U.S. HARD RED SPRING WHEAT

2012 REGIONAL QUALITY REPORT

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MINNESOTA | MONTANA | NORTH DAKOTA | SOUTH DAKOTA

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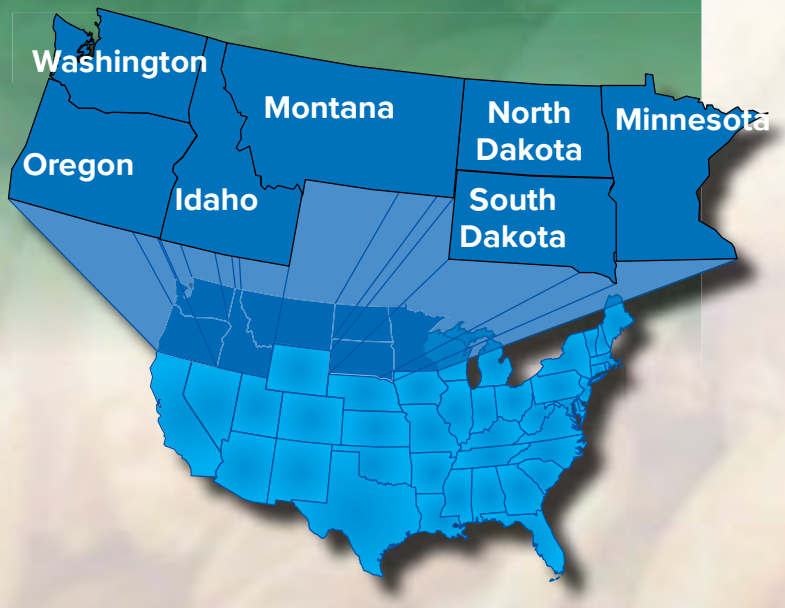


THE ARISTOCRAT OF WHEAT

HARD RED SPRING—a specialty wheat grown primarily in the Northern Plains of the United States—stands out as the aristocrat of wheat when it comes to baking bread. The high protein content and superior gluten quality of hard red spring wheat make it ideal for use in some of the world's finest baked goods. Yeast breads, hard rolls and specialty products such as hearth breads, whole grain breads, bagels and pizza crusts look and taste their best when baked with top quality spring wheat flour. Even frozen dough products are better with spring wheat because they can be stored longer than those made with lower protein wheats.

Flour mills in the United States and around the world also use hard red spring wheat extensively as a blending wheat to increase the gluten strength in a batch of flour. Adding hard red spring to lower protein wheat improves dough handling and mixing characteristics as well as water absorption. The resulting flour can be used to make an assortment of bread products, as well as Chinese-type noodles.

2012 ADDITIONS

The 2012 data includes samples collected from Idaho, Oregon and Washington in the PNW region. In 2011 only Washington and Oregon were included.

2012 OVERVIEW

The 2012 U.S. hard red spring wheat crop is one-fourth larger than 2011, due to a marginal increase in planted area and a significant rebound in yields across central and eastern areas of the four-state region. Quality is high with an average grade of #1 Dark Northern Spring (DNS), and eighty-six percent of the crop making a #1 grade. The crop averages 14.6% protein, similar to last year and about a half percentage point above the five-year average.

The test weight average on the crop is 60.8 pounds per bushel (79.9 kg/hl), similar to 2011 and only slightly below the five-year average. Test weights across central and southern production areas are showing improvement over last year, while western parts of the region are slightly lower. More than one-half of the 2012 crop exceeds 60 pounds per bushel (79 kg/hl). Due to the earlier maturity of the 2012 crop 1,000 KWT's improved as well with an overall crop average of 29.2 grams, up from 27.9 last year.

Only thirteen percent of the 2012 crop falls below 25 grams/1,000 kernels compared to one-third in 2011. Kernel weights still remain below the five-year average however, as some areas experienced hot temperatures during kernel fill.

Total defects at 1.4% are lower than the 1.7% surveyed in 2011. Damaged kernels average zero this year, compared to 0.2% in 2011. Shrunken and broken kernels at 1.3% are lower than 1.5% last year, but slightly higher than the five-year average. Most notable improvements are across central and eastern production areas. Some areas of the region are reporting minor levels of damage due to Fusarium Headblight pressure during flowering. This also raised DON levels in those areas to around a 1 ppm average. Still for the crop as a whole, the average DON is only 0.2 ppm compared to 0.8 ppm in 2011.

Protein is very abundant in 2012 with an average of 14.6%, similar to last year and above the five-year average of 14.0 percent. Two-thirds of the crop registers above 14% protein with good balance in protein across the region. Corresponding with the rapid and dry harvest period is very low moisture in the crop at 11.6%, compared to a five-year average of 12.4%, and a high average falling number of 421 seconds. Kernel ash is notably lower in the 2012 crop, averaging 1.56% down from 1.73% in 2011

Milling data, based on a Buhler laboratory mill, indicates improved extraction over 2011. Average extraction for the crop overall is 69.0%, compared to 68.1% in 2011 and 69.2% for a five-year average. Flour ash is lower at 0.49%, compared to 0.54% in 2011. Wet gluten values are slightly lower than 2011, averaging 35.9% for the overall crop, compared to 36.4%. Starch damage measured at 7.2%, lower than 8% in 2011 and 7.8% for a five-year average.

PRODUCTION DATA	2011	2012	2007-11 AVERAGE
MILLION BUSHELS			
Minnesota	69	75	82.9
Montana	74	96	72.6
North Dakota	168	257	243.1
South Dakota	38	42	56.5
ID/OR/WA	47	35	36.8
U.S. Total	**398**	**505**	**496**
MILLION METRIC TON			
Minnesota	1.88	2.04	2.26
Montana	2.01	2.61	1.98
North Dakota	4.57	7.00	6.62
South Dakota	1.03	1.14	1.54
ID/OR/WA	1.27	0.95	1.00
U.S. Total	**10.8**	**13.7**	**13.5**

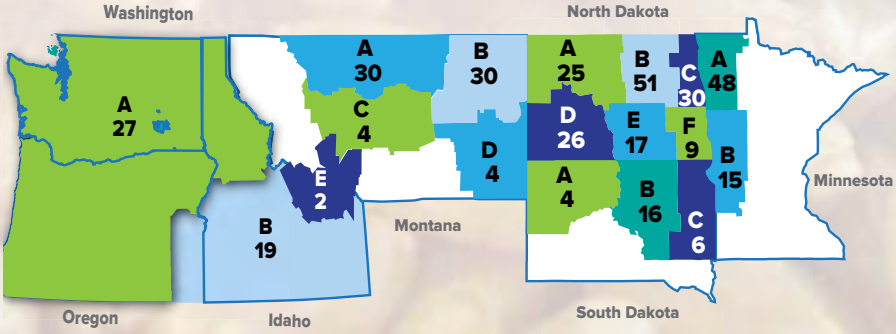
Source: USDA • September 2012 Small Grains Summary

Dough strength in the 2012 crop is exhibiting stronger properties over the 2011 crop, more evident on the Alveograph and Extenisgraph measurements, as compared to the Farinograph. The average Farinograph stability time for the crop is 12.2 minutes, up from 11 minutes in 2011 but still below the five-year average of 12.8 minutes. Average stability measurements across the region ranged from a low of 7.5 minutes to a high of 16.5 minutes. Peak times for dough development remained similar to last year and the five-year average at 7.4 minutes. The crop average Farinograph absorption value of 63.3% is about a point lower than 2011 and 2 points below the five-year average.

Dough quality, as measured by the Extensigraph and Alveograph, is reflecting stronger, more resistant dough in the 2012 crop. The Extensigraph testing shows stronger dough parameters when compared to 2011 as well as the five-year average. Resistance values on the 45 minute pull average 481 B.U. compared to only 394 B.U. in 2011 and 439 for a five-year average. Resistance values appear to be higher across all parts of the region compared to 2011. The dough is less extensible when compared to both last year and the five-year average, with the overall crop at 16.3 centimeters, compared to 18.5 and 18.1, respectively. Alveograph analysis is revealing improved strength with an average W-value of 376, compared to 318 in 2011, but slightly less than the five-year

2011 HARD RED SPRING WHEAT PRODUCTION DENSITY BY CROP REPORTING AREA

(million bushels: 1 metric ton = 36.74 bushels)



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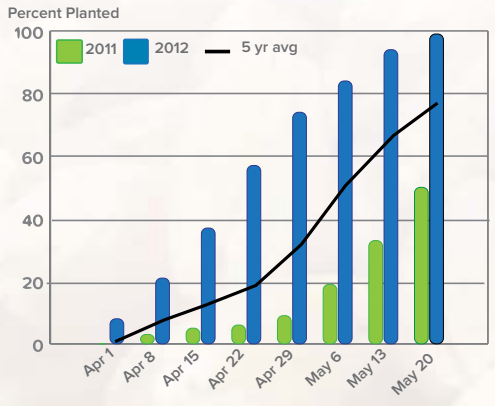
average of 388. The P/L ratio for the crop as a whole is 0.82, up from 0.63 last year and near the five-year average of 0.89.

Baking quality on the 2012 crop is showing lower bake absorption but higher loaf volumes. Average loaf volume is 991 cubic centimeters, up from 984 last year and 958 for a five-year average. Loaf volumes show a strong correlation with protein content in the 2012 crop. The baked bread scores are showing slightly poorer grain and texture, averaging 8.0 on a scale of 1 to 10, compared to 8.6 in 2011 and 8.4 for a five-year average.

The strong features of the 2012 U.S. HRS crop are very high protein levels, a high grade profile with improved kernel weights, near zero damaged kernels, low moisture content and larger production. Functional quality is also showing some positive improvements with greater dough strength and larger loaf volumes. Buyers are encouraged to retain DON specifications, even though DON levels are near zero on the overall crop, because there were pockets of the region that did experience some disease pressure. Overall the crop exhibits good balance in quality parameters from east to west across the region. Buyers should be pleased with the value the 2012 crop affords them.

SEASONAL CONDITIONS

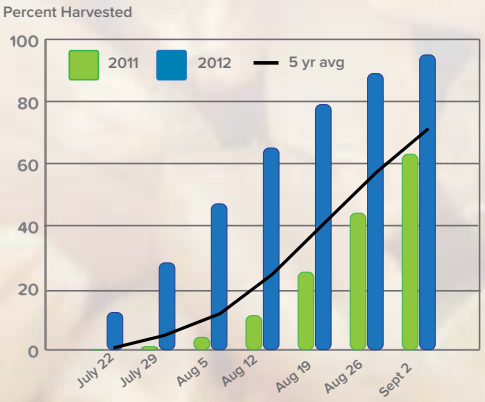
HARD RED SPRING PLANTING PROGRESS



PLANTING began in late March in the four-state region, about three weeks ahead of normal due to a mild and dry winter season. Planting advanced rapidly and steadily through the month of April with nearly three-fourths planted by month's end, well ahead of only 10 percent in 2011 and one-third for a five-year average. Planting was completed across the region by mid May. Planting conditions in Pacific Northwest states were favorable as well, although start dates were closer to the long-term average.

GROWING season conditions were characterized by adequate, but not abundant, topsoil moisture early with favorable temperatures. As the season progressed rainfall levels diminished. Especially across eastern and southern areas with the crop having to rely mostly on subsoil moisture reserves for growth. Temperatures were generally above normal for much of the season with periods of hot temperatures. This advanced crop maturity but also limited disease pressure over much of the region. The exception being areas in the north and west where humidity levels were high during flowering. Yield potential remained strong for much of the growing season aided by sufficient subsoil moisture and the advanced maturity of the crop. Growing season conditions in the Pacific Northwest were also favorable early, but yield potential declined late in the season due to very hot temperatures and limited rainfall.

HARD RED SPRING HARVEST PROGRESS



HARVEST began in mid July, about two weeks earlier than normal in the four-state region and advanced rapidly. Warm and dry conditions prevailed for most of August allowing for rapid and sound harvest conditions. Harvest was one-half completed by August 10 and was generally finished by early September about three weeks ahead of normal.

WHEAT CHARACTERISTICS

OFFICIAL U.S. GRADES AND GRADE REQUIREMENTS (Revised June 1993)

GRADING FACTORS	U.S. Grades 1	2	3	4	5
HARD RED SPRING - MINIMUM TEST WEIGHTS					
Pounds per bushel	58.0	57.0	55.0	53.0	50.0
Kilograms per hectoliter	76.4	75.1	72.5	69.9	66.0
MAXIMUM PERCENT LIMITS OF:					
Damaged kernels					
Heat (part of total)	0.2	0.2	0.5	1.0	3.0
Total	2.0	4.0	7.0	10.0	15.0
Foreign material	0.4	0.7	1.3	3.0	5.0
Shrunken/broken kernels	3.0	5.0	8.0	12.0	20.0
Total [1]	3.0	5.0	8.0	12.0	20.0
Wheat of other classes [2]					
Contrasting classes	1.0	2.0	3.0	10.0	10.0
Total [3]	3.0	5.0	10.0	10.0	10.0
Stones	0.1	0.1	0.1	0.1	0.1
MAXIMUM COUNT LIMITS OF:					
Other material					
Animal filth	1	1	1	1	1
Castor beans	1	1	1	1	1
Crotalaria seeds	2	2	2	2	2
Glass	0	0	0	0	0
Stones	3	3	3	3	3
Unknown foreign material	3	3	3	3	3
Total [4]	4	4	4	4	4
Insect-damaged kernels	31	31	31	31	31

U.S. sample grade is wheat that:

a. Does not meet the requirements for U.S. Nos. 1, 2, 3, 4, or 5; or

b. Has a musty, sour, or commercially objectionable foreign odor (except smut or garlic odor); or

c. is heating or of distinctly low quality.

1. Includes damaged kernels (total), foreign material, and shrunken and broken kernels.
2. Unclassed wheat of any grade may contain not more than 10.0 percent of wheat of other classes.
3. Includes contrasting classes.
4. Includes any combination of animal filth, castor beans, crotalaria seeds, glass, stones, or unknown foreign substance.

Wheat grades, as defined by the USDA Grain Inspection, Packers and Stockyards Administration (GIPSA), reflect the general quality and condition of a representative sample. U.S. grades are based on test weight and include limits on damaged kernels, foreign material, shrunken and broken kernels, and wheat of contrasting classes.

Subclass is a separate marketing factor based on the number of kernels that are dark, hard and vitreous. For hard red spring wheat the subclasses are:

- Dark Northern Spring (DNS)—at least 75 percent or more dark, hard, vitreous kernels;
- Northern Spring (NS)—between 25 and 74 percent dark, hard, vitreous kernels;
- Red Spring (RS)—less than 25 percent dark, hard, vitreous kernels.

Other basic criteria not included as grading factors but important in the U.S. wheat marketing system.

Protein is probably the most important factor in determining the value of hard red spring wheat since it relates to many processing properties. In the U.S. market HRS prices are usually quoted for 14.0 percent protein (on a 12.0 percent moisture basis). Price premiums or discounts may be specified for halves, fifths and tenths of a percentage point above and below 14.0 percent.

Moisture content is an indicator of grain storability. Wheat with lower moisture content is generally more stable during storage and more profitable to a miller. U.S. HRS ranges from 12 to 13 percent.

Dockage is any material easily removed from a wheat sample during cleaning using standard mechanical means. All U.S. grade and non-grade factors are determined only after dockage is removed.

Falling number indicates the soundness of wheat or its alpha-amylase activity. Falling numbers above 300 seconds are most desired for baking products.

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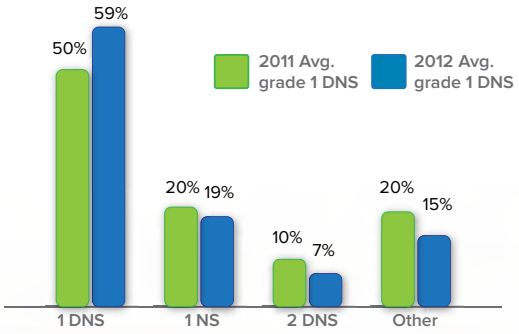
WHEAT GRADING DATA

STATE AND CROP REPORTING AREA	TEST WEIGHT LBS/BU	TEST WEIGHT KG/HL	DAMAGE %	FOREIGN MATERIAL %	SHRUNKEN/ BROKEN KERNELS %	TOTAL DEFECTS %	CONTRASTING CLASSES %	U.S. GRADE	VITREOUS KERNELS %
MINNESOTA									
Area A	61.3	80.6	0.0	0.0	0.8	0.8	0.0	1 NS	59
Area B	61.2	80.5	0.0	0.0	0.6	0.6	0.0	1 NS	41
State Avg. 2012	61.3	80.6	0.0	0.0	0.8	0.8	0.0	1 NS	55
State Avg. 2011	61.5	80.9	0.2	0.0	1.2	1.3	0.0	1 DNS	77
MONTANA									
Area A	60.8	79..9	0.0	0.0	1.9	1.9	0.0	1 DNS	82
Area B	59.6	78.5	0.0	0.0	2.8	2.8	0.0	1 DNS	82
Area C	60.7	79.8	0.0	0.0	2.2	2.2	0.0	1 DNS	95
Area D	58.7	77.3	0.0	0.0	3.8	3.8	0.0	2 DNS	97
Area E	62.4	82.0	0.0	0.0	1.3	1.3	0.0	1 DNS	93
State Avg. 2012	60.3	79.3	0.0	0.0	2.4	2.4	0.0	1 DNS	84
State Avg. 2011	61.3	80.6	0.0	0.0	1.7	1.8	0.0	1 DNS	90
NORTH DAKOTA									
Area A	60.7	79.8	0.1	0.1	1.5	1.7	0.0	1 DNS	83
Area B	61.2	80.5	0.1	0.0	0.8	0.9	0.0	1 NS	63
Area C	61.9	81.4	0.1	0.0	0.8	0.9	0.0	1 DNS	77
Area D	60.2	79.2	0.0	0.0	1.6	1.6	0.0	1 DNS	85
Area E	58.5	76.9	0.1	0.0	1.4	1.5	0.0	1 DNS	79
Area F	60.5	79.6	0.0	0.0	0.5	0.5	0.0	1 NS	59
State Avg. 2012	60.7	79.8	0.1	0.0	1.2	1.2	0.0	1 DNS	75
State Avg. 2011	60.3	79.3	0.2	0.0	1.4	1.6	0.0	1 DNS	79
SOUTH DAKOTA									
Area A	59.5	78.3	0.0	0.0	2.5	2.5	0.0	1 DNS	83
Area B	60.8	80.0	0.0	0.0	1.1	1.1	0.0	1 NS	72
Area C	60.3	79.3	0.0	0.0	1.3	1.3	0.0	1 NS	59
State Avg. 2012	60.5	79.5	0.0	0.0	1.4	1.4	0.0	1 NS	71
State Avg. 2011	58.5	77.1	0.2	0.0	2.7	2.9	0.0	1 DNS	78
ID/OR/WA									
Area A	63.4	83.3	0.0	0.0	0.6	0.6	0.0	1 DNS	91
Area B	62.1	81.7	0.0	0.0	0.9	0.9	0.0	1 DNS	98
State Avg. 2012	62.9	82.6	0.0	0.0	0.7	0.7	0.0	1 DNS	94
State Avg. 2011	63.4	83.3	0.0	0.0	0.9	0.9	0.0	1 DNS	94
REGION AVERAGE									
Avg. 2012	60.8	80.0	0.0	0.0	1.3	1.4	0.0	1 DNS	75
Avg. 2011	60.7	79.6	0.2	0.0	1.5	1.7	0.0	1 DNS	82
Five-Year Avg	61.2	80.5	0.1	0.0	1.1	1.3	0.0	1 NS	74

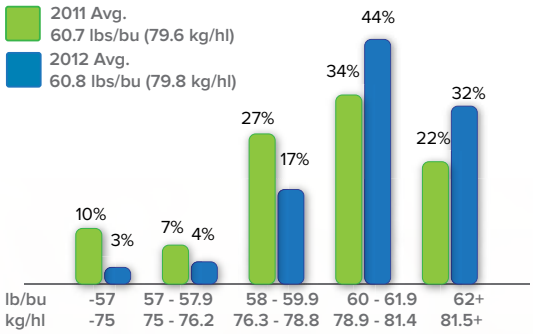
REGIONAL GRADE DISTRIBUTION



Overall grade

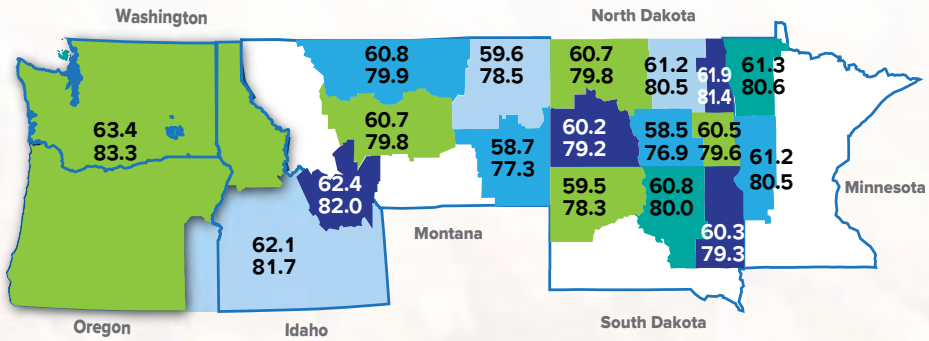
The average grade for the region is 1 DNS. This grade reflects the average vitreous kernel content of 75 percent. Of the 18 composite samples, 11 graded 1 DNS, six graded 1 NS and one graded 2 DNS.

REGIONAL TEST WEIGHT DISTRIBUTION



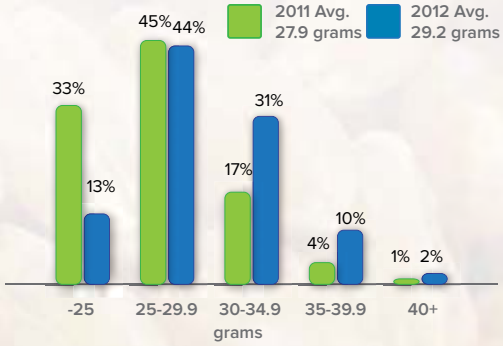
Ninety-three percent of the 2012 samples have a test weight of 58 lb/bu (76.3 kg/hl) or greater. The regional average test weight is 60.8 lb/bu (80.0 kg/hl).

AVERAGE TEST WEIGHT BY AREA



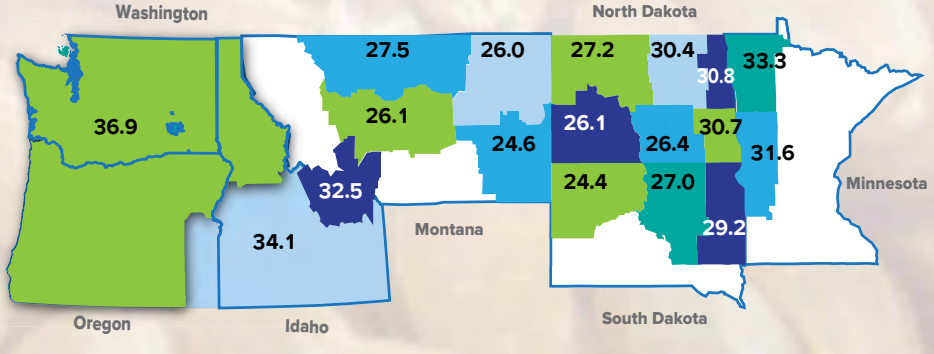
Pounds per bushel - top
Kilograms per hectoliter - bottom

REGIONAL 1000 KERNEL WEIGHT DISTRIBUTION



Forty-three percent of the 2012 samples have a thousand kernel weight of 30 grams or more.

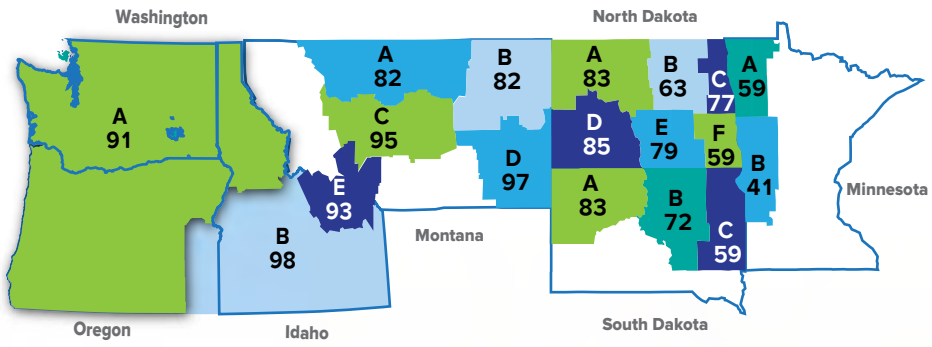
AVERAGE 1000 KERNEL WEIGHT BY AREA



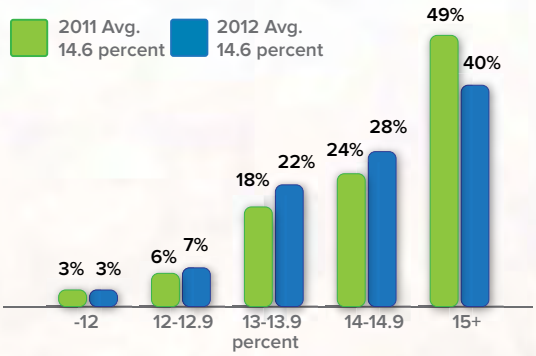
OTHER KERNEL QUALITY DATA

STATE AND CROP REPORTING AREA	DOCKAGE %	MOISTURE %	1000 KERNEL WEIGHT G	KERNEL DIST. Medium %	KERNEL DIST. Large %	PROTEIN (0% Moisture) %	PROTEIN (12% Moisture) %	DON (ppm)	WHEAT ASH %	FALLING NUMBER (Sec)	ZELENY SED (cc)
MINNESOTA											
Area A	0.4	12.8	33.3	42	56	16.3	14.3	0.0	1.53	441	63
Area B	0.7	13.0	31.6	44	54	15.9	14.0	0.0	1.56	439	54
State Avg. 2012	0.5	12.8	32.9	42	56	16.2	14.2	0.0	1.54	441	61
State Avg. 2011	0.8	12.7	29.5	55	40	15.8	13.9	0.7	1.71	368	55
MONTANA											
Area A	1.0	10.2	27.5	68	26	15.3	13.5	0.0	1.54	410	60
Area B	1.2	10.1	26.0	70	21	16.5	14.5	0.0	1.57	419	63
Area C	0.8	9.4	26.1	55	30	17.5	15.4	0.0	1.63	403	61
Area D	0.6	9.5	24.6	69	15	17.8	15.7	0.0	1.56	398	60
Area E	0.6	10.9	32.5	50	46	16.9	14.9	0.0	1.51	356	63
State Avg. 2012	1.1	10.1	26.9	67	25	16.1	14.2	0.0	1.56	411	62
State Avg. 2011	0.5	10.4	30.9	69	28	15.7	13.8	<0.1	1.56	358	58
NORTH DAKOTA											
Area A	1.0	11.8	27.2	65	30	17.5	15.4	1.2	1.57	413	66
Area B	0.9	12.7	30.4	50	47	16.3	14.3	0.7	1.52	430	67
Area C	0.8	12.7	30.8	54	44	16.3	14.3	0.0	1.54	403	65
Area D	0.8	11.0	26.1	76	19	17.7	15.6	0.0	1.55	430	63
Area E	1.1	12.3	26.4	67	27	17.5	15.4	0.0	1.69	433	63
Area F	0.9	12.8	30.7	47	51	15.7	13.8	0.0	1.54	450	57
State Avg. 2012	0.9	12.1	28.5	61	35	16.9	14.9	0.5	1.56	424	65
State Avg. 2011	0.9	12.3	25.7	67	26	17.3	15.2	1.3	1.81	360	64
SOUTH DAKOTA											
Area A	0.6	11.1	24.4	81	10	17.2	15.1	0.0	1.65	426	60
Area B	0.6	11.7	27.0	73	22	16.4	14.4	0.0	1.63	459	60
Area C	0.8	12.5	29.2	55	41	16.3	14.3	0.0	1.61	424	54
State Avg. 2012	0.6	11.8	27.0	71	24	16.5	14.5	0.0	1.63	446	58
State Avg. 2011	0.9	12.2	24.2	74	15	17.7	15.6	1.2	1.91	390	48
ID/OR/WA											
Area A	0.2	9.0	36.9	34	65	16.6	14.6	0.0	1.53	324	59
Area B	0.2	8.8	34.1	45	52	16.7	14.7	0.0	1.56	393	57
State Avg. 2012	0.2	8.9	35.7	39	60	16.6	14.6	0.0	1.54	353	58
State Avg. 2011	0.2	9.3	35.5	39	58	15.5	13.6	<0.1	1.49	372	63
REGION AVERAGE											
Avg. 2012	0.8	11.6	29.2	59	37	16.6	14.6	0.2	1.56	421	62
Avg. 2011	0.8	11.8	27.9	64	30	16.6	14.6	0.8	1.73	365	59
Five-Year Avg	0.8	12.4	31.7	47	48	15.9	14.0	n/a	1.59	387	58

AVERAGE VITREOUS KERNEL BY AREA (percent)

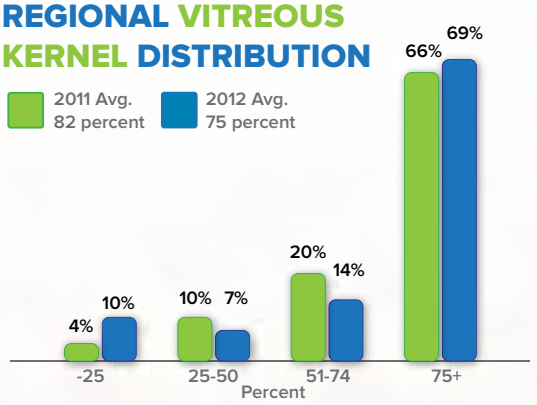


REGIONAL PROTEIN DISTRIBUTION (12% moisture basis)



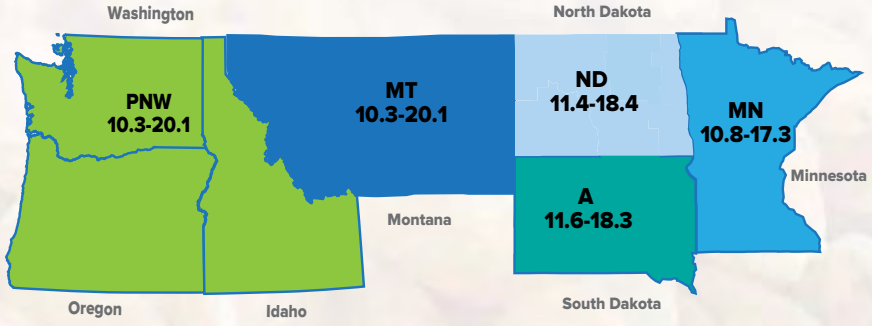
Sixty-eight percent of the 2012 samples have a protein content of 14.0 percent or greater.

REGIONAL VITREOUS KERNEL DISTRIBUTION

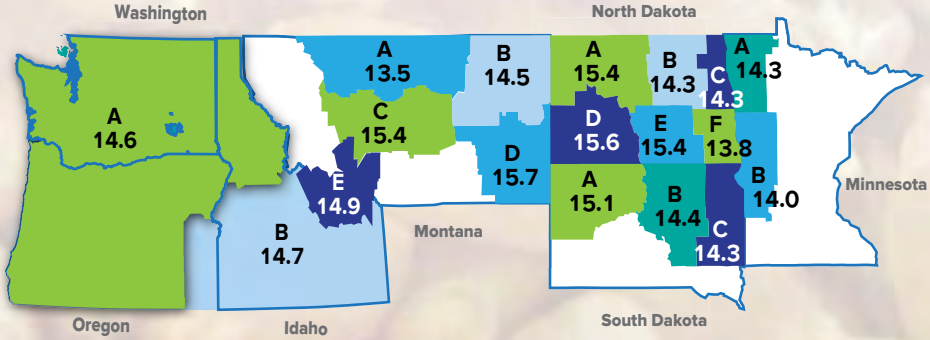


Sixty-nine percent of the 2012 samples have a dark, hard vitreous kernel count of 75 or better.

PROTEIN RANGE BY STATE (12% Moisture basis-percent)



AVERAGE PROTEIN BY AREA (12% moisture basis-percent)



U.S. HARD RED SPRING WHEAT

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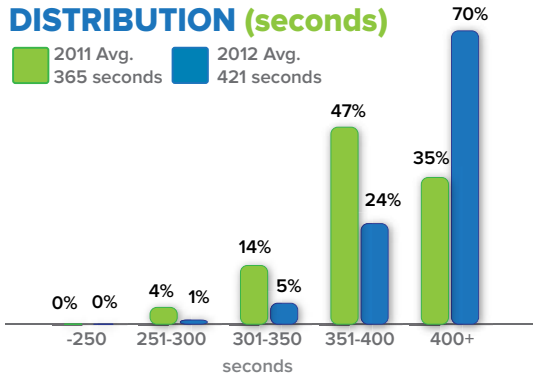
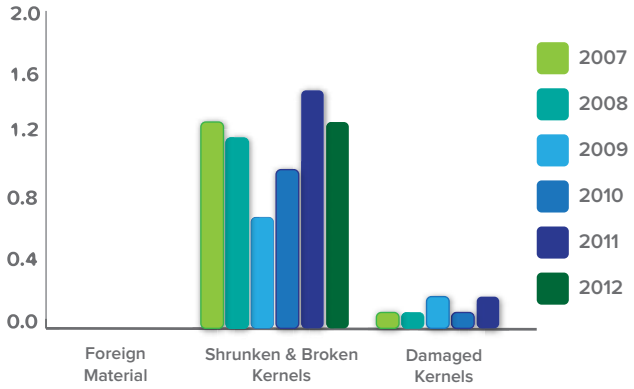
REGIONAL FALLING NUMBER DISTRIBUTION (seconds)

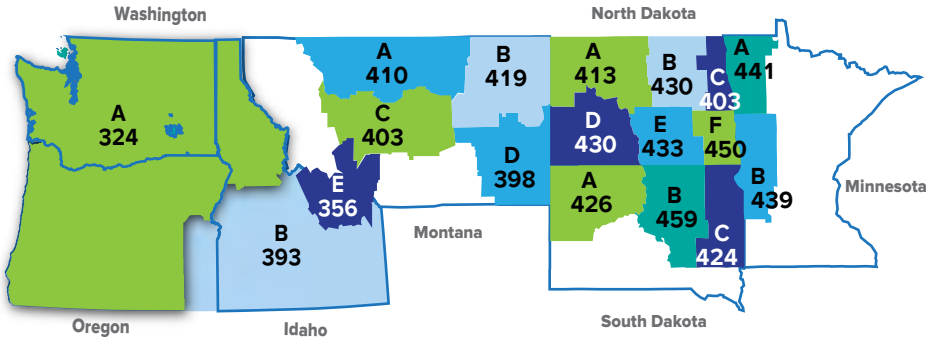


Ninety-four percent of the 2012 samples have a falling number of 350 seconds or greater.

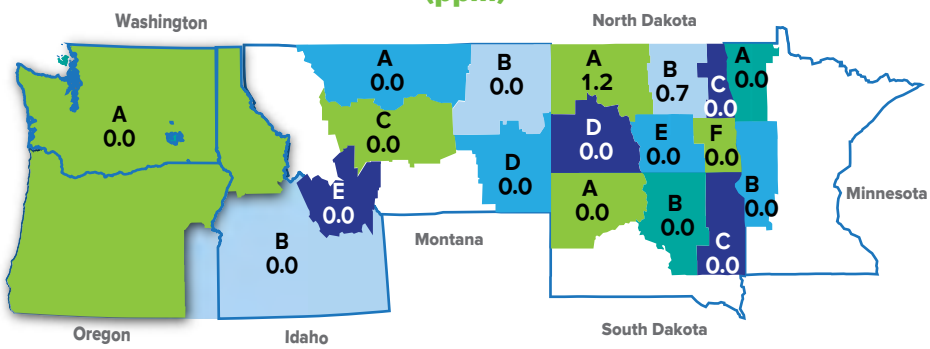
AVERAGE TOTAL DEFECTS (percent)



AVERAGE FALLING NUMBER BY AREA (seconds)



AVERAGE DON BY AREA (ppm)



MILLING CHARACTERISTICS

Flour is evaluated for several factors to determine overall milling efficiency, grade, soundness and functional properties.

Extraction, or the proportion of the wheat kernel that can be milled into flour, is important to mill profitability. For purposes of this survey, test milling was conducted with a Buhler laboratory mill. Results are suitable for comparison between crop years, however yields are lower than those obtained in commercial mills.

Another measure of milling efficiency and of flour grade is the **ash content**, or mineral residue, remaining after incineration of a sample.

Starch damage measures physical damage to a proportion of the starch granules of flour. The level directly affects water absorption and dough mixing properties.

Wet gluten provides a quantitative measure of the gluten forming proteins in flour that are primarily responsible for its dough mixing and baking properties.

Falling number measures enzyme activity in flour. A fast time indicates high activity, revealing too much sugar and too little starch. Since starch provides bread's supporting structure, too much activity results in sticky dough and poor texture in finished products.

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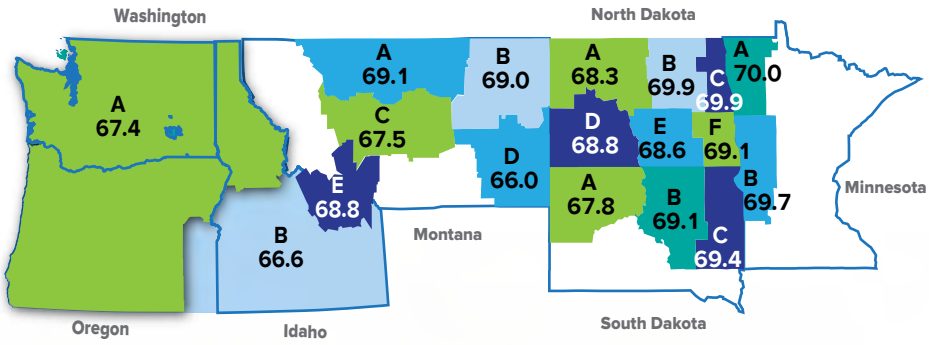
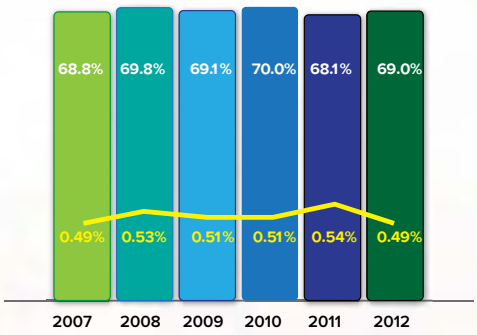
FLOUR QUALITY DATA

STATE AND CROP REPORTING AREA	FLOUR EXTRACTION %	FLOUR ASH %	FLOUR PROTEIN (14% moisture) %	STARCH DAMAGE %	WET GLUTEN %	GLUTEN INDEX %	FALLING NUMBER sec	AMYLOGRAPH PEAK VISCOSITY 65 G FL B.U.	AMYLOGRAPH PEAK VISCOSITY 100 G FL B.U.
MINNESOTA									
Area A	70.0	0.49	13.6	7.7	35.6	91	413	751	2916
Area B	69.7	0.53	13.1	7.2	33.8	89	422	706	2959
State Avg. 2012	69.9	0.50	13.5	7.6	35.2	91	415	741	2926
State Avg. 2011	69.0	0.53	12.6	8.4	34.0	94	370	579	2143
MONTANA									
Area A	69.1	0.50	12.5	7.5	33.0	90	433	713	2960
Area B	69.0	0.49	13.8	6.3	37.0	79	425	846	3218
Area C	67.5	0.50	14.2	6.4	39.0	69	447	765	2962
Area D	66.0	0.50	14.6	6.7	40.4	72	440	821	3009
Area E	68.8	0.48	14.0	7.7	37.5	71	418	606	2628
State Avg. 2012	68.9	0.50	13.3	6.9	35.6	82	429	775	3064
State Avg. 2011	67.9	0.49	12.5	7.8	34.2	88	412	677	2409
NORTH DAKOTA									
Area A	68.3	0.47	14.4	6.6	39.0	79	401	679	2446
Area B	69.9	0.46	13.3	7.3	34.4	92	407	775	2784
Area C	69.9	0.45	13.5	7.5	35.1	87	389	597	2398
Area D	68.8	0.50	14.6	7.4	38.4	84	433	733	2824
Area E	68.6	0.55	14.4	7.1	38.1	85	449	844	2910
Area F	69.1	0.48	13.0	7.1	32.5	91	438	832	3258
State Avg. 2012	69.1	0.48	13.9	7.1	36.6	86	415	730	2706
State Avg. 2011	68.1	0.56	13.9	8.1	38.3	86	378	517	1731
SOUTH DAKOTA									
Area A	67.8	0.53	14.1	6.9	37.5	77	483	750	3060
Area B	69.1	0.51	13.5	7.2	33.8	91	448	830	3140
Area C	69.4	0.53	13.3	7.9	33.9	90	462	769	2978
State Avg. 2012	68.9	0.52	13.6	7.3	34.4	88	457	804	3092
State Avg. 2011	67.2	0.64	14.2	7.7	38.5	83	415	666	2530
ID/OR/WA									
Area A	67.4	0.49	13.6	7.1	35.1	90	452	470	2594
Area B	66.6	0.49	13.7	7.6	36.6	93	452	650	2590
State Avg. 2012	67.0	0.49	13.6	7.3	35.7	91	452	546	2592
State Avg. 2011	67.4	0.44	12.4	7.4	33.1	91	386	621	2502
REGION AVERAGE									
Avg. 2012	69.0	0.49	13.7	7.2	35.9	87	424	733	2831
Avg. 2011	68.1	0.54	13.3	8.0	36.4	88	388	581	2069
Five-Year Avg	69.2	0.52	13.0	7.8	35.2	93	404	628	2371

AVERAGE FLOUR EXTRACTON BY AREA (percent)

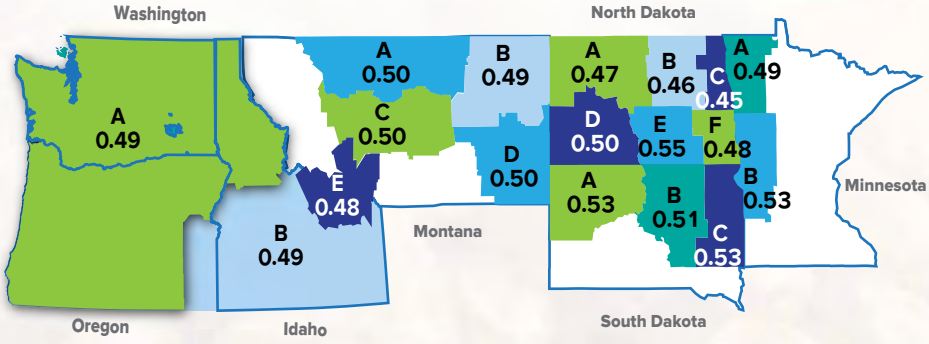


AVERAGE FLOUR EXTRACTION and ASH CONTENT

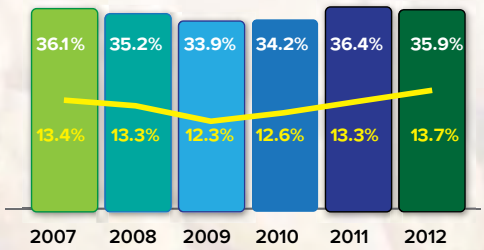


The regional average flour extraction is 69.0 percent, and the ash content is 0.49 percent.

AVERAGE FLOUR ASH BY AREA (percent)

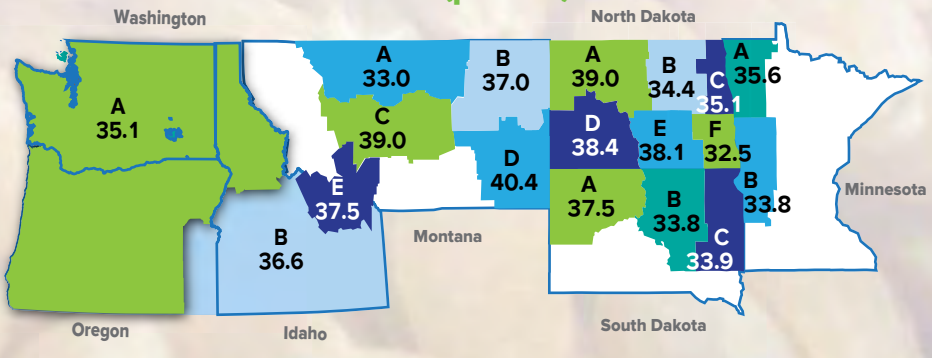


AVERAGE WET GLUTEN and FLOUR PROTEIN



Average wet gluten content for the 2012 crop is 35.9 percent, and flour protein is 13.7 percent.

AVERAGE WET GLUTEN BY AREA (percent)



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DOUGH CHARACTERISTICS

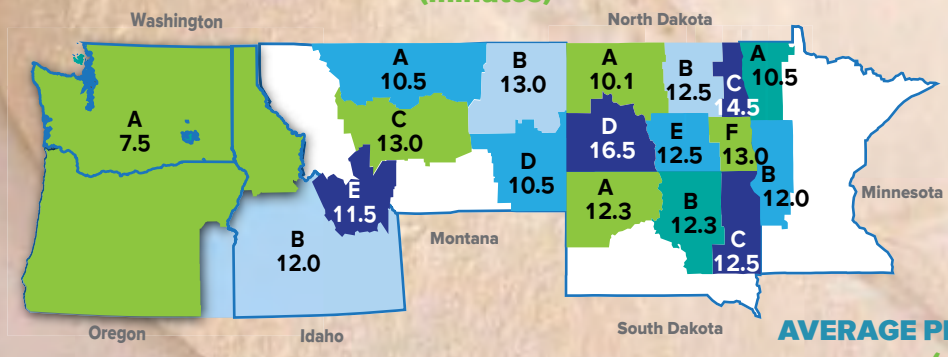
Physical characteristics of dough are evaluated to reveal useful information about variations in flour types, processing requirements and expected end-product quality.

A farinograph traces a curve during the dough mixing process to record variations in gluten development and the breakdown of gluten proteins over time. Water absorption indicates the amount of water that can be added to the flour until the dough reaches a definite consistency. Peak time indicates the number of minutes required to achieve this level of dough consistency and mixing tolerance indicates the stability of the dough. Both development time and mixing tolerance are related to dough strength. Farinograms are rated on a scale of 1 to 8, with higher values indicating strong mixing properties.

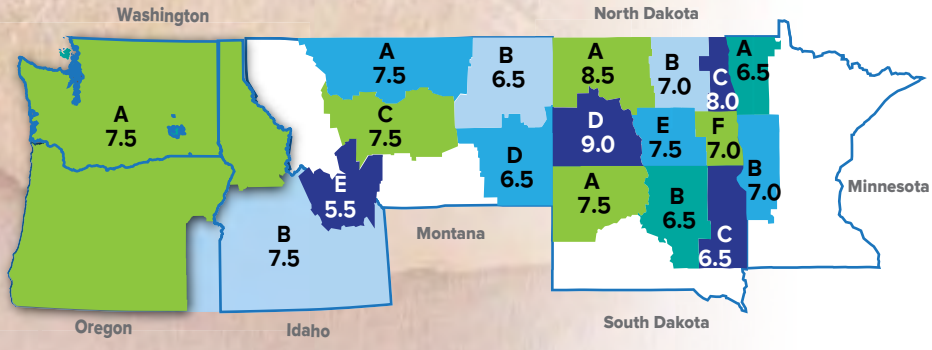
The extensigraph measures dough strength by stretching a piece of dough on a hook until it breaks. The apparatus traces a curve that measures extensibility, resistance to extension and the area beneath the curve, or energy value.

An alveograph traces a curve that measures the air pressure necessary to inflate a piece of dough to the point of rupture. The overpressure (P) value reflects the maximum pressure needed to deform the piece of dough during the inflation process and is an indication of resistance, or dough stability. The length (L) measurement reflects dough extensibility. The deformation energy (W) measurement is the amount of energy needed to inflate the dough to the point of rupture and is indicative of dough strength.

AVERAGE STABILITY BY AREA (minutes)



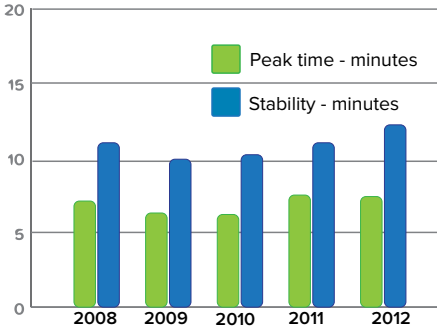
AVERAGE PEAK TIME BY AREA (minutes)



PHYSICAL DOUGH QUALITY PROPERTIES

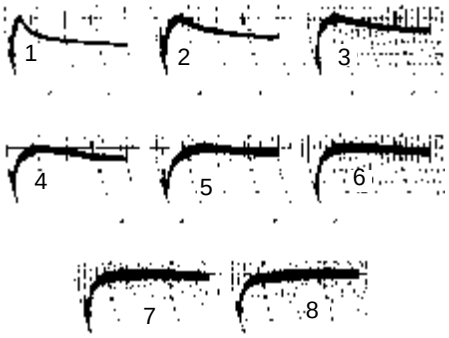
STATE AND CROP REPORTING AREA	FARINOGRAPH ABSORPTION %	PEAK TIME min	STABILITY min	MTI B.U.	SCORE (1-8)	VALORI-METER
MINNESOTA						
Area A	62.8	6.5	10.5	35	5.0	64
Area B	61.7	7.0	12.0	20	5.0	66
State Avg. 2012	62.6	6.6	10.8	32	5.0	64
State Avg. 2011	63.5	7.9	11.5	38	5.0	69
MONTANA						
Area A	62.6	7.5	10.5	40	5.0	68
Area B	62.8	6.5	13.0	20	5.0	67
Area C	64.9	7.5	13.0	20	5.0	69
Area D	64.6	6.5	10.5	20	5.0	65
Area E	65.5	5.5	11.5	30	5.0	61
State Avg. 2012	63.0	6.9	11.8	29	5.0	67
State Avg. 2011	63.9	7.2	8.9	46	4.1	64
NORTH DAKOTA						
Area A	63.8	8.5	10.1	25	4.0	69
Area B	63.1	7.0	12.5	30	5.0	67
Area C	62.7	8.0	14.5	30	6.0	71
Area D	64.8	9.0	16.5	30	6.0	72
Area E	64.1	7.5	12.5	30	5.0	68
Area F	61.5	7.0	13.0	20	5.0	67
State Avg. 2012	63.5	7.9	13.1	28	5.1	69
State Avg. 2011	65.7	7.6	11.9	38	5.1	68
SOUTH DAKOTA						
Area A	63.1	7.5	12.3	30	5.0	69
Area B	61.9	6.5	12.3	30	5.0	65
Area C	61.9	6.5	12.5	20	5.0	65
State Avg. 2012	62.1	6.7	12.3	28	5.0	66
State Avg. 2011	63.4	6.9	11.3	39	5.0	66
ID/OR/WA						
Area A	65.7	7.5	7.5	40	4.0	68
Area B	64.0	7.5	12.0	30	5.0	68
State Avg. 2012	65.0	7.5	9.4	36	4.4	68
State Avg. 2011	62.9	7.0	10.0	45	5.0	66
REGION AVERAGE						
Avg. 2012	63.3	7.4	12.2	29	5.0	68
Avg. 2011	64.5	7.5	11.0	40	4.8	67
Five-Year Avg	65.6	7.3	12.8	33	5.3	67

REGIONAL AVERAGE FARINOGRAPH RESULTS

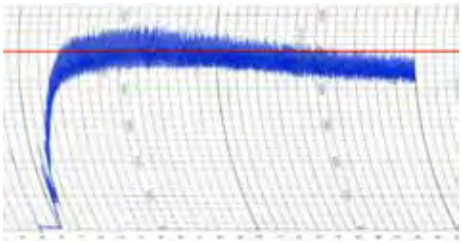


The 2012 average peak time is 7.4 minutes and stability is 12.2 minutes.

REFERENCE FARINOGRAMS FOR HARD RED SPRING WHEAT



2012 AVERAGE FARINOGRAM



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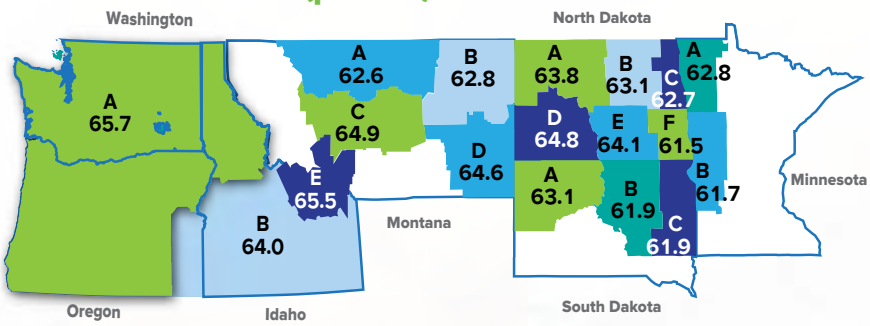
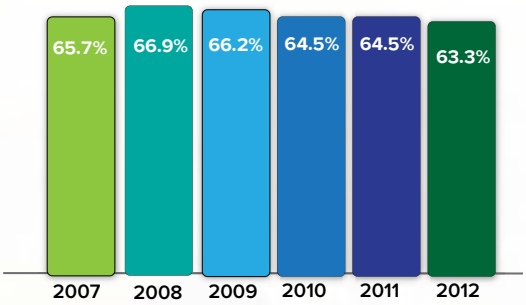
AVERAGE FARINOGRAM ABSORPTION BY AREA (percent)

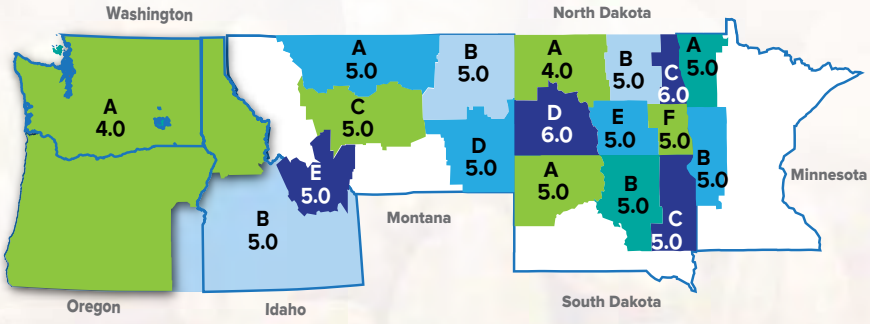


REGIONAL AVERAGE FARINOGRAM ABSORPTION

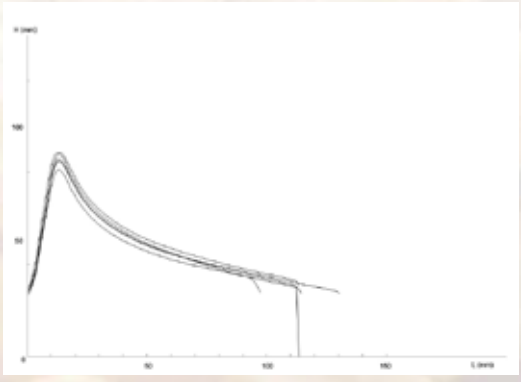


The average farinogram absorption is 63.3 percent, lower than last year and the five year average.

AVERAGE DOUGH CLASSIFICATION BY AREA (scale of 1-8)

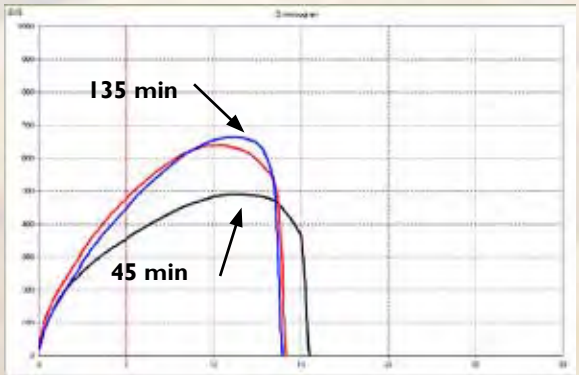


2012 AVERAGE ALVEOGRAM



P-curve height shows maximum pressure needed to deform dough, indicating stability.
L-length of curve reflects extensibility.
W- measurement of total energy or work needed to inflate dough.

2012 AVERAGE EXTENSOGRAM



Indicates extensibility and resistance to extesension. Area beneath curve indicates the energy or work required.

PHYSICAL DOUGH QUALITY PROPERTIES

	EXTENSIGRAPH						ALVEOGRAPH			
STATE AND CROP REPORTING AREA	EXTENSIBILITY 45 MIN sq cm	RESISTANCE 45 MIN B.U.	AREA sq cm	EXTENSIBILITY 135 MIN sq cm	RESISTANCE 135 MIN B.U.	AREA sq cm	p mm	L mm	P/L ratio	W joules X 10^4
MINNESOTA										
Area A	15.4	534	109	12.9	687	113	92	110	0.84	370
Area B	15.7	442	91	13.5	578	104	93	110	0.85	365
State Avg. 2012	15.5	513	105	13.0	662	111	92	110	0.84	369
State Avg. 2011	17.5	432	99	16.6	542	115	84	124	0.68	351
MONTANA										
Area A	15.5	490	103	13.7	656	113	98	110	0.89	371
Area B	16.6	418	94	16.3	544	116	87	128	0.68	357
Area C	16.3	371	82	15.2	502	100	96	113	0.85	352
Area D	16.0	378	80	14.7	549	108	94	111	0.85	355
Area E	18.0	333	82	16.3	465	104	96	118	0.81	352
State Avg. 2012	16.2	440	96	15.1	584	113	93	119	0.78	362
State Avg. 2011	18.4	398	99	16.8	596	128	83	126	0.66	323
NORTH DAKOTA										
Area A	19.9	358	97	19.3	432	111	81	112	0.72	320
Area B	15.7	495	103	13.5	696	123	89	123	0.72	376
Area C	15.7	562	115	13.8	870	150	107	107	1.00	403
Area D	15.0	560	107	12.5	954	148	105	120	0.88	449
Area E	16.4	551	118	13.8	857	149	101	111	0.91	405
Area F	15.2	486	97	13.1	688	113	88	115	0.77	356
State Avg. 2012	16.5	493	105	14.6	731	131	94	116	0.81	384
State Avg. 2011	19.2	369	96	19.5	456	117	78	130	0.60	312
SOUTH DAKOTA										
Area A	14.9	475	95	13.0	795	133	95	109	0.87	363
Area B	17.3	482	111	16.1	559	121	93	102	0.91	345
Area C	16.4	538	115	13.7	698	123	96	109	0.88	375
State Avg. 2012	16.7	493	109	15.1	628	123	94	105	0.90	354
State Avg. 2011	18.7	377	95	17.6	471	108	70	120	0.58	258
ID/OR/WA										
Area A	17.5	381	89	16.1	530	116	96	127	0.76	395
Area B	15.8	472	96	13.9	664	117	97	118	0.82	399
State Avg. 2012	16.8	419	92	15.2	586	116	96	123	0.78	397
State Avg. 2011	16.4	482	104	16.6	637	136	85	120	0.71	354
REGION AVERAGE										
Avg. 2012	16.3	481	103	14.6	674	123	94	115	0.82	376
Avg. 2011	18.5	394	97	18.1	512	119	80	126	0.63	318
Five-Year Avg	18.1	439	104	17.6	585	131	101	114	0.89	388

U.S. HARD RED SPRING WHEAT

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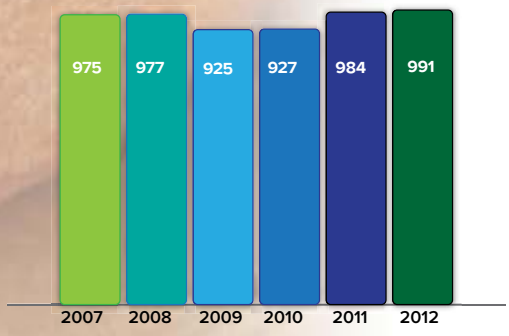
BAKING CHARACTERISTICS

The gluten strength in flour milled from U.S. hard red spring wheat is essential to supporting the heavy ingredients in many whole grain and artisan breads.

Although consumers make the ultimate judgement, baking tests are the final laboratory method for evaluating wheat quality. In general, a good correlation exists between loaf volume and protein quantity and quality.

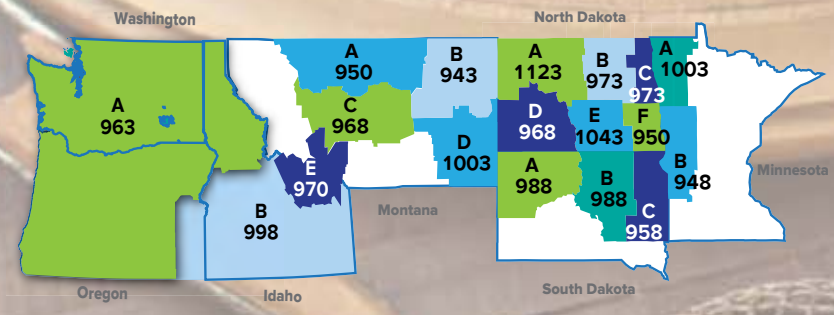
Laboratory technicians also visually evaluate test loaves for crumb grain, texture and color, as well as crust color and loaf symmetry.

AVERAGE LOAF VOLUME (cubic centimeters)



Loaf volume for the 2012 crop is 991 cubic centimeters, higher than last year and the five-year average

AVERAGE LOAF VOLUME BY AREA (cubic centimeters)



BAKING DATA

STATE AND CROP REPORTING AREA	BAKING ABSORPTION %	DOUGH HANDLING PROPERTIES	LOAF VOLUME CC	GRAIN AND TEXTURE	CRUMB COLOR	CRUST COLOR	SYMMETRY
MINNESOTA							
Area A	62.8	10.0	1003	8.0	8.5	10.0	9.0
Area B	61.2	9.5	948	8.0	8.0	10.0	9.0
State Avg. 2012	62.4	9.9	990	8.0	8.4	10.0	9.0
State Avg. 2011	62.0	10.0	956	8.2	8.5	10.0	8.6
MONTANA							
Area A	62.4	10.0	950	8.3	7.5	10.0	7.5
Area B	62.3	9.5	943	8.5	7.5	10.0	8.5
Area C	64.6	8.5	968	7.8	7.5	10.0	9.0
Area D	64.1	9.5	1003	7.8	7.3	10.0	8.5
Area E	65.5	8.0	970	9.0	7.5	10.0	8.5
State Avg. 2012	62.7	9.6	950	8.4	7.5	10.0	8.1
State Avg. 2011	62.4	10.0	904	8.6	8.1	10.0	8.5
NORTH DAKOTA							
Area A	63.3	10.0	1123	7.0	7.8	10.0	9.5
Area B	62.6	9.0	973	8.0	8.0	10.0	7.5
Area C	62.4	10.0	973	8.3	8.5	10.0	7.5
Area D	64.3	10.0	968	8.0	7.8	10.0	8.0
Area E	63.6	10.0	1043	7.8	8.0	10.0	7.5
Area F	61.3	9.0	950	8.3	8.0	10.0	8.0
State Avg. 2012	63.1	9.3	1010	7.8	8.0	10.0	8.1
State Avg. 2011	64.2	10.0	1039	8.7	8.2	10.0	9.1
SOUTH DAKOTA							
Area A	62.6	9.5	988	8.3	8.0	10.0	9.0
Area B	61.4	10.0	988	7.3	8.3	10.0	8.0
Area C	61.4	10.0	958	8.0	8.0	10.0	7.5
State Avg. 2012	61.6	9.9	981	7.6	8.2	10.0	8.1
State Avg. 2011	61.9	10.0	990	8.7	8.0	9.6	8.7
ID/OR/WA							
Area A	65.2	8.5	963	8.5	8.3	10.0	8.5
Area B	64.0	9.0	998	8.5	8.5	10.0	8.0
State Avg. 2012	64.7	8.7	977	8.5	8.4	10.0	8.3
State Avg. 2011	61.4	10.0	910	8.5	9.0	10.0	8.0
REGION AVERAGE							
Avg. 2012	62.9	9.5	991	8.0	8.0	10.0	8.2
Avg. 2011	63.0	10.0	984	8.6	8.2	10.0	8.8
Five-Year Avg	64.1	10.0	958	8.4	8.6	10.0	8.9

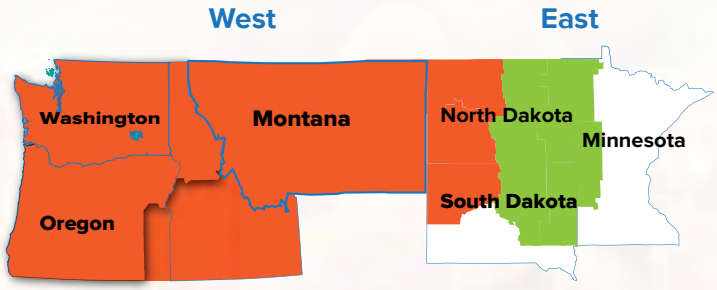
U.S. HARD RED SPRING WHEAT

MINNESOTA | MONTANA | NORTH DAKOTA | SOUTH DAKOTA
IDAHO | OREGON | WASHINGTON

Data contained on pages 20-23 represent the composites of samples by a West and East production region and a low, medium and high protein range.

The same base collection samples as shown in the area specific data displayed on previous pages were used for the West/East and protein splits.

TYPICAL GEOGRAPHICAL SPLIT FOR EXPORT FLOW



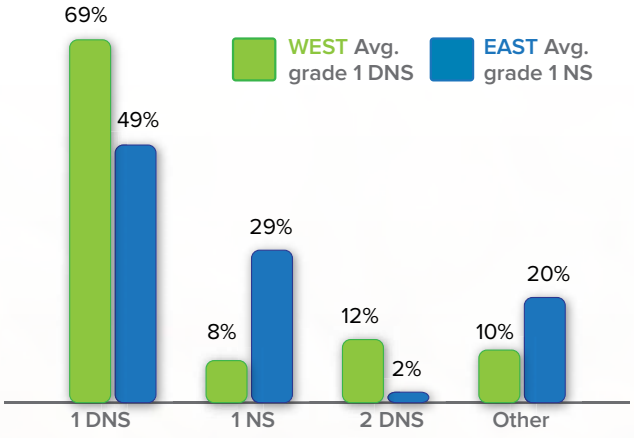
WEST - PNW Export Tributary
EAST - Gulf/Great Lakes Export Tributary

Higher protein flour typically yields greater loaf volume.

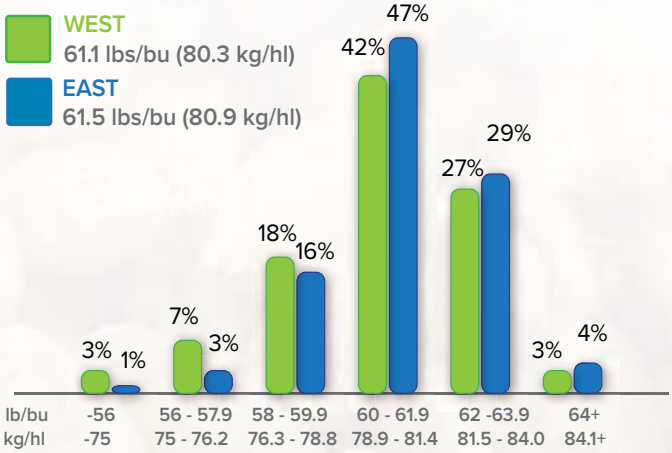
Photo: NDSU Quality Lab

2012 DISTRIBUTIONS BY EAST AND WEST PRODUCTION REGIONS

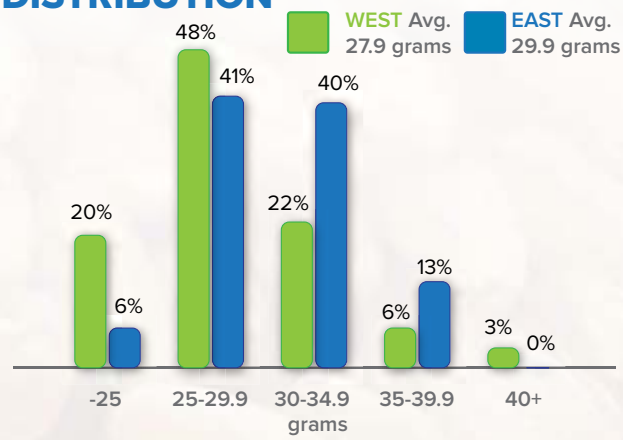
REGIONAL GRADE DISTRIBUTION



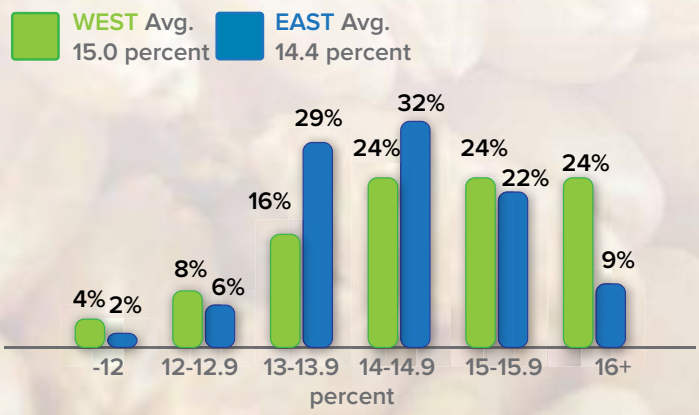
TEST WEIGHT DISTRIBUTION



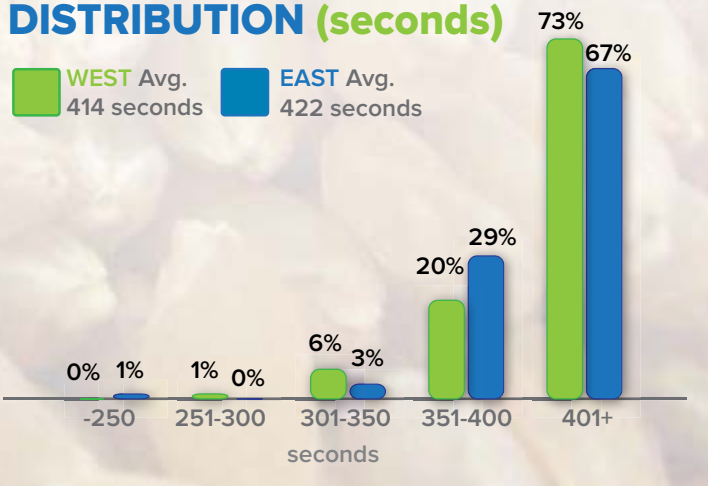
REGIONAL 1000 KERNEL WEIGHT DISTRIBUTION



REGIONAL PROTEIN DISTRIBUTION (12% moisture basis)



REGIONAL FALLING NUMBER DISTRIBUTION (seconds)



2012 QUALITY FACTORS BY PROTEIN RANGE

WEST

Samples in this region were collected from Montana, North Dakota areas A and D, South Dakota area A, and Idaho, Oregon and Washington.

	Protein Ranges		
WHEAT GRADING DATA	**Low**	**Medium**	**High**
Test Weight (lb/bu)	61.7	61.9	60.6
Test Weight (kg/hl)	81.1	81.4	79.7
Damage (%)	0.0	0.0	0.0
Shrunken/Broken (%)	1.8	1.5	2.1
Total Defects (%)	1.8	1.5	2.2
Vitreous Kernels (%)	94	78	88
Grade	1 DNS	1 DNS	1 DNS
WHEAT DATA			
Dockage (%)	1.2	0.8	0.9
Moisture (%)	10.6	10.7	10.6
Protein: 12%/0% moisture (%)	12.7/14.4	14.2/16.1	16.0/18.2
Ash: 14%/0% moisture (%)	1.57/1.83	1.56/1.82	1.58/1.84
1000 Kernel Weight	29.7	29.6	26.7
Falling Number (sec)	409	411	417
Sedimentation (cc)	54.8	61.6	64.6
FLOUR DATA			
Extraction (%)	68.7	69.1	67.8
Color: L	91.1	90.9	90.9
a	-1.1	-1.0	-1.0
b	9.1	9.1	9.5
Protein: 14%/0% moisture (%)	11.6/13.5	13.1/15.2	14.7/17.1
Ash: 14%/0% moisture (%)	0.48/0.56	0.50/0.58	0.50/0.58
Wet Gluten (%)	28.8	35.5	38.9
Gluten Index (%)	93.0	81.3	76.5
Falling Number (sec)	422	412	431
Amylograph Viscosity: 65g FL (BU)	783	669	757
DOUGH PROPERTIES			
Farinograph: Absorption (%)	62.1	63.8	64.6
Peak Time (min)	5.5	8.0	8.0
Stability (min)	8.5	11.0	15.0
Classification	4.0	5.0	6.0
Alveograph: P (mm)	96	93	97
L (mm)	94	119	118
P/L Ratio	1.02	0.78	0.82
W (10^{-4} joules)	320	368	396
Extensograph (45/135 min): Resistance	419/555	395/585	535/710
Extensibility (cm)	16.6/13.6	15.9/13.9	16.9/14.5
Area (sq cm)	93/98	82/102	116/133
BAKING DATA			
Absorption (%)	61.5	62.9	64.2
Crumb Grain and Texture	7.5	8.0	8.0
Loaf Volume (cc)	**865**	**930**	**1080**
PRODUCTION %	19	20	61

EAST

Samples in this region were collected from North Dakota areas B, C, E and F, South Dakota areas B and C, and Minnesota.

	Protein Ranges		
WHEAT GRADING DATA	**Low**	**Medium**	**High**
Test Weight (lb/bu)	61.9	61.4	61.4
Test Weight (kg/hl)	81.4	80.7	80.7
Damage (%)	0.2	0.0	0.0
Shrunken/Broken (%)	0.8	0.9	1.0
Total Defects (%)	1.0	0.9	1.0
Vitreous Kernels (%)	55	64	71
Grade	1 NS	1 NS	1 NS
WHEAT DATA			
Dockage (%)	0.6	0.5	0.6
Moisture (%)	12.7	12.8	12.5
Protein: 12%/0% moisture (%)	12.8/14.5	14.1/16.0	15.6/17.7
Ash: 14%/0% moisture (%)	1.54/1.79	1.53/1.78	1.58/1.84
1000 Kernel Weight	31.7	30.3	28.7
Falling Number (sec)	432	416	424
Sedimentation (cc)	50.9	61.2	64.7
FLOUR DATA			
Extraction (%)	70.6	70.0	68.8
Color: L	91.0	90.6	90.6
a	-0.9	-0.9	-1.0
b	8.7	8.8	9.4
Protein: 14%/0% moisture (%)	12.1/14.1	13.2/15.4	14.4/16.8
Ash: 14%/0% moisture (%)	0.49/0.57	0.50/0.58	0.52/0.61
Wet Gluten (%)	31.1	34.4	38.2
Gluten Index (%)	95.1	91.8	89.0
Falling Number (sec)	393	417	436
Amylograph Viscosity: 65g FL (BU)	776	742	686
DOUGH PROPERTIES			
Farinograph: Absorption (%)	60.8	64.2	64.1
Peak Time (min)	6.0	7.0	7.0
Stability (min)	13.0	12.0	13.5
Classification	5.0	5.0	6.0
Alveograph: P (mm)	88	90	97
L (mm)	109	125	93
P/L Ratio	0.81	0.72	1.04
W (10^{-4} joules)	345	384	341
Extensograph (45/135 min): Resistance	466/568	500/619	422/727
Extensibility (cm)	17.0/14.9	17.8/14.7	15.4/13.4
Area (sq cm)	103/107	119/119	82/124
BAKING DATA			
Absorption (%)	60.8	62.2	63.3
Crumb Grain and Texture	**8.0**	**8.3**	**8.3**
Loaf Volume (cc)	**950**	**978**	**1020**
PRODUCTION %	20	40	40

2012 QUALITY FACTORS BY PROTEIN RANGE

OVERALL

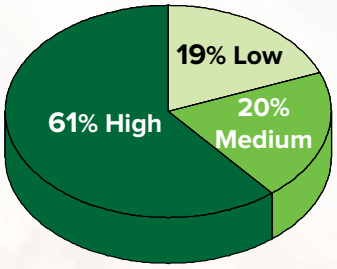
As protein content increased in the 2012 crop, wet gluten, absorption, stability and loaf volume all improved.

	Protein Ranges		
WHEAT GRADING DATA	**Low**	**Medium**	**High**
Test Weight (lb/bu)	61.8	61.6	60.9
Test Weight (kg/hl)	81.3	81.0	80.1
Damage (%)	0.1	0.0	0.0
Shrunken/Broken (%)	1.3	1.1	1.6
Total Defects (%)	1.4	1.1	1.7
Vitreous Kernels (%)	65	69	81
Grade	1 NS	1 NS	1 DNS
WHEAT DATA			
Dockage (%)	0.9	0.6	0.7
Moisture (%)	11.7	12.1	11.4
Protein: 12%/0% moisture (%)	12.8/14.5	14.2/16.1	15.8/17.9
Ash: 14%/0% moisture (%)	1.56/1.81	1.54/1.79	1.58/1.84
1000 Kernel Weight	30.7	30.1	27.5
Falling Number (sec)	421	414	420
Sedimentation (cc)	52.8	61.3	64.7
FLOUR DATA			
Extraction (%)	69.7	69.7	68.2
Color: L	91.1	90.7	90.8
a	-1.0	-0.9	-1.0
b	8.9	8.9	9.5
Protein: 14%/0% moisture (%)	11.9/13.8	13.2/15.3	14.6/17.0
Ash: 14%/0% moisture (%)	0.49/0.57	0.50/0.58	0.51/0.59
Wet Gluten (%)	30.0	34.8	38.6
Gluten Index (%)	94.1	88.4	81.6
Falling Number (sec)	407	415	433
Amylograph Viscosity: 65g FL (BU)	779	719	728
DOUGH PROPERTIES			
Farinograph: Absorption (%)	61.4	64.1	64.4
Peak Time (min)	5.8	7.3	7.6
Stability (min)	10.8	11.7	14.4
Classification	4.5	5.0	6.0
Alveograph: P (mm)	92	91	97
L (mm)	102	123	108
P/L Ratio	0.90	0.74	0.90
W (10^{-4} joules)	333	379	373
Extensograph (45/135 min): Resistance	443/562	466/608	489/717
Extensibility (cm)	16.8/14.3	17.2/14.4	16.3/14.0
Area (sq cm)	98/103	107/114	102/129
BAKING DATA			
Absorption (%)	61.1	62.5	63.8
Crumb Grain and Texture	7.8	8.2	8.1
Loaf Volume (cc)	909	962	1055
PRODUCTION %	19	31	50

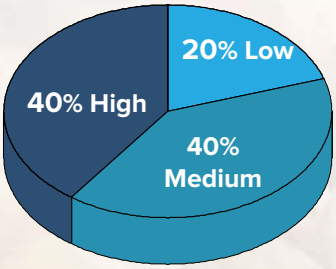
Performance characteristics often improve as buyers increase their protein specifications. To illustrate the correlation between higher protein and other quality parameters, samples of the regional crop were segregated by protein levels (all based on 12 percent moisture content):

- LOW (less than 13.5 percent),
- MEDIUM (13.5 percent to 14.5 percent), and
- HIGH (more than 14.5 percent).

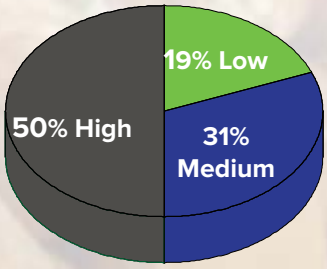
PRODUCTION DISTRIBUTION BY PROTEIN RANGE



WEST



EAST



OVERALL

U.S. HARD RED SPRING WHEAT

MINNESOTA | MONTANA | NORTH DAKOTA | SOUTH DAKOTA
IDAHO | OREGON | WASHINGTON

HISTORICAL AVERAGE OF QUALITY FACTORS FOR THE REGIONAL HARD RED SPRING WHEAT CROP

SUMMARY INFORMATION							
CROP YEAR	2007	2008	2009	2010	2011	Five-year Average	2012
WHEAT GRADING DATA							
Test Weight (lb/bu)	61.1	61.0	61.8	61.6	60.7	61.2	60.8
Test Weight (kg/hl)	80.4	80.2	81.3	81.0	79.6	80.5	80.0
Vitreous Kernels (%)	79	71	71	70	82	74	75
1000 Kernel Weight (gm)	31.2	32.6	34.0	32.8	27.9	31.7	29.2
Protein 12% moisture (%)	14.2	14.3	13.1	13.7	14.6	14.0	14.6
Protein dry (%)	16.1	16.2	14.9	15.6	16.6	15.9	16.6
Ash: 14% moisture (%)	1.60	1.55	1.51	1.57	1.73	1.59	1.56
Falling Number (sec)	428	379	375	387	365	387	421
FLOUR DATA							
Extraction (%)	68.8	69.8	69.1	70.0	68.1	69.2	69.0
Ash: 14% moisture (%)	0.49	0.53	0.51	0.51	0.54	0.52	0.49
Protein: 14% moisture (%)	13.4	13.3	12.3	12.6	13.3	13.0	13.7
Wet Gluten (%)	36.1	35.2	33.9	34.2	36.4	35.2	35.9
Falling Number (sec)	449	397	397	391	388	404	424
Amylograph Peak Viscosity							
65g FL (B.U.)	711	689	580	578	581	628	733
100g FL (B.U.)	2647	2501	2027	2613	2069	2371	2831
PHYSICAL DOUGH PROPERTIES							
Farinograph:							
Absorption (%)	65.7	66.9	66.2	64.5	64.5	65.6	63.3
Peak Time (min)	9.6	7.1	6.3	6.2	7.5	7.3	7.4
Stability (min)	22.1	11.0	9.9	10.2	11.0	12.8	12.2
Classification	6.9 (strong)	5.0 (med)	4.8 (med)	4.8 (med)	4.8 (med)	5.3 (med)	5.0 (med)
Extensigraph:							
Extensibility-45 min (cm)	17.0	19.1	19.2	16.5	18.5	18.1	16.3
Resistance-45 min (B.U.)	508	418	386	489	394	439	481
Area-45 min (sq cm))	110	107	100	105	97	104	103
Alveograph:							
P (mm)	116	108	96	104	80	101	94
L (mm)	104	110	122	109	126	114	115
W (joules X 10^4)	433	406	382	402	318	388	376
BAKING DATA							
Absorption (%)	64.2	65.4	64.7	63.0	63.0	64.1	62.9
Dough Handling Properties	10.0	10.0	9.8	10.0	10.0	10.0	9.5
Loaf Volume (CC)	975	977	925	927	984	958	991
Grain and Texture	7.9	8.9	8.6	8.2	8.6	8.4	8.0
Crumb Color	8.2	8.8	8.9	8.9	8.2	8.6	8.0
Crust Color	10.0	10.0	10.0	9.9	10.0	10.0	10.0
Symmetry	9.9	9.3	8.3	8.2	8.8	8.9	8.2

EXPORT CARGO SAMPLING

Data contained in previous sections of this report are derived from the testing of samples gathered during harvest from origination points throughout the U.S. hard red spring wheat region. The results provide an assessment of the overall average quality of the crop produced in a given year, but actual market channel quality may vary from the crop average.

U.S. Wheat Associates, the export market development arm for American wheat growers, furthers this information by commissioning an export cargo sampling program. The program provides an accurate representation of the supplies moving through the grain marketing and transportation system and actually reaching export points. Results show the quality levels at which U.S. wheat is realistically traded and are useful to customers in developing reasonable purchase specifications.

The Federal Grain Inspection Service oversees the program and collects every tenth sublot sample from every vessel of U.S. wheat shipped during three two-month time periods annually at the three main wheat export ports.

	PNW AVERAGE (WEST)		GREAT LAKES AVERAGE (EAST)		GULF AVERAGE (EAST)	
SAMPLE COUNT	2010 (152)	2011 (138)	2010 (40)	2011 (3)	2010 (58)	2011 (29)
GRADING DATA						
Test Weight (lb/bu)	61.6	61.7	62.3	61.6	61.8	61.7
Test Weight (kg/hl)	81.0	81.1	81.9	81.1	81.2	81.2
Damaged Kernels (%)	0.4	0.6	1.4	1.9	1.2	1.0
Shrunken & Broken (%)	1.1	1.5	0.9	1.7	0.8	1.3
Total Defects (%)	1.6	2.2	2.4	3.8	2.1	2.4
Vitreous Kernels (%)	66	79	45	40	51	69
Grade	1 NS	1 DNS	1 NS	2 NS	1 NS	1 NS
OTHER WHEAT DATA						
Dockage (%)	0.3	0.4	0.6	0.7	0.7	0.4
Moisture (%)	11.8	11.6	12.0	12.6	12.9	12.6
Protein: 12%/0% moisture basis	13.6/15.5	14.0/15.9	13.0/14.8	13.9/15.8	13.0/14.8	13.5/15.3
Ash: (%) 14%/0% moisture basis	1.51/1.76	1.56/1.81	1.51/1.76	1.68/1.96	1.55/1.81	1.60/1.86
Kernel Size (%) lg/md/sm	50/47/3	37/58/5	55/43/2	43/52/5	54/43/2	46/50/4
Falling Number (sec)	384	419	387	417	407	417
DON	0.1	0.6	0.1	n/a	0.2	0.9
FLOUR DATA						
Lab Mill Extraction (%)	69.6	69.5	70.4	69.6	70.4	69.2
Color: L (white-black)	90.8	90.5	90.7	90.2	90.7	90.6
a (red-green)	-0.95	-0.93	-0.98	-0.88	-0.89	-0.91
b (yellow-blue)	8.6	9.2	8.9	9.1	8.6	9.0
Protein 14%/0% moisture basis	12.5/14.6	13.0/15.1	11.9/13.9	12.8/14.9	11.9/13.9	12.4/14.4
Ash: (%) 14%/0% moisture basis	0.53/0.62	0.53/0.61	0.53/0.61	0.54/0.63	0.56/0.65	0.55/0.63
Wet Gluten (%)	33.4	35.4	31.7	33.8	31.6	33.7
Gluten Index (%)	91	89	94	95	93	92
Falling Number (sec)	418	467	407	436	430	463
Amylograph Peak Viscosity 65 g FL (BU)	523	596	554	507	602	635
PHYSICAL DOUGH DATA						
Farinograph: Absorption (%)	64.4	64.0	64.3	62.7	63.8	63.1
Peak Time (min)	5.9	7.2	4.8	7.2	5.0	6.9
Stability (min)	10.4	10.3	10.2	12.4	10.5	11.0
Classification	4.7	4.8	4.6	5.3	4.8	5.0
Alveograph: P (mm)	103	89	109	94	106	90
L (mm)	109	116	103	108	96	112
P/L Ratio	0.94	0.77	1.06	0.87	1.10	0.80
W (joules X 10^4)	380	340	400	354	362	335
BAKING DATA						
Absorption	64.1	65.0	63.4	61.6	63.6	65.2
Loaf Volume (cc)	925	975	900	987	891	966
Crumb Grain & Texture	8.4	8.4	8.2	8.3	8.2	8.5

The hard red spring wheat samples are sent to the North Dakota State University Plant Science Department's Hard Red Spring Wheat Quality Laboratory for analysis. Average results for the past two years are shown to the right. The samples represented here are based on samples collected from the fall of 2010 through the summer of 2011 for crop year 2010. And from the fall of 2011 through the spring of 2012 for crop year 2011. Grade data in the table is the actual official grade on individual sublots.

2012 SURVEY BACKGROUND

All quality data contained in this report are the result of testing and analysis conducted under the supervision of Dr. Senay Simsek, Wheat Quality Specialist, and by her team members Brent Hinsz, Rachel Olson, DeLane Olson, Kelly McMonagle, Kristin Whitney, Mary Valenzuela, and Gloria Nygard with the Hard Red Spring Wheat Quality Laboratory in the Department of Plant Science at North Dakota State University, Fargo, USA.

Collection

The North Dakota, South Dakota, Montana and Minnesota state offices of the National Agricultural Statistics Service obtained wheat samples during harvest directly from growers either in the fields or farm bins and local elevators. These samples reflect the condition of the grain at the point of origin. Collection began in late July when approximately 10 percent of the hard red spring wheat had been harvested and continued until mid September when about 95 percent of the region's crop was harvested.

Sample collection was weighted by county production histories with a total of 786 samples being collected during harvest from Minnesota (117), Montana (153), North Dakota (391), South Dakota (83) and PNW (42).

Analysis

Approximately 60 percent of the total wheat samples collected were analyzed for grade and other physical kernel characteristics. Distributions as a percentage of the harvested crop were calculated for key factors including test weight, thousand kernel weight, protein, falling number, and overall grade. Distribution results may differ from data presented in the various tables, because the latter are derived from production adjusted averages, rather than simple averages.

Quality tests, including milling, flour evaluation, physical dough and bread properties, were conducted on composite samples representing each crop reporting area. Again, all state and regional averages have been adjusted to reflect production as opposed to simple averaging.

METHODS, TERMS, SYMBOLS

WHEAT

SAMPLE COLLECTION • Each sample contained approximately 2 to 3 pounds of wheat, stored in sealed, moisture proof plastic bags.

MOISTURE • Official USDA procedure using Dickey-John Moisture Meter.

GRADE • Official United States Standards for Grain, as determined by a licensed grain inspector. North Dakota Grain Inspection Service, Fargo, ND, provided grades for composite wheat samples representing each crop reporting area.

VITREOUS KERNELS • Approximate percentage of kernels having vitreous endosperm.

DOCKAGE • Official USDA procedure. All matter other than wheat which can be removed readily from a test portion of the original sample by use of an approved device (Carter Dockage Tester). Dockage may also include underdeveloped, shriveled and small pieces of wheat kernels removed in properly separating the material other than wheat and which cannot be recovered by properly rescreening or recleaning.

TEST WEIGHT • American Association of Cereal Chemists Method 55-10. Measured as pounds per bushel (lb/bu), kilograms per hectoliter (kg/hl) = (lbs/bu X 1.292) + 1.419. *Approved Methods of the American Association of Cereal Chemists International Approved Methods (11th Edition), St. Paul, MN.

THOUSAND KERNEL WEIGHT • Based on 10 gram sample of cleaned wheat (free of foreign material and broken kernels) counted by electronic seed counter.

KERNEL SIZE DISTRIBUTION • Percentages of the size of kernels (large, medium, small) were determined using a wheat sizer equipped with the following sieve openings:
•top sieve—Tyler #7 with 2.92 mm opening;
•middle sieve—Tyler #9 with 2.24 mm opening; and
•bottom sieve—Tyler #12 with 1.65 mm opening.

PROTEIN • American Association of Cereal Chemists (NIR) Method: 39.10.01 expressed on dry basis and 12 percent moisture basis.

ASH • American Association of Cereal Chemists Method 08.01, expressed on a 14 percent moisture basis.

DON • Analysis was done on ground wheat using a gas chromatograph with an electron capture detector as described in J. Assoc. Official Anal. Chem 79,472 (1996)

FALLING NUMBER • American Association of Cereal Chemists Method 56.81.03; units of seconds (14 percent moisture basis).

SEDIMENTATION • American Association of Cereal Chemists Method 56.61.01, expressed in centimeters.

FLOUR

EXTRACTION • Thoroughly cleaned wheat is tempered to 15.5 percent moisture for 16 hours and an additional 0.5 percent water is added five minutes prior to milling. The milling laboratory is controlled at 68 percent relative humidity and 72°F to 74°F. Milling is performed on a Buhler laboratory mill (Type MLU-202). Straight grade flour (of all six flour streams) is blended and reported as "flour extraction." The blended flour is rebolted through an 84 SS sieve to remove any foreign material. This product is used for the other flour quality determinations.

ASH • American Association of Cereal Chemists Method 08.01, expressed on a 14 percent moisture basis.

PROTEIN • American Association of Cereal Chemists Method 39.10.01 (NIR Method), expressed on a 14 percent moisture basis.

WET GLUTEN • American Association of Cereal Chemists Method 38.12.02, expressed on a 14 percent moisture basis determined with the glutomatic instrument.

GLUTEN INDEX • American Association of Cereal Chemists Method 38.12.02, determined with the glutomatic instrument as an indication of gluten strength.

FLOUR FALLING NUMBER • American Association of Cereal Chemists Method 56.81.03, units of seconds. Determination is performed on 7.0 g of Buhler milled flour (14 percent moisture basis).

AMYLOGRAM • (100 g) American Association of Cereal Chemists Method 22.10.01. Peak viscosity reported in Brabender units (B.U.), on a 14 percent moisture basis.

(65 g) American Association of Cereal Chemists Method 22.10.01, modified as follows: 65 g of flour (14 percent moisture basis) are slurried in 450 ml distilled water, paddle stirrers are used with the Brabender Amylograph. Peak viscosity reported in Brabender units (B.U.), on a 14 percent moisture basis.

STARCH DAMAGE • American Association of Cereal Chemists Method 76.31.02. Proportion of starch granules that have incurred physical damage from milling.

U.S. HARD RED SPRING WHEAT

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PHYSICAL DOUGH PROPERTIES

FARINOGRAM • American Association of Cereal Chemists Method 54-02; constant flour weight method, small (50 g) mixing bowl. (Flour weight 14 percent moisture basis)

ABSORPTION • Amount of water required to center curve peak on the 500 Brabender unit line, expressed on 14 percent moisture basis.

PEAK TIME • The interval, to the nearest 0.5 min, from the first addition of water to the maximum consistency immediately prior to the first indication of weakening. Also known as dough development time.

STABILITY • The time interval, to the nearest 0.5 min, between the point where the top of the curve that first intersects the 500-BU line and the point where the top of the curve departs the 500-BU line.

MIXING TOLERANCE INDEX • The difference, in Brabender units, from the top of the curve at the peak to the top of the curve measured five minutes after the peak.

VALORIMETER VALUE • An empirical, single-figure quality score based on the development time and tolerance to mixing. Derived from the farinogram by means of a special template supplied by the equipment manufacturer. Generally, stronger flours have higher valorimeter values.

CLASSIFICATION • An empirical classification incorporating peak time, stability, MTI, and general curve characteristics. A scale of 1 to 8 is employed with higher values indicating stronger curve types.

EXTENSIGRAM • American Association of Cereal Chemists Method 54-10.01; modified as follows: (a) 100 grams of flour (14 percent moisture basis), 2.0 percent sodium chloride (U.S.P.) and water (equal to farinograph absorption minus 2 percent) are mixed to optimum development in a National pin dough mixer; (b) doughs are scaled to 150 grams, rounded, moulded, placed in extensigram holders, and rested for 45 minutes and 135 minutes, respectively, at 30°C and 78 percent relative humidity. The dough is then stretched as described in the procedure referenced above. For conversion purposes, 500 grams equals 400 B.U.

EXTENSIBILITY • Total length of the curve at the base line in centimeters.

RESISTANCE • Maximum curve height, reported in Brabender units (B.U.).

AREA • The area under the curve is measured and reported in square centimeters.

ALVEOGRAPH • AACC Method 54.30.02. Measurement of dough extensibility and resistance to extension.

"P" • Maximal overpressure; related to dough's resistance to deformation.

"L" • Dough extensibility.

"W" • The "work" associated with dough deformation.

BAKING

PROCEDURE • American Association of Cereal Chemists Method 10-09.01, modified as follows: (a) fungal amylase (SKB 15) replacing malt dry powder, (b) Instant dry yeast (1 percent) in lieu of compressed yeast, (c) 5 to 10 ppm ammonium phosphate, where added oxidants are required, (d) 2 percent shortening added. Doughs are mechanically punched using 6-inch rolls, and mechanically moulded using a National "Roll-R-Up" moulder. Baking is accomplished in "Shogren-type" pans.

BAKING ABSORPTION • Water required for optimum dough baking performance, expressed as a percent of flour weight on a 14 percent moisture basis.

DOUGH CHARACTER • Handling characteristics assessed at panning on a scale of 1 to 10 with higher scores preferred.

LOAF VOLUME • Rapeseed displacement measurement made 30 minutes after bread is removed from the oven.

CRUMB GRAIN AND TEXTURE • Visual comparison to standard using a constant illumination source. Scale of 1 to 10, the higher scores preferred.

CRUMB COLOR • Visual comparison with a standard using a constant illumination source on a scale of 1 to 10, the higher scores preferred.

CRUST COLOR • Visual comparison with a standard using a constant illumination source on a scale of 1 to 10, the higher scores preferred.

SYMMETRY • Visual comparison with a standard using a constant illumination source on a scale of 1 to 10, the higher scores preferred.

VARIETAL INFORMATION AND COMPARISONS

Quality products begin with quality ingredients. In wheat, quality begins with the varieties planted. Within the hard red spring class of wheat, there are different varieties available — to fit different environments, and disease and pest challenges across the region.

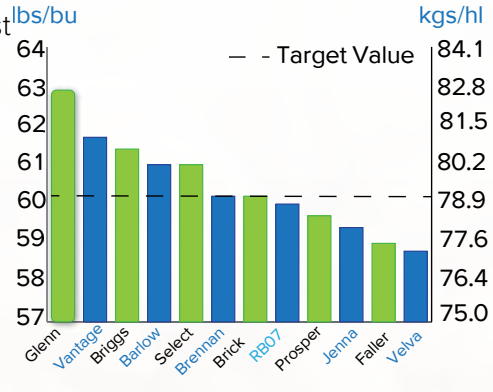
Variety development is carried out through public breeding programs at North Dakota State University, the University of Minnesota, South Dakota State University, and Montana State University.

Public plant breeders test varieties for performance at experiment stations across the region. Private firms also develop spring wheat varieties for the region. Some major ones include AgriPro, Westbred, Lima and others.

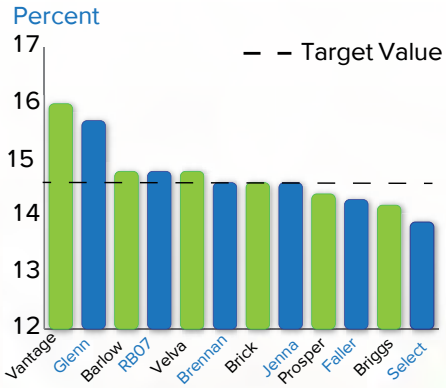
Before any spring wheat variety is released for commercial production, it must meet or exceed current quality standards for the class. Prospective variety releases are evaluated for milling and baking characteristics as well as for yield, protein content, test weight, resistance to diseases and insects, and straw strength.

Target values represent regionally agreed upon goals of public and private variety development programs. Environment influences the quality of varieties across growing areas and planting years. Target values help to enhance more uniform functional quality across a broad growing region. They usually test and analyze quality data from multiple years and growing locations before a variety is released.

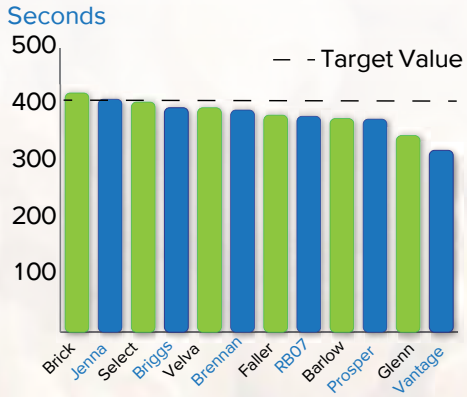
TEST WEIGHT



PROTEIN CONTENT
(12% moisture basis)



FALLING NUMBER



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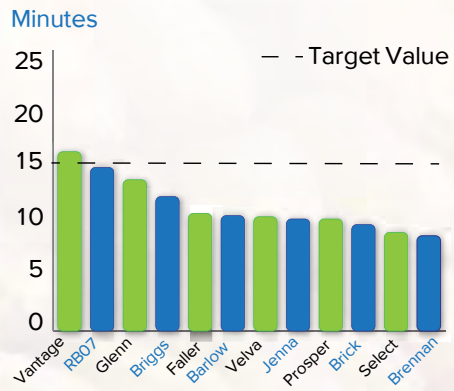
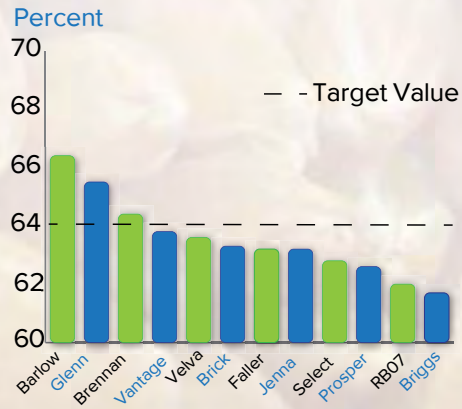
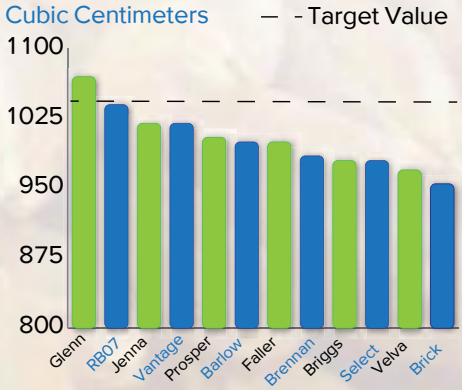


FARINOGRAPH ABSORPTION



LOAF VOLUME



Footnote: Based on NDSU drill strip trials across multiple North Dakota locations in 2010-2011.

VARIETAL INFORMATION

MAJOR VARIETIES PRODUCED ACROSS ND, SD AND MN • AGRONOMIC FACTORS

			Agronomic Description		Reaction to Disease[2]			Average Yield			
	Agent or Origin[1]	Year Released	Straw Strength	Maturity	Leaf Rust	Foliar Disease	Head (Scab)	Eastern North Dakota[3]		Western North Dakota[4]	
								BU/Acre	MT/Hect	BU/Acre	MT/Hect
Barlow	ND	2009	med.	m. early	MR/MS	MR	M	66.1	4.44	53.0	3.56
Brennan	AgriPro	2009	strg.	m. early	MR	M	MS	62.2	4.18	52.8	3.55
Brick	SD	2009	med.	m. early	MR/MS	MS/S	MR	62.8	4.22	50.5	3.4
Briggs	SD	2002	weak	m. early	MR/MS	MS	S	63.7	4.28	n/a	n/a
Faller	ND	2007	med.	med.	S	MR	M	73.8	4.96	53.3	3.58
Glenn	ND	2005	strg.	m. early	MR/MS	M	MR	62.0	4.17	51.0	3.43
Jenna	AgriPro	2009	strg.	m. late	MR/MS	M	M	65.7	4.42	57.6	3.87
Prosper	ND	2011	med.	med.	S	M	M	71.9	4.83	n/a	n/a
RB07	MN	2007	med.	m. early	R/MR	MS	MR	63.6	4.28	52.3	3.52
Select	SD	2010	med.	early	R/MR	R/MR	MR	68.5	4.61	n/a	n/a
Vantage	Westbred	2007	v. strg.	m. late	MR/MS	MS	MS	62.1	4.17	51.5	3.46
Velva	ND	2012	strg.	m. late	MR/MS	M	MS	65.8	4.42	n/a	n/a

MAJOR VARIETIES PRODUCED ACROSS MT AND WESTERN ND • AGRONOMIC FACTORS

			Agronomic Description		Reaction to Disease[2]			Average Yield	
	Agent or Origin[1]	Year Released	Straw Strength	Maturity	Leaf Rust	Foliar Disease	Head (Scab)	Western, North Dakota BU/Acre	MT/Hect
Barlow	ND	2009	med.	m. early	MR/MS	MR	M	53.0	3.56
Choteau	MT	2004	weak	late	MR/MS	M	S	51.2	3.44
Glenn	ND	2005	strg.	m. early	MR/MS	M	MR	51.0	3.43
Mott	ND	2009	strg.	m. late	S	MS	MS	53.0	3.56
Reeder	ND	1999	strg.	m.early	S	S	S	56.0	3.76
Velva	ND	2012	strg.	m. late	MR/MS	M	MS	n/a	n/a
Vida	MT	2005	m. strg.	m. late	MR	MS	S	n/a	n/a

1. ND=North Dakota State University (Public), SD=South Dakota State University (Public), MN=University of Minnesota (Public), MT=Montana State University (Public), Westbred (Private) and AgriPro (Private).
2. Reaction to Disease: resistant (R), moderately resistant (MR), intermediate (M), moderately susceptible (MS), susceptible (S), very susceptible (VS).
3. 2009-11 North Dakota average yield data from eastern locations in North Dakota. Some varieties not grown at all locations.
4. 2009-11 North Dakota average yield data from western locations in North Dakota. Some varieties not grown at all locations.

MAJOR VARIETIES PRODUCED ACROSS ND, SD AND MN • QUALITY & END-USE FACTORS

	Quality Factors[5]							End-Use[7]	
Variety	Test Weight LB/BU	Test Wheat KG/HL	Wheat Protein %	Wheat Falling # Seconds	Farinogram Stability (Min)	Absorption %	Loaf Volume CC	Gluten Strength Description [7]	Mill & Bake Quality Rating [8]
Barlow	61.0	80.2	14.8	376	10.3	66.4	1000	traditional strong	★★★
Brennan	60.2	79.2	14.6	391	8.5	64.4	985	mellow	★★
Brick	61.4	80.7	14.2	395	12.0	61.7	980	traditional strong	★★★
Briggs	60.2	79.2	14.6	421	9.5	63.3	955	mellow	★★
Faller	59.0	77.6	14.3	382	10.5	63.2	1000	traditional strong	★★★
Glenn	62.9	82.7	15.7	346	13.5	65.5	1070	traditional strong	★★★★★
Jenna	59.4	78.2	14.6	410	10.0	63.2	1020	mellow	★★★
Prosper	59.7	78.6	14.4	375	10.0	62.6	1005	mellow	★★★
RB07	60.0	78.9	14.8	380	14.6	62.0	1040	traditional strong	★★★★
Select	61.0	80.2	13.9	405	8.8	62.8	980	mellow	★★
Vantage	61.7	81.1	16.0	320	16.0	63.8	1020	traditional strong	★★★
Velva	58.8	77.4	14.8	395	10.2	63.6	970	mellow	★★

MAJOR VARIETIES PRODUCED ACROSS MT AND WESTERN ND • QUALITY & END-USE FACTORS

	Quality Factors[6]							End Use[7]	
	Test Weight LB/BU	Test Weight KG/HL	Wheat Protein %	Wheat Falling # Seconds	Farinogram Stability (Min)	Absorption %	Loaf Volume CC	Gluten Strength Description[7]	Mill & Bake Quality Rating [8]
Barlow	60.7	79.8	15.5	367	11.4	66.8	1031	traditional strong	★★★
Choteau	58.8	77.4	15.7	406	11.2	63.3	1028	traditional strong	★★★
Glenn	62.8	82.6	16.0	341	15.1	65.3	1080	traditional strong	★★★★★
Mott	60.6	79.7	16.0	359	11.5	64.1	1002	traditional strong	★★★
Reeder	61.2	80.5	15.7	374	9.3	64.5	977	mellow	★★
Velva	59.1	77.8	15.2	425	11.0	64.0	978	mellow	★★
Vida	59.2	77.9	16.5	389	9.0	64.9	1030	mellow	★★★

5 Source: NDSU Plant Science Department, Hard Red Spring Wheat Quality Laboratory, 2010-2011 drill strip trials statewide in ND.

6 2010-11 drill strip trials in western N.D. only.

7 Traditional Strong—functionality characteristic of hard red spring wheat; relatively quick mixing time, long mixing stability and tolerance to over-mixing.

Extra Strong—stronger than traditional hard red spring wheat varieties; longer mixing time and very long mixing stability.

Mellow—weaker than "traditional strong" varieties; shorter mixing time and stability.

8 Mill and bake quality rating based on protein content, milling performance, flour attributes, dough characteristics and baking performance. Five stars = superior, four stars = excellent, three stars = good, two stars = average, one star = poor.

U.S. HARD RED SPRING WHEAT

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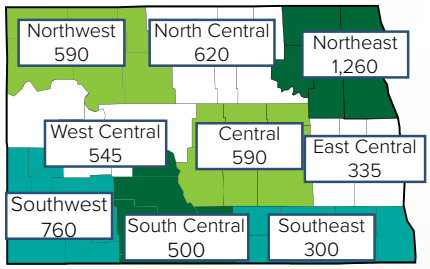
NORTH DAKOTA

BARLOW advanced to first place in North Dakota in 2012, up from third the previous year as its share of acres doubled to 17 percent. It is also the fourth place variety in Minnesota with 8 percent of the acres. In North Dakota, Barlow is the leading variety in the southwest and central parts of the state. The 2009 NDSU release is gaining in acres due to its higher yield potential, good foliar disease ratings and a good balance of protein and test weight. Barlow is the variety that shows very high bake absorption percentages and is rated good for overall milling and baking quality.

GLENN fell to second place in North Dakota with 14 percent of the acres. After being the leading variety for five straight years, acres are slowly declining due to improved yield potential in newer lines. Glenn remains the top variety in 3 of the 9 cropping districts, where it is popular for its very high test weight, high protein levels and very good disease resistance traits. A 2005 NDSU release, Glenn touts the highest end-use quality score of 5 on the 1 to 5 scale for milling and baking quality. It is the quality "check" for both public and private breeding programs for developing hard red spring wheat lines.

BRENNAN remained the fifth most popular variety in North Dakota, holding 5 percent of acre share. Released in 2009 by Syngenta / AgriPro, it is a variety that shows balanced appeal across the state with high yield potential, intermediate disease resistance and moderate protein. Brennan is rated as a mellow gluten strength variety with good milling and baking quality.

North Dakota 2012 Planted Acres
(1,000 acres) by NASS District



Top 3 ND Varieties by Crop District

	First	Second	Third
	percentage (%)[1]		
Northwest	Glenn (31.0)	Barlow (16.9)	Brennan (6.6)
North Central	Barlow (27.2)	Glenn (22.4)	Faller (15.1)
Northeast	Faller (29.9)	Vantage (14.5)	Barlow (10.8)
West Central	Glenn (23.7)	Barlow (17.6)	Mott (7.5)
Central	Barlow (35.8)	Glenn (16.4)	Faller (6.7)
East Central	Faller (19.7)	Barlow (12.2)	RB07 (6.2)
Southwest	Barlow (17.0)	RB07 (11.0)	Mott (9.8)
South Central	Glenn (18.2)	Mott (9.9)	Briggs (9.9)
Southeast	Faller (28.5)	Briggs (13.7)	Brennan (5.8)

North Dakota Varieties
2012 Share and Planted Acres

Variety	2011%[1]	2012%[1]	2012 Acres (1,000)[3]
Barlow	8.5	17.2	941
Glenn	18.1	14.4	786
Faller	11.4	13.1	721
Vantage	3.5	5.5	302
Brennan	5.4	4.9	271
RB07	7.0	4.1	227
Mott	1.2	3.1	170
Briggs	4.0	3.1	169
Jenna	3.1	3.0	166
Kelby	5.4	2.6	145
Other[2]	32.4	27.7	1,601

1. Percentages may not add to 100 due to rounding.
2. Includes varieties with less than 1% of acreage in2011 and unknown varieties.
3. 1,000 acres (1 acre = 0.405 hectares)

MONTANA

VIDA is again the most popular variety in Montana in 2012 with 19 percent of the acres, although down slightly from 23 percent in 2011. It is a high yielding variety with moderate resistance to leaf and stem rust. Vida is a 2005 release from the Montana Agricultural Experiment Station that is most popular from central to northeast Montana.

CHOTEAU remained in second place in 2012 with 15 percent of the acres. A 2003 release, it is most popular in areas of Montana where the wheat stem sawfly is a perpetual challenge and Choteau's solid stem is a benefit. Choteau is resistant to leaf rust and is rated good for milling and baking quality.

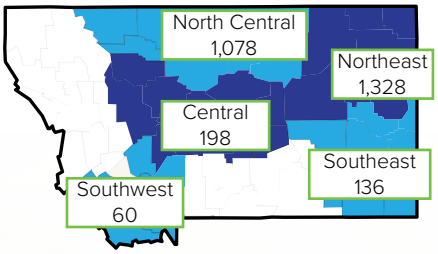
REEDER holds 13 percent of Montana's acres in 2012, up slightly from 2011. It remains popular due to its combination of high yield potential and high protein levels. It is rated as average for milling and baking qualities.

Montana Varieties Share and Planted Acres

Variety	2011%[1]	2012%[1]	2012 Acres (1,000)[3]
Vida	22.6	19.3	554
Choteau	18.1	15.4	443
Reeder	11.4	13.4	280
Corbin	7.4	7.0	182
ONeal	5.5	6.5	135
McNeal	5.8	5.4	142
Conan	3.0	2.4	74
Brennan	0.6	1.9	14
WB Gunnison	0.7	1.8	17
Mott	0.6	1.7	14
Other[2]	24.3	25.2	597

1. Percentages may not add to 100 due to rounding.
2. Includes varieties with less than 1% of acreage in2012 and unknown varieties.
3. 1,000 acres (1 acre - 0.405 hectares

Montana 2012 Planted Acres (1,000 acres) by NASS District



Montana Top 3 Varieties by Crop District

	First	Second	Third
	percentage (%)[1]		
North Central	Solano (41.3)	Hank (8.4)	Kelby (4.3)
North East	Reeder (25.6)	Vida (25.0)	Choteau (11.7)
Central	ONeal (19.8)	Choteau (15.3)	Vida (13.6)
Southwest	Solano (9.5)	Choteau (6.0)	Westbred 936 (5.2
Southeast	Reeder (18.9)	McNeal (10.5)	Steele (10.4)

MINNESOTA

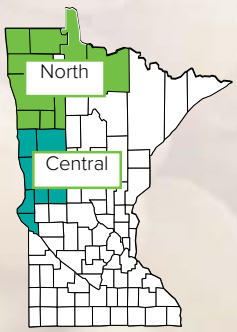
Minnesota Varieties Share of 2012 Planted Acres

Variety	Total State 2011%[1]	Total State 2012%
Faller	28.7	28.5
Vantage	5.8	10.4
RB07	22.1	10.3
Barlow	4.9	8.5
Samson	6.0	7.1
LCS Albany	2.3	4.6
WB-Mayville	0.3	4.4
Rollag	0.3	3.8
Prosper	0.3	3.7
SY-Soren	0.4	3.1
Other[2]	28.8	15.7

1. Percentages may not add to 100 due to rounding.
2. Includes varieties with less than 1% of acreage in 2012 and unknown varieties.

FALLER remains the top variety in Minnesota with 28 percent of the acres, and is third in North Dakota with 13 percent. It is one of the elite varieties for yield potential, especially across eastern areas of the HRS production region where its production is most concentrated. Faller does tend to have lower than average protein levels but tends to out-prove its protein in milling and baking parameters with a good rating. It is susceptible to the latest races of leaf rust but has relatively high foliar disease resistance and intermediate resistance to Fusarium headblight.

VANTAGE, a 2007 Westbred release, advanced to second in Minnesota with a 10 percent share of acres and fourth in North Dakota with 5 percent share. It has grown in popularity with producers due to its very high protein levels and very strong straw, which makes it more ideal for high input production practices. It is rated as traditional strong for gluten properties and good for milling and baking quality.



Minnesota Top 3 Varieties of 2012 Planted Acres by Crop Distirct

	First	Second	Third
North	Faller (28.2)	Vantage (10.22)	RB07 (9.7)
Central	Faller (30.1)	Vantage (11.3)	RB07 (11.0)

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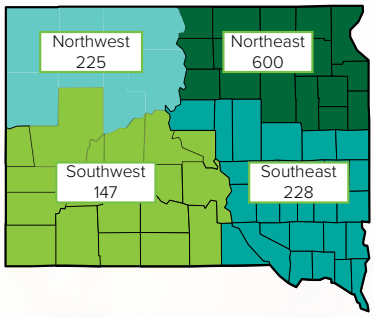
SOUTH DAKOTA - conducts a variety survey every three years - next available in 2014.

South Dakota 2011 Planted Acres by NASS District (1,000 acres)



BRIGGS was the dominant variety in South Dakota with nearly 29 percent of the acres in the 2011 survey, and is also popular in southeast North Dakota. It is a 2002 release from SDSU that has high yield potential with moderate resistance to leaf rust. Briggs is rated as average for milling and baking quality with mel- lower gluten

BRICK was the third most popular variety in South Dakota with 12 percent of the acres in the 2011 survey and is expected to have garnered a larger share of the 2012 acres based on producer comments. A 2009 release from SDS, it is popular for its very high yield potential, moderate resistance to Fusarium headblight and improved straw strength compared to Briggs. Brick is rated as good for milling and baking quality with traditional strong gluten properties.

South Dakota Top 3 Varieties of 2011 Planted Acres by Crop District

	First	Second	Third
	percentage (%)[1]		
Northwest	Briggs (30.9)	Howard (15.3)	RB07 (10.8)
Northeast	Briggs (31.8	RB07 (19.1)	Brick (12.6)
Southwest	Briggs (22.1)	Forge (15.6)	RB07 (11.6)
Southeast	Briggs (23)	RB07 (22.7)	Brick (16.1)

PNW VARIETAL INFORMATION

GROWN & TESTED WASHINGTON/OREGON • QUALITY AND END USE FACTORS

				Quality Factors[3]						End Use[4]
Variety	Agent or Origin[1]	Year Released	% of Acres[2]	Test Weight LB/BU	Test Weight KG/HL	Wheat Protein %	Farinogram Stability (min)	Absorption	Loaf Volume CC	Mill/Bake Quality Rating
Buck Pronto	Buck Semillas S.A.	2001	9.0	61.8	77.3	15.3	22.1	67.9	931	D
Bullseye	AgriPro	2009	4.0	63.2	83.1	13.7	22.4	68.4	994	D
Cabernet	Resource Seeds	2008	12.0	62.3	81.9	13.3	9.0	65.9	1069	D
Expresso	Westbred	2007	1.0	63.3	83.2	14.9	n/a	68.4	1023	A
Hollis	WSU	2003	13.0	61.4	80.7	15.1	21.9	68.5	1066	MD
Jefferson	ID	1997	17.0	62.4	82.0	13.6	18.3	66.1	964	D
Kelse	WSU	2008	18.0	61.5	80.9	14.9	19.8	69.0	1105	D
Solano	Westbred	2006	1.0	63.2	83.1	14.8	21.7	66.8	1041	A
Tara 2002	WSU	2001	2.0	61.7	81.1	14.2	7.6	68.1	1074	MD
WB936	Westbred	1995	4.0	61.8	81.3	13.4	18.0	67.6	982	MD

1. ID=University of Idaho (Public), WSU=Washington State University (Public), AgriPro (Private), Buck Semillas S.A. (Private Resource Seeds (Private), and Westbred (Private).
2. Idaho, Oregon and Washington Wheat Variety Surveys.
3. Western Wheat Quality Lab, Pullman, WA.
4. Mill and bake quality rating based on protein content, milling performance, flour attributes, dough characteristics and baking. Western Wheat Quality Lab. Most Desirable (MD), Desirable (D), Acceptable (A).

HANDLING & TRANSPORTATION

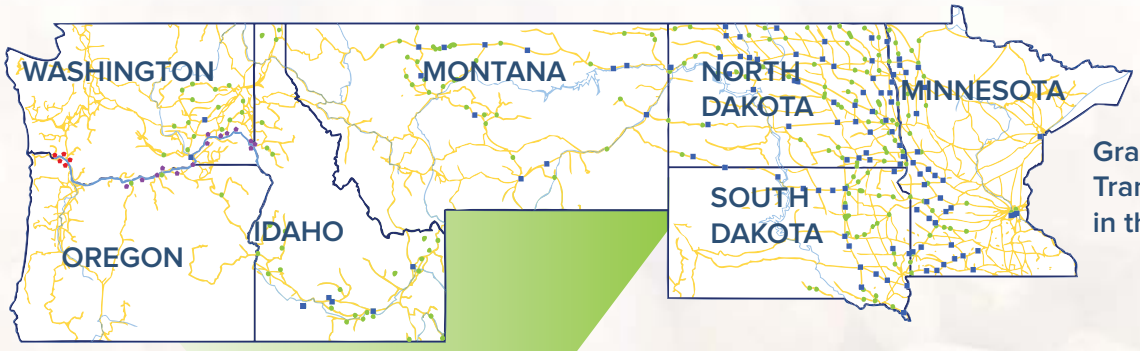
The hard red spring wheat growing region utilizes truck, rail and water to get wheat from farms to export facilities. The Northern Plains has a vast network of country elevators to facilitate efficient and precise movement to domestic and export markets. On average, nearly 80 percent of the region's wheat moves to markets by rail. The dominant railroads are the Burlington Northern Santa Fe, the Union Pacific and the Canadian Pacific.

In the Pacific Northwest, a large river system is used along with rail to move wheat to export points.

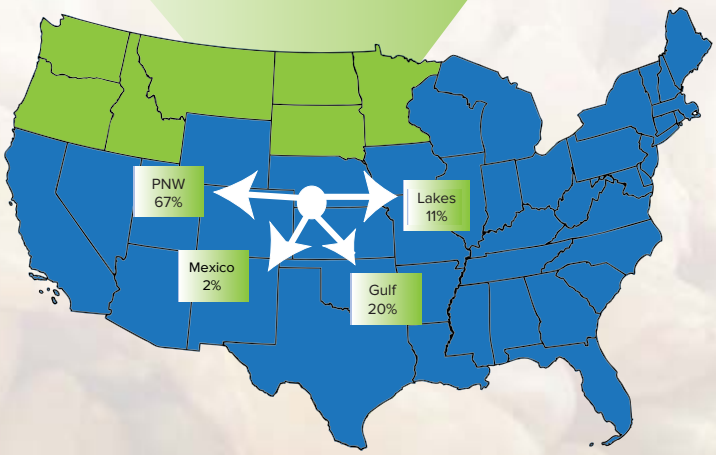
An increasing number of the elevators in the region are investing in facilities and rail capacity to ship 100 car units. Each rail car holds approximately 3,500 bushels (95 metric tons) of wheat. Some of the 100-car shippers have invested in "shuttle" capabilities. Shuttle-equipped facilities receive the lowest rates, sharing volume and transaction efficiencies with the railroad.

The diverse rail and water shipping capacities and a widespread network of elevators are strengths that buyers can capitalize on, especially as their demand heightens for more precise quality specifications and consistency between shipments. Buyers are increasingly exploring origin-specific shipments. Many international buyers now find it possible to request wheat from certain locations to optimize the quality and value of wheat they purchase.

The elevator network in the U.S. hard red spring wheat region is well suited for meeting the increasing quality demands of both domestic and international customers.



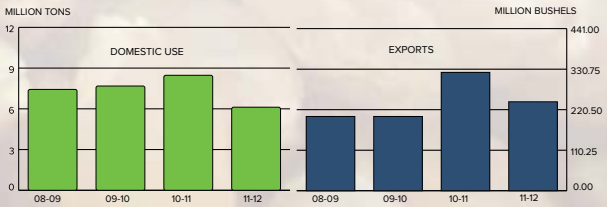
Grain Handling and Transportaion Facilities in the U.S. HRS Region



Average share of U.S. HRS exports by port (2008-2011)

- Track for 100 or more rail cars
- Track for 50 to 99 rail cars
- Export terminals
- River terminals
- River system
- Rail network

2008-2011 U.S. HRS Domestic Use and Exports



Marketing Years (June-May)

FUNDING & SUPPORT PROVIDED BY

U.S. Wheat Associates

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