OSU release, yields comparable to **Stephens** in early October plantings but less well in later plantings. **Tubbs** is taller than **Stephens**, and milling and baking quality is lower.

Tubbs 06 is a re-selection of **Tubbs** and in limited testing has yielded higher 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. It has not yielded as well as **Stephens** in later plantings.

Simon (ID91-34302A), the latest UI soft white winter release for irrigated systems, has not yielded as well as **Stephens** in 5 years of western Idaho testing.

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 four years, especially in later plantings.

ID629 and **ID630** are waxy spring genotypes that have been tested for two years in fall plantings. They are less productive than released varieties of soft white winter wheat. These lines will likely be licenced if there are food processors interested.

Several other Idaho advanced lines (**ID99-419**, **ID99-435**, and **ID9922407A**) have been evaluated over the last two seasons. Of these, **ID99-419** 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 2007. Both **ID99-419** and **ID99-435** are imazamox tolerant Clearfield lines.

Table 3. Irrigated Soft White Winter Wheat Performance in the Treasure Valley across all 2007 sites.

Entry	Yield	Protein	Test Wt.	Height	Lodging
	bu/A	%	lb/bu	in	%
<i>(4 sites)</i>					
Goetze	134	11.4	58.7	32	0
ID629	124	11.8	61.3	36	10
ID630	117	12.5	61.3	33	5
ID99-22407A	130	11.0	59.9	38	13
ID99-419	133	10.9	58.8	35	13
ID99-435	126	11.6	59.0	39	6
Malcolm	136	11.2	59.9	36	8
ORCF-102	128	11.8	59.7	36	9
Stephens	136	11.5	58.7	35	13
Tubbs	134	11.2	58.9	36	3
Tubbs 06	134	11.6	58.8	38	12
WB 528	133	11.5	60.8	34	4
Average	130	11.5	59.7	36	8
LSD _{.10} ²	5	0.3	0.3	1	6

Goetze is a new OSU release that has been tested for at least two 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 Tables 4-5 that enable direct comparison among the varieties shown.

Entries	October Planted	November Planted
-----bu/A-----		
1996-05		
	(20 sites)	(17 sites)
Brundage	130	128
Malcolm	140	132
Stephens	139	135
LSD₁₀	3	4
2003-06		
	(8 sites)	(7 sites)
Dune	139	137
Malcolm	138	129
ORCF-101	128	125
Simon	133	129
Stephens	139	137
Tubbs	138	131
WB528	136	137
LSD₁₀	6	5
2006-07		
	(4 sites)	(4sites)
Goetze	143	106
ID0629	--	107
ID0630	--	102
ID99-419	144	117
ID99-435	134	111
ID99-22407A	140	111
Malcolm	146	109
ORCF-102	146	108
Stephens	147	117
Tubbs	149	107
Tubbs 06	147	121
WB 528	147	112
LSD₁₀	7	6

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). 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**. Late planted **Tubbs 06**, **WB528** and **Dune** may be exceptions.

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.

Variety	96-05	00-05	03-06	04-07	06-07
-----bu/A-----					
Malcolm	136	137	134	133	127
Stephens	138	139	138	138	132
Brundage	129	130	--	--	--
Tubbs		138	135	134	128
Simon			131	--	--
Dune			138	--	--
ORCF-101			126	--	--
WB528			136	136	130
Goetze					124
ORCF-102				132	133
Tubbs 06					134
ID99-22407A					126
ID99-419					131
ID99-435					122
LSD₁₀	7	4	4	4	4

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 2007 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, 2007

Variety	Yield	Protein	Test wt	Height	Lodging
	bu/A	%	lb/bu	in	%
<i>Parma (planted Oct. 2)</i>					
Hard Reds					
Hoff	143	13.0	61.1	40	29
ID621	146	13.4	61.2	40	51
ID653	112	14.2	62.1	49	56
Moreland	138	12.9	60.7	39	41
Hard Whites					
Darwin	134	14.1	59.7	44	91
Gary	120	13.1	61.3	43	87
Ivory	155	12.7	59.9	41	52
NuHorizon	148	12.2	63.2	42	24
average	137	13.2	61.2	42	54
LSD_{.10}	12	0.9	1.6	3.2	30
<i>Weiser (planted Oct. 4)</i>					
Hard Reds					
Hoff	146	12.9	62.6	38	17
ID621	156	12.7	62.8	36	2
ID653	119	14.1	62.5	43	55
Moreland	147	13.9	61.5	33	0
Hard Whites					
Darwin	127	13.8	63.2	41	25
Gary	119	14.0	60.1	38	67
Ivory	150	12.8	62.6	37	0
NuHorizon	162	13.4	64.8	33	0
average	141	13.5	62.5	38	21
LSD_{.10}	14	1.3	0.8	3	33

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 two of the last three years (2005 and 2007).

Two Idaho advanced lines were evaluated in 2007 at all locations. **ID0621** averaged the highest in yield across all sites including the stressed trial at Grandview. 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 lower yielding, much taller than other varieties and more susceptible to lodging.

M4 is a high protein variety evaluated only in the late plantings. We have little experience with this variety but it does not appear to be adapted to the area. There was significant stand loss of this variety at Grandview.

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) where it yielded higher than **Moreland** and **Hoff** and also had higher protein.

Hard White Winter Wheat

Several hard white winter wheat varieties have been released. 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 in all but the stressed Grandview trial.

Mol and **Mieti** are hard white varieties from AllStar seed. Both are particularly short and yielded lower than **Ivory** and **NuHorizon**. They do not appear to be adapted to the area.

Fall Planted Hard Spring Wheat

We have fall planted spring genotypes for the last sixteen years. 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.

Two hard red spring (**WB 936** and **Sagitario**) and one hard white spring variety (**Lochsa**) were evaluated in the late planted Parma trial (Table 7). Although we have infrequently reduced plant populations of spring genotypes in other trials due to winter kill, winterkill did not occur at this site. **Sagitario**, the shortest of the hard reds did not yield as well as the other two spring genotypes. **WB 936** and **Lochsa** yielded as well as the highest of the hard winter wheat entries. Often, the later the planting, the closer in yield that spring genotypes are to winter wheat of the same market class.

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 arrest grain development. For that reason, fields more prone to late frost should be avoided.

Fall Planted Barley

Winter barley in 2007 was evaluated in the earliest planted trials at Parma and Weiser (Table 8). Winter barley performance over several site years is shown in Table 9. Relatively few winter barley entries were evaluated in the recent past as few new entries were released and barley acreage in western Idaho has significantly declined. Excellent yields were achieved at the two sites in 2007.

Strider, an OSU release with Barley Stripe Rust resistance has excellent 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 four years of testing. The protein in **Maja** may be higher than other barley with comparable

Table 7. Mid November Planted Irrigated Hard Winter Wheat Performance in the Treasure Valley, 2007

Variety	Yield	Protein	Test	Height	Lodging
	bu/A	%	lb/bu	in	%
<i>Parma (planted Nov. 10)</i>					
Hard Reds					
Esperia	133	13.5	60.9	33	0
Hoff	125	12.2	61.6	38	0
ID621	139	12.5	60.4	38	0
ID653	107	13.5	61.5	49	70
M4	114	14.3	69.1	43	27
Moreland	119	12.4	58.5	36	0
Sagitario (s)	122	12.8	60.9	28	0
WB 936 (s)	139	12.7	62.4	36	0
Hard Whites					
Darwin	129	12.7	61.9	46	50
Gary	118	12.1	58.3	44	47
Ivory	142	11.4	60.7	41	0
Locksa (s)	137	12.9	61.1	41	0
Mieti	118	12.7	60.2	27	0
Mol	99	14.6	61.2	31	0
NuHorizon	141	11.9	62.9	37	0
average	126	12.8	61.5	38	13
LSD_{.10}	8	0.5	1.3	2	18
<i>Grandview (planted Nov. 21)</i>					
Hard Reds					
Hoff	47	12.4	61.1	26	0
ID621	57	11.6	60.8	24	0
ID653	47	12.6	60.5	32	0
Moreland	49	13.2	59.5	22	0
M4	29	15.1	57.1	26	0
WB 936 (s)	39	14.4	59.3	22	0
Hard Whites					
Darwin	52	13.3	60.4	32	0
Gary	51	11.8	61.5	31	0
Ivory	46	12.2	60.1	26	0
Locksa (s)	46	13.6	59.5	23	0
NuHorizon	47	12.0	61.9	23	0
average	46	12.9	59.5	23	0
LSD_{.10}	6	0.7	0.4	2	--

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 8. Irrigated Winter Barley Performance in the Treasure Valley, 2007

Variety	Yield	Test wt	Height	Lodging	Thins
	bu/A	lb/bu	in	%	%
<i>Parma (planted Oct. 2)</i>					
<i>Winter</i>					
Charles	168	46.7	37	62	0.8
Maja	205	48.9	43	34	2.7
Strider	180	46.0	43	63	6.5
Sunstar	209	48.6	39	55	6.1
Pride					
<i>Spring</i>					
Herald	138	49.3	48	2	0.8
Idagold	194	51.6	35	32	1.3
Merlin (hl)	162	61.1	37	8	1.0
WB Salute	102	51.0	45	17	1.1
YU599-006	154	50.3	41	0	0.2
02AH684(hl)	117	58.6	46	2	1.0
Average	160	51.4	41	27	2.2
LSD _{.10}	22	1.3	3	20	1.1
<i>Weiser (planted Oct.4)</i>					
<i>Winter</i>					
Charles	163	50.5	29	0	0.6
Maja	196	53.6	29	0	0.6
Strider	202	51.1	29	0	0.7
Sunstar	218	50.9	26	0	2.7
Pride					
<i>Spring</i>					
Herald	121	50.0	31	0	0.8
Idagold	178	54.2	24	0	0.8
Merlin (hl)	139	61.9	27	0	2.7
WB Salute	149	53.7	29	0	1.1
YU599-006	139	50.9	24	0	0.3
02AH684(hl)	129	60.3	31	0	2.0
Average	163	53.7	28	0	1.2
LSD _{.10}	26	0.7	3	--	0.4

Table 9. Irrigated Fall Planted Barley Long Term Yield Performance, 1996-07.

Variety	2004-07	2004-07	2006-07	2007
	-----bu/A-----			
	6 sites	6 sites	4 sites	2 sites
Strider	186	188	166	192
Sunstar Pride	190		176	213
Maja	175		163	201
Idagold (s)	167	171	147	186
YU599-006 (s)	138	132	113	144
Merlin (s)	--	136	117	151
WB Salute (s)	--	127	103	126
Charles	--	--	146	166
Herald (s)	--	--	109	130
02AH684 (s)	--	--	109	123
LSD _{.10}	10	10	13	19

in the past. Of the waxy barley, **YU599-006** has the highest beta-glucan or soluble fiber.

Herald (00Ab1550) is a low phytate barley. **Herald** is the first USDA barley release with the low phytate gene that increases the availability of P in the barley to non-ruminants, reducing the amount of P excreted. **Herald** did not overwinter as well as most other spring barleys.

02AH684 is a high beta-glucan spring barley from the USDA program at Aberdeen. **02AH684** does not have sufficient cold tolerance for fall plantings.

Ultimately, true winter genotype specialty barleys with better winter hardiness are desirable. But they are not currently available.

Dryland Trials

Dryland winter wheat in southwestern Idaho's outlying areas generally is planted in a wheat fallow rotation. Wheat protein was very high in the 2007 dryland nursery at Emmett (Table 10). 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 (four 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 1996-07 period. In more recent testing other varieties have also matched **Stephens** in yield. **Juniper** and **Moreland** in 2007 were the highest in protein while **Buchanan** was the lowest. Dryland test weights are typically higher for hard red winters than soft white winters.

Several spring barley genotypes of interest were included with the fall planted winter barley. Fall planted spring barley did not over-winter well this year as there was significant stand loss for some entries. Consequently yields were considerably lower than winter genotypes.

Idagold, an Adolph Coors 2-row feed barley, was the most productive spring genotype. **YU599-006**, **WB Salute** and **Merlin** (hullless) are waxy spring genotypes appropriate for certain foods. **WB Salute** is particularly susceptible to winterkill. **WB Salute** was marketed to Japan for food in the past year as **Merlin** has

Table 10. Dryland Winter Wheat Performance in Southwestern Idaho.

Variety	Yield			Protein -----2007----- %	Test Weight lb/bu	Height in
	96-06	04-07	2007			
<i>Soft Whites</i>						
Eltan	43	49	40	16.2	59.8	25
Hubbard	--	49	35	16.9	60.0	25
IDO587	--	49	46	17.1	57.0	24
IDO620	--	--	37	16.8	59.2	24
Malcolm	44	47	39	16.7	59.7	28
Simon	--	54	51	16.6	58.6	24
Stephens	42	47	42	17.2	57.5	22
Tubbs	--	51	44	16.7	56.9	25
Tubbs 06		44	44	17.2	57.6	25
Average		45	42	16.8	58.5	24
LSD _{.10}		4	13	0.9	1.0	2
<i>Hard Red and White</i>						
<i>Hard Reds</i>						
Boundary	--	43	35	17.5	58.4	22
Buchanan	44	40	32	16.6	61.2	28
Finley	--	44	46	17.2	62.5	29
Juniper	--	42	41	18.4	62.0	27
Moreland	--	45	25	18.3	58.4	25
Promontory	45	46	31	17.7	58.5	23
Utah 100	44	45	37	17.4	60.7	31
<i>Hard Whites</i>						
Darwin	--		43	17.0	58.2	22
Gary	--	44	44	17.4	61.4	25
Ivory	--	42	42	17.5	57.9	25
Average	44	41	38	17.5	59.9	26
LSD _{.10}	2	4	12	0.5	1.2	2

Hard white winter wheats have been evaluated for the last four years in the dryland trial. **Gary** and **Ivory** yielded with 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 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

Local research indicates that late winter top-dressed urea N is more effective than early fall preplant incorporated urea for winter wheat in 2 out of 3 years, due either to less leaching, denitrification, or immobilization. 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 during 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; phytotoxicity).

ESN, a polymer coated urea and controlled release N fertilizer marketed for corn in the Midwest has potential for significantly delaying N release and reducing immobilization, nitrification, phytotoxicity and excessive growth of wheat. A research trial was conducted in 2006 at Parma and repeated in 2007 to compare the relative performance of ESN and urea dry fertilizers for both preplant and later top-dressed applications to irrigated winter wheat.

Treatments included ESN, urea, or a 50-50 mixture applied preplant incorporated or topdressed in late fall or late winter at rates of 60, 120, or 180 lb N/A. An untreated control was included. The results for 2007 are shown in Table 11. Results for 2006 are available in the

Table 11. Irrigated soft white winter wheat response to N source, rate, and timing. Parma, 2007.

N Fertilizer	Application Timing			Yield	Protein	Test weight lb/bu	Height in	Grain N lb/A
Control	--	--	--	117	8.7	58.6	36.3	108
Urea	60	--	--	138	9.5	58.8	36.8	139
ESN	60	--	--	155	10.1	59.4	37.6	166
Mix 50-50	60	--	--	152	9.7	58.4	38.9	157
Urea	120	--	--	156	10.2	58.8	38.1	171
ESN	120	--	--	177	11.3	59.4	38.4	211
Mix 50-50	120	--	--	168	10.9	59.4	38.3	194
Urea	180	--	--	164	10.9	59.2	38.8	191
ESN	180	--	--	183	12.0	60.0	39.0	234
Mix 50-50	180	--	--	166	11.3	59.6	37.2	200
Urea	--	60	--	138	9.3	58.6	37.4	138
ESN	--	60	--	146	10.1	58.9	35.9	157
Mix 50-50	--	60	--	152	9.8	58.7	36.7	158
Urea	--	120	--	164	10.2	58.9	38.9	177
ESN	--	120	--	158	10.7	59.8	37.1	180
Mix 50-50	--	120	--	158	11.5	58.0	37.9	191
Urea	--	180	--	178	10.9	58.7	38.5	206
ESN	--	180	--	178	11.5	60.1	36.9	218
Mix 50-50	--	180	--	172	11.2	59.8	37.9	205
Urea	--	--	60	155	10.0	58.7	37.4	165
ESN	--	--	60	142	10.2	59.6	36.6	155
Mix 50-50	--	--	60	143	10.1	59.4	38.2	153
Urea	--	--	120	178	11.0	59.2	37.8	209
ESN	--	--	120	163	11.3	60.0	37.6	194
Mix 50-50	--	--	120	161	10.8	59.6	36.6	185
Urea	--	--	180	178	11.2	59.6	37.8	205
ESN	--	--	180	170	11.9	58.2	37.1	215
Mix 50-50	--	--	180	172	11.7	60.2	38.4	214
			CV	7	6.1	2.0	3.6	9
			LSD _{.10}	14	0.8	1.3	1.6	20

Cereal Sentinel newsletter issue 43 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 our previous research. Among preplant incorporated treatments, the ESN was consistently higher yielding than preplant urea by 17-19 bu/A. Protein concentrations were also higher for preplant ESN at the two highest N rates than for preplant urea. The total protein N in harvested grain ranged from 25 to 43 lb/A higher for ESN than urea.

For both urea and ESN the highest N rate was necessary to maximize yield.

In contrast to preplant incorporated N, with late winter topdressings, ESN was lower yielding than conventional urea at the lower N rates. 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. Plant heights were typically taller with late winter topdressed urea at the highest N rates, but test weights were lower than with ESN at the highest N rate. Protein concentrations for fall or late winter topdressed

fertilizers did not differ appreciably although they consistently averaged higher for ESN.

Although this trial involved a soft white winter wheat variety, the results have implications for hard red or hard white winter wheat. Winter genotypes in other market classes would likely respond similar to Stephens wheat to the same treatments. Considering that the protein for preplant ESN ranged up to 1.1% 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.

Unlike 2006, yields did not decrease with urea at the highest N rate for some applications. Otherwise the results for 2007 were quite similar to 2006. The slow release N was the superior preplant choice and urea was the better topdressing in late fall or late winter.

The cost of ESN will be a few cents a pound higher than dry urea. The ESN applications that would have been cost effective in this trial (assuming costs are 10 cents per lb of N higher for ESN) were those involving preplant N. Moderate N rates in late fall or late winter would not have paid for the extra costs of the slow release N if topdressed.

Given the results for the late fall applications, ESN would have little advantage for early fall planted wheat that was late fall topdressed with N. 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 at least as effective as preplant urea depending on the N rate. The reduced effectiveness of topdressed ESN may be related to rapidly drying soil surfaces that reduce the diffusion of urea from the ESN granule.

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

Wheat after Wheat

As this issue was being prepared, Portland prices for soft white wheat were well over \$10 a bushel. Forward contracts for 2008 were well over \$6 a bushel. These prices have significant implications for the coming crop year. Throw in the uncertainty of irrigation water for full season crops and you have the makings for vastly increased wheat acreage in 2008.

Wheat after Wheat

While two years of wheat before potatoes is common in eastern Idaho, wheat after wheat occurs much less frequently in western Idaho. That may change this year with considerably more wheat after wheat given the market and water scenario.

Perhaps 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 building up in the previous crop, are promulgated even more in the volunteer wheat, and then are poised to infect the newly planted wheat for 2008. 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.

This 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.

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. Also, 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.

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 probably minimal.

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 if we don't replenish our reservoirs with sufficient runoff this fall, winter, and spring. 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.

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. I have no 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. If our wheat ever required treatment, it would be after a previous wheat crop.

Triticale Forage P Uptake and N

Dairymen use boot stage triticale followed by silage corn to increase forage and total annual P removal. The P removal is important because their manuring rates are frequently limited by the amount of P removed. Last year I reported (*The Cereal Sentinel* Issue 42 and 45) the boot stage triticale forage production and phosphorus uptake results from preplant incorporated and winter topdressed N at low and high available P. Briefly, preplant N consistently increased forage biomass and P uptake more than late winter topdressed urea, consistent with our understanding that preplant N promotes vegetative growth more than it does grain yield. While greater vegetative growth may be detrimental for the production of grain, it is essential for maximizing forage production and phosphorus (P) removal. The results for 2007 are reported here.

Optimum N for forage production was only 60 lb N/A. Phosphorus removal was highest at N rates higher than were necessary for forage yield (Fig. 12).

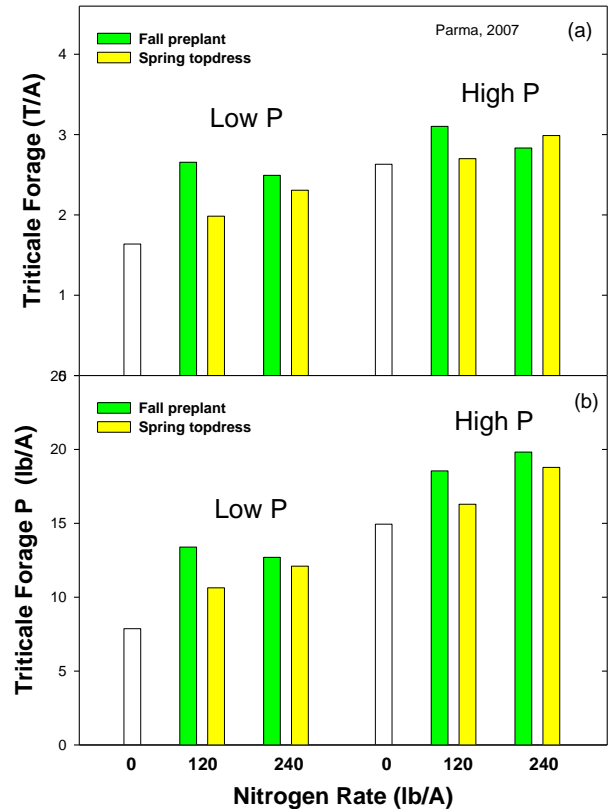


Figure 12. Boot stage winter triticale forage yield and P content as affected by N rate and timing of application. Parma, 2007.

Maximizing P removal under high P conditions appears to require more N than is required for maximizing forage yield. Increased P uptake with higher N was due primarily to increased forage P concentrations.

Similar to 2006, the timing of N application was not as critical for P removal as for forage production under limited P conditions. But with high P, moderate rates of fall preplant N resulted in higher P removal than with late winter topdressed N. The greater P uptake with fall preplant N was due primarily to increased forage production rather than higher forage P concentrations.

Relative forage yield (percent of maximum) is related to protein concentrations (Fig. 13). Maximum forage yield was associated with a minimum of 11% forage protein regardless of the available P present. Protein increased beyond 11% with N rates above 120 lb/A but forage yields peaked between 10 and 11% protein.

Triticale can accumulate excessive nitrates under some stress conditions with high available N. Triticale forage nitrates in this study measured as high as 890 ppm with the highest N rate (300 lb N/A) under non-stressed

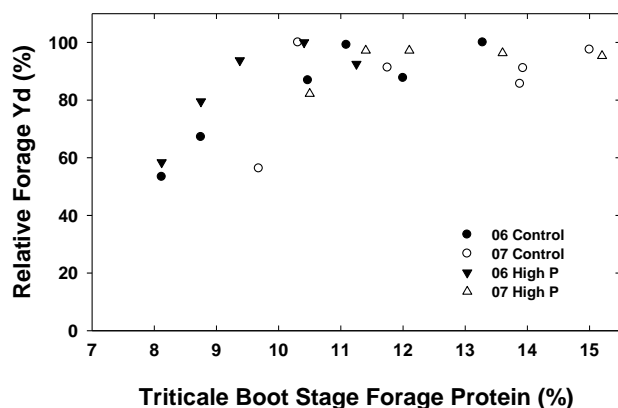


Figure 13. Boot stage triticale forage relative yield (% of maximum) as related to forage protein in 2006 and 2007.

conditions. These levels are not likely a problem for most livestock particularly if fed with other forages.

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.

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