

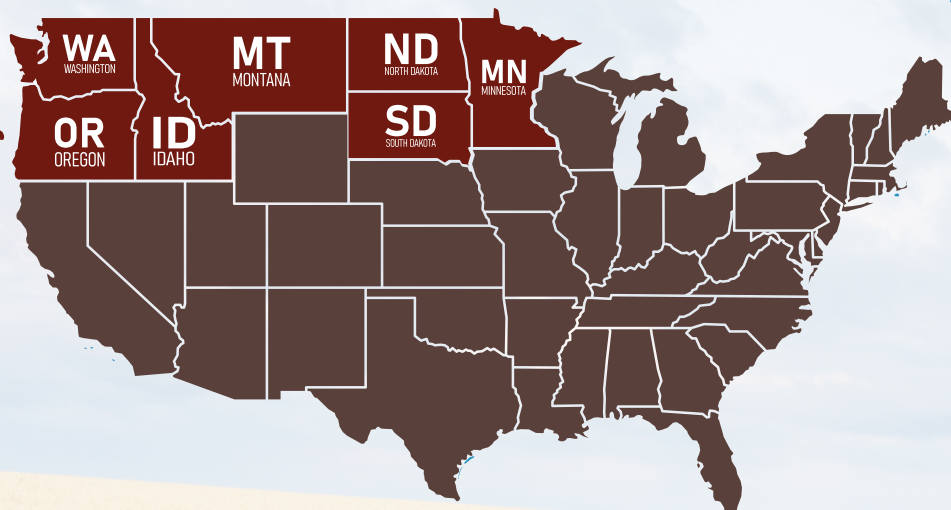


2024

U.S. HARD RED
SPRING WHEAT

REGIONAL QUALITY REPORT

U.S. HARD RED SPRING
Wheat



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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, 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.

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

OVERVIEW

THE 2024 U.S. HARD RED SPRING WHEAT crop is nearly 12% larger in production compared to the 5-year average, and is characterized by high grades, near average protein levels, and functional parameters that are characteristic for the HRS class, although slightly below 2023 values. Record yields were attained in central and eastern parts of the production region due to an excellent growing season with abundant moisture. In sharp contrast, western areas of the region produced below average yields due to hot, dry conditions in the latter half of the growing season. This divergence in growing conditions created a greater than typical variance in some kernel and functional quality parameters although crop average values remain strong for key factors.

THE CROP AVERAGES a No. 1 Northern Spring, similar to last year and the 5-year average. Slightly more than ninety percent of the survey samples graded a No. 1, which is exceptionally high. Crop average test weight is 61.3 lbs/bu (80.6 kg/hl), similar to 2023 and the 5-yr average, although distributions are skewed slightly lower than 2023, due to late season drought stress in western areas which pushed a higher than typical percent of the crop below 57.9 lbs/bu (76.2 kg/hl). Still, more than seventy percent of the survey samples were greater than 60 lbs/bu (78.9 kg/hl).

Damaged kernel levels average 0.6 percent, higher than last year and the 5-year average, due to elevated disease pressures in central and eastern areas. In western areas, damaged kernel levels average near zero, although shrunken and broken kernel levels are slightly higher than 2023. Crop average vitreous kernel levels of 66 percent, are improved over 2023, although still lower than typical, due to rains during harvest and lower crop protein in central and east areas. Western parts of the region tout notably higher vitreous kernel levels.

PROTEIN levels are below normal in eastern parts of the region, but higher than average in western areas. The crop average protein is 13.9% (12% moisture basis), compared to 14.1% last year and 14.5% for a 5-year average. Distribution of protein shows nearly one-half of the crop falls below 14% protein, compared to roughly one-third in 2023, and only one-fifth of the crop exceeds 15% protein, compared nearly one-third last year.

THOUSAND KERNEL WEIGHTS (TKW) are 32.5 grams for a crop average, notably lower than last year's 34.5 grams, but near the 5-year average. There is a sharp contrast between western and eastern areas, although TKW values are broadly lower than 2023 across the region. Disease pressures from Fusarium Headlight were more prevalent than recent years, especially across eastern parts of the region. The crop average DON is 0.7 ppm, up from 0.0 in 2023 and 0.2 ppm for a 5-year average. Crop average falling number values are slightly higher than a year ago at 401 seconds, with nearly ninety percent of the crop higher than 350 seconds. Variance does exist across the region, as portions of the eastern region endured untimely rains during harvest, and six percent of the crop falls below 300 seconds, doubled last year.

MILLING analysis, based on a Buhler Lab Mill, averages 69.0% extraction, slightly lower than 2023, but higher than the 5-year average. The lower TKW values and lower skew in test weights may have contributed to the slightly lower mill yields. Flour ash is 0.50%, higher than last year, paralleling the increase in kernel ash in the 2024 crop. Flour viscosity is 564 B.U., notably lower than last year and the 5-year average, reflective of the untimely rains during harvest in some eastern parts of the region.

PHYSICAL DOUGH tests are revealing a crop with weaker dough characteristics as measured by the Farinograph, Extensograph and Alveograph, relative to last year. The crop average stability on the Farinograph is 11.7 minutes, down from 15.2 minutes in 2023, and 13.1 for the 5-year average. Farinograph absorption is 61.6%, lower than recent years, with the lower average crop protein levels likely a contributing factor. Western areas of the region are showing stronger dough characteristics and slightly higher absorption compared to eastern areas. The Extensograph data is showing weaker dough properties with greater extensibility, relative to last year and the 5-year average. Alveograph values for the crop average are 0.66 P/L ratio, down from 0.81 last year, and a W value of 386, compared to 411 in 2023.

BAKING evaluations are showing slightly lower loaf volumes compared to last year but more comparable to the 5-year average. The crop averages 960 cubic centimeters, ranging from 925 to 1075 cubic centimeters across the region. Dough handling properties scored slightly higher than recent years, along with crust color and symmetry scores, but s crumb color and grain and texture scores were slightly lower.

2024 PRODUCTION DATA			
	2024	2023	2019-23 AVERAGE
MILLION BUSHELS			
Minnesota	81	78	72
Montana	61	79	81
North Dakota	310	266	255
South Dakota	31	28	28
ID/OR/WA	20	14	16
U.S. Total	503	468	451
MILLION METRIC TON			
Minnesota	2.20	2.12	1.96
Montana	1.66	2.18	2.20
North Dakota	8.44	7.29	6.94
South Dakota	0.84	0.76	0.75
ID/OR/WA	0.54	0.38	0.43
U.S. Total	13.7	12.7	12.3

Source: USDA 2024 Small Grains Summary

SEASONAL CONDITIONS - 2024

PLANTING

of the 2024 HRS crop was slightly ahead of average due to milder weather and lower than normal snowfall over the winter. Moisture conditions at planting were mostly adequate, though some dryness persisted in western areas. Some spring precipitation did help alleviate the dryness. Planting progressed with only a few interruptions due to cooler temperatures and rainfall and was mostly complete by the first week of June.

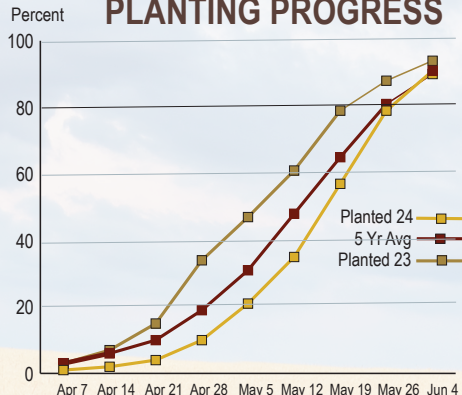
The crop **EMERGED** under mostly good conditions with adequate moisture and cool temperatures. The early season mild weather conditions promoted emergence and good yield potential. The latter part of the growing season produced starkly different conditions across the region. Most of the eastern area had a humid, wet growing season with higher disease pressure and higher yields, while western areas were hot and dry, with minimal disease pressure and reduced yields.

HARVEST

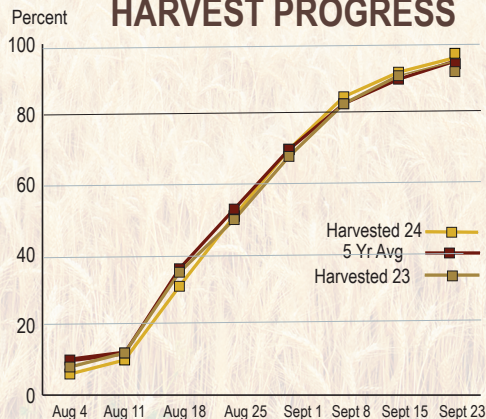
started in early August and got off to a slow start due to some wet conditions, but progressed normal after that. In the eastern area, the early crop was harvested in mostly dry weather, while rain and cooler temperatures delayed the middle portion and caused some downgrades in falling number values and vitreous kernel levels. The final part of the harvest occurred under dry conditions. In western areas, conditions were mostly dry throughout harvest and there were very few harvest interruptions or quality related concerns. Harvest was finished by mid-September.

A record regional yield made up for the marginal decline in acreage, producing a 503 million bushel crop. This year's production is 8% higher than last year.

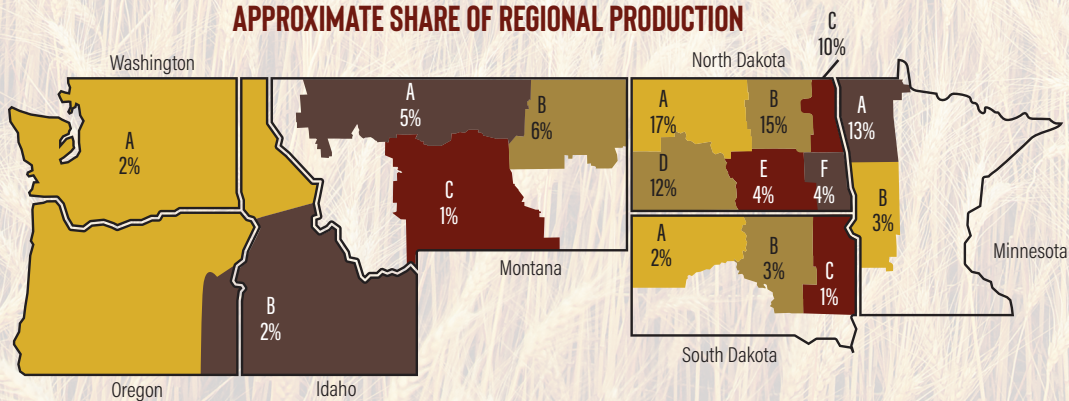
PLANTING PROGRESS



HARVEST PROGRESS



APPROXIMATE SHARE OF REGIONAL PRODUCTION



THE ARISTOCRAT OF WHEAT

WHEAT GRADES as defined by the Federal Grain Inspection Service (FGIS) of 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. Each determination is made on the basis of the grain when free from dockage and shrunken and broken kernels.

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.

WHEAT GRADING DATA					
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					
<i>Heat (part of total)</i>	0.2	0.2	0.5	1.0	3.0
<i>Total</i>	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	3.0	5.0	8.0	12.0	20.0
Wheat of other class ²					
<i>Contracting classes</i>	1.0	2.0	3.0	10.0	20.0
<i>Total¹</i>	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					
<i>Animal filth</i>	1	1	1	1	1
<i>Castor beans</i>	1	1	1	1	1
<i>Crotalaria seeds</i>	2	2	2	2	2
<i>Glass</i>	0	0	0	0	0
<i>Stones</i>	3	3	3	3	3
<i>Unknown foreign material</i>	3	3	3	3	3
<i>Total¹</i>	4	4	4	4	4
<i>Insect-damaged kernels</i>	31	31	31	31	31

U.S. sample grade is wheat that:

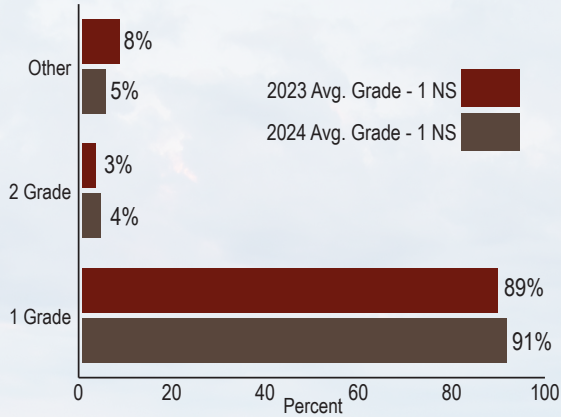
- Does not meet the requirements for U.S. Nos. 1, 2, 3, 4 or 5; or
- Has a musty, sour or commercially objectionable foreign odor (except smut or garlic odor); or
- Is heating or of distinctly low quality.
 - Includes damaged kernels (total), foreign material and shrunken and broken kernels.
 - Unclassed wheat of any grade may contain not more than 10.0 percent of wheat of other classes.
 - Includes contrasting classes.
 - Includes any combination of animal filth, castor beans, crotalaria seeds, glass, stones or unknown foreign substance.

2024 WHEAT GRADING DATA							
STATE AND CROP REPORTING AREA	TEST WEIGHT		KERNEL FACTORS				
	LBS/BU	KG/HL	DAMAGE %	SHRUNKEN/BROKEN KERNELS %	TOTAL DEFECTS %	U.S. GRADE SUBCLASS	VITREOUS KERNELS %
MINNESOTA							
Area A	61.7	81.1	1.0	0.4	1.4	1 NS	49
Area B	59.6	78.4	1.4	0.4	1.8	1 RS	21
State Avg. 2024	61.4	80.7	1.1	0.4	1.5	1 NS	45
State Avg. 2023	62.1	81.7	0.3	0.2	0.5	1 NS	48
MONTANA							
Area A	59.4	78.2	0.0	1.6	2.1	1 DNS	92
Area B	59.2	77.9	0.0	1.9	2.2	1 DNS	95
Area C	60.0	78.9	0.4	1.8	2.2	1 NS	71
State Avg. 2024	59.3	78.1	0.0	1.8	2.2	1 DNS	92
State Avg. 2023	59.6	78.5	0.0	1.4	1.4	1 DNS	78
NORTH DAKOTA							
Area A	62.0	81.5	0.5	0.5	1.0	1 NS	74
Area B	61.6	81.0	1.2	0.3	1.5	1 NS	57
Area C	62.4	82.0	0.8	0.3	1.1	1 NS	51
Area D	60.8	80.0	0.0	1.0	1.0	1 DNS	87
Area E	61.2	80.5	0.2	0.5	0.7	1 NS	38
Area F	60.7	79.8	1.7	0.4	2.1	1 NS	39
State Avg. 2024	61.6	81.0	0.7	0.5	1.2	1 NS	65
State Avg. 2023	61.4	80.7	0.1	0.5	0.6	1 NS	54
SOUTH DAKOTA							
Area A	60.9	80.1	0.5	1.0	1.9	1 NS	66
Area B	61.5	80.9	0.3	0.5	0.8	1 NS	65
Area C	59.8	78.7	2.4	1.0	3.4	2 NS	45
State Avg. 2024	61.1	80.4	0.6	0.7	1.4	1 NS	62
State Avg. 2023	60.4	79.5	0.3	0.8	1.1	1 NS	42
IDAHO - OREGON - WASHINGTON							
Area A	61.6	81.0	0.0	0.7	0.7	1 DNS	98
Area B	63.3	83.2	0.1	0.4	0.5	1 DNS	79
State Avg. 2024	62.3	81.9	0.0	0.6	0.6	1 DNS	90
State Avg. 2023	61.9	81.4	0.5	0.6	1.1	1 DNS	76
REGION AVERAGE							
Avg. 2024	61.3	80.6	0.6	0.7	1.4	1 NS	66
Avg. 2023	61.2	80.4	0.1	0.6	0.7	1 NS	57
Five-Year Avg	61.5	80.8	0.2	0.7	0.9	1 NS	68

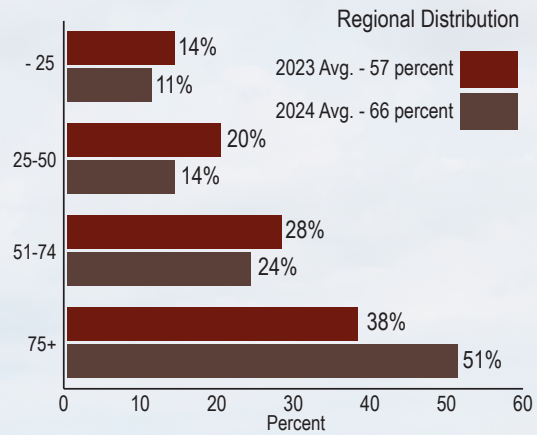
U.S. HARD RED SPRING *Wheat*

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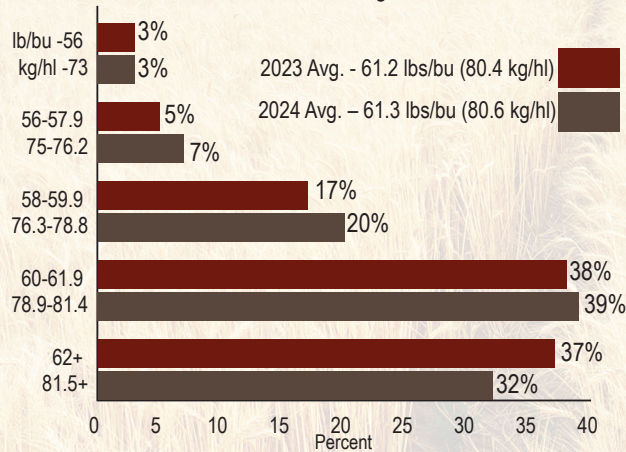
GRADE – Regional Distribution



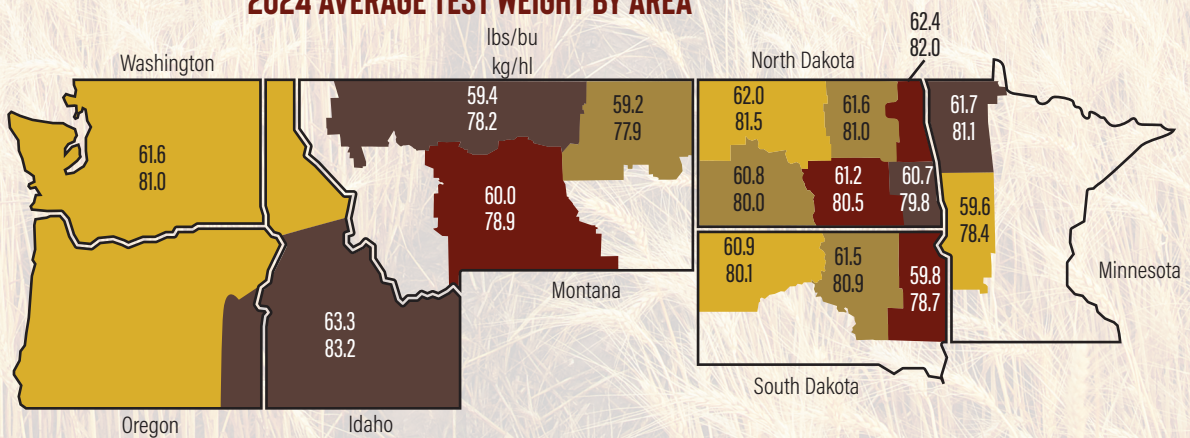
VITREOUS KERNEL



TEST WEIGHT – Regional Distribution



2024 AVERAGE TEST WEIGHT BY AREA

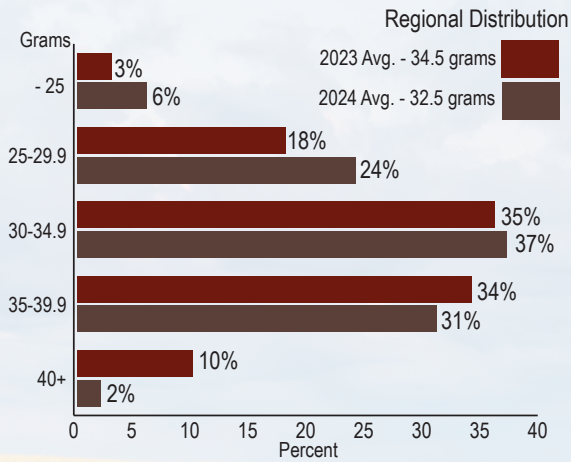


2024 OTHER KERNEL QUALITY DATA									
STATE AND CROP REPORTING AREA	DOCKAGE %	MOISTURE %	1000 KERNEL WEIGHT (G)	KERNEL DIST. MED/LGE %	PROTEIN 12%/0% MOISTURE BASIS %	DON (PPM)	WHEAT ASH%	FALLING NUMBER (SEC)	ZELNY SED (CC)
MINNESOTA									
Area A	0.3	13.0	35.7	31/68	13.3/15.1	0.7	1.50	336	64
Area B	0.5	13.1	32.4	42/56	13.7/15.6	1.9	1.60	339	61
State Avg. 2024	0.4	13.0	35.2	33/66	13.4/15.2	0.9	1.52	336	64
State Avg. 2023	0.4	12.9	38.2	25/74	14.3/16.3	0.0	1.47	373	62
MONTANA									
Area A	1.1	11.1	28.2	69/25	15.1/17.2	0.1	1.54	432	69
Area B	0.7	11.1	26.3	75/17	15.0/17.0	0.2	1.58	448	66
Area C	1.1	10.0	28.2	65/27	14.7/16.7	0.3	1.58	433	67
State Avg. 2024	0.9	11.0	27.2	72/21	15.0/17.1	0.2	1.56	441	67
State Avg. 2023	0.7	10.9	31.0	68/27	14.4/16.4	0.0	1.48	377	68
NORTH DAKOTA									
Area A	0.8	12.9	33.2	48/51	13.8/15.7	0.5	1.56	404	66
Area B	0.5	13.1	34.0	39/60	13.6/15.5	0.5	1.57	387	64
Area C	0.7	12.8	34.7	32/67	13.7/15.6	1.7	1.59	405	64
Area D	0.9	12.1	29.0	61/36	14.0/15.9	0.3	1.58	433	67
Area E	0.5	12.8	31.5	43/55	14.3/16.3	0.8	1.63	436	67
Area F	0.6	13.2	32.7	35/63	13.6/15.5	1.9	1.62	350	64
State Avg. 2024	0.7	12.8	32.7	45/54	13.8/15.7	0.7	1.58	404	65
State Avg. 2023	0.7	12.7	34.6	42/56	13.9/15.8	0.0	1.45	396	68
SOUTH DAKOTA									
Area A	0.8	10.6	29.1	59/37	14.3/16.3	0.1	1.61	444	64
Area B	0.5	12.6	34.0	36/62	14.3/16.3	1.0	1.53	437	61
Area C	0.8	12.9	32.1	48/49	14.0/15.9	2.6	1.67	375	55
State Avg. 2024	0.6	12.1	32.4	44/53	14.3/16.2	1.0	1.57	430	61
State Avg. 2023	0.6	12.2	32.3	48/49	14.9/16.9	0.0	1.68	393	65
IDAHO - OREGON - WASHINGTON									
Area A	0.6	8.7	33.3	50/46	14.2/16.1	0.3	1.56	466	67
Area B	0.1	11.0	34.7	41/58	14.4/16.4	0.1	1.61	408	69
State Avg. 2024	0.4	9.6	33.9	46/51	14.3/16.2	0.2	1.58	443	68
State Avg. 2023	0.4	9.7	35.9	47/51	14.5/16.5	0.0	1.58	386	68
REGION AVERAGE									
Avg. 2024	0.6	12.5	32.5	46/52	13.9/15.8	0.7	1.57	401	65
Avg. 2023	0.6	12.3	34.5	44/53	14.1/16.0	0.0	1.48	389	67
Five-Year Avg	0.6	12.1	32.0	51/47	14.5/16.5	0.2	1.53	380	66

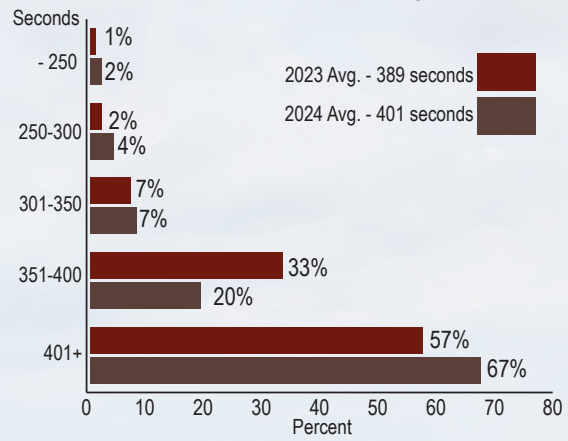
U.S. HARD RED SPRING *Wheat*

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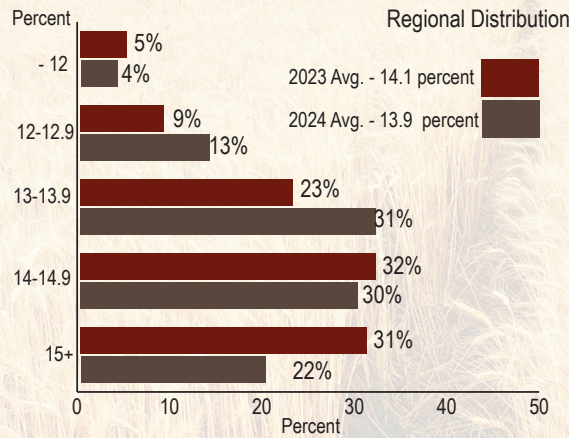
1000 KERNEL WEIGHT



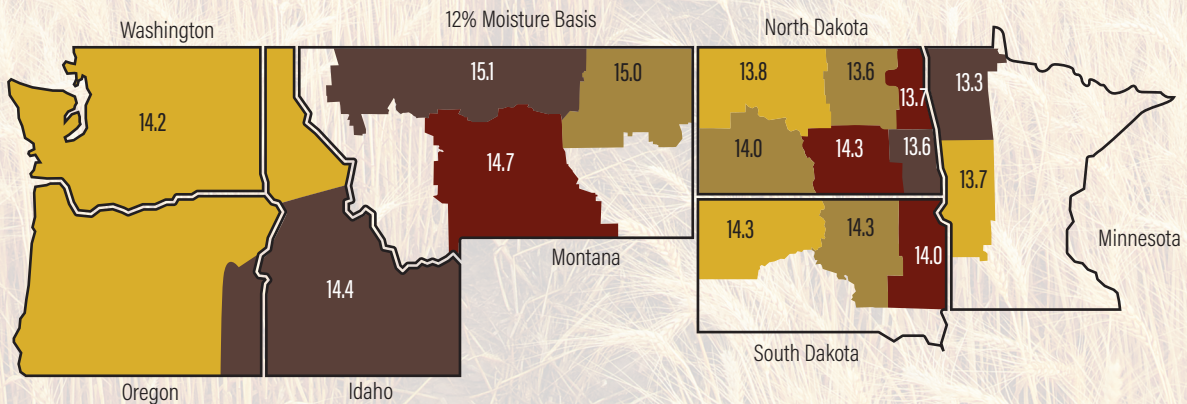
FALLING NUMBER - Regional Distribution



PROTEIN - 12% MOISTURE



2024 AVERAGE PROTEIN% BY AREA



2024 FLOUR QUALITY DATA											
STATE AND CROP REPORTING AREA	FLOUR EXTRACTION %	FLOUR ASH %	FLOUR PROTEIN (14% MOISTURE) %	STARCH DAMAGE %	SRC: GPI	WATER 50% SUCROSE%	5% LACTIC ACID/5% NA ₂ CO ₃ %	WET GLUTEN %	GLUTEN INDEX	FALLING NUMBER	AMYLOGRAPH VISCOSITY 65 G FL B.U.
MINNESOTA											
Area A	69.4	0.45	12.1	6.5	0.76	66/105	146/87	31.7	93	359	373
Area B	69.2	0.51	12.4	6.3	0.71	66/107	137/84	32.5	82	346	271
State Avg. 2024	69.4	0.46	12.1	6.5	0.75	66/105	145/87	31.8	91	357	358
State Avg. 2023	68.7	0.49	13.0	6.2	0.70	70/114	147/97	33.7	95	372	532
MONTANA											
Area A	68.7	0.49	13.7	6.5	0.74	71/120	161/97	36.2	85	407	743
Area B	68.4	0.52	13.7	6.5	0.72	71/117	154/99	35.8	87	437	776
Area C	65.9	0.50	13.3	6.8	0.76	71/117	162/98	35.9	74	422	749
State Avg. 2024	68.4	0.51	13.7	6.5	0.73	71/118	157/98	36.0	85	424	761
State Avg. 2023	69.2	0.48	13.0	6.3	0.67	71/122	151/103	34.9	89	392	705
NORTH DAKOTA											
Area A	69.7	0.51	12.5	6.8	0.77	70/110	158/95	32.4	93	391	620
Area B	69.9	0.52	12.3	7.1	0.71	71/108	144/94	32.5	89	380	502
Area C	70.7	0.52	12.5	7.1	0.71	69/108	144/93	32.5	88	390	492
Area D	68.9	0.50	12.8	6.6	0.71	68/112	148/95	33.3	88	416	689
Area E	65.7	0.50	12.7	6.0	0.75	66/109	147/85	33.5	88	374	521
Area F	67.0	0.50	12.2	6.6	0.72	66/108	141/89	32.0	80	363	409
State Avg. 2024	69.3	0.51	12.5	6.8	0.73	69/109	149/94	32.7	89	390	566
State Avg. 2023	70.4	0.46	12.6	6.3	0.70	70/116	151/99	32.4	95	386	619
SOUTH DAKOTA											
Area A	68.0	0.48	12.8	5.8	0.74	63/109	143/85	33.9	89	424	633
Area B	67.9	0.50	12.6	6.8	0.71	67/107	140/90	34.9	70	416	572
Area C	67.2	0.59	12.7	7.5	0.66	69/109	133/92	33.8	76	371	428
State Avg. 2024	67.8	0.51	12.7	6.6	0.71	66/108	140/89	34.5	76	412	568
State Avg. 2023	70.2	0.52	13.3	6.1	0.69	69/115	143/93	35.3	93	389	570
IDAHO - OREGON - WASHINGTON											
Area A	66.7	0.51	13.2	6.7	0.70	71/120	153/98	35.0	72	472	721
Area B	64.4	0.50	13.1	6.9	0.70	70/122	156/101	35.2	90	439	837
State Avg. 2024	65.8	0.51	13.2	6.8	0.70	71/121	154/99	35.1	79	459	767
State Avg. 2023	69.6	0.50	13.3	6.4	0.64	73/126	148/105	35.8	86	441	671
REGION AVERAGE											
Avg. 2024	69.0	0.50	12.6	6.7	0.73	69/110	149/93	33.1	88	393	564
Avg. 2023	69.9	0.47	12.8	6.3	0.69	70/117	150/99	33.3	93	386	618
Five-Year Avg	68.1	0.50	13.3	6.5	0.67	72/119	148/102	34.1	93	389	625

TERMS DEFINED

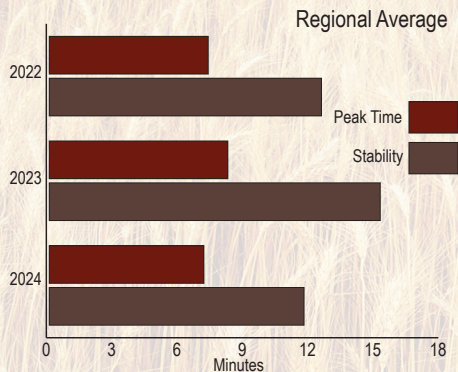
- **FLOUR** is evaluated for several factors to determine overall milling efficiency grade, soundness and functional properties.
- **EXTRACTION**, or the proportion of the wheat kernel that can be milled into flour, is important for mill profitability. For purposes of this survey, test milling was conducted 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 the 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.



- 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 peak time and stability are related to dough strength.

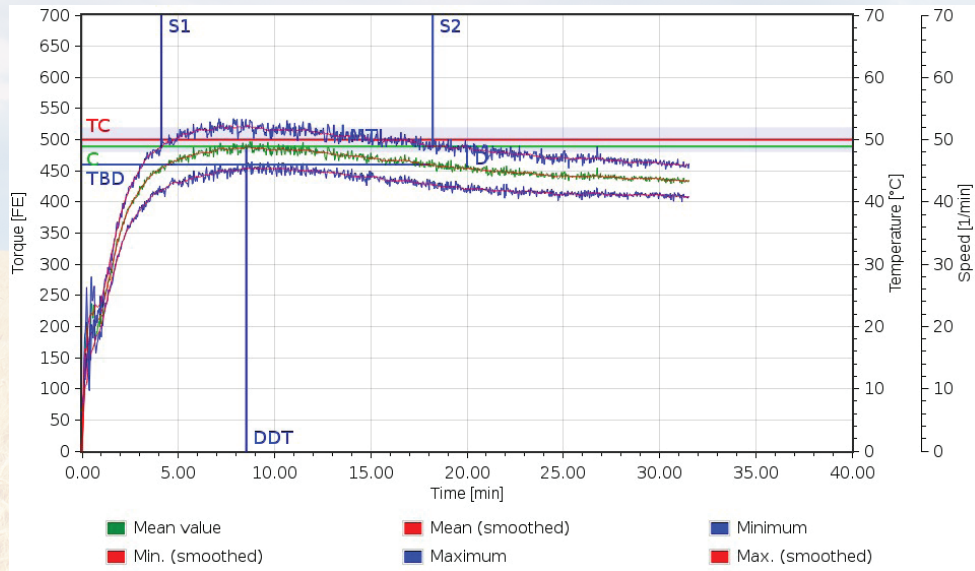
2024 FARINOGRAPH QUALITY DATA					
STATE AND CROP REPORTING AREA	ABSORPTION %	PEAK TIME MIN	STABILITY MIN	MTI B.U.	QUALITY NUMBER MM
MINNESOTA					
Area A	60.0	6.0	11.5	27	134
Area B	60.0	5.7	10.3	27	126
State Avg. 2024	60.0	6.0	11.3	27	133
State Avg. 2023	62.9	7.4	15.3	19	169
MONTANA					
Area A	62.3	8.0	13.0	22	166
Area B	62.9	7.8	11.7	24	154
Area C	63.7	9.3	14.3	22	202
State Avg. 2024	62.7	8.0	12.4	23	162
State Avg. 2023	63.6	8.1	12.8	19	161
NORTH DAKOTA					
Area A	61.7	7.6	11.7	26	145
Area B	61.9	6.1	9.4	30	117
Area C	61.4	7.1	11.0	30	129
Area D	61.5	8.2	14.4	20	166
Area E	60.8	6.1	13.2	18	151
Area F	60.8	5.7	10.6	22	125
State Avg. 2024	61.6	7.1	11.5	26	139
State Avg. 2023	62.5	8.4	16.5	21	179
SOUTH DAKOTA					
Area A	60.6	8.4	16.5	16	197
Area B	63.1	7.5	10.5	22	143
Area C	62.5	5.8	7.2	40	97
State Avg. 2024	62.3	7.5	11.7	23	151
State Avg. 2023	63.2	7.7	10.7	24	143
IDAHO - OREGON - WASHINGTON					
Area A	63.6	8.4	12.7	20	183
Area B	65.9	9.5	14.3	14	215
State Avg. 2024	64.5	8.8	13.3	18	196
State Avg. 2023	65.0	9.3	12.8	22	174
REGION AVERAGE					
Avg. 2024	61.6	7.1	11.7	25	144
Avg. 2023	62.9	8.2	15.2	21	172
Five-Year Avg	62.6	7.8	13.1	22	166

FARINOGRAPH RESULTS

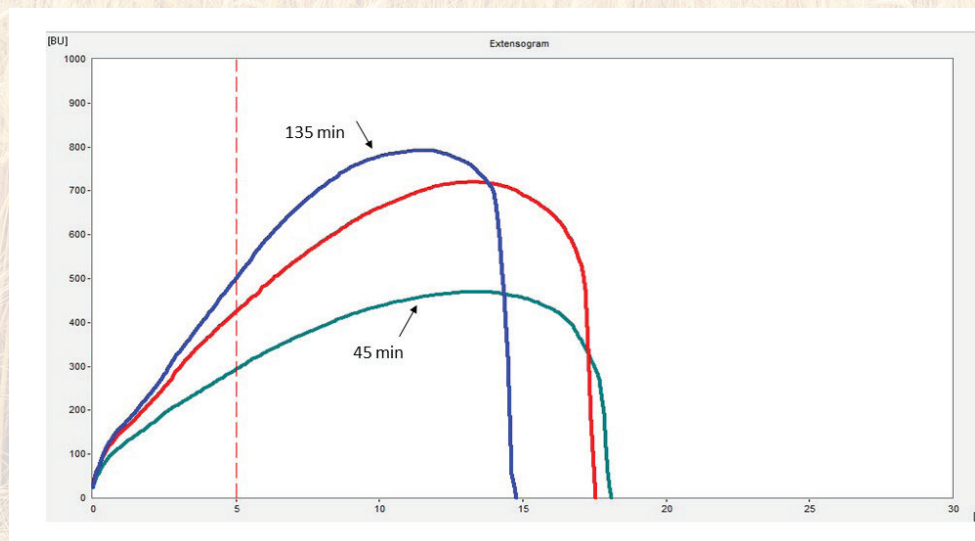


2024 PHYSICAL DOUGH QUALITY										
EXTENSIGRAPH DATA						ALVEOGRAPH DATA				
STATE AND CROP REPORTING AREA	EXTENSIBILITY 45 MIN CM	RESISTANCE 45 MIN B.U.	AREA SQ CM	EXTENSIBILITY 135 MIN CM	RESISTANCE 135 MIN B.U.	AREA SQ CM	P MM	L MM	P/L RATIO	W JOULES X 10 ⁴
MINNESOTA										
Area A	18.5	549	122	15.3	897	163	82	129	0.64	385
Area B	17.0	452	94	15.2	847	152	72	126	0.57	318
State Avg. 2024	18.3	534	118	15.3	890	161	81	129	0.63	375
State Avg. 2023	16.1	668	133	12.8	1251	178	104	119	0.87	456
MONTANA										
Area A	16.4	561	113	14.8	993	175	87	152	0.57	441
Area B	16.8	556	119	15.8	935	176	91	137	0.66	420
Area C	15.9	509	102	15.5	834	158	100	124	0.81	427
State Avg. 2024	16.6	555	116	15.4	953	175	90	142	0.63	429
State Avg. 2023	16.6	532	115	15.0	897	173	91	120	0.76	378
NORTH DAKOTA										
Area A	18.5	524	122	16.6	835	168	90	122	0.74	387
Area B	18.1	470	111	14.8	792	145	83	134	0.62	360
Area C	16.8	457	94	15.8	786	153	82	131	0.63	362
Area D	17.8	585	130	14.1	879	150	88	143	0.62	434
Area E	18.2	531	118	14.1	766	129	81	120	0.68	341
Area F	17.7	470	104	15.5	694	131	84	120	0.70	354
State Avg. 2024	18.0	509	115	15.3	813	152	86	130	0.66	381
State Avg. 2023	16.9	642	136	14.0	1068	193	98	117	0.83	414
SOUTH DAKOTA										
Area A	16.5	584	119	13.4	974	151	83	147	0.56	432
Area B	17.8	383	83	15.1	610	115	91	114	0.80	346
Area C	19.1	351	84	15.6	542	102	73	125	0.58	275
State Avg. 2024	17.6	433	93	14.7	699	123	86	124	0.69	359
State Avg. 2023	16.7	514	113	13.4	919	163	79	134	0.59	349
IDAHO - OREGON - WASHINGTON										
Area A	19.1	435	106	15.8	812	161	92	130	0.71	398
Area B	17.0	412	89	17.8	828	181	109	122	0.89	439
State Avg. 2024	18.3	426	99	16.6	818	169	99	127	0.78	414
State Avg. 2023	16.3	492	107	13.1	931	162	90	130	0.69	395
REGION AVERAGE										
Avg. 2024	17.8	511	114	15.3	835	155	86	131	0.66	386
Avg. 2023	16.7	615	130	13.9	1056	185	96	119	0.81	411
Five-Year Avg	16.8	553	119	14.2	899	159	88	131	0.67	391

2024 AVERAGE FARINOGRAM



2024 AVERAGE EXTENSIGRAM



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.

2024 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	62.7	9.0	940	70	70	10.0	8.0
Area B	63.2	8.0	955	75	75	9.0	8.0
State Avg. 2024	62.8	8.9	942	7.1	7.1	9.9	8.0
State Avg. 2023	64.9	8.8	959	7.4	8.1	10.0	8.6
MONTANA							
Area A	65.9	10.0	1025	75	8.0	10.0	9.0
Area B	65.8	8.0	1045	75	8.0	10.0	9.0
Area C	63.9	9.0	1015	70	7.5	9.0	10.0
State Avg. 2024	65.7	8.9	1035	7.5	8.0	9.9	9.1
State Avg. 2023	65.8	9.0	1011	8.0	8.3	10.0	9.4
NORTH DAKOTA							
Area A	64.2	8.0	945	8.0	7.5	10.0	8.0
Area B	64.6	9.0	925	7.5	8.0	10.0	9.0
Area C	64.5	10.0	935	8.0	8.0	10.0	9.0
Area D	65.4	10.0	980	8.0	8.0	10.0	10.0
Area E	61.6	9.0	940	7.5	7.5	10.0	7.0
Area F	63.3	9.0	970	8.0	7.0	10.0	7.0
State Avg. 2024	64.3	9.0	946	7.8	7.8	10.0	8.7
State Avg. 2023	64.6	8.5	955	7.8	7.9	9.9	8.0
SOUTH DAKOTA							
Area A	63.1	8.0	945	8.5	8.0	10.0	8.0
Area B	64.6	9.0	955	7.5	8.0	9.0	7.0
Area C	64.3	7.0	975	8.0	7.5	9.0	7.0
State Avg. 2024	64.2	8.5	955	7.8	7.9	9.3	7.3
State Avg. 2023	64.6	9.5	971	8.2	7.9	9.2	7.6
IDAHO - OREGON - WASHINGTON							
Area A	65.6	10.0	990	8.5	8.5	10.0	9.0
Area B	67.9	9.0	1075	8.0	8.0	10.0	10.0
State Avg. 2024	66.5	9.6	1024	8.3	8.3	10.0	9.4
State Avg. 2023	67.7	9.4	1040	8.3	8.5	10.0	9.0
REGION AVERAGE							
Avg. 2024	64.3	9.0	960	7.7	7.7	9.9	8.5
Avg. 2023	64.9	8.7	969	7.8	8.0	9.9	8.4
Five-Year Avg	67.4	8.7	963	7.8	7.9	9.9	8.5

*Dough handling, grain and texture, crumb color, crust color, symmetry all have a scale of 1-10. The highest rating is 10.

RECENT QUALITY TRENDS							
CROP YEAR	2024	2023	2022	2021	2020	2019	FIVE-YEAR AVERAGE
WHEAT GRADING							
Test Weight (lbs/bu)	61.3	61.2	61.2	61.5	61.8	60.7	61.5
Test Weight (kg/hl)	80.6	80.4	81.7	80.8	81.3	79.8	80.8
Vitreous Kernels (%)	66	57	73	81	72	55	68
1000 Kernel Weight (gm)	32.5	34.5	30.9	30.6	32.0	31.9	32.0
Protein: 12%/0% moisture	13.9/15.8	14.1/16.0	14.2/16.1	15.4/17.4	14.3/16.2	14.5/16.4	14.5/16.5
Ash: 14% moisture (%)	1.57	1.48	1.56	1.52	1.57	1.54	1.53
Falling Number (sec)	401	389	390	398	389	337	380
FLOUR DATA							
Extraction (%)	69.0	69.9	67.0	67.4	67.7	68.7	68.1
Ash: 14% moisture (%)	0.50	0.47	0.49	0.50	0.52	0.53	0.50
Protein: 14% moisture (%)	12.6	12.8	12.7	14.3	13.3	13.5	13.3
Wet Gluten (%)	33.1	33.3	33.1	37.1	33.1	34.1	34.1
Falling Number (sec)	393	386	393	409	407	352	389
Amylograph Peak Viscosity							
65g FL (B.U.)	564	618	730	705	632	441	625
PHYSICAL DOUGH PROPERTIES							
Farinograph:							
<i>Absorption (%)</i>	61.6	62.9	63.0	62.8	61.6	62.6	62.9
<i>Peak Time (min)</i>	7.1	8.2	7.3	8.1	7.9	7.3	7.8
<i>Stability (min)</i>	11.7	15.2	12.5	16.2	11.8	10.0	13.1
Extensograph:							
<i>Extensibility-45 min (cm)</i>	178	16.7	16.3	16.8	16.2	179	16.8
<i>Resistance-45 min (B.U.)</i>	511	615	541	615	498	497	553
<i>Area-45 min (sq cm)</i>	114	130	113	130	105	117	119
Alveograph:							
<i>P (mm)</i>	86	96	96	85	81	83	88
<i>L (mm)</i>	131	119	129	140	134	135	131
<i>W (joules x10³)</i>	386	411	412	415	359	360	391
BAKING DATA							
Absorption (%)	64.3	64.9	70.6	67.2	67.0	67.2	67.4
Dough Handling Properties	9.0	8.7	8.9	8.7	8.9	8.4	8.7
Loaf Volume (CC)	960	969	931	918	977	1019	963
Grain and Texture	7.7	7.8	7.8	7.8	7.8	7.7	7.8
Crumb Color	7.7	8.0	8.0	8.0	7.7	7.6	7.9
Crust Color	9.9	9.9	10.0	9.8	9.9	9.8	9.9
Symmetry	8.5	8.4	8.5	8.0	8.7	9.1	8.5

2024 SURVEY BACKGROUND

All quality data contained in this report are the result of testing and analysis conducted under the supervision of Dr. Shahidul Islam, Wheat Quality Specialist, and by his team members, Kelly McMonagle, Amber Walter, Heymant Kaur, Yun Zhao and Sultan Mahmud with the Hard Red Spring Wheat Quality Laboratory at North Dakota State University, Fargo, North Dakota, USA.

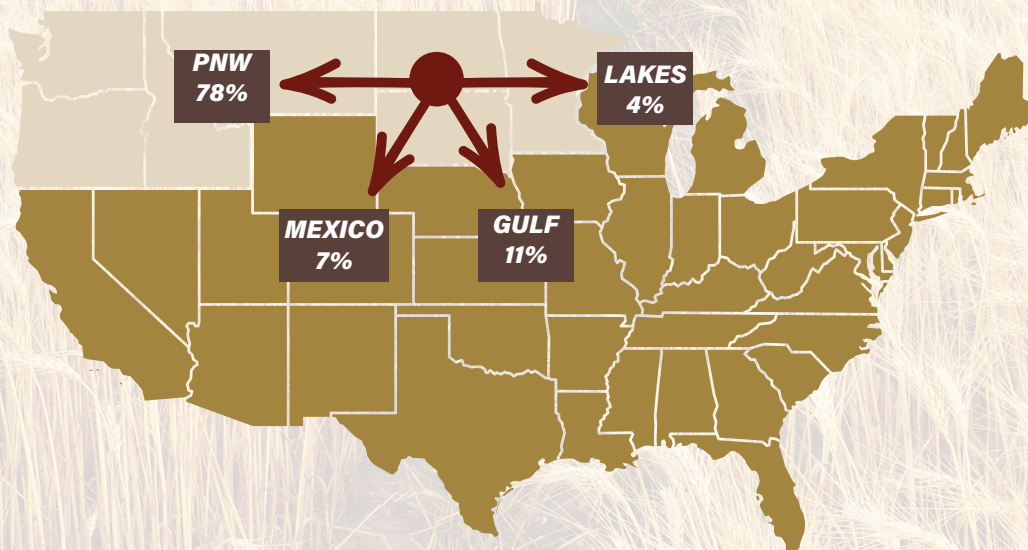
COLLECTION - The North Dakota, South Dakota, Montana and Minnesota state offices of the National Agricultural Statistics Service obtained samples during harvest directly from growers either in the fields or farm bins and local elevators. PNW samples were obtained from the Wheat Marketing Center. These samples reflect the condition of the grain at the point of origin.

Sample collection is based on county production histories. A total of 716 samples were collected. Minnesota (100), Montana (147), North Dakota (356), South Dakota (78) and PNW (35).

ANALYSIS - Approximately 60 percent of the total wheat samples collected were analyzed for grade and other physical kernel characteristics, to generate distribution data. Distribution averages may differ from data averages in the various tables, because the latter are derived from all samples.

All samples collected are represented in the composite for each crop reporting area. All state and regional averages have been adjusted to reflect current year production.

AVERAGE SHARE OF U.S. HRS EXPORTS BY PORT (2020-2023)



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 International (AACCI) Method 55-10.01. Measured as pounds per bushel (lb/bu), kilograms per hectoliter (kg/hl) = (lbs/bu X 1.292) + 1.419. *Approved Methods of the AACCI 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 – AACCI (NIR) Method: 39.25.01 expressed on dry basis and 12 percent moisture basis.

ASH – AACCI Method 08-01.01, 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 – AACCI Method 56-81.04; units of seconds (14 percent moisture basis).

SEDIMENTATION – AACCI Method 56.60.01, expressed in centimeters.

FLOUR

EXTRACTION – Samples are cleaned and tempered. 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. All mill settings are optimized to achieve maximum laboratory mill flour extraction with standardized ash content.

ASH – AACCI Method 08-01.01, expressed on a 14 percent moisture basis.

PROTEIN – AACCI Method 39-11.01 (NIR Method), expressed on a 14 percent moisture basis.

WET GLUTEN – AACCI Method 38-12.02, expressed on a 14 percent moisture basis determined with the glutomatic instrument.

GLUTEN INDEX – AACCI Method 38.12.02, determined with the glutomatic instrument as an indication of gluten strength.

FLOUR FALLING NUMBER – AACCI Method 56-81.04, units of seconds. Determination is performed on 7.0 g of Buhler milled flour (14 percent moisture basis).

AMYLOGRAM – (65 g) AACCI 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 – AACCI Method 76-31.01. Amperometric method using SDmatic.

SOLVENT RETENTION CAPACITY (SRC) – AACCI 56-11.02, expressed on a 14 percent moisture basis. SRC is used to predict commercial baking performance. Flour is shaken with excess of four types of solvent, to determine the amount of solvent held by the flour. The four solvents used relate to the functionality to flour components as follows:

- **WATER** – Water absorption
- **SUCROSE** – Non-starch polysaccharides
- **LACTIC ACID** – Glutenins
- **SODIUM CARBONATE** – Damaged Starch

U.S. HARD RED SPRING *Wheat*

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

GLUTEN PERFORMANCE INDEX (GPI) – is a ratio of the solvents and used as an overall performance of flour glutenins especially in relation to bread wheat flour.

PHYSICAL DOUGH PROPERTIES

FARINOGRAM – AACC I Method 54-21.02; 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.

QUALITY NUMBER – The length, expressed in mm, along the time axis, between the point of water addition and the point where the height in the center of the curve decreased by 30 BU compared to the height of the center of the curve at development time. Stronger flours have a higher quality number.

EXTENSOGRAM – AACC I 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 extensogram 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 I Method 54.30.02. Alveolab is used to measure 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 – AACC I 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 Laboratory Test 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 conversion 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										
2024 MAJOR VARIETIES PRODUCED - AGRONOMIC FACTORS										
VARIETY	AGRONOMIC DESCRIPTION			REACTION TO DISEASE ³			AVERAGE YIELD			
	AGENT OR ORIGIN ¹	YEAR RELEASED	STRAW STRENGTH ²	LEAF RUST	BACTERIAL LEAF STREAK	HEAD (SCAB)	EASTERN ND ⁴		WESTERN ND ⁵	
							BU/ACRE	MT/HECT	BU/ACRE	MT/HECT
AP Murdock	Syngenta/AgriPro	2019	4	5	6	6	77.1	5.18	58.3	3.92
AP Smith	Syngenta/AgriPro	2021	2	3	5	6	74.8	5.03	62.6	4.21
Glenn	NDSU	2005	4	6	5	4	71.7	4.82	56.7	3.81
MN Rothsay	U of MN	2022	3	6	5	5	78.4	5.27	64.4	4.33
MN Torgy	U of MN	2020	4	3	5	4	75.8	5.10	65.7	4.42
ND Frohberg	NDSU	2020	4	5	5	5	77.0	5.18	59.1	3.97
ND Heron	NDSU	2021	6	7	7	4	72.8	4.89	55.4	3.72
ND Thresher	NDSU	2023	4	4	4	4	76.7	5.16	60.2	4.05
SY Ingmar	Syngenta/AgriPro	2014	3	3	6	6	73.3	4.93	57.4	3.86
SY Valda	Syngenta/AgriPro	2015	4	2	6	5	84.4	5.67	66.0	4.44
WB 9590	Westbred	2017	3	3	8	8	79.5	5.34	59.0	3.97

1. ND - North Dakota State University (Public), MN - University of Minnesota (Public), Syngenta/AgriPro - (Private), and Westbred (Private).
2. Straw Strength: 1 to 9 scale, with 1 the strongest and 9 the weakest.
3. Disease reaction scores from 1 - 9, with 1 = resistant and 9 = very susceptible.
4. Data source was 2023 North Dakota statewide variety trials. East locations: Forman, Langdon and Prosper.
5. West locations: Dickinson, Hettinger, Mandan and Minot.

QUALITY INFORMATION							
2024 MAJOR VARIETIES PRODUCED - QUALITY & END-USE FACTORS ⁶							
VARIETY	TEST WEIGHT LB/BU	TEST WEIGHT KG/HL	WHEAT PROTEIN %	FARINOGRAM STABILITY (MIN)	ABSORPTION %	LOAF VOLUME CC	MILL & BAKE QUALITY RATING ⁷
AP Murdock	59.3	78.0	14.6	12.3	65.1	960	★★★
AP Smith	60.3	79.3	14.4	12.7	62.1	880	★★★
Glenn	62.9	82.7	15.0	17.3	65.4	993	★★★★★
MN Rothsay	59.9	78.8	14.2	21	61.2	893	★★★
MN Torgy	60.5	79.6	14.5	17.2	61.4	845	★★★
ND Frohberg	61.0	80.2	14.4	12.3	66.8	1000	★★★★★
ND Heron	60.8	80.0	14.7	8.1	73.2	1015	★★★
ND Thresher	59.1	77.8	14.5	13.0	63.6	1033	★★★
SY Ingmar	61.1	80.4	14.7	14.9	63.3	948	★★★★★
SY Valda	60.7	79.8	13.5	8.6	63.5	910	★★
WB 9590	60.1	79.1	14.8	13.3	64.4	928	★★★

6. Source: NDSU Plant Science Department, Hard Red Spring Wheat Quality Laboratory, 2023 drill strip trials across ND locations.
7. 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.

NORTH DAKOTA

WB 9590 remained the top variety planted in both North Dakota and Minnesota for a second straight year, with a 13.8 and 23 percent share of the acres, respectively. In North Dakota, it's share of acres increased by 5 percent from 2023, while in Minnesota it held steady. A 2017 release from Westbred, it provides producers with strong straw characteristics, very high yield potential and moderately high protein content. WB 9590 is rated as good for milling and baking qualities.

SY VALDA moved up to second place in North Dakota, rebounding in acreage share from 2023 to capture 10 percent in 2024. In Minnesota, it is the fourth most popular variety at 10 percent of the acres, similar to a year ago. A 2015 release from Syngenta/AgriPro, it is popular in eastern parts of the HRS region for its elite yield potential. It is rated as average for milling and baking quality.

AP MURDOCK is the third most popular variety in North Dakota with 9.8 percent of the acres, up slightly from 2023. Released in 2019 by Syngenta/AgriPro, AP Murdock shows balanced appeal across central and northern districts in North Dakota, and is replacing older varieties due to its higher yield potential, good straw strength, and moderately high protein levels. It is rated as good for milling and baking quality.

NORTH DAKOTA VARIETY SHARE OF PLANTED ACRES ³		
VARIETY	2024%	2023%
WB 9590	13.8	8.7
SY Valda	10.0	6.9
AP Murdock	9.8	8.4
MN Torgy	4.7	4.5
SY Ingmar	4.4	6.4
AP Smith	3.7	2.0
Faller	3.0	3.1
WB 9719	2.6	3.1
LCS Trigger	2.1	2.4
Glenn	1.7	2.6
Other ²	44.2	51.9

1. Percentage may not add to 100 due to rounding.
2. Includes varieties with less than 1% of acreage and unknown varieties.
3. (1 acre = 0.405 hectares)
2024 - 5,350,000 planted acres
2023 - 5,550,000 planted acres

TOP 3 NORTH DAKOTA VARIETIES BY CROP DISTRICT%			
	FIRST	SECOND	THIRD
Northwest	SY Ingmar 13.3	WB 9590 10.9	AP Murdock 7.5
North Central	WB 9590 18.0	SY Valda 15.9	AP Murdock 13.1
Northeast	WB 9590 20.1	AP Murdock 14.9	SY Valda 14.5
West Central	SY Ingmar 7.7	WB 9590 6.8	WB 9606 6.7
Central	WB 9590 19.0	AP Murdock 14.1	AP Smith 8.3
East Central	WB 9590 24.1	SY Valda 23.4	AP Murdock 15.8
Southwest	Lang 10.8	LCS Trigger 10.8	MN Torgy 10.6
South Central	Elgin ND 11.9	WB 9590 8.9	ND Vitpro 8.2
Southeast	SY Valda 23.2	WB 9590 19.6	MN Torgy 8.0

1. Percentage may not add to 100 due to rounding.
2. Includes varieties with less than 1% of acreage and unknown varieties.
3. (1 acre = 0.405 hectares)
2024 - 5,350,000 planted acres
2023 - 5,550,000 planted acres

MINNESOTA

MINNESOTA VARIETY SHARE OF SURVEYED ACRES ³		
VARIETY	2024%	2023%
WB 9590	23.0	24.0
MN Rothsay	22.0	6.0
MN Torgy	12.0	19.0
SY Valda	10.0	9.0
WB 9479	7.0	7.0
Other ²	26.0	35.0

- Percentage may not add to 100 due to rounding.
- Includes varieties with less than 1% of acreage and unknown varieties.
- (1 acre = 0.405 hectares)
2024 - 1,220,000 planted acres
2023 - 1,300,000 planted acres

MN ROTHSAY advanced to second place in Minnesota in 2024, with a 22 percent acreage share, up sharply from just 6 percent last year. A 2022 release from the University of Minnesota, it is a variety which touts exceptional straw strength, high yield potential and a high level of resistance to Fusarium head blight. MN-Rothsay is rated as average for milling and baking qualities.

MN TORGY is the third most popular variety in Minnesota with a 12 percent acreage share, and the fourth most popular in North Dakota with a 4.7 percent share. Acreage remained fairly steady with 2023 in North Dakota, but showed a second straight year of declines in Minnesota. MN Torgy is a 2020 release from the University of Minnesota, that has very broad appeal across the region due to it having excellent disease resistant traits, very strong straw, and high yield potential. It is rated as good for milling and baking quality.

TOP 3 MINNESOTA VARIETIES BY CROP DISTRICT [%]			
	FIRST	SECOND	THIRD
North	WB 9590 27.0	MN Rothsay 21.0	SY Valda 9.0
Central	MN Torgy 26.0	MN Rothsay 25.0	SY Valda 16.0
South	MN Torgy 37.0	SY Valda 17.0	MN Rothsay 15.0

PNW VARIETAL INFORMATION									
MAJOR VARIETIES PRODUCED IN WASHINGTON, OREGON AND IDAHO - QUALITY & END-USE FACTORS ²									
VARIETY	AGENT OR ORIGIN ¹	YEAR RELEASED	TEST WEIGHT LB/BU	TEST WEIGHT KG/HL	WHEAT PROTEIN %	FARINOGRAM STABILITY (MIN)	ABSORPTION %	LOAF VOLUME CC	MILL & BAKE QUALITY RATING ³
Alum	WSU	2014	62.6	82.3	13.8	25.2	66.4	1062	MD
Espresso	Westbred	2007	62.6	82.3	14.7	5.1	68.5	1032	*NR
Hale	WSU	2022	63.1	82.9	13.0	26.3	65.8	961	MD
Jefferson	ID	1997	62.3	81.9	13.6	20.9	66.1	977	MD
Kelse	WSU	2008	62.0	81.5	14.4	19.0	67.7	1075	D
AP Renegade	Syngenta	2017	61.9	81.4	13.3	28.9	65.2	922	D
Net CL+	WSU	2019	63.5	83.5	12.7	15.6	65.6	985	MD
WB 9303	Bayer	2021	62.7	82.4	15.5	*	67.9	955	D
WB 9662	Bayer	2014	62.4	82.0	14.5	5.5	67.7	998	LD
WB 9668	Bayer	2014	62.7	82.4	14.8	13.5	68.9	1079	D

- ID - University of Idaho (Public), WSU - Washington State University (Public), Bayer (Private), Syngenta - (Private), and Westbred (Private).
 - Western Wheat Quality Lab, Pullman, WA
 - 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).
- * Insufficient data exists to produce rating scores.

MONTANA

DAGMAR moved into the top position with 22 percent of the acres, up from 9 percent in 2023. It is a 2019 release from the Montana Agricultural Experiment Station. Dagmar is a solid stem variety with good yield and high protein content, and was developed to replace Vida in areas of the state where a higher level of resistance to the wheat stem sawfly is needed. It has good milling and baking quality.

VIDA fell to second position with 14.3 percent of the acres, down from 22.5 percent in 2023. It had been the top variety in the state for twelve straight years. Vida is popular with producers for its high yield and moderate resistance to leaf rust and stripe rust. A 2006 release from the Montana Agricultural Experiment Station, it is most popular across northern and central areas. Vida is rated as good for milling and baking quality.

SY LONGMIRE is the third most popular variety in Montana, with 8.9 percent of the acres in 2024, steady with the past two years. It is a 2019 release from Syngenta/AgriPro. SY Longmire is a solid stem variety that is highly tolerant to the wheat stem sawfly which is a persistent pest challenge in parts of Montana, making it most popular in north central and northeast districts. SY Longmire has very good yield potential and good protein levels.

MONTANA VARIETY SHARE OF SURVEYED ACRES ³		
VARIETY	2024%	2023%
Dagmar	22.0	9.0
Vida	14.3	22.5
SY Longmire	8.9	8.8
Reeder	7.4	11.7
WB Gunnison	4.1	3.2
SY Ingmar	3.9	2.6
SY Soren	3.3	1.5
Duclair	3.1	2.7
AP Smith	2.5	1.6
Lanning	2.2	4.4
Other ²	28.3	32.0

1. Percentage may not add to 100 due to rounding.
2. Includes varieties with less than 1% of acreage and unknown varieties.
3. (1 acre = 0.405 hectares)
2024 - 2,450,000 planted acres
2023 - 2,700,000 planted acres

TOP 2 MONTANA VARIETIES BY CROP DISTRICT%		
	FIRST	SECOND
North Central	Dagmar 34.0	Vida 18.9
North East	Reeder 16.4	SY Longmire 13.2
Central	Dagmar 28.6	Vida 18.3

SOUTH DAKOTA - no survey results in 2024.



2024

U.S. HARD RED SPRING WHEAT

REGIONAL QUALITY REPORT

FUNDING & SUPPORT PROVIDED BY:

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NORTH DAKOTA WHEAT COMMISSION

MONTANA WHEAT AND BARLEY COMMITTEES

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