

# North Dakota

# Hard Red Spring Wheat

## Variety Trial Results for 2014 and Selection Guide

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Hard red spring (HRS) wheat was harvested from 6.19 million acres in 2014, up from 5.06 million acres in 2013. The average yield of spring wheat was 47.5 bushels/acre (bu/a), up slightly from the yield of 46 bu/a recorded last year.

Barlow was again the most popular HRS wheat variety in 2014, occupying 15.7 percent of the planted acreage, followed by Prosper (11.7), SY Soren (10.4), Faller (8.8), Glenn (8.2) and WB Mayville (4.4). SY Soren was released by Syngenta/AgriPro and WB Mayville was released by Monsanto/WestBred. All other varieties are NDSU releases.

Much of the spring wheat was planted later than is considered optimal due to a late and wet spring. However, temperatures were moderate during much of the growing season, which helped the development of relatively high yield potential, even in the late plantings. Some scab damage was reported, and DON levels varied considerably, depending on the planting and flowering date and variety grown.

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).

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Gluten strength, and milling and baking quality ratings, are provided for individual varieties 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.

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. Yield is reported at 13.5 percent moisture, while protein content is reported at 12 percent moisture content.

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, 2014.**

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 <sup>5</sup>	Leaf Rust	Leaf Spot <sup>6</sup>	Bact. Leaf Streak	Head Scab
Advance	SD	2012	32	6	64	R	MR/MS	M	MS	MS
Alpine <sup>7</sup>	AgriPro	2008	34	6	62	MS	S	MS	S	MS
Barlow	ND	2009	35	6	62	R	MS	MR	MS	M
Brennan	AgriPro	2009	30	4	62	R	MR	M	MS	MS
Brick	SD	2009	35	5	60	R	MS	MS/S	NA	MR
Duclair <sup>8</sup>	MT	2011	31	4	65	R	NA	NA	NA	NA
Elgin-ND	ND	2012	36	5	65	R	MS	M	MS/S	M
Faller	ND	2007	35	5	65	R	S	MR	MS	M
Forefront	SD	2012	37	5	61	R/MR	MR	MR	M	MR
Glenn	ND	2005	37	4	61	R	MS	M	M/MS	MR
<b>HRS 3361</b>	<b>Croplan</b>	<b>2013</b>	<b>33</b>	<b>3</b>	<b>65</b>	<b>NA</b>	<b>MS/MR</b>	<b>MR</b>	<b>NA</b>	<b>M</b>
<b>HRS 3378</b>	<b>Croplan</b>	<b>2013</b>	<b>32</b>	<b>4</b>	<b>64</b>	<b>NA</b>	<b>MR</b>	<b>M</b>	<b>NA</b>	<b>M</b>
<b>HRS 3419</b>	<b>Croplan</b>	<b>2014</b>	<b>32</b>	<b>2</b>	<b>68</b>	<b>NA</b>	<b>MR</b>	<b>MR</b>	<b>NA</b>	<b>MR</b>
Jenna	AgriPro	2009	32	4	66	R	MR	M	M/MS	M
Kelby	AgriPro	2006	30	4	62	R/MR	MR/MS	M	S	M
Kuntz	AgriPro	2007	31	4	65	NA	MS	MS	NA	M
LCS Albany	Limagrain	2008	32	5	67	NA	MR	MS	M	M
LCS Breakaway	Limagrain	2011	32	5	63	R	R	MS	MS	M
<b>LCS Iguacu</b>	<b>Limagrain</b>	<b>2014</b>	<b>33</b>	<b>3</b>	<b>66</b>	<b>NA</b>	<b>MS</b>	<b>M</b>	<b>M/MS</b>	<b>MR</b>
LCS Powerplay	Limagrain	2011	33	5	65	R	MS	MS	S	M
Linkert	MN	2013	31	2	63	R	MR/MS	M	MS	M
Mott <sup>7</sup>	ND	2009	36	3	66	R	MS	MS	MS	MS
<b>MS Chevelle</b>	<b>Meridian</b>	<b>2014</b>	<b>30</b>	<b>5</b>	<b>63</b>	<b>NA</b>	<b>R</b>	<b>NA</b>	<b>NA</b>	<b>M</b>
MS Stingray	Meridian	2013	35	NA	67	NA	MS	NA	NA	NA
ND901CL Plus <sup>9</sup>	ND	2010	36	4	60	MR	MS/MR	NA	NA	M
Norden	MN	2012	32	3	6	R	MR/MS	M	S	M
Pivot	WestBred	2010	27	3	67	NA	S	MR	NA	S
<b>Prevail</b>	<b>SD</b>	<b>2014</b>	<b>31</b>	<b>4</b>	<b>64</b>	<b>NA</b>	<b>MR</b>	<b>MS</b>	<b>NA</b>	<b>M</b>
Prosper	ND	2011	35	5	65	R	MS	M	MS	M
RB07	MN	2007	32	5	62	R	MS	MS	MS/S	MR
Rollag	MN	2011	32	3	63	R	MR/MS	MR	M	MR
Sabin	MN	2009	33	6	65	R	MR/MS	MS	NA	M
Samson	WestBred	2007	31	2	63	O	MR/MS	MS	MS	S
Select	SD	2010	35	6	60	R	MS	R/MR	S	MR
<b>SY Ingmar</b>	<b>Syngenta/AgriPro</b>	<b>2014</b>	<b>31</b>	<b>4</b>	<b>64</b>	<b>NA</b>	<b>MR</b>	<b>M</b>	<b>M</b>	<b>M</b>
SY Rowyn	Syngenta/AgriPro	2013	31	4	62	R	R	M	M	M
SY Soren	Syngenta/AgriPro	2011	30	4	63	R	R	M	S	M
SY Tyra <sup>8</sup>	Syngenta/AgriPro	2011	31	5	62	R	R	MS	S	S
Vantage	WestBred	2007	32	2	67	MR	R	MS	MS/S	MS
Velva	NDSU	2011	35	4	63	R	R	M	S	MS
<b>WB9507</b>	<b>WestBred</b>	<b>2013</b>	<b>32</b>	<b>5</b>	<b>61</b>	<b>NA</b>	<b>MR</b>	<b>R</b>	<b>NA</b>	<b>MR</b>
<b>WB9879CLP<sup>9</sup></b>	<b>WestBred</b>	<b>2012</b>	<b>33</b>	<b>4</b>	<b>64</b>	<b>NA</b>	<b>MS</b>	<b>MR</b>	<b>NA</b>	<b>MS</b>
WB Digger	WestBred	2009	34	6	63	MR	R	M	NA	MS
WB Gunnison	WestBred	2013	31	NA	65	NA	MS	MS	M	MS
WB Mayville	WestBred	2011	30	4	63	R	R	MS	S	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 are 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 and years.

<sup>4</sup>R = resistant; MR = moderately resistant; M = intermediate; MS = moderately susceptible; NA = Not adequately tested; S = susceptible.

<sup>5</sup>Fargo stem rust nursery inoculated with *Puccinia graminis* f. sp. Tritici races TPMK, TMLK, RTQQ, QFCQ and QTHJ.

<sup>6</sup>Leaf spot refers to the leaf fungal diseases such as tan spot and septoria. It does not include bacterial leaf streak.

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

<sup>8</sup>Solid stemmed or semisolid stem, imparting resistance to sawfly.

<sup>9</sup>CL = refers to a Clearfield variety, with tolerance to the Beyond family of herbicides.

**Table 2. Analytical milling and baking data from field plot variety trials at Carrington, Casselton, Dickinson, Hettinger, Langdon, Minot and Williston, 2012 and 2013 (unless otherwise noted).**

Variety	2014 N.D. Planted	OBS <sup>1</sup>	Test Weight	Protein 12% MB	Vitreous Kernels	Falling Number	Farinograph Stability	Farinograph Absorption	Loaf Volume	Mill and Bake Quality Rating
	(% area)		(lb/bu)	(%)	(%)	(seconds)	(minutes)	(%)	(cc)	(1-5 Stars) <sup>2</sup>
Advance	--	13	62.9	13.4	63	424	10.2	59.5	922	**
Barlow	15.7	13	62.5	14.9	80	403	11.2	66.0	981	***
Brennan	3.2	13	62.4	14.6	64	442	7.8	63.5	908	*
Elgin-ND	2.7	13	61.4	14.5	84	423	9.0	64.4	967	**
Faller	8.8	13	61.0	13.7	69	433	11.6	63.0	954	**
Forefront	--	13	62.3	14.2	60	429	10.7	61.1	966	***
Glenn <sup>3</sup>	8.2	13	63.9	15.1	89	407	13.8	65.2	983	*****
Jenna	1.1	13	61.3	14.0	55	440	8.7	62.9	928	**
LCS Breakaway	--	7	63.8	14.8	84	447	6.5	64.2	913	*
Linkert	--	13	62.1	15.3	74	452	18.1	63.2	976	****
Norden	--	13	63.3	13.9	86	413	8.8	63.2	923	**
Prevail	--	10	61.5	13.8	62	398	9.1	60.7	915	**
Prosper	11.7	13	61.3	13.9	69	419	10.9	63.2	944	**
Rollag	1.5	13	62.6	14.8	70	522	7.2	65.9	877	*
Select	1.1	13	62.9	14.2	71	443	7.4	62.7	915	*
SY Soren	10.4	13	62.3	14.6	60	447	10.0	62.4	948	**
Vantage	1.9	13	63.1	15.7	87	358	11.4	64.0	943	***
Velva	1.3	13	61.2	14.1	75	412	10.0	63.2	921	**

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, 2013 (unless otherwise noted).**

Variety	2014 N.D. Planted	OBS <sup>1</sup>	Test Weight	Protein 12% MB	Vitreous Kernels	Falling Number	Farinograph Stability	Farinograph Absorption	Loaf Volume	Mill and Bake Quality Rating
	(% area)		(lb/bu)	(%)	(%)	(seconds)	(minutes)	(%)	(cc)	(1-5) <sup>2</sup>
Advance	--	7	63.7	13.1	63	425	9.5	60.2	908	**
Barlow	15.7	7	63.4	14.7	83	389	9.1	66.6	955	***
Brennan	3.2	7	62.9	14.6	67	432	7.8	64.3	896	*
Duclair	--	4	61.8	13.8	72	401	9.6	61.2	916	**
Elgin-ND	2.7	7	62.5	14.4	91	420	8.3	65.3	961	**
Faller	8.8	7	62.1	13.7	73	424	10.3	64.1	951	***
Forefront	--	7	62.9	14.2	62	425	10.3	62.1	956	***
Glenn <sup>3</sup>	8.2	7	64.6	15.0	93	388	11.7	65.7	981	*****
Jenna	1.1	7	62.0	13.7	53	436	8.5	63.4	914	**
Kelby	1.9	5	62.5	15.0	64	415	7.9	63.6	921	**
Linkert	--	7	63.0	14.8	73	449	17.1	63.8	959	****
Mott	2.9	6	62.9	14.4	78	386	9.3	62.5	903	***
Norden	--	7	64.2	13.6	83	421	8.7	64.3	901	**
LCS Albany	--	5	62.7	13.0	62	433	7.5	59.1	875	*
LCS Breakaway	--	6	64.1	14.7	82	450	6.3	64.2	909	*
LCS Powerplay	--	6	63.6	13.8	73	418	7.0	65.6	915	*
Prevail	--	7	61.8	13.8	62	387	8.0	61.5	915	**
Prosper	11.7	7	62.8	13.6	76	415	9.8	64.3	936	**
RB07	2.6	5	62.8	14.3	75	411	10.5	62.5	971	***
Rollag	1.5	7	63.5	14.7	75	521	6.7	67.1	863	*
Select	1.1	7	63.4	13.9	75	428	7.3	63.2	903	*
Steele-ND	1.7	6	63.6	14.5	72	408	8.3	64.9	958	***
SY Rowyn	--	7	62.7	13.6	63	443	21.9	61.0	929	****
SY Soren	10.4	7	63.1	14.4	66	425	9.4	63.2	941	***
Vantage	1.9	7	63.7	15.1	82	342	11.1	64.3	937	***
Velva	1.3	7	62.2	14.2	74	416	9.4	64.1	916	**
WB Mayville	4.4	5	62.5	14.7	66	474	10.9	65.7	942	***

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

<sup>1</sup>Observations

<sup>2</sup>Mill and Bake Quality Rating scale 1 to 5, with 1 being low and 5 being superior.

<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 four locations in eastern North Dakota, 2012-2014.**

Variety	<u>Carrington</u>		<u>Casselton</u>		<u>Prosper</u>		<u>Langdon</u>		<u>Avg. eastern N.D.</u>	
	2014	3 Yr.	2014	3 Yr.	2014	2 Yr.	2014	3 Yr.	2014	2/3 Yr.
	------(bu/a)-----									
Advance	88.9	60.2	90.3	78.7	83.8	69.4	84.9	87.5	87.0	74.0
Alpine	85.8	61.9	79.0	76.1	75.1	66.1	91.5	89.9	82.9	73.5
Alsen	85.4	61.7	74.6	69.2	72.0	60.3	--	--	--	--
Barlow	87.4	64.9	78.2	68.5	77.3	62.5	85.5	83.7	82.1	69.9
Breaker	85.8	61.3	89.4	75.5	82.4	67.9	83.1	85.6	85.2	72.6
Brennan	83.3	62.9	82.3	73.2	77.3	63.8	80.0	75.0	80.7	68.7
Duclair	75.5	--	83.9	--	75.0	--	--	--	--	--
Elgin-ND	93.2	66.8	88.5	76.1	78.8	67.4	90.1	88.6	87.7	74.7
Faller	110.9	72.4	101.2	82.5	92.0	73.3	95.5	97.5	99.9	81.4
Forefront	92.9	67.9	91.5	78.2	83.2	71.4	74.3	80.2	85.5	74.4
Glenn	87.6	61.3	76.5	66.5	77.2	67.7	75.8	78.3	79.3	68.5
Howard	94.2	67.1	86.8	75.8	79.9	65.3	--	--	--	--
HRS 3361	100.0	--	--	--	--	--	84.6	--	--	--
HRS 3378	85.6	--	--	--	--	--	87.1	--	--	--
HRS 3419	110.2	--	--	--	--	--	88.9	--	--	--
Jenna	100.0	69.1	87.8	80.0	77.6	67.2	87.0	85.4	88.1	75.4
Kelby	83.6	60.5	72.9	66.4	75.7	66.3	--	--	--	--
LCS Albany	106.5	67.5	93.7	--	77.9	--	95.2	93.0	93.3	--
LCS Breakaway	89.3	61.2	82.3	--	83.2	--	77.1	80.3	83.0	--
LCS Iguacu	94.5	--	94.6	--	85.2	--	90.6	--	91.2	--
LCS Powerplay	96.6	66.5	87.8	--	79.4	--	88.1	88.1	88.0	--
Linkert	92.3	65.5	83.8	--	77.5	--	81.7	77.7	83.8	--
Mott	97.2	66.0	89.5	74.3	80.1	63.0	--	--	--	--
MS Chevelle	102.6	--	81.0	--	81.7	--	91.2	--	89.1	--
MS Stingray	105.4	--	102.1	--	78.0	--	93.4	--	94.7	--
ND901CL Plus	83.3	60.7	78.9	67.3	76.3	63.8	--	--	--	--
Norden	96.3	64.0	83.7	74.6	78.5	64.0	80.5	80.9	84.8	70.9
Prevail	93.4	67.7	--	--	--	--	84.8	82.5	--	--
Prosper	105.2	69.4	89.9	76.1	90.1	74.5	92.9	95.4	94.5	78.9
RB07	92.2	63.7	90.6	75.9	79.2	67.6	88.3	86.1	87.6	73.3
Rollag	97.5	67.9	83.8	72.0	80.8	66.4	85.1	79.4	86.8	71.4
Samson	72.6	57.4	81.1	76.9	82.7	67.0	86.3	83.1	80.7	71.1
Select	94.8	66.6	80.9	72.3	83.0	61.7	77.3	79.8	84.0	70.1
Steele-ND	89.8	64.3	83.0	73.8	76.4	64.6	--	--	--	--
SY605 CL	82.9	59.2	82.6	72.5	85.5	70.4	--	--	--	--
SY Ingmar	90.9	--	89.6	--	76.1	--	86.8	--	85.9	--
SY Rowyn	93.1	64.5	93.1	--	87.0	--	87.0	86.8	90.1	--
SY Soren	89.9	63.5	83.1	74.6	74.3	65.2	85.1	80.8	83.1	71.0
SY Tyra	85.0	58.8	78.6	70.3	63.3	54.0	--	--	--	--
Vantage	92.3	61.9	82.2	70.7	70.0	54.4	81.4	78.0	81.5	66.3
Velva	90.2	59.1	86.3	75.3	70.5	58.8	92.6	87.9	84.9	70.3
WB Digger	94.8	66.6	95.2	80.7	80.1	67.6	90.3	89.5	90.1	76.1
WB Mayville	77.9	57.7	76.6	68.6	80.8	64.4	81.4	79.2	79.2	67.5
WB9507	104.8	--	--	--	--	--	86.8	--	--	--
Mean	91.3	63.9	84.9	73.8	78.2	65.0	85.7	84.2	86.5	72.4
CV%	5.6	--	4.9	--	8.1	--	5.6	--	--	--
LSD 0.10	6.0	--	4.9	--	7.4	--	5.5	--	--	--

**Table 5. Yield of hard red spring wheat varieties grown at four locations in western North Dakota, 2012-2014.**

Variety	<u>Dickinson</u>		<u>Hettinger</u>		<u>Minot</u>		<u>Williston</u>		<u>Avg. western N.D.</u>	
	2014	3 Yr.	2014	3 Yr.	2014	3 Yr.	2014	3 Yr.	2014	3 Yr.
	------(bu/a)-----									
Advance	88.1	67.4	89.0	80.6	67.1	60.5	38.0	33.0	70.6	60.4
Alpine	92.6	68.0	--	--	55.7	47.8	46.1	--	--	--
Barlow	91.1	69.3	80.1	73.3	62.2	55.8	36.3	35.0	67.4	58.4
Breaker	88.4	67.6	84.5	76.6	--	--	39.0	35.7	--	--
Brennan	84.9	66.2	80.4	76.7	54.1	49.2	41.3	37.5	65.2	57.4
Duclair	88.5	--	--	--	66.6	54.2	40.3	36.6	--	--
Elgin-ND	88.9	69.0	88.5	77.4	62.3	52.9	41.7	37.6	70.4	59.2
Faller	95.1	73.2	94.1	72.4	76.4	62.4	41.5	34.7	76.8	60.7
Forefront	80.0	64.3	85.2	75.3	55.8	49.2	45.0	40.2	66.5	57.3
Glenn	86.0	67.9	77.1	69.6	57.5	50.8	33.7	35.3	63.6	55.9
Howard	91.2	69.3	80.3	74.4	72.0	59.1	40.5	33.1	71.0	59.0
HRS 3361	83.9	--	88.2	--	56.6	--	38.0	--	66.7	--
HRS 3378	92.7	--	89.6	--	58.7	--	36.5	--	69.4	--
HRS 3419	69.8	--	97.9	--	67.7	--	41.9	--	69.3	--
Jenna	93.3	73.2	86.5	75.4	67.5	52.2	42.5	38.9	72.5	66.9
Kelby	81.3	61.4	--	--	54.9	47.9	37.8	36.4	--	--
LCS Albany	91.2	68.7	95.4	--	77.1	62.3	44.0	35.7	76.9	--
LCS Breakaway	88.9	66.6	86.4	--	63.1	55.8	37.1	36.3	68.9	--
LCS Iguacu	78.2	--	88.2	--	60.0	--	39.6	--	66.5	--
LCS Powerplay	92.2	72.5	82.9	--	65.0	58.6	40.9	40.1	70.3	--
Linkert	87.2	64.8	80.5	74.0	61.1	--	41.6	37.7	67.6	58.8
Mott	87.0	66.9	78.9	72.4	60.6	54.9	38.9	33.4	66.4	56.9
MS Chevelle	--	--	91.3	--	65.0	--	--	--	--	--
MS Stingray	87.4	--	95.9	--	75.1	--	--	--	--	--
ND901CL Plus	79.5	63.9	73.5	66.1	59.9	51.9	37.0	33.0	62.5	53.7
Norden	87.4	67.4	83.5	75.3	54.3	55.2	39.7	36.0	66.2	58.5
Prevail	85.3	63.1	87.2	79.2	74.1	57.9	43.3	--	72.5	--
Prosper	88.7	67.8	86.3	75.3	74.7	61.7	41.6	35.4	72.8	60.1
RB07	61.1	58.7	84.1	75.4	61.1	53.0	42.6	38.1	62.2	56.3
Rollag	86.5	65.6	84.2	76.2	63.2	56.1	40.2	--	68.5	--
Samson	87.6	70.3	90.1	79.9	65.0	53.7	41.5	37.4	71.1	60.3
Select	82.4	63.4	82.6	73.9	53.4	57.3	36.1	35.9	63.6	57.6
Steele-ND	79.9	63.9	80.9	73.5	69.3	58.0	41.3	33.9	67.9	57.3
SY605 CL	89.8	67.8	83.1	78.4	60.4	51.3	37.9	33.6	67.8	57.8
SY Ingmar	88.3	--	82.1	--	68.1	--	44.2	--	70.7	--
SY Rowyn	87.0	65.4	85.0	79.4	74.6	--	37.3	--	71.0	72.4
SY Soren	86.9	66.5	86.2	80.2	62.3	50.6	37.2	35.6	68.2	58.2
SY Tyra	90.8	68.7	85.7	78.1	56.7	53.7	41.2	36.2	68.6	59.2
Vantage	83.1	61.8	75.4	67.7	56.3	50.9	38.3	33.4	63.3	53.5
Velva	96.0	72.7	85.7	77.6	66.2	57.1	46.2	39.7	73.5	61.8
WB Digger	96.0	72.7	92.5	83.9	68.8	56.6	42.9	36.4	75.1	62.4
WB Gunnison	86.4	64.7	73.4	65.2	60.2	47.8	40.4	32.4	65.1	52.5
WB Mayville	93.2	67.9	79.7	73.0	66.6	52.9	40.4	34.8	70.0	57.2
WB9507	89.0	--	92.8	--	73.4	--	45.0	--	75.1	--
WB9879CLP	90.8	--	83.4	--	56.9	--	38.0	--	67.3	--
Mean	86.9	67.1	85.2	75.2	63.8	54.5	40.3	35.8	69.1	58.2
CV %	5.4	--	5.2	--	11.3	--	8.0	--	--	--
LSD 0.10	5.5	--	5.2	--	8.3	--	3.8	--	--	--

**Table 6. Protein at 12 percent moisture of hard red spring wheat varieties grown at eight locations in North Dakota, 2014.**

Variety	Carrington	Casselton	Prosper	Dickinson	Hettinger	Langdon	Minot	Williston	State Avg.
	------(%)-----								
Advance	14.0	13.2	14.5	11.7	12.7	12.6	12.4	14.8	13.2
Alpine	14.9	13.5	14.2	12.6	--	12.9	12.8	13.9	13.5
Alsen	15.0	14.4	15.0	--	--	--	--	--	14.8
Barlow	14.6	13.5	14.8	12.5	13.8	13.9	14.4	15.5	14.1
Breaker	14.4	13.3	14.6	11.8	13.2	13.0	13.5	14.8	13.6
Brennan	14.4	14.3	14.3	12.5	12.5	13.8	14.7	15.5	14.0
Duclair	14.3	13.5	14.9	12.1	--	--	14.0	14.5	13.9
Elgin-ND	14.8	13.6	14.3	12.7	13.4	13.7	13.9	15.4	14.0
Faller	14.3	12.2	13.8	11.9	11.9	12.3	12.7	14.5	13.0
Forefront	14.7	14.1	14.4	12.7	13.2	13.8	13.5	14.4	13.9
Glenn	15.3	14.0	14.5	11.7	14.5	14.4	14.6	15.3	14.3
Howard	14.6	13.3	14.6	12.7	12.9	--	14.4	14.7	13.9
HRS 3361	14.3	--	--	11.7	11.7	13.5	13.8	15.4	13.4
HRS 3378	13.5	--	--	11.6	12.1	12.4	13.1	14.3	12.8
HRS 3419	13.5	--	--	11.6	11.8	12.3	11.5	14.2	12.5
Jenna	14.6	13.5	14.7	12.2	13.0	12.7	14.3	14.3	13.7
Kelby	14.4	14.4	14.9	13.8	--	--	13.7	15.3	14.4
LCS Albany	13.6	12.3	13.5	11.4	12.2	11.7	12.1	14.4	12.7
LCS Breakaway	15.0	13.9	14.8	12.3	13.5	13.7	14.5	15.2	14.1
LCS Iguacu	12.5	12.3	13.3	10.6	11.1	11.6	12.0	14.1	12.2
LCS Powerplay	14.2	12.8	13.9	12.4	12.4	13.4	13.9	14.8	13.5
Linkert	14.8	14.7	15.2	13.7	14.2	13.6	14.3	15.8	14.5
Mott	15.1	13.5	14.8	12.5	12.9	--	13.6	15.3	14.0
MS Chevelle	13.2	13.1	13.7	--	10.7	12.5	12.7	--	12.7
MS Stingray	12.2	11.3	12.7	11.0	10.5	10.7	10.9	--	11.3
ND901CL Plus	16.6	14.8	15.5	13.0	14.9	-	14.6	16.9	15.2
Norden	13.9	13.2	14.3	12.1	12.5	13.2	13.4	14.5	13.4
Prevail	14.1	13.0	14.4	12.9	12.2	13.3	13.8	14.5	13.5
Prosper	14.2	12.1	13.8	11.5	11.7	12.4	13.1	15.3	13.0
RB07	14.8	13.5	14.5	13.1	13.3	13.8	13.4	15.0	13.9
Rollag	15.2	13.9	15.2	13.2	13.7	14.1	14.0	15.4	14.3
Samson	13.6	13.4	14.2	11.9	11.8	12.5	13.0	14.5	13.1
Select	14.7	13.2	14.0	12.3	12.7	13.7	13.3	14.7	13.6
Steele-ND	14.6	13.5	14.2	12.7	13.6	--	14.2	14.8	13.9
SY605 CL	15.8	13.7	14.9	13.2	14.1	--	13.3	15.6	14.4
SY Ingmar	14.8	13.9	15.2	12.7	13.2	13.7	14.1	15.1	14.1
SY Rowyn	13.9	13.1	13.7	12.7	12.0	12.9	12.9	14.0	13.2
SY Soren	14.7	13.9	14.9	12.4	13.4	13.4	13.6	15.5	14.0
SY Tyra	13.7	12.5	14.1	11.9	11.8	--	13.2	14.3	13.1
Vantage	16.6	15.1	15.5	13.1	14.9	14.4	14.4	16.1	15.0
Velva	14.8	12.9	15.1	12.3	13.0	12.5	13.8	14.9	13.7
WB Digger	15.1	13.3	14.2	10.9	12.7	12.8	13.5	14.5	13.4
WB Mayville	14.8	14.1	14.3	12.0	13.2	13.6	14.1	14.3	13.8
WB9507	14.8	--	--	11.8	12.2	13.1	13.2	15.4	13.4
WB9879CLP	--	--	--	12.8	12.3	--	12.4	15.1	13.2
Mean	14.5	13.4	14.4	12.3	12.8	13.1	13.5	14.9	13.6
CV %	1.6	3.6	4.1	6.4	3.7	4.2	6.8	4.0	--
LSD 0.10	0.3	0.6	0.7	1.1	0.5	0.7	1.1	0.7	--

**Table 7. Test weight of hard red spring wheat varieties grown at eight locations in North Dakota, 2014.**

Variety	Carrington	Casselton	Prosper	Dickinson	Hettinger	Langdon	Minot	Williston	State Avg.
-----lb/bu-----									
Advance	61.0	63.4	62.1	57.6	61.5	62.6	62.4	59.8	61.3
Alpine	57.9	61.0	60.8	55.9	--	61.1	60.0	60.2	59.6
Alsen	60.5	63.6	62.1	--	--	--	--	--	62.1
Barlow	60.9	62.4	61.9	57.4	60.9	62.9	61.1	60.5	61.0
Breaker	60.9	63.9	63.4	58.8	61.5	62.7	64.4	61.5	62.1
Brennan	60.3	62.2	61.4	55.9	60.0	62.5	59.7	61.3	60.4
Duclair	58.7	61.5	61.0	54.6	--	--	59.0	58.2	58.8
Elgin-ND	60.4	62.7	61.7	55.8	60.8	62.3	60.8	59.1	60.5
Faller	61.3	63.2	62.2	55.9	61.1	62.2	62.7	58.4	60.9
Forefront	60.4	63.1	62.0	57.1	61.2	62.1	60.6	61.0	60.9
Glenn	62.8	64.2	63.7	55.2	62.4	64.0	61.2	62.3	62.0
Howard	61.6	63.3	62.8	55.4	61.5	--	61.8	59.4	60.8
HRS 3361	60.9	--	--	55.9	60.1	61.3	60.7	59.2	59.7
HRS 3378	60.7	--	--	56.9	60.9	62.7	62.8	61.0	60.8
HRS 3419	60.4	--	--	54.9	60.2	60.0	60.5	57.3	58.9
Jenna	59.7	62.5	60.3	56.2	60.0	61.4	61.9	59.1	60.1
Kelby	60.2	62.5	61.5	56.8	--	--	60.4	61.4	60.5
LCS Albany	61.1	63.3	60.8	55.9	59.1	61.9	62.6	58.8	60.4
LCS Breakaway	61.2	63.3	63.0	58.0	62.2	62.9	63.7	61.5	62.0
LCS Iguacu	60.8	63.2	61.8	54.6	59.8	62.0	61.2	60.8	60.5
LCS Powerplay	61.3	62.7	62.9	56.5	60.8	62.4	61.4	60.5	61.1
Linkert	60.6	63.1	61.7	57.0	60.8	62.2	59.7	59.6	60.6
Mott	61.0	63.0	61.2	57.0	60.8	--	61.1	60.4	60.6
MS Chevelle	59.7	61.3	61.0	--	60.2	62.1	59.7	--	60.7
MS Stingray	59.9	61.6	59.7	54.4	58.7	60.1	62.3	--	59.5
ND901CL Plus	60.4	62.5	61.2	55.9	60.0	--	60.4	60.5	60.1
Norden	61.8	64.0	63.0	58.1	62.3	63.2	63.7	61.0	62.1
Prevail	60.1	62.3	61.7	56.0	61.0	61.9	61.1	59.5	60.5
Prosper	61.0	62.0	62.2	56.4	60.7	62.4	63.1	58.1	60.7
RB07	60.4	63.0	60.7	50.6	60.1	62.1	59.9	61.1	59.7
Rollag	61.7	63.5	62.6	57.5	61.6	63.0	61.5	60.4	61.5
Samson	56.9	61.1	61.2	54.0	59.2	60.9	59.4	59.7	59.1
Select	61.3	63.2	62.7	58.5	62.7	62.6	59.9	60.5	61.4
Steele-ND	60.7	62.4	62.7	58.2	61.3	--	61.4	59.7	60.9
SY605 CL	60.9	63.1	61.8	55.1	62.0	--	59.0	60.1	60.3
SY Ingmar	60.8	63.0	61.7	56.9	61.3	62.9	62.4	60.7	61.2
SY Rowyn	60.2	63.0	62.2	57.0	60.3	62.2	60.6	59.6	60.6
SY Soren	60.9	62.6	61.6	57.0	61.3	63.2	61.7	60.0	61.0
SY Tyra	59.6	61.2	61.1	56.2	60.4	--	60.6	61.5	60.1
Vantage	62.4	64.4	62.8	56.2	61.1	63.5	63.3	61.1	61.9
Velva	58.9	62.6	60.2	55.2	59.2	61.2	59.6	59.5	59.6
WB Digger	60.5	61.6	60.3	56.8	59.9	61.9	61.8	59.0	60.2
WB Mayville	58.4	61.0	61.6	55.5	59.6	61.4	61.1	60.8	59.9
WB9507	59.0	--	--	54.1	58.7	60.4	59.9	57.4	58.3
WB9879CLP	--	--	--	52.2	59.5	--	57.2	60.5	57.4
Mean	60.5	62.7	61.8	56.14	60.7	62.1	61.1	60.0	60.5
CV %	0.8	1.1	0.8	1.9	0.7	0.7	1.7	1.0	--
LSD 0.10	0.6	0.8	0.6	1.2	0.5	0.5	1.2	0.7	--

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