

**2006-07 On-Farm
Hard Red and Hard White Winter Wheat Variety Demonstration Trial
Four Locations in North Central Idaho**

Larry J. Smith, University of Idaho Extension, Nez Perce County
with

Idaho Wheat Commission

Stephen Guy, University of Idaho Crop Management Specialist, Moscow, Idaho

Grower Cooperators:

Robert Blair, Blair Farm, Leland, Idaho
James Evans, Evans Farm, Genesee, Idaho
Art & Doug McIntosh, McIntosh Farm, Lewiston, Idaho
Bob, Dick, Mark, & Todd Wittman, Wittman Farm, Lapwai, Idaho
Bob Brown, UI/Nez Perce County Extension Tech Support

Seed Processor Cooperators:

Genesee Union Warehouse, Genesee, Idaho
Primeland Cooperatives, Lewiston, Idaho
UI Foundation Seed Program, Kimberly, Idaho
WSU Foundation Seed, Pullman, Washington

Situation: The UI/Nez Perce County Extension Crops Advisory Committee has identified on-farm variety testing a high priority in north central Idaho. Growers continue to seek comparative information for winter wheat varieties in direct-seed and other cropping systems. The Extension Crop Advisory Committee and seed processors continue to recommend on-farm trials and demonstrations as a means to scientifically compare, demonstrate, and avail growers with information for decision making.

Objective: To evaluate seed yield, protein percentage, and test weight of three hard white and ten hard red winter wheat varieties at four locations in north central Idaho.

Methods: All locations were planted with grower equipment and produced under grower's agricultural practices. Trials were harvested using grower equipment and comparative yield was taken in the field using portable, electronic truck pad scales. Lewiston Grain Inspection provided protein percentage and test weight readings. Statistical comparison for yield, protein, and test weight were by Oregon State University AGSTATS program.

Comments:

- The following information comparing yield, test weight, and protein represents one year's data and should be considered as such. Multiple years' data is required for assimilation and sound decision making.
- Drought: The 2006-07 crop season was a year of short moisture by 5 inches on average, impacting yield and quality of many fields in north central Idaho.
- Random, scattered late-season rain showers.
- The Leland location was impacted, to some degree, by herbicide usage and wildlife feeding damage, especially in latter maturing varieties.
- The Tammany/Lewiston locations was impacted, by some degree, by early spring cattle feeding on wet soils and partial summer fallowing. Undulating stands were expressed due to moisture shortages found in slick spots (alkali soil spots).
- Even during a drought year, winter wheat across the four test sites provided relatively good seed yield and quality due to advantageously capturing and utilizing the winter and spring rainfall patterns before the severe drought impact set in during late-spring and summer.

Varieties Tested by Class:

Hard White Winter Wheat

Gary (IDO 550) Hard white winter wheat released by Idaho and USDA-ARS. A semi-dwarf adapted for rain-fed production. Good dual purpose quality, bread baking, and noodles. Lower ash content than other varieties available. High yielding in regional dryland trials, but limited testing in the Treasure Valley. Highly resistant to dwarf bunt, moderate adult plant resistance to stripe rust, moderately resistant to leaf rust and moderately tolerant of snow mold. Gary is similar in yield to Golden Spike, lower in test weight, earlier to head, and taller. Inadequate straw strength will limit acreage under irrigated conditions.

MDM (WA 7936) A Washington State University release in 2005 for low to intermediate rainfall regions. It yielded higher than Golden Spike and Gary in Washington dryland testing. Milling yield and bread making quality are poorer than Finley, a quality hard red winter variety, MDM has not been tested in western Idaho dryland regions.

UI Darwin (IDO 604) A hard white winter wheat intended as a replacement for the hard red winter cultivar Bonneville. UI Darwin is similar to Bonneville in appearance and agronomic characteristics and does best in dryland production areas. UI Darwin has average height, maturity, yield, and test weight. UI Darwin has some adult plant resistance to stripe rust, is resistant to dwarf bunt and has moderate resistance to snow mold. UI Darwin is similar to Bonneville in quality.

Hard Red Winter Wheat

AgriPro Paladin (W96-355) A hard red winter wheat released by AgriPro in 2005. Paladin had higher than average yields and test weight and is shorter than average. Paladin yielded well in the District III trials and had average grain and flour protein. Loaf volume was low.

Bauermeister (WA 7939) A Washington State University release in 2005 adapted to dryland conditions. It is higher yielding than Weston and Buchanan in Washington testing. A semi-dwarf, it is shorter than Finley and Weston. Milling yield, protein, and bread making quality are lower than Finley and Weston. Bauermeister has not been tested in western Idaho dryland trials as seed has never been provided. Bauermeister yielded well under irrigated and dryland conditions, but had lower than average test weight. Quality tested in the Pacific Northwest Regional Quality Testing was poor.

Boundary (IDO 467) Released by Idaho AES, USDA-ARS in 1997. Boundary is intended for production in the high yield production zones. Yield under irrigation has been less than Promontory. Test weight and grain protein tend to be lower than average. Straw strength is very good and better than Promontory. Mixing tolerance is much better than average and loaf volume is slightly less than average.

Delco (SMD 215-2) Released by Sunderman Breeding in 1999. Delco is a high yielding variety for irrigated conditions. It has high test weight and is shorter than Boundary and Promontory and taller than Garland. Date head is later than Promontory and earlier than Boundary. Protein content is higher than Boundary and similar to Promontory.

Eddy A new hard red winter wheat from WestBred, LLC. Eddy is showing excellent quality in 2-year data equal to Finley, the hard red wheat check. Eddy was assigned the “Q+” quality score. The quality of some hard red wheat varieties is not consistent with customer expectations for the “commodity” hard red wheat market class. Before selecting varieties with the “Q-” designation, consult the buyer or user of your wheat.

DW (IDO 513) A Hard red winter variety release by the University of Idaho and the USDA-ARS. DW is best adapted to dryland environments. DW tends to be slightly lower in yield compared to Boundary and Bonneville. Replacement for Bonneville. Intermediate protein but good bread making quality, loaf volume, and mix time. Named for D.W. Sundermann, former USDA-ARS wheat breeder at Aberdeen.

CDC Falcon 1999, Western Plant Breeders, Saskatchewan, Canada.
Short height, medium maturity, medium strong straw strength, good winter hardiness (according to a North Dakota Wheat Growers publication).

Finley 2001 release date, Washington State University and USDA-ARS

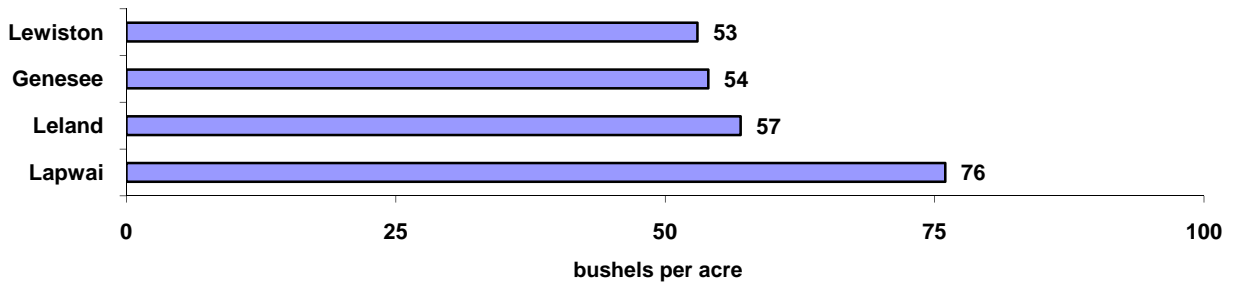
Juniper (IDO 575) An Idaho 2006 release intended primarily for low rainfall production. There has been limited testing of this variety in western Idaho. It has dwarf bunt resistance. It lodges less than Weston. Protein is lower than Bonneville and comparable to Weston. Milling yield and loaf volume is similar to Weston but mixing tolerance is better for Juniper.

Moreland (IDO 517) A University of Idaho 2002 release from Ed Souza in Aberdeen. Early maturing, adapted to irrigated production. TCK (Dwarf bunt) resistant and susceptible to stripe rust. More winter hardy than Stephens but less snow mold tolerance than Boundary. Good yield potential in the absence of stripe rust. Baking quality is exceptional (good mixing time and high bake volume), much better than Garland and other commonly grown irrigated hard red winters. Moreland is similar in yield to Boundary. Height is similar to Declo, shorter than Boundary, and straw strength is very good.

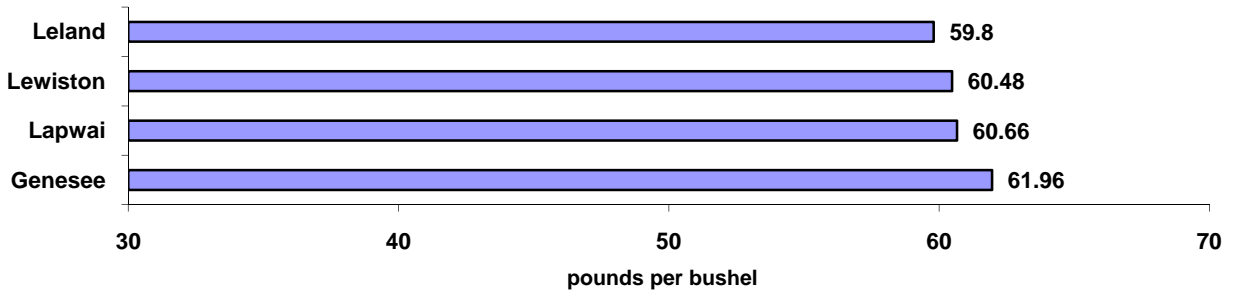
**2006-07 On-Farm
Hard Red and Hard White Winter Wheat Variety Demonstration Trial
Four Locations in North Central Idaho**

	Average Yield bu/acre	Average Test Weight lb/bu	Average % Protein %
Leland	57	59.80	12.98
Genesee	54	61.96	12.06
Lewiston	53	60.48	14.24
Lapwai	76	60.66	12.28
Average	60	60.73	12.89

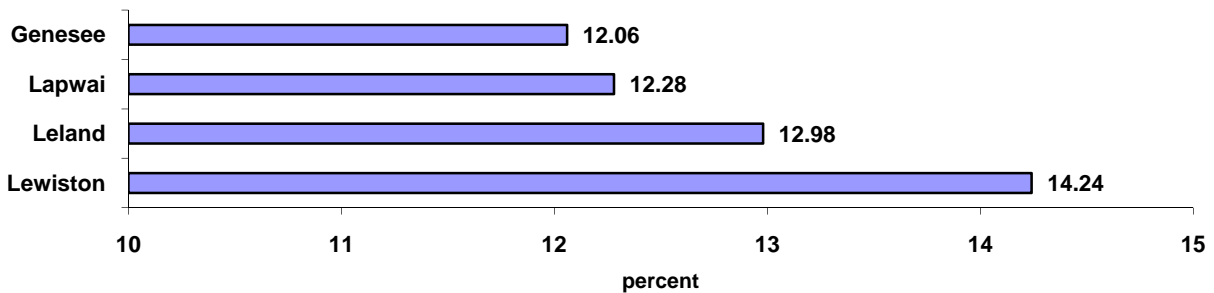
Average Seed Yield--Hard Red & Hard White Winter Wheat--4 Locations



Average Test Weight--Hard Red & Hard White Winter Wheat--4 Locations



Average Percent Protein--Hard Red & Hard White Winter Wheat--4 Locations



**2006-07 On-Farm
Hard Red and Hard White Winter Wheat Variety Demonstration Trial
Four Locations in North Central Idaho**

The variety Moreland was not planted at the Leland location.

Yield across 4 locations for Hard Red & Hard White Wheat

Variety	Leland	Genesee	Lewiston	Lapwai	Average
	-----bushels/acre-----				
MDM (WA 7936) (hard white winter wheat)	65	66	55	76	66
Gary (hard white winter wheat)	64	61	46	74	61
UI Darwin (hard white winter wheat)	58	49	53	76	59
Bauermeister (hard red winter wheat)	56	67	59	68	63
Finley (hard red winter wheat)	43	55	41	63	51
DW (IDO 513) (hard red winter wheat)	64	57	63	79	66
Declo (hard red winter wheat)	66	51	46	77	60
Boundary (hard red winter wheat)	71	41	58	79	62
Eddy (hard red winter wheat)	64	45	52	89	63
Paladin (hard red winter wheat)	56	57	64	83	65
Falcon (hard red winter wheat)	41	51	50	77	55
Juniper (hard red winter wheat)	41	55	48	65	52
Moreland (hard red winter wheat)	---	45	47	76	56
Average	57	54	52	76	60

Test Weight across 4 locations for Hard Red & Hard White Wheat

Variety	Leland	Genesee	Lewiston	Lapwai	Average
	-----pounds/bushel-----				
MDM (WA 7936) (hard white winter wheat)	56.3	60	59.3	57.8	58.35
Gary (hard white winter wheat)	56.5	61	59.6	58.8	58.98
UI Darwin (hard white winter wheat)	62.5	62.6	61.5	62.1	62.18
Bauermeister (hard red winter wheat)	57.3	60.7	60	58.7	59.18
Finley (hard red winter wheat)	60.3	63.1	61.2	61.2	61.45
DW (IDO 513) (hard red winter wheat)	60.8	63	62.2	62.2	62.05
Declo (hard red winter wheat)	60.2	62.6	58.6	61.2	60.65
Boundary (hard red winter wheat)	59.3	60.9	60.5	60.5	60.30
Eddy (hard red winter wheat)	62.4	62.4	61.3	62.7	62.20
Paladin (hard red winter wheat)	61.3	63.3	61.7	62.7	62.25
Falcon (hard red winter wheat)	59.5	62.7	60.2	61.1	60.88
Juniper (hard red winter wheat)	61.2	62.2	61.8	59.3	61.13
Moreland (hard red winter wheat)	---	61	58.3	60.3	59.87
Average	59.80	61.96	60.48	60.66	60.73

Percent Protein across 4 locations for Hard Red & Hard White Wheat

Variety	Leland	Genesee	Lewiston	Lapwai	Average
	-----%-----				
MDM (WA 7936) (hard white winter wheat)	14.2	12.6	13.6	12.2	13.15
Gary (hard white winter wheat)	13.2	11.7	14.3	12.1	12.83
UI Darwin (hard white winter wheat)	12.8	12.3	14.5	13	13.15
Bauermeister (hard red winter wheat)	13	11.9	13.5	12	12.60
Finley (hard red winter wheat)	13.3	11.8	14.3	12.6	13.00
DW (IDO 513) (hard red winter wheat)	12.8	11.5	13.3	11.8	12.35
Declo (hard red winter wheat)	13.6	12.3	15.1	12.1	13.28
Boundary (hard red winter wheat)	12.4	12	14.2	11.6	12.55
Eddy (hard red winter wheat)	12.4	12	14.5	11.9	12.70
Paladin (hard red winter wheat)	13.5	12.6	13.8	12.5	13.10
Falcon (hard red winter wheat)	11.9	11.8	14.2	12.4	12.58
Juniper (hard red winter wheat)	12.6	12.1	14.7	13.3	13.18
Moreland (hard red winter wheat)*	---	12.2	15.1	12.2	13.17
Average	12.98	12.06	14.24	12.28	12.89

*The variety Moreland was not planted at the Leland location. However, it was used to average overall seed yield, test weight, and protein percentage for hard red and hard white winter wheat evaluated for all sites except Leland.

However, in separate statistical evaluations for seed yield, test weight, and percent protein on the following pages, Moreland was omitted from the hard red wheat class comparison to negate any data shift accuracy since it was not planted in Leland, thus presenting a null data set for that location.

Note: The hard red and hard white winter wheat varieties have been separated by class for statistical evaluation and comparison of seed yield, test weight, and seed protein percentage for the remainder of this report. Also, Moreland (hrww) was dropped from comparative statistical analysis since it was not planted in Leland due to lack of sufficient plot space to provide for a clean entry strip within the plot area. The plot site was just shy of holding the last entry, Moreland hrww, and a decision was made throw it out rather than reap a contaminated mix of variety overlap entry at harvest and jaundiced results.

**2006-07 On-Farm
Hard White and Hard Red Winter Wheat Variety Demonstration Trial
Four Locations in North Central Idaho**

*Larry J. Smith, UI/Cooperative Extension System
Idaho Wheat Commission*

Stephen Guy, University of Idaho Crop Management Specialist, Moscow, Idaho

Cooperators: Robert Blair, Blair Farm, Leland, Idaho
James Evans, Evans Farm, Genesee, Idaho
Art & Doug McIntosh, McIntosh Farm, Lewiston, Idaho
Bob, Dick, Mark, & Todd Wittman, Wittman Farm, Lapwai, Idaho
Bob Brown, UI/Nez Perce County Extension Tech Support

Seed Processor Cooperators:
Genesee Union Warehouse, Genesee, Idaho
Primeland Cooperatives, Lewiston, Idaho
UI Foundation Seed Program, Kimberly, Idaho
WSU Foundation Seed, Pullman, Washington

Location: Blair Farm, Leland:
Planting date: October 22, 2006
Harvest date: August 10, 2007
Seeding rate: 84 lbs/acre
Fertilizer: Nitrogen 120 lbs/acre
100 lbs NH₃ (anhydrous ammonia)
20 lbs liquid nitrogen
Phosphorous 25 lbs/acre
Sulfur 20 lbs/acre
Weed control: No herbicide applied to trial area—weed pressure acceptable

Location: Evans Farm, Genesee:
Planting date: October 24, 2006
Harvest date: July 24, 2007
Seeding rate: 95 lbs/acre
Fertilizer: Nitrogen 150 lbs/acre
Phosphorous 25 lbs/acre
Sulfur 25 lbs/acre
Potassium 10 lbs/acre
Weed control:

Location: McIntosh Farm, Tammany area, Lewiston:
Planting date:
Harvest date:
Seeding rate:
Fertilizer:

Weed control:

Location: Wittman Farm, Lapwai:
Planting date: October 13, 2006
Harvest date: July 26, 2007
Seeding rate: 90 lbs/acre
Fertilizer: Liquid NH₃ 150 lbs/acre
Phosphorous 13.25 lbs/acre
Sulfur (Thiosol) 13 lbs/acre
Liquid nitrogen 10 lbs/acre
16-20-0 50 lbs/acre
Weed control:

**2006-07 Hard Red Winter Wheat Variety Demonstration Trial
Four Locations in North Central Idaho**

Seed Yield—Hard Red Winter Wheat

Variety by Class	Leland	Genesee	Lewiston	Lapwai	Average
-----bushels per acre-----					
Hard Red					
Bauermeister	56	67	59	68	63
Finley	43	55	41	63	51
DW (IDO 513)	64	57	63	79	66
Declo	66	51	46	77	60
Boundary	71	41	58	79	62
Eddy	64	45	52	89	63
Paladin	56	57	64	83	65
Falcon	41	51	50	77	55
Juniper	41	55	48	65	52
Average hard red	56	53	53	76	60
LSD 5% = 11.98 bushels		C.V. = 13.79%			

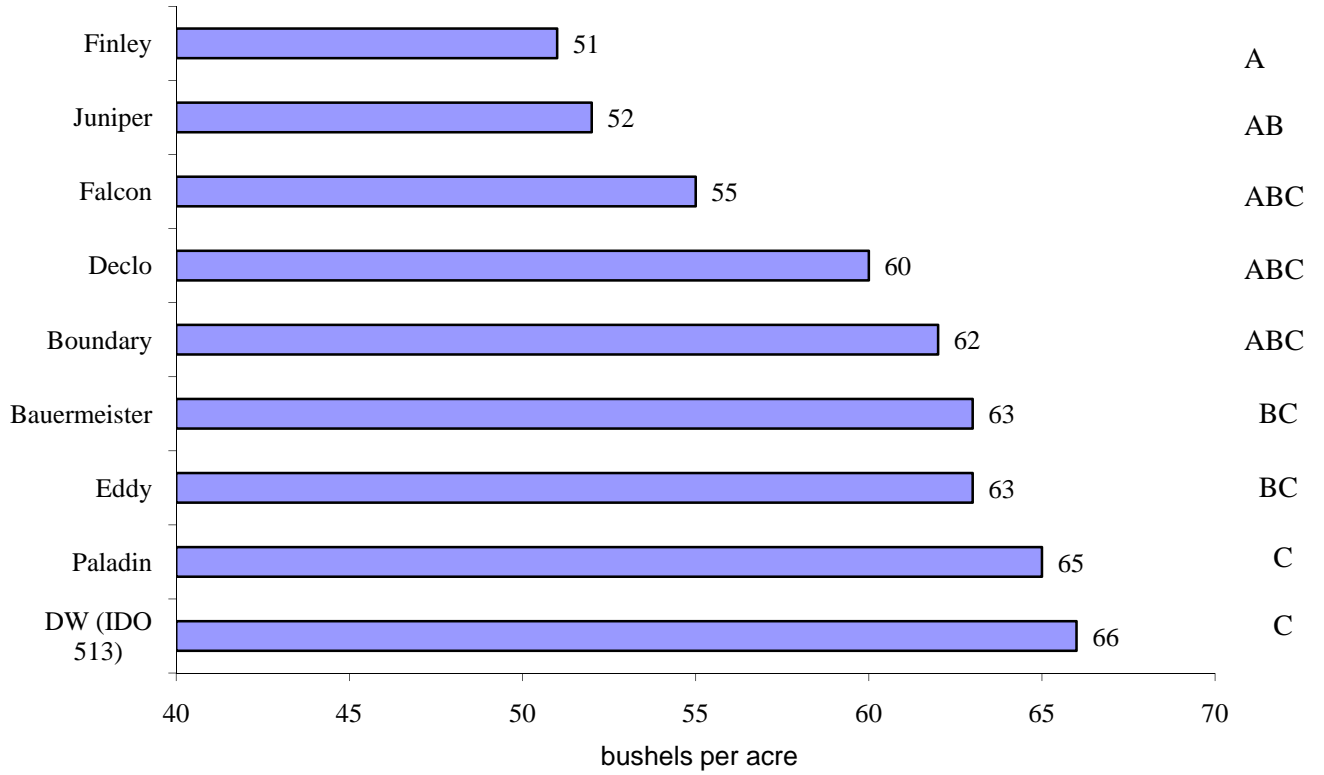
LSD Summary Table

Variety	Hard Red Winter Wheat	
	bushels per acre	
Finley	51	A
Juniper	52	AB
Falcon	55	ABC
Declo	60	ABC
Boundary	62	ABC
Bauermeister	63	BC
Eddy	63	BC
Paladin	65	C
DW (IDO 513)	66	C

Comments:

- DW (IDO 512) and Paladin yielded significantly better at the 5% significance level than Juniper and Finley.
- Average seed yield across the four locations ranged from a low of 53 bushels per acre at the Genesee and Lewiston locations to a high of 76 bushels per acre at the Lapwai location.
- Average seed yield across the four locations was 60 bushels per acre.
- Falcon, Juniper, Boundary, and Finley (deer damage) were varieties providing the lowest yields of 41 bushels per acre each at Leland, Genesee, and Lewiston, respectively. The variety Eddy provided the highest seed yield of 89 bushels per acre at Lapwai.
- The Leland location was impacted by wildlife feeding damage and herbicide timing.
- The Tammany location was impacted by early-season cattle feeding under wet conditions and partial summer fallow and moisture deficient slick spots (alkali soil spots).

2006-07 Hard Red Winter Wheat Seed Yield Average 4 Locations



**2006-07 Hard Red Winter Wheat Variety Demonstration Trial
Four Locations in North Central Idaho**

Seed Protein Percentage—Hard Red Winter Wheat

Variety by Class	Leland	Genesee	Lewiston	Lapwai	Average
	-----% protein-----				
Hard Red					
Bauermeister	13.0	11.9	13.5	12.0	12.60
Finley	13.3	11.8	14.3	12.6	13.00
DW (IDO 513)	12.8	11.5	13.3	11.8	12.35
Declo	13.6	12.3	15.1	12.1	13.27
Boundary	12.4	12.0	14.2	11.6	12.55
Eddy	12.4	12.0	14.5	11.9	12.70
Paladin	13.5	12.6	13.8	12.5	13.10
Falcon	11.9	11.8	14.2	12.4	12.58
Juniper	12.6	12.1	14.7	13.3	13.18
Average hard red	12.83	12.00	14.18	12.24	12.81
LSD 5% = 0.65		C.V. = 3.45%			

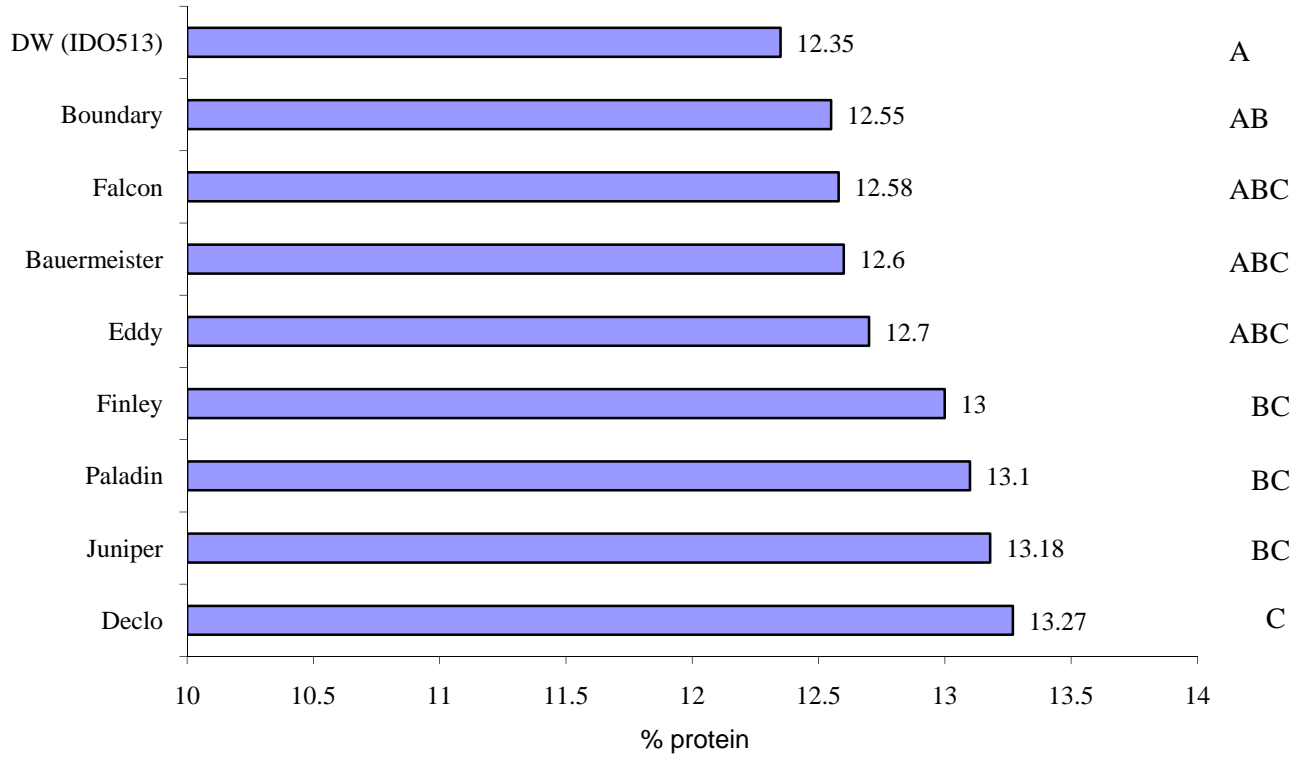
LSD Summary Table

Variety	Hard Red Winter Wheat	
	percent seed protein	
DW (IDO 513)	12.35	A
Boundary	12.55	AB
Falcon	12.58	ABC
Bauermeister	12.60	ABC
Eddy	12.70	ABC
Finley	13.00	BC
Paladin	13.10	BC
Juniper	13.18	BC
Declo	13.27	C

Comments:

- Declo provided significantly higher protein percentage at the 5% significance level than Bauermeister, Falcon Boundary, and DW (IDO 513).
- Declo, Juniper, Paladin, Finley, and Eddy provided significantly higher protein percentage than DW (IDO 513) at the 5% significance level.
- Average seed protein across four locations was 12.81%.
- All four locations provided average seed protein percentages above 11.5%.

2006-07 Hard Red Winter Wheat Percent Protein Average 4 Locations



**2006-07 Hard Red Winter Wheat Variety Demonstration Trial
Four Locations in North Central Idaho**

Test Weight—Hard Red Winter Wheat

Variety by Class	Leland	Genesee	Lewiston	Lapwai	Average
-----pounds per bushel-----					
Hard Red					
Bauermeister	57.3	60.7	60	58.7	59.18
Finley	60.3	63.1	61.2	61.2	61.45
DW (IDO 513)	60.8	63	62.2	62.2	62.05
Declo	60.2	62.6	58.6	61.2	60.65
Boundary	59.3	60.9	60.5	60.5	60.30
Eddy	62.4	62.4	61.3	62.7	62.20
Paladin	61.3	63.3	61.7	62.7	62.25
Falcon	59.5	62.7	60.2	61.1	60.88
Juniper	61.2	62.2	61.8	59.3	61.13
Average hard red	60.26	62.36	60.83	61.07	61.13
LSD 5% = 1.25 pounds per bushel		C.V. = 1.41%			

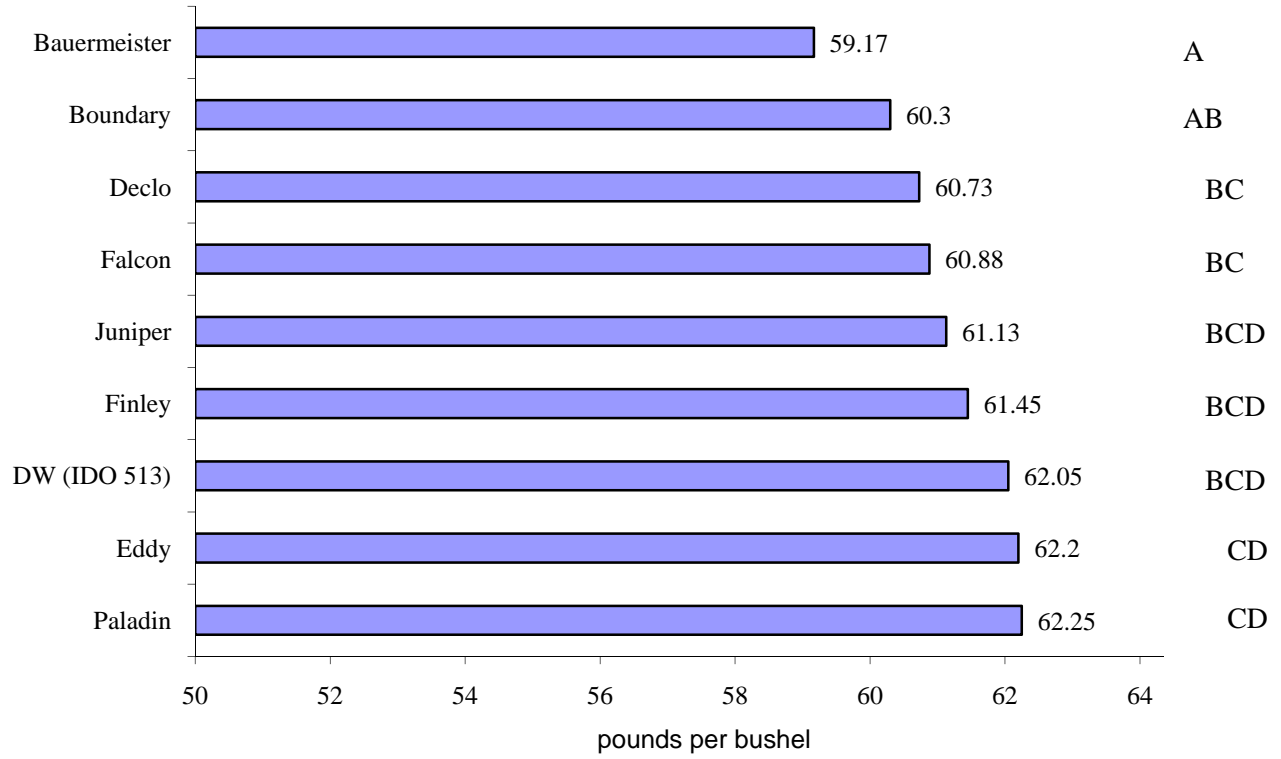
LSD Summary Table

Variety	Hard Red Winter Wheat	
	pounds per bushel	
Bauermeister	59.17	A
Boundary	60.30	AB
Declo	60.73	BC
Falcon	60.88	BC
Juniper	61.13	BCD
Finley	61.45	BCD
DW (IDO 513)	62.05	BCD
Eddy	62.20	CD
Paladin	62.25	CD

Comments:

- Paladin and Eddy provided significantly higher test weights at the 5% significance level than Falcon, Declo, Boundary, and Bauermeister.
- DW (IDO 513), Finley, Juniper, Falcon, and Declo provided significantly higher test weight than Boundary and Bauermeister at the 5% significance level.
- Average test weight across the four locations was 61.13 pounds per bushel.
- All locations provided average test weight readings above 60 pounds per bushel.

2006-07 Hard Red Winter Wheat Test Weight Average 4 Locations



Position Yourself for Producing Hard White Winter Wheat

Before purchasing and planting hard white winter wheat seed, be sure you take into consideration the following six items. This information is adapted from the University of Nebraska.

1. I have identified a buyer for my harvested grain.

Hard white wheat is a new class of wheat for the Great Plains. What little white wheat has been grown in the area has been produced within an identity preserved system, where the seed of a proprietary variety is sold to the grower and the grower is under contract to sell the grain back to the company supplying the seed. The release of public varieties of hard white wheat, such as Nuplains, is a departure from this system. Only a few grain buyers are set-up to handle and market hard white wheat at this time. You need to identify a buyer for your white wheat grain before you place the first kernel of wheat in the ground! There is no guarantee of a buyer at harvest if you have not made prior arrangements.

You will want to confirm variety selection with your grain buyer because they may only be interested in handling a specific variety for a specific end use.

2. It has been at least 24 months since I last harvested hard red winter wheat in the field I will be planting to hard white wheat.

Hard red winter wheat and hard white wheat are considered to be contrasting classes by the Federal Grain Inspection Service. Having more than 1% contamination by a contrasting class results in grade reduction. Therefore, it is important to minimize the amount of volunteer hard red winter wheat that may grow in a field of hard white wheat. Hard white wheat should only be grown on dryland ground that has not been planted to hard red winter wheat for at least three years, or on irrigated ground not planted to hard red winter wheat for at least two years.

3. I can maintain a minimum 15-foot isolation strip between my hard white wheat and hard red winter wheat fields.

4. I will carefully clean all drills, harvest equipment, and grain bins to assure that the two different classes of wheat do not get mixed.

One of the benefits of growing hard white wheat is that the same equipment is used for both crops. However, for reasons explained above, extra attention is needed to avoid mixing the grain of the two wheat classes. Drills, harvesting equipment (combines, trucks, augers, grain carts), and storage facilities must be cleaned carefully to assure mixture of the two classes does not occur.

5. I have the ability to store my hard white wheat grain on the farm for at least two months from the time it is harvested.

On-farm grain storage may be an indispensable aspect of white wheat production at its inception due to the fact elevators may not have sufficient demand to dedicate storage space for white wheat.

6. I do have the ability to harvest my white wheat fields in a timely manner to avoid pre-harvest sprouting.

Hard white wheat varieties are more susceptible to pre-harvest sprouting than most hard red winter wheat varieties. Rain, high humidity, and low temperatures after ripening may cause the grain to sprout in the spike. Hard white wheat fields should be harvested promptly when ripe to avoid exposure to wet, humid weather.

**2006-07 Hard White Winter Wheat Variety Demonstration Trial
Four Locations in North Central Idaho**

Seed Yield—Hard White Winter Wheat

Variety by Class	Leland	Genesee	Lewiston	Lapwai	Average
-----bushels per acre-----					
Hard White					
MDM (WA 7936)	65	66	55	76	66
Gary	64	61	46	74	61
UI Darwin	58	49	53	76	59
Average hard white	62	59	51	76	62
LSD 5% = 8.40 bushels per acre		C.V. = 7.84%			

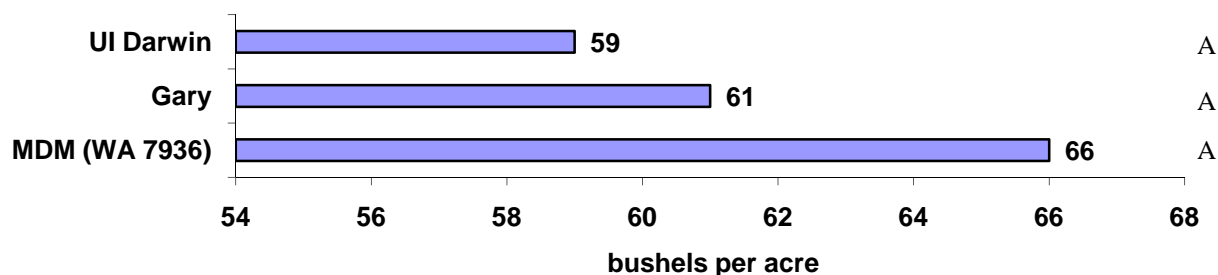
LSD Summary Table

Variety	Hard White Winter Wheat	
	bushels per acre	
UI Darwin	59	A
Gary	61	A
MDM (WA 7936)	66	A

Comments:

- There were no significant differences at the 5% significance level in seed yield among the varieties.
- Average seed yield across the four locations was 62 bushels per acre.
- Seed yield across the four locations was impacted during a drought year by cropping sequences, cultural practices, scattered showers, and other factors.
- From one year's data, MDM, hard white winter wheat, appears more adapted and yielded better across the four locations.

2006-07 Hard White Winter Wheat Seed Yield Average 4 Locations



**2006-07 Hard White Winter Wheat Variety Demonstration Trial
Four Locations in North Central Idaho**

Seed Protein Percentage—Hard White Winter Wheat

Variety by Class	Leland	Genesee	Lewiston	Lapwai	Average
	-----% protein-----				
Hard White					
MDM (WA 7936)	14.2	12.6	13.6	12.2	13.15
Gary	13.2	11.7	14.3	12.1	12.83
UI Darwin	12.8	12.3	14.5	13.0	13.15
Average hard white	13.40	12.20	14.13	12.43	13.04
LSD 5% = 1.03		C.V. = 4.55%			

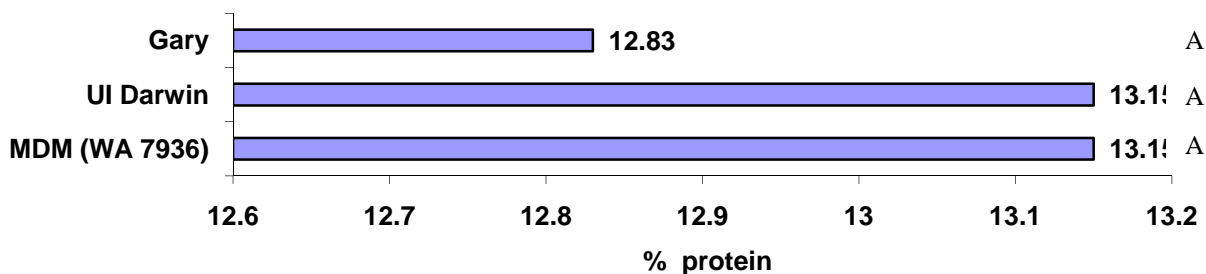
LSD Summary Table

Variety	Hard White Winter Wheat	
	percent seed protein	
Gary	12.83	A
UI Darwin	13.15	A
MDM (WA 7936)	13.15	A

Comments:

- There were no significant differences at the 5% significance level in percent seed protein.
- Average seed protein across four locations was 13.04%
- Percent seed protein across the four locations ranged from 12.2% to 14.13%.
- All four locations provided seed protein percentages above 11.5%

2006-07 Hard White Winter Wheat Percent Protein Average 4 Locations



**2006-07 Hard White Winter Wheat Variety Demonstration Trial
Four Locations in North Central Idaho**

Test Weight—Hard White Winter Wheat

Variety by Class	Leland	Genesee	Lewiston	Lapwai	Average
-----pounds per bushel-----					
Hard White					
MDM (WA 7936)	56.3	60	59.3	57.8	58.35
Gary	56.5	61	59.6	58.8	58.98
UI Darwin	62.5	62.6	61.5	62.1	62.18
Average hard white	58.43	61.20	60.13	59.57	59.83
LSD 5% = 1.94 pounds per bushel		C.V. = 1.88%			

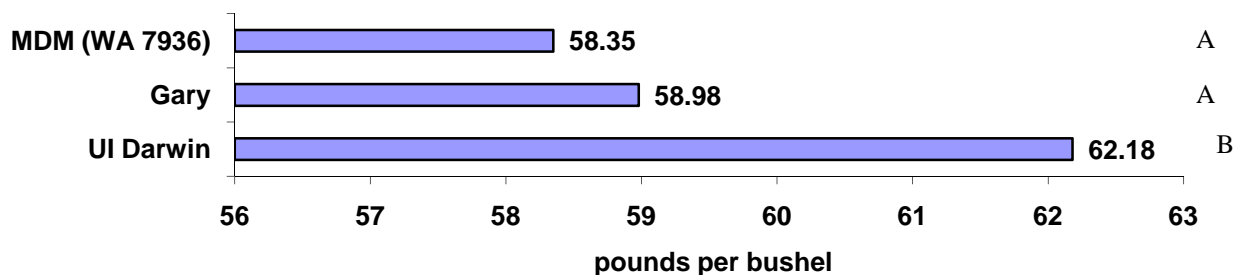
LSD Summary Table

Variety	Hard White Winter Wheat	
	pounds per bushel	
MDM (WA 7936)	58.35	A
Gary	58.98	A
UI Darwin	62.18	B

Comments:

- UI Darwin had significantly better test weight than Gary and MDM, respectively, at the 5% significance level.
- Average test weight of hard white winter wheat across four locations was 59.83 pounds per bushel.
- Both the Genesee and Lewiston locations provided test weights above 60 pounds per bushel

2006-07 Hard White Winter Wheat Test Weight Average 4 Locations



**Overall Results for Hard Red and Hard White Winter Wheat
Seed Yield, Protein Percentage, and Test Weight Comparison
Across Four Locations in North Central Idaho
Leland, Genesee, Lewiston, Lapwai**

Seed yield: Average for seed yield across the four locations was 60 bushels per acre for the hard red winter wheat; 60 bushels per acre for combined hard red and hard white wheat. Moreover, the hard white wheat varieties provided 62 bushels per acre and the best for all classes tested.

Seed protein percentage: The average seed protein percentage across the four locations ran from an average low of 12.81% for hard red wheat with a modest upgrade to 12.89% for combined hard red and hard white classes. Noteworthy, hard white wheat provided the highest seed percent protein at 13.04%.

Test weight: The average test weight across the four locations provided the hard white varieties with the worst test weights and the best seed protein and yield of all classes tested. However, hard white winter wheat fell short on test weight, failing to achieve the revised benchmark of 60 pounds per bushel instead falling short by 0.17 pounds by demonstration test weight of 59.83 pounds per bushel.

Conclusions and comments: Given the drought impact felt at lower elevations areas, 5 inches rain below normal for the crop season, such as the Rimrock area and Tammany (Lewiston) where re-cropping is the backbone of cropping sequences, it is significant that these locations were still able to “punch out” average yields in the 50 bushel per acre or better range along with acceptable seed protein percentages for market classes and acceptable test weights. Test weights ranged from just shy of 60 pounds per bushel at the Leland location to almost 62 pounds per bushel at the warm, dry Genesee Rimrock area. Other locations stretching for test weights of near 61 pounds per bushel in Tammany and Lapwai also did well on the comparative results of seed yield and seed protein percentages.

Indeed, since the county has applied for a D3 category—severe drought, it became clear that crop husbandry, historical cropping sequences, and the judicious use of husbandry and fertilizer products have produced crops, along with the on-farm test plots, of higher yield quality and value than I would have imagined a few weeks before harvest. Our farmers, once again, prove they are the best and have adapted to maximize economic return even though at various elevations and rainfall areas of the county.

Each of the cooperative growers are similar, yet each with their own specifically unique avenues that run their crop husbandry, cropping sequences, and equipment selection and usage that work jointly to the benefit of each participating farm operation to continue to excel as demonstrated in their work at conducting the business for feeding the world and profits to insure farm sustainability.