



# The Cereal Sentinel

*A newsletter for Treasure Valley cereal producers*

February 11, 2000

Issue No. 22



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## Important Dates:

February 9	Idaho Barley Commission Research Review.
February 16-17	Idaho Ag Summit, Boise
February 19	Idaho Wheat Commission Research Review.
March 7	Hard Wheat Management Workshop, Parma
July 11	Parma Research and Extension Center Field Day
July 12	Malheur Station Field Day, Ontario

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 1999 season marked the 13th season of the Southwest Idaho Cooperative Extension Variety Performance Trials. The trials, supported by the Idaho Wheat Commission, Idaho Barley Commission, private breeders and the University of Idaho College of Agriculture allow the testing of public and proprietary varieties and advanced lines under the irrigated conditions of the Treasure Valley.

Four irrigated spring trials were conducted during the 1999 season. Trials were located at the Parma Research and Extension Center (early and late planted), Nampa, and Weiser.

The early and late Parma trials were planted March 17 and April 14. Nampa was planted March 24 and Weiser on March 26. Plantings at Nampa and Weiser were delayed due to intermittent rain and poor planting conditions. There was significant lodging of wheat at Parma but very little lodging at other locations. The earliest planted trial at Parma was the most productive, in part because of earlier maturity and avoidance of adverse conditions later in the season.

Cool temperatures during spring delayed vegetative growth and maturity. Whereas 1998 was characterized by excessive temperatures during grain fill and poor test weight, 1999 conditions were much more favorable resulting in extraordinarily good test weight at all locations.

There was no incidence of barley stripe rust in the Treasure Valley during 1999. Barley variety performance should be interpreted in that light.

## Soft White Spring Wheat

The 1999 results for soft white spring wheat varieties are shown in Table 1 on this page and the next. The best indication of long term variety performance is comparisons involving several sites and years.

**Alpowa** was the poorest yielding variety in 1999 although this variety has been among the more productive entries in years past. Even with its poor performance in 1999, over the long term it has matched the yield of **Penawawa**. Unfortunately neither variety has the more acceptable milling and baking

Table 1. 1999 Early Planted Irrigated Soft White Spring Wheat Performance in the Treasure Valley.

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>Parma (early planted)</i>					
Alpowa	113 <sup>1</sup>	9.6	65.0	41	23
BZ692-108	118	8.9	63.3	39	43
Centennial	118	8.9	64.5	38	25
IDO 506	131	8.9	62.4	41	43
IDO 525	127	9.6	64.3	43	30
IDO 526	120	8.6	64.3	38	20
ML042-29,3	128	9.8	64.6	39	38
ML042-409-1,5	129	9.8	60.8	42	33
Penawawa	115	9.3	64.3	39	28
Pomerelle	121	9.0	63.8	39	38
Treasure	119	9.2	62.6	40	33
Whitebird	123	9.0	64.8	41	8
Average	121	9.3	63.7	40	31
LSD <sub>.10</sub>	12	0.7	1.6	2	29
<i>Weiser</i>					
Alpowa	52	13.2	64.0	28	0
BZ 692-108	63	11.1	63.3	27	0
Centennial	80	12.7	63.9	29	0
IDO 506	78	11.5	63.8	31	0
IDO 525	66	12.3	64.6	30	0
IDO 526	89	12.1	63.8	31	0
ML042-29,3	64	12.9	63.5	27	0
ML042-409-1,5	81	13.3	63.4	31	0
Penawawa	65	13.1	64.1	28	0
Pomerelle	76	12.4	63.9	29	0
Treasure	73	11.4	63.1	28	0
Whitebird	72	12.2	65.1	31	0
Average	70	12.4	63.8	29	0
LSD <sub>.10</sub>	22	1.1	0.7	3	-
<i>Nampa</i>					
Alpowa	92	9.5	65.6	37	0
BZ 692-108	121	9.2	63.3	36	0
Centennial	115	9.7	64.4	36	0
IDO 506	111	9.3	63.3	36	0
IDO 525	104	9.4	65.0	37	0
IDO 526	109	9.6	63.9	36	0
Penawawa	111	9.8	64.0	36	0
Pomerelle	109	9.4	63.6	36	0
Treasure	99	9.8	63.5	34	0
Whitebird	108	9.5	64.8	37	0
Average	107	9.5	64.1	36	0
LSD <sub>.10</sub>	15	0.8	0.9	1	-

properties that other varieties can claim (more later).

Table 1 continued. 1999 Irrigated Soft White Spring Wheat Performance in the Treasure Valley.

Variety	Yield bu/acre	Protein %	Test Weight lb/bu	Height in	Lodging %
<i>Parma (late planted)</i>					
Alpowa	82 <sup>1</sup>	8.2	63.1	37	0
BZ692-108	99	7.8	61.0	36	0
Centennial	94	7.9	62.6	33	0
Penawawa	96	8.3	61.6	35	0
Pomerelle	95	8.6	61.5	35	0
Treasure	95	7.9	60.4	34	0
Whitebird	88	8.4	61.9	37	0
Average	92	8.2	61.7	35	0
LSD <sub>.10</sub>	8	0.6	0.8	2	-
<i>1999 (4 sites)</i>					
Alpowa	84	10.1	64.4	36	6
BZ 692-108	99	9.3	62.7	35	11
Centennial	101	9.8	63.9	34	6
Penawawa	96	10.1	63.5	34	7
Pomerelle	99	9.9	63.2	35	9
Treasure	95	9.6	62.4	34	8
Whitebird	97	9.8	64.1	37	2
Average	96	9.8	63.5	35	7
LSD <sub>.10</sub>	14	1.2	0.8	3	11
<i>1993-99 (20 site years)</i>					
Alpowa	111	10.6	62.8	37	15
Centennial	111	10.8	62.3	36	11
Penawawa	111	11.2	61.5	36	15
Pomerelle	107	10.3	60.9	36	14
Treasure	106	10.4	60.9	36	16
Whitebird	109	10.5	62.3	37	11
LSD <sub>.10</sub> <sup>1</sup>	6	0.4	0.7	1	7

<sup>1</sup> Means must differ by more than the LSD to be statistically different

**Alpowa** is slightly taller than many others, but has good lodging resistance and excellent test weight.

The numbered line **BZ692-108** from Western Plant Breeders was evaluated for the second year at multiple locations. It has yielded well but no better than **Centennial** and has lower test weight. Quality of **BZ692-108** appears to have acceptable flour yield and cookie diameter.

**Penawawa** is an older Washington release that has yielded well but typically has higher protein and poorer quality than **Centennial** and **Whitebird**. **Penawawa** is lower in test weight than **Centennial** and is as early as **Centennial** in heading.

**Centennial** has good yield potential, test weight, and straw strength. **Centennial** under some conditions is more difficult to thresh. Its milling and baking quality is acceptable.

**Pomerelle** and **Treasure** were the least productive when averaged across several years and locations but have superior baking qualities and in some areas are marketed as variety preserved wheat for a premium. **Pomerelle** has better straw strength than **Treasure**.

**Whitebird** has good yield potential but yielded slightly less than **Penawawa** and **Alpowa** in long term testing. **Whitebird** does have low protein and superior baking quality. It threshes easier than **Centennial**. **Whitebird** is no shorter than other varieties but has good straw strength and lodging resistance.

The MLO advanced lines have undergone limited testing. They were evaluated only at the Parma location. **ML042-409-1,5** and **ML042-29,3** have yielded well in the limited testing at Parma the past two years. Despite its taller height, **ML042-409-1,5** has good straw strength.

A number of advanced lines from Idaho were tested this year including IDO numbers **506**, **525** and **526**. **IDO525** yielded well in the more productive nursery at Parma but did not yield well under the stress conditions at Weiser, but then neither did **Penawawa** or **Alpowa**. **IDO525** has yielded well in other southern Idaho testing with milling and baking quality comparable to our highest quality soft whites. It also has good straw strength and test weight.

**IDO506** and **IDO526** were among the more productive entries in the less productive environment at Weiser.

## Hard Red Spring Wheat

Hard red spring varieties in the Cooperative Extension nurseries are evaluated because of historically higher prices and potential for greater returns to spring wheat producers. The price difference between soft whites and hard red springs has been as much as 50% higher for the hard red spring class. Results for hard red spring wheat are given in Tables 2 and 3. As with any variety comparison, the more years and sites they can be compared over the more reliable the information.

**WB 936**, a Western Plant Breeders release, is the most commonly grown hard red spring in the limited acreage of southwestern Idaho. Historically, **WB 936** yields are better than **Vandal**, it has a test weight advantage, and matures considerably earlier than

Table 2. Hard Red Spring Wheat Performance in the Treasure Valley. 1999.

Variety	Yield bu/A	Protein %	Test Weight lb/bu	Height in.	Lodged %
<i>Parma (early planted)</i>					
BZ992-322	126 <sup>1</sup>	10.8	64.5	36	8
Hi-Line	105	10.9	65.8	38	5
Jefferson	111	10.7	65.0	39	5
Vandal	98	11.0	64.3	34	0
WB 936	120	10.6	64.6	34	0
LSD <sub>.10</sub>	11	0.6	0.6	1	7
<i>Weiser</i>					
BZ992-322	106	14.6	63.5	31	0
Hi-Line	74	14.3	64.4	30	8
Jefferson	100	14.1	64.1	32	0
Vandal	90	15.6	63.4	29	0
WB 936	81	14.4	63.0	27	0
LSD <sub>.10</sub>	23	1.0	1.1	3	8
<i>Nampa</i>					
BZ992-322	98	12.1	64.1	33	0
Hi-Line	92	11.9	65.0	35	0
Jefferson	97	11.4	65.3	37	0
Vandal	89	12.4	64.3	33	0
WB 936	83	11.7	64.4	34	0
LSD <sub>.10</sub>	10	1.1	1.1	2	-
<i>Parma (late planted)</i>					
BZ992-322	87	10.1	62.8	35	0
WB 936	73	10.2	61.8	33	0
LSD <sub>.10</sub>	10	1.4	0.4	1	-

<sup>1</sup> Means must differ by more than the LSD<sub>.10</sub> to be statistically different

Table 3. Hard Red Spring Wheat Performance in the Treasure Valley over several locations or years.

Variety	Yield bu/A	Protein %	Test Weight lb/bu	Height in.	Lodged %
<i>1999 (3 site years)</i>					
BZ992-322	109 <sup>1</sup>	12.5	64.0	34	3
Hi-Line	90	12.4	65.0	34	4
Jefferson	103	12.1	64.8	36	2
Vandal	92	13.0	64.0	32	0
WB 936	94	12.2	64.0	32	0
LSD <sub>.10</sub>	13	1.4	0.6	2	4
<i>1997-99 (9 site years)</i>					
Hi-Line	91	12.9	62.7	34	2
Jefferson	101	12.5	62.7	36	3
Vandal	94	13.4	61.1	33	0
WB 936	98	12.8	61.6	32	0
LSD <sub>.10</sub>	7	0.6	1.2	1	2
<i>1996-99 (12 site years)</i>					
Jefferson	103	12.6	62.6	36	14
Vandal	99	13.6	60.8	33	1
WB 936	104	12.8	61.6	33	1
LSD <sub>.10</sub>	6	0.6	0.9	1	6

<sup>1</sup> Means must differ by more than the LSD<sub>.10</sub> to be statistically different

**Hi-Line**, a Montana variety, has been evaluated for three years in western Idaho. **Hi-Line** was less productive than **WB 936** and **Jefferson** but had slightly better protein and higher test weight than **WB 936**. It is taller than **WB 936** and shorter than **Jefferson** with good straw strength.

**BZ992-322**, a Western Plant Breeders advanced line, was evaluated in four trials during 1999. It ranked highest in yield in all four trials. The protein for **BZ992-322** is comparable to **WB 936** and **Jefferson**.

Significant discounts can result with hard red springs if protein is below 14%. The protein levels reported for the hard reds in these variety trials are low at some locations (Parma early planted and Nampa). The trials were not fertilized with N for maximum protein. The commercial production of these varieties would entail quite different N management than what is provided in these trials for soft white spring wheat. All the hard red spring varieties evaluated are capable of being marketed at 14% protein with appropriate N management.

For those of you that don't follow hard red spring prices, the following may be of interest. Hard red spring

**Vandal**. **Vandal's** primary advantage over **WB 936** is its protein, which is excellent. **Vandal** averaged 0.8% higher protein than **WB 936** over 12 trials in four years of testing. Both varieties have good straw strength.

**Jefferson** is a new hard red spring from the UI breeding program at Aberdeen. In four years of testing **Jefferson** yielded as well as **WB936**. **Jefferson** is as well adapted to environmental stresses as **WB936** or **Vandal**. **Jefferson** generally has slightly lower protein than **WB936** and significantly less than **Vandal**. **Jefferson** has moderate Hessian fly resistance, excellent milling yield and good baking quality. **Jefferson** is taller than **Vandal** or **WB 936** and more susceptible to lodging. **Jefferson** also has excellent test weight.

at 14% protein has been trading lately in Portland at about **\$1.00 per bushel** over soft whites. At 15% protein the difference was closer to **\$1.19 a bushel**. On the other hand, at 13% protein the hard red spring advantage was only **\$.44 a bushel**. Clearly, it will pay in this market to avoid the low protein discounts. When corrected for transportation the hard red prices at 14% are 40-50% higher than the soft white price. The hard red springs are typically about 5% less productive than the soft whites when early spring planted. For very late plantings the hard reds may be as productive as the soft whites.

## 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 Table 4 and 5 for the six-rows, Table 6 and 7 for the two-rows.

Barley stripe rust was not a factor in the 1999 season, unlike the previous year when it was widespread. Six row varieties are more susceptible than two rows, which accounted for their poorer production relative to two rows last year. Despite the absence of stripe rust, two row yields averaged as good as six row yields in 1999 when averaged over the first three plantings. The excellent relative performance of two rows in the absence of stripe rust is a testimony to the improved two row varieties provided from such breeding programs as Adolph Coors and Western Plant Breeders.

Moderate temperatures during 1999 appreciably improved barley quality over last year. Barley test weights this season were excellent in irrigated trials.

### *Six-Row Varieties*

**Steptoe**, still the most commonly grown six-row in western Idaho, has serious flaws for an irrigated feed barley. Its weak straw and susceptibility to lodging limit its yield potential under high yielding conditions. But **Steptoe** performance in 1999 was the best in several years in part due to very little lodging at any of the locations.

Western Idaho appears to be the last stronghold for **Steptoe**. It has been displaced in Washington, Oregon, and all other production districts in Idaho due to its lower productivity and feed quality. The feeding quality of **Steptoe** is generally poorer than other six-rows due to higher hull content, hulls that are also less digestible than other six- row hulls.

Table 4. Six-Row Spring Barley Variety Performance in the Treasure Valley. 1999

Variety	Yield bu/A	Test Weight lb/bu	Height in.	Lodging %
<i>Parma</i>				
Century	119	53.1	39	0
Colter	136	54.0	42	0
Maranna	127	52.9	33	3
Statehood	110	52.9	38	5
Steptoe	142	52.4	40	0
Tango	127	53.3	41	0
WB Gustoe	135	52.9	29	0
WB Nebula	123	53.1	30	0
Average	127	53.1	37	1
LSD <sub>.10</sub>	18	0.9	3	5
<i>Weiser</i>				
Century	123	52.8	40	0
Colter	123	52.9	36	0
WB Gustoe	121	51.9	25	8
Maranna	130	52.1	30	0
WB Nebula	95	50.0	25	0
Statehood	132	52.4	36	0
Steptoe	143	52.0	40	5
Tango	130	51.9	39	0
Average	125	51.9	34	2
LSD <sub>.10</sub>	15	0.9	2	7
<i>Nampa</i>				
Century	113	53.4	39	0
Colter	128	53.5	40	0
WB Gustoe	103	52.1	26	0
Maranna	111	53.8	29	0
WB Nebula	106	51.3	27	0
Statehood	93	53.1	35	0
Steptoe	125	54.0	39	0
Tango	116	53.8	40	0
Average	112	53.1	35	0
LSD <sub>.10</sub>	20	1.6	2	-

<sup>1</sup> Means must differ by more than the LSD to be statistically different.

**WB Gustoe**, a Western Plant Breeders release, has better yield potential and is substantially shorter with better lodging resistance than **Steptoe**. Test weight of **WB Gustoe** is less than **Colter** or **Maranna**, especially in the absence of stripe rust.

**Maranna**, an OSU release, normally yields better than **Steptoe** in the absence of stripe rust and has better test weight, stronger straw, and is shorter. However, **Maranna** is particularly susceptible to barley stripe rust.

Table 5. Spring 6-Row Barley Variety Performance in the Treasure Valley over several sites and years

Variety	Yield bu/A	Test Weight lb/bu	Height in.	Lodging %
<i>1994-99 (17 site years)</i>				
Colter	125 <sup>1</sup>	50.0	39	23
Maranna	124	49.7	32	13
Step toe	121	48.8	39	56
WB Gustoe	125	48.5	28	22
LSD <sub>.10</sub>	9	1.0	1	11
<i>1996-99 (12 site years)</i>				
Colter	118	49.7	39	20
Maranna	113	49.2	31	15
Step toe	116	48.6	38	55
WB Gustoe	117	48.2	28	21
WB Nebula	124	47.6	30	8
LSD <sub>.10</sub>	10	1.4	1	11
<i>1997-99 (9 site years)</i>				
Century	113	49.8	38	27
Colter	117	49.5	38	10
Maranna	107	49.2	30	9
Step toe	113	48.7	37	43
Statehood	111	49.1	35	24
WB Gustoe	113	48.3	27	12
WB Nebula	112	47.5	29	1
LSD <sub>.10</sub>	12	1.7	1	12
<i>1999 (3 sites)</i>				
Century	118	53.1	39	0
Colter	130	53.5	39	0
Maranna	123	52.9	31	1
Statehood	111	52.8	37	2
Step toe	137	52.8	40	2
Tango	124	52.8	40	0
WB Gustoe	120	52.3	27	3
WB Nebula	108	51.5	27	0
LSD <sub>.10</sub>	12	0.8	2	3

<sup>1</sup> Means must differ by more than the LSD to be statistically different.

**Colter**, a USDA release from Aberdeen, has several advantages over **Step toe** in most years including better yield potential and test weight. Though it tends to be slightly taller than **Step toe** it has much better straw strength and lodging resistance. **Colter** also matures

earlier than **Step toe**. **Colter**, like **Maranna**, is especially susceptible to stripe rust.

**WB Nebula** is a Western Plant Breeders release. Over four years of testing, including 1998 with stripe rust present, **WB Nebula** out yielded the next highest entry by 6 bu/A. **WB Nebula** is a short variety with excellent lodging resistance. Test weight is comparable to **WB Gustoe** and **Step toe** under more favorable conditions but lower than **Maranna** and **Colter**.

Two Utah varieties were tested for the third year in 1999. **Century** and **Statehood** were named in honor of Utah's centennial celebration. Both varieties tend to lack the straw strength of the more productive six row varieties but they lodge less and have better test weight than **Step toe**.

**Tango**, is one of the first six row spring barley varieties released for its resistance to stripe rust. An OSU release, it has **Step toe** parentage which accounts for its poor lodging resistance. **Tango** was limited in yield due to lodging but still averaged the highest in test weight.

#### **Two-Row Varieties**

Breeders have made great strides in providing two-row barley for feed or malt with significantly improved yield and straw strength. The difference in yield between available six and two-row varieties has narrowed considerably. With better tolerance to stripe rust, the better two row varieties can now be expected, particularly when stripe rust is present, to be more productive than many six row barleys normally produced in western Idaho.

**Baronesse**, from Western Plant Breeders (originally from Germany), is now widely grown in the Pacific Northwest. **Baronesse** replaced most of the **Step toe** acreage in Washington because it yields more in those rainfed environments and has better feed quality in all environments. In the Treasure Valley, **Baronesse** yields better than **Lud**, previously our most commonly grown two row, but it does not yield higher than the six row **Step toe** when there is no stripe rust. With stripe rust, **Baronesse** out yielded **Step toe** by about 14 bu per acre over three sites in 1998.

**Idagold**, an Adolph Coors feed barley, has now been tested for six years in the Treasure Valley. **Idagold** out yielded **Baronesse** by at least 10 bu/A when averaged over at least 9 site years, was six inches shorter than **Baronesse**, and lodged considerably less than **Baronesse** or **Lud**. **Idagold** yielded as well as the best six-row types, and significantly better than **Step toe**. **Idagold** is the shortest of the released two row feed

barleys and has excellent lodging resistance compared to other two row feed varieties. **Idagold** is later than **Baronesse** and has lower test weight, especially when temperatures are higher during grain fill. It's later maturity was a disadvantage with last year's stripe rust and heat. Even so, **Idagold** and **Baronesse** were equally productive across all 1998 locations.

**Lud**, an older Agripro release, does not have the yield potential of **Baronesse** or **Idagold**. But **Lud** has both better protein and test weight than **Baronesse** and **Idagold**.

**Harrington**, **Merit**, and **AB1202** are two-row malting barleys from Busch Ag Resources. They yielded less than **Idagold** and **Baronesse**. Both of these varieties met the requirements for malting in 1996 and 1997 despite considerable lodging in some trials and very high temperatures during grain filling. **Merit**, has the lowest test weight of the three.

**Orca**, a recent release from OSU, is one of the first two-rows with barley stripe rust resistance. **Orca** is taller than **Idagold** but has comparable straw strength and resistance to lodging. It has yielded less than **Idagold** and **Baronesse** in the more productive earlier plantings, but comparable to or better than these varieties in the later or less productive sites, in some cases due to its stripe rust resistance.

**Galena** is a two-row malting barley from Adolph Coors. It typically yields less than **Idagold** with earlier plantings but better than **Idagold** in later seedings. **Galena** is earlier and taller than **Idagold** and has higher test weight.

**Galena** was available to all growers in 1997-99 regardless of whether it was actually contracted by Coors. **Galena** is contracted primarily in the Magic Valley but there is always the chance Coors will purchase non-contracted production if there are problems in other production areas, as they have done the last three years. Freight from the western border area could be a problem in that any **Galena** purchased would probably be trucked to the Burley elevator. But for counties closer to Burley, freight should not be prohibitive in relation to the typical malting barley premium of \$1 per bushel over feed barley prices.

Coors has other two row barleys that have been tested in western Idaho. The lines **C32**, and **C37** were tested the last two years and yielded as well as **Idagold** but **C37** was higher in test weight. **C32** is almost as short as **Idagold** and appears to have even better straw strength. **C37** is 3-4 inches taller than **Idagold**, but has straw strength and lodging resistance equal to **Idagold**.

Table 6. Two-Row Spring Barley Variety Performance in the Treasure Valley, 1999

Variety	Yield bu/A	Test Weight lb/bu	Height in.	Lodging %
<i>Parma</i>				
Baronesse	138	55.9	31	13
BCD47	98	54.8	28	0
Camas	137	56.1	39	0
C32	130	54.6	30	0
C37	142	55.0	36	5
Galena	137	54.9	35	0
Idagold	134	54.8	32	0
Merit	129	54.5	38	3
Orca	124	55.7	38	0
WA9504-94	137	55.8	33	0
LSD <sub>.10</sub>	15	0.8	3	11
<i>Weiser</i>				
Baronesse	110	54.0	35	23
BCD47	103	53.8	26	0
Camas	126	56.0	36	0
C32	126	54.4	28	0
C37	127	55.6	30	0
Galena	122	54.1	30	0
Idagold	131	53.9	27	5
Merit	113	54.1	37	5
Orca	132	53.5	34	0
WA9504-94	113	55.4	31	0
LSD <sub>.10</sub>	17	0.7	2	17
<i>Nampa</i>				
Baronesse	131	56.6	34	0
BCD47	96	55.6	25	0
Camas	120	56.5	36	0
C32	101	55.1	27	0
C37	118	56.6	31	0
Galena	107	55.5	30	0
Idagold	130	55.0	29	0
Merit	122	54.8	36	0
Orca	116	55.8	37	0
WA9504-94	112	56.8	29	0
LSD <sub>.10</sub>	16	1.0	2	-

<sup>1</sup> Means must differ by more than the LSD to be statistically different.

**WA9504-94**, an advanced line from the WSU breeding program, was less productive in the later March plantings but comparable to the better yielding two rows in the early March planted.

**Camas** is a North Dakota line released for Idaho. It has superior test weight, the only barley to average over 56 lb per bu at all sites. It yielded well in all 1999

Table 7. Spring 2-Row Barley Variety Performance in the Treasure Valley over several sites and years

Variety	Yield bu/A	Test Weight lb/bu	Height in.	Lodging %
<i>1996-98 (9 site years)</i>				
<i>Two-Rows</i>				
AB1202	98	49.7	37	53
Baronesse	105	50.7	35	61
Harrington	99	49.4	37	62
Idagold	115	48.3	29	22
Lud	102	51.3	37	60
LSD <sub>.10</sub>	4	0.6	1	8
<i>1998-99 (6 site years)</i>				
Baronesse	108	52.7	34	24
C32	110	51.7	29	1
C37	114	52.7	32	9
Galena	109	51.7	32	8
Idagold	112	49.9	29	11
Merit	102	50.4	37	18
Orca	110	52.5	37	10
LSD <sub>.10</sub>	12	2.1	1	11
<i>1999(3 site years)</i>				
Baronesse	126	55.5	33	12
BCD47	99	54.7	26	0
Camas	128	56.2	37	0
C32	119	54.7	28	0
C37	129	55.8	32	2
Galena	122	54.8	32	0
Idagold	131	54.5	29	2
Merit	121	54.5	37	3
Orca	124	55.0	36	0
WA9504-94	121	55.9	31	0
LSD <sub>.10</sub>	11	0.7	2	6

<sup>1</sup> Means must differ by more than the LSD to be statistically different.

nurseries. **Camas** has excellent straw strength for its height.

Treasure Valley barley producers can now enjoy the high yields typical of six-row barley without sacrificing the superior test weight and feed quality of a two-row.

## Durum Wheat

Pendleton Flour Mills will accept durum wheat from southern Idaho producers, but the mill has stringent specifications. Contract specifications include at least 13% protein, 85% hard amber vitreous kernels, and 60 lb

test weight. There is no tolerance for sprout as indicated by falling number values less than 325, and no tolerance for black tip, the discoloration of the germ end of the kernel. Dockage must not exceed 1%. Pendleton is also concerned about high ash contents in irrigated durum. If you have durum, they will examine and mill composite samples collected from the harvest at no cost.

Durum wheat performance was measured during the 1994-98 seasons. A limited number of varieties were also grown in 1999. Results are given in Table 8.

**WB Cortez** was more productive over the five-year period than **WB Kofa** and **WB 881**, the older quality standard. Protein percentage and the percentage of hard amber vitreous kernels did not differ appreciably among these three WB varieties.

**Kronos**, an Arizona Plant Breeders variety, yielded as well as **WB Cortez** and better than **WB 881** in three years of testing. **Kronos** had a lower percentage of hard and vitreous kernels than **WB Cortez** and tended to have lower test weight and protein though the differences were not statistically significant.

**Ocotillo** was tested at three locations in 1999. It was comparable in yield and vitreous kernels to **WB Cortez**.

We've had no difficulty obtaining 85% hard and vitreous kernels with the varieties listed in Table 8. Protein values have averaged less than 13% in some sites because the trials have not been managed for durum production.

The number at Pendleton Flour Mills for contract information is 541-276-6511. On farm storage is required. For seed the numbers are 541-963-8815 (OR) or 208-678-2286 (ID).

## Hard Wheat Management Workshop

Producing high yielding irrigated hard red wheat with acceptable protein is no mean accomplishment. Market prices currently favor the production of hard red wheat with acceptable protein, but low protein discounts can rapidly erode any price advantage over the soft white class.

For those interested in reviewing the Treasure Valley experience of growing hard red wheat during the 1999 season, a workshop is scheduled for March 7 at 7 PM at the Parma Research and Extension Center. The discussion will involve cultural practices within the grower's control that can be used to enhance protein at

Table 8. Durum performance in 1999 and over other years and locations.

Variety	Yield bu/A	Protein %	Height in	Test Weight lb/bu	HVAK %	Lodged %
<i>Parma 1999</i>						
Kronos	115 <sup>1</sup>	11.2	33	65.4	70	3
Ocatillo	103	11.5	36	64.8	86	0
WB Cortez	97	12.1	31	66.5	89	0
WB 881	111	11.8	35	65.5	85	0
LSD <sub>.10</sub>	15	1.6	1	1.1	10	3
<i>Weiser 1999</i>						
Kronos	64	15.8	26	62.9	96	0
Ocatillo	74	15.7	28	64.9	98	0
WB Cortez	72	15.8	25	63.4	96	5
WB 881	71	15.1	27	62.8	94	0
LSD <sub>.10</sub>	31	1.0	3	1.5	2	6
<i>Nampa 1999</i>						
Kronos	75	12.1	33	64.9	67	0
Ocatillo	72	12.8	35	65.5	88	0
WB Cortez	81	13.3	33	65.9	89	0
WB 881	65	12.1	35	63.8	86	0
LSD <sub>.10</sub>	8	1.5	3	1.4	15	-
<i>1999 (all three sites)</i>						
Kronos	85	13.1	31	64.4	78	1
Ocatillo	83	13.3	33	65.0	91	0
WB Cortez	83	13.7	30	65.3	91	2
WB 881	82	13.0	32	64.0	88	0
LSD <sub>.10</sub>	19	1.6	3	1.1	8	2
<i>1997-99 (9 site years)</i>						
Kronos	90	13.4	30	61.6	87	2
WB Cortez	87	13.8	30	62.2	95	1
WB 881	83	13.5	31	61.1	92	0
LSD <sub>.10</sub>	9	0.8	1	1.3	3	2
<i>1994-98 (13 site years)</i>						
WB Cortez	103	13.0	31	62.6	93	2
WB Kofa	99	13.2	32	61.5	94	4
WB 881	97	13.0	32	61.4	92	4
LSD <sub>.10</sub>	3	0.3	1	0.4	1	3

harvest, as well as conditions beyond their control that can also influence protein.

## Fall Planted Hard Wheat

We have planted spring wheat varieties in the fall for many years now at the Parma Research and Extension Center with variable results. Durum varieties seem to be the most susceptible to winter kill and we've lost them on a regular basis. But soft white and hard reds seldom winter-killed.

There have been problems other than winter kill. In Elmore county, the earlier heading spring varieties were more susceptible to late season frost. At Parma we've seen greater lodging from fall plantings of spring wheat. But fall planted spring wheat, barring winter kill, is invariably more productive than normal spring plantings.

This past year a limited acreage of **WB 936** hard red spring wheat was fall planted on farms in western Idaho. A small percentage of this was lost to winter kill, as was some of the winter wheat in the area. But for the most part the fall planted spring wheat yielded well, and better than most spring plantings of the same variety.

We conducted a trial in 1999 comparing the yield and protein of three hard spring wheats (**Vandal**, **WB 936**, and **377s**) planted late fall (Nov. 23), early spring (Mar. 5), or late spring (Apr. 14). This work was supported by the Idaho Wheat Commission.

**Vandal** and **WB 936** were the most productive in the late fall planting but **Vandal** was the least productive when planted early or late spring (Fig. 1). **WB 936** was the highest yielding when spring planted. **Vandal** averaged the highest protein regardless of planting date. **Vandal** in particular was more productive when late fall planted.

**Vandal** was particularly sensitive to spring plantings because it is later maturing and develops under warmer temperatures that are less conducive for grain filling.

Fall plantings of spring wheat are not without risks, but they also have the potential for increasing production, especially of late maturing varieties such as **Vandal**.

## Wheat Milling and Baking Quality

You may have seen the listing of varieties in the Idaho Grain magazine according to their quality acceptability. There were some varieties very conspicuous by their absence. **Penawawa**, the most commonly planted spring wheat in the Treasure Valley, was not on the **Quality Plus** or **Acceptable Quality** list. **Alpowa** wasn't on the lists either.

**Penawawa** and **Alpowa** both have relatively poor flour yield, averaging 2-4 % lower than higher quality varieties such as **Whitebird**, **Centennial**, **Treasure** or **Pomerelle**. **Penawawa** and **Alpowa** also have poorer baking quality, averaging 0.3 to 0.4 cm smaller cookie diameters.

The widespread planting of **Penawawa** and **Alpowa** varieties are hurting efforts to improve the quality of PNW soft white wheat. Fortunately, there are

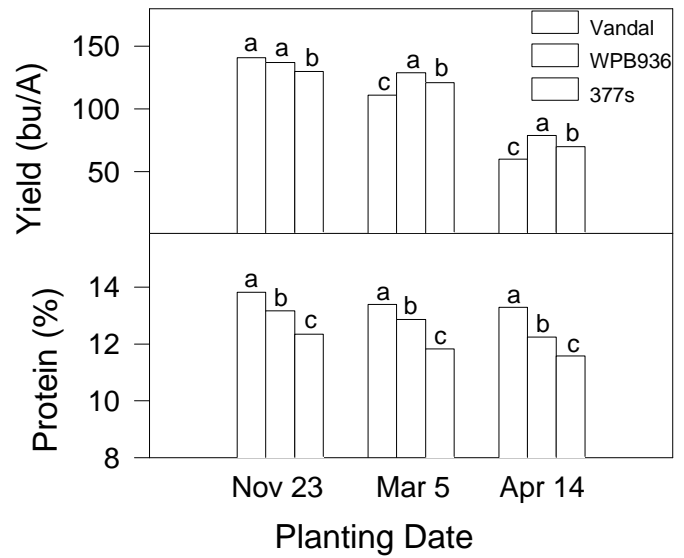


Fig. 1. Hard spring wheat yield and protein as affected by late fall, early and late spring planting dates. Parma, 1999.

productive alternatives for the Treasure Valley in **Whitebird** and **Centennial**, with high yielding high quality new releases on the way.

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