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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 2007 season marked the 21st 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 trials were conducted during the 2007 season. Trials were located at the Parma R & E Center, Weiser, and Kuna. The Parma trial was planted March 12, Weiser on March 13, and Kuna on March 19. Yields and plant heights were lowest at Kuna likely due to moisture stress. There was no wheat lodging at any location.

There was no stripe rust on wheat in 2007 in the Treasure Valley 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 2007 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 or baking quality over the most commonly grown **Penawawa**. P**enawawa**, is an early maturing, older release that tends to be higher in protein, lower in test weight with very poor milling and baking quality. It was susceptible to stripe rust in 2005 and 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 in 2007 over the three sites. **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. 2007.

Variety	Yield	Protein	Test Weight	Height	Lodging
	bu/acre	%	lb/bu	in	%
			Parma		
Alturas	137	10.4	61.3	40	0
Cataldo	129	11.6	61.7	38	0
IDO629	134	11.3	61.0	40	0
IDO630	132	12.1	61.1	38	0
IDO645	142	10.6	60.7	40	0
Jubilee	127	10.6	59.3	42	0
WB Nick	138	11.0	61.5	39	0
Penawawa	124	10.5	60.4	37	0
PenawawaX	125	11.0	60.4	38	0
Pettit	140	10.4	60.7	33	0
Average	133	11.0	60.8	39	0
$LSD_{.10}$[1]	6	0.7	0.7	1	0
			Weiser		
Alturas	139	11.1	61.9	36	0
Cataldo	130	11.5	61.9	34	0
IDO629	132	11.6	61.7	37	0
IDO630	127	12.1	62.6	34	0
IDO645	133	10.9	62.6	37	0
Jubilee	128	11.7	61.7	38	0
WB Nick	131	11.5	62.8	36	0
Penawawa	126	11.8	62.8	34	0
PenawawaX	133	11.9	62.9	33	0
Pettit	133	10.5	61.2	29	0
Average	131	11.5	62.2	35	0
$LSD_{.10}$	8	0.8	0.7	2	0
			Kuna		
Alturas	111	9.9	61.2	32	0
Cataldo	90	11.9	58.9	30	0
IDO629	111	11.1	61.0	34	0
IDO630	107	11.2	62.4	33	0
IDO645	100	11.5	63.2	34	0
Jubilee	105	10.6	62.7	32	0
WB Nick	106	10.5	62.5	33	0
Penawawa	101	10.9	62.7	32	0
PenawawaX	100	11.3	62.1	30	0
Pettit	103	10.4	61.3	26	0
Average	103	10.9	61.8	32	0
$LSD_{.10}$	11	0.9	1.5	2	0

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

Alturas showed good resistance to stripe rust prevalent in 2005.

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	%
2007 (3 sites)					
Alturas	129	10.5	61.5	36	0
Cataldo	116	11.7	60.9	34	0
IDO629	126	11.3	61.3	37	0
IDO630	122	11.8	62.1	35	0
IDO645	125	11.0	62.2	37	0
Jubilee	120	10.9	61.3	37	0
WB Nick	125	11.0	62.3	36	0
Penawawa	117	11.1	62.0	34	0
PenawawaX	119	11.4	61.8	34	0
Pettit	125	10.4	61.1	30	0
Average	123	11.1	61.6	35	0
$LSD_{.10}$[1]	6	0.5	0.6	1	0
2006-2007 (6 sites)					
Alturas	112	10.3	61.2	35	0
Cataldo	104	11.3	61.2	33	0
IDO629	108	11.3	61.2	35	1
IDO630	107	11.3	62.3	33	2
IDO645	114	10.7	61.9	36	6
Jubilee	108	10.9	61.6	36	2
WB Nick	110	10.9	62.1	34	5
Penawawa	104	11.0	61.7	33	1
Pettit	111	9.9	61.4	28	1
Average	109	10.9	61.6	34	2
$LSD_{.10}$	4	0.4	0.6	0.7	3
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.

Jubilee, in the absence of stripe rust, has been as productive as **Alturas,** but is slightly taller with better test weight. **Pettit** is a new very short UI release, averaging 6 inches shorter than **Alturas**. **Pettit** (ID0632) in three years of testing has yielded as well as **Alturas** and **WB Nick**. It also has low protein, similar to **Alturas**.

WB Nick yielded as well as **Alturas** in the last three years of testing but has better test weight. It is slightly shorter than **Alturas**.

Cataldo (ID0642) is a 2007 Idaho release for northern Idaho with resistance to Hessian fly. It does not yield as well as **Alturas** or **Pettit** in the Treasure Valley**. ID0645** is an Idaho advanced line that yielded as well as **Alturas** over two years of testing. The protein, height, and test weight are higher for **ID0645** than **Alturas**.

Two Idaho, **ID0629** and **ID0630**, and one Washington waxy spring wheat varieties yielded comparable to **Penawawa** in 2006 and 2007. Waxy wheat 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,** but less than **Jerome**. **WB936** is susceptible to stripe rust. It has better 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.

Jerome (IDO566) is an Idaho release that is the most productive entry over six years of testing. It had good tolerance to stripe rust in 2005. **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**.

Table 3. Hard Red Spring Wheat Performance in the Treasure Valley. 2007.

Variety	Yield	Protein	Test Weight	Height	Lodged
	bu/acre	%	lb/bu	in	%
			Parma		
Jefferson	120	13.5	62.2	38	0
Jerome	135	13.6	62.0	37	0
Sagittario	116	13.4	60.3	28	0
WB 936	131	13.4	61.3	36	0
Winchester	124	13.6	62.3	37	2
Average	125	13.5	61.6	35	0.5
$LSD_{.10}$[1]	4	0.6	0.7	1	2
			Weiser		
Jefferson	109	15.1	61.9	37	20
Jerome	141	14.1	63.1	34	0
Sagittario	119	14.6	61.2	27	0
WB 936	133	14.9	62.6	32	0
Winchester	113	14.3	62.6	35	2
Average	123	14.6	62.3	34	4
$LSD_{.10}$	13	1.8	1.5	1.4	13
			Kuna		
Jefferson	90	13.5	62.9	31	0
Jerome	90	13.0	63.3	30	0
Sagittario	88	12.2	61.5	24	0
WB 936	80	13.8	62.2	25	0
Winchester	81	12.8	63.6	30	0
Average	86	13.1	62.7	28	0
$LSD_{.10}$	12	0.7	1.3	2	0

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

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**.

Sagittario is an AllStar variety. It is very short, averaging 4 inches shorter than **WB 936**. It did not yield as well **WB 936** in its first year of testing.

Forward contract prices for hard red spring wheat were considerably higher than soft whites as of this printing. Consequently there may be increased interest in planting this market class in the coming weeks. This may be exacerbated by the scarcity of soft white spring wheat seed.

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

Variety	Yield	Protein	Test Weight	Height	Lodged
	bu/acre	%	lb/bu	in	%
			2007 (3 sites)		
Jefferson	106	14.0	62.4	36	7
Jerome	122	13.6	62.8	34	0
Sagittario	108	13.4	61.1	27	0
WB 936	115	14.0	62.1	31	0
Winchester	106	13.6	62.9	34	2
Average	111	13.7	62.2	32	2
$LSD_{.10}$[1]	6	0.7	0.7	1	4
			2003-2007 (14 sites)		
Jefferson	102	13.3	62.9	36	18
Jerome	111	12.9	62.9	34	7
WB 936	103	13.8	62.4	32	17
Average	106	13.3	62.7	34	10
$LSD_{.10}$	4	0.3	0.4	1	6

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

As many know from experience, 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 the two furrow irrigated trials in 2007 (Parma and Kuna) are typical of the protein that results when additional N is not applied for protein enhancement.

Some of these trials are lower than desired because late season N was 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.)

Hard White Spring Wheat

Hard white spring wheat (HWS) is a different market class from the soft white and hard red classes.

Table 5. Hard White Spring Wheat Performance in the Treasure Valley. 2007.

Variety	Yield	Protein	Test Weight	Height	Lodged
	bu/acre	%	lb/bu	in	%
			Parma		
Lochsa	129	13.2	60.1	39	0
Lolo	134	12.5	63.7	40	0
Otis	127	12.5	61.8	44	0
Vaiolet	93	13.9	59.5	26	0
Average	122	13.1	61.3	37	0
$LSD_{.10}$[1]	4	0.6	0.7	1	0
			Weiser		
Lochsa	130	14.9	61.7	36	0
Lolo	126	13.8	64.0	37	0
Otis	120	14.0	61.6	42	7
Vaiolet	109	13.9	61.1	24	2
Average	122	14.1	62.2	34	3
$LSD_{.10}$	13	1.8	1.5	1.4	13
			Kuna		
Lochsa	93	13.5	62.2	29	0
Lolo	100	11.9	64.1	32	0
Otis	107	11.3	63.9	33	0
Vaiolet	80	12.7	58.0	18	0
Average	95	12.4	62.1	28	0
$LSD_{.10}$	12	0.7	1.3	3	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	%
			2007 (3 sites)		
Lochsa	118	13.9	61.4	35	0
Lolo	120	12.7	64.0	37	0
Otis	118	12.6	62.5	40	3
Vaiolet	94	13.5	59.6	23	1
Average	113	13.2	61.8	33	1
$LSD_{.10}$[1]	6	0.7	0.7	1	4
			2004-2007 (11 sites)		
Lochsa	104	13.5	60.8	35	8
Lolo	108	12.4	62.5	35	13
Otis	108	12.6	61.5	39	8
Average	106	12.8	61.6	36	10
$LSD_{.10}$	5	0.3	0.6	1	4

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

Hard whites are used for both noodle and bread making depending on the variety and protein level.

There is considerable breeder and industry interest in hard whites as they 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 **Otis** 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 **Lolo** or **Otis**. **Lochsa** was similar in height but has better straw strength than **Lolo**. It has lower test weight than **Lolo**.

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. Spring barley variety performance is presented in Tables 7 thru 10.

Barley stripe rust was not evident this past season in western Idaho. There was more lodging at Weiser and yields were lower than at Parma.

Table 7. Six-Row Spring Barley Variety Performance in the Treasure Valley. 2007.

Variety	Yield	Test Weight	Height	Lodged	Thins
	bu/acre	lb/bu	in	%	%
		Parma			
Aquila	160	53.0	43	8	0.98
Creel	131	48.5	44	80	3.68
Goldeneye	139	51.8	42	54	1.24
Herald	154	48.9	46	22	1.28
Legacy	140	49.5	43	74	2.07
Millenium	174	50.0	40	19	2.58
Nebula	178	49.7	35	0	0.44
Steptoe	147	48.6	44	85	1.47
YU599-006	146	47.7	31	0	0.96
Average	152	49.9	41	40	1.63
$LSD_{.10}$[1]	23	1.4	2	24	1.39
		Weiser			
Aquila	133	54.8	33	2	1.82
Creel	134	51.1	36	45	1.62
Goldeneye	145	51.5	34	60	1.36
Herald	129	51.9	37	12	1.82
Legacy	120	51.6	35	55	1.78
Millenium	154	51.4	33	20	1.28
Nebula	146	50.5	27	0	0.64
Steptoe	137	51.4	37	20	1.13
YU599-006	140	50.2	28	10	0.41
Average	136	51.7	34	31	1.50
$LSD_{.10}$	26	1.7	3	34	2.40

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

Table 8. 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	%	%
		2007 (2 sites)			
Aquila	147	53.4	38	5	1.40
Creel	133	49.9	40	63	2.65
Goldeneye	142	51.7	38	57	1.30
Herald	142	50.4	42	18	1.55
Merit	105	48.9	37	69	5.29
Millenium	164	50.7	37	19	1.93
Nebula	162	50.1	31	0	0.54
Steptoe	142	50.7	41	70	1.30
YU599-006	143	49.0	30	5	0.72
Average	145	50.8	37	33	1.48
$LSD_{.10}$[1]	16	1.3	2	22	1.04
		2004-2007 (8 sites)			
Creel	142	51.0	39	56	4.39
Herald	135	50.5	42	23	3.18
Legacy	136	52.0	40	62	2.83
Millenium	158	51.1	36	16	3.95
Nebula	149	49.7	30	16	2.04
Steptoe	134	50.0	40	67	2.64
Average	142	50.7	38	40	3.17
$LSD_{.10}$	7	0.6	1	9	0.58
		2000-2007 (18 sites)			
Millenium	153	52.1	35	17	3.49
Nebula	146	50.5	30	17	1.35
Steptoe	133	51.3	38	64	2.24
Average	144	51.3	37	33	2.36
$LSD_{.10}$	6	0.4	1	6	0.53

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

Six-Row Varieties

Millenium, a Utah State release, was evaluated for the seventh year in 2007. 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 across 18 site years, averaging 20 bu/A higher than **Steptoe** and 7 bu/A higher than **Nebula**. **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 higher yielding than **Steptoe** but less than **Nebula**, and consistently yields less than **Millenium**. **Creel** has better straw strength than **Steptoe** but 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 of **Steptoe**. Both **Nebula** and its waxy offspring **YU599-006** do not do as consistently well as **Millenium**. **YU599-006** is a six row hulled waxy barley that is very similar to **Nebula** but does not yield as well as **Nebula**.

Herald (01ID1550) is distinctive in that it has the low phytate gene. It is derived from **Colter** parentage and is similar to **Colter** in most agronomic characteristics. Low phytate grain has a greater percentage of seed phosphorus in forms that are better used by non-ruminants. Greater utilization of seed

Table 9. Two-Row Spring Barley Variety Performance in the Treasure Valley. 2007.

Variety	Yield	Test Weight	Height	Lodged	Thins
	bu/acre	lb/bu	in	%	%
		Parma			
02AH684	124	59.1	44	2	1.15
2B99-2316	109	49.5	39	69	3.55
2B99-2657	140	49.7	41	54	1.94
Burton	138	52.8	44	67	1.23
Clearwater	107	52.4	41	82	4.56
Idagold	173	52.3	34	29	2.52
Merit	131	49.6	41	82	2.70
Merlin	158	61.2	35	0	1.11
PB1-01P044220	123	57.1	42	52	3.16
Radiant	139	52.3	41	77	2.58
Salute	123	51.8	42	84	1.74
Spaulding	148	54.6	41	37	1.32
WA 10701-99	123	51.4	42	79	1.86
Average	133	53.5	41	54	2.29
$LSD_{.10}$[1]	23	1.4	2	24	1.39
		Weiser			
02AH684	116	59.5	34	0	2.00
2B99-2316	94	48.6	33	67	7.41
2B99-2657	118	49.8	35	75	3.71
Burton	134	53.3	36	17	1.12
Clearwater	75	55.3	38	65	6.60
Idagold	123	50.6	28	12	4.25
Merit	80	48.0	33	55	7.87
Merlin	128	61.7	29	10	1.60
PB1-01P044220	109	57.4	34	73	3.61
Radiant	123	52.6	35	65	3.88
Salute	94	51.7	36	30	1.87
WA10701-99	132	51.2	35	55	1.80
Average	112	53.4	34	42	3.69
$LSD_{.10}$	26	1,7	3	34	2.40

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

phosphorus by non-ruminants results in less P excreted in manure which provides several advantages to the feeder. The low phytate gene typically leads to somewhat lower test weight. However, **Herald** is as productive as **Steptoe** in four years of testing. It is taller than **Steptoe** but lodges less.

Goldeneye and **Aquila** are Utah State releases. **Goldeneye** is taller than **Millenium** with weaker straw. **Aquila** has excellent test weight, and lodging resistance as good as **Nebula,** but did 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, especially with stripe rust present, to be more productive than many six row barleys normally produced in western Idaho.

Idagold, the 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 four years of testing. **WA10701-99** a WSU advanced line, has not yielded as well as **Radiant**.

Merit, a Busch malt barley, is taller than **Idagold,** with comparable test weight. It yielded significantly less than **Idagold** in four years of testing**.** It has weaker straw than **Idagold**. Busch advanced lines include **2B99-2316** and **2B99-2657,** both of which are relatively weak strawed.

Burton is an Idaho USDA-ARS release with Russian wheat aphid resistance. It does not yield as well as other two rows evaluated over the last two years. **Clearwater** is an Idaho USDA-ARS release that is a hulless low-phytate variety. It has relatively weak straw. It is taller than **Idagold** and poorly adapted to irrigated southern Idaho.

Spaulding is a PB1 release that did not yield as well as Idagold. **PB1-01-PO4-4220** is a unique advanced line from PB1 that is a hulless line with the low phytate gene. It is not as well adapted to irrigated production as **Merlin.**

Several waxy barley's were evaluated in 2007. **Salute** and **Merlin** are **Westbred** varieties, and **Merlin** is hullless. **Salute** production was contracted in northern Idaho and marketed to Japan this past year as a food barley. **Merlin** has very good barley straw strength and is as short as **Idagold**.

02AH684 is a hulless USDA-ARS advanced waxy line with excellent straw strength. Many of these are relatively high in Beta-glucan, the soluble fiber found helpful for reducing cholesterol and coronary heart disease. Barley has received FDA approval of a food claim for barley's soluble fiber benefits. The announcement for the claim is available on the **Idaho Barley Commission** website http://www.idahobarley.org/barleyfoods.htm.

Table 10. Two-Row Spring Barley Variety Performance in the Treasure Valley over several years or sites.

Variety	Yield	Test Weight	Height	Lodged	Thins
	bu/acre	lb/bu	in	%	%
		2007 (2 sites)			
02AH684	120	59.4	39	1	1.58
2B99-2316	102	49.1	36	68	5.48
2B99-2657	129	49.8	38	64	2.82
Burton	136	53.1	40	43	1.18
Clearwater	91	53.9	40	74	5.62
Idagold	148	51.5	31	21	3.39
Merit	105	48.9	37	69	5.29
Merlin	143	61.5	32	5	1.35
PB1-01P044222	116	57.3	38	62	3.39
Radiant	131	52.5	38	71	3.23
Salute	109	51.8	39	57	1.80
WA 10701-99	128	51.3	39	67	1.83
Average	123	53.4	37	50	3.00
$LSD_{.10}$[1]	18	1.3	2	21	1.51
		2006-2007 (4 sites)			
02AH684	112	59.6	38	0	2.69
2B99-2316	105	50.8	35	50	4.21
2B99-2657	119	49.9	37	45	3.31
Burton	119	53.0	38	43	1.71
Clearwater	94	56.9	38	56	5.56
Idagold	135	51.7	30	26	3.00
Merit	107	50.5	36	44	3.83
Merlin	127	60.8	29	13	3.46
Radiant	127	52.9	37	54	3.54
Salute	102	53.0	39	45	1.63
WA10701-99	117	51.9	38	59	2.20
Average	122	53.1	36	35	3.19
$LSD_{.10}$	10	0.8	1.4	14	0.91
		2004-2007 (8 sites)			
Idagold	138	51.7	30	34	5.04
Merit	125	51.1	37	47	5.41
Radiant	135	52.9	37	56	5.44
Average	133	51.9	35	46	5.30
$LSD_{.10}$	7	0.6	1	9	0.90

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

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).

Slow Release Preplant N for Hard Spring Wheat

The difference in hard red spring (HRS) and soft white prices narrowed for a time but forward contracts for HRS are now several dollars higher. There are opportunities to lock in better than break even prices by forward contracting a portion of your 2008 crop.

Since prices for hard red spring wheat with acceptable protein are somewhat better than for soft whites, there may be continued interest in hard red spring production in 2008. Hard red spring production for 2006 and 2007 in western Idaho was generally of good quality with most of the production at or only slightly below 14%. As many of you know that is not always our experience.

Excessive N

With the understanding that higher seasonal N rates are needed to meet the requirements for both yield and acceptable protein, it is tempting to apply the entire seasonal N requirement pre-plant to avoid later application costs. While tempting, we have measured yield reductions from excessive N available during early vegetative growth in the absence of lodging. We have measured the adverse effects on grain yield of excessive available N during early vegetative growth, in the absence of lodging and disease, with hard red winter wheat, soft white winter wheat, winter barley, and more recently in HRS wheat.

We don't know just why yields are reduced with excessive N, when there is no lodging or exacerbated diseases or increased moisture stress. The wheat plant's physiological response to excessive N isn't a topic often addressed with research.

Though we don't know why the yields decline with excessive N, we do measure them often enough. To avoid excessive N during vegetative growth, pre-plant soil testing is essential to determine the residual N.

Table 11. HRS wheat response to pre-plant urea and polymer-coated urea (ESN). Parma 2005, 2006, 2007.

Pre-plant		Late	2005		2006		2007	
Urea N	ESN N	Urea N	Yield	Protein	Yield	Protein	Yield	Protein
----------lb/acre----------			bu/acre	%	bu/acre	%	bu/acre	%
----------Untreated----------								
--	--	--	--	--	79	8.9	87	11.7
----------120 lb N/acre----------								
120	--	--	84	13.9	114	11.2	119	13.4
--	120	--	92	14.0	117	11.6	124	13.8
----------180 lb N/acre----------								
180	--	--	82	14.2	119	11.7	121	14.8
120	60	--	82	14.3	121	12.2	122	14.9
60	120	--	84	14.4	124	12.3	124	14.8
--	180	--	87	14.4	129	12.7	131	15.0
120	--	60	83	14.6	126	12.7	128	15.2
----------240 lb N/acre----------								
240	--	--	73	14.6	117	12.5	127	15.0
--	240	--	83	14.6	125	13.0	128	15.8
180	--	60	79	14.9	123	13.1	126	15.5
CV			8	2	5	4	5	3
$LSD_{.10}$[1]			8	0.3	6	0.4	8	0.5

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

Slow Release Preplant N

While high preplant N using conventional N fertilizers has been problematic, newer generation N fertilizers may provide a viable option. The results of a 2005 and 2006 study were reported in previous newsletters. The results from all years (2005, 2006, and 2007) are reported here.

The study involved a comparison of slow release polymer–coated urea N (PCU) with conventional urea pre-plant applied for HRS wheat grown under furrow irrigation at Parma. Initial residual N in the first foot measured about 135 lb/A in 2005, 80 lb/A in 2006, and 84 lb/A in 2008. Both fertilizer N sources were broadcast pre-plant at rates of 120, 180, and 240 lb N/A with various combinations of urea and PCU also evaluated as shown in Table 1. A control was included in 2006 and 2007.

While the available N with the highest N rate may seem excessive, it is no more than some may encounter if they fertilize pre-plant without measuring residual N following previous crops such as potatoes or onions.

Yields were appreciably higher in 2006 and 2007 with no stripe rust present. Yields tended to be higher for the slow release N, and the differences were statistically significant for at least one N rate in each year. Unlike 2005, a yield reduction did not occur from the highest N rates in 2006 or 2007 using either N source. But the yield increase with slow release N was greater than with conventional urea. Yield was maximized in both 2006 and 2007 with the 180 lb N/A rate.

Protein was much higher in 2005 and 2007 than in 2006. Protein increased with the higher rates of both N sources in all years and also tended to be higher for the PCU slow release N. Protein did not differ between preplant N fertilizers in 2005 but in other years protein was higher for the slow release N in a least one of the N rates.

Another way of assessing the relative effectiveness of N fertilizers is to calculate the harvested N from the yield and grain protein. The N in grain ranged from 8 to 16 lb N/A higher with the slow release N in 2005, 8 to 28 lb N/A more in 2006, and 11 to 20 lb N/A more in 2007 depending on the N rate (data not shown). Preplant slow release N was apparently recovered in the grain more than preplant conventional urea.

With a control included, it is also possible to calculate the apparent N use efficiency, the portion of the fertilizer N applied that was removed with the grain. The apparent N recovered in harvested grain of that applied in 2006 decreased as N rates increased. The N recovery ranged from highs of 50.6% with urea and 57.1% with ESN applied preplant for the 120 N rate to only 33.4% with urea and 40.7% with ESN at the 240 rate.

Delaying until heading the application of 60 lb N/A of the urea N as part of a split application was generally more effective for both yield and protein than all urea applied preplant. In 2006 and 2007, protein with slow release N matched the protein of the urea split application.

Plant height was seldom if ever greater with preplant slow release N than preplant conventional urea at the lower N rates. Likewise, chlorophyll meter readings at heading were similar for both preplant N sources. This suggests that any advantage to the slow release N was due to later N availability, not the N available during vegetative growth.

Test weight was improved with the slow release N in all years at one of the N rates. Better grain filling also suggests more available N during grain fill.

Considering only the effects of the two N fertilizers on yield the economic returns from them can be calculated. Assuming the slow release N was $.11 per lb N more expensive than urea and $4/bu wheat prices, the return at the optimum N rate each year ranged from $18 to $23 per acre higher for the slow release N.

The previous crop in each year was beans and there was sufficient N to promote early season tillering in these trials. The results could be different if early season available N was very short. We could not determine if the release of N from slow release N would have been adequate under more deficient N conditions. If N were extremely low, early season N requirements could be met by mixing the slow and conventional N, providing 50-70 lb of N as conventional urea, the balance as slow release polymer coated urea N.

The results are encouraging and suggest there is potential for single pre-plant applications that could serve to safely provide the N required for both yield and protein of hard wheat, particularly in a production system such as furrow irrigation that provides limited options for applying late season N for protein enhancement.

The use of pre-plant slow release N will probably be more commonly used for HRS and HWS wheat in furrow irrigated or sprinkler systems that don't have the capability to inject soluble N during the season. Producing furrow irrigated wheat with acceptable protein has been particularly challenging.

The PCU in this study was ESN marketed by Agrium. Other PCU products may give similar results but have not been evaluated for our HRS wheat production.

Wheat Quality

The wheat commissions in Idaho, Oregon and Washington sponsor an annual survey of harvested wheat in the PNW for use by our foreign and domestic customers. The entire southern Idaho area (including Malheur Co OR) is known as the Southeast District (SE). Although the area includes some dryland production, it is for the most part irrigated. It may be of interest to you to see how our irrigated wheat compares to other PNW production areas, when averaged over the last three years.

Table 12. Three year average soft white wheat quality measures of wheat from different PNW productions areas, 2005-2008.

Quality	units	SE[1]	NE	C	NC
		Whole kernel			
Test weight	lb/bu	60.4	59.9	59.9	60.4
Dockage	%	1.1	0.6	0.6	0.5
Moisture	%	9.4	8.9	8.9	8.8
Falling number	sec.	327	350	337	340
Hardness index		29	38	40	32
		Flour			
Milling Yield	%	68.3	68.8	67.5	67.4
Protein	%	8.5	8.7	8.5	8.3
Color, B*		7.6	8.1	8.3	8.1
		Baked Product			
Cookie diameter	cm	8.3	8.1	8.0	8.3
Sponge cake volume	cc	1198	1193	1175	1194
Steamed bread specific volume	cc/g	2.47	2.59	2.49	2.59

[1]SE-southern ID, primarily irrigated
NE-northern ID, eastern WA, rainfed
C-Central-north central OR, Horse Heaven Hills, mostly rainfed
Columbia Basin and north central WA, mostly rainfed

Test weights for the irrigated SE are acceptable and meet the No 1 grade requirement. The SE was one of only two districts that graded No 1. Moisture content tends to be higher in the SE probably due to both irrigated production and production in higher elevations with shorter growing seasons.

Dockage is almost twice as high in the SE as other areas. There are likely several reasons for this. Irrigated production involves much greater straw going through the combine which makes it more difficult to clean. This is exacerbated when the header is dropped to pass

more residue through the combine to leave in a swath for subsequent baling. Residue removal has become the rule for much of southern ID production.

The falling number value is lower in our district which indicates higher alpha amylase activity. The test is used to measure sprout damage, the lower the number the greater the conversion of starches to sugars. While our wheat does not score as high as other areas, values over 300 are quite acceptable.

Ash contents represent non-flour components and the lower the values the better. Ash content of soft wheat in southern Idaho tends to be slightly higher. This may be related to the irrigated production.

The hardness index tends to be lower for our district. This makes it a better soft white for purposes such as pastries, a common use of soft wheat flour. The color value (B*) refers to the yellowness of the flour, the lower the number the less yellow the flour and noodles made from it. The color value for southern Idaho tends to be slightly lower than for other areas, so our flour would be slightly more white, though not much.

Flour protein is intermediate relative to other areas. Cookie diameter is good in wheat from our area, matched only by the north central region of WA. Sponge cake volume also compares favorably with other areas. Steamed bread density is lighter with Treasure Valley wheat which is less desirable.

Several of the values shown are variety influenced in addition to their sensitivity to the different environments. To the degree that areas differ in the varieties grown they can be expected to differ in these quality values. Stephens, an OSU release and the most commonly grown soft white in the Treasure Valley has good milling yield and good baking quality. Brundage, an Idaho release, is also widely grown in southern ID and has excellent baking quality.

Spring N Fertilization

Nitrogen prices are at all time highs. Market prices for wheat are also high. To take full advantage of higher market prices, nitrogen fertilizers need to be used judiciously. Yield can be reduced from both not enough and too much available N.

Knowing the available N in soil is essential for optimizing the effectiveness of applied N. It is not too late to soil test in winter wheat fields for available N. Our research shows that spring measured available N is as useful as fall measured available N for predicting the N required. In some cases it is superior, as when winter leaching moves nitrate nitrogen from the surface to lower depths, or when appreciable nitrogen is mineralized after wheat fields are fall sampled.

Sampling the first foot is common for wheat but more accurate measures of available nitrogen will include sampling the second foot as well. It is essential that the soil collected is representative of the area to be managed. The composite for each depth should consist of a minimum of 15 cores.

Our research indicates that the 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. One reason for the difference is that wheat established has already taken up some of the nitrogen in the system. Another reason may be that some nitrogen mineralization takes place after available N is measured in the fall, and this N is reflected in the spring sampling.

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. In these studies the N was applied as a spring topdress of urea.

We have compared the effectiveness of late winter topdressed urea, ammonium nitrate, and ammonium sulfate and found urea to be generally at least if not more effective. The relatively good performance of topdressed urea may be attributed to the cooler temperatures in late winter when the applications were made. Volatile losses of N are minimized with cooler temperatures because hydrolysis of urea is slowed and less free ammonia is released.

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.

New Publications

From the Oregon State University Ag Publications catalog at http://extension.oregonstate.edu/catalog/

Managing Salt-Affected Soils for Crop Production. PNW 601-E (On-line only).

Monitoring Soil Nutrients Using a Management Unit Approach. PNW 570-E. (On-line only).

Acidifying Soil for Crop Production: Inland Pacific Northwest. PNW599-E**.** (On-line only).

Irrigation Water Quality for Crop Production in the Pacific Northwest. PNW 597-E (On-line only)

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Southwest Idaho Extension Cereals Website

Previous issues of the ***Cereal Sentinel*** newsletter back to 1996 can be viewed as PDF files on the Southwest Idaho Extension Cereals Homepage at http://www.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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