

MONTANA COUNTIES



Performance Evaluations for Spring Wheat

2020

SPRING WHEAT VARIETY PERFORMANCE SUMMARY IN MONTANA

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INTRODUCTION

The agronomic characteristics of spring wheat varieties evaluated by the Montana Agricultural Experiment Station are compared in this publication with other varieties commonly grown in the state. The objective of this summary is to help farmers select the varieties which will perform best in their area. Data from 2016-2019 is provided for each of the testing sites. Data for varieties grown in previous years can be found on this website:

<http://plantsciences.montana.edu/crops/index.html>.

The map on the cover shows the districts in the state for purposes of reference for specific areas of adaptation. A brief description is given which may include a variety's particular advantages or disadvantages. The information was extracted from data collected and analyzed from the Advanced Spring Wheat nursery. These reports are prepared by research personnel of the Montana Agricultural Experiment Station.

VARIETY TESTING PROCEDURES

Locations

Typically, the Advanced Spring Wheat nursery is planted at 8 Montana sites; including Bozeman (dryland), Kalispell (dryland), Havre (dryland), Sidney (dryland and irrigated), Huntley (dryland), Moccasin (dryland) and Conrad (dryland).

Experimental Design and Data Collection

Varieties currently recommended, widely grown, or recently released are evaluated for agronomic performance in the Advanced Spring Wheat nursery. Also evaluated in these nurseries are experimental breeding lines tested against the check varieties

Agronomic data collected throughout the growing season includes heading date, plant height, lodging, disease and insect reactions. Experimental plots are trimmed, measured and harvested with small plot combines. The grain is weighed for yield and test weight. One trait important to wheat growers is resistance to the wheat stem sawfly. The major mode of resistance is a solid versus hollow stemmed variety. To evaluate this trait we cut several stems of each variety and score them on a scale of 1=hollow, 2=2/5 solid, 3=3/5 solid, 4=4/5 solid and 5=solid. The cuts are made in the center of each internode, so there are 5 scores per stem. The five scores are added up to get a total number ranging from 5=very hollow up to 25=very solid. Entries are submitted to the Cereal Quality Lab at MSU, Bozeman for protein, milling, baking and Asian noodle quality evaluation as needed. Data is analyzed and summarized for each location and overall comparisons are made to determine which varieties and/or experimental lines look promising for Montana producers. When sufficient data is collected and analyzed, promising experimental lines are submitted to the MAES wheat variety release committee.

ADDITIONAL DESCRIPTIVE INFORMATION ON SPRING WHEAT VARIETIES

Hard Red Spring Wheats

McNEAL – Developed from the cross RS6880/Glenman made by the Montana Agricultural Experiment Station. It was released in March 1995. McNeal is a semidwarf, hard red spring wheat with red chaff and tan straw. The spike is awned and mid-dense. The glumes are reddish brown with some white on the outer edges of the lemma and palea. Kernels are red, ovate, medium length with a short brush. The cheeks are slightly rounded with a medium crease. Under Montana growing conditions McNeal is moderately resistant to lodging. It is moderately resistant to prevalent races of stem rust and wheat streak mosaic virus. McNeal is moderately susceptible to leaf rust and stripe rust. It is susceptible to Russian wheat aphid and the wheat stem sawfly. Under some climatic conditions one white chaffed plant per 2,000 plants may appear in the field. McNeal's milling and baking qualities are acceptable by industry.

CHOTEAU – Developed and released by the Montana Agricultural Experiment Station in 2003. Choteau was derived from the cross of MT 9401/MT 9328. Choteau is a semidwarf hard red spring wheat with solid stems conferring tolerance to the wheat stem sawfly. The spike is lax and tapered with white awns and glumes. Kernels are red, ovate with a medium crease and brush. Choteau is resistant to the prevalent race of stem rust in Montana. Choteau has good grain protein and acceptable milling and baking quality. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

VIDA – Vida was derived from the cross of Scholar/Reeder made in 1998 by the Montana Agricultural Experiment Station. Vida was released in 2005. Vida is a high yielding hard red spring with moderate resistance to leaf and stripe rust but is moderately susceptible to stem rust. Vida is a semidwarf wheat with white glumes and awns. Kernels are red, ovate with rounded cheeks and a mid-deep crease. Vida has good milling and baking characteristics. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

DUCLAIR – Developed and released by the Montana Agricultural Experiment Station in 2011. Duclair was derived from a cross of Choteau//ND695/MT9433. Duclair is an awned semidwarf hard red spring wheat heading one day earlier than and growing ~ one inch taller than Choteau. Duclair generally has more solid stems than Fortuna but slightly less than Choteau. Duclair is resistant to the prevalent races of stem rust and has moderately good resistance to stripe rust in Montana. Duclair exhibits acceptable milling and baking traits. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

EGAN – Developed in response to identification of the orange wheat blossom midge (OWBM) as a serious yield and quality-reducing pest of spring wheat in the Flathead Valley in 2014. The source of resistance is a single gene, referred to as *Sm1*, which causes mortality of the young larvae feeding on developing seed. Egan has the pedigree (McNeal*5/Glupro)*2//CAP19/Choteau. Glupro was developed by North Dakota State University, and contains a chromosome segment from the wheat relative *Triticum dicoccoides*. CAP19 (Reeder/BW-277) was developed by North Dakota University and contains the *Sm1* gene for OWBM resistance. To avoid development of resistance in the OWBM to the effect of the *Sm1* gene, Egan should be grown in a 90:10 blend with an OWBM-susceptible spring wheat variety. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

NS PRESSER CLP – NS Presser CLP hard red spring wheat (*Triticum aestivum* L.) was developed by the Montana Agricultural Experiment Station and released in 2016 to the commercial partner Northern Seed LLC. NS Presser CLP is a two-gene Clearfield wheat intended for use with the selective imidazolinone herbicide imazamox (Beyond, BASF Corp.). NS Presser CLP was developed by a single backcross of alleles for resistance to the imidazolinone herbicide class into the recurrent parent Vida. Yield trials at sites in Montana showed that NS Presser CLP has yield potential under dryland production similar to Vida. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

LANNING – Lanning hard red spring wheat was released by the Montana Agricultural Experiment Station due to its yield potential in dryland areas of Montana and its superior end-use quality in 2016. Lanning was derived from the cross ‘Glenn’/MT0747 by single seed descent beginning in the F₂ generation. Lanning has grain yield similar to ‘Vida’ with higher grain protein and stronger gluten characteristics than Vida. Lanning is hollow-stemmed, suggesting that it will be susceptible to damage caused by the wheat stem sawfly (*Cephus cinctus* Nort.). This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

DAGMAR - Dagmar hard red spring wheat was released by the Montana Agricultural Experiment Station in 2019 due to its excellent yield potential in dryland areas of Montana, solid stems, and superior end-use quality. Dagmar was a selection from the cross MT1133/MT1148. Dagmar has similar grain yield potential to ‘Vida’ (PI 642366), the most widely grown cultivar in Montana. Stems of Dagmar are more solid than those of Vida, suggesting increased resistance to the wheat stem sawfly. Dagmar has higher grain protein and stronger gluten than Vida. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

FORTUNA – Developed from the cross Rescue/Chinook/3/(Frontana//Kenya58/Newthatch made at North Dakota Agricultural Experiment Station with the Crops Research Division of USDA cooperating. A joint North Dakota-Montana release was made in 1966. Fortuna is beardless with white chaff and straw. It is a solid-stemmed variety, resistant to the wheat stem sawfly. Fortuna is susceptible to Septoria and black chaff fungus. It has acceptable baking properties.

REEDER – Developed by the North Dakota Agricultural Experiment Station from the cross IAS#4/H567.71//Stoa/3/ND674. Reeder was released in 1999. Reeder is an awned, semidwarf hard red spring wheat. Reeder yields well especially in northeastern Montana and western North Dakota. Reeder has resistance to the upper Midwest races of stem and leaf rust. Milling and baking qualities are acceptable. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

WB9879CLP – WB9879CLP was derived from the cross of Choteau*3//Choteau/IMI8134 made in 2004 to be used as a Clearfield wheat. WB9879CLP is an awned semidwarf hard red spring wheat heading one and a half days later than Choteau while plant height is 30 inches the same as Choteau. WB9879CLP has solid stems similar to Choteau averaging 20-23 over two years. WB9879CLP exhibits acceptable milling and baking quality traits similar to Choteau. WB9879CLP is currently licensed exclusively to WestBred-Monsanto with PVP title V protection.

CORBIN – Developed and released by WestBred, LLC in 2006. Corbin is a hard red spring wheat derived from the cross Border/Conan. This line is best adapted to the wheat stem sawfly areas of Montana. Corbin is a one gene semi-dwarf with moderately strong straw. Disease/sawfly ratings for Corbin show it to be moderately resistant to stripe rust and similar to Conan for sawfly tolerance. Milling and baking quality is acceptable for the market class being grown in Montana, as determined by the MSU Quality Lab. This variety is protected under the Plant Variety Protection Act.

ONEAL – ONeal is a hard red spring wheat developed by WestBred, LLC from the cross McNeal/WestBred 906R and was released in 2008. ONeal is a hollow stemmed, semidwarf wheat with red chaff. ONeal heads about the same as McNeal and one day later than Choteau. ONeal is susceptible to stripe rust. Test weight of ONeal is average with grain protein, milling and baking traits similar to McNeal. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

WB GUNNISON – A hard red spring wheat developed by WestBred from the cross Conan/Agawam and released in 2011. WB-Gunnison is being released as a high quality hard red spring wheat that is intended to replace Conan and Corbin acres. Milling and baking quality data indicate that WB-Gunnison has acceptable quality. Disease/sawfly ratings for WB Gunnison show it to be MR to stripe rust. WB Gunnison is a hollow stemmed variety, but has high yields under wheat stem sawfly pressure due to relative non-preference in small plot nursery trials. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

BRENNAN – Brennan was developed by Syngenta Seeds, Inc. and released to AgriPro Associates in 2009. Brennan was derived from the cross Reeder//China Scab #140/N90-0690. It is a hollow stemmed, semidwarf, hard red spring variety that has shown good adaptation across the northern plains including several areas in Montana. It is resistant to stem and leaf rust and has good tolerance to leaf spotting diseases. Its scab rating is intermediate which would make it a good choice for use under irrigation. Brennan has acceptable overall breadmaking quality. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

MOTT – Developed by North Dakota State University and released by the North Dakota Agricultural Experiment Station in 2009. Mott was released primarily for its resistance to the wheat stem sawfly and adaptation to the western region of North Dakota. It is a medium-tall, awned wheat that matures approximately 2 days later than Reeder and Choteau. Mott is susceptible to moderately susceptible to prevalent races of leaf rust. It is resistant to moderately resistant to prevalent races of stem rust. It is susceptible to tan spot and resistant to Stagonospora leaf blotch. Mott has good milling and baking characteristics and better than average grain protein content.

SY TYRA – SY Tyra is a hard red spring wheat initially developed at Montana State University for release by Syngenta Seeds, Inc. It originated from a marker assisted backcross project with the final cross as Choteau/4*Norpro. It has a semi-solid stem which confers some tolerance to the wheat stem sawfly. Yield performance has been very good statewide. Test weight has been very high averaging one pound heavier than Choteau. It has medium maturity similar to Reeder. It is a short semidwarf with very good straw strength. Overall milling and baking characteristics are acceptable. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

SY SOREN – SY Soren is a hollow stemmed, hard red spring wheat developed by Syngenta Seeds, Inc. and released to AgriPro Associates in 2011. PVP, Title V certificate was issued in 2012. SY Soren was derived from the cross Norpro/Kelby. It has medium maturity and very good test weight. It is a short semi-dwarf, similar to Brennan. Straw strength is very good, between Kelby and Kuntz. It is resistant to stem rust and moderately resistant to leaf rust. It has very good tolerance to Fusarium head blight. Overall quality of SY Soren is acceptable. This variety is protected under the Plant Variety Protection Act and can only be sold or advertised by variety name as a class of certified seed.

PLANT VARIETY PROTECTION (PVP)

The developer of a new distinct variety may obtain protection (essentially a patent) for that variety if he/she chooses to do so, provided the variety meets the requirements of the Plant Variety Protection Act of 1970. This Act permits the owner or developer of a variety to prohibit others from selling, sexually multiplying, using for propagation for seed, or using to produce a hybrid, seed of his/her variety.

Two options, for plant variety protection, are available to the developer of the variety. Under the first option, the developer of the variety or his/her agent may sell either certified or uncertified seed of the variety. If the developer of the variety has reason to believe that anyone is infringing on his/her rights, he/she may resort to civil action. The other option ("certification option") for protecting a variety utilizes the provision of Title V of the Federal Seed Act. A variety protected in this manner may be sold by variety name only as a class of certified seed. It is the responsibility of the seller to inform the buyer if the variety is protected. Each container of seed sold should be labeled with a tag indicating the type of protection which the owner has. Under the first option, the label will state: "Unauthorized Propagation Prohibited - U.S. Protected Variety." If the owner of the variety has chosen the other option for variety protection, the label will state, "Unauthorized Propagation Prohibited - To be Sold by Variety Name Only as a Class of Certified Seed - U.S. Protected Variety."

PLEASE NOTE: Varieties protected under the PVP act, as amended in 1994, can no longer can be sold without permission of the variety owner (the farmer exemption has been excluded)'

A complete listing of all protected varieties is available in the "Official Journal of the Plant Variety Protection Office" which may be obtained upon request from:

Plant Variety Protection Office Warehouse Division, AMS U.S. Dept. of Agriculture
National Agricultural Library Beltsville, MD 20705

Phone: (301) 504-5518

Internet: <http://www.ams.usda.gov/science/pvpo/pvpindex.htm>

2016-2019 ADVANCED SPRING WHEAT NURSERY, KALISPELL : District 1

VARIETY	YIELD			TEST WEIGHT			PROTEIN			PLANT HEIGHT (IN)	HEADING DATE (JULIAN)
	(BU/AC)			(LB/BU)			(%)				
	2019	2017, 2019	2016, 2017, 2019	2019	2017, 2019	2016, 2017, 2019	2019	2017, 2019	2016, 2017, 2019	2017, 2019	
SY INGMAR	45.8	50.8	59.2	62.0	61.1	<u>61.3</u>	16.5	15.9	16.0	24.6	171.5
SY VALDA	54.0	51.8	67.2	60.5	59.5	60.3	14.1	14.2	14.1	23.8	171.0
SY ROCKFORD	44.1	51.2	57.6	59.0	58.8	59.0	15.3	15.1	14.8	23.9	175.5
WB GUNNISON	45.2	49.7	65.3	61.6	60.3	60.6	14.2	14.0	14.0	23.2	172.0
CORBIN	43.5	49.8	60.1	61.1	60.4	60.9	14.3	14.6	14.8	24.8	170.4
THATCHER	43.9	46.4	56.1	60.1	58.7	59.4	14.6	15.0	15.0	<u>32.4</u>	177.0
FORTUNA	38.3	45.4	60.1	60.0	59.8	60.3	15.0	14.8	15.1	31.2	172.4
REEDER	46.7	50.4	65.8	61.5	59.7	60.4	14.6	15.1	15.1	23.7	177.0
MCNEAL	49.9	52.7	64.0	60.5	58.8	59.3	14.8	14.9	15.2	26.0	176.5
CHOTEAU	38.8	44.9	55.9	59.8	59.1	59.6	15.2	15.1	15.1	23.2	174.2
VIDA	49.0	55.0	68.7	60.5	59.3	59.8	14.2	14.3	14.6	24.6	174.6
DUCLAIR	52.2	54.1	66.3	60.3	59.1	59.5	14.7	14.3	14.5	25.2	<u>170.2</u>
EGAN	42.9	47.8	65.5	59.9	57.9	58.4	<u>17.0</u>	<u>16.7</u>	<u>16.4</u>	25.1	175.5
LANNING	46.1	50.8	60.0	60.9	58.6	59.2	15.5	15.5	15.4	23.7	173.5
NS PRESSER CLP	<u>59.6</u>	<u>60.5</u>	<u>71.5</u>	60.7	59.0	59.6	13.6	14.2	14.3	26.9	176.8
WB 9879 CLP	42.9	48.1	56.9	59.8	59.4	59.5	15.4	15.3	15.3	25.0	173.3
ALUM	50.1	51.1	60.5	62.1	60.5	60.7	14.7	14.8	14.4	25.2	173.5
LCS REBEL ²⁾	56.4	58.4		62.7	61.4		15.0	14.9		27.7	171.4
DAGMAR ²⁾	50.1	56.0		60.8	59.9		14.9	14.9		24.9	170.8
WB 9590 ²⁾	44.4	51.2		60.3	59.4		15.6	15.4		22.0	170.5
WB 9719 ²⁾	38.8	47.3		<u>63.6</u>	<u>62.3</u>		15.3	15.0		22.9	175.7
LSD(0.05)	10.5	7.5	ns	0.5	1.6	1.2	0.4	0.9	0.8	2.3	1.8

1) No planting in 2018, 2) two year's data ('17,'19)

2016-2019 ADVANCED SPRING WHEAT NURSERY, BOZEMAN : District 2

VARIETY	YIELD				TEST WEIGHT				PROTEIN				PLANT HEIGHT	HEADING DATE	SOLIDNESS
	(BU/AC)				(LB/BU)				(%)				(IN)	(JULIAN)	(5-25)
	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2017-2019		
SY INGMAR	89.6	92.5	82.2	74.0	60.9	61.7	60.8	60.3	15.3	15.3	15.4	15.5	31.7	185.3	9.1
SY VALDA	92.7	102.1	89.4	80.2	60.6	61.2	60.5	60.4	14.3	14.4	14.7	14.6	31.1	184.7	7.9
SY ROCKFORD	<u>95.0</u>	99.6	88.3	78.7	58.6	60.0	59.6	59.3	14.2	14.1	14.4	14.6	33.3	187.9	8.3
WB GUNNISON	77.4	92.8	79.8	72.2	61.5	61.9	61.4	61.1	14.3	14.1	14.3	14.3	31.6	184.8	11.3
CORBIN	83.1	89.9	79.1	72.5	59.9	61.2	61.0	61.2	15.1	15.0	15.1	14.9	33.7	<u>183.4</u>	11.2
THATCHER	70.5	71.5	64.6	58.9	59.8	60.5	59.3	59.1	15.1	15.2	15.6	15.4	<u>45.0</u>	189.7	8.7
FORTUNA	78.5	76.2	69.2	63.8	59.7	60.9	60.8	61.0	14.8	14.8	14.9	14.8	42.5	186.1	15.2
REEDER	87.1	95.9	84.2	75.5	60.9	61.4	60.8	60.8	15.3	15.2	15.4	15.3	35.8	188.2	7.0
MCNEAL	74.8	79.2	73.1	67.3	59.7	60.3	59.4	59.3	15.7	16.0	15.9	15.6	34.1	188.3	7.7
CHOTEAU	82.6	91.3	79.6	72.2	58.7	60.4	59.7	59.9	15.3	15.2	15.3	15.3	33.0	185.7	22.1
VIDA	91.9	104.7	<u>92.1</u>	<u>84.4</u>	59.6	60.4	60.1	60.3	14.7	14.4	14.5	14.5	34.1	187.3	10.8
DUCLAIR	94.0	102.8	87.4	77.2	59.4	60.6	59.8	59.3	16.8	15.6	15.5	15.4	33.6	183.7	19.2
EGAN	81.6	86.0	75.1	67.4	59.5	60.4	59.7	59.5	<u>17.0</u>	<u>17.4</u>	<u>17.1</u>	<u>16.9</u>	33.9	187.7	7.5
LANNING	89.4	93.8	82.5	75.4	60.3	61.5	60.8	60.5	16.0	15.8	15.8	15.6	32.4	185.4	6.6
NS PRESSER CLP	89.1	96.9	86.7	79.2	58.7	59.5	58.9	59.1	14.8	14.8	15.1	14.9	35.2	189.1	7.8
WB 9879 CLP	89.5	93.5	81.8	72.5	58.8	60.3	60.1	60.1	15.3	15.0	15.2	15.3	33.0	186.2	<u>22.7</u>
ALUM	89.5	98.6	85.2	74.7	62.3	62.6	61.8	<u>61.4</u>	14.4	14.6	14.9	14.9	34.6	187.4	9.2
LCS REBEL ¹⁾	94.2	98.9	87.7		61.4	62.1	61.8		14.8	14.7	14.8		36.8	184.3	8.4
DAGMAR ¹⁾	89.1	96.8	86.4		60.1	61.3	60.9		15.3	15.4	15.5		33.8	183.8	15.0
WB 9590 ¹⁾	92.8	100.3	86.2		59.8	61.2	60.9		15.3	15.2	15.3		29.2	183.6	8.3
WB 9719 ¹⁾	94.3	<u>105.0</u>	90.7		<u>64.2</u>	<u>64.6</u>	<u>63.9</u>		14.3	14.2	14.4		31.4	188.1	7.2
LSD(0.05)	8.8	9.8	9.2	8.2	1REP	1.2	1.1	1.0	1REP	0.8	0.7	0.7	1.3	1.1	2.1

1) three year's data ('17-'19)

2016-2019 ADVANCED SPRING WHEAT NURSERY, HUNTLEY : District 3

VARIETY	YIELD			TEST WEIGHT			PROTEIN			PLANT HEIGHT	HEADING DATE
	(BU/AC)			(LB/BU)			(%)			(IN)	(JULIAN)
	2018	2017-2018	2016-2018	2018	2017-2018	2016-2018	2018	2017-2018	2016-2018	2017-2018	
SY INGMAR	68.0	73.3	78.1	62.2	61.5	62.0	15.6	15.3	14.4	34.9	165.3
SY VALDA	76.4	75.2	80.8	62.0	60.8	61.3	14.9	14.7	13.9	35.0	165.7
SY ROCKFORD	<u>82.9</u>	80.5	81.4	62.0	60.8	61.2	14.8	14.7	13.6	36.6	167.0
WB GUNNISON	63.8	67.1	73.7	61.9	60.3	61.1	14.4	14.0	13.5	35.6	164.9
CORBIN	68.6	73.8	78.4	62.3	61.6	62.2	15.4	14.7	13.5	37.4	163.2
THATCHER	61.4	62.2	59.4	60.3	59.5	60.4	15.7	15.8	15.1	<u>50.8</u>	168.9
FORTUNA	68.1	71.5	67.7	62.3	62.2	<u>62.3</u>	14.9	14.8	14.5	47.4	165.7
REEDER	68.2	74.1	78.5	59.9	60.3	61.3	15.6	15.5	14.5	40.4	165.7
MCNEAL	76.4	71.0	75.4	60.5	59.2	60.1	15.7	15.4	14.5	38.2	167.8
CHOTEAU	78.5	73.8	78.7	62.3	60.9	61.4	15.5	15.1	14.1	37.4	165.3
VIDA	74.9	79.6	82.7	61.5	60.9	61.2	14.4	14.4	13.5	37.7	166.0
DUCLAIR	79.9	78.6	<u>85.1</u>	62.1	60.4	61.0	14.6	14.6	13.7	37.7	163.2
EGAN	71.5	76.3	77.6	60.3	59.8	60.6	<u>17.4</u>	<u>17.1</u>	<u>16.1</u>	38.4	167.2
LANNING	74.0	78.0	78.0	61.3	61.2	61.4	15.8	15.3	14.5	36.4	163.9
NS PRESSER CLP	82.1	76.3	79.4	58.4	57.7	59.1	14.8	14.7	13.6	40.1	168.9
WB 9879 CLP	71.9	72.9	77.4	62.1	61.0	61.6	15.6	15.2	14.2	37.8	166.2
ALUM	69.8	74.4	79.4	61.4	60.2	61.3	14.7	14.8	13.7	38.5	166.4
LCS REBEL ²⁾	73.4	77.0		62.8	62.5		15.5	15.0		41.0	163.7
DAGMAR ²⁾	73.0	<u>81.3</u>		61.5	61.5		15.6	15.1		38.3	<u>163.0</u>
WB 9590 ²⁾	68.1	71.3		61.7	61.0		15.4	15.0		32.5	<u>163.0</u>
WB 9719 ²⁾	60.1	73.0		<u>63.2</u>	<u>62.6</u>		14.3	14.5		34.6	166.7
LSD(0.05)	7.5	ns	11	1.1	1.8	1.3	0.5	0.7	0.8	1.7	2.4

1) No harvest due to hail in 2019, 2) two year's data ('17-'18)

2016-2019 ADVANCED SPRING WHEAT NURSERY, MOCCASIN : District 4

VARIETY	YIELD				TEST WEIGHT				PROTEIN				PLANT HEIGHT	HEADING DATE
	(BU/AC)				(LB/BU)				(%)				(IN)	(JULIAN)
	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2017-2019	
SY INGMAR	52.8	52.5	45.6	42.3	60.4	62.0	60.5	<u>61.2</u>	13.0	12.5	13.2	13.2	28.9	178.1
SY VALDA	49.5	53.1	45.0	42.4	59.5	61.0	59.9	60.7	13.0	11.8	12.8	12.5	29.3	178.6
SY ROCKFORD	<u>61.4</u>	<u>59.4</u>	<u>51.9</u>	<u>48.0</u>	59.7	60.7	59.9	60.1	12.5	11.4	12.4	12.6	30.5	180.3
WB GUNNISON	53.2	57.6	49.3	44.8	59.7	61.0	59.8	60.5	13.1	11.8	12.6	12.4	28.2	178.3
CORBIN	53.2	52.8	45.5	41.3	60.1	59.9	59.2	60.1	13.4	12.2	13.1	13.2	29.7	177.7
THATCHER	27.5	36.2	33.2	32.8	55.0	57.9	56.6	57.2	<u>14.6</u>	12.8	13.8	13.6	<u>37.1</u>	182.6
FORTUNA	43.1	43.8	39.3	35.9	59.1	60.2	59.2	59.8	13.5	12.3	13.1	12.9	32.9	178.6
REEDER	43.8	50.4	44.4	42.1	60.6	61.5	60.1	60.8	12.8	11.8	12.7	12.6	30.5	178.8
MCNEAL	45.9	50.8	45.4	42.2	59.2	60.7	59.3	59.9	12.6	11.5	12.4	12.4	30.3	179.8
CHOTEAU	50.3	51.2	45.1	40.7	60.4	61.0	60.1	60.7	13.1	12.3	13.1	13.2	28.5	177.9
VIDA	53.5	55.2	47.3	43.7	59.3	60.5	59.2	60.0	11.8	10.8	11.9	11.9	28.9	179.0
DUCLAIR	47.6	49.2	44.1	41.1	60.0	60.7	59.3	59.9	12.7	11.7	12.6	12.4	29.4	177.8
EGAN	47.1	49.8	43.2	39.2	58.7	60.1	58.7	59.4	14.4	<u>13.1</u>	<u>14.1</u>	<u>14.2</u>	30.2	178.8
LANNING	59.1	57.7	50.3	46.6	61.2	61.6	59.8	60.5	12.5	11.6	12.5	12.2	28.9	<u>176.8</u>
NS PRESSER CLP	51.6	54.3	48.1	44.2	57.9	59.0	58.0	59.1	12.5	11.1	12.0	12.2	30.0	180.0
WB 9879 CLP	47.9	51.5	45.0	42.4	61.1	62.1	60.9	<u>61.2</u>	12.9	12.1	13.0	13.1	28.4	178.3
ALUM	42.1	50.4	44.8	44.0	58.0	60.4	59.6	60.5	13.4	11.9	12.8	12.6	29.5	179.0
LCS REBEL ¹⁾	49.3	54.4	47.3		61.1	62.1	60.8		12.7	11.4	12.6		32.2	178.1
DAGMAR ¹⁾	46.4	53.2	48.2		61.0	61.8	60.8		12.6	11.6	12.5		28.5	177.5
WB 9590 ¹⁾	56.9	57.3	49.2		60.4	61.5	60.1		12.7	11.9	12.9		26.7	177.7
WB 9719 ¹⁾	44.5	50.7	44.5		<u>62.6</u>	<u>63.3</u>	<u>61.9</u>		11.8	11.3	12.3		28.0	179.7
LSD(0.05)	8.0	8.6	6.3	ns	1.2	1.6	1.3	1.8	0.7	0.9	0.6	1.1	2.2	1.5

1) three year's data ('17-'19)

2016-2019 ADVANCED SPRING WHEAT NURSERY, CONRAD : District 5

VARIETY	YIELD				TEST WEIGHT				PROTEIN				PLANT HEIGHT	HEADING DATE	LODGING
	(BU/AC)				(LB/BU)				(%)				(IN)	(JULIAN)	
	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2017-2019		
SY INGMAR	53.7	59.5	57.6	60.6	61.4	59.8	59.6	60.8	15.2	15.4	15.5	15.2	28.3	176.0	18.5
SY VALDA	50.1	63.1	61.2	63.9	62.0	60.0	59.5	60.8	15.0	14.8	14.8	14.3	28.4	176.1	20.5
SY ROCKFORD	45.3	55.4	55.1	59.4	59.7	58.1	57.7	58.8	14.9	14.8	14.7	14.4	28.2	178.5	27.4
WB GUNNISON	58.1	65.1	64.1	64.6	62.7	61.2	60.5	61.3	13.3	13.5	13.7	13.4	29.1	176.7	3.3
CORBIN	51.6	60.5	59.7	61.2	62.9	61.1	60.1	61.1	14.2	14.3	14.6	14.3	28.8	175.3	5.4
THATCHER	35.3	45.9	46.8	47.5	57.7	57.0	56.4	57.9	15.0	15.0	15.1	14.6	35.9	180.0	33.1
FORTUNA	54.0	57.1	56.3	57.6	62.1	60.5	59.8	60.7	13.9	14.3	14.4	14.1	33.2	177.5	12.8
REEDER	46.2	57.7	61.1	61.6	61.9	59.9	59.4	60.4	15.5	15.5	15.4	15.0	30.2	177.3	22.5
MCNEAL	50.9	55.6	56.0	55.5	61.2	59.1	58.2	59.4	13.9	14.4	14.4	14.0	30.1	177.7	28.9
CHOTEAU	53.0	60.0	60.0	60.1	60.7	59.4	59.0	59.8	14.7	14.9	15.1	14.7	28.5	176.4	7.1
VIDA	58.1	64.6	62.3	65.1	61.9	59.4	58.8	59.8	14.1	14.3	14.2	14.0	28.5	177.2	10.6
DUCLAIR	54.2	63.6	62.7	62.0	60.9	59.5	58.6	59.1	15.6	15.1	15.1	14.7	29.2	174.8	6.7
EGAN	46.3	54.6	54.9	57.6	60.1	58.3	57.9	59.2	15.6	15.9	15.8	15.5	28.4	176.5	27.7
LANNING	49.3	62.8	61.4	62.7	61.5	59.9	59.0	59.9	15.5	15.4	15.4	15.1	28.8	176.4	19.7
NS PRESSER CLP	57.1	66.9	66.4	66.9	61.5	58.8	58.2	59.0	14.0	14.5	14.4	13.9	31.4	180.5	13.6
WB 9879 CLP	59.4	62.6	63.3	62.4	61.3	59.3	59.3	60.1	15.2	15.5	15.3	15.0	28.7	177.6	7.9
ALUM	46.7	52.1	57.1	59.6	60.4	59.1	58.9	60.5	14.7	14.9	14.6	14.2	28.8	177.2	18.9
LCS REBEL ¹⁾	46.5	58.3	60.6		63.9	61.1	60.5		15.5	15.4	15.3		30.1	175.5	22.5
DAGMAR ¹⁾	66.7	76.3	74.0		62.7	61.0	60.4		14.8	15.0	15.0		30.4	175.3	6.7
WB 9590 ¹⁾	50.6	58.6	57.3		62.4	60.5	60.2		15.7	15.6	15.7		26.2	175.3	16.5
WB 9719 ¹⁾	64.2	70.8	68.3		65.2	62.7	61.9		13.9	14.3	14.3		28.6	177.8	15.5
LSD(0.05)	9.0	9.0	8.0	7.1	1.4	1.3	1.5	ns	0.7	0.7	0.5	0.7	1.8	3.2	11.3

1) three year's data ('17-'19)

2016-2019 ADVANCED SPRING WHEAT NURSERY, HAVRE : District 5

VARIETY	YIELD				TEST WEIGHT				PROTEIN				PLANT HEIGHT	HEADING DATE
	(BU/AC)				(LB/BU)				(%)				(IN)	(JULIAN)
	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2017-2019	
SY INGMAR	44.6	42.9	38.8	39.4	60.6	61.2	60.6	<u>60.0</u>	16.3	16.2	16.2	16.1	26.5	170.0
SY VALDA	47.5	44.9	39.3	39.1	59.9	60.0	60.0	59.6	15.9	16.1	16.1	15.8	25.4	170.1
SY ROCKFORD	45.2	44.7	40.2	40.5	57.9	58.8	58.5	57.9	15.8	15.7	15.7	15.7	27.0	171.1
WB GUNNISON	<u>52.6</u>	44.7	38.7	37.5	60.2	60.3	59.7	59.0	15.1	15.2	15.2	15.1	25.4	170.1
CORBIN	45.6	43.2	36.9	39.1	59.9	60.4	59.9	59.6	16.5	16.6	16.5	16.1	25.8	168.1
THATCHER	37.6	35.9	33.1	32.9	54.1	54.9	55.2	55.3	16.3	16.6	16.3	16.3	<u>35.3</u>	173.3
FORTUNA	41.2	38.3	34.6	35.1	58.0	58.7	58.4	58.6	15.7	15.7	15.6	15.7	32.1	170.9
REEDER	42.3	42.9	38.5	40.1	59.7	59.8	59.3	59.0	15.9	15.9	15.9	15.7	28.0	170.1
MCNEAL	47.0	43.4	39.8	39.7	58.5	58.0	57.7	57.2	15.5	15.8	15.8	15.7	29.2	170.7
CHOTEAU	44.5	40.6	35.8	36.1	58.8	59.2	58.7	58.6	16.6	16.4	16.4	16.2	25.6	170.6
VIDA	52.1	48.2	<u>44.2</u>	<u>43.3</u>	59.4	59.5	59.2	58.5	15.4	15.2	15.3	15.4	26.2	171.4
DUCLAIR	49.2	42.1	36.9	37.3	58.6	59.2	58.5	58.3	16.1	16.0	16.1	16.0	25.1	168.3
EGAN	44.1	41.6	37.5	39.8	57.2	57.3	56.9	56.9	<u>17.1</u>	<u>17.3</u>	<u>17.2</u>	<u>17.2</u>	26.4	170.6
LANNING	44.5	44.3	38.7	40.5	59.9	59.2	58.9	58.7	16.8	16.5	16.6	16.5	25.2	169.1
NS PRESSER CLP	46.8	45.9	42.3	40.6	58.4	58.5	58.5	57.4	15.7	15.5	15.4	15.5	27.6	173.0
WB 9879 CLP	51.4	48.0	41.6	42.1	58.8	59.3	58.9	58.6	16.5	16.4	16.3	16.2	25.9	170.6
ALUM	50.0	45.0	40.2	43.0	59.5	59.8	59.4	59.4	15.4	15.6	15.7	15.7	26.2	170.9
LCS REBEL ¹⁾	44.0	41.2	35.6		59.8	60.6	60.5		16.5	16.4	16.5		28.2	168.0
DAGMAR ¹⁾	50.1	47.1	41.2		59.3	60.2	59.9		16.3	16.2	16.2		26.3	168.0
WB 9590 ¹⁾	45.9	42.2	36.0		60.3	60.9	60.9		16.5	16.5	16.4		22.7	<u>167.6</u>
WB 9719 ¹⁾	49.6	<u>48.4</u>	43.0		<u>61.6</u>	<u>61.9</u>	<u>61.4</u>		15.5	15.4	15.4		25.4	172.0
LSD(0.05)	5.1	5.6	ns	4.9	0.6	1.2	1.1	1.2	0.3	0.5	0.4	0.5	2.9	ns

1) three year's data ('17-'19)

2016-2019 ADVANCED SPRING WHEAT NURSERY, SIDNEY (Dry) : District 6

VARIETY	YIELD				TEST WEIGHT				PROTEIN				PLANT HEIGHT	HEADING DATE
	(BU/AC)				(LB/BU)				(%)				(IN)	(JULIAN)
	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2017-2019	
SY INGMAR	84.7	65.7	54.4	51.8	63.2	64.2	63.5	63.6	<u>14.9</u>	15.4	15.0	14.5	26.5	170.7
SY VALDA	88.9	73.8	57.2	54.5	63.3	63.9	63.4	63.4	13.9	14.1	14.1	13.6	27.1	170.4
SY ROCKFORD	<u>98.9</u>	74.8	61.4	58.0	62.2	62.6	62.2	62.1	13.0	13.9	13.9	13.4	27.9	172.2
WB GUNNISON	73.5	64.0	51.2	47.5	63.4	63.6	63.2	63.4	13.2	13.9	13.8	13.3	26.4	170.5
CORBIN	80.8	65.7	51.7	49.6	62.7	63.4	63.0	63.1	14.1	14.7	14.5	13.9	28.3	168.5
THATCHER	76.6	61.5	46.7	43.8	61.0	60.9	59.5	60.0	13.5	14.7	14.7	14.3	<u>34.1</u>	174.8
FORTUNA	70.8	56.6	47.5	45.4	62.2	62.7	62.2	62.3	13.3	14.0	14.1	13.9	31.4	171.3
REEDER	88.1	75.0	60.6	58.1	63.4	63.6	63.1	63.2	14.0	14.5	14.3	14.0	28.9	170.0
MCNEAL	87.5	75.1	58.0	54.6	62.9	63.1	61.8	61.8	12.8	13.5	13.7	13.7	29.4	173.2
CHOTEAU	91.8	71.0	54.0	52.1	62.3	62.9	62.1	62.2	13.9	14.6	14.4	13.9	27.1	171.5
VIDA	86.3	73.7	61.3	57.3	62.5	63.2	62.8	62.3	13.2	13.8	13.4	13.5	27.4	171.4
DUCLAIR	86.9	69.6	53.8	51.7	62.3	62.7	61.9	62.1	13.1	14.1	14.2	13.6	26.8	<u>167.9</u>
EGAN	79.7	64.8	52.2	48.5	62.1	62.3	60.8	61.1	14.7	<u>15.8</u>	<u>15.6</u>	<u>15.2</u>	26.9	172.3
LANNING	84.3	70.6	56.4	53.2	62.8	63.0	62.6	62.8	<u>14.9</u>	15.3	15.0	14.2	26.4	168.1
NS PRESSER CLP	91.7	74.6	62.0	<u>58.3</u>	62.0	62.4	61.9	61.8	13.4	14.1	13.6	13.4	29.8	174.3
WB 9879 CLP	86.2	69.1	55.8	51.8	62.5	63.2	62.7	62.9	13.0	14.0	14.1	13.5	26.8	172.0
ALUM	89.1	75.2	58.7	55.9	63.6	64.4	63.7	<u>63.8</u>	12.6	13.6	13.7	13.3	27.4	171.3
LCS REBEL ¹⁾	84.2	67.8	55.3		64.2	64.8	64.6		14.2	14.9	14.7		28.6	168.8
DAGMAR ¹⁾	82.8	70.5	57.7		63.2	63.6	63.4		13.6	14.3	14.3		27.3	168.0
WB 9590 ¹⁾	85.4	72.0	58.3		63.3	64.1	64.2		14.3	14.6	14.4		24.6	168.9
WB 9719 ¹⁾	97.8	<u>79.7</u>	<u>62.4</u>		<u>66.4</u>	<u>66.3</u>	<u>65.3</u>		13.0	14.3	14.0		26.7	171.6
LSD(0.05)	7.5	8.3	8.0	6.3	0.8	0.8	1.2	1.0	0.8	0.8	0.7	0.8	2.1	1.4

1) three year's data ('17-'19)

2016-2019 ADVANCED SPRING WHEAT NURSERY, SIDNEY (Irrigated) : District 6

VARIETY	YIELD				TEST WEIGHT				PROTEIN				PLANT HEIGHT	HEADING DATE
	(BU/AC)				(LB/BU)				(%)				(IN)	(JULIAN)
	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2019	2018-2019	2017-2019	2016-2019	2017-2019	
SY INGMAR	95.5	95.7	94.1	88.0	62.4	63.4	63.7	<u>63.1</u>	15.5	15.5	14.5	14.5	31.7	176.0
SY VALDA	96.6	<u>101.3</u>	99.4	<u>94.1</u>	63.0	63.5	63.3	62.9	14.9	15.1	13.7	13.7	31.9	175.1
SY ROCKFORD	<u>97.9</u>	97.1	98.6	90.8	60.5	61.4	61.5	60.5	14.8	14.9	13.9	14.0	33.0	177.0
WB GUNNISON	77.4	78.7	79.4	74.7	62.1	62.6	63.1	62.8	14.6	14.8	13.7	13.8	30.0	175.2
CORBIN	82.3	80.8	87.2	80.3	61.8	62.5	62.9	62.3	15.7	15.6	14.8	14.8	32.3	172.7
THATCHER	65.5	68.6	71.9	66.6	60.2	61.0	61.3	60.7	<u>16.4</u>	16.1	14.9	14.9	<u>40.8</u>	179.8
FORTUNA	68.2	68.7	73.5	68.4	60.7	61.3	61.9	61.4	15.5	15.4	14.6	14.7	38.6	175.3
REEDER	94.6	94.2	95.3	89.1	62.1	62.6	63.0	62.6	15.5	15.7	14.9	15.0	35.2	175.3
MCNEAL	90.7	88.8	90.9	84.7	61.0	61.6	61.9	61.5	15.7	15.6	14.5	14.5	33.7	176.8
CHOTEAU	82.7	83.4	85.8	82.1	60.9	61.5	61.8	61.3	15.0	15.1	14.0	14.2	32.5	176.0
VIDA	97.6	95.2	97.5	88.1	61.9	62.0	62.3	61.4	15.4	15.1	13.8	14.2	32.7	176.0
DUCLAIR	88.3	88.3	90.7	85.7	60.9	61.7	61.8	61.5	14.8	15.0	13.9	14.0	33.2	172.8
EGAN	88.2	83.9	84.9	80.1	61.0	61.4	61.7	61.1	15.8	15.9	<u>15.1</u>	<u>15.3</u>	33.0	176.1
LANNING	97.5	94.3	95.1	89.3	61.0	61.8	62.2	61.7	15.9	16.0	14.8	15.1	32.5	173.0
NS PRESSER CLP	89.5	84.6	91.4	82.0	60.7	60.8	61.3	60.0	15.1	15.0	13.9	14.2	35.2	177.9
WB 9879 CLP	80.7	82.9	86.6	82.1	60.5	61.5	61.9	61.5	16.0	15.8	14.5	14.5	32.4	176.2
ALUM	83.8	89.5	91.8	84.9	62.6	63.2	63.7	62.6	15.3	15.2	14.1	14.3	32.9	174.9
LCS REBEL ¹⁾	90.7	92.3	94.1		63.3	63.9	64.2		15.8	16.0	15.0		34.5	172.5
DAGMAR ¹⁾	95.6	94.2	97.0		61.9	62.3	62.7		15.9	<u>16.3</u>	14.9		33.2	<u>172.1</u>
WB 9590 ¹⁾	93.0	93.1	94.8		61.8	62.4	62.7		15.9	16.1	14.9		28.6	172.3
WB 9719 ¹⁾	97.0	99.8	<u>101.2</u>		<u>64.8</u>	<u>65.3</u>	<u>65.7</u>		15.0	15.1	14.2		31.4	176.5
LSD(0.05)	7.2	10.3	7.6	7.4	0.9	0.7	0.6	0.9	0.7	0.7	0.6	0.6	2.2	1.7

1) three year's data ('17-'19)

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