

# North Dakota Hard Red Spring Wheat

## Variety Trial Results for 2013 and Selection Guide

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Hard red spring (HRS) wheat was harvested from 5.06 million acres in 2013, down from 5.75 million acres in 2012. The average yield of spring wheat was 46 bushels/acre (bu/a), up slightly from the yield of 45 bu/a recorded last year.

Barlow was again the most popular HRS wheat variety in 2013, occupying 18 percent of the planted acreage, followed by Glenn (10.1 percent), SY Soren (9), Faller (9 percent), Prosper (8.8), Kelby (4.3) and Brennan (3.8). SY Soren, Kelby and Brennan were released by AgriPro/Syngenta. All other varieties are NDSU releases.

Much of the spring wheat was planted later this year than was considered optimal due to a late and wet spring. Temperatures were below average in May and July, which helped the development of relatively high yield potential even in the late plantings. Even though the later part of the growing season was dry, yields were relatively high, perhaps in part due to high levels of stored soil moisture and low disease pressure. Some scab damage was reported, but levels of DON in the grain were minimal in most cases.

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 consider in selecting a variety may include yield potential, protein content when grown with proper fertility, straw strength, plant height, reaction to problematic pests (diseases, insects, etc.) and maturity. Every growing season differs; therefore, when selecting a variety, we recommend using 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.

Selecting varieties with good milling and baking quality also is important to maintain market recognition and avoid discounts. 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 (greater than 300 seconds indicates minimal sprout damage), high protein content (the majority of HRS wheat 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).

Gluten strength, and milling and baking quality ratings, are provided for individual varieties in Tables 2 and 3, 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 fields but can be used to compare differences among varieties.

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The agronomic data presented in this publication are from replicated research plots using experimental designs that enable the use of statistical analysis. These analyses enable the reader to determine, at a predetermined level of confidence, if the differences observed among varieties are reliable or if they might be due to error inherent in the experimental process.

The LSD (least significant difference) values beneath the columns in the tables are derived from these statistical analyses and apply only to the numbers in the column in which they appear. If the difference between two varieties exceeds the LSD value, it means that with 90 percent confidence (LSD probability 0.10), the higher-yielding variety has a significant yield advantage. When the difference between two varieties is less than the LSD value, no significant difference was found between those two varieties under those growing conditions.

NS is used to indicate no significant difference for that trait among any of the varieties at the 90 percent level of confidence. The CV stands for coefficient of variation and is expressed as a percentage. The CV is a measure of variability in the trial. Large CVs mean a large amount of variation that could not be attributed to differences in the varieties.

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. Additional data from county sites are available from each Research Extension Center at [www.ag.ndsu.edu/varietytrials/spring-wheat](http://www.ag.ndsu.edu/varietytrials/spring-wheat).

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**Table 1. North Dakota hard red spring wheat variety descriptions, agronomic traits, 2013.**

Variety	Agent or Origin <sup>1</sup>	Year Released	Height (inches)	Straw Strength <sup>2</sup>	Days to Head <sup>3</sup>	Reaction to Disease <sup>4</sup>			
						Stem Rust	Leaf Rust	Leaf Spot <sup>5</sup>	Head Scab
Advance	SD	2012	32	6	64	MR	MR	NA	MS
Agawam <sup>6</sup>	WestBred	2008	30	7	58	NA	MR/MS	NA	MS
Alpine <sup>7</sup>	AgriPro	2008	34	6	62	NA	S	MS	MS
Alsen	ND	2000	34	3	63	R	MR/MS	S	MR
Barlow	ND	2009	35	6	62	R	MR/MS <sup>9</sup>	MR	M
Blade	WestBred/Sabre	2007	33	4	64	R	MS <sup>9</sup>	MS	M
Breaker	WestBred	2007	34	3	64	R	MR/MS <sup>9</sup>	MS	M
Brennan	AgriPro	2009	30	4	62	R	MR	M	MS
Brick	SD	2009	35	5	60	R/MR	MR/MS	MS/S	MR
Briggs	SD	2002	35	7	61	R/MR	MR/MS	MS	S
Edge	WestBred/Sabre	2008	33	5	62	NA	S	MS	MS
Elgin-ND	ND	2012	36	5	65	R	M <sup>9</sup>	NA	M
Faller	ND	2007	35	5	65	R	S <sup>9</sup>	MR	M
Forefront	SD	2012	37	5	61	MR	MR	NA	MR
Glenn	ND	2005	37	4	61	R	MR/MS <sup>9</sup>	M	MR
Howard	ND	2006	36	7	63	R	R	M	M
Jenna	AgriPro	2009	32	4	66	R	MR/MS	M	M
Kelby	AgriPro	2006	30	4	62	MR	MR/MS <sup>9</sup>	M	M
Kuntz	AgriPro	2007	31	4	65	R	MS <sup>9</sup>	MS	M
LCS Albany	Limagrain	2008	32	5	67	MR	S	MS	M
LCS Breakaway	Limagrain	2011	32	5	63	NA	R	MS	M
LCS Powerplay	Limagrain	2011	33	5	65	NA	MR	MS	M
<b>Linkert</b>	<b>MN</b>	<b>2013</b>	<b>31</b>	<b>2</b>	<b>63</b>	<b>R</b>	<b>MR</b>	<b>NA</b>	<b>M</b>
Mott <sup>6</sup>	ND	2009	36	3	66	MR	S <sup>9</sup>	MS	MS
<b>MS Stingray</b>	<b>Meridian</b>	<b>2013</b>	<b>35</b>	<b>NA</b>	<b>67</b>	<b>NA</b>	<b>MS</b>	<b>NA</b>	<b>NA</b>
ND901CL Plus <sup>8</sup>	ND	2010	36	4	60	R/MR	MR	NA	M
Norden	MN	2012	32	3	6	R	R/MR	M	M
Pivot	WestBred	2010	27	3	67	MS	S <sup>9</sup>	MR	S
Prosper	ND	2011	35	5	65	R	S <sup>9</sup>	M	M
RB07	MN	2007	32	5	62	R	R/MR <sup>9</sup>	MS	MR
Rollag	MN	2011	32	3	63	R	MS	MR	MR
Sabin	MN	2009	33	6	65	R	MR	MS	M
Samson	WestBred	2007	31	2	63	R	MR/MS	MS	S
Select	SD	2010	35	6	60	R/MR	R/MR	R/MR	MR
Steele-ND	ND	2004	35	7	63	R	R	MS	M
<b>SY Rowyn</b>	<b>Syngenta/AgriPro</b>	<b>2013</b>	<b>31</b>	<b>4</b>	<b>63</b>	<b>R</b>	<b>MR</b>	<b>M</b>	<b>M</b>
SY Soren	Syngenta/AgriPro	2011	30	4	63	R	MR	M	M
SY Tyra <sup>6</sup>	Syngenta/AgriPro	2011	31	5	62	R	MR	NA	S
SY605 CL <sup>8</sup>	AgriPro	2009	34	7	62	R/MR	MR/MS	MS	S
Vantage	WestBred	2007	32	2	67	MR	MR/MS	MS	MS
Velva	ND	2011	35	4	63	R	MR/MS <sup>9</sup>	M	MS
WB Digger	WestBred	2009	34	6	63	MR	MR/MS	NA	MS
<b>WB Gunnison</b>	<b>WestBred</b>	<b>2013</b>	<b>31</b>	<b>NA</b>	<b>65</b>	<b>NA</b>	<b>MS</b>	<b>MS</b>	<b>MS</b>
WB Mayville	Monsanto/WB	2011	30	4	63	R	MR/MS	MS	S

<sup>1</sup>Refers to agent or developer: MN = University of Minnesota; MT = Montana State University; ND = North Dakota State University; SD = South Dakota State University; **Bold** varieties are those recently released, so data is limited and rating values may change. NA indicates insufficient information is available to make an accurate assessment.

<sup>2</sup>Straw Strength = 1 to 9 scale, with 1 the strongest and 9 the weakest. These values are based on recent data and may change as more data become available.

<sup>3</sup>Days to Head = the number of days from planting to head emergence from the boot averaged from several locations in 2010 and 2011.

<sup>4</sup>R = resistant; MR = moderately resistant; M = intermediate; MS = moderately susceptible; S = susceptible.

<sup>5</sup>Leaf spot refers to the leaf fungal diseases such as tan spot and septoria. It does not include bacterial leaf streak.

<sup>6</sup>Solid stemmed or semisolid stem, imparting resistance to sawfly.

<sup>7</sup>Hard white wheat.

<sup>8</sup>CL = refers to a Clearfield variety, with tolerance to the Beyond family of herbicides.

<sup>9</sup>These lines were resistant to moderately resistant to races prevalent prior to 2011 and show some level of susceptibility to a new race of the pathogen that was detected at low frequency in 2012.

**Table 2. Analytical milling and baking data from field plot variety trials at Carrington, Casselton, Dickinson, Hettinger, Langdon, Minot and Williston, 2011 and 2012 (unless otherwise noted).**

Variety	2013 N.D. Planted	Test Weight	Protein 12% MB	Vitreous Kernels	Falling Number	Farinograph Stability	Farinograph Absorption	Loaf Volume	Gluten Strength	Mill and Bake Quality Rating
	(% area)	(lb/bu)	(%)	(%)	(seconds)	(minutes)	(%)	(cc)	Description	(1-5 Stars) <sup>1</sup>
Alsen <sup>2</sup>	0.8	60.6	16.0	86	390	11.2	63.9	1,023	mellow	**
Barlow	18.0	60.7	15.5	82	399	12.5	66.2	1,026	Trad. strong	***
Brennan	3.8	60.7	15.1	66	417	8.5	63.3	968	mellow	**
Briggs <sup>2</sup>	1.5	60.1	14.9	62	433	9.4	62.1	938	mellow	*
Elgin-ND	0.0	59.3	15.5	80	410	10.8	65.1	988	mellow	**
Faller	9.0	59.0	14.5	68	421	12.5	63.0	994	Trad. strong	***
Glenn <sup>3</sup>	10.1	62.8	15.8	87	390	15.4	65.6	1,049	Trad. strong	*****
Howard	1.2	60.2	15.1	72	410	10.7	63.7	1,023	mellow	**
Jenna	2.5	59.4	15.2	66	412	10.0	62.9	995	mellow	**
Kelby	4.3	60.6	15.4	62	414	8.3	63.2	975	mellow	**
Mott <sup>2</sup>	2.1	60.3	16.0	84	395	13.5	63.3	976	Trad. strong	**
ND901CL Plus <sup>2</sup>	0.0	60.0	16.6	83	394	14.0	65.3	1,101	Trad. strong	****
Prosper <sup>2</sup>	8.8	59.5	14.6	70	405	11.8	62.1	1,001	mellow	***
Rollag <sup>2</sup>	0.8	60.8	15.5	67	491	8.4	65.5	923	mellow	*
RB07	3.6	59.8	15.0	63	397	13.6	60.9	1,035	Trad. strong	****
Select	1.7	61.4	14.7	70	434	8.7	62.2	974	mellow	**
Steele-ND	1.7	60.4	15.4	76	403	10.5	63.9	1,039	mellow	***
SY Soren <sup>2</sup>	9.2	60.4	15.4	65	429	12.2	62.5	1,015	Trad. strong	***
Vantage <sup>2</sup>	2.8	61.8	16.6	88	353	16.0	63.9	1,007	Trad. strong	***
Velva	0.0	59.2	14.8	82	389	12.1	63.0	970	mellow	**
WB Mayville <sup>2</sup>	2.7	59.7	15.4	80	425	11.1	64.0	979	mellow	**

Analyses conducted at the NDSU Hard Red Spring Wheat Quality Laboratory in Fargo, N.D.

For footnotes, see bottom of Table 3.

**Table 3. Analytical milling and baking data from field plot variety trials at Dickinson, Hettinger, Langdon, Minot and Williston, 2012 (unless otherwise noted).**

Variety	2013 N.D. Planted	Test Weight	Protein 12% MB	Vitreous Kernels	Falling Number	Farinograph Stability	Farinograph Absorption	Loaf Volume	Gluten Strength	Mill and Bake Quality Rating
	(% area)	(lb/bu)	(%)	(%)	(seconds)	(minutes)	(%)	(cc)	Description	(1-5) <sup>1</sup>
Advance	0.0	62.0	13.7	62	423	11.1	58.8	938	mellow	**
Alsen <sup>2</sup>	0.8	61.6	15.3	86	414	11.3	62.8	963	mellow	***
Barlow	18.0	61.4	15.1	78	418	13.6	65.2	1,011	Trad. strong	****
Brennan	3.8	61.9	14.6	61	455	7.9	62.5	923	mellow	**
Briggs <sup>2</sup>	1.5	60.9	14.3	48	456	8.4	61.1	904	mellow	*
Edge <sup>2</sup>	0.0	59.7	14.8	78	430	14.7	60.0	1,010	Trad. strong	***
Elgin-ND	0.0	60.2	14.7	76	426	9.8	63.5	975	mellow	**
Faller	9.0	59.6	13.8	64	443	13.3	61.7	957	Trad. strong	***
Forefront	0.0	61.6	14.3	58	433	11.2	60.0	978	mellow	**
Glenn <sup>5</sup>	10.1	63.2	15.2	83	429	16.2	64.6	986	Trad. strong	*****
Howard	1.2	60.8	14.4	66	437	11.1	62.3	961	mellow	***
Jenna	2.5	60.5	14.4	58	444	8.8	62.3	944	mellow	**
Kelby	4.3	61.7	14.8	56	444	7.3	62.6	933	mellow	**
Mott <sup>2</sup>	2.1	61.1	15.2	79	428	14.5	61.9	944	Trad. strong	***
ND901CL Plus <sup>2</sup>	0.0	61.1	16.0	76	430	12.4	64.7	1,033	Trad. strong	****
Norden	0.0	62.1	14.2	90	405	9.0	62.0	948	mellow	**
Prosper	8.8	59.9	14.2	62	422	12.3	61.6	933	Trad. strong	***
RB 07	3.6	60.7	14.4	58	415	10.9	60.1	972	mellow	***
Rollag	0.8	61.7	15.0	65	524	7.8	64.5	893	mellow	*
Select	1.7	62.3	14.5	67	460	7.5	62.0	930	mellow	*
Steele-ND	1.7	61.0	14.9	72	410	11.2	62.7	984	mellow	***
SY Soren	9.2	61.3	14.7	54	472	10.6	61.5	957	mellow	**
SY605 CL <sup>2</sup>	0.0	61.8	15.2	70	485	11.2	61.7	940	mellow	**
Vantage	2.8	62.4	16.3	92	377	11.7	63.6	951	Trad. strong	***
Velva	0.0	60.1	14.0	76	407	10.7	61.3	928	mellow	**
WB Mayville <sup>2</sup>	2.7	60.9	14.8	78	463	12.0	62.5	927	Trad. strong	***

Analyses conducted at the NDSU Hard Red Spring Wheat Quality Laboratory in Fargo, N.D.

<sup>1</sup> Mill and Bake Quality Rating scale 1 to 5, with 1 being low and 5 being superior.

<sup>2</sup> Varieties were not tested at all locations.

<sup>3</sup> Glenn is the current Wheat Quality Council check variety for comparing new experimental lines and newly released varieties.

**Table 4. Yield of hard red spring wheat varieties grown at three locations in eastern North Dakota, 2011-2013.**

Variety	<u>Carrington</u>		<u>Casselton</u>		<u>Langdon</u>		<u>Avg. eastern N.D.</u>	
	2013	3 Yr.	2013	2 Yr.	2013	3 Yr.	2013	2/3 Yr.
	------(bu/a)-----							
Advance	50.3	--	79.0	72.9	96.5	82.6	75.3	--
Alpine	54.6	60.3	76.2	74.7	99.0	79.5	76.6	71.5
Alsen	54.7	59.7	72.5	66.5	--	--	--	--
Barlow	57.1	65.4	64.2	63.6	93.7	77.1	71.7	68.7
Breaker	53.4	59.1	72.6	68.6	98.5	80.4	74.8	69.4
Brennan	53.2	64.3	75.3	68.6	75.3	68.7	67.9	67.2
Brick	54.7	63.8	76.5	67.7	81.3	74.8	70.8	68.8
Briggs	54.4	63.5	65.3	66.1	--	--	--	--
Elgin-ND	55.4	64.9	73.5	69.9	99.3	82.3	76.1	72.4
Faller	57.5	64.4	81.2	73.2	111.8	91.9	83.5	76.5
Forefront	57.2	--	80.3	71.6	88.7	74.6	75.4	--
Glenn	50.5	60.0	75.1	61.5	90.9	72.3	72.2	64.6
Howard	54.3	63.3	75.9	70.3	--	--	--	--
Jenna	55.9	64.3	82.1	76.1	94.9	80.5	77.6	73.6
Kelby	53.7	61.0	64.9	63.2	--	--	--	--
LCS Albany	53.2	--	--	--	105.2	85.2	--	--
LCS Breakaway	53.1	--	79.2	79.2	88.0	--	73.4	--
LCS Iguacu	59.4	--			93.8	--		
LCS Powerplay	60.9	--	66.3	66.3	100.7	80.9	76.0	--
Linkert	52.1	--	69.8	69.8	81.4	70.8	67.8	--
Mott	56.4	60.4	72.6	66.7	--	--	--	--
MS Stingray	60.7	--	--	--	117.8	--	--	--
ND901CL Plus	53.4	59.2	70.1	61.5	--	--	--	--
Norden	50.6	58.7	71.7	70.0	89.7	76.5	70.7	68.4
Prosper	57.7	62.3	73.5	69.3	109.7	90.2	80.3	73.9
RB07	50.7	60.0	75.2	68.6	96.4	80.1	74.1	69.6
Rollag	55.8	--	72.5	66.1	83.0	72.1	70.4	--
Sabin	52.7	63.4	81.5	74.0	--	--	--	--
Samson	54.2	61.4	73.7	74.8	91.5	74.9	73.1	70.4
Select	54.1	64.8	69.6	68.0	84.0	77.7	69.2	70.2
Steele-ND	53.0	61.6	74.5	69.2	--	--	--	--
SY605 CL	56.4	59.9	74.9	67.4	--	--	--	--
SY Rowyn	55.9	--	69.3	69.3	94.7	--	73.3	--
SY Soren	52.2	--	68.9	70.4	86.1	73.9	69.1	--
SY Tyra	58.6	--	68.6	66.2	--	--	--	--
Vantage	48.3	57.1	70.2	65.0	85.9	70.3	68.1	64.1
Velva	49.4	57.4	75.2	69.9	99.0	80.1	74.5	69.1
WB Digger	57.0	62.6	76.5	73.5	98.5	81.3	77.3	72.5
WB Mayville	55.5	--	69.9	64.6	86.0	71.3	70.5	--
Mean	54.6	61.6	73.2	68.4	93.8	78.0	71.8	70.0
CV%	8.5	--	10.8	--	4.3	--	--	--
LSD 0.10	5.4	--	7.7	--	4.8	--	--	--

**Table 5. Yield of hard red spring wheat varieties grown at four locations in western North Dakota, 2011-2013.**

Variety	<u>Dickinson</u>		<u>Hettinger</u>		<u>Minot</u>		<u>Williston</u>		<u>Avg. western N.D.</u>	
	2013	3 Yr.	2013	3 Yr.	2013	3 Yr.	2013	3 Yr.	2013	3 Yr.
	------(bu/a)-----									
Advance	43.1	--	67.8	67.2	59.1	47.0	28.3	30.8	49.6	--
Alpine	39.6	55.5	--	--	51.2	--	--	--	--	--
Barlow	38.2	59.1	68.2	61.7	54.5	42.9	32.1	34.3	48.3	49.5
Breaker	46.1	58.1	69.0	63.1	49.9	41.0	33.5	32.0	49.6	48.6
Brennan	40.8	56.5	69.8	66.5	45.4	38.8	33.1	33.8	47.3	48.9
Briggs	--	--	--	--	53.3	35.5	29.0	30.8	--	--
Choteau	--	--	--	--	44.3	35.1	34.0	30.9	--	--
Duclair	42.9	--	--	--	56.1	--	34.9	32.6	--	--
Elgin-ND	48.5	59.1	66.7	64.6	58.3	42.5	36.1	35.2	52.4	50.4
Faller	48.0	57.7	54.4	53.7	63.4	45.2	32.2	31.4	49.5	47.0
Forefront	44.0	--	64.9	62.2	48.3	43.6	36.6	36.1	48.5	--
Glenn	39.9	59.5	60.2	57.0	48.6	--	37.8	33.6	46.6	--
Howard	43.4	56.6	69.9	63.0	54.0	--	26.9	29.1	48.6	--
Jenna	49.3	62.3	67.7	62.9	53.0	39.2	39.3	35.3	52.3	49.9
Kelby	37.3	52.2	--	--	40.3	--	34.0	34.3	--	--
LCS Albany	42.4	--	75.7	--	62.8	46.6	29.8	31.1	52.7	--
LCS Breakaway	40.8	--	69.6	--	53.0	--	38.5	--	50.5	--
LCS Iguacu	45.9	--	69.1	--	55.6	--	34.3	--	51.2	--
LCS Powerplay	50.0	60.1	69.8	--	58.3	44.1	44.5	37.6	55.7	--
Linkert	41.2	--	61.0	62.1	49.3	--	34.3	--	46.5	--
Mott	46.4	55.5	65.0	59.2	56.6	43.4	--	--	--	--
ND901CL Plus	42.3	53.9	55.7	54.5	52.8	39.8	29.3	31.0	45.0	44.8
Norden	45.0	57.7	65.8	61.9	53.6	45.2	33.4	32.7	49.5	49.4
Prosper	46.6	56.8	63.0	59.9	66.2	--	33.9	30.8	52.4	---
RB07	39.6	55.4	62.7	59.3	51.4	39.3	32.8	34.7	46.6	47.2
Rollag	42.1	--	63.9	59.8	54.1	--	--	--	--	--
Sabin	41.6	55.0	65.4	65.2	50.9	--	32.6	--	47.6	--
Samson	51.5	61.9	70.4	67.6	55.3	--	33.4	--	52.7	--
Select	44.3	55.0	66.0	61.3	59.9	48.8	36.8	35.2	51.8	50.1
Steele-ND	40.7	54.0	67.3	59.4	54.8	--	27.9	30.6	47.7	--
SY605 CL	35.5	--	71.8	67.9	55.6	--	31.3	--	48.6	--
SY Rowyn	39.2	--	69.5	--	47.2	--	34.9	--	47.7	--
SY Soren	44.7	55.7	72.2	67.7	53.1	39.2	31.8	33.0	50.5	48.9
SY Tyra	45.0	55.4	66.0	62.5	56.9	--	32.7	33.0	50.2	--
Vantage	39.2	50.0	60.0	55.1	51.5	40.6	30.8	29.7	45.4	43.9
Velva	45.7	59.9	68.0	65.4	54.5	44.2	37.7	35.5	51.5	51.3
WB Digger	48.4	58.9	75.8	66.0	66.6	40.8	28.6	32.4	54.9	49.5
WB Gunnison	40.9	48.5	51.8	50.8	45.7	32.7	22.3	29.4	40.2	40.4
WB Mayville	39.1	55.0	62.6	60.3	49.2	38.9	28.0	32.5	44.7	46.7
Mean	43.5	56.5	66.1	61.6	53.9	41.5	33.6	32.6	49.2	47.9
CV %	12.9	--	5.6	--	6.4	--	14.8	--	--	--
LSD 0.10	6.6	--	4.3	--	4.1	--	6.7	--	--	--

**Table 6. Protein at 12 percent moisture of hard red spring wheat varieties grown at seven locations in North Dakota, 2013.**

Variety	Carrington	Casselton	Dickinson	Hettinger	Langdon	Minot	Williston	State Avg.
	------(%)-----							
Advance	13.4	12.8	14.0	14.4	12.9	12.5	11.7	13.1
Alpine	14.1	13.6	13.8	--	13.8	13.8	--	--
Alsen	14.3	14.4	--	--	--	13.9	--	--
Barlow	14.8	13.9	14.3	16.1	14.2	13.2	13.3	14.3
Breaker	13.9	13.9	13.9	15.4	14.1	13.6	13.0	14.0
Brennan	14.2	14.2	15.1	16.0	14.8	12.9	13.5	14.4
Brick	13.3	14.5	--	--	13.9	12.7	--	--
Briggs	13.8	13.5	--	--	--	13.0	12.5	--
Choteau	--	13.0	--	--	--	13.2	14.1	--
Duclair	--	13.8	13.5	--	--	13.3	12.4	--
Elgin-ND	14.2	13.5	13.8	16.2	14.1	13.3	13.8	14.1
Faller	13.9	13.2	12.7	15.0	13.4	12.3	12.7	13.3
Forefront	13.9	13.7	14.2	15.9	14.3	13.0	12.8	14.0
Glenn	14.7	14.6	13.6	17.2	14.6	13.1	13.7	14.5
Howard	14.6	13.7	13.0	15.7	--	13.3	12.8	--
Jenna	13.7	13.2	13.6	15.3	13.8	13.7	12.7	13.7
Kelby	14.9	13.6	16.0	--	--	13.8	13.9	--
LCS Albany	13.0	--	12.6	14.4	12.8	12.7	10.8	--
LCS Breakaway	14.8	13.2	15.2	15.8	14.5	13.6	13.8	14.4
LCS Iguacu	12.7		12.8	13.8	12.4	12.0	11.9	
LCS Powerplay	13.5	13.2	12.8	15.0	13.5	12.3	13.2	13.4
Linkert	14.6	14.3	14.3	16.8	15.4	13.4	13.8	14.7
Mott	14.0	14.0	13.7	16.2	--	13.6	--	--
MS Stingray	11.4	--	--	13.7	11.4	10.6	--	--
ND901CL Plus	15.0	14.0	14.5	17.4	--	14.3	15.5	--
Norden	13.4	12.9	13.5	15.3	13.9	12.9	12.7	13.5
Prosper	14.0	13.2	13.0	14.9	13.2	11.5	13.0	13.3
RB07	13.9	13.5	13.8	16.0	14.5	13.4	13.1	14.0
Rollag	15.1	14.3	14.1	16.4	14.8	13.9	--	--
Sabin	13.6	13.8	13.9	15.9	--	13.5	12.8	--
Samson	14.0	14.0	13.1	15.0	13.9	13.3	12.7	13.7
Select	13.0	13.2	13.9	15.2	14.0	12.4	12.7	13.5
Steele-ND	14.5	13.9	14.4	15.2	--	13.9	13.0	--
SY605 CL	13.8	14.1	13.4	16.2	--	13.4	12.6	--
SY Rowyn	13.6	13.0	14.0	14.8	14.0	13.0	13.5	13.7
SY Soren	14.9	13.7	14.5	15.7	14.8	14.2	14.0	14.5
SY Tyra	13.6	12.8	14.1	14.3	--	12.9	12.4	--
Vantage	14.5	15.1	14.3	17.8	15.8	14.3	13.9	15.1
Velva	14.2	13.5	13.6	15.8	13.8	12.9	13.7	13.9
WB Digger	13.7	13.4	13.7	15.2	14.1	12.6	12.8	13.6
WB Gunnison	--	--	13.8	14.6	--	13.2	12.6	--
WB Mayville	15.0	14.2	15.1	16.0	14.5	14.2	12.9	14.6
Mean	14.1	13.7	13.9	15.6	14.0	13.2	13.1	13.9
CV %	3.3	4.0	5.4	2.5	2.1	3.3	4.6	--
LSD 0.10	0.5	0.54	1.3	0.5	0.3	0.5	0.8	--

**Table 7. Test weight of hard red spring wheat varieties grown at seven locations in North Dakota, 2013.**

Variety	Carrington	Casselton	Dickinson	Hettinger	Langdon	Minot	Williston	State Avg.
	------(lb/bu)-----							
Advance	63.3	64.2	63.0	63.0	61.7	62.1	62.6	62.8
Alpine	62.8	61.4	62.5	--	59.8	59.6	--	--
Alsen	63.6	63.4	--	--	--	61.6	--	--
Barlow	64.1	63.0	63.5	62.2	61.7	62.8	62.3	62.8
Breaker	64.3	64.0	64.3	61.3	61.9	62.0	63.4	63.0
Brennan	64.3	63.6	63.0	63.2	59.6	61.0	61.6	62.3
Brick	63.5	64.0	--	--	61.5	62.3	--	--
Briggs	63.0	62.1	--	--	--	61.8	61.7	--
Choteau	--	62.6	--	--	--	59.5	61.0	--
Duclair	--	61.6	61.5	--	--	61.0	60.7	--
Elgin-ND	62.3	62.2	63.0	61.5	61.1	61.8	61.0	61.8
Faller	62.6	62.9	61.8	59.7	60.7	61.7	60.4	61.4
Forefront	63.2	64.2	62.8	62.8	60.5	61.8	62.6	62.6
Glenn	64.8	65.2	63.3	63.1	63.0	63.7	63.9	63.9
Howard	63.5	63.4	63.0	62.3	--	62.6	62.3	--
Jenna	62.5	63.4	62.0	61.4	59.0	60.8	60.4	61.4
Kelby	63.4	63.8	62.3	--	--	61.1	61.4	--
LCS Albany	62.9	--	62.0	61.5	61.4	62.5	61.5	--
LCS Breakaway	64.5	64.8	63.8	63.9	62.2	63.3	63.1	63.7
LCS Iguacu	63.7		63.0	62.8	60.2	62.1	62.4	
LCS Powerplay	64.0	63.0	63.5	62.9	61.0	62.0	62.6	62.7
Linkert	63.1	63.7	62.8	62.4	60.8	61.4	61.6	62.3
Mott	63.0	63.4	63.0	60.6	--	61.2	--	--
MS Stingray	62.2	--	--	60.4	59.6	60.2	--	--
ND901CL Plus	63.0	63.3	62.5	61.7	--	60.5	61.1	62.0
Norden	64.4	64.4	63.8	62.8	62.2	62.9	63.1	63.4
Prosper	63.2	62.9	62.3	61.3	60.3	62.3	61.1	61.9
RB07	60.5	63.6	60.5	61.9	60.4	62.0	62.0	61.5
Rollag	63.9	64.0	62.5	63.0	61.6	62.1		62.9
Sabin	62.4	63.1	62.3	62.6	--	61.8	61.1	--
Samson	62.5	62.0	62.0	61.2	59.8	60.1	61.0	61.2
Select	63.5	63.6	63.5	63.6	61.7	62.4	62.6	63.0
Steele-ND	64.2	63.3	64.3	61.6	--	63.1	62.1	--
SY605 CL	62.9	63.6	62.8	63.1	--	62.0	61.7	--
SY Rowyn	62.4	62.7	62.3	62.0	60.7	61.8	61.0	61.8
SY Soren	63.0	63.1	62.8	63.0	61.4	62.1	62.0	62.5
SY Tyra	64.3	62.8	63.8	61.8	--	61.5	63.3	--
Vantage	62.9	62.8	63.3	60.8	62.1	62.6	62.5	62.4
Velva	61.8	61.2	63.0	59.1	60.2	61.1	62.0	61.2
WB Digger	62.5	61.3	62.3	61.8	60.4	60.9	61.3	61.5
WB Gunnison	--	--	62.5	60.4	--	60.3	61.1	--
WB Mayville	62.4	62.1	62.8	61.4	60.3	59.6	61.7	61.5
Mean	63.2	63.1	62.8	61.9	60.9	61.6	61.9	62.2
CV %	1.1	1.1	0.5	0.9	0.4	1.3	0.6	--
LSD 0.10	0.8	0.7	0.6	0.6	0.3	1.0	0.5	--

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