

2018 Winter Wheat Field Crop Trials Results



Minnesota Agricultural Experiment Station and the College of Food, Agricultural and Natural Resource Sciences

The success of a winter wheat variety depends largely on its ability to survive Minnesota winters. Research on the northern plains has shown that planting winter wheat in standing stubble using no-till methods will

decrease winterkill considerably. A stubble height of 4 to 6 inches is ideal but even shorter soybean stubble provides some protection. Trapped snow provides insulation that increases the odds that the young seedlings will

survive.

These performance evaluations are not designed for crop comparisons, because the spring and winter wheat trials are grown on different fields

Table 1. Agronomic characteristics of winter wheat varieties.

Entry	Agent or Breeder ¹	Year of Release	Class ²	Legal Status	Winterhardiness	Days to Heading	Plant Height	Straw Strength	Test Weight	Grain Protein
AAC Gateway	Seed Depot	2012	CWRW	PVP(94)	6	7	1	1	4	3
AC Broadview	Meridian Seeds	2008	CWRW	PVP(94)	9	8	2	6	6	5
AC Emerson	Meridian Seeds	2010	CWRW	PVP(94)	5	8	3	1	4	1
CDC Chase	Canterra Seeds	2013	CWRW	PVP(94)	6	6	6	6	4	4
Decade	MT/NDSU	2010	HRWW	PVP(94)	1	6	1	4	5	7
Flourish	SeCan	2010	CWRW	PVP(94)	5	5	3	5	9	5
Freeman	USDA-ARS/NE	2013	HRWW	PVP(94)	4	1	2	6	5	9
Ideal	SDSU	2011	HRWW	PVP(94)	1	6	1	8	5	7
Jerry	NDSU	2001	HRWW	None	6	6	5	5	5	7
Keldin	WestBred	2011	HRWW	PVP(94)	7	7	4	6	9	2
LCS Chrome	Limagrain Cereal Seeds	2016	HRWW	PVP Pending	5	3	7	4	5	2
LCS Link	Limagrain Cereal Seeds	2017	HRWW	PVP Pending	4	3	5	4	4	5
LCS Mint	Limagrain Cereal Seeds	2014	HRWW	PVP(94)	1	1	5	5	1	9
Loma	MT	2016	HRWW	PVP Pending	4	9	2	4	9	3
Moats	SeCan	2010	HRWW	PVP(94)	4	7	5	6	3	2
Northern	MT	2015	HRWW	PVP(94)	5	8	2	4	8	4
Oahe	SDSU	2016	HRWW	PVP Pending	5	2	5	4	3	7
Overland	NE	2006	HRWW	PVP (94)	1	4	3	3	5	6
Redfield	SDSU	2013	HRWW	PVP(94)	5	5	2	5	4	5
Ruth	NE	2015	HRWW	PVP Pending	4	3	2	5	4	9
SY Monument	Syngenta	2014	HRWW	PVP(94)	1	5	1	3	8	9
SY Sunrise	Syngenta	2015	HRWW	PVP(94)	1	3	1	3	8	5
SY Wolf	Syngenta	2010	HRWW	PVP(94)	1	3	1	1	5	5
Thompson	SDSU	2017	HRWW	PVP Pending	1	5	8	5	6	3
Warhorse	MT	2013	HRWW	PVP(94)	7	8	3	3	6	3
WB4462	WestBred	2016	HRWW	PVP(94)	5	1	5	4	4	6
WB4614	WestBred	2013	HRWW	PVP(94)	4	7	1	4	7	4
WB-Grainfield	WestBred	2013	HRWW	PVP(94)	5	1	1	8	3	6
WB-Matlock	WestBred	2010	HRWW	PVP(94)	5	6	3	1	3	4
Yellowstone	MT	2005	HRWW	PVP(94)	1	7	2	1	8	9
LSD (0.1)					2	1	1	2	1	1

¹MT = Montana State University, NDSU = North Dakota State University, NE = University of Nebraska/Husker Genetics, SDSU = South Dakota State University, USDA-ARS = USDA Agricultural Research Service.

²CWRW = Canadian Western Red Winter Wheat, HRWW = Hard Red Winter Wheat, SRWW = Soft Red Winter Wheat.

³1 = best, 9 = worst.

and with different management. The data should be used only to compare varieties within a table. Nonetheless, yield potential of winter wheat - if the crop maintains a stand of 23 plants per square foot or better – is routinely higher than spring wheat, especially in the southern half of the state.

The results of the variety performance evaluations are summarized in Tables 1 through 3. The winter wheat performance trials were grown near Roseau, Crookston, Kimball, St. Paul, Le Center and Lamberton in 2018. This past year was challenging: The trials near Roseau and Lamberton were lost completely due to winterkill while the trial in Crookston was lost due to hail and gopher damage yielded the trial in St. Paul unusable. It is for that reason

that no single year is presented.

Winter hardiness, relative maturity - as measured by the number of days to heading - plant height, and resistance to lodging have been converted to a 1-9 scale to allow for easier interpretation of the data (Table 1). Differences for all four characteristics are generally much less in the southern half of the state. In the northern half of the state the gap in characteristics widens. Presenting averages of the actual data therefore can be misleading. Varieties with lodging scores greater than 4 should be chosen with caution as lodging can reduce harvestability, yield, and quality. This is especially important if your soils are highly fertile.

While all winter wheat varieties

should be considered susceptible to very susceptible to Fusarium head blight (scab), they head earlier than spring wheat varieties and thus have a chance of escaping losses in grain yield and test weight and presence of deoxynivalenol or vomitoxin, a major food safety concern that can result in steep discounts. AC Emerson, Moats and Redfield provide the best genetic resistance among winter wheat varieties (Table 3). However, still consider these varieties to be more susceptible to Fusarium head blight than most spring wheat varieties. Most winter wheat varieties are also susceptible to very susceptible to the leaf diseases - including powdery mildew. Disease ratings for leaf diseases, stripe, leaf, stem rust, and scab are provided by North Dakota State University. Research results in the region indicate that fungicides to control leaf diseases early in the season and suppress scab at anthesis are nearly always warranted and should be considered an integral part of your production practices.

Project Leaders

Jochum Wiersma and Jim Anderson.

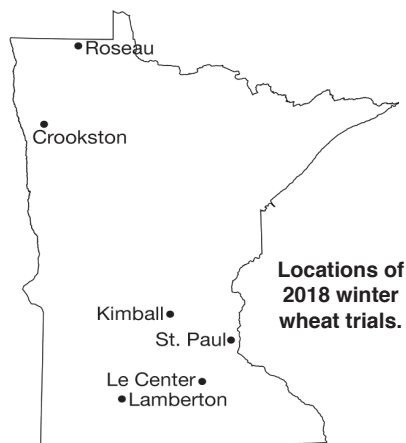
Test Plot Managers

Dave Grafstrom, Houston Lindell, Susan Reynolds, Steve Quiring and Donn Vellekson.

Table 2. Relative grain yield of winter wheat cultivars in Minnesota in multiple year comparisons (2016-2018).

Entry	Lamberton 2 Yr	Le Center 3 Yr	St. Paul 3 Yr	Kimball 2 Yr	Crookston 2 Yr	State ¹ 3 Yr
AAC Gateway	106	103	111	104	118	106
AC Broadview	85	96	90	92	102	92
AC Emerson	87	86	77	100	94	88
CDC Chase	108	95	80	119	92	96
Decade	84	98	96	107	96	90
Flourish	102	112	111	94	95	101
Freeman	87	108	108	127	105	110
Ideal	112	96	95	—	115	103
Jerry	68	91	76	112	89	90
Keldin	125	111	120	72	68	104
LCS Chrome	—	92	—	84	—	96
LCS Link	—	89	—	78	—	94
LCS Mint	—	94	—	113	—	104
Loma	108	86	104	75	103	96
Moats	105	95	81	124	95	97
Northern	117	87	87	76	90	92
Oahe	104	95	103	106	98	104
Overland	101	109	106	106	104	104
Redfield	106	105	122	123	104	110
Ruth	114	125	101	121	103	112
SY Monument	115	106	135	—	112	117
SY Sunrise	101	117	113	46	107	105
SY Wolf	103	117	114	103	111	111
Thompson	—	109	—	103	—	104
Warhorse	101	100	120	99	112	106
WB4462	—	82	—	100	—	100
WB4614	107	87	82	81	100	86
WB-Grainfield	74	115	100	128	81	100
WB-Matlock	90	97	97	118	107	102
Yellowstone	102	123	103	104	105	97
Mean (Bu/Acre)	99.7	85.5	70.4	57.4	86.8	82.7
LSD (0.1)	12	12	12	7	12	6

¹Includes data from trials in 2016 near Roseau.



Winter Wheat
Planting Rate and Date

Bushel Weight, Pounds.....60
 Seeds/Pound.....14,500
 Planting Rate, Pounds/Acre.....75+
 Planting Rate, Seeds/Sq. Ft.....25
 Planting Date.....Sept. 1 - Oct. 1

Table 3. Disease reactions to economically important diseases of winter wheat.

Entry	Powdery Mildew	Leaf Spotting Diseases ^{1,2}	(1-9) ³			
			Stripe Rust ²	Leaf Rust ²	Stem Rust ²	FHB ²
AAC Gateway	3	7	2	4	1	6
AC Broadview	5	—	4	1	1	9
AC Emerson	4	5	1	6	1	4
CDC Chase	4	—	1	1	1	6
Decade	6	4	8	9	1	9
Flourish	4	7	2	6	6	8
Freeman	4	—	—	—	—	7
Ideal	—	4	4	1	3	8
Jerry	3	8	8	3	1	8
Keldin	—	—	2	3	—	—
LCS Chrome	—	—	—	—	—	—
LCS Link	—	—	—	—	—	—
LCS Mint	—	—	—	—	—	—
Loma	—	—	1	—	1	8
Moats	4	7	1	1	1	3
Northern	—	6	1	8	1	8
Oahe	—	—	2	3	6	—
Overland	4	4	3	2	3	8
Redfield	3	—	4	6	8	3
Ruth	5	—	6	—	—	8
SY Monument	—	—	3	3	—	6
SY Sunrise	—	—	3	—	—	6
SY Wolf	3	1	3	4	1	6
Thompson	—	—	5	3	3	3
Warhorse	—	—	—	—	—	—
WB4462	—	6	7	3	—	8
WB4614	6	—	—	—	—	8
WB-Grainfield	5	6	—	6	—	8
WB-Matlock	3	—	6	6	1	6
Yellowstone	—	—	—	—	—	—
LSD (0.1)	1					

¹Includes tan spot and Septoria complex.

²Data provided by NDSU.

³1 = most resistant, 9 = least resistant.