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2018 South Dakota Winter Wheat Variety Trial Results Regional Summaries

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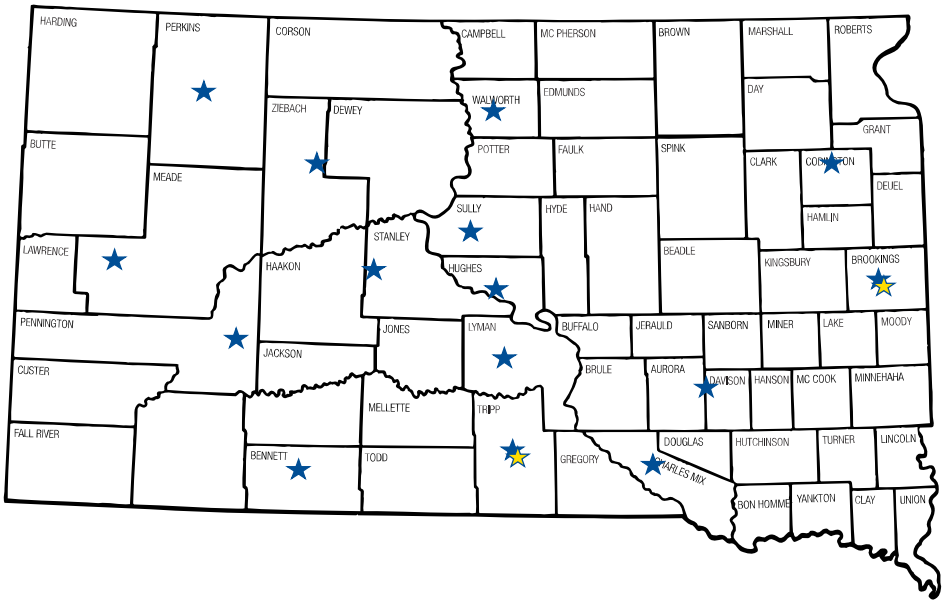

Eastern trial locations:	Brookings, Brookings w/fungicide, Mount Vernon, South Shore
Central trial locations:	Geddes, Hayes, Onida (hailed out), Pierre, Selby, Vivian, Winner, Winner intensive
Western trial locations:	Bison, Faith, Martin, Sturgis, Wall

Individual trial location results can be accessed online at:
http://igrow.org/agronomy/wheat/winter-wheat-variety-trial-results/

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2018 South Dakota Winter Wheat Performance Trial Highlights

Jonathan Kleinjan | SDSU Extension Crop Production Associate

The 2017-18 winter wheat growing season in South Dakota was characterized by a variable winter with many late spring snow events. Despite very cold temperatures at some times during the winter, the SDSU Extension Crop Performance Testing (CPT) program had no winterkill issues at any of the 15 trial locations. However, the Onida trial location was destroyed by hail in late June. Precipitation was variable but adequate in most areas of the state, especially in the west. There were some areas of excessive heat and drought stress during flowering, most notably in the central portion of the state. Late rain events in these areas seemed to favor later-maturing varieties. No widespread disease pressure was noted, however Fusarium Head Blight (scab) and Bacterial Leaf Streak (BLS) were noticed later in the season beginning in the south-central areas of the state. In most cases, disease pressure was not enough to cause significant yield losses. Harvest progressed rapidly and produced average to above-average yields in most areas of the state.

Yields from the SDSU Extension CPT program averaged 65 bu/acre in eastern South Dakota (Brookings, Mt. Vernon, and South Shore), ranging from 59 bu/acre at South Shore to 70 bu/acre at Brookings. Varieties yielding in the top 1/3 of the eastern SD trials for 2018 were **Ideal**, **Cowboy**, **Keldin**, **LCS Chrome**, **Oahe**, **Redfield**, **SY Monument**, **Thompson**, and **WB4462**. Yields in central SD (Geddes, Hayes, Pierre, Selby, Vivian, and Winner) averaged 64 bu/acre, ranging from 40 bu/acre at Hayes to 88 bu/acre at Selby. Varieties yielding in the top 1/3 of the central SD trials for 2018 were **WB4462**, **Cowboy**, **Ideal**, **LCS Chrome**, **Lyman**, **Oahe**, **Redfield**, **SY Monument**, and **WB4418**. Western SD trial locations (Bison, Faith, Martin, Sturgis, and Wall) had a good year, averaging 59 bu/acre, ranging from 46 bu/acre at Bison to 70 bu/acre at Wall. Varieties yielding in the top 1/3 for 2018 in the western trial locations were **Cowboy**, **Ideal**, **Keldin**, **LCS Mint**, **Lyman**, **Redfield**, **SY Benefit**, **SY Monument**, and **WB4462**. The protein content of the crop averaged 14.4%, 13.7%, and 13.2% in eastern, central, and western SD, respectively. Detailed trial results, including height and lodging notes for each location are available at: http://igrow.org/agronomy/wheat/winter-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 2018 tended to favor later-maturing varieties and the absence of stripe rust allowed susceptible varieties to perform better than average. 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.

2018 South Dakota Winter Wheat Variety Trial Results Variety List

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	Rel. Hdg.‡ (days)	Rel. Height‡ (inches)	2018 Lodging Score§	Winter Hrd.¶	2018 Test Wt. (lb/bu)#	2018 Protein (%)#	Baking Quality††
Alice (white)	5+	SD-06	0	-2	1.4	G	0.6	-0.2	E
Avery	3	PG-15	1	-1	2.0	F	-0.1	-0.7	*(G)*
Cowboy	3	WY-12	4	0	1.7	*(G)‡‡*	0.7	-0.8	*(A)*
Dyna-Gro Long Branch	2	DG-16	0	-1	1.6	*(E)*	-1.8	-0.6	-
Expedition	5+	SD-02	**0**	**0**	1.8	G	0.7	0.5	G
Ideal	5+	SD-11	6	-1	1.5	G-E	1.6	0.3	A
Keldin	2	WB-13	6	0	1.5	*(E)*	-0.5	-0.5	-
Langin	2	PG-16	-1	-3	2.1	*(E)*	0.0	-0.8	*(G)*
LCS Chrome	new	LCS-16	2	-1	1.3	*(E)*	0.0	0.5	*(G)*
LCS Link	new	LCS-17	2	-1	1.3	*(E)*	0.6	-0.3	*(E)*
LCS Mint	5+	LCS-12	1	-1	1.8	G	1.4	-0.5	*(G)*
Lyman	5+	SD-08	2	0	1.9	G-E	1.3	0.9	A
NHH144913-3	new	NE-exp	2	-2	1.3	-	-1.8	0.3	-
Oahe	5+	SD-16	3	1	1.6	G-E	1.2	0.0	A
Overland	5+	NE-07	3	-1	1.5	G-E	0.9	0.2	*(A)*
PSB13NEDH-7-140	3	LCS-exp	5	-2	1.4	*(G)*	0.6	0.3	*(A)*
Redfield	5+	SD-13	4	-1	2.2	G	0.4	-0.5	G
SY 517 CL2	2	AP-17	2	-3	1.5	*(G)*	2.1	0.4	*(A)*
SY Benefit	new	AP-18	1	-2	1.5	*(G)*	-0.1	-0.5	*(G)*
SY Monument	4	AP-15	4	-2	1.4	G-E	-1.6	-0.5	*(G)*
SY Sunrise	3	AP-16	3	-3	1.4	*(E)*	-1.1	-0.4	*(G)*
SY Wolf	5+	AP-11	2	-2	1.2	G	-0.4	0.6	A
Thompson	4	SD-17	4	1	1.7	G	-0.5	-0.2	A
WB-Grainfield	5+	WB-12	-1	-1	1.9	F	-0.2	0.1	G
WB4418	new	WB-17	1	-4	1.3	*(G)*	-2.0	0.4	*(G)*
WB4462	new	WB-16	0	-1	1.6	*(G)*	1.2	-0.5	*(G)*
WB4623CLP	new	WB-15	7	-2	1.0	P	-2.9	1.2	*(G)*
Wesley	5+	NE-99	2	-2	1.8	G	-0.2	0.3	G

† AP, AgriPro; DG, Dyna-Gro Seed; LCS, Limagrain Cereal Seeds; NE, Nebraska (Husker Brand Genetics); PG, PlainsGold; SD, South Dakota; WB, WestBred; WY, Wyoming; and – (Year of Release).
‡ Difference in days to heading compared to **Expedition** (2018 eastern sites - **Julian date 151**); height compared to Expedition (2018 eastern sites - **27 inches**).
§ Lodging score: 1, perfectly standing; to 5, completely flat; ¶ Winter hardiness: E, excellent; G, good; F, fair; P, poor.
# Test weight (lbs/bu) and protein (%) as compared to trial averages (eastern 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.

2018 South Dakota Winter Wheat Variety Trial Results Disease Ratings

Table 2. Winter wheat variety disease ratings.

Variety	Disease Ratings†						
	Stripe Rust	Stem Rust	Leaf Rust	Tan Spot	SNB‡	WSMV§	FHB (Scab)
Alice (white)	MS-S	MR	MS	MS	R	MS	MR-MS
Avery	S	*(S)#*	MR-R	MR	R	*(R)*	MS
Cowboy	S	*(MR)*	MS	S	MR	*(S)*	S
Dyna-Gro Long Branch	*(MR)*	*(MR)*	R	MS	R	-	*(S)*
Expedition	S	R	MS	MS	S	S	MR
Ideal	S	MR	MR-R	MS	MS	S	MS
Keldin	*(MR)*	-	MR	MR	MR	-	*(MS)*
Langin	*(MR)*	*(S)*	MR	MR	R	*(MS)*	MR-MS
LCS Chrome	*(R)*	*(S)*	*(R)*	*(MR)*	-	*(S)*	*(MR)*
LCS Link	*(MR)*	*(S)*	*(R)*	*(MR)*	-	*(MR-MS)*	*(R)*
LCS Mint	MS-S	MS	MR	MR	R	MR	S
Lyman	S	R	MR	MR	MR	S	MR
NHH144913-3	*(MR)*	*(MR)*	*(MS)*	-	-	*(MS)*	-
Oahe	MR	MR-MS	MR	MS	MR	MR	MR
Overland	S	MR	MR	MS	MS	MS	MR
PSB13NEDH-7-140	MS-S	-	MR	MS	R	-	MR
Redfield	MR-MS	MR	MS	MR	MR	S	MR
SY 517 CL2	*(MR-MS)*	*(R)*	R	R	MR	-	*(MR-MS)*
SY Benefit	*(MR)*	*(R)*	*(MS)*	*(MR)*	-	-	*(MR)*
SY Monument	MR-R	*(R)*	R	MR	MR	*(MS)*	MR-MS
SY Sunrise	MR-R	(R)	R	MS	MR	*(MR-MS)*	MR
SY Wolf	S	MR	R	MR	MR	MR	S
Thompson	MR-MS	MR-MS	R	S	N/A	MS	MR-MS
WB-Grainfield	MR-MS	MR	R	MR	MR	MR	S
WB4418	*(MR-MS)*	*(MR)*	*(R)*	*(S)*	-	*(MR)*	*(MS)*
WB4462	*(S)*	-	*(MR)*	*(S)*	-	*(S)*	*(S)*
WB4623CLP	*(MR)*	-	*(MS)*	-	-	-	-
Wesley	S	R	MS	MR	MR	S	S

† Disease ratings: R, resistant; MR, moderately resistant; MS, moderately susceptible; S, 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.

2018 South Dakota Winter Wheat Variety Trial Results Eastern Summary

Table 3. 2016-2018 winter wheat variety performance trial results for testing sites in eastern South Dakota. Varieties ranking in the top 1/3 of each trial category are shaded light blue.

Variety	2016 Yield (bu/a)	2017 Yield (bu/a)	2018			2-year Yield (bu/a)	3-year Yield (bu/a)
			Yield (bu/a)	Test Wt (lbs)	Protein %		
SY Monument	74.2	84.0	67.8	56.0	13.9	76.2	75.4
SY Wolf	75.2	81.6	65.7	57.0	14.8	74.1	74.2
SY Sunrise	72.9	80.7	63.8	56.1	13.7	72.5	72.4
Oahe	69.1	77.5	69.5	58.7	14.4	73.9	72.1
WB-Grainfield	74.0	83.5	56.6	57.7	14.3	70.2	71.3
LCS Mint	72.5	79.2	61.1	59.3	13.9	70.4	70.9
Cowboy	70.7	71.6	68.5	58.1	13.4	70.3	70.2
PSB13NEDH-7-140	67.3	79.3	63.2	58.6	15.0	71.7	70.0
Redfield	66.7	74.1	68.7	58.0	14.3	71.7	69.8
Avery	72.5	69.9	61.5	56.5	13.6	65.8	67.8
Thompson	63.8	68.0	70.1	57.6	14.6	69.4	67.3
Overland	66.1	68.7	65.6	58.3	14.9	67.5	66.8
Ideal	68.3	58.4	71.3	58.2	14.3	65.0	65.9
Wesley	67.6	69.5	59.4	57.3	15.0	64.6	65.4
Lyman	65.6	64.4	62.7	59.3	16.2	64.0	64.3
Alice	61.8	74.0	56.7	57.9	14.4	65.7	64.1
Expedition	62.3	56.3	58.4	58.8	14.9	57.4	58.9
Keldin	-	86.1	69.2	56.9	14.1	78.0	-
Dyna-Gro Long Branch	-	90.4	62.5	56.5	13.5	76.9	-
Langin	-	84.9	65.1	57.6	13.7	75.3	-
SY 517 CL2	-	72.2	59.1	60.2	14.8	65.9	-
WB4462	-	-	70.5	58.5	14.1	-	-
LCS Chrome	-	-	67.0	57.8	15.2	-	-
LCS Link	-	-	64.5	58.0	13.9	-	-
NHH144913-3	-	-	62.1	55.2	15.2	-	-
WB4418	-	-	59.4	56.3	14.2	-	-
WB4623CLP	-	-	58.4	54.6	15.7	-	-
SY Benefit	-	-	55.2	57.6	14.1	-	-
Trial Average#	68.9	75.4	65.4	57.7	14.4	70.3	68.7
LSD(0.05)†	7.0	9.6	7.3	1.7	0.6	13.3	9.2
C.V.%‡	6.9	5.7	5.4	1.5	2.1	5.7	6.1

Trial averages may include values from experimental lines that are not reported.
† Value required (≥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.

2018 South Dakota Winter Wheat Variety Trial Results Central Summary

Table 4. 2016-2018 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	2016 Yield (bu/a)	2017 Yield (bu/a)	2018			2-year Yield (bu/a)	3-year Yield (bu/a)
			Yield (bu/a)	Test Wt (lbs)	Protein %		
SY Sunrise	82.3	56.9	60.3	59.2	13.8	60.4	66.0
SY Monument	77.9	55.8	64.1	58.7	13.1	61.8	65.5
LCS Mint	81.6	52.3	61.0	61.6	13.2	58.4	64.5
SY Wolf	77.2	54.3	62.5	60.2	14.3	60.3	64.2
Overland	75.4	54.7	63.0	60.9	13.7	60.7	63.9
Cowboy	72.6	52.7	67.7	60.7	12.9	62.1	63.9
Avery	71.3	60.5	61.2	59.7	12.9	62.6	63.9
WB-Grainfield	76.6	52.5	62.5	59.6	13.6	59.3	63.5
Redfield	74.4	52.7	64.4	60.4	13.8	60.4	63.4
Ideal	67.3	55.1	68.1	60.9	13.6	63.5	63.1
Oahe	72.2	53.4	64.7	61.2	13.4	60.9	63.0
Thompson	73.0	53.8	63.2	60.1	13.9	60.3	62.9
Alice	78.6	48.8	60.3	60.0	13.8	56.3	62.2
Lyman	72.9	47.5	67.5	61.0	14.7	59.2	62.1
PSB13NEDH-7-140	77.4	51.2	58.4	60.9	14.5	56.6	61.9
Expedition	69.7	51.3	63.0	61.8	14.1	59.0	61.0
Wesley	72.7	47.8	62.0	59.3	14.1	56.8	60.4
Langin	-	58.6	62.9	60.5	13.2	62.5	-
Dyna-Gro Long Branch	-	58.7	60.9	59.3	13.1	61.6	-
Keldin	-	56.6	61.0	59.1	13.9	60.6	-
SY 517 CL2	-	48.1	55.5	61.7	14.2	53.6	-
WB4462	-	-	74.4	60.6	13.5	-	-
LCS Chrome	-	-	64.9	59.7	14.3	-	-
WB4418	-	-	64.1	59.4	13.3	-	-
SY Benefit	-	-	63.8	60.7	13.5	-	-
LCS Link	-	-	60.7	60.3	13.7	-	-
NHH144913-3	-	-	55.2	57.2	14.2	-	-
WB4623CLP	-	-	43.7	57.0	15.2	-	-
Trial Average#	75.0	53.5	64.2	60.2	13.7	58.8	64
LSD(0.05)†	6.2	5.4	6.0	1.4	0.4	7.1	6.5
C.V.%‡	8.2	15.9	10.3	1.8	3.6	13.1	11

Trial averages may include values from experimental lines that are not reported.
† Value required (≥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.

2018 South Dakota Winter Wheat Variety Trial Results Western Summary

Table 5. 2016-2018 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	2016 Yield (bu/a)	2017 Yield (bu/a)	2018			2-year Yield (bu/a)	3-year Yield (bu/a)
			Yield (bu/a)	Test Wt (lbs)	Protein %		
Cowboy	70.0	33.1	65.2	58.4	12.1	49.1	56.1
SY Monument	71.9	35.9	59.8	56.3	12.9	47.9	55.9
Ideal	65.5	39.3	61.2	57.7	12.9	50.2	55.3
LCS Mint	73.2	32.4	58.4	57.5	13.2	45.4	54.6
SY Wolf	67.9	38.2	57.3	56.2	13.4	47.7	54.5
Avery	70.1	36.7	55.7	56.7	12.2	46.2	54.2
Overland	68.4	38.6	55.2	57.2	13.2	46.9	54.1
PSB13NEDH-7-140	66.5	37.3	57.0	57.8	14.1	47.2	53.6
WB-Grainfield	71.0	33.8	52.5	56.8	13.0	43.1	52.4
Lyman	63.1	32.2	61.7	58.3	13.7	46.9	52.3
Wesley	66.0	36.6	53.8	56.5	13.8	45.2	52.1
Redfield	65.3	30.5	59.9	58.3	13.1	45.2	51.9
Oahe	65.9	32.4	55.9	57.7	13.2	44.1	51.4
SY Sunrise	67.9	29.7	55.1	56.3	12.8	42.4	50.9
Thompson	60.8	34.9	55.5	58.0	13.2	45.2	50.4
Expedition	61.4	32.9	52.5	56.9	13.3	42.7	49.0
Alice	62.6	30.0	53.4	56.9	13.3	41.7	48.7
Keldin	-	32.5	65.1	57.0	12.9	48.8	-
SY 517 CL2	-	33.2	57.6	57.5	13.4	45.4	-
Dyna-Gro Long Branch	-	34.5	54.6	56.6	12.8	44.6	-
Langin	-	37.4	48.1	56.2	13.0	42.7	-
SY Benefit	-	-	59.8	56.8	13.1	-	-
WB4462	-	-	57.8	56.7	13.2	-	-
LCS Chrome	-	-	57.2	57.9	13.7	-	-
WB4418	-	-	54.2	56.3	12.6	-	-
LCS Link	-	-	53.7	57.1	13.6	-	-
NHH144913-3	-	-	51.2	54.6	13.7	-	-
WB4623CLP	-	-	48.0	54.2	13.9	-	-
Trial Average#	66.9	34.8	58.9	57.2	13.2	45.8	52.7
LSD(0.05)†	4.5	4.7	6.7	1.8	0.5	7.2	4.6
C.V.%‡	10.0	20.9	10.4	3.7	4.5	14.4	12.3

Trial averages may include values from experimental lines that are not reported.
† Value required (≥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.