

# 2019 South Dakota Winter Wheat Variety Trial Results Regional Summaries

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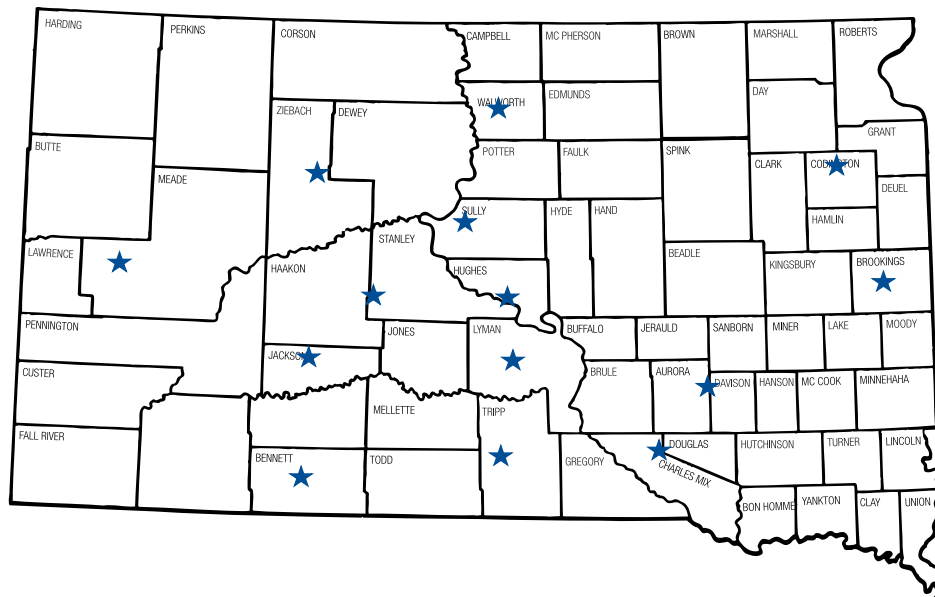
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**Eastern trial locations:** Not reported in 2019 due to winterkill/flooding

**Central trial locations:** Hayes, Onida, Pierre, Selby, Vivian, Winner, Winner intensive

**Western trial locations:** Faith, Martin, Sturgis, Wall

Individual trial location results can be accessed online at:

<https://extension.sdstate.edu/wheat-variety-trial-results>

The 2018-19 winter wheat growing season in South Dakota was characterized by a very wet early fall followed by a cold winter with many late spring snow events. Most eastern testing locations were lost to winterkill/icing or flooding. The only eastern trial to survive in 2019 was Mt. Vernon. Precipitation was above normal in most areas of the state during the 2019 growing season. Significant Fusarium Head Blight (scab) infestations were noted in some areas of the state and Bacterial Leaf Streak (BLS) was also noticed later in the season. Harvest progressed relatively slowly and produced variable yields. While most areas in the central and western portions of South Dakota produced average to above-average yields, areas with excessive rainfall had disappointing crops.

Yields in central SD (Hayes, Onida, Pierre, Selby, Vivian, and Winner) averaged 71 bu/acre, ranging from 56 bu/acre at Vivian to 79 bu/acre at Hayes. Varieties yielding in the top 1/3 of the central SD trials for 2019 were **Winner, Overland, WB4595, SY Monument, Oahe, Draper, SY Wolf, SY Wolverine, and Ideal**. Western SD trial locations (Faith, Martin, Sturgis, and Wall) also had a good year, averaging 58 bu/acre, ranging from 48 bu/acre at Sturgis to 64 bu/acre at Martin. Varieties yielding in the top 1/3 for 2019 in the western trial locations were **Winner, Draper, WB4462, Redfield, Keldin, SY Wolverine, SY Monument, Ideal, and Oahe**. Producers should note that the varieties **Winner, Draper, and SY Wolverine** are only available to Foundation growers in the fall of 2019. The protein content of the crop averaged 13.8%, and 12.8% in central and western SD, respectively. Detailed trial results, including height and lodging notes for each location (where measured) are available at: <https://extension.sdstate.edu/wheat-variety-trial-results>.

Consider as much performance information as possible when selecting a variety and give more weight to information from trials close to home, as some varieties may be better suited to certain geographic areas. Also pay close attention to relative performance over many locations. This type of performance is an indication of "yield stability." Good yield stability refers to the ability of a variety exhibit high yield potential at many locations over years. For example, a variety that ranks in the upper 40% at all locations exhibits better yield stability than a variety that is number one for yield at one location but ranks in the lower 40% at some other locations. Performance over multiple years is also very important. Growing conditions in a single season may favor certain varieties, providing a poor representation of yield potential over time. For example, growing conditions in 2019 tended to favor later-maturing varieties and the absence of stripe rust allowed susceptible varieties to perform better than average. Varieties with a slow growth pattern in the fall also did not fare well in late-planted trial locations. A good rule of thumb is to plant 65%-75% of your acres to varieties with a proven track record (i.e. a good multi-year average) and plant the remaining 25%-35% to a promising new variety.

It is important to remember that varieties may differ by 5 bu/acre or even more and still be statistically similar. This is due to inherent variability in the environment and the yield testing process. Varieties that are statistically similar to the top performing variety at each location can be calculated by subtracting the least significant difference (LSD) value from the top performing variety. The LSD is a statistic used to determine if varieties are truly different from one another.

The coefficient of variation (CV) listed at the bottom of each data column, which is often expressed as a percentage of a given trait mean, is a relative measure of the amount of test variation for that trait. Generally, in yield trials, a CV of 15% is considered acceptable and a CV of 10% or less indicates good quality data. Higher variability (and thus higher CVs) can be caused by several environmental factors, such as stand loss due to winterkill or drought, and reduces the ability to detect true varietal differences.

Table 1. List of winter wheat varieties tested in 2017-18 along with origin, agronomic, and grain quality characteristics.

Variety	Testing and Origin		Agronomic Characteristics				Grain Quality		
	Years tested in SD trials	Origin†-Year	Heading (Julian d)	Height (inches)	Lodging Score (1-9)§	Winter Hrd.¶	2019 Test Wt. (lb/bu)#	2019 Protein (%)#	Baking Quality††
Alice (white)	5+	SD-06	165	30	3	G	58.6	13.3	E
Avery	4	PG-15	164	33	4	F	58.8	12.2	(G)‡‡
Canvas	new	PG-18	165	30	2	-	59.4	12.9	-
Cowboy	4	WY-12	167	35	3	(G)	59.3	12.3	(A)
Draper	3	SD-19	164	32	1	G	59.2	12.9	G
Expedition	5+	SD-02	162	34	2	G	59.6	13.4	G
Ideal	5+	SD-11	167	34	2	G-E	60.0	12.9	A
Keldin	3	WB-13	169	35	2	(E)	60.1	12.9	-
Langin	3	PG-16	161	29	4	(E)	58.7	12.2	(G)
LCS Chrome	2	LCS-16	165	34	2	(E)	59.8	14.1	(G)
LCS Mint	5+	LCS-12	162	33	3	G	60.8	12.9	(G)
Lyman	5+	SD-08	167	35	3	G-E	60.0	14.4	A
NHH144913-3	2	NE-exp	162	31	1	-	56.3	13.9	-
NW13493	new	NE-exp	164	32	4	(G)	60.6	13.1	(G)
Oahe	5+	SD-16	166	38	3	G-E	60.9	13.2	A
Overland	5+	NE-07	166	36	2	G-E	59.9	13.1	(A)
Redfield	5+	SD-13	167	33	2	G	59.5	13.2	G
SY 517 CL2	3	AP-17	161	30	2	(G)	60.8	13.5	(A)
SY Monument	5+	AP-15	166	33	1	G-E	58.1	12.6	(G)
SY Sunrise	4	AP-16	164	29	3	(E)	59.0	12.7	(G)
SY Wolf	5+	AP-11	164	30	1	F	60.0	13.3	A
SY Wolverine	new	AP-19	162	28	1	(G)	59.6	12.8	(G)
Thompson	4	SD-17	167	36	1	G	60.2	13.4	A
WB-Grainfield	5+	WB-12	160	32	3	F	58.7	12.6	G
WB4462	2	WB-16	161	34	2	(G)	59.2	13.1	(G)
WB4595	new	WB-18	166	32	1	(G)	61.3	12.8	(A)
Wesley	5+	NE-99	164	32	1	G	58.5	13.5	G
Winner	3	SD-19	164	33	1	G	59.9	13.1	G

† AP, AgriPro; LCS, Limagrain Cereal Seeds; NE, Nebraska (Husker Brand Genetics); PG, PlainsGold; SD, South Dakota; WB, WestBred; WY, Wyoming; and - (Year of Release).

§ Lodging score: 1, perfectly standing; to 9, completely flat; ¶ Winter hardiness: E, excellent; G, good; F, fair; P, poor.

# Test weight (lbs/bu) and protein (%) as averaged from central SD testing sites.

†† Baking quality: E, excellent; G, good; A, acceptable; P, Poor. Note: SDSU does not typically do baking quality analysis.

‡‡ Estimated ratings (X), based on information provided by entity that submitted the variety.

Table 2. Winter wheat variety disease ratings.

Variety	Disease Ratings†							
	Stripe Rust	Stem Rust	Leaf Rust	Tan Spot	SNB‡	Bacterial Leaf Streak	WSMV§	FHB¶ (Scab)
Alice (white)	MS-S	MR	7	7	R	7	MS	4
Avery	S	(S)#	3	6	R	5	(R)	8
Canvas	-	-	5	5	-	5	-	9
Cowboy	S	(MR)	3	3	MR	8	(S)	7
Draper	MR-MS	MR-MS	5	5	-	7	-	5
Expedition	S	R	6	7	S	7	S	4
Ideal	S	MR	5	7	MS	5	S	5
Keldin	(MR)	-	2	2	MR	6	-	6
Langin	(MR)	(S)	2	4	R	4	(MS)	4
LCS Chrome	(R)	(S)	2	2	-	4	(S)	5
LCS Mint	MS-S	MS	3	5	R	6	MR	7
Lyman	S	R	5	7	MR	5	S	2
NHH144913-3	(MR)	(MR)	7	7	-	5	(MS)	6
NW13493	(MR-MS)	(MR)	6	7	-	4	(S)	6
Oahe	MR	MR-MS	6	6	MR	5	MR	4
Overland	S	MR	5	6	MS	5	MS	6
Redfield	MR-MS	MR	7	6	MR	6	S	5
SY 517 CL2	(MR-MS)	(R)	3	2	MR	7	-	2
SY Monument	MR-R	(R)	3	4	MR	6	(MS)	6
SY Sunrise	MR-R	(R)	3	7	MR	5	(MR-MS)	8
SY Wolf	S	MR	2	4	MR	5	MR	7
SY Woverine	(MR)	(R)	3	2	-	7	(MR)	7
Thompson	MR-MS	MR-MS	4	7	N/A	7	MS	5
WB-Grainfield	MR-MS	MR	3	5	MR	5	MR	8
WB4462	(S)	-	3	5	-	5	(S)	5
WB4595	(MR)	-	2	5	-	7	(MR)	8
Wesley	S	R	7	6	MR	7	S	7
Winner	MS	MR	6	5	-	7	-	6

† Disease ratings: R, resistant; MR, moderately resistant; MS, moderately susceptible; S, susceptible; or 1, most resistant to 9, most susceptible. note: SDSU does not perform nursery screenings for all listed pathogens in each growing season.

‡ Septoria/Stagonospora nodorum blotch.

§ Wheat Streak Mosaic Virus.

¶ Fusarium Head Blight.

# Estimated rankings (X) based on information provided by the program that submitted the variety.

Table 3. 2017-2019 winter wheat variety performance trial results for testing sites in central South Dakota. Varieties ranking in the top 1/3 of each trial category are shaded light blue.

Variety	2019			2-year			3-year		
	Yield (bu/a)	Test Wt (lbs)	Protein %	Yield (bu/a)	Test Wt (lbs)	Protein %	Yield (bu/a)	Test Wt (lbs)	Protein %
Winner	<b>75.9</b>	59.9	13.1	<b>74.1</b>	60.5	13.3	<b>68.2</b>	60.5	13.5
SY Monument	<b>74.4</b>	58.1	12.6	70.5	58.7	12.7	<b>66.8</b>	59.1	13.1
Draper	<b>73.5</b>	59.2	12.9	<b>72.4</b>	59.9	13.3	<b>66.6</b>	60.0	13.7
Ideal	72.4	60.0	12.9	71.6	60.9	13.1	<b>66.5</b>	60.7	13.6
Cowboy	71.4	59.3	12.3	70.6	60.4	12.5	65.6	60.2	12.7
Oahe	<b>73.9</b>	60.9	13.2	70.6	61.4	13.1	65.2	61.2	13.5
Overland	75.4	59.9	13.1	70.4	60.8	13.2	64.6	60.8	13.7
SY Wolf	73.0	60.0	13.3	68.8	60.4	13.6	64.6	60.5	13.7
Thompson	72.3	60.2	13.4	69.7	61.0	13.4	64.5	60.8	13.8
Langin	70.0	58.7	12.2	66.6	59.5	12.5	64.4	60.3	12.7
Keldin	71.7	60.1	12.9	67.4	60.0	13.2	63.6	60.0	13.5
Redfield	70.2	59.5	13.2	68.9	60.4	13.4	63.4	60.4	13.9
SY Sunrise	71.1	59.0	12.7	66.4	59.5	13.0	62.8	60.2	13.5
Avery	66.8	58.8	12.2	64.2	59.4	12.4	62.6	60.1	12.6
WB-Grainfield	70.6	58.7	12.6	67.6	59.6	12.9	62.4	60.2	13.3
Lyman	65.1	60.0	14.4	68.4	60.7	14.3	61.0	60.6	14.8
Wesley	66.3	58.5	13.5	65.5	59.3	13.6	60.0	59.3	14.2
Expedition	64.4	59.6	13.4	64.1	60.7	13.6	59.5	60.9	14.1
LCS Mint	67.3	60.8	12.9	64.6	61.7	12.9	59.3	61.9	13.2
Alice	60.9	58.6	13.3	61.8	59.6	13.3	56.9	59.7	13.9
SY 517 CL2	65.3	60.8	13.5	60.4	61.4	13.7	55.7	61.7	14.1
WB4462	71.8	59.2	13.1	<b>74.5</b>	60.2	13.1	-	-	-
LCS Chrome	68.6	59.8	14.1	68.3	60.6	14.0	-	-	-
NHH144913-3	65.2	56.3	13.9	60.3	57.2	14.0	-	-	-
WB4595	<b>74.4</b>	61.3	12.8	-	-	-	-	-	-
SY Wolverine	72.7	59.6	12.8	-	-	-	-	-	-
NW13493	71.2	60.6	13.1	-	-	-	-	-	-
Canvas	66.8	59.4	12.9	-	-	-	-	-	-
<b>Trial Average#</b>	70.6	59.6	13.8	69.0	60.2	13.2	63.6	60.4	13.6
<b>LSD(0.05)†</b>	2.7	0.5	0.3	2.5	0.4	0.2	2.7	0.3	0.2
<b>C.V.%‡</b>	7.2	1.4	3.8	9.0	1.0	2.8	11.6	1.5	4.4

# Trial averages may include values from experimental lines that are not reported.

† Value required ( $\geq$ LSD) to determine if varieties are significantly different from one another.

‡ C.V. is a measure of variability or experimental error, 15% or less is considered acceptable.

Table 4. 2017-2019 winter wheat variety performance trial results for testing sites in western South Dakota. Varieties ranking in the top 1/3 of each trial category are shaded light blue.

Variety	2019			2-year			3-year		
	Yield (bu/a)	Test Wt (lbs)	Protein %	Yield (bu/a)	Test Wt (lbs)	Protein %	Yield (bu/a)	Test Wt (lbs)	Protein %
Draper	64.0	56.5	13.1	63.1	57.2	13.0	57.2	58.0	13.1
Keldin	62.2	55.9	12.7	64.8	56.5	12.7	56.0	57.5	13.1
Ideal	60.9	55.5	12.5	61.3	56.6	12.7	55.8	57.7	13.0
SY Monument	61.0	53.9	12.5	61.7	55.2	12.6	54.8	56.7	12.7
Winner	66.7	55.8	12.9	59.7	56.4	13.1	54.4	57.6	13.3
Cowboy	57.5	54.8	12.3	61.7	56.6	12.1	54.1	57.7	12.3
SY Wolf	56.0	53.3	13.2	58.4	55.3	13.2	53.7	57.1	13.3
Redfield	62.8	56.1	12.9	62.6	57.4	12.9	53.5	58.2	13.2
Overland	57.4	55.8	12.4	56.8	56.5	12.8	52.7	57.9	12.9
LCS Mint	57.5	55.7	11.1	59.7	56.8	12.0	52.5	58.3	12.4
Avery	55.4	55.4	12.0	57.3	56.3	12.0	52.4	57.8	12.2
Oahe	59.5	57.0	12.9	58.8	57.5	13.0	51.8	58.6	13.2
WB-Grainfield	58.3	55.9	12.8	57.8	56.3	12.8	51.4	57.7	13.2
SY 517 CL2	52.6	57.5	13.4	57.6	58.1	13.2	50.7	59.1	13.5
Wesley	52.7	53.8	13.6	55.0	55.1	13.5	50.5	56.5	13.8
Thompson	54.5	57.1	13.2	55.3	57.6	13.2	50.3	58.5	13.4
Lyman	49.2	55.2	13.9	56.4	56.7	13.6	50.2	57.7	13.9
Langin	51.0	54.2	12.4	50.8	55.2	12.6	48.5	57.0	12.7
SY Sunrise	51.8	54.2	12.7	55.1	55.6	12.7	48.0	57.4	13.2
Expedition	49.6	54.2	12.9	52.6	55.8	13.0	47.6	57.4	13.2
Alice	44.6	54.4	12.6	50.8	55.7	12.9	45.7	57.0	13.4
WB4462	63.7	56.1	13.3	62.5	56.3	13.2	-	-	-
LCS Chrome	50.8	55.9	13.9	55.3	57.1	13.7	-	-	-
NHH144913-3	55.7	53.1	13.3	55.3	54.2	13.4	-	-	-
SY Wolverine	61.3	52.1	13.2	-	-	-	-	-	-
WB4595	55.9	57.0	12.2	-	-	-	-	-	-
NW13493	52.9	56.2	13.0	-	-	-	-	-	-
Canvas	52.4	53.8	12.8	-	-	-	-	-	-
<b>Trial Average#</b>	57.7	55.5	12.8	58.7	56.5	12.9	52.3	57.7	13.1
<b>LSD(0.05)†</b>	4.0	1.4	0.8	2.7	1.0	0.4	2.5	0.7	0.4
<b>C.V.%‡</b>	9.9	3.5	8.3	9.7	3.5	7.0	12.2	2.9	7.2

# Trial averages may include values from experimental lines that are not reported.

† Value required ( $\geq$ LSD) to determine if varieties are significantly different from one another.

‡ C.V. is a measure of variability or experimental error, 15% or less is considered acceptable.