

Title: North Central Montana Off-Station Spring Wheat Variety Performance Evaluations

Principal Investigator: Peggy F. Lamb, Research Scientist, Northern Ag Research Center, Havre

Project Personnel: Luther E. Talbert, Breeder/Geneticist, Spring Wheat, Bozeman
Hwa-Young Heo, Research Associate, Spring Wheat, Bozeman
Kasee Clark, Research Associate, Havre
Kyla McNamara, Research Associate, Havre
Jesse Fulbright, Liberty County Extension
Tyler Lane, Chouteau County Extension
Marko Manoukian, Phillips County Extension
Julianne Snedigar, Blaine County Extension

Cooperators: Max Cederberg, Landowner, Turner
Kurt Kammerzell, Landowner, Chester
Pete Lumsden & John Flansaas, Landowners, Loring
Lyle McKeever & Terry McKeever, Landowners, Loma

Objectives:

Diverse cropping environments exist within the five-county area most closely served by Northern Agricultural Research Center. Winter wheat, spring wheat, barley, durum and oat production together in the five counties (Blaine, Chouteau, Hill, Liberty and Phillips), represents just over 28 percent of the 2013-2017 statewide cereal production totals (43 percent for winter wheat and 25 percent for spring wheat). Producers are keenly interested in variety performance data generated under local conditions. It is our objective, within budget and other resource limitations, to evaluate small grain variety performance, over time, under conditions representative of specific areas of northern Montana, yet differing from that of the Research Center. Growers are provided reliable, unbiased, up-to-date information to make comparisons among improved spring wheat varieties. This report provides producers in north central Montana the information necessary to select varieties best suited for their specific area and growing conditions.

Methods:

Standard off-station spring wheat variety performance trials were conducted on chemical fallow or minimal tillage during 2018 in four northern Montana counties.

Dryland Spring Wheat Trials:

- | | |
|-------------------------------------------|---------------|
| 1. Cederberg Farm, Blaine County | S13-T36N-R25E |
| 2. Flansaas/Lumsden Farm, Phillips County | S24-T35N-R29E |
| 3. McKeever Farms, Chouteau County | S16-T27N-R10E |
| 4. Kammerzell Farm, Liberty County | S11-T31N-R05E |

All four spring wheat trials consisted of 22 entries and were seeded in replicated, 3-row, 22-foot plots on a 12-inch row spacing, utilizing a self-propelled cone seeder with Atom Jet paired row openers. All rows of each plot were trimmed to a harvest length of approximately 17 feet with a three-point rototiller. Plant height was measured from the soil surface to the top of the head, excluding awns, and percent sawfly cutting was visually estimated for each plot immediately prior to harvest. A 'Wintersteiger Classic' plot combine, funded in part by the Montana Wheat and Barley Committee, was used to harvest each 3-row plot. Seed was cleaned prior to measuring plot weight for yield determination. Protein, test weight and moisture content were determined using a Foss Infratec 1241 near infrared analyzer. Falling number was determined using a Perten FN1700 according to the FGIS Directive 9180.38. Other variables specific to each individual trial are listed with the current year data tables.

Please note that research trial yield results recorded under wheat stem sawfly pressure are likely much higher than a producer should expect. Small plot variety trials are managed to assess maximum yield potential and are harvested in such a way that all stems and heads are picked up by the combine, regardless of lodging or cutting due to sawfly. Pickup guards coupled with an extremely slow ground speed and an exceptionally low cutting height help researchers collect all heads in order to assess seed yield potential. If you are a producer in a wheat stem sawfly environment, although hollow stemmed varieties may be high yielding in research trials in your area, we strongly recommend against growing those hollow stemmed varieties. Please be aware that if you seed hollow stemmed varieties with sawfly present, you are only creating a breeding ground for future generations of sawfly in your area and not helping combat

the pest population.

Results:

Following late seeding and early high temperatures, the spring wheat trial yields at Turner averaged nearly 36 bu/ac (Table 1). For the second year in a row, Northern Seeds 'NS Presser CLP' was the top yielding entry producing 40.4 bu/ac. 'Alum', 'Brennan', 'Choteau', 'Lanning', 'LCS Pro', 'Reeder', 'SY Ingmar', 'Vida', 'WB Gunnison' and the breeding line 'MT 1651' all produced yields statistically equal to that of NS Presser CLP. Test weight of all spring wheat entries was very good for this site, averaging over 60 lb/bu. Following a severe hailstorm in 2014, there were consecutive years with no sawfly cutting or infestation in the spring wheat trial at Turner, and only minimal cutting in 2017 and 2018. Stand percent, plant height, yield, protein, falling number and sawfly cutting data for the 2018 Turner dryland spring wheat trial are summarized in Table 1.

Comparable averages are calculated using a standard check variety when not all entries are present in a specific trial for all years. Variety means are adjusted by multiplying the actual check mean by the ratio of the individual variety mean compared to the check mean for the same years as tested. All varieties are then directly comparable to each other when in the same nursery. A minimum of three years of data is necessary to be included in the comparable average calculation. Nine-year comparable averages (2009-2018) for spring wheat seed yield and test weight at Turner are summarized in Table 2, while nine-year comparable averages for sawfly cutting are summarized in Table 3.

Loring spring wheat yields averaged just under 33 bu/ac with NS Presser CLP, a 2-gene Clearfield spring wheat, producing the highest yield at over 40 bu/ac (Table 4). Vida, at nearly 39 bu/ac, was the only other entry to produce a seed yield statistically equal to that of NS Presser CLP. For the fourth consecutive year, sawfly cutting was virtually nonexistent in the trial at the Loring site. Stand percent, plant height, yield, test weight, moisture, protein, falling number and sawfly cutting data for the 2018 Loring dryland spring wheat trial are summarized in Table 4. Nine-year comparable averages for spring wheat seed yield and test weight at Loring are summarized in Table 5, while nine-year comparable averages for sawfly cutting are summarized in Table 6.

In 2013, off-station spring wheat trials were re-established near Loma. The late seeding date coupled with the lack of timely precipitation following seeding, limited spring wheat yields and test weights. Seed yields averaged 32.8 bu/ac (Table 7). A Syngenta variety, SY Ingmar, was the highest yielding entry at nearly 38 bu/ac. Brennan, SY Soren, and two Montana breeding lines, 'MT 1621' and MT 1651, produced yields statistically equal to that of SY Ingmar. Due to late seeding, sawfly damage in the spring wheat small plot scenario was low again this year, averaging only 2.6 percent cutting. Stand percent, plant height, yield, test weight, protein, falling number and sawfly cutting data for the 2018 Loma dryland spring wheat trial are summarized in Table 7. Six-year comparable averages for spring wheat seed yield and test weight at Loma are summarized in Table 8, while six-year comparable averages for sawfly cutting are summarized in Table 9.

The Chester area received early season moisture, resulting in great spring wheat establishment and prolific tillering to set the trial up for high yield potential. However, lack of timely rainfall coupled with high temperatures from flowering through seed set, had an adverse effect on the spring wheat. Seed yields averaged just over 38 bu/ac, while test weights averaged less than 56 lb/bu (Table 10). Montana State University breeding line MT 1621 was the highest yielding entry at just under 45 bu/ac. 'MT 1651', Brennan, 'Egan', Lanning, NS Presser CLP, 'Oneal', Reeder and Vida, yields were statistically equal to that of MT 1621. Sawfly cutting in the small plot scenario averaged just over five percent in 2018, however, there were three lines that were cut and lodged between 14 and 18 percent. Stand percent, plant height, yield, test weight, protein, falling number and sawfly cutting data for the 2018 Chester dryland spring wheat trial are summarized in Table 10. Five-year comparable averages for spring wheat seed yield and test weight at Chester are summarized in Table 11, while five-year comparable averages for sawfly cutting are summarized in Table 12.

Summary:

Cropping environments for 2018 started out with an abundance of early snow and very good soil moisture recharge, however, all spring cereal trial sites were seeded later than anticipated due to prolonged snow cover and wet soil conditions throughout April. Although winter months were wetter than normal, spring and summer months during the growing season were slightly warmer than average with drought conditions persisting across north central Montana. Both Turner and Loring received near average rainfall for the year, however the precipitation events were not always timely. The Turner site was seeded into a mechanical fallow field, as the producer is still dealing with soil drifts from a windstorm in 2017. The Loma location was seeded into chemical fallow ground that had been minimally tilled to

eliminate potential weed issues. The Chester area also started out with excellent recharge soil moisture, and timely spring precipitation resulted in a very good stand, and producing a high number of tillers. However, prolonged heat and lack of moisture from flowering through grain fill, limited the seed yield and test weight of the spring cereals.

This work has been strongly supported by producers near each of the off-station locations, and by the Northern Agricultural Research Center Advisory Council. With budget and other resources allowing, it is planned to continue off-station cereal variety investigations in the five-county area. The Loring location is entering its twenty-fourth year, and the cooperator and area producer interest and support has been outstanding. The Turner location is only 32 miles from the Loring site, but growing conditions are quite different. Cooperator and producer support in the Big Flat area has been outstanding through the years with 2018 marking 35 years at the present Turner site. Various winter and spring cereal trials have been conducted with great producer support at the Chouteau County location, between Big Sandy and Loma, since 1998. The Chester location was reestablished in 2014 following a prolonged absence of uniform off-station spring cereal testing in Liberty County.

Recognition:

This research would not have been possible without the assistance of the following seasonal employees: Tawnya Brown, Daisen Fox, Marca Herron and Cordell King.

TABLE 1. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2018. (Exp# 18-9951-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/	TEST WT Lbs/Bu	2/	3/	4/
				YIELD Bu/Ac		PROTEIN %	FN Seconds	SAWFLY %
WSCIA	ALUM	91.1	24.0	37.8	60.8	16.0	331	0.7
AGRIPR10	BRENNAN	91.8	21.1	37.2	61.5	17.4	333	0.7
PI633974	CHOTEAU	100.0	21.7	37.0	60.2	16.8	334	0.0
BZ996434	CORBIN	89.5	22.1	30.2	60.9	16.5	337	1.0
PI660981	DUCLAIR	91.8	23.1	28.7	59.3	16.2	318	0.3
PI 671855	EGAN	90.8	24.8	35.0	58.1	18.1	356	1.0
CI 13596	FORTUNA	97.3	26.4	28.8	60.8	15.7	305	0.7
PI 676978	LANNING	100.0	23.8	39.5	59.3	16.9	329	1.0
LIMAGR143	LCS Pro	94.3	27.1	39.3	60.4	16.1	327	0.7
PI 679964	NS PRESSER CLP	90.0	25.1	40.4	59.4	15.9	337	0.3
BZ999592	ONEAL	100.0	23.6	35.7	60.3	16.5	339	0.3
ND 695	REEDER	94.5	21.1	36.8	60.0	16.5	333	0.7
AGRIPR141	SY INGMAR	94.7	22.4	39.0	61.9	16.5	353	0.0
AGRIPR14	SY SOREN	92.0	22.8	32.1	61.5	17.0	344	0.7
PI642366	VIDA	87.2	22.7	39.3	60.4	15.3	318	0.0
BZ92413R	WB GUNNISON	95.7	23.0	37.7	60.8	15.2	351	0.7
WB9879CLP	WB9879CLP	84.3	22.2	32.6	60.5	17.1	350	0.0
HRS 3504	WINFIELD 3504	87.6	21.1	35.6	60.8	15.5	349	0.3
HRS 3616	WINFIELD 3616	89.1	23.2	36.2	60.8	17.4	336	0.7
MT 1621	MT1148/MT1133	86.6	22.1	35.4	60.5	16.3	322	0.7
MT 1651	MT1148//CHOTEAU/MT0614	90.6	23.1	37.5	60.9	16.7	353	0.7
MT 1673	DuclairxMcNeal/Glupro,+,fam72-17	95.6	22.7	34.7	58.0	17.0	316	0.0
EXPERIMENTAL MEANS		92.5	23.1	35.7	60.3	16.5	335.0	0.5
LSD (0.05)		16.6	1.9	4.1	0.7	0.4	8.9	0.7
C.V.%		10.9	5.1	6.9	0.7	1.3	335.0	91.0
P-VALUE (Varieties)		0.9081	<.0001	<.0001	<.0001	<.0001	<.0001	0.0832

1/ Volumetric yields are based on plot weights adjusted to uniform 13 percent grain moisture and 60 lbs/bu as the standard test weight for wheat

2/ Protein values are adjusted to 13 percent grain moisture.

3/ FN is the falling number value reported in seconds adjusted to 14 percent flour moisture.

4/ Sawfly rating is reported as the percentage of cut stems.

Bold indicates highest value within a column.

Bold indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05).

Management Information (18-9951-SW)

Seeding Date: May 7, 2018
 Harvest Date: August 22, 2018
 Fertility: 100-20-10-10 side banded
 System: Till
 Herbicide: Bromac-16oz/ac, Affinity-1oz/ac
 Insecticide: none
 Previous Crop: Chemical Fallow - Winter Wheat
 Precipitation: 4.0" seeding to harvest maturity

TABLE 2. Nine-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2009-2018. (Exp# 9951-SW)

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)								
		2014 4/	2015	2016	2017	2018	AVE.	%	9-YR COMP. AVE. YIELD 6/	2014	2015 4/	2016	2017	2018	AVE.	%	9-YR COMP. TEST WT 6/
							for YEARS TESTED 3/	of CHECK YIELD 5/							for YEARS TESTED 3/	of CHECK TEST WT 5/	
PI676978 LANNING (++)	4	43.8	43.5	19.6	39.5	36.6	163.6	48.8	61.7	56.9	59.8	59.3	59.4	98.7		59.5	
PI671855 EGAN (+)	4	38.5	49.7	18.9	35.0	35.5	158.8	47.3	60.6	57.6	58.6	58.1	58.7	97.5		58.8	
0150042-10 BRENNAN (P+)	4	29.3	40.3	11.5	37.2	29.6	132.2	39.4	63.0	60.2	61.0	61.5	61.4	102.1		61.5	
01S0263-28 SY SOREN (P+)	4	36.2	30.4	18.5	32.1	29.3	130.8	39.0	62.3	55.2	60.8	61.5	60.0	99.6		60.0	
PI642366 VIDA (+)	9	43.5	38.3	25.1	39.3	38.6	129.5	38.6	62.2	55.8	59.3	60.4	59.8	99.2		59.8	
WA 8166 ALUM (+)	3		41.4	18.8	37.8	32.7	126.0	37.6		58.7	60.6	60.8	60.0	100.8		60.7	
Win 3504 HRS 3504 (P+)	3		39.7	20.8	35.6	32.0	123.6	36.9		55.3	60.6	60.8	58.9	98.8		59.5	
BZ999592 ONEAL (P+)	9	41.1	31.6	19.9	35.7	36.5	122.4	36.5	62.7	54.5	60.3	60.3	60.4	100.2		60.4	
PI679964 NS PRESSER CLP (P+)	3		27.9	25.4	40.4	31.2	120.5	35.9		52.8	59.2	59.4	57.1	95.9		57.7	
ND 695 REEDER (+)	9	39.0	40.4	21.2	36.8	35.8	120.2	35.8	62.9	57.4	59.3	60.0	60.2	100.0		60.2	
PI660981 DUCLAIR (+)(saw fly tol)	8	39.4	39.9	22.1	28.7	34.7	119.5	35.6	60.6	55.8	58.8	59.3	58.6	97.5		58.7	
IMICHT-79 WB9879CLP (P+)	7	38.7	35.4	19.5	32.6	34.1	114.8	34.2	61.8	57.6	59.6	60.5	60.4	99.5		59.9	
BZ996434 CORBIN (P+)	9	38.3	43.0	16.1	30.2	34.2	114.6	34.2	62.3	57.9	60.8	60.9	60.4	100.3		60.4	
BZ902413 WB GUNNISON (P+)(sf)	7	37.2	35.2	20.3	37.7	33.6	113.0	33.7	62.3	58.3	59.9	60.8	61.1	100.7		60.6	
PI633974 CHOTEAU (+)(saw fly tol)	9	35.3	31.7	17.3	37.0	33.1	110.9	33.1	61.2	56.1	59.7	60.2	59.2	98.2		59.2	
PI574642 McNEAL	7	38.1	35.9			35.2	109.9	32.8	61.7	54.8			59.2	98.2		59.2	
Win 3616 HRS 3616 (P+)	3		33.1	15.4	36.2	28.2	108.9	32.5		56.9	58.8	60.8	58.8	98.7		59.5	
04S0515-2-2 SY TYRA (P+)	7	42.0	25.0			34.5	108.0	32.2	64.2	53.8			60.7	100.8		60.7	
NDSW0449 MOTT (+)(saw fly tol)	6	34.7	29.5			33.7	107.5	32.0	62.4	57.1			59.9	99.6		60.0	
CI13596 FORTUNA (saw fly tol)	9	34.2	33.2	15.7	28.8	29.8	100.0	29.8	62.0	58.3	59.6	60.8	60.2	100.0		60.2	
MEANS (For Entries Listed)		38.1	36.3	19.2	35.3			36.3	62.1	56.6	59.8	60.3	59.7	99.3		59.8	
7/ Growing Season Precipitation (in.)		16.4	n/a	8.6	2.3	4.0	7.9										
Soil PAW (in.) to SD @ Planting		8.9	6.3	6.1	n/a	n/a	7.8										
Total Plant Available Water (in.)		25.2	n/a	14.7	n/a	n/a	17.6										
Soil NO3 (lbs.) to SD at Planting		65	49	85	n/a	n/a	66										
SD (Sampling Depth in Inches)		48	48	48	n/a	n/a	48										
Fertilizer Applied	(# N)	100	100	125	100	100	91										
	(# P2O5)	20	20	20	20	20	28										
	(# K2O)	10	10	10	10	10	16										
	(# S)	0	0	10	0	10	2										

Check variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at <http://plantsciences.montana.edu/crops/index.html> for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 Pending.

3/ Only the most recent 5 years are shown, but summary calculations include all years noted.

4/ No harvest in 2014 due to hail.

5/ Percent of Fortuna yield or test weight for the same data years as those in which a given entry was tested.

6/ 9-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 9-Yr average yield or test weight for the check variety Fortuna.

7/ Seeding to 14 days prior to harvest maturity.

TABLE 3. Nine-Year Sawfly Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2009-2018. (Exp# 9951-SW)

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ SAWFLY RATING (% of cut and lodged stems)										AVE. for YEARS TESTED	% of CHECK SAWFLY 4/	9-YR COMP. AVE. SAWFLY 5/
		2009	2010	2011	2012	2013	2014 3/	2015	2016	2017	2018			
NDSW0449 MOTT (+)(saw fly tol)	6		3.7	5.0	1.0	0.0		0.0	0.0			1.6	16.0	1.1
BZ902413 WB GUNNISON (P+)(sf)	7			6.7	2.3	0.3		0.0	0.0	0.3	0.7	1.5	19.6	1.4
BZ996434 CORBIN (P+)	9	3.7	10.3	21.7	18.3	2.0		0.0	0.0	0.3	1.0	6.4	92.5	6.4
0150042-10 BRENNAN (P+)	4							0.0	0.0	0.0	0.7	0.2	99.8	6.9
CI 13596 FORTUNA (saw fly tol)	9	1.0	8.3	28.3	20.0	3.7		0.0	0.0	0.0	0.7	6.9	100.0	6.9
Win 3504 HRS 3504 (P+)	3								0.0	0.3	0.3	0.2	100.1	6.9
Win 3616 HRS 3616 (P+)	3								0.0	0.0	0.7	0.2	100.1	6.9
IMICHT-79 WB9879CLP (P+)	7			40.0	16.7	2.0		0.0	0.0	0.0	0.0	8.4	111.4	7.7
PI660981 DUCLAIR (+)(saw fly tol)	8		13.7	33.3	30.0	4.0		0.0	0.0	0.3	0.3	10.2	133.9	9.2
PI642366 VIDA (+)	9	2.3	18.3	26.7	33.3	3.3		0.0	0.0	0.3	0.0	9.4	136.0	9.4
PI633974 CHOTEAU (+)(saw fly tol)	9	3.7	13.3	36.7	28.3	6.7		0.0	0.0	0.0	0.0	9.9	143.0	9.9
BZ999592 ONEAL (P+)	9	7.0	2.3	40.0	35.0	5.0		0.0	0.0	0.0	0.3	10.0	144.6	10.0
WA 8166 ALUM (+)	3								0.0	0.3	0.7	0.3	150.2	10.3
04S0515-2-2 SY TYRA (P+)	7	3.7	15.0	46.7	23.3	3.7		0.0	0.0			13.2	150.6	10.4
ND 695 REEDER (+)	9	6.7	16.7	53.3	33.3	5.3		0.0	0.0	2.3	0.7	13.1	190.9	13.1
01S0263-28 SY SOREN (P+)	4							0.0	0.0	1.0	0.7	0.4	249.5	17.2
PI671855 EGAN (+)	4							0.0	0.0	0.7	1.0	0.4	249.5	17.2
PI676978 LANNING (++)	4							0.0	0.0	0.7	1.0	0.4	249.5	17.2
PI574642 McNEAL	7	18.3	25.0	80.0	61.7	21.7		0.0	0.0			29.5	337.0	23.2
PI679964 NS PRESSER CLP (P+)	3								0.0	3.7	0.3	1.3	600.6	41.4
MEANS (For Entries Listed)		5.8	12.7	34.9	25.3	4.8		0.0	0.0	0.6	0.5	6.2	168.7	11.6
6/ Growing Season Precipitation (in.)		6.0	10.3	8.3	7.5	n/a	16.4	n/a	8.6	2.3	4.0	7.9		
Soil PAW (in.) to SD @ Planting		7.8	9.0	7.9	8.9	7.8	8.9	6.3	6.1	n/a	n/a	7.8		
Total Plant Available Water (in.)		13.8	19.2	16.2	16.4	n/a	25.2	n/a	14.7	n/a	n/a	17.6		
Soil NO3 (lbs.) to SD at Planting		94	162	51	15	11	65	49	85	n/a	n/a	66		
SD (Sampling Depth in Inches)		48	48	48	48	48	48	48	48	n/a	n/a	48		
Fertilizer Applied	(# N)	70	70	70	70	100	100	100	125	100	100	91		
	(# P ₂ O ₅)	40	40	40	40	20	20	20	20	20	20	28		
	(# K ₂ O)	25	25	25	25	10	10	10	10	10	10	16		
	(# S)	0	0	0	0	0	0	0	10	0	10	2		

Check variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at <http://plantsciences.montana.edu/crops/index.html> for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 Pending.

3/ No harvest in 2014 due to hail.

4/ Percent of Fortuna yield or test weight for the same data years as those in which a given entry was tested.

5/ 9-Yr Comparable Average = (x/y) * z where x = average saw fly of a given entry for years tested, y = average saw fly for Fortuna for the same years, and z = 9-Yr average saw fly for the check variety Fortuna.

6/ Seeding to 14 days prior to harvest maturity.

TABLE 4. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Flansaa-Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2018. (Exp# 18-9955-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/	TEST WT Lbs/Bu	2/	3/	4/
				YIELD Bu/Ac		PROTEIN %	FN Seconds	SAWFLY %
WSCIA	ALUM	91.8	23.4	35.9	62.9	15.3	338	0.3
AGRIPR10	BRENNAN	93.6	20.2	21.8	62.0	17.5	337	1.7
PI633974	CHOTEAU	95.1	21.2	31.9	60.6	16.2	339	0.0
BZ996434	CORBIN	95.4	21.4	34.6	62.0	16.1	340	0.3
PI660981	DUCLAIR	96.1	22.0	31.4	60.0	15.8	324	0.0
PI 671855	EGAN	88.8	22.6	28.0	59.2	17.7	362	2.3
CI 13596	FORTUNA	96.0	27.3	28.9	61.1	15.8	314	0.3
PI 676978	LANNING	98.5	22.9	36.7	60.9	15.7	327	2.3
LIMAGR143	LCS Pro	96.7	25.4	34.9	61.4	16.5	315	0.7
PI 679964	NS PRESSER CLP	94.1	24.3	40.2	61.1	14.9	328	0.7
BZ999592	ONEAL	96.7	24.1	35.6	62.5	15.1	332	1.0
ND 695	REEDER	97.7	23.1	36.7	61.3	15.6	333	2.0
AGRIPR141	SY INGMAR	95.4	21.6	32.7	62.3	16.7	344	0.3
AGRIPR14	SY SOREN	94.4	20.2	28.9	62.2	17.6	343	0.7
PI642366	VIDA	92.8	22.4	38.7	61.5	14.6	315	0.3
BZ92413R	WB GUNNISON	91.1	22.6	31.7	62.0	14.9	344	0.3
WB9879CLP	WB9879CLP	98.4	22.0	31.5	61.0	16.6	345	0.3
HRS 3504	WINFIELD 3504	93.4	20.6	33.0	61.9	15.4	354	0.7
HRS 3616	WINFIELD 3616	88.8	22.2	26.4	61.0	17.9	338	0.3
MT 1621	MT1148/MT1133	98.7	21.1	36.0	61.8	16.3	327	0.0
MT 1651	MT1148//CHOTEAU/MT0614	89.2	22.9	33.3	62.0	16.4	356	0.7
MT 1673	DuclairxMcNeal/Glupro,+,fam72-17	98.0	22.7	30.2	58.8	16.8	323	0.0
EXPERIMENTAL MEANS		94.6	22.6	32.7	61.3	16.2	335.4	0.7
LSD (0.05)		9.1	2.0	2.3	0.4	0.7	10.9	-
C.V.%		5.8	5.3	4.2	0.4	2.6	2.0	-
P-VALUE (Varieties)		0.5238	<.0001	<.0001	<.0001	<.0001	<.0001	-

1/ Volumetric yields are based on plot weights adjusted to uniform 13 percent grain moisture and 60 lbs/bu as the standard test weight for wheat

2/ Protein values are adjusted to 13 percent grain moisture.

3/ FN is the falling number value reported in seconds adjusted to 14 percent flour moisture.

4/ Sawfly rating is reported as the percentage of cut stems.

Bold indicates highest value within a column.

Bold indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05).

Management Information (18-9955-SW)

Seeding Date: May 6, 2018
 Harvest Date: August 21, 2018
 Fertility: 100-20-10-10 side banded
 System: Till
 Herbicide: TrumpCard- 20oz/ac
 Insecticide: none
 Previous Crop: Chemical Fallow- Spring Wheat
 Precipitation: n/a

TABLE 5. Nine-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at the Flansaas/Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2009-2018. (Exp# 9955-SW)

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)								
		2014	2015	2016	2017	2018	AVE. for YEARS TESTED 3/	% of CHECK YIELD 5/	9-YR COMP. AVE. YIELD 6/	2014	2015	2016	2017	2018	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 5/	9-YR COMP. TEST WT 6/
PI642366 VIDA (+)	9	54.3	52.0	49.3		38.7	44.8	128.3	44.8	56.9	59.8	60.3		61.5	59.8	202.7	120.6
PI676978 LANNING	3		55.1	50.1		36.7	47.3	126.4	44.2		59.5	60.7		60.9	60.4	99.2	59.0
ND 695 REEDER (+)	9	47.7	48.4	45.4		36.7	41.5	118.7	41.5	57.1	60.5	61.5		61.3	60.3	204.3	121.5
BZ999592 ONEAL (P+)	9	45.3	52.3	39.5		35.6	41.2	118.0	41.2	57.0	61.0	59.4		62.5	60.6	205.4	122.2
04S0515-2-2 SY TYRA (+)	7	47.5	46.3	42.4			41.7	112.6	39.3	56.7	62.1	60.2		59.7	100.4		59.8
BZ996434 CORBIN (P+)	9	41.4	45.4	43.3		34.6	38.9	111.2	38.9	56.4	60.3	61.5		62.0	60.1	203.7	121.2
PI660981 DUCLAIR (+)(saw fly tol)	8	47.2	47.0	41.5		31.4	39.7	110.3	38.5	55.3	57.2	60.1		60.0	58.4	97.9	58.2
IMICHT-79 WB9879CLP (P+)	7	43.7	44.7	43.0		31.5	41.2	110.0	38.4	55.5	59.6	59.8		61.0	59.5	99.1	59.0
PI671855 EGAN (+)	4	41.5	51.4	44.3		28.0	41.3	109.7	38.3	54.7	60.6	59.6		59.2	58.5	98.0	58.3
BZ902413 WB GUNNISON (P+)(sf)	7	45.9	47.2	43.2		31.7	40.2	107.4	37.5	57.5	61.1	61.5		62.0	60.7	101.1	60.1
PI633974 CHOTEAU (+)(saw fly tol)	9	42.5	42.5	44.9		31.9	36.9	105.7	36.9	55.5	58.7	59.9		60.6	58.7	199.0	118.4
01S0263-28 SY SOREN (P+)	3		46.7	42.2		28.9	39.3	105.0	36.7		59.7	61.1		62.2	61.0	100.3	59.7
NDSW0449 MOTT (+)(saw fly tol)	7	41.9	41.9	35.3			38.5	104.0	36.3	55.3	60.1	59.6		59.0	99.4		59.1
PI574642 McNEAL	8	40.7	44.5	36.4			36.2	101.5	35.5	56.1	59.4	59.7		59.1	99.7		59.3
CI13596 FORTUNA (saw fly tol)	9	38.3	43.0	40.3		28.9	34.9	100.0	34.9	56.3	60.4	61.0		61.1	59.5	201.7	120.0
0150042-10 BRENNAN (P+)	4	47.3	39.3	39.4		21.8	36.9	98.1	34.3	57.4	61.3	61.7		62.0	60.6	101.5	60.4
MEANS (For Entries Listed)		44.6	46.7	42.5		32.0			38.6	56.3	60.1	60.5		61.2			82.3
7/ Growing Season Precipitation (in.)		9.5	5.6	8.9	7.2	n/a	8.1										
Soil PAW (in.) to SD @ Planting		8.8	8.9	8.2	3.7	n/a	8.0										
Total Plant Available Water (in.)		18.3	14.5	17.2	10.9	n/a	16.1										
Soil NO3 (lbs.) to SD at Planting		34	64	41	25	n/a	48										
SD (Sampling Depth in Inches)		48	48	48	24	n/a	45										
Fertilizer Applied	(# N)	100	100	100	125	100	88										
	(# P ₂ O ₅)	20	20	20	20	20	30										
	(# K ₂ O)	10	10	10	10	10	18										
	(# S)	0	0	0	10	10	2										

Check variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at <http://plantsciences.montana.edu/> for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 Pending.

3/ Only the most recent 5 years are shown, but summary calculations include all years noted.

4/ No harvest in 2017 due to hail.

5/ Percent of Fortuna yield or test weight for the same data years as those in which a given entry was tested.

6/ 9-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 9-Yr average yield or test weight for the check variety Fortuna.

7/ Seeding to 14 days prior to harvest maturity.

TABLE 6. Nine-Year Sawfly Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at the Flanssaas/Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2009-2018. (Exp# 9955-SW)

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ SAWFLY RATING (% Cut and Lodged)										AVE. for YEARS TESTED	% of CHECK SAWFLY	9-YR COMP. AVE SAWFLY
		2009	2010	2011	2012	2013	2014	2015	2016	2017 3/	2018			
NDSW0449 MOTT (+)(saw fly tol)	7		1.0	5.0	1.0	0.0	0.7	0.0	0.0			1.1	28.7	1.0
BZ902413 WB GUNNISON (P+)(saw fly tol)	7			5.0	1.0	1.0	0.0	0.0	0.0		0.3	1.0	47.7	1.7
BZ996434 CORBIN (P+)	9	2.3	5.3	10.0	3.7	0.7	0.3	0.0	0.0		0.3	2.5	70.2	2.5
BZ999592 ONEAL (P+)	9	3.7	2.3	16.7	8.3	0.0	0.0	0.0	0.0		1.0	3.6	98.8	3.6
CH13596 FORTUNA (saw fly tol)	9	5.3	11.7	6.7	6.7	0.7	1.0	0.0	0.0		0.3	3.6	100.0	3.6
IMICHT-79 WB9879CLP (P+)	7			13.3	2.3	0.3	0.0	0.0	0.0		0.3	2.3	106.3	3.8
PI633974 CHOTEAU (+)(saw fly tol)	9	3.7	8.3	16.7	6.7	0.7	1.0	0.0	0.0		0.0	4.1	114.4	4.1
PI660981 DUCLAIR (+)(saw fly tol)	8		10.0	15.0	6.7	0.0	0.3	0.0	0.0		0.0	4.0	118.3	4.3
04S0512-2-2 SY TYRA (P+)	7		5.0	15.0	11.7	0.0	0.7	0.0	0.0			4.6	121.1	4.4
0150042-10 BRENNAN (P+)	4						0.0	0.0	0.0		1.7	0.4	125.1	4.5
PI642366 VIDA (+)	9	8.3	10.0	18.3	10.0	0.3	0.3	0.0	0.0		0.3	5.3	147.2	5.3
ND 695 REEDER (+)	9	3.7	10.3	18.3	15.0	0.7	2.3	0.0	0.0		2.0	5.8	161.8	5.8
01S0263-28 SY SOREN (P+)	3							0.0	0.0		0.7	0.2	200.2	7.2
PI671855 EGAN (+)	4						0.3	0.0	0.0		2.3	0.7	200.2	7.2
PI574642 McNEAL	8	21.7	20.0	20.0	25.0	1.0	7.0	0.0	0.0			11.8	295.5	10.6
PI676978 LANNING (++)	3							0.0	0.0		2.3	0.8	700.7	25.2
MEANS (For Entries Listed)		7.0	8.4	13.3	8.2	0.5	1.0	0.0	0.0		0.9			5.9
6/ Growing Season Precipitation (in.)		5.3	11.6	n/a	n/a	9.5	5.6	8.9	7.2	n/a	n/a	8.0		
Soil PAW (in.) to SD @ Planting		10.5	7.7	7.1	8.8	8.8	8.9	8.2	3.7	n/a	n/a	8.0		
Total Plant Available Water (in.)		15.7	19.3	n/a	n/a	18.3	14.5	17.2	10.9	n/a	n/a	16.0		
Soil NO3 (lbs.) to SD at Planting		42	94	50	34	34	64	41	25	n/a	n/a	48		
SD (Sampling Depth in Inches)		48	48	48	48	48	48	48	24	n/a	n/a	45		
Fertilizer Applied	(# N)	70	70	70	70	100	100	100	125	100	100	91		
	(# P ₂ O ₅)	40	40	40	40	20	20	20	20	20	20	28		
	(# K ₂ O)	25	25	25	25	10	10	10	10	10	10	16		
	(# S)	0	0	0	0	0	0	0	10	0	10	2		

Check variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at <http://plantsciences.montana.edu/> for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 Pending.

3/ No harvest in 2017 due to hail.

4/ Percent of Fortuna saw fly rating for the same data years as those in which a given entry was tested.

5/ 9-Yr Comparable Average = (x/y) * z where x = average saw fly rating of a given entry for years tested, y = average saw fly rating for Fortuna for the same years, and z = 9-Yr average saw fly for the check variety Fortuna.

6/ Seeding to 14 days prior to harvest maturity.

TABLE 7. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2018. (Exp# 18-9957-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/	2/	3/	4/	
				YIELD Bu/Ac	TEST WT Lbs/Bu	PROTEIN %	FN Seconds	SAWFLY %
WSCIA	ALUM	99.0	28.6	31.4	53.3	18.6	308	2.3
AGRIPR10	BRENNAN	98.3	26.0	35.2	57.1	17.5	343	8.3
PI633974	CHOTEAU	100.0	27.4	29.6	53.7	18.0	334	0.7
BZ996434	CORBIN	99.0	27.3	32.7	55.4	18.2	335	0.0
PI660981	DUCLAIR	99.0	28.4	31.2	53.3	17.8	324	0.7
PI 671855	EGAN	100.0	27.7	31.4	51.6	19.9	356	3.7
CI 13596	FORTUNA	97.3	34.8	31.5	54.5	17.2	336	1.0
PI 676978	LANNING	98.7	27.8	33.2	50.2	18.8	332	2.3
LIMAGR143	LCS Pro	100.0	31.3	33.3	51.7	17.5	342	3.7
PI 679964	NS PRESSER CLP	99.3	30.5	31.9	49.9	17.7	335	1.0
BZ999592	ONEAL	100.0	26.3	32.9	54.4	18.8	335	2.3
ND 695	REEDER	98.7	28.4	32.1	53.4	18.1	327	5.3
AGRIPR141	SY INGMAR	97.7	29.8	37.9	54.2	18.0	368	6.7
AGRIPR14	SY SOREN	98.0	28.6	35.5	53.3	18.4	339	6.7
PI642366	VIDA	97.0	28.3	33.5	52.8	17.5	331	0.3
BZ92413R	WB GUNNISON	98.7	28.2	31.3	54.3	17.1	349	0.7
WB9879CLP	WB9879CLP	97.7	26.7	29.9	54.6	17.7	332	0.7
HRS 3504	WINFIELD 3504	100.0	25.6	29.9	51.8	17.8	343	5.0
HRS 3616	WINFIELD 3616	99.7	28.1	31.7	55.4	18.0	347	5.0
MT 1621	MT1148/MT1133	99.3	29.2	37.8	55.3	17.9	344	0.7
MT 1651	MT1148//CHOTEAU/MT0614	99.3	28.5	34.5	54.0	18.8	354	0.3
MT 1673	Duclairx McNeal/Glupro, +, fam72-17	100.0	28.8	33.3	52.8	18.5	295	0.3
EXPERIMENTAL MEANS		98.9	28.5	32.8	53.5	18.1	336.8	2.6
LSD (0.05)		1.9	2.8	3.6	1.2	0.4	15.0	3.0
C.V.%		1.1	5.9	6.6	1.4	1.4	2.7	69.8
P-VALUE (Varieties)		0.0208	<.0001	0.0004	<.0001	<.0001	<.0001	<.0001

1/ Volumetric yields are based on plot weights adjusted to uniform 13 percent grain moisture and 60 lbs/bu as the standard test weight for wheat.

2/ Protein values are adjusted to 13 percent grain moisture.

3/ FN is the falling number value reported in seconds adjusted to 14 percent flour moisture.

4/ Sawfly rating is reported as the percentage of cut stems.

Bold indicates highest value within a column.

Bold indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05).

Management Information (18-9957-SW)

Seeding Date: May 4, 2018
 Harvest Date: August 2, 2018
 Fertility: 100-20-10-10 side banded
 System: no till
 Herbicide: Bromac-16oz/ac, Affinity-.6oz/ac
 Insecticide: none
 Previous Crop: Spring Wheat
 Precipitation: n/a

TABLE 8. Six-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2013-2018. (Exp# 9957-SW)

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)										TEST WEIGHT (Pounds Per Bushel)								
		2013	2014	2015	2016	2017	2018	AVE. for YEARS TESTED	% of CHECK YIELD 3/	6-YR COMP. AVE YIELD 4/	2013	2014	2015	2016	2017	2018	AVE. for YEARS TESTED	% of CHECK TEST WT 3/	6-YR COMP. AVE TEST WT 4/	
PI642366 VIDA (+)	6	70.8	42.8	32.0	14.8	32.0	33.5	37.6	127.8	37.6	60.0	55.2	53.7	54.1	53.5	52.8	54.9	97.9	54.9	
PI574642 McNEAL	4	53.6	40.5	33.2	10.5			34.5	117.2	34.5	60.1	54.9	54.0	50.2			54.8	96.5	54.1	
PI676978 LANNING (++)	4			36.8	12.2	30.9	33.2	28.3	115.7	34.1			53.0	51.4	50.4	50.2	51.3	93.9	52.6	
BZ996434 CORBIN (P+)	6	60.0	37.0	31.8	12.9	30.0	32.7	34.0	115.6	34.0	60.3	56.5	53.5	53.3	53.5	55.4	55.4	98.8	55.4	
BZ92413R WB GUNNISON (P+)(sf)	6	58.6	35.8	30.4	13.5	33.7	31.3	33.9	115.1	33.9	62.0	57.3	54.7	54.1	54.7	54.3	56.2	100.2	56.2	
PI660981 DUCLAIR (+)(saw fly tol)	6	56.3	35.4	29.7	16.9	33.2	31.2	33.8	114.7	33.8	58.0	56.1	52.1	54.8	52.3	53.3	54.4	97.1	54.4	
BZ999592 ONEAL (P+)	6	58.6	37.3	32.8	9.9	28.8	32.9	33.4	113.4	33.4	61.0	55.6	56.1	51.9	54.8	54.4	55.6	99.2	55.6	
ND 695 REEDER (+)	6	60.8	35.7	30.3	10.5	29.3	32.1	33.1	112.4	33.1	60.6	55.7	54.7	54.5	52.8	53.4	55.3	98.6	55.3	
NDSW0449 MOTT (+)(saw fly tol)	4	61.2	32.3	26.8	9.8			32.5	110.6	32.6	60.8	57.0	53.8	50.6			55.6	97.8	54.9	
IMICHT-79 WB9879CLP (P+)	6	59.2	37.3	27.8	12.4	26.7	29.9	32.2	109.3	32.2	60.7	56.0	53.5	51.8	53.6	54.6	55.0	98.1	55.0	
04S0515-2-2 SY TYRA (P+)	4	57.1	33.4	27.7	7.9			31.5	107.2	31.6	61.9	56.4	54.6	53.1			56.5	99.6	55.9	
0150042-10 BRENNAN (P+)	5		35.4	32.6	6.9	31.1	35.2	28.2	106.9	31.5		59.3	56.1	54.9	56.1	57.1	56.7	102.7	57.6	
PI671855 EGAN (+)	5		37.4	32.4	11.7	25.6	31.4	27.7	104.9	30.9		54.7	52.9	51.4	51.0	51.6	52.3	94.8	53.1	
PI633974 CHOTEAU (+)(saw fly tol)	6	54.7	35.0	29.0	10.9	25.5	29.6	30.8	104.4	30.8	58.9	56.1	53.4	52.7	52.8	53.7	54.6	97.4	54.6	
01S0263-28 SY SOREN (P+)	4			29.3	8.5	28.6	35.5	25.4	104.1	30.7			53.8	53.1	54.0	53.3	53.6	98.2	55.0	
PI679964 NS PRESSER CLP (P+)	3				11.0	32.8	31.9	25.2	103.7	30.5				51.4	52.6	49.9	51.3	94.4	52.9	
WA 8166 ALUM (+)	3				11.3	31.0	31.4	24.6	100.9	29.7				52.9	55.3	53.3	53.8	99.0	55.5	
CI13596 FORTUNA (saw fly tol)	6	44.7	34.3	24.7	13.9	27.6	31.5	29.5	100.0	29.5	60.4	57.7	55.2	53.8	54.8	54.5	56.1	100.0	56.1	
Win 3504 HRS 3504(P+)	3				10.4	25.1	29.9	21.8	89.5	26.3				51.8	52.8	51.8	52.1	95.8	53.7	
Win 3616 HRS 3616 (P+)	3				5.4	24.5	31.7	20.5	84.3	24.8				50.3	53.1	55.4	52.9	97.3	54.6	
MEANS (For Entries Listed)		58.0	36.4	30.4	11.0	29.2	32.0			31.8	60.4	56.3	54.1	52.6	53.4	53.5			54.9	
5/ Growing Season Precipitation (in.)		9.0	5.1	n/a	6.0	n/a	n/a	6.7												
Soil PAW (in.) to SD @ Planting		9.1	10.4	8.8	8.7	n/a	n/a	9.3												
Total Plant Available Water (in.)		18.1	15.5	n/a	14.8	n/a	n/a	16.1												
Soil NO3 (lbs.) to SD at Planting		51	85	126	194	n/a	n/a	114												
SD (Sampling Depth in Inches)		48	48	48	48	n/a	n/a	48												
Fertilizer Applied	(# N)	100	100	100	125	100	100	104												
	(# P ₂ O ₅)	20	20	20	20	20	20	20												
	(# K ₂ O)	10	10	10	10	10	10	10												
	(# S)	0	0	0	10	0	10	3												

Check variety is Fortuna.

1/ See MCEB Bulletin 1093 or the Plant Sciences & Plant Pathology website at <http://plantsciences.montana.edu/> for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 Pending.

3/ Percent of Fortuna yield or test weight for the same data years as those in which a given entry was tested.

4/ 6-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 6-Yr average yield or test weight for the check variety Fortuna.

5/ Seeding to 14 days prior to harvest maturity.

TABLE 9. Six-Year Sawfly Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2013-2018. (Exp# 9957-SW)

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ SAWFLY RATING (% of cut and lodged stems)						AVE. YEARS TESTED	% of CHECK SAWFLY 3/	6-YR COMP. AVE SAWFLY 4/
		2013	2014	2015	2016	2017	2018			
NDSW0449 MOTT (+)(saw fly tol)	4	1.0	0.3	1.0	0.0			0.6	19.4	0.4
BZ92413R WB GUNNISON (P+)(sf)	6	1.0	0.0	1.0	0.0	0.0	0.7	0.4	20.0	0.4
IMICHT-79 WB9879CLP (P+)	6	3.7	0.3	1.0	0.3	0.3	0.7	1.1	47.5	1.1
BZ996434 CORBIN (P+)	6	3.7	0.0	2.3	0.3	0.0	0.0	1.1	47.5	1.1
PI633974 CHOTEAU (+)(saw fly tol)	6	5.7	0.0	2.3	1.0	0.0	0.7	1.6	72.5	1.6
04S0515-2-2 SY TYRA (P+)	4	7.0	0.0	4.0	1.0			3.0	100.0	2.2
CI13596 FORTUNA (saw fly tol)	6	5.0	1.0	2.3	3.7	0.3	1.0	2.2	100.0	2.2
PI679964 NS PRESSER CLP (P+)	3				2.3	2.3	1.0	1.9	113.2	2.5
PI660981 DUCLAIR (+)(saw fly tol)	6	7.0	0.0	3.7	3.7	0.7	0.7	2.6	117.5	2.6
PI642366 VIDA (+)	6	6.7	0.3	5.0	5.0	0.3	0.3	2.9	132.5	2.9
BZ999592 ONEAL (P+)	6	6.7	0.7	6.7	3.7	0.3	2.3	3.4	152.5	3.4
WA 8166 ALUM (+)	3				5.0	2.3	2.3	3.2	193.2	4.3
0150042-10 BRENNAN (P+)	5		0.3	2.3	8.3	10.0	8.3	5.9	351.9	7.8
PI574642 McNEAL	4	20.0	0.7	10.0	11.7			10.6	352.7	7.8
PI671855 EGAN (+)	5		0.7	3.7	15.0	6.7	3.7	5.9	355.9	7.9
ND 695 REEDER (+)	6	15.0	0.7	10.0	18.3	10.0	5.3	9.9	444.8	9.9
Win 3504 HRS 3504 (P+)	3				13.3	8.3	5.0	8.9	532.8	11.8
01S0263-28 SY SOREN (P+)	4			6.7	20.0	6.7	6.7	10.0	545.3	12.1
Win 3616 HRS 3616 (P+)	3				20.0	11.7	5.0	12.2	732.7	16.3
PI676978 LANNING (++)	4			28.3	21.7	8.3	2.3	15.2	827.0	18.4
MEANS (For Entries Listed)		6.9	0.4	5.6	7.7	4.0	2.7			5.8
5/ Growing Season Precipitation (in.)		9.0	5.1	n/a	6.0	n/a	n/a	6.7		
Soil PAW (in.) to SD @ Planting		9.1	10.4	8.8	8.7	n/a	n/a	9.3		
Total Plant Available Water (in.)		18.1	15.5	n/a	14.8	n/a	n/a	16.1		
Soil NO3 (lbs.) to SD at Planting		51	85	126	194	n/a	n/a	114		
SD (Sampling Depth in Inches)		48	48	48	48	n/a	n/a	48		
Fertilizer Applied	(# N)	100	100	100	125	100	100	104		
	(# P ₂ O ₅)	20	20	20	20	20	20	20		
	(# K ₂ O)	10	10	10	10	10	10	10		
	(#S)	0	0	0	10	0	10	3		

Check variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at <http://plantsciences.montana.edu/> for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 Pending.

3/ Percent of Fortuna cut for the same data years as those in which a given entry was tested.

4/ 6-Yr Comparable Average = (x/y) * z where x = average saw fly rating of a given entry for years tested, y = average saw fly rating for Fortuna for the same years, and z = 6-Yr average saw fly rating for the check variety Fortuna.

5/ Seeding to 14 days prior to harvest maturity.

TABLE 10. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Kammerzell Farm, Chester. Northern Agricultural Research Center. Havre, Montana. 2018. (Exp# 18-9953-SW)

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/	TEST WT Lbs/Bu	2/	3/	4/
				YIELD Bu/Ac		PROTEIN %	FN Seconds	SAWFLY %
WSCIA	ALUM	99.7	29.1	37.2	55.5	16.7	309	3.8
AGRIPR10	BRENNAN	99.0	28.4	41.4	58.5	15.7	351	14.2
PI633974	CHOTEAU	100.0	28.9	36.2	56.3	15.8	332	0.8
BZ996434	CORBIN	99.7	30.4	37.5	55.6	17.2	314	2.3
PI660981	DUCLAIR	99.3	29.0	37.0	54.6	16.6	310	1.5
PI 671855	EGAN	100.0	31.8	41.8	55.3	17.0	356	10.8
CI 13596	FORTUNA	99.7	35.3	38.3	57.3	15.6	338	10.8
PI 676978	LANNING	98.7	29.0	40.8	54.6	15.8	333	1.7
LIMAGR143	LCS Pro	99.7	33.8	34.1	53.6	16.4	328	14.2
PI 679964	NS PRESSER CLP	99.7	29.6	39.8	54.8	15.8	343	0.3
BZ999592	ONEAL	99.7	28.3	44.1	57.9	15.3	352	3.0
ND 695	REEDER	99.7	31.3	40.1	55.7	16.1	322	8.3
AGRIPR141	SY INGMAR	99.3	27.6	32.7	53.1	17.5	351	5.2
AGRIPR14	SY SOREN	99.3	26.9	36.4	54.7	16.7	332	6.7
PI642366	VIDA	99.3	29.6	41.8	55.7	16.0	335	2.3
BZ92413R	WB GUNNISON	99.7	28.3	37.3	55.6	16.8	354	0.5
WB9879CLP	WB9879CLP	99.7	27.7	36.3	56.6	15.7	335	1.3
HRS 3504	WINFIELD 3504	99.3	27.2	36.4	53.4	16.2	359	3.0
HRS 3616	WINFIELD 3616	98.0	28.0	29.8	54.6	16.5	346	17.5
MT 1621	MT1148/MT1133	100.0	28.2	44.6	57.5	16.0	345	1.0
MT 1651	MT1148//CHOTEAU/MT0614	100.0	29.9	41.3	56.8	15.8	352	6.0
MT 1673	DuclairxMcNeal/Glupro,+ ,farm72-17	99.3	29.9	35.8	53.8	17.6	310	3.0
EXPERIMENTAL MEANS		99.5	29.5	38.2	55.5	16.3	336.6	5.4
LSD (0.05)		1.3	2.1	5.0	1.3	0.8	8.8	3.9
C.V.%		0.8	4.3	8.0	1.4	3.1	1.6	44.0
P-VALUE (Varieties)		0.4371	<.0001	0.0010	<.0001	<.0001	<.0001	<.0001

1/ Volumetric yields are based on plot weights adjusted to uniform 13 percent grain moisture and 60 lbs/bu as the standard test weight for wheat.

2/ Protein values are adjusted to 13 percent grain moisture.

3/ FN is the falling number value reported in seconds adjusted to 14 percent flour moisture.

4/ Sawfly rating is reported as the percentage of cut stems.

Bold indicates highest value within a column.

Bold indicates varieties with values equal to highest variety within a column based on Fisher's protected LSD (p=0.05).

Management Information (18-9953-SW)

Seeding Date: May 8, 2018
 Harvest Date: August 24, 2018
 Fertility: 100-20-10 side banded
 System: no till
 Herbicide: none
 Insecticide: none
 Previous Crop: Chemical Fallow - Spring Wheat
 Precipitation: n/a

TABLE 11. Five-Year Yield and Test Weight Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at the Kammerzell Farm, Chester. Northern Agricultural Research Center. Havre, Montana. 2014-2018. (Exp# 9953-SW)

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)					TEST WEIGHT (Pounds Per Bushel)										
		2014	2015	2016	2017	2018	AVE. for YEARS TESTED	% of CHECK YIELD 3/	5-YR COMP. AVE. YIELD 4/	AVE. for YEARS TESTED	% of CHECK TEST WT 3/	5-YR COMP. AVE. TEST WT 4/					
0150042-10 BRENNAN (P+)	5	43.0	24.3	31.3	30.4	41.4	34.1	121.0	34.1	56.5	58.2	53.1	57.5	58.5	56.8	101.4	56.8
PI660981 DUCLAIR (+)(saw fly tol)	5	40.3	16.1	34.2	33.7	37.0	32.3	114.6	32.3	52.6	53.6	50.5	53.6	54.6	53.0	94.6	53.0
PI671855 EGAN (+)	5	33.9	22.6	32.4	27.2	41.8	31.6	112.1	31.6	53.3	55.5	49.8	54.4	55.3	53.7	95.8	53.7
PI642366 VIDA (+)	5	37.0	22.8	23.0	33.0	41.8	31.5	112.0	31.5	52.8	56.7	48.5	55.7	55.7	53.9	96.3	53.9
PI676978 LANNING (++)	4		24.5	23.8	30.8	40.8	30.0	111.8	31.5		54.4	47.4	53.9	54.6	52.6	93.5	52.4
BZ996434 CORBIN (P+)	5	36.4	21.3	26.8	35.2	37.5	31.4	111.7	31.4	54.3	55.5	50.6	55.7	55.6	54.3	97.0	54.3
BZ92413R WB GUNNISON (P+)(sf)	5	38.3	23.1	18.3	35.1	37.3	30.4	108.0	30.4	54.5	56.8	51.8	56.0	55.6	54.9	98.1	54.9
ND 695 REEDER (+)	5	34.4	22.0	23.1	31.6	40.1	30.2	107.4	30.2	54.0	56.6	50.2	55.4	55.7	54.4	97.1	54.4
PI574642 McNEAL	3	34.6	22.3	20.3			25.7	101.2	28.5	53.7	56.1	48.3			52.7	95.2	53.3
04S0515-2-2 SY TYRA (P+)	3	34.7	21.5	20.9			25.7	101.0	28.4	53.7	57.1	47.7			52.8	95.4	53.4
01S0263-28 SY SOREN (P+)	4		16.9	25.9	28.8	36.4	27.0	100.6	28.3		54.9	49.0	54.6	54.7	53.3	94.9	53.1
CI13596 FORTUNA (saw fly tol)	5	33.4	18.3	24.6	26.1	38.3	28.1	100.0	28.1	55.2	57.7	53.2	56.6	57.3	56.0	100.0	56.0
BZ999592 ONEAL (P+)	5	33.6	19.8	15.3	27.6	44.1	28.1	99.7	28.1	55.8	58.4	50.1	57.4	57.9	55.9	99.9	55.9
NDSW0449 MOTT (+)(saw fly tol)	3	36.4	18.3	19.8			24.8	97.6	27.5	53.9	58.7	49.5			54.0	97.7	54.7
IMICHT-79 WB9879CLP (P+)	5	33.1	18.1	21.4	28.3	36.3	27.4	97.5	27.4	54.1	56.6	48.9	55.7	56.6	54.4	97.1	54.4
PI633974 CHOTEAU (+)(saw fly tol)	5	29.9	18.3	24.8	26.4	36.2	27.1	96.3	27.1	53.3	55.7	49.6	55.3	56.3	54.1	96.5	54.1
WA 8166 ALUM (+)	3			22.4	24.1	37.2	27.9	94.0	26.5			51.4	58.4	55.5	55.1	98.9	55.4
Win 3616 HRS 3616 (P+)	3			24.7	27.6	29.8	27.4	92.2	26.0			48.3	54.7	54.6	52.5	94.3	52.8
Win 3504 HRS 3504 (P+)	3			19.6	25.9	36.4	27.3	91.9	25.9			45.7	55.0	53.4	51.4	92.3	51.7
PI679964 NS PRESSER CLP (P+)	3			12.0	29.1	39.8	26.9	90.7	25.5			46.1	54.4	54.8	51.8	93.0	52.1
MEANS (For Entries Listed)		35.6	20.6	23.2	29.5	38.4			29.0	54.1	56.4	49.5	55.6	55.7			54.0
5/ Growing Season Precipitation (in.)		n/a	5.0	8.3	2.8	n/a	5.3										
Soil PAW (in.) to SD @ Planting		13.7	9.8	n/a	n/a	n/a	11.7										
Total Plant Available Water (in.)		n/a	14.8	n/a	n/a	n/a	14.8										
Soil NO3 (lbs.) to SD at Planting		257	251	n/a	n/a	n/a	254										
SD (Sampling Depth in Inches)		48	48	48	n/a	n/a	48										
Fertilizer Applied	(# N)	100	100	125	100	100	105										
	(# P2O5)	20	20	20	20	20	20										
	(# K2O)	10	10	10	10	10	10										
	(# S)	0	0	10	0	0	2										

Check variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at <http://plantsciences.montana.edu/> for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 Pending.

3/ Percent of Fortuna yield or test weight for the same data years as those in which a given entry was tested.

4/ 5-Yr Comparable Average = (x/y) * z where x = average yield or test weight of a given entry for years tested, y = average yield or test weight for Fortuna for the same years, and z = 5-Yr average yield or test weight for the check variety Fortuna.

5/ Seeding to 14 days prior to harvest maturity.

TABLE 12. Five-Year Sawfly Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at Kammerzell Farm, Chester. Northern Agricultural Research Center. Havre, Montana. 2014-2018. (Exp# 9953-SW)

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ SAWFLY RATING (% of cut and lodged stems)					AVE. for YEARS TESTED	% of CHECK SAWFLY 3/	5-YR COMP. AVE SAWFLY 4/
		2014	2015	2016	2017	2018			
BZ92413R WB GUNNISON (P+)(sf)	5	3.7	0.0	4.0	0.3	0.5	1.7	27.0	1.7
PI633974 CHOTEAU (+)(saw fly tol)	5	5.7	0.0	5.3	2.0	0.8	2.8	43.9	2.8
IMICHT-79 WB9879CLP (P+)	5	3.7	0.0	10.3	1.0	1.3	3.3	51.8	3.3
PI660981 DUCLAIR (+)(saw fly tol)	5	5.0	0.0	6.7	3.7	1.5	3.4	53.4	3.4
BZ996434 CORBIN (P+)	5	1.0	0.0	13.3	0.7	2.3	3.5	55.0	3.5
Win 3504 HRS 3504 (P+)	3			4.0	8.3	3.0	5.1	61.7	3.9
WA 8166 ALUM (+)	3			11.7	3.7	3.8	6.4	77.2	4.9
BZ999592 ONEAL (P+)	5	3.7	0.0	15.0	3.7	3.0	5.1	80.4	5.1
PI642366 VIDA (+)	5	18.3	0.0	5.3	2.3	2.3	5.7	89.9	5.7
NDSW0449 MOTT (+)(saw fly tol)	3	15.0	0.0	2.0			5.7	92.7	5.8
04S0515-2-2 SY TYRA (P+)	3	13.3	0.0	3.7			5.7	92.7	5.8
0150042-10 BRENNAN (P+)	5	5.0	0.0	3.7	6.7	14.2	5.9	93.6	5.9
CI13596 FORTUNA (saw fly tol)	5	6.7	0.0	11.7	2.3	10.8	6.3	100.0	6.3
PI 679964 NS PRESSER CL+	3			18.3	6.7	0.3	8.4	102.0	6.4
PI 671855 EGAN (+)	5	6.7	0.0	5.0	13.3	10.8	7.2	113.8	7.2
01S0263-28 SY SOREN (P+)	4		0.0	6.7	15.0	6.7	7.1	114.1	7.2
PI574642 McNEAL	3	7.0	0.0	16.7			7.9	129.1	8.1
PI 676978 LANNING (++)	4		0.0	18.3	13.3	1.7	8.3	134.2	8.5
ND 695 REEDER (+)	5	6.7	0.0	16.7	13.3	8.3	9.0	142.8	9.0
Win 3616 HRS 3616 (P+)	3			10.0	11.7	17.5	13.1	157.7	9.9

MEANS (For Entries Listed) 7.2 0.0 9.4 6.4 5.2 5.7

5/ Growing Season Precipitation (in.)	n/a	5.0	8.3	2.8	n/a	5.3
Soil PAW (in.) to SD @ Planting	13.7	9.8	n/a	n/a	n/a	11.7
Total Plant Available Water (in.)	n/a	14.8	n/a	n/a	n/a	14.8
Soil NO3 (lbs.) to SD at Planting	257	251	n/a	n/a	n/a	254
SD (Sampling Depth in Inches)	48	48	48	n/a	n/a	48
Fertilizer Applied	(# N)	100	100	125	100	105
	(# P2O5)	20	20	20	20	20
	(# K2O)	10	10	10	10	10
	(# S)	0	0	10	0	2

Check variety is Fortuna.

1/ See MCES Bulletin 1093 or the Plant Sciences & Plant Pathology website at

<http://plantsciences.montana.edu/> for evaluation of other important variety performance characteristics to include protein, quality, disease resistance, etc. before making cultivar selection decisions.

2/ P = Private Variety, + = Protected Variety, ++ = PVP Title 5 Pending.

3/ Percent of Fortuna cut for the same data years as those in which a given entry was tested.

4/ 5-Yr Comparable Average = (x/y) * z where x = average saw fly rating of a given entry for years tested, y = average saw fly rating for Fortuna for the same years, and z = 5-Yr average saw fly rating for the check variety Fortuna.

5/ Seeding to 14 days prior to harvest maturity.