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The Cereal Sentinel

A newsletter for Treasure Valley cereal producers

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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)**

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Spring Cereal Variety Performance

The 2008 season marked the 22nd season of the Southwest Idaho Cooperative Extension Variety Performance Trials for spring cereals. The trials, supported by the **Idaho Wheat Commission**, **Idaho Barley Commission**, private breeders, and the **UI College of Agriculture and Life Sciences**, allow the testing of public and proprietary varieties and advanced lines under the irrigated conditions of the Treasure Valley.

Three irrigated spring wheat and one spring barley trials were conducted during the 2008 season. Trials were located at the Parma R & E Center, Weiser, and Kuna. The Parma trial was planted March 19, Weiser on March 25, and Kuna on March 12. Plant heights were lowest at Kuna but the site yielded as well as the other sites. Protein was highest and test weight the lowest at Weiser. Lodging of wheat was minimal at all locations.

There was no stripe rust in 2008, unlike 2005. As with any variety comparison, the more years and sites varieties can be compared over, the more reliable the information.

Soft White Spring Wheat

The 2008 results for soft white spring wheat varieties are shown in Tables 1and 2. Several soft white spring releases offer not only increased yield but significant improvements in milling and/or baking quality over the commonly grown **Penawawa**. P**enawawa**, is an early maturing, older release that tends to be higher in protein, and lower in test weight with very poor milling and baking quality. It was susceptible to stripe rust in 2005 and with stripe rust yielded significantly less than **Alturas** and other stripe rust tolerant varieties. In 23 trials over an eight year period, **Penawawa** yielded 7 bu/A less than **Alturas. Penawawa,** though an acceptable feed wheat, is not a preferred variety for milling or export.

Alturas (ID0526) is a high yielding, high quality Idaho release that has performed very well since its introduction. **Alturas** was the most productive variety evaluated from 1999-06 and averaged the highest in yield from 2005 to 2007. **Alturas** is slightly taller than **Penawawa** but lodging was similar. Test weight for **Alturas** is slightly lower than **Penawawa**.

Table 1. Soft White Spring Wheat Performance in the Treasure Valley. 2008.

Variety	Yield	Protein	Test Weight	Height	Lodging
	bu/acre	%	lb/bu	in	%
		Parma			
Alturas	114	9.5	60.5	36	0
Cataldo	104	10.2	60.3	34	0
IDO629	113	10.2	61.8	39	0
IDO630	102	10.2	61.2	35	0
IDO645	116	9.3	61.7	37	0
Jubilee	113	9.3	61.7	38	0
WB Nick	102	9.5	61.1	36	0
Penawawa	115	9.2	61.3	36	0
PenawawaX	115	9.9	60.8	36	0
Pettit	107	9.1	60.4	31	0
Average	110	9.7	61.1	36	0
$LSD_{.10}$[1]	10	0.6	0.4	2	0
		Weiser			
Alturas	111	11.9	59.5	38	0
Cataldo	111	12.4	59.4	36	0
IDO629	98	12.4	58.6	38	0
IDO630	101	13.2	58.4	36	0
IDO645	124	12.4	61.6	40	0
Jubilee	111	12.3	59.9	39	0
WB Nick	113	12.8	59.5	38	0
Penawawa	102	13.6	58.3	38	2
PenawawaX	103	13.3	59.1	35	13
Pettit	120	11.6	61.6	31	0
Average	109	12.6	59.6	37	1
$LSD_{.10}$	11	0.9	1.8	2	10
		Kuna			
Alturas	113	10.0	60.7	35	0
Cataldo	108	10.4	61.3	33	0
IDO629	114	10.5	60.8	35	0
IDO630	109	10.7	61.8	33	0
IDO645	118	9.4	62.2	33	0
Jubilee	109	9.6	62.0	35	0
WB Nick	117	10.0	61.3	35	2
Penawawa	117	10.1	61.7	34	0
PenawawaX	111	10.2	61.0	32	0
Pettit	128	9.4	61.8	32	0
Average	114	10.0	61.5	34	0.2
$LSD_{.10}$	8	0.4	0.9	1	1

[1] Means must differ by more than the LSD to be statistically different.

Table 2. Soft White Spring Wheat Performance in the Treasure Valley over several sites or years.

Variety	Yield	Protein	Test Weight	Height	Lodged
	bu/acre	%	lb/bu	in	%
2008 (3 sites)					
Alturas	113	10.5	60.3	36	0
Cataldo	108	11.0	60.3	35	0
IDO629	108	11.0	60.4	37	0
IDO630	104	11.4	60.5	35	0
IDO645	119	10.4	61.8	37	0
Jubilee	111	10.4	61.2	37	0
WB Nick	111	10.8	60.6	36	1
Penawawa	112	11.0	60.5	36	1
PenawawaX	110	11.2	60.3	34	4
Pettit	119	10.0	61.3	31	0
Average	111	10.8	60.7	35	1
$LSD_{.10}$[1]	6	0.4	0.7	1	3
2006-2008 (9 sites)					
Alturas	112	10.3	60.9	35	1
Cataldo	105	11.2	60.9	33	0.3
IDO629	108	11.2	60.9	36	1
IDO630	106	11.5	61.5	33	1
IDO645	116	10.6	61.9	36	4
Jubilee	109	10.7	61.5	36	1
WB Nick	110	10.9	61.6	35	4
Penawawa	107	11.0	61.3	34	1
Pettit	114	10.0	61.3	29	1
Average	110	10.8	61.3	34	1
$LSD_{.10}$	4	0.3	0.5	1	2
2005-2007 (8 sites)					
Alturas	117	10.3	61.5	36	2
Jubilee	101	10.9	60.7	37	2
Penawawa	103	11.0	61.3	34	1
Pettit	115	9.8	61.6	30	2
WB Nick	115	10.8	62.2	36	4
Average	110	10.6	61.5	34	2
$LSD_{.10}$	4	0.4	0.5	1	3
1999-2006 (23 sites)					
Alpowa	100	11.1	63.1	37	11
Alturas	111	10.6	62.5	35	12
Jubilee	106	10.8	62.8	37	12
Penawawa	104	11.2	62.7	35	13
Average	105	10.9	62.8	36	12
$LSD_{.10}$	3	0.2	0.3	1	4

[1] Means must differ by more than the LSD to be statistically different.

Alturas showed good resistance to stripe rust prevalent in 2005.

Jubilee lacks stripe rust resistance, but in the absence of stripe rust (2006-08) has been nearly as productive as **Alturas.** It is slightly taller than **Alturas** with better test weight.

Pettit (ID0632) is a relatively new UI release that is short, averaging 6 inches shorter than **Alturas**. **Pettit** in four years of testing has yielded as well as **Alturas** and **WB Nick**. It also has low protein, similar to **Alturas** and lower than **WB Nick**.

WB Nick yielded as well as **Alturas** in the last four years of testing and frequently has better test weight. It is similar in height to **Alturas** and taller than **Pettit**.

Cataldo (ID0642) is a 2007 Idaho release for northern Idaho with resistance to Hessian fly. It does not yield as well as **Alturas, Pettit,** or **WB Nick** in the Treasure Valley**.**

ID0645 is an Idaho advanced line that yielded as well as **Alturas** over the last three years of testing. The protein, height, and test weight are higher for **ID0645** than **Alturas**. **ID0645** may be more susceptible to lodging than **Pettit** or **Alturas.**

Two Idaho waxy spring wheat varieties, **ID0629** and **ID0630**, yielded comparable to **Penawawa** from 2006 through 2008. **Penawawa X** is a waxy derivative of **Penawawa** than has been evaluated only in one year. Waxy wheats such as these should not be grown and mixed with other soft wheat because it does not have the same functionality when baked.

Hard Red Spring Wheat

Hard red spring varieties are evaluated because of their historically higher prices and potential for greater returns. Results for hard red spring wheat are given in Tables 3 and 4.

WB936 is the most commonly planted hard red spring wheat in Idaho. Historically it has good yield potential, comparable to **Jefferson** and **Jerome**. **WB936,** like **Jerome,** is susceptible to stripe rust. It has higher protein than **Jerome** and good milling and baking quality.

Jefferson, a release from the UI breeding program at Aberdeen, has yielded as well as **WB936** over several years of testing, but less than **Jerome**. **Jefferson** is taller than **WB936** and **Jerome** and can be more susceptible to lodging. It has protein comparable to **WB936** with excellent milling yield and good baking quality. It was tolerant of stripe rust in 2005. **Jefferson** has better test weight than **WB936**.

Table 3. Hard Red Spring Wheat Performance in the Treasure Valley. 2008.

Variety	Yield	Protein	Test Weight	Height	Lodged
	bu/acre	%	lb/bu	in	%
			Parma		
Dannyboy	100	12.3	58.4	35	0
Jefferson	101	12.2	61.7	37	0
Jerome	107	12.2	61.8	35	0
WB 936	99	12.6	61.3	32	0
Winchester	99	12.4	62.3	36	0
Average	101	12.3	61.1	35	0
$LSD_{.10}$[1]	9	0.3	0.7	2	0
			Weiser		
Dannyboy	97	14.4	54.6	37	0
Jefferson	102	13.9	59.6	38	15
Jerome	106	13.8	59.2	36	0
WB 936	113	14.1	58.7	34	0
Winchester	107	14.0	60.8	38	0
Average	105	14.1	58.6	37	3
$LSD_{.10}$	8	0.3	2.0	2	17
			Kuna		
Jefferson	108	12.9	61.9	35	3
Jerome	101	13.0	60.1	33	0
WB 936	106	13.4	59.6	32	0
Winchester	99	13.1	61.5	33	0
Average	104	13.1	60.8	33	1
$LSD_{.10}$	13	0.5	1.7	1	3

[1] Means must differ by more than the LSD to be statistically different.

Jerome (ID0566) is an Idaho release with good yield potential in the absence of stripe rust. **Jerome** has excellent test weight, better than **WB936**, and is slightly taller than **WB936**. **Jerome** has excellent milling yield, mixing tolerance and very good baking quality. **Jerome** has lower protein than both **WB936** and **Jefferson**. **Jerome** may be less tolerant of moisture stress during stem elongation than **Jefferson**.

Winchester is an Idaho release for rainfed northern Idaho. It does not yield as well in the Treasure Valley as the better adapted varieties. Protein, height, and test weight are similar to **Jerome**.

Dannyboy is a Helena Chemical variety evaluated for the first time in 2008. It has lower test weight than other varieties tested.

Table 4. Hard Red Spring Wheat Performance in the Treasure Valley over several sites or years.

Variety	Yield	Protein	Test Weight	Height	Lodged
	bu/acre	%	lb/bu	in	%
			2008 (3 sites)		
Jefferson	104	13.0	61.1	36	6
Jerome	105	13.0	60.4	35	0
WB 936	106	13.3	59.9	33	0
Winchester	102	13.2	61.6	36	0
Average	104	13.1	60.7	35	1
$LSD_{.10}$[1]	8	0.2	0.9	1	6
			2006-2008 (9 sites)		
Jefferson	100	13.2	61.9	35	4
Jerome	106	12.9	62.0	33	0.3
WB 936	104	13.4	61.4	31	0
Winchester	97	13.1	62.2	34	1
Average	102	13.1	61.9	33	1
$LSD_{.10}$	4	0.3	0.5	1	3

[1] Means must differ by more than the LSD to be statistically different.

Forward contract prices for hard red spring wheat were considerably higher than soft whites as of this printing. Consequently there may be renewed interest in planting this market class in the coming weeks.

As many know, significant discounts can result with hard red spring protein below 14%. Producing irrigated hard spring wheat with 14% protein is always a challenge, particularly for furrow irrigated fields. The protein levels for the hard reds in two of the three sites in 2008 (Parma and Kuna) are typical of the protein that results when additional N is not applied for protein enhancement.

The hard red springs are typically about 5% less productive than the soft whites. They are more comparable in yield under more stressful conditions, i.e. later plantings.

For a detailed discussion of N management issues related to hard wheat protein you can access on-line the Cooperative Extension publication PNW 578, "**Nitrogen Management for Hard Wheat Protein Enhancement**" at http://info.ag.uidaho.edu/pdf/pnw/bul578.pdf. The publication is also available as a hard copy from Ag Publications (phone 208/885-7982, fax 208/885-4648, email: calspubs@uidaho.edu.)

Table 5. Hard White Spring Wheat Performance in the Treasure Valley. 2008.

Variety	Yield	Protein	Test Weight	Height	Lodged
	bu/acre	%	lb/bu	in	%
			Parma		
Lochsa	105	12.1	61.4	36	0
Lolo	110	11.7	63.5	39	0
Otis	112	11.8	63.1	41	0
Average	109	11.9	62.7	38	0
$LSD_{.10}$[1]	11	0.3	0.3	1	0
			Weiser		
Lochsa	107	14.3	58.2	37	0
Lolo	104	13.6	60.1	38	19
Otis	100	13.8	60.0	42	0
Average	104	13.9	59.4	39	6
$LSD_{.10}$	7	0.6	1.2	2	30
			Kuna		
Lochsa	116	13.2	60.9	35	0
Lolo	108	12.8	61.8	36	0
Otis	117	12.7	62.5	39	0
Average	114	12.9	61.7	37	0
$LSD_{.10}$	16	0.3	1.7	1	0

[1] Means must differ by more than the LSD to be statistically different.

Table 6. Hard White Spring Wheat Performance in the Treasure Valley over several sites or years.

Variety	Yield	Protein	Test Weight	Height	Lodged
	bu/acre	%	lb/bu	in	%
			2008 (3 sites)		
Lochsa	109	13.2	60.2	36	0
Lolo	108	12.7	61.8	37	6
Otis	110	12.8	61.9	41	0
Average	109	12.9	61.3	38	2
$LSD_{.10}$[1]	8	0.2	0.9	1	9
			2005-2008 (11 sites)		
Lochsa	109	13.2	61.0	35	0.2
Lolo	110	12.3	62.7	36	5
Otis	110	12.5	62.3	40	2
Average	110	12.7	62.0	37	2
$LSD_{.10}$	4	0.3	0.4	1	4

[1] Means must differ by more than the LSD to be statistically different.

Hard White Spring Wheat

Hard white spring wheat (HWS) is a different market class from the soft white and hard red classes. Hard whites are used for both noodle and bread making depending on the variety and protein level.

Hard whites have potential for re-capturing significant foreign bread and noodle markets, as well as satisfying an increasing demand for hard white wheat domestically. Southern Idaho and Utah mills are currently milling hard white wheat and significant quantities are now marketed to domestic mills east of the region. Variety Preserved hard white wheat is contracted in southern Idaho at prices above hard red winter wheat.

Lolo, a UI release, has good yield potential but is lower in protein than **Lochsa** and has weaker straw. Test weight is higher than **Lochsa**.

Otis (WA7931), a 2004 WSU release, has been evaluated for the past five years. **Otis** has protein and test weight similar to **Lolo**. It is 3-5 inches taller than the other entries but has excellent straw strength. It is comparable in yield to **Lochsa** and **Lolo**.

Lochsa (ID0597), a recent Idaho release, was comparable in yield to **Otis** and **Lolo** but higher in protein than both **Lolo** or **Otis**. **Lochsa** was similar in height but has better straw strength than **Lolo**. It has lower test weight than **Lolo** or **Otis**.

Producers are reminded that co-mingling soft white and hard white wheat will destroy the value of the mix for food uses, a sure way to lose domestic and export markets. Growers are urged to grow hard whites only if they have a ready market and can insure the segregation of hard whites from soft whites. This is perhaps the greatest concern with large scale hard white production in a traditional soft white production area such as western Idaho. There are currently very limited local hard white markets in the Treasure Valley.

Spring Barley

The Southwest Idaho Cooperative Extension Variety Performance trials have evaluated barley varieties and advanced lines since 1987. Only one Extension spring barley nursery is now grown in western Idaho due to reduced Idaho Barley Commission funding. Spring barley variety performance is presented in Tables

Table 7. Six-Row Spring Barley Variety Performance in the Treasure Valley over several sites and years.

Variety	Yield	Test Weight	Height	Lodged	Thins
	bu/acre	lb/bu	in	%	%
Parma 2008 (1 site)					
Aquila	118	54.1	33	0	0.61
BG006	96	50.1	24	0	0.39
Creel	135	52.4	34	0	1.10
Goldeneye	138	53.8	32	0	0.62
Millenium	127	50.7	31	0	1.38
Nebula	115	49.5	26	0	0.55
Average	122	51.8	30	0	0.78
$LSD_{.10}$[1]	16	0.7	2	0	0.19
2007-2008 (3 sites)					
Aquila	137	53.9	36	3	1.14
Creel	134	50.7	38	42	2.14
Goldeneye	141	52.4	36	38	1.07
Millenium	152	50.7	35	13	1.75
Nebula	146	49.9	29	0	0.54
BG006	127	49.4	28	3	0.61
Average	140	51.2	34	17	1.21
$LSD_{.10}$[1]	12	0.7	1	15	0.66
2004-2008 (9 sites)					
Creel	142	51.1	38	50	4.03
Millenium	154	51.1	35	14	3.67
Nebula	145	49.7	30	14	1.88
Average	147	50.6	34	26	3.19
$LSD_{.10}$	5	0.5	1	9	0.57

[1] Means must differ by more than the LSD to be statistically different.

7 and 8. Barley stripe rust was not evident this past season at Parma.

Six-Row Varieties

Millenium, a Utah State release, was evaluated for the eighth year in 2008. It is 2 to 3 inches shorter than **Steptoe** with far superior straw strength and lodging resistance**. Millenium** has better yield potential and test weight than **Steptoe** under good management. **Millenium** ranked highest in yield over the 2004-2008 period averaging 9 bu/A higher than **Nebula** and 12 bu higher than **Creel**. **Millenium** has excellent test weight for a six row.

Creel, a 2002 USDA release, is shorter with improved straw strength over **Steptoe** and better test weight. **Creel** tends to be lower yielding than **Nebula**, and consistently yields less than **Millenium**. **Creel** lodges more than **Millenium** and **Nebula.**

Nebula is a Westbred variety, very short, with excellent lodging resistance. It has lower test weight than **Millenium** and comparable to the poor test weight of **Steptoe**. Both **Nebula** and its waxy offspring **BG006** do not do as consistently well as **Millenium**.

BG006 is a six row hulled waxy barley that is very similar to **Nebula** but does not yield as well as **Nebula**. **BG006** is a high beta-glucan variety with potential for food use.

Goldeneye and **Aquila** are Utah State releases and both have excellent test weight for six row barley. Both are taller than **Millenium** but shorter than **Creel**. **Goldeneye** is taller than **Millenium** with weaker straw. **Aquila** has excellent test weight and lodging resistance**,** but did not yield as well as **Millenium**.

Two-Row Varieties

With better tolerance to stripe rust, moisture stress, and improved lodging resistance, the better two row varieties can now be expected to be more productive than some of the older six row barleys produced in western Idaho.

Idagold, an Adolph Coors feed barley release, has excellent yield potential and better straw strength than older two rows. **Idagold** is six to seven inches shorter than **Baronesse,** the most commonly grown two row feed barley in Idaho. **Idagold** has yielded better than **Steptoe** in many trials where lodging was significant.

Radiant, a 2004 WSU release, is considerably taller and lodges more but yielded about as well as **Idagold** over five years of testing. **WA10701-99**, a WSU advanced line, is also quite tall and has not yielded as well as **Radiant**.

Spaulding is a PB1 release that has only been evaluated in two sites. It is taller than **Idagold** and more susceptible to lodging and when lodging is significant it yielded less than **Idagold**. **Spaulding** has excellent test weight.

Champion is a Westbred release evaluated for the first time in 2008. It yielded very well at the one location at Parma, averaging as high as the best six row. **Champion** is similar in height to **Radiant** but appreciably taller than **Idagold**. **Champion** has excellent test weight.

Waxy barley's were evaluated again in 2008. **Salute** and **Merlin** are Westbred varieties. **Merlin** has very good barley straw strength and is as short as **Idagold**. **Merlin** yields less than **Idagold** in part because it is

hulless. Test weight of **Merlin** is high also because it is hulless.

Salute is considerably taller than **Merlin** but lodges more and yields less despite being a hulled barley. Salute production was contracted in northern Idaho in 2008 and marketed to Japan as a food barley.

Additional Variety Performance Information

Variety performance information from related areas is available from other extension cereal and research breeding program web sites including the following: OSU (http://www.css.orst.edu/cereals), USU (http://wheat.usu.edu), WSU (http://variety.wsu.edu/) and UI (http://www.ag.uidaho.edu/scseidaho/).

Alternative N for Hard Spring Wheat Protein

There is currently a considerable difference in hard red spring (HRS) and soft white prices ($2.00 - 2.40 per bushel) which will likely sustain the interest in HRS. Producing hard wheat with acceptable protein is always a challenge in irrigated production, especially with furrow irrigation

Effective N management is critical for avoiding low protein discounts in either HRS or hard white spring wheat (HWS) that is contracted in southern Idaho. More N is needed for both yield and higher protein than is needed for just yield. This can lead to foliar or dry applications that are excessive and overwhelm the plant's tolerance, either by causing leaf burn, lodging, or other mechanisms.

Topdressed N is commonly used to bolster late season N availability and increase protein. These can be less effective if volatile losses of N are excessive. This is particularly true for furrow irrigated wheat when precipitation does not adequately move urea N into soil.

Our previous research (3 years) with slow release N (ESN®) applied preplant indicated it was a safer material than urea. Yield and protein were comparable with ESN® to urea applied in split application, when 60 lb of the total urea N applied was topdressed at heading. Preplant urea was clearly less effective than split applied urea in those trials for hard wheat protein.

Since those trials were reported in the ***Cereal Sentinel*** (Issue 47) we have gained experience with other marketed enhanced fertilizers used either as preplant incorporated, as later topdressed N, or foliar applied solutions. Trials with HWS were conducted in both 2007 and 2008. Not all fertilizers were evaluated in both years.

The focus of the recent trials was the additional late season available N (generally 30 or 60 lb applied N per acre) needed for increasing protein and the materials that might best provide that N. Therefore we wanted to minimize late season N effects on yield. Consequently, sufficient N was uniformly preplant incorporated (100 lb urea N per acre) to satisfy all or most of the N required for yield.

Table 8. Two-Row Spring Barley Variety Performance in the Treasure Valley over several sites and years.

Variety	Yield	Test Weight	Height	Lodged	Thins
	bu/acre	lb/bu	in	%	%
Parma 2008 (1 site)					
Champion	145	55.6	35	0	0.71
Idagold	137	53.6	28	0	0.92
Merlin	114	61.2	24	0	1.86
Radiant	136	54.6	35	0	1.48
Salute	127	54.5	34	0	0.58
Spaulding	137	55.5	33	0	0.91
WA 10701-99	123	50.6	37	0	0.78
Average	131	55.1	32	0	1.03
$LSD_{.10}$[1]	17	0.6	3	0	0.66
2006-2008 (5 sites)					
Idagold	136	52.0	29	21	2.59
Merlin	124	60.9	28	11	3.14
Radiant	130	53.2	36	44	3.13
Salute	107	53.3	38	36	1.42
WA10701-99	118	51.6	38	47	1.92
Average	123	54.2	34	32	2.44
$LSD_{.10}$	8	0.6	1	11	0.68
2004-2008 (9 sites)					
Idagold	138	51.9	30	30	4.59
Radiant	135	53.1	37	51	5.00
Average	137	52.5	34	41	4.80
$LSD_{.10}$	7	0.6	1	7	0.78

[1] Means must differ by more than the LSD to be statistically different.

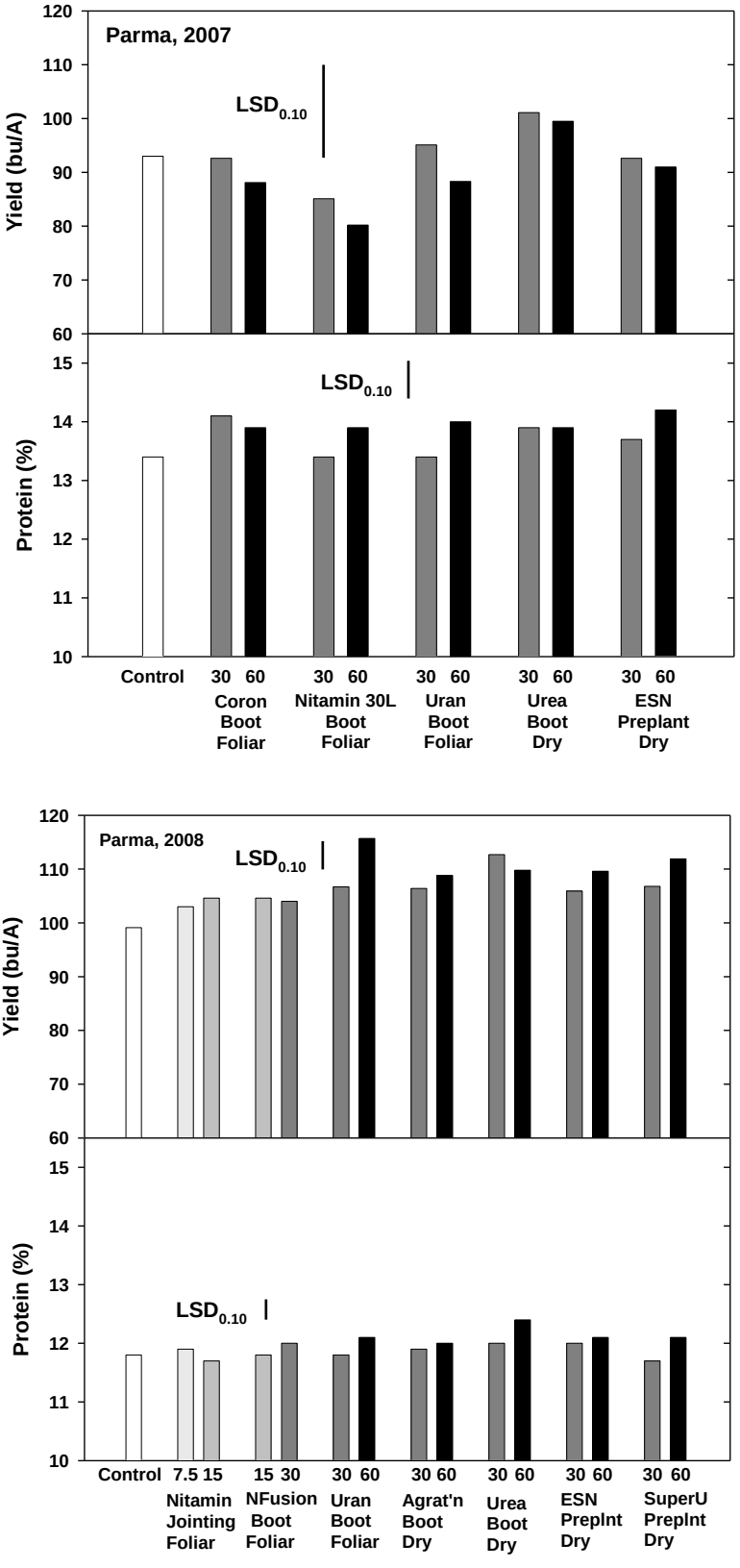

Figure 1. Otis hard white spring wheat yield and protein as affected by enhanced N fertilizers applied for increasing protein at Parma in 2007 (top) and 2008 (bottom).

SuperU® was applied preplant and compared with either later dry topdressed N (urea or Agrotain treated urea) at heading, or foliar applied N products (Nitamin, Coron, NFusion,or uran). The results for yield and protein are shown in Figure 1. There was no lodging with any treatment in 2007 or 2008. Residual available N to a depth of two feet prior to a basal uniform urea application measured 170 lb N/A in 2007 and much less in 2008, about 75 lb/A.

We could not show yield differences relative to the control with any confidence in 2007 due to variability within the trial area. But yield increased from 5 to 16% with the additional 60 lb N/A in 2008. Averaged across N rates, yields increased 3.9, 5.5, 8.0, and 12.0 bu/A for N rates of 7.5, 15, 30 or 60 lb N/A in addition to the 100 lb N/A applied broadcast preplant. Yields in 2008 increased about 0.2 bu per lb of N applied above the basal rate of 100.

Foliar applied N solutions in 2007 caused significantly leaf burn at the 30 lb rate (20 to 40% of leaf area) and even more at the 60 lb rate (43 to 80% of leaf area). For the foliar N treatments, yields averaged from 4.7 to 12.8 bu/A less with the 60 lb rate compared to the control. In 2008 leaf burn at the same N rates was considerably less and did not appear to affect yield.

Protein was considerably higher in 2007 but yields tended to be lower in 2007 than 2008. Protein was affected by the additional N treatments in 2007 relative to the control. Protein increased from 0.5 to 0.8% with the 60 lb rate in 2007. The protein increase in 2008 was marginal at the same N rate, ranging from 0.2 to 0.6% . Enhanced N fertilizers generally did not differ in protein at the same N rate.

Plants were taller in 2007 than 2008 but plant height and test weight were not affected by the enhanced fertilizer N materials.

We did not find an advantage in yield or protein with any of the enhanced N fertilizers relative to the conventional late topdress of urea N in 2007 or 2008. However, many were as effective or nearly so and may enable the additional N to be applied with other broadcast or tank mixed applications to save the cost of topdressing separately.

Enhanced fertilizer N is more costly than conventional urea, and the per unit N price differs for each one. The results thus far suggest that using

the enhanced fertilizer N materials will not justify costs that much exceed the costs of a conventional topdressing. The study will be continued in 2009.

Spring N Fertilization

Nitrogen prices are considerable below what they were this past season. However, wheat market prices are also lower. For maximum economic returns, nitrogen fertilizers need to be used judiciously. Yield can be reduced from both not enough and too much available N.

Knowing the residual N in soil is essential for optimizing the effectiveness of applied N. Our research shows that late winter or early spring measured available N is at least as useful as fall measured available N for predicting the N required.

The most accurate measures of available nitrogen for wheat or barley or corn and most crops will include sampling the second foot. Our research indicates that the late winter applied N required per bushel of wheat produced is about 0.3 lb per bu less for spring measured available N than early fall measured N for wheat that is well established. The nitrogen fertilizer required per bu for winter wheat with a spring measurement of available N ranged from 1.2 to 1.5 lb N per acre.

Urea topdressed at high N rates can be detrimental even in the absence of lodging. If fertilizer applications are upwards of 150 lb per acre consider applying the nitrogen in split applications, for example through the sprinklers. Additional split N can be applied with the herbicide application as well to reduce the high one-time application rates. Foliar application rates above 30-40 lb N/A can cause foliar burn. Flag leaves burned can reduce yield by limiting photosynthesis during grain filling

UI Extension publications related to spring fertilization of irrigated winter and spring wheat or winter barley are available in the Ag Publications Catalog as listed below:

Southern Idaho Fertilizer Guide -Irrigated Spring Wheat. Idaho Cooperative Extension System. CIS No. 828.

Southern Idaho Fertilizer Guide - Irrigated Winter Barley. Idaho Cooperative Extension System. CIS No. 1082.

Southern Idaho Fertilizer Guide - Irrigated Winter Wheat. Idaho Cooperative Extension System. CIS No. 373.

The URL for the catalog is http://info.ag.uidaho.edu/catalog/catalog.html.

Seed Banded N

Due to security concerns, few major suppliers will no longer manufacture ammonium nitrate (AN) fertilizer. Ammonium nitrate, with only half the ammonic N content of ammonium sulfate or urea, was historically a favored seed banded N source for crops due to its reduced potential for seed damage or phytotoxicity. Higher N rates could be seed-banded using AN so it facilitated single pass seeding and fertilization, especially in dryland systems where the amount of N needed was relatively low anyway.

Seed-banded N at seeding effectively reduced field traffic in wetter soils and fuel expenses. In addition, preplant incorporated N helped distribute the workload in addition to minimizing volatile N losses from the soil surface.

There is need for N fertilizer that can be applied with the seed without the limitations of conventional dry N sources (immobilization; rapid nitrification and subsequent leaching or denitrification; phytotoxicity). Older slow release N sources were shown to reduce phytotoxicity on germinating wheat and barley but were considerably more expensive.

More recently developed and less expensive controlled release nitrogen products such as polymer coated urea may also have potential for significantly delaying N release and reducing immobilization, nitrification, and phytotoxicity.

To compare a polymer coated urea, ESN® (Agrium), with conventional urea when seed–banded, an Idaho Wheat Commission sponsored field study was initiated at the Parma R & E Center on October 10 and November 2 seeded winter wheat in fall 2007. Treatments included an untreated control, and both fertilizers at four N rates (20, 40, 60, and 80 lb N/A) seed-banded through double disk openers in 7” spaced rows.

Stand counts collected from 2 meters of row were used to determine phytotoxicity relative to the untreated control. The resulting stands from the treatments in the early and late wheat planting are shown in Figure 2.

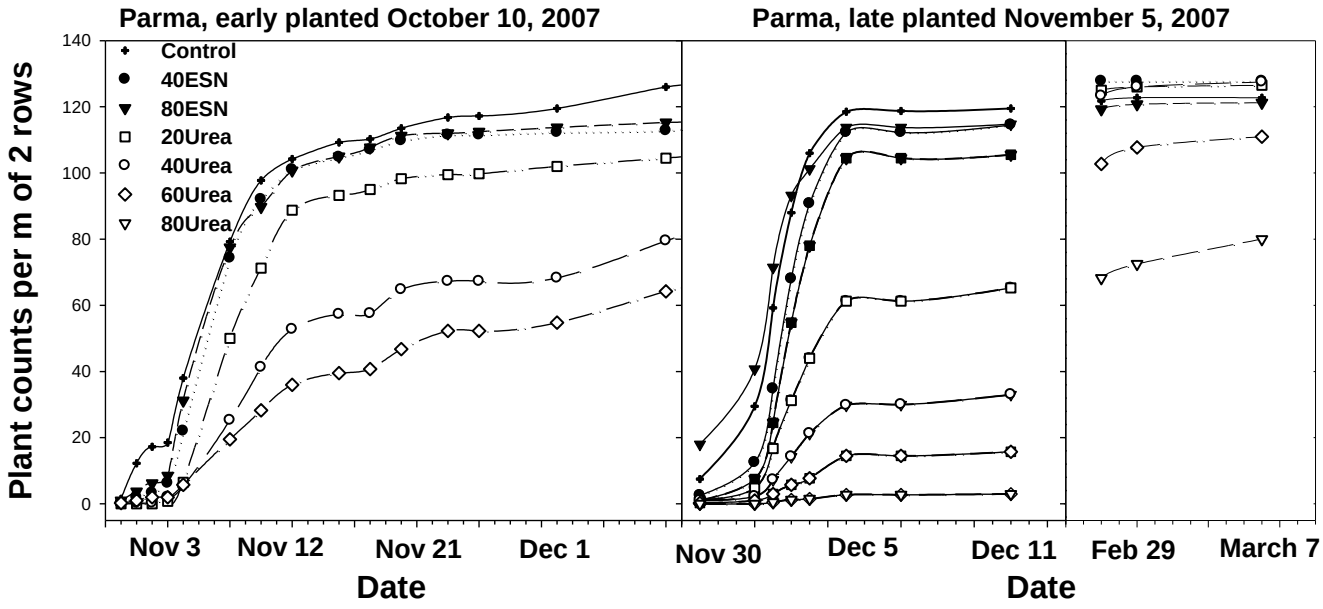

Figure 2. Early and late planted winter wheat plant counts as affected by seed banded N at Parma in fall and spring 2008.

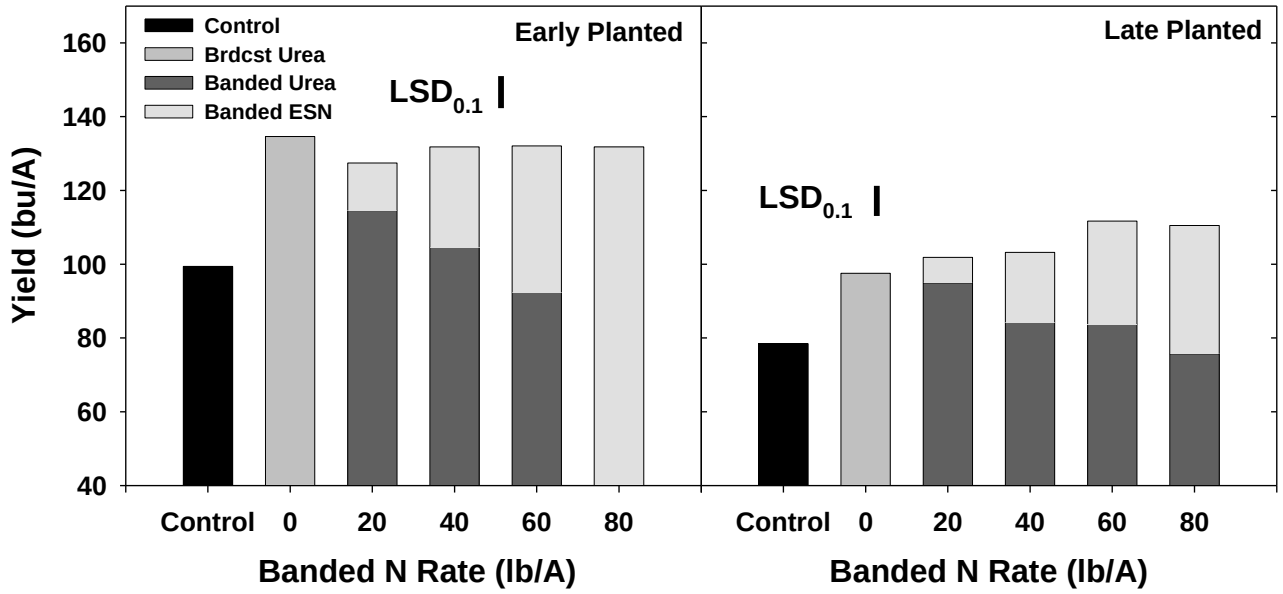

Figure 3. Early and late planted winter wheat yield as affected by N rates of seed banded conventional urea or slow release ESN N. Parma, 2008. The higher yield with ESN is shown in the column for each seed banded N rate. The only exception was the 80 lb urea seed banded rate where there was no yield for the earlier planted wheat.

Seed-banded conventional urea reduced or significantly delayed stand counts of early planted wheat as compared to seed-banded ESN®. There was virtually no improvement in the early planted wheat stand with late winter emergence.

Results were similar for late planted wheat. There was very little fall emergence of late planted wheat with the highest seed banded urea N rate, but there was appreciable late winter emergence.

Plant counts of late planted wheat with the seed banded 60 lb urea N rate were roughly twice those of the same N rate seed banded with early planted wheat. Cooler soil temperatures apparently ameliorated urea caused phytotoxicity.

Slow release polymer coated ESN® was considerably safer than conventional urea when seed-banded. The results were similar for the early November winter wheat planting. Emergence was neither delayed nor reduced with 60 lb ESN® N banded with seed of early or late planted wheat. There may have been a slight reduction in emergence with the 80 lb rate of seed banded ESN®.

Yield was higher with the earlier wheat planting despite the greater impact of seed banded urea on emergence and wheat stands. Yield was reduced in both plantings as the seed banded urea N rate increased. In contrast, yield for both early and late wheat plantings with seed banded ESN® (including the 80 lb N rate) was as good as urea broadcast preplant.

Reduced yield with seed banded urea is due to more than one factor. Obviously, yield can be reduced with poorer stands despite the increased tillering of individual plants. Delays in emergence may be as important as reduced stands. Any delay in emergence also effectively reduces the tillering of individual plants and delays maturity.

Using the same seed-banded fertilizer N rates per acre with wider row spacings of 10" or 14" would concentrate the fertilizer in fewer rows, and increase the phytotoxicity of seed-banded N. For example, using the same rate per acre of seed banded urea would double the concentration in the row if you switched from 7" to 14" rows. Consequently, with wider row spacings, lower seed-banded N rates will be required to avoid affects on germinating wheat.

There may be other slow release N sources that would reduce the impact of seed banded N on wheat. But we have not evaluated those materials. Seed banded enhanced N fertilizers that keep more of the applied N in the ammonium form could be problematic as they would also increase free ammonia present with seed. This study is currently under way for the 2009 season.

The Nutrient Digest

The Nutrient Digest is an Idaho Cooperative Extension newsletter devoted to nutrient management issues ranging from crop fertilization to animal waste management. **The Nutrient Digest** is now available for your viewing or downloading. The content includes summaries of Idaho based research on fertilization of a variety of crops including small grains as well as timely general soil fertility topics.

The Nutrient Digest is edited and managed by Dr. Amber Moore, the Extension Soil Specialist in Twin Falls, now in her second year with the University of Idaho. **The Nutrient Digest** newsletter is available on-line at this time from the Nutrient Management website at http://webs.extension.uidaho.edu/nutrient. Click on the button for the **Nutrient Digest Newsletter** to see the links to specific issues. To be placed on the distribution list for the announcements of new **Nutrient Digest** issues send your email address to amberm@uidaho.edu.

The first two issues are currently available with another due in late winter. Don't be surprised if some of the information in the **Nutrient Digest** you see also in the ***Cereal Sentinel*** here. Some of the article titles of particular interest to small grain producers include a couple related to residue management and a number related to N fertilization. The pertinent articles are listed below:

Issue 1
Available Nitrogen After the Wheat Harvest
Is Residue Removal = Soil Carbon Removal

Issue 2
Slow Release Nitrogen and Winter Wheat
Topdressing Winter Wheat with Urease and Nitrification Inhibitors – Year 1.

When you go to the website that hosts **The Nutrient Digest**, check out other information available there. The website is new and under development and you can expect the content to grow with time. It is the first UI website devoted exclusively to nutrient management issues. Your comments and suggestions for improving the website are welcomed.

Acknowledgement

The **Idaho Wheat Commission** has awarded a grant of $3600 to subsidize this newsletter. We are pleased to acknowledge their support for this Cooperative Extension educational project.

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.ag.uidaho.edu/swidaho. If you would like to receive electronic notice of new ***Cereal Sentinel*** newsletters 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. 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 have been added as well as other topics. If you have suggestions for the website send them to me at bradb@uidaho.edu.

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