

# North Dakota

# Hard Red Spring Wheat

## Variety Trial Results for 2007 and Selection Guide

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Rainfall was slightly above average during the 2007 growing season for North Dakota as a whole. Southwestern North Dakota, which had been under droughty conditions for several years, received substantially more rainfall than average. Heavy rains in eastern North Dakota early in the season caused crusting and losses of nitrogen, and delayed planting. Hot, dry conditions during flowering caused some sterility, but reduced the incidence of Fusarium head blight (FHB). Leaf rust was prevalent early in the season in most regions of the state, reducing yields of nonresistant varieties that were not treated with fungicides.

Wheat varieties are tested each year at multiple sites throughout North Dakota. The relative performance of these varieties is presented in table form. Variety performance data are used to provide variety recommendations to producers. Some varieties may not be included in the tables due to insufficient testing or lack of seed availability, or they offer no yield or disease advantage over similar varieties. Additional data from county sites are available in the "Crop Production Guide 2008" (No. 18) and from each Research Extension Center at [www.ag.ndsu.nodak.edu/aginfo/variety/hrsw.htm](http://www.ag.ndsu.nodak.edu/aginfo/variety/hrsw.htm). Descriptions of the most commonly grown varieties in the region are included for informational purposes. Use data from multiple locations and years when selecting a variety.

Information contained in this publication is based on research conducted by the following North Dakota Agricultural Experiment Station scientists, plant breeders, cereal chemists and plant pathologists.

Blaine Schatz - Carrington  
Steve Zwinger - Carrington  
Eric Eriksmoen - Hettinger  
Mark Halvorson - Minot  
Bryan Hanson - Langdon  
Neil Riveland - Williston  
Glenn Martin - Dickinson

Timothy Friesen – USDA – Plant Pathologist  
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Shaukat Ali - Plant Pathology  
Truman Olson - Cereal Chemist  
Jack Rasmussen - Plant Pathology

# NDSU

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Successful wheat production depends on numerous factors, including selecting the right variety for a particular area. The information included in this publication is meant to aid in selecting that variety or group of varieties. Characteristics to evaluate in selecting a variety should include yield potential in your area, protein content when grown with proper fertility, straw strength and plant height, reaction to important diseases and maturity. Selecting varieties with good milling and baking quality also is important to maintain market recognition.

Every growing season differs; therefore, when selecting a variety, use data that summarize several years and locations. Choose the variety that, on average, performs the best at multiple locations near your farm during several years.

Hard red spring wheat varieties currently grown in North Dakota are described in the following tables. Presentation of data for the entries tested does not imply approval or endorsement by the authors or agencies conducting the test. North Dakota State University approves the reproduction of any table in the publication only if no portion is deleted, appropriate footnotes are given and the order of the data is not rearranged.

### **List of Tables and Figures**

- Table 1. 2007 North Dakota hard red spring wheat variety description table, agronomic traits.
- Table 2. 2007 North Dakota hard red spring wheat variety descriptions, quality traits.
- Table 3. 2005 and 2006 analytical milling and baking data from field plot variety trials at Carrington, Casselton, Dickinson, Hettinger, Langdon, Minot and Williston. Analyses conducted at the NDSU Hard Red Spring Wheat Quality Laboratory in Fargo, N.D.
- Table 4. 2006 analytical milling and baking data from field plot variety trials at Carrington, Casselton, Dickinson, Hettinger, Langdon, Minot and Williston. Analyses conducted at the NDSU Hard Red Spring Wheat Quality Laboratory in Fargo, N.D.
- Table 5. Yield of hard red spring wheat varieties grown at three locations in eastern North Dakota, 2005-2007.
- Table 6. Yield of hard red spring wheat varieties grown at four locations in western North Dakota, 2005-2007.
- Table 7. Protein of hard red spring wheat varieties grown at seven locations in North Dakota, 2007.
- Table 8. Test weight of hard red spring wheat varieties grown at seven locations in North Dakota, 2007.

**Table 1. 2007 North Dakota hard red spring wheat variety description table, agronomic traits.**

Variety	Agent or Origin <sup>1</sup>	Year Released	Beard	Height	Straw Strength	Maturity	Reaction to Disease <sup>2</sup>				
							Stem Rust	Leaf Rust	Foliar Disease	Root Rot	Head (Scab)
AC Superb	Can	2001	yes	sdwf	strg	m.early	R	S	S	M	S
<b>AP 604 CL</b>	<b>AgriPro</b>	<b>2007</b>	<b>yes</b>	<b>sdwf</b>	<b>m.strg</b>	<b>m.early</b>	<b>R</b>	<b>MS</b>	<b>MS</b>	<b>NA</b>	<b>NA</b>
Ada	MN	2006	yes	sdwf	strg	med	R	MR	MS	NA	MS
Alsen	ND	2000	yes	sdwf	strg	m.early	R	MR-MS	S	M	MR
Bakker Gold	N. Star G.	2006	yes	med	NA	late	S	NA	NA	NA	NA
Banton	Trigen	2004	yes	sdwf	strg	m.early	R	MR	MS	NA	S
Bigg Red	WestBred	2004	yes	sdwf	med	med	R-MR	S	MS	NA	MR
<b>Blade</b>	<b>WestBred/Sabre</b>	<b>2007</b>	<b>yes</b>	<b>sdwf</b>	<b>m.strg</b>	<b>med</b>	<b>R</b>	<b>MR-MS</b>	<b>MS</b>	<b>NA</b>	<b>NA</b>
Briggs	SD	2002	yes	sdwf	med	m.early	R-MR	R	MS	S	S
Choteau	MT	2004	yes	sdwf	NA	m.early	NA	NA	NA	NA	NA
<b>Cromwell</b>	<b>Thunder Seed</b>	<b>2007</b>	<b>yes</b>	<b>sdwf</b>	<b>strg</b>	<b>m.late</b>	<b>NA</b>	<b>MR</b>	<b>MR</b>	<b>NA</b>	<b>NA</b>
Dapps	ND	2003	yes	sdwf	med	m.early	R	R	M	M	MS
<b>Faller</b>	<b>ND</b>	<b>2007</b>	<b>yes</b>	<b>sdwf</b>	<b>strg</b>	<b>med</b>	<b>R</b>	<b>R</b>	<b>MR</b>	<b>NA</b>	<b>MR</b>
FBC Dylan	FBC	2006	yes	sdwf	med	med	NA	MR	S	NA	NA
Fireball	N. Star G.	2006	yes	sdwf	NA	med	NA	R	NA	NA	NA
Freyr	AgriPro	2004	yes	sdwf	strg	med	R	MR-MS	MS	NA	MR
Glenn	ND	2005	yes	sdwf	strg	m.early	R	R	M	NA	MR
Granger	SD	2004	yes	sdwf	m.strg.	m.early	R	R	MS	NA	MS
Granite	WestBred	2002	yes	sdwf	v.strg	m.late	R-MR	MR	S	NA	MS
Gunner	AgriPro	1995	yes	med	m.strg.	med	R-MR	MS	M	S	M
Hanna	AgriPro	2002	yes	med	med	m.early	MR	MS	MS	MS	MS
Howard	ND	2006	yes	sdwf	strg.	med	R	R	M	NA	M
Ingot	SD	1998	yes	sdwf	med	early	R	S	S	M	MS
Kelby	AgriPro	2006	yes	sdwf	strg.	m.early	MR	R	M	NA	MR
Keystone	WPB	2001	yes	med	med	m.early	R	MR	S	S	MS
Knudson	AgriPro	2001	yes	sdwf	strg	med	MR	MR	MR	MS	M
<b>Kuntz</b>	<b>AgriPro</b>	<b>2007</b>	<b>yes</b>	<b>sdwf</b>	<b>strg.</b>	<b>m.early</b>	<b>R</b>	<b>MR</b>	<b>MS</b>	<b>NA</b>	<b>NA</b>
Mercury	N. Star G.	1999	yes	sdwf	strg	m.early	R	MR	S	S	S
Norpro	AgriPro	1999	yes	sdwf	strg	med	R	MS-S	M	M	S
<b>Norwell</b>	<b>Thunder Seed</b>	<b>2007</b>	<b>yes</b>	<b>med</b>	<b>m.strg.</b>	<b>m.early</b>	<b>NA</b>	<b>MS</b>	<b>S</b>	<b>NA</b>	<b>NA</b>
Oklee	MN	2003	yes	sdwf	med	m.early	R	MS	MR	NA	M
Outlook	MT	2002	yes	sdwf	strg	m.early	NA	NA	NA	NA	NA
Oxen	SD	1996	yes	sdwf	strg.	m.early	MR	MS	S	MS	S
Parshall	ND	1999	yes	med	strg.	m.early	MR	S	M	MS	M
Polaris	N. Star G.	2003	yes	med	strg.	late	NA	MS	MS	NA	S
<b>RB07</b>	<b>MN</b>	<b>2007</b>	<b>yes</b>	<b>sdwf</b>	<b>m.strg.</b>	<b>m.early</b>	<b>R</b>	<b>R</b>	<b>MS</b>	<b>NA</b>	<b>NA</b>
Reeder	ND	1999	yes	sdwf	strg.	m.early	R	MS	S	M	S
Rush	WestBred	2006	yes	sdwf	strg.	m.early	NA	NA	NA	NA	NA
Russ	SD	1995	yes	med	med	m.early	R	MS	S	MS	S
<b>Samson</b>	<b>WestBred</b>	<b>2007</b>	<b>yes</b>	<b>sdwf</b>	<b>strg.</b>	<b>m.early</b>	<b>R</b>	<b>MR-MS</b>	<b>MR-MS</b>	<b>NA</b>	<b>S</b>
Saturn	N.Star G.	2003	yes	med	NA	m.late	NA	MR-MS	S	NA	S
Steele-ND	ND	2004	yes	sdwf	med	med	R	R	MS	MS	M
Traverse	SD	2006	yes	sdwf	med	m.early	R	MR	NA	NA	MR
Trooper	WestBred	2004	yes	sdwf	strg	m.early	R	MR	S	NA	S
Ulen	MN	2005	yes	sdwf	med	m.early	R	MR	MS	NA	S
<b>Vantage</b>	<b>WestBred</b>	<b>2007</b>	<b>yes</b>	<b>sdwf</b>	<b>v.strg</b>	<b>m.late</b>	<b>R</b>	<b>MR-MS</b>	<b>MS</b>	<b>NA</b>	<b>NA</b>
Walworth	SD	2001	yes	sdwf	med	m.early	R	S	S	M	S

<sup>1</sup> Refers to agent or developer: Can = Agriculture Canada; CDC = Crop Development Center, University of Saskatchewan; FBC = Farm Breeders Club; M = University of Minnesota; MT = Montana State University; ND = North Dakota State University; N. Star G. = North Star Genetics;. <sup>2</sup> R = resistant; MR = moderately resistant; M = intermediate; MS = moderately susceptible; S = susceptible; VS = very susceptible. **Bold** varieties are those released in 2007.

**Table 2. 2007 North Dakota hard red spring wheat variety descriptions, quality traits.**

Variety	Quality Factors	
	Test Weight	Wheat Protein
AC Superb	avg.	avg.
<b>AP 604 CL</b>	<b>high</b>	<b>avg.</b>
Ada	high	avg.
Alsen	high	avg.
Banton	high	avg.
Bigg Red	high	low
<b>Blade</b>	<b>high</b>	<b>avg.</b>
Briggs	avg.	avg.
Choteau	avg.	avg.
<b>Cromwell</b>	<b>high</b>	<b>avg.</b>
Dapps	low	high
<b>Faller</b>	<b>avg.</b>	<b>low/avg.</b>
FBC Dylan	high	low
Freyr	avg.	avg.
Glenn	v.high	avg.
Granger	avg.	avg.
Granite	high	high
Gunner	high	high
Hanna	high	avg.
Howard	high	avg.
Ingot	high	avg.
Kelby	high	avg.
Keystone	high	low
Knudson	high	low/avg.
<b>Kuntz</b>	<b>high</b>	<b>low</b>
Mercury	avg.	low
Norpro	avg.	low
<b>Norwell</b>	<b>avg.</b>	<b>low/avg.</b>
Oklee	high	avg.
Oxen	avg.	avg.
Parshall	high	avg.
Polaris	avg.	avg.
<b>RB07</b>	<b>high</b>	<b>avg.</b>
Reeder	high	avg.
Rush	high	avg.
Russ	avg.	avg.
<b>Samson</b>	<b>avg.</b>	<b>low</b>
Saturn	low	avg.
Steele-ND	high	avg.
Traverse	avg.	low
Trooper	avg.	low/avg.
Ulen	avg.	avg.
<b>Vantage</b>	<b>high</b>	<b>high</b>
Walworth	avg.	low

**Bold** varieties were released in 2007 and ratings are based on limited data. NA indicates insufficient information is available to make an accurate assessment.

### Importance of End-use Quality

Hard red spring wheat from the northern Great Plains is known around the world for its excellent end-use quality. Millers and bakers consider many factors in

determining the quality and value of wheat they purchase. Several key parameters are: high test weight (for optimum milling yield and flour color), high falling number (>300 seconds indicates minimal sprout damage), high protein content (the majority of HRS export markets want at least 14 percent protein) and excellent protein quality (for superior bread-making quality as indicated by traditional strong gluten proteins, high baking absorption and large bread loaf volume).

Millers and bakers are gaining a better understanding of their individual needs for consistent, high-quality wheat and flour to succeed in a very competitive industry. Wheat buyers are becoming increasingly sophisticated in their ability to test and source for quality. The U.S. grain trade is receiving requests for adding functional performance specifications to purchase contracts to obtain more consistent end-use performance. The majority of HRS wheat buyers are looking for traditional strong gluten properties (Farinogram rating of 6 to 7); however, instances arise where processors are looking for specific quality parameters, providing marketing alternatives for the wheat you produce.

Gluten strength, and milling and baking quality ratings, are provided for individual varieties in Tables 3 and 4, based on the results from the NDSU field plot variety trials. These ratings are applied to varieties grown for multiple years at seven NDSU Research Extension Centers across the state to provide producers and end users with end-use performance data. The wheat protein data often are higher than obtained in actual production, but can be used to compare differences among varieties. In addition, actual commercial end-use quality can vary due to a number of factors, with environmental conditions, planting date and location having the greatest impact.

The following photo illustrates the difference between bread made with poor-quality wheat (loaf on the right) and that made with good-quality wheat (loaf on the left).



**Table 3. 2005 and 2006 analytical milling and baking data from field plot variety trials at Carrington, Casselton, Dickinson, Hettinger, Langdon, Minot and Williston. Analyses conducted at the NDSU Hard Red Spring Wheat Quality Laboratory in Fargo, N.D.**

Variety	2007 N.D. Planted	Test Weight (lb/bu)	Protein (12% MB) (%)	Vitreous Kernels (%)	Falling Number (seconds)	Farinograph Classification (1-8) <sup>1</sup>	Farinograph Stability (minutes)	Farinograph Absorption (%)	Loaf Volume (cc)	Gluten Strength Description	Mill & Bake Quality Rating (1-5 Stars) <sup>2</sup>
Alsen	15.1	60.2	15.7	85	427	6.7	17.9	66.5	1055	Trad. Strong	****
Banton <sup>3</sup>	0.8	62.1	15.1	78	435	5.7	17.4	60.1	1010	Mellow	**
Briggs	9.2	60.0	15.1	77	466	5.3	14.7	65.8	980	Mellow	**
Dapps	1.4	58.8	16.7	85	465	6.7	17.6	65.9	1109	Trad. Strong	****
Faller	0	58.5	14.5	75	437	6.4	18.1	65.5	1043	Trad. Strong	***
Freyr	9.5	59.8	15.0	76	476	6.8	19.1	66.1	1001	Trad. Strong	***
Glenn <sup>4</sup>	20.9	62.5	15.7	88	410	7.3	22.8	66.5	1101	Trad. Strong	*****
Granger	2.2	60.1	15.0	80	460	5.9	14.6	66.8	1028	Mellow	***
Granite	1.9	61.1	16.4	82	369	6.5	15.4	65.7	1015	Trad. Strong	***
Howard	0.9	60.2	15.6	81	449	5.9	16.5	67.2	1040	Mellow	***
Knudson	4.4	59.7	14.6	70	466	7.2	28.5	65.6	960	Extra Strong	***
Parshall	1.1	60.6	15.5	91	425	6.2	16.7	66.3	1079	Trad. Strong	****
Polaris	0	58.5	14.6	64	432	5.8	15.4	60.1	1009	Mellow	**
Reeder	8.8	59.0	15.1	79	442	5.6	12.9	65.2	1005	Mellow	**
Steele-ND	9.1	60.3	15.7	79	457	6.1	16.7	68.1	1037	Trad. Strong	***
Trooper	0.6	60.4	14.5	73	456	6.5	23.1	65.2	919	Trad. Strong	**
Ulen	0	60.4	15.2	72	446	6.2	15.7	64.6	1027	Trad. Strong	***

see footnotes below

**Table 4. 2006 analytical milling and baking data from field plot variety trials at Carrington, Casselton, Dickinson, Hettinger, Langdon, Minot and Williston. Analyses conducted at the NDSU Hard Red Spring Wheat Quality Laboratory in Fargo, N.D.**

Variety	2007 N.D. Planted	Test Weight (lb/bu)	Protein (12% MB) (%)	Vitreous Kernels (%)	Falling Number (seconds)	Farinograph Classification (1-8) <sup>1</sup>	Farinograph Stability (minutes)	Farinograph Absorption (%)	Loaf Volume (cc)	Gluten Strength Description	Mill & Bake Quality Rating (1-5 Stars) <sup>2</sup>
Alsen	15.1	60.3	15.6	79	425	7.3	23.1	66.2	1040	Trad. Strong	****
Banton <sup>3</sup>	0.8	62.7	15.2	79	433	5.7	23.4	60.5	1006	Mellow	**
Bigg Red	0	61.9	14.4	74	421	5.6	13.4	67.0	894	Mellow	**
Briggs	9.2	60	15.1	75	445	6.1	20.5	65.7	996	Mellow	**
Dapps	1.4	58.7	16.8	84	438	7.3	22.0	66.8	1099	Trad. Strong	****
Faller	0	58	14.7	72	424	6.7	23.6	64.9	1092	Trad. Strong	***
Freyr	9.5	60.1	15.0	76	462	7.4	23.1	66.7	1017	Trad. Strong	***
Glenn <sup>4</sup>	20.9	62.3	15.8	85	408	7.9	31.1	65.8	1116	Trad. Strong	*****
Granger	2.2	59.6	15.0	78	454	6.6	18.8	67.2	1056	Mellow	***
Granite	1.9	61.3	16.3	81	358	6.4	15.1	65.8	994	Trad. Strong	***
Howard	0.9	60.1	15.6	77	452	6.7	23.5	67.6	1059	Mellow	***
Kelby	0.9	60.8	15.8	73	450	5.7	14.9	66.8	950	Mellow	**
Knudson	4.4	60.1	14.9	72	473	7.6	33.8	66.3	931	Extra Strong	***
Parshall	1.1	60.6	15.5	95	420	7.0	23.0	65.7	1111	Trad. Strong	****
Polaris	0	58.5	14.5	74	419	6.4	19.5	60.6	1026	Mellow	**
Reeder	8.8	59.7	15.1	81	433	6.1	16.3	65.0	1036	Mellow	**
Rush	0	61.6	16.0	80	400	5.9	15.2	66.4	845	Mellow	**
Saturn	0	56.5	16.2	81	440	7.7	17.2	65.1	1051	Trad. Strong	****
Steele-ND	9.1	59.5	15.9	77	457	7.0	23.0	68.2	1044	Trad. Strong	****
Traverse	0	57.5	14.5	73	437	4.4	10.6	64.6	946	Mellow	*
Trooper	0.6	61.4	14.6	76	462	6.7	31.3	65.7	869	Trad. Strong	**
Ulen	0	60.5	15.6	78	433	7.0	21.0	65.2	1034	Trad. Strong	***

1 Scale 1 to 8 where 1= weak and 8= very strong dough-mixing properties. Farinograph properties affected by growing conditions, so compare varieties.

2 Mill and Bake Quality Rating scale 1 to 5 stars with 1 being low and 5 being superior

3 Banton was tested at six of the seven locations in 2005 and 2006.

4 Glenn is the current Wheat Quality Council check variety for comparing new experimental lines and newly released varieties.

**Table 5. Yield of hard red spring wheat varieties grown at three locations in eastern North Dakota, 2005- 2007.**

Variety	Prosper		Carrington		Langdon		Average, eastern N.D.	
	2007	3 Yr.	2007	3 Yr.	2007	3 Yr.	2007	3 Yr.
	------(bu/A)-----							
AC Superb	30.2	--	40.3	35.5	51.0	50.1	40.5	--
AP 604 CL	45.9	--	51.0	--	58.6	--	51.8	--
Ada	48.1	--	53.3	48.0	71.2	62.9	57.5	--
Alsen	47.7	55.1	48.2	46.1	59.1	59.3	51.7	53.5
Bakker Gold	--	--	41.4	43.1	66.8	63.3	--	--
Banton	--	--	56.2	57.9	--	--	--	--
Bigg Red	--	--	48.8	50.6	58.6	57.5	--	--
Blade	52.0	--	--	--	--	--	--	--
Briggs	49.2	59.1	59.7	52.9	64.6	61.2	57.8	57.7
Cromwell	46.8	--	52.0	--	73.1	--	57.3	--
Dapps	47.6	53.4	54.4	45.0	66.9	63.1	56.3	53.8
Faller	46.3	--	61.4	54.7	75.6	74.7	61.1	--
FBC Dylan	40.8	--	49.0	47.2	59.8	--	49.9	--
Fireball	--	--	50.1	44.9	63.6	58.7	--	--
Freyr	48.2	59.2	54.7	49.5	72.3	61.8	58.4	56.8
Glenn	45.1	56.6	56.8	53.4	76.2	63.6	59.4	57.9
Granger	48.3	59.6	55.4	53.4	68.6	61.4	57.4	58.1
Granite	47.4	54.6	54.3	47.5	62.9	60.3	54.9	54.1
Gunner	35.6	42.5	40.7	38.7	49.6	49.6	42.0	43.6
Hanna	--	--	51.0	46.0	63.2	60.7	--	--
Hotshot	--	--	45.9	45.3	61.5	59.4	--	--
Howard	55.1	--	57.7	50.8	63.0	62.3	58.6	--
Ingot	42.0	49.5	51.3	43.1	45.9	47.7	46.4	46.8
Kelby	49.7	--	56.1	--	70.2	--	58.7	--
Knudson	53.6	60.8	52.3	48.3	72.1	67.6	59.3	58.9
Kuntz	51.5	--	59.6	--	71.3	--	60.8	--
Mercury	54.9	--	46.6	--	75.6	--	59.0	--
Norpro	49.2	--	56.8	47.5	71.4	65.0	59.1	--
Norwell	40.2	--	46.7	--	61.6	--	49.5	--
Oklee	--	--	56.0	51.7	64.5	59.8	--	--
Oxen	51.0	53.0	48.5	45.3	45.0	52.1	48.2	50.1
Parshall	38.7	50.0	47.7	43.4	67.3	61.1	51.2	51.5
Pasteur	--	--	47.8	--	65.9	--	--	--
Polaris	--	--	43.7	45.0	71.1	67.4	--	--
RB07	52.2	--	57.8	53.9	73.3	67.9	61.1	--
Reeder	47.6	48.0	46.8	43.6	62.4	58.1	52.3	49.9
Rush	45.4	--	53.4	--	67.8	--	55.5	--
Russ	46.9	55.0	48.4	46.7	59.5	58.0	51.6	53.2
Samson	53.4	--	--	--	--	--	--	--
Steele-ND	56.2	62.4	58.9	51.0	63.4	62.0	59.5	58.5
Traverse	48.3	--	62.0	--	75.9	--	62.1	--
Trooper	39.0	50.3	49.7	43.0	73.8	63.5	54.2	52.3
Ulen	50.5	58.3	54.1	47.8	63.4	58.0	56.0	54.7
Vantage	49.1	--	--	--	--	--	--	--
Average	47.2	54.6	51.9	47.5	65.2	60.6	54.8	53.6

**Table 6. Yield of hard red spring wheat varieties grown at four locations in western North Dakota, 2005-2007.**

Variety	Minot		Williston		Hettinger		Dickinson		Avg. western N.D.	
	2007	3 Yr.	2007	3 Yr.	2007	3 Yr.	2007	3 Yr.	2007	3 Yr.
	------(bu/A)-----									
AC Superb	11.8	--	43.5	42.3	27.0	33.1	44.5	38.5	31.7	--
AP 604 CL	--	--	47.7	--	41.2	--	53.0	--	--	--
Ada	30.8	61.1	41.2	43.4	--	--	--	--	--	--
Alsen	27.9	53.3	43.2	41.8	37.8	38.4	51.5	39.7	40.1	43.3
Bakker Gold	19.1	--	39.7	--	--	--	--	--	--	--
Banton	31.7	--	41.8	41.2	--	--	--	--	--	--
Bigg Red	20.4	51.3	45.9	44.2	--	--	--	--	--	--
Blade	--	--	41.9	--	--	--	--	--	--	--
Briggs	38.9	65.4	46.7	45.6	47.1	43.8	50.5	39.5	45.8	48.6
Choteau	--	--	44.1	42.4	--	--	48.5	36.0	--	--
Cromwell	--	--	41.4	--	--	--	--	--	--	--
Dapps	35.5	57.8	41.1	41.0	--	--	--	--	--	--
Faller	36.7	68.1	45.4	43.9	42.3	39.0	52.8	39.1	44.3	47.5
FBC Dylan	27.5	--	44.1	--	38.0	--	46.4	--	39.0	--
Fireball	31.9	--	41.0	--	--	--	--	--	--	--
Freyr	34.1	60.3	42.7	44.3	35.7	39.9	50.4	41.0	40.7	46.3
Glenn	32.7	61.2	48.2	44.4	39.4	39.6	52.7	38.2	43.3	45.9
Granger	34.8	61.4	46.7	43.4	37.9	39.9	51.2	40.5	42.7	46.3
Granite	30.8	--	41.5	41.4	37.2	35.8	46.9	39.5	39.1	--
Gunner	14.9	45.7	42.9	40.7	25.9	32.9	42.4	37.9	31.5	39.3
Howard	34.7	60.2	46.7	44.0	37.2	37.7	53.6	41.6	43.1	45.9
Ingot	23.5	--	44.1	42.3	36.5	38.7	47.4	38.4	37.9	--
Kelby	36.7	--	43.3	--	38.2	--	53.6	--	43.0	--
Knudson	37.6	65.6	43.7	42.1	36.0	36.5	53.7	--	42.8	--
Kuntz	31.9	--	49.1	--	37.4	--	50.8	--	42.3	--
Mercury	31.7	--	41.0	--	39.7	41.6	52.1	41.1	41.1	--
Norpro	28.1	63.2	46.4	44.9	33.2	38.5	49.5	41.4	39.3	47.0
Norwell	--	--	44.8	--	--	--	--	--	--	--
Oxen	30.8	53.1	46.9	43.1	43.5	43.9	51.2	41.8	43.1	45.5
Parshall	22.2	52.0	41.0	41.6	37.4	39.0	51.4	38.2	38.0	42.7
Polaris	--	--	40.7	39.4	--	--	--	--	--	--
RB07	33.0	65.7	45.7	46.9	39.0	42.3	57.5	--	43.8	--
Reeder	23.9	52.1	45.2	44.8	38.5	43.2	43.8	37.7	37.9	44.5
Rush	28.6	--	39.5	--	35.4	--	45.6	--	37.3	--
Russ	32.6	58.2	48.5	43.6	34.0	37.7	49.7	39.6	41.2	44.8
Samson	--	--	47.8	--	--	--	--	--	--	--
Steele-ND	38.4	61.4	48.6	46.5	41.2	41.8	50.8	40.3	44.8	47.5
Traverse	39.5	--	46.9	--	36.4	40.9	53.9	--	44.2	--
Trooper	30.5	60.2	48.5	45.6	33.1	37.1	55.4	39.8	41.9	45.7
Ulen	34.6	58.0	47.1	46.7	--	--	--	--	--	--
Vantage	--	--	41.0	--	--	--	--	--	--	--
Average	26.6	57.6	44.3	43.4	37.3	39.2	50.4	39.5	39.3	45.4

**Table 7. Protein of hard red spring wheat varieties grown at seven locations in North Dakota, 2007.**

Variety	Prosper	Carrington	Langdon	Williston	Minot	Hettinger	Dickinson	State Avg.
	----- (%) -----							
AC Superb	13.2	14.7	14.8	13.4	15.9	15.4	14.7	14.6
AP 604 CL	12.9	15.3	14.4	13.5	--	16.0	15.1	--
Ada	14.0	14.9	14.2	14.0	16.3	--	--	--
Alsen	13.8	15.4	15.3	13.8	16.2	15.7	14.2	14.9
Bakker Gold	--	14.9	13.5	14.0	15.9	--	--	--
Banton	--	15.1	--	13.7	16.4	--	--	--
Bigg Red	--	14.7	13.6	13.4	14.6	--	--	--
Blade	13.8	--	--	14.0	--	--	--	--
Briggs	14.3	15.7	14.8	13.9	16.9	15.0	14.7	15.0
Choteau	--	--	--	13.8	--	--	14.8	--
Cromwell	14.1	15.5	14.7	14.2	--	--	--	--
Dapps	15.7	16.4	16.5	15.0	17.6	--	--	--
Faller	13.6	14.6	15.0	13.2	15.8	15.5	13.9	14.5
FBC-Dylan	13.4	15.1	14.9	13.2	15.7	15.7	14.2	14.6
Fireball	--	16.2	15.8	15.2	17.1	--	--	--
Freyr	13.4	14.8	13.9	13.6	15.3	15.2	14.7	14.4
Glenn	13.9	16.0	15.0	13.9	16.5	16.3	14.7	15.2
Granger	13.4	15.0	14.9	13.5	16.2	15.8	14.4	14.7
Granite	15.7	16.8	16.3	14.9	17.4	18.0	16.0	16.4
Gunner	13.9	15.7	15.9	14.4	16.2	15.6	15.2	15.3
Hanna	--	14.9	15.5	--	15.8	--	--	--
Hotshot	--	14.7	14.0	--	--	--	--	--
Howard	13.6	15.2	15.2	13.4	16.4	16.5	13.6	14.8
Ingot	12.4	15.1	13.8	13.7	15.4	15.3	14.9	14.4
Kelby	14.8	15.3	15.2	14.2	16.8	15.4	15.3	15.3
Knudson	14.2	15.2	14.2	13.6	15.9	16.2	14.0	14.8
Kuntz	13.2	14.3	14.1	13.0	15.4	14.6	13.9	14.1
Mercury	13.2	15.5	13.6	13.3	16.5	15.7	13.4	14.5
Norpro	13.8	14.7	14.6	13.9	16.2	16.0	14.7	14.8
Norwell	14.0	15.1	13.7	13.6	--	--	--	--
Oklee	--	15.5	15.2	--	--	--	--	--
Oxen	12.4	14.1	13.8	13.3	14.7	15.2	14.2	14.0
Parshall	14.1	15.3	14.9	14.1	15.5	15.4	14.2	14.8
Pasteur	--	15.1	13.9	--	--	--	--	--
Polaris	--	14.9	13.1	14.0	--	--	--	--
RB07	14.3	15.0	14.7	13.4	16.4	15.8	13.9	14.8
Reeder	13.2	15.1	14.5	13.5	15.4	16.3	15.0	14.7
Rush	14.7	16.1	15.0	14.7	16.6	15.8	15.4	15.5
Russ	13.6	14.8	14.6	13.2	15.0	15.5	14.5	14.5
Samson	13.5	--	--	13.5	--	--	--	--
Steele-ND	14.1	15.3	15.5	13.4	16.8	16.4	13.9	15.1
Traverse	13.1	14.3	13.9	13.1	14.9	14.8	13.0	13.9
Trooper	13.1	15.0	13.5	13.3	15.0	16.0	13.3	14.2
Ulen	13.9	15.5	15.1	13.8	16.7	--	--	--
Vantage	15.9	--	--	14.9	--	--	--	--
Average	13.8	15.2	14.6	13.8	16.0	15.7	14.4	14.8

**Table 8. Test weight of hard red spring wheat grown at seven locations in North Dakota, 2007.**

Variety	Prosper	Carrington	Langdon	Williston	Minot	Hettinger	Dickinson	State Avg.
------(lb/bu)-----								
AC Superb	58.9	52.7	57.6	62.4	52.5	53.7	57.1	56.4
AP 604 CL	61.7	57.6	60.6	63.0	--	62.8	61.0	--
Ada	62.1	56.9	62.4	61.0	58.8	--	--	--
Alsen	62.0	56.9	61.8	52.2	56.5	59.6	60.9	58.6
Bakker Gold	--	55.0	61.6	59.1	49.2	--	--	--
Banton	--	59.7	--	62.9	60.2	--	--	--
Bigg Red	--	59.9	62.5	63.2	57.1	--	--	--
Blade	63.8	--	--	62.4	--	--	--	--
Briggs	61.9	57.1	60.4	60.9	59.0	63.9	60.3	60.5
Choteau	--	--	--	61.2	--	--	59.0	--
Cromwell	62.7	57.0	62.1	61.1	--	--	--	--
Dapps	61.2	56.1	60.1	58.9	56.9	--	--	--
Faller	60.7	55.3	61.1	58.7	54.9	56.8	57.6	57.9
FBC Dylan	60.9	54.3	59.5	60.9	43.9	59.1	59.5	56.9
Fireball	--	55.2	59.5	60.7	54.2	--	--	--
Freyr	60.6	55.9	60.9	61.0	56.6	55.7	60.1	58.7
Glenn	63.4	60.6	63.8	63.2	59.2	63.3	63.5	62.4
Granger	61.2	57.1	61.2	60.4	57.4	61.3	60.4	59.9
Granite	63.6	59.9	62.8	62.3	57.6	61.3	62.4	61.4
Gunner	61.3	56.7	61.3	61.3	53.0	57.6	60.3	58.8
Hanna	--	56.4	60.5	--	56.6	--	--	--
Hotshot	--	55.5	60.4	--	--	--	--	--
Howard	62.2	56.7	62.2	60.7	56.9	60.8	60.1	59.9
Ingot	62.3	59.1	61.3	62.8	56.3	63.2	62.3	61.0
Kelby	61.9	57.8	60.7	62.2	58.7	62.2	61.1	60.7
Knudson	61.5	56.0	60.9	61.3	57.5	57.9	60.8	59.4
Kuntz	61.2	57.0	60.5	62.2	54.6	56.7	60.4	58.9
Mercury	61.3	54.3	60.5	61.0	54.5	60.6	59.8	58.9
Norpro	60.7	55.4	60.3	60.3	54.9	55.9	57.6	57.9
Norwell	60.9	57.3	61.5	61.9	--	--	--	--
Oklee	--	58.5	61.3	--	--	--	--	--
Oxen	59.3	52.7	56.1	60.7	55.6	59.2	58.8	57.5
Parshall	59.9	56.3	62.4	61.2	56.3	60.3	60.9	59.6
Pasteur	--	53.9	59.9	--	--	--	--	--
Polaris	--	55.4	61.9	59.3	--	--	--	--
RB07	61.6	56.8	60.4	62.3	56.5	61.8	62.0	60.2
Reeder	61.8	55.2	60.7	60.7	53.3	58.0	59.5	58.5
Rush	62.3	57.8	61.9	63.4	57.7	64.3	62.6	61.4
Russ	59.4	53.9	58.9	60.3	54.7	58.1	58.9	57.7
Samson	60.5	--	--	61.0	--	--	--	--
Steele-ND	62.0	56.5	61.9	61.1	57.6	60.8	59.5	59.9
Traverse	59.2	54.2	58.8	58.5	53.6	57.4	58.1	57.1
Trooper	61.1	55.9	61.3	62.4	58.2	58.6	59.6	59.6
Ulen	61.7	56.9	60.4	61.9	55.8	--	--	--
Vantage	63.4	--	--	61.8	--	--	--	--
Average	61.4	56.4	60.8	61.1	55.8	59.7	60.1	59.2

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