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North Dakota
Hard Red Winter Wheat

Variety Trial Results for 2025 and Selection Guide

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During the 2024-25 growing season, 100,000 acres of winter wheat were planted and 85,000 acres were harvested. While no statewide winter wheat yield estimate was available at the time of writing this publication, winter wheat yield was extremely variable across the state. Many acres of winter wheat were abandoned early in 2025 after an exceptionally warm and dry fall in 2024 inhibited germination and emergence. Much of the crop failed to emerge before snowfall and many fields suffered winter kill. For those fields surviving the winter and harvested for grain, yield varied from typical ranges of 50-60 bushels per acre (bu/a) to exceptionally high, for example, 90 plus bu/a, in areas that received abundant spring precipitation.

ND Noreen, a 2020 release from NDSU, was reported as the most commonly planted winter wheat variety in the state at 16.6% of acres. In second place was Ideal, a 2011 release from SDSU, reported on 10.8% of acres. Other varieties not named in the survey comprised 72.6% of winter wheat acres.

Characteristics of hard red winter wheat varieties adapted for production in North Dakota are described in Table 1. Information on the agronomic and quality performance of selected varieties is summarized in subsequent tables. Yields are expressed on a 13.5% moisture basis and protein on a 12% basis, which are the industry standards.

Successful winter wheat production depends on numerous production practices, including selecting the right variety for a particular area. The information included in this publication is meant to help growers choose that variety or group of varieties. Characteristics to consider when selecting a variety are winter hardiness, yield potential in your area, test weight, protein content when grown with proper fertility, straw strength, plant height, reaction to important diseases and maturity.

The recommended seeding dates for winter wheat are Sept. 1-15 north of North Dakota Highway 200 and Sept. 15-30 in southern regions. Planting after the recommended dates reduces winter survival and grain yield potential. Planting prior to the recommended date may deplete soil moisture reserves unnecessarily. It also increases the risk of wheat streak mosaic virus and may reduce winter survival.

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Winter wheat should be seeded at a rate of 1 million to 1.2 million pure live seeds per acre. The higher seeding rates of this recommended range should be used for late seeding or with poor seedbed conditions. Producers should consider only the most winter-hardy varieties available when growing winter wheat in North Dakota. Relative ratings for winter hardiness are found in Table 1.

Phosphorus aids winter survival by stimulating root growth and fall tillering. The secondary root system that develops during tillering is essential for a healthy, deep-rooted plant capable of withstanding stress. If winter wheat is planted on bare soil or following fallow, an application of phosphorus is recommended if soil phosphorous levels are low. While important, the contribution of phosphorus to winter survival is secondary to varietal hardiness.

Data from several years and locations should be used when selecting varieties. The idea that data from a single location nearest your farm will indicate which variety will perform the best for you next year is incorrect. You should select varieties that, on average, perform the best at multiple trial locations near your farm across several years.

List of Tables

Table 1. 2025 North Dakota hard red winter wheat variety descriptions and agronomic traits.

Variety	Agent or Origin[2]	Year	Reaction to Disease[1]					Days to Heading[3]	Straw Strength[4]	Height[5] (inches)	Winter[6] Hardiness
			Stripe Rust	Leaf Rust	Stem Rust	Scab	Tan Spot				
AAC Coldfront	AAFC	2022	4	4	4	5	NA	0	2	33	4
AAC Goldrush	AAFC	2021	5	3	5	5	NA	1	4	33	4
AAC Overdrive	AAFC	2022	3	4	3	4	NA	0	4	30	3
AAC Vortex	Meridian	2021	4	4	4	4	8	0	3	33	2
AAC Wildfire	AAFC	2015	1	5	8	4	6	4	4	33	2
AC Emerson	Meridian	2011	1	6	1	3	5	1	3	35	5
CS Bridger CLP	**Circle S**	**2024**	**NA**	**NA**	**NA**	**NA**	**NA**	**-1**	**4**	**28**	**NA**
Jerry	ND	2001	8	3	1	8	8	0	6	38	3
LCS Steel AX	Limagrain	2022	7	7	9	8	4	-1	4	32	5
MS Maverick	Meridian	2020	2	6	5	8	4	-3	5	29	4
ND Allison	ND	2023	7	5	4	4	NA	1	4	34	4
ND Noreen	ND	2020	3	3	1	3	4	0	4	35	3
Northern	MT	2015	1	8	1	8	6	2	4	32	4
SD Andes	SD	2020	2	8	NA	5	6	-1	4	32	2
SD Midland	SD	2021	1	8	7	6	8	-2	4	33	4
SD Pheasant	SD	2023	NA	NA	NA	5	NA	-2	5	32	4
SY Monument	Agripro	2014	3	3	1	8	8	-3	4	30	4
WB 4422	WB	2022	8	6	6	8	5	-4	3	31	4
WB 4540	**WB**	**2024**	**NA**	**NA**	**NA**	**NA**	**NA**	**-5**	**3**	**31**	**NA**
Winner	SD	2019	5	NA	3	4	5	-4	4	31	4

[1]Disease reaction scores from 1-9, with 1 = resistant and 9 = very susceptible, NA = not available.

[2]MT = Montana State University; ND = North Dakota State University; SD = South Dakota State University; WB = WestBred; AAFC = Agriculture and Agri-Food Canada; Meridian = Meridian Seeds; Circle S = Circle S Seeds (Montana).

[3]Days to heading relative to Jerry.

[4]Straw strength: 1 = strongest, 9 = weakest. Based on field observations from limited sites.

[5]Based on the average of several environments and should be used for comparing varieties. The environment can impact the height of varieties.

[6]Relative winter hardiness rating: 1 = excellent, 10 = no survival. These values are subject to change as additional information becomes available.

Bold varieties are those recently released or the first time tested, so data are limited and rating values may change.

Table 2. Yield of winter wheat varieties grown at 4 locations in North Dakota in 2025, with three-year averages (2023-25).

	Langdon		Minot		Dickinson		Hettinger		Avg. N.D.	
Variety	2025	3-Yr. Avg.	2025	3-Yr. Avg.	2025	3-Yr. Avg.	2025	3-Yr. Avg.	2025	3-Yr. Avg.
	- bu/a -									
AAC Coldfront	136.5	--	84.3	--	102.3	--	57.7	--	95.2	--
AAC Goldrush	120.4	90.2	75.2	58.4	93.0	70.3	52.2	58.4	85.2	69.3
AAC Overdrive	122.7	--	78.8	--	95.3	--	55.6	--	88.1	--
AAC Vortex	127.4	97.7	67.0	58.6	99.2	72.7	51.9	59.3	86.4	72.1
AAC Wildfire	119.1	90.8	56.8	58.0	100.5	75.7	49.2	60.4	81.4	71.2
AC Emerson	120.1	87.7	78.1	62.8	88.8	64.1	51.4	53.4	84.6	67.0
CS Bridger CLP	127.1	--	71.0	--	85.7	--	53.9	--	84.4	--
Jerry	99.7	81.0	71.8	60.3	92.6	63.2	48.3	51.3	78.1	64.0
LCS Steel AX	134.4	--	71.8	--	97.4	--	61.8	--	91.3	--
MS Maverick	118.9	88.4	61.4	54.8	75.7	62.3	61.6	56.4	79.4	65.5
ND Allison	126.6	97.9	71.5	59.6	98.7	78.5	57.6	58.4	88.6	73.6
ND Noreen	123.1	94.3	65.4	63.0	100.5	68.8	54.0	58.6	85.7	71.2
Northern	125.6	94.0	72.1	62.8	91.2	77.8	57.7	62.4	86.6	74.3
SD Andes	131.0	97.9	71.5	65.8	96.1	84.0	60.6	63.6	89.8	77.8
SD Midland	132.8	99.5	71.5	59.7	98.5	77.8	60.5	62.9	90.8	75.0
SD Pheasant	119.8	89.0	73.0	--	106.8	71.7	64.7	59.5	91.1	73.4
SY Monument	124.0	88.3	68.5	55.1	97.3	64.7	63.0	55.2	88.2	65.8
WB 4422	132.7	--	84.9	--	94.1	--	60.9	--	93.2	--
WB 4540	127.7	--	77.0	--	96.7	--	64.6	--	90.5	--
Winner	125.5	94.1	76.8	--	90.9	70.4	64.5	59.2	89.4	74.6
Mean	124.9	92.2	72.7	59.9	96.1	71.6	57.7	57.1	87.8	71.0
CV (%)	5.1	--	7.5	--	6.0	--	5.0	--	6.7	--
LSD 0.10	4.4	--	7.5	--	5.4	--	2.7	--	6.9	--

Note: the 2025 winter wheat trials at Casselton, Carrington, and Williston were lost to winter kill.

Table 3. Test weight of winter wheat varieties grown at 4 locations in North Dakota in 2025.

Variety	Langdon	Minot	Dickinson	Hettinger	Average
	……..……...(lb/bu)……...……				
AAC Coldfront	62.2	62.8	62.1	54.1	60.3
AAC Goldrush	60.2	62.2	60.1	52.5	58.8
AAC Overdrive	58.3	59.6	58.6	50.8	56.8
AAC Vortex	60.6	61.5	61.2	51.8	58.8
AAC Wildfire	60.9	61.6	60.5	49.1	58.0
AC Emerson	60.8	62.3	61.7	52.7	59.4
CS Bridger CLP	58.8	60.7	57.0	51.7	57.1
Jerry	58.8	60.8	60.2	52.5	58.1
LCS Steel AX	60.8	62.0	59.4	54.5	59.2
MS Maverick	61.1	61.9	59.7	55.4	59.5
ND Allison	60.9	62.3	61.1	54.1	59.6
ND Noreen	61.6	62.8	62.9	55.3	60.7
Northern	58.5	61.0	58.2	53.1	57.7
SD Andes	61.7	62.8	61.5	55.0	60.3
SD Midland	60.9	62.0	61.5	54.3	59.7
SD Pheasant	59.7	61.6	60.9	54.4	59.2
SY Monument	59.2	60.0	58.6	52.1	57.5
WB 4422	61.2	61.9	60.2	55.0	59.6
WB 4540	59.6	60.1	58.7	54.6	58.3
Winner	60.3	61.9	59.9	55.2	59.3
Mean	60.1	61.4	60.1	53.6	58.9
CV (%)	1.1	1.2	0.8	1.5	1.5
LSD 0.10	0.6	1.0	0.4	0.8	1.0

Note: 58.0 lb/bu test weight is required for US No. 1 grade Hard Red Winter Wheat

Table 4. Grain protein content at 12% moisture of winter wheat varieties grown at 4 locations in North Dakota in 2025.

Variety	Langdon	Minot	Dickinson	Hettinger	Average
			(%)		
AAC Coldfront	11.9	12.5	11.7	12.5	12.2
AAC Goldrush	13.1	12.8	12.4	13.7	13.0
AAC Overdrive	13.1	12.4	12.5	13.8	13.0
AAC Vortex	13.3	13.4	12.6	13.8	13.3
AAC Wildfire	12.9	12.8	12.4	14.5	13.2
AC Emerson	13.3	13.2	12.9	13.6	13.3
CS Bridger CLP	12.3	12.4	12.6	13.8	12.8
Jerry	13.2	13.4	12.7	13.8	13.3
LCS Steel AX	11.8	11.4	11.3	12.6	11.8
MS Maverick	13.1	13.3	12.8	12.9	13.0
ND Allison	11.6	12.3	11.6	12.1	11.9
ND Noreen	13.1	13.6	12.7	13.5	13.2
Northern	12.8	13.0	12.5	13.0	12.8
SD Andes	12.4	12.6	12.2	13.4	12.7
SD Midland	12.4	11.9	11.8	13.5	12.4
SD Pheasant	12.9	13.2	12.7	13.6	13.1
SY Monument	12.6	11.9	11.8	12.9	12.3
WB 4422	12.6	13	12.5	12.8	12.7
WB 4540	12.1	12.5	11.9	12.5	12.3
Winner	12.6	12.5	12.4	12.2	12.4
Mean	12.7	12.7	12.3	13.2	12.7
CV (%)	1.9	3.4	2.5	4.9	3.0
LSD 0.10	0.2	0.7	0.3	0.6	0.5

Table 5. Analytical milling and baking characteristics of selected varieties evaluated at Casseltonand Hettinger, North Dakotain 2024.

	Kernel			Flour			Farinograph				Loaf	
Variety	Test Weight[1]	1,000 Kernel Weight[2]	Whole Wheat Protein 12 MB[3]	Flour Protein 14 MB	Flour Ash 14 MB	Milling Extraction[5]	Abs[6]	Peak Time	Stability[7]	Mixing Tolerance Index	Loaf Volume[8]	Crumb Color
	(lb/bu)	(gram)	(%)	(%)	(%)	(%)	(%)	(min)	(min)	(BU)	(cc)	(1-10)[9]
Jerry	61.3	25.5	11.7	10.8	0.5	74.0	60.7	6.6	13.0	21	851	8
SD Andes	63.6	31.6	10.3	9.4	0.5	76.0	57.4	7.0	13.0	22	811	8
ND Noreen	63.7	29.7	11.9	11.0	0.5	74.2	59.9	8.7	17.4	21	876	8
Keldin	62.6	35.2	10.1	9.2	0.5	73.7	58.8	4.5	14.4	18	767	8
AC Emerson	63.0	22.5	12.3	11.1	0.4	74.7	57.9	16.5	34.5	13	925	9
Northern	61.1	33.6	10.7	9.9	0.5	75.5	61.4	3.9	9.6	26	869	8
Mean	62.5	29.7	11.2	10.2	0.5	74.7	59.3	7.9	17.0	20	850	8

[1]Test weight - Expressed in pounds (lbs) per bushel. A high test weight is desirable. A 58 lb test weight is required for a grade of U.S. No. 1.

[2]1,000 KWT - Estimate of weight of 1,000 seeds based on a clean 10g sample. Expressed in grams and used to approximate seed size.

[3]Wheat Protein - Measured by NIR at a 12% moisture basis. A high protein is desirable for baking quality.

[4]Falling Number - Expressed in seconds at a 14% moisture basis. It is used as an indicator of sprouting based on elevated enzyme activity.
A high falling number is desirable, preferably greater than 400 seconds.

[5]Flour Extraction - Percentage of milled flour recovered from cleaned and tempered wheat. A high flour extraction percentage is desirable.

[6]Farinograph Absorption - Measured by NIR at a 14% moisture basis. A measure of dough water absorption, expressed as percent. A high absorption is desirable.

[7]Farinograph Stability - A measure of dough strength. It is expressed in minutes above the 500 Brabender unit line during mixing. A high stability is desirable.

[8]Loaf Volume - The volume of the pup loaf of bread, expressed in cubic centimeters. A high volume is desirable.

[9]Scale 1-10, with 1 being low and 10 being superior.

For more information on this and other topics, see www.ndsu.edu/agriculture

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