

**Title (4W6471):** North Central Montana Off-Station Spring Wheat Variety Performance Evaluations

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### **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 nearly 28 percent of the 2012-2016 statewide cereal production totals (43 percent for winter wheat and 24 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 2017 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        | S21-T27N-R10E |
| 4. Kammerzell Farm, Liberty County        | S11-T31N-R05E |

All four spring wheat trials consisted of 23 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.

### **Results:**

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.

Cropping environments in 2017 started out with very good recharge soil moisture, and cooler than typical early spring temperatures followed by a season of high winds and drought conditions across north central Montana. Both Turner and Loring suffered from lack of precipitation throughout the year resulting in thin stands and reduced tillering. The Turner site was hit with an extreme windstorm for several days at the end of May which sandblasted and buried spring cereal seedlings under drifts of soil, increasing crop stress. Following a summer of drought, ultimately, the research site near Loring was taken out by a late season hail storm. The Loma location was seeded into chemical fallow ground that had been minimally tilled to eliminate potential weed issues. Loma started out the spring with good soil moisture, but crops were hit with drought and prolonged excessive temperatures midseason. The Chester area also started out with excellent recharge soil moisture, and timely spring precipitation resulted in a very good stand, 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.

At Havre, annual growing season precipitation (9/1/16 through 8/31/17) was 9.48 inches, 2.58 inches lower than the average for all years since 1916. April 1 through July 31 precipitation was 2.41 inches, just 34 percent of the 102-year average. Heat units expressed as "Growing Degree Days" (GDD, base 50) from May through July totaled 1393, or 108 percent of the average for the last 67 years (1951-2017). The last spring frost was on May 19 and the first fall frost of 2017 was on September 25, resulting in 129 frost-free days. The minimum winter temperature was -27 degrees F on December 17, 2016. Overall, the 2016-2017 average crop year temperatures were higher than the long-term average. The April through July growing season saw an average daily temperature of 59 degrees F, 2.5 degrees F higher than historical temperatures. July and August average temperatures were nearly three degrees F higher than long-term averages with the high for 2017 recorded on July 15 at 101 degrees F. There were 30 days with temperatures 90 degrees F or above, with only one day over 100 degrees F.

Following a summer plagued by drought and high winds, the spring wheat trial yields at Turner averaged only 18 bu/ac (Table 1). Northern Seeds 'NS Presser CLP' and the Montana State University release 'Vida' were statistically the two top yielding entries at 25.4 and 25.1 bu/ac, respectively, with no other entries matching their production. Test weight of all spring wheat entries was very good for this site, averaging 60 lb/bu. Following a severe hailstorm in 2014, there were consecutive years of no sawfly cutting or infestation in the spring wheat trial at Turner, and only minimal cutting in 2017. Stand percent, plant height, yield, protein, falling number and sawfly cutting data for the 2017 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 (2008-2017) 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.

The Loring spring wheat trial was also in a drought stricken area and was not harvested due to a late season hail storm. Nine-year comparable averages for spring wheat seed yield and test weight at Loring are summarized in Table 4, while nine-year comparable averages for sawfly cutting are summarized in Table 5.

In 2013, off-station spring wheat trials were re-established near Loma. The lack of timely precipitation following seeding, coupled with heat during flowering and seed set, limited spring wheat yields and test weights. Seed yields averaged 29.8 bu/ac (Table 6). Montana State University experimental line 'MT1543' was the highest yielding entry at 36 bu/ac while 'Duclair', 'WB Gunnison' and 'LCS Pro' were the only entries to yield statistically equal to MT1543. Sawfly damage in the small plot scenario was low again this year, averaging only 4.1 percent cutting. Stand percent, plant height, yield, test weight, protein, falling number and sawfly cutting data for the 2017 Loma dryland spring wheat trial are summarized in Table 6. Five-year comparable averages for spring wheat seed yield and test weight at Loma are summarized in Table 7, while five-year comparable averages for sawfly cutting are summarized in Table 8.

In 2014, off-station spring wheat trials were established near Chester. With early season moisture, great spring wheat establishment and prolific tillering set the trial up for high yield potential. However, mid-season drought and untimely high temperatures from flowering through seed set, had an adverse effect on spring wheat yields which averaged just over 29 bu/ac, while test weights averaged just under 56 lb/bu (Table 9). 'Corbin' was the highest yielding entry at over

35 bu/ac, with Duclair, 'Vida', WB Gunnison, 'MT1525' and MT1543 producing yields statistically equal to that of Corbin. Sawfly cutting in the small plot scenario was just over six percent in 2017. Stand percent, plant height, yield, test weight, protein, falling number and sawfly cutting data for the 2017 Chester dryland spring wheat trial are summarized in Table 9. Four-year comparable averages for spring wheat seed yield and test weight at Chester are summarized in Table 10, while four-year comparable averages for sawfly cutting are summarized in Table 11.

### **Summary:**

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-third 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 have been outstanding through the years with 2017 marking 34 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.

### **Funding Summary:**

Expenditure information for grant index 4W6471 is to be provided by Montana State University, Office of Sponsored Programs. There is no other grant support for this project.

### **MWBC CY2018 Grant Submission Plans:**

This project has been submitted for funding consideration in the next calendar year.

### **Recognition:**

This research would not have been possible without the assistance of the following summertime hourly employees: Marley Manoukian, Nicole Parsons and Emily Simonson.

**TABLE 1. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Leon Cederberg Farm, Turner. Northern Agricultural Research Center. Havre, Montana. 2017. (Exp# 17-9951-SW)**

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %	3/ FN Seconds	4/ SAWFLY %
WSCIA	ALUM	100.0	18.0	18.8	60.6	16.8	321	0.3
AGRIPR10	BRENNAN	99.3	16.4	11.5	61.0	17.7	328	0.0
PI633974	CHOTEAU	100.0	18.1	17.3	59.7	17.1	328	0.0
BZ996434	CORBIN	100.0	18.2	16.1	60.8	16.9	336	0.3
PI660981	DUCLAIR	99.3	18.9	22.1	58.8	15.6	320	0.3
PI 671855	EGAN	100.0	19.3	18.9	58.6	<b>18.8</b>	<b>356</b>	0.7
CI 13596	FORTUNA	98.7	22.2	15.7	59.6	16.0	306	0.0
PI 676978	LANNING	99.7	18.8	19.6	59.8	17.1	327	0.7
LIMAGR143	LCS PRO	99.3	18.9	19.0	60.5	17.3	297	2.3
PI 679964	NS PRESSER CLP	99.7	20.8	<b>25.4</b>	59.2	16.2	322	3.7
BZ999592	ONEAL	100.0	17.3	19.9	60.3	16.8	317	0.0
ND 695	REEDER	100.0	19.3	21.2	59.3	16.5	314	2.3
AGRIPR141	SY INGMAR	99.0	19.0	15.8	<b>61.3</b>	17.6	330	0.0
AGRIPR14	SY SOREN	99.3	19.6	18.5	60.8	17.5	334	1.0
PI642366	VIDA	99.3	18.6	<b>25.1</b>	59.3	15.4	287	0.3
BZ92413R	WB GUNNISON	99.3	21.4	20.3	59.9	15.8	332	0.3
WB9879CLP	WB9879CLP	99.0	18.6	19.5	59.6	17.2	336	0.0
Winfield-1	HRS 3361	99.7	17.4	13.4	59.6	17.8	327	0.0
Winfield-2	HRS 3504	98.7	18.0	20.8	60.6	16.5	335	0.3
Winfield-3	HRS 3616	99.3	19.8	15.4	58.8	<b>18.2</b>	317	0.0
MT 1525	MT1015/MT1007 (BULK)	100.0	18.7	19.6	<b>61.7</b>	17.2	303	0.3
MT 1543	CHOTEAU/YELLOWSTONE-26//K	100.0	19.2	15.8	58.8	16.5	327	0.0
MT 1570	CHOTEAU/MT0516//CAP151-3	98.7	13.8	12.6	60.6	17.5	333	0.0
EXPERIMENTAL MEANS		99.5	18.7	18.4	60.0	17.0	323.0	0.6
LSD (0.05)		1.6	2.7	3.0	0.5	0.6	11.5	1.4
C.V.%		1.0	8.6	9.9	0.5	2.2	2.2	154.9
P-VALUE (Varieties)		0.8534	0.0004	<.0001	<.0001	<.0001	<.0001	0.0002

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 (17-9951-SW)

Seeding Date: April 26, 2017  
 Harvest Date: August 10, 2017  
 Fertility: 100-20-10 side banded  
 System: no till  
 Herbicide: none  
 Insecticide: none  
 Previous Crop: Chemical Fallow - Winter Wheat  
 Precipitation: 2.26" 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. 2008-2017. (Exp# 9951-SW)**

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)								
		2013	2014	2015	2016	2017	AVE. for YEARS TESTED 3/	% of CHECK YIELD 5/	9-YR COMP. AVE. YIELD 6/	2013	2014	2015	2016	2017	AVE. for YEARS TESTED 3/	% of CHECK TEST WT 5/	9-YR COMP. AVE. TEST WT 6/
PI671855 EGAN (+)	3			38.5	49.7	18.9	35.7	154.3	<b>44.1</b>			60.6	57.6	58.6	58.9	98.3	<b>58.2</b>
PI676978 LANNING (++)	3			43.8	43.5	19.6	35.6	154.0	<b>44.0</b>			61.7	56.9	59.8	59.5	99.1	<b>58.7</b>
PI642366 VIDA (+)	9	66.8		43.5	38.3	25.1	36.5	127.8	<b>36.5</b>	61.3		62.2	55.8	59.3	59.2	99.2	<b>58.8</b>
01S0263-28 SY SOREN (P+)	3			36.2	30.4	18.5	28.3	122.4	<b>35.0</b>			62.3	55.2	60.8	59.4	99.1	<b>58.7</b>
PI660981 DUCLAIR (+)(saw fly tol)	7	55.7		39.4	39.9	22.1	35.6	122.3	<b>34.9</b>	60.8		60.6	55.8	58.8	58.5	97.5	<b>57.7</b>
BZ999592 ONEAL (P+)	9	61.7		41.1	31.6	19.9	34.8	121.8	<b>34.8</b>	63.2		62.7	54.5	60.3	60.1	100.6	<b>59.6</b>
ND 695 REEDER (+)	9	59.0		39.0	40.4	21.2	33.7	118.2	<b>33.7</b>	62.8		62.9	57.4	59.3	59.9	100.3	<b>59.4</b>
0150042-10 BRENNAN (P+)	3			29.3	40.3	11.5	27.0	116.8	<b>33.4</b>			63.0	60.2	61.0	61.4	102.4	<b>60.7</b>
BZ996434 CORBIN (P+)	9	54.1		38.3	43.0	16.1	33.0	115.6	<b>33.0</b>	62.2		62.3	57.9	60.8	59.9	100.3	<b>59.4</b>
PI574642 McNEAL	8	50.4		38.1	35.9		33.2	110.0	<b>31.4</b>	62.2		61.7	54.8		58.7	98.3	<b>58.2</b>
PI633974 CHOTEAU (+)(saw fly tol)	9	52.5		35.3	31.7	17.3	31.2	109.3	<b>31.2</b>	61.3		61.2	56.1	59.7	58.5	98.0	<b>58.0</b>
04S0515-2-2 SY TYRA (P+)	8	54.6		42.0	25.0		32.4	107.5	<b>30.7</b>	63.8		64.2	53.8		60.0	100.5	<b>59.5</b>
CI13596 FORTUNA (saw fly tol)	9	48.4		34.2	33.2	15.7	28.6	100.0	<b>28.6</b>	61.6		62.0	58.3	59.6	59.7	100.0	<b>59.2</b>
IMICHT-79 WB9879CLP (P+)	6	54.7		38.7	35.4	19.5	34.4	99.3	<b>28.4</b>	61.8		61.8	57.6	59.6	60.3	99.5	<b>59.0</b>
BZ902413 WB GUNNISON (P+)(sf tol)	6	50.3		37.2	35.2	20.3	32.9	95.1	<b>27.2</b>	62.8		62.3	58.3	59.9	61.1	100.8	<b>59.7</b>
NDSW0449 MOTT (+)(saw fly tol)	6	56.2		34.7	29.5		33.7	89.8	<b>25.7</b>	62.6		62.4	57.1		59.9	99.6	<b>59.0</b>
MEANS (For Entries Listed)		55.4		38.1	36.4	18.9			<b>33.3</b>	62.2		62.1	56.7	59.8			<b>59.0</b>
7/ Growing Season Precipitation (in.)		n/a	16.4	n/a	8.6	2.3	8.2										
Soil PAW (in.) to SD @ Planting		7.8	8.9	6.3	6.1	n/a	7.9										
Total Plant Available Water (in.)		n/a	25.2	n/a	14.7	n/a	17.2										
Soil NO3 (lbs.) to SD at Planting		11	65	49	85	n/a	66										
SD (Sampling Depth in Inches)		48	48	48	48	n/a	48										
Fertilizer Applied																	
	(# N)	100	100	100	125	100	88										
	(# P2O5)	20	20	20	20	20	30										
	(# K2O)	10	10	10	10	10	18										
	(# S)	0	0	0	10	0	1										

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 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. 2008-2017. (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/
		2008	2009	2010	2011	2012	2013	2014 3/	2015	2016	2017			
0150042-10 BRENNAN (P+)	3								0.0	0.0	0.0	0.0	0.0	<b>0.0</b>
PI671855 EGAN (+)	3								0.0	0.0	0.7	0.2	0.0	<b>0.0</b>
PI676978 LANNING (++)	3								0.0	0.0	0.7	0.2	0.0	<b>0.0</b>
01S0263-28 SY SOREN (P+)	3								0.0	0.0	1.0	0.3	0.0	<b>0.0</b>
NDSW0449 MOTT (+)(saw fly tol)	6			3.7	5.0	1.0	0.0		0.0	0.0		1.6	16.0	<b>1.2</b>
BZ902413 WB GUNNISON (P+)(sf tol)	6				6.7	2.3	0.3		0.0	0.0	0.3	1.6	18.6	<b>1.4</b>
BZ996434 CORBIN (P+)	9	11.7	3.7	10.3	21.7	18.3	2.0		0.0	0.0	0.3	7.6	97.6	<b>7.6</b>
CI 13596 FORTUNA (saw fly tol)	9	8.3	1.0	8.3	28.3	20.0	3.7		0.0	0.0	0.0	7.7	100.0	<b>7.7</b>
IMICHT-79 WB9879CLP (P+)	6				40.0	16.7	2.0		0.0	0.0	0.0	9.8	112.8	<b>8.7</b>
PI660981 DUCLAIR (+)(saw fly tol)	7			13.7	33.3	30.0	4.0		0.0	0.0	0.3	11.6	134.8	<b>10.4</b>
PI633974 CHOTEAU (+)(saw fly tol)	9	13.3	3.7	13.3	36.7	28.3	6.7		0.0	0.0	0.0	11.3	146.4	<b>11.3</b>
PI642366 VIDA (+)	9	20.0	2.3	18.3	26.7	33.3	3.3		0.0	0.0	0.3	11.6	149.8	<b>11.6</b>
BZ999592 ONEAL (P+)	9	21.7	7.0	2.3	40.0	35.0	5.0		0.0	0.0	0.0	12.3	159.3	<b>12.3</b>
04S0515-2-2 SY TYRA (P+)	8	30.0	3.7	15.0	46.7	23.3	3.7		0.0	0.0		15.3	175.6	<b>13.6</b>
ND 695 REEDER (+)	9	18.3	6.7	16.7	53.3	33.3	5.3		0.0	0.0	2.3	15.1	195.2	<b>15.1</b>
PI574642 McNEAL	8	46.7	18.3	25.0	80.0	61.7	21.7		0.0	0.0		31.7	363.7	<b>28.1</b>
MEANS (For Entries Listed)		21.3	5.8	12.7	34.9	25.3	4.8		0.0	0.0	0.5			<b>8.1</b>
6/ Growing Season Precipitation (in.)		6.6	6.0	10.3	8.3	7.5	n/a	16.4	n/a	8.6	2.3	8.2		
Soil PAW (in.) to SD @ Planting		8.1	7.8	9.0	7.9	8.9	7.8	8.9	6.3	6.1	n/a	7.9		
Total Plant Available Water (in.)		14.6	13.8	19.2	16.2	16.4	n/a	25.2	n/a	14.7	n/a	17.2		
Soil NO3 (lbs.) to SD at Planting		n/a	94	162	51	15	11	65	49	85	n/a	66		
SD (Sampling Depth in Inches)		48	48	48	48	48	48	48	48	48	n/a	48		
Fertilizer Applied	(# N)	70	70	70	70	70	100	100	100	125	100	88		
	(# P <sub>2</sub> O <sub>5</sub> )	40	40	40	40	40	20	20	20	20	20	30		
	(# K <sub>2</sub> O)	25	25	25	25	25	10	10	10	10	10	18		
	(# S)	0	0	0	0	0	0	0	0	10	0	1		

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 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. 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. 2008-2017. (Exp# 9955-SW)**

2/ VARIETY or SELECTION	No. of YEARS TESTED 3/	1/ YIELD (Bushels Per Acre)							TEST WEIGHT (Pounds Per Bushel)								
		2013	2014	2015	2016	2017 4/	AVE. for YEARS TESTED 3/	% of YIELD 5/	9-YR COMP. AVE. YIELD 6/	2013	2014	2015	2016	2017 4/	AVE. for YEARS TESTED 3/	% of TEST WT 5/	9-YR COMP. TEST WT 6/
PI642366 VIDA (+)	9	71.4	54.3	52.0	49.3		44.3	129.8	<b>44.3</b>	60.5	56.9	59.8	60.3		59.4	100.9	<b>59.4</b>
ND 695 REEDER (+)	9	70.3	47.7	48.4	45.4		41.5	121.6	<b>41.5</b>	61.8	57.1	60.5	61.5		59.9	101.8	<b>59.9</b>
BZ999592 ONEAL (P+)	9	61.4	45.3	52.3	39.5		41.5	118.8	<b>40.5</b>	62.0	57.0	61.0	59.4		60.3	101.9	<b>60.0</b>
04S0515-2-2 SY TYRA (+)	8	59.3	47.5	46.3	42.4		41.2	114.3	<b>39.0</b>	61.3	56.7	62.1	60.2		59.4	100.3	<b>59.0</b>
BZ996434 CORBIN (P+)	9	58.8	41.4	45.4	43.3		38.9	114.0	<b>38.9</b>	60.8	56.4	60.3	61.5		59.6	101.4	<b>59.6</b>
PI671855 EGAN (+)	3		41.5	51.4	44.3		45.7	112.8	<b>38.5</b>		54.7	60.6	59.6		58.3	98.5	<b>57.9</b>
BZ9M1044 JEDD (P+)	7	50.8	38.0				36.5	110.6	<b>37.7</b>	60.9	56.7				60.1	102.4	<b>60.3</b>
PI660981 DUCLAIR (+)(saw fly tol)	7	56.4	47.2	47.0	41.5		40.9	110.4	<b>37.7</b>	59.3	55.3	57.2	60.1		58.1	97.8	<b>57.6</b>
IMICHT-79 WB9879CLP (P+)	6	59.2	43.7	44.7	43.0		42.8	110.1	<b>37.6</b>	59.6	55.5	59.6	59.8		59.3	99.4	<b>58.5</b>
PI633974 CHOTEAU (+)(saw fly tol)	9	55.7	42.5	42.5	44.9		37.3	109.3	<b>37.3</b>	59.6	55.5	58.7	59.9		58.2	98.9	<b>58.2</b>
ACS53610 VOLT (P+)	7	57.8	45.8				35.9	108.6	<b>37.1</b>	62.4	58.1				60.2	102.7	<b>60.4</b>
BZ902413 WB GUNNISON (P+)(sf tol)	6	55.4	45.9	47.2	43.2		41.6	107.2	<b>36.6</b>	61.7	57.5	61.1	61.5		60.5	101.0	<b>59.4</b>
PI574642 McNEAL	9	55.0	40.7	44.5	36.4		36.1	105.8	<b>36.1</b>	61.3	56.1	59.4	59.7		58.9	100.2	<b>58.9</b>
NDSW0449 MOTT (+)(saw fly tol)	7	57.1	41.9	41.9	35.3		38.5	104.0	<b>35.5</b>	60.6	55.3	60.1	59.6		59.0	99.4	<b>58.5</b>
0150042-10 BRENNAN (P+)	3		47.3	39.3	39.4		42.0	103.6	<b>35.3</b>		57.4	61.3	61.7		60.1	101.6	<b>59.8</b>
CI13596 FORTUNA (saw fly tol)	9	54.4	38.3	43.0	40.3		35.0	102.5	<b>35.0</b>	60.9	56.3	60.4	61.0		59.1	100.5	<b>59.1</b>
MEANS (For Entries Listed)		58.8	44.3	46.1	42.0				<b>38.0</b>	60.9	56.4	60.2	60.4				<b>59.2</b>
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 <sub>2</sub> O <sub>5</sub> )	20	20	20	20	20	30										
	(# K <sub>2</sub> O)	10	10	10	10	10	18										
	(# S)	0	0	0	10	0	1										

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 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 5. Nine-Year Sawfly Summary on Selected Entries from Dryland Fallow Spring Wheat Variety Nurseries Grown Off-Station at the Flansaa/Lumsden Farm, Loring. Northern Agricultural Research Center. Havre, Montana. 2008-2017. (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
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017 3/			
0150042-10 BRENNAN (P+)	3							0.0	0.0	0.0		0.0	0.0	0.0
NDSW0449 MOTT (+)(saw fly tol)	7			1.0	5.0	1.0	0.0	0.7	0.0	0.0		1.1	28.7	1.1
BZ902413 WB GUNNISON (P+)(sf tol)	6				5.0	1.0	1.0	0.0	0.0	0.0		1.2	30.3	1.2
PI671855 EGAN (+)	3							0.3	0.0	0.0		0.1	33.4	1.3
BZ996434 CORBIN (P+)	9	2.3	2.3	5.3	10.0	3.7	0.7	0.3	0.0	0.0		2.7	69.2	2.7
IMICHT-79 WB9879CLP (P+)	6				13.3	2.3	0.3	0.0	0.0	0.0		2.7	69.2	2.7
BZ9M1044 JEDD (P+)	7	1.0	2.3	2.3	10.0	11.7	0.0	0.7				4.0	77.7	3.1
BZ999592 ONEAL (P+)	9	1.0	3.7	2.3	16.7	8.3	0.0	0.0	0.0	0.0		3.6	88.7	3.5
C113596 FORTUNA (saw fly tol)	9	4.0	5.3	11.7	6.7	6.7	0.7	1.0	0.0	0.0		4.0	100.8	4.0
PI633974 CHOTEAU (+)(saw fly tol)	9	2.3	3.7	8.3	16.7	6.7	0.7	1.0	0.0	0.0		4.4	110.2	4.4
04S0512-2-2 SY TYRA (P+)	8	2.3		5.0	15.0	11.7	0.0	0.7	0.0	0.0		4.3	112.9	4.5
PI660981 DUCLAIR (+)(saw fly tol)	7			10.0	15.0	6.7	0.0	0.3	0.0	0.0		4.6	119.8	4.8
PI642366 VIDA (+)	9	6.7	8.3	10.0	18.3	10.0	0.3	0.3	0.0	0.0		6.0	151.0	6.0
ND 695 REEDER (+)	9	3.7	3.7	10.3	18.3	15.0	0.7	2.3	0.0	0.0		6.0	151.2	6.0
PI574642 McNEAL	9	6.7	21.7	20.0	20.0	25.0	1.0	7.0	0.0	0.0		11.3	283.6	11.3
ACS53610 VOLT (P+)	7	23.3	26.7	15.0	23.3	26.7	6.7	2.0				17.7	343.3	13.6
MEANS (For Entries Listed)		5.3	8.6	8.4	13.8	9.7	0.9	1.0	0.0	0.0				4.4
6/ Growing Season Precipitation (in.)		8.9	5.3	11.6	n/a	n/a	9.5	5.6	8.9	7.2	n/a	8.1		
Soil PAW (in.) to SD @ Planting		8.2	10.5	7.7	7.1	8.8	8.8	8.9	8.2	3.7	n/a	8.0		
Total Plant Available Water (in.)		17.2	15.7	19.3	n/a	n/a	18.3	14.5	17.2	10.9	n/a	16.1		
Soil NO3 (lbs.) to SD at Planting		n/a	42	94	50	34	34	64	41	25	n/a	48		
SD (Sampling Depth in Inches)		48	48	48	48	48	48	48	48	24	n/a	45		
Fertilizer Applied	(# N)	70	70	70	70	70	100	100	100	125	100	88		
	(# P <sub>2</sub> O <sub>5</sub> )	40	40	40	40	40	20	20	20	20	20	30		
	(# K <sub>2</sub> O)	25	25	25	25	25	10	10	10	10	10	18		
	(# S)	0	0	0	0	0	0	0	0	10	0	1		

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 6. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at McKeever Farm & Seed, Inc., Loma. Northern Agricultural Research Center. Havre, Montana. 2017. (Exp# 17-9957-SW)**

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %	3/ FN Seconds	4/ SAWFLY %
WSCIA	ALUM	94.4	24.4	31.0	55.3	18.4	316	2.3
AGRIPR10	BRENNAN	97.0	23.3	31.1	<b>56.1</b>	17.8	347	10.0
PI633974	CHOTEAU	98.0	25.3	25.5	52.8	18.7	340	0.0
BZ996434	CORBIN	94.3	24.8	30.0	53.5	19.1	323	0.0
PI660981	DUCLAIR	97.3	26.9	<b>33.2</b>	52.3	18.5	316	0.7
PI 671855	EGAN	99.0	25.0	25.6	51.0	<b>20.7</b>	<b>357</b>	6.7
CI 13596	FORTUNA	97.3	29.1	27.6	54.8	17.7	345	0.3
PI 676978	LANNING	99.3	25.2	30.9	50.4	19.0	324	8.3
LIMAGR143	LCS PRO	98.0	26.4	<b>33.2</b>	53.3	17.7	334	8.3
PI 679964	NS PRESSER CLP	98.7	25.3	32.8	52.6	18.4	337	2.3
BZ999592	ONEAL	94.0	24.0	28.8	54.8	19.4	343	0.3
ND 695	REEDER	99.7	25.4	29.3	52.8	18.6	328	10.0
AGRIPR141	SY INGMAR	96.0	25.2	29.1	53.6	18.5	<b>358</b>	6.7
AGRIPR14	SY SOREN	94.6	24.1	28.6	54.0	18.5	349	6.7
PI642366	VIDA	97.7	25.0	32.0	53.5	18.3	333	0.3
BZ92413R	WB GUNNISON	97.3	24.6	<b>33.7</b>	54.7	17.7	<b>352</b>	0.0
WB9879CLP	WB9879CLP	90.7	24.3	26.7	53.6	18.4	334	0.3
Winfield-1	HRS 3361	95.7	21.8	26.2	53.4	18.3	345	10.0
Winfield-2	HRS 3504	96.7	23.6	25.1	52.8	18.3	<b>357</b>	8.3
Winfield-3	HRS 3616	96.0	24.4	24.5	53.1	18.9	<b>353</b>	11.7
MT 1525	MT1015/MT1007 (BULK)	93.7	24.6	32.0	<b>57.1</b>	18.4	323	0.3
MT 1543	CHOTEAU/YELLOWSTONE-26//C	97.3	25.4	<b>36.0</b>	53.5	17.4	325	0.0
MT 1570	CHOTEAU/MT0516//CAP151-3	94.7	21.9	31.7	55.1	17.7	333	0.0
EXPERIMENTAL MEANS		96.4	24.8	29.8	53.7	18.5	338.0	4.1
LSD (0.05)		3.9	1.9	3.1	1.1	0.5	7.2	3.7
C.V.%		2.5	4.6	6.2	1.3	1.7	1.3	55.2
P-VALUE (Varieties)		0.0056	<.0001	<.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 (17-9957-SW)

Seeding Date: May 5, 2017  
 Harvest Date: August 9, 2017  
 Fertility: 100-20-10 side banded  
 System: no till  
 Herbicide: none  
 Insecticide: none  
 Previous Crop: Mechanical Fallow - Winter Wheat  
 Precipitation: N/A

**TABLE 7. Five-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. 2013-2017. (Exp# 9957-SW)**

2/ VARIETY or SELECTION	No. of YEARS TESTED	1/ YIELD (Bushels Per Acre)					TEST WEIGHT (Pounds Per Bushel)					5-YR COMP. AVE. YIELD 4/	5-YR COMP. TEST WT 4/				
		2013	2014	2015	2016	2017	AVE. YEARS TESTED	% of CHECK YIELD 3/	2013	2014	2015			2016	2017	AVE. YEARS TESTED	% of CHECK TEST WT 3/
PI642366 VIDA (+)	5	70.8	42.8	32.0	14.8	32.0	38.5	132.5	<b>38.5</b>	60.0	55.2	53.7	54.1	53.5	55.3	98.1	<b>55.3</b>
PI676978 LANNING (++)	3			36.8	12.2	30.9	26.6	120.5	<b>35.0</b>			53.0	51.4	50.4	51.6	93.1	<b>52.5</b>
BZ92413R WB GUNNISON (P+)(sf tol)	5	58.6	35.8	30.4	13.5	33.7	34.4	118.5	<b>34.4</b>	62.0	57.3	54.7	54.1	54.7	56.6	100.3	<b>56.6</b>
BZ996434 CORBIN (P+)	5	60.0	37.0	31.8	12.9	30.0	34.3	118.1	<b>34.3</b>	60.3	56.5	53.5	53.3	53.5	55.4	98.3	<b>55.4</b>
PI660981 DUCLAIR (+)(saw fly tol)	5	56.3	35.4	29.7	16.9	33.2	34.3	118.1	<b>34.3</b>	58.0	56.1	52.1	54.8	52.3	54.7	96.9	<b>54.7</b>
PI574642 McNEAL	4	53.6	40.5	33.2	10.5		34.5	117.2	<b>34.0</b>	60.1	54.9	54.0	50.2		54.8	98.6	<b>55.6</b>
BZ999592 ONEAL (P+)	5	58.6	37.3	32.8	9.9	28.8	33.5	115.3	<b>33.5</b>	61.0	55.6	56.1	51.9	54.8	55.9	99.1	<b>55.9</b>
ND 695 REEDER (+)	5	60.8	35.7	30.3	10.5	29.3	33.3	114.7	<b>33.3</b>	60.6	55.7	54.7	54.5	52.8	55.7	98.7	<b>55.7</b>
IMICHT-79 WB9879CLP (P+)	5	59.2	37.3	27.8	12.4	26.7	32.7	112.4	<b>32.7</b>	60.7	56.0	53.5	51.8	53.6	55.1	97.7	<b>55.1</b>
NDSW0449 MOTT (+)(saw fly tol)	4	61.2	32.3	26.8	9.8		32.5	110.6	<b>32.1</b>	60.8	57.0	53.8	50.6		55.6	100.0	<b>56.4</b>
04S0515-2-2 SY TYRA (P+)	4	57.1	33.4	27.7	7.9		31.5	107.2	<b>31.1</b>	61.9	56.4	54.6	53.1		56.5	101.7	<b>57.3</b>
PI633974 CHOTEAU (+)(saw fly tol)	5	54.7	35.0	29.0	10.9	25.5	31.0	106.7	<b>31.0</b>	58.9	56.1	53.4	52.7	52.8	54.8	97.2	<b>54.8</b>
PI671855 EGAN (+)	4		37.4	32.4	11.7	25.6	26.8	106.5	<b>30.9</b>		54.7	52.9	51.4	51.0	52.5	90.9	<b>51.2</b>
0150042-10 BRENNAN (P+)	4		35.4	32.6	6.9	31.1	26.5	105.3	<b>30.6</b>		59.3	56.1	54.9	56.1	56.6	98.0	<b>55.3</b>
01S0263-28 SY SOREN (P+)	3			29.3	8.5	28.6	22.1	100.1	<b>29.1</b>			53.8	53.1	54.0	53.7	96.8	<b>54.6</b>
C113596 FORTUNA (saw fly tol)	5	44.7	34.3	24.7	13.9	27.6	29.0	100.0	<b>29.0</b>	60.4	57.7	55.2	53.8	54.8	56.4	100.0	<b>56.4</b>
MEANS (For Entries Listed)		58.0	36.4	30.4	11.4	29.5			<b>32.7</b>	60.4	56.3	54.1	52.9	53.4			<b>55.2</b>
5/ Growing Season Precipitation (in.)		9.0	5.1	n/a	6.0	n/a	6.7										
Soil PAW (in.) to SD @ Planting		9.1	10.4	8.8	8.7	n/a	9.3										
Total Plant Available Water (in.)		18.1	15.5	n/a	14.8	n/a	16.1										
Soil NO3 (lbs.) to SD at Planting		51	85	126	194	n/a	114										
SD (Sampling Depth in Inches)		48	48	48	48	n/a	48										
Fertilizer Applied	(# N)	100	100	100	125	100	105										
	(# P <sub>2</sub> O <sub>5</sub> )	20	20	20	20	20	20										
	(# K <sub>2</sub> O)	10	10	10	10	10	10										
	(# S)	0	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 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 8. Five-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. 2013-2017. (Exp# 9957-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/
		2013	2014	2015	2016	2017			
BZ92413R WB GUNNISON (P+)(sf tol)	5	1.0	0.0	1.0	0.0	0.0	0.4	16.2	<b>0.4</b>
NDSW0449 MOTT (+)(saw fly tol)	4	1.0	0.3	1.0	0.0	0.0	0.6	19.4	<b>0.5</b>
IMICHT-79 WB9879CLP (P+)	5	3.7	0.3	1.0	0.3	0.3	1.1	45.9	<b>1.1</b>
BZ996434 CORBIN (P+)	5	3.7	0.0	2.3	0.3	0.0	1.3	51.3	<b>1.3</b>
PI633974 CHOTEAU (+)(saw fly tol)	5	5.7	0.0	2.3	1.0	0.0	1.8	73.0	<b>1.8</b>
04S0515-2-2 SY TYRA (P+)	4	7.0	0.0	4.0	1.0	0.0	3.0	100.0	<b>2.5</b>
C113596 FORTUNA (saw fly tol)	5	5.0	1.0	2.3	3.7	0.3	2.5	100.0	<b>2.5</b>
PI660981 DUCLAIR (+)(saw fly tol)	5	7.0	0.0	3.7	3.7	0.7	3.0	121.6	<b>3.0</b>
PI642366 VIDA (+)	5	6.7	0.3	5.0	5.0	0.3	3.5	140.5	<b>3.5</b>
BZ999592 ONEAL (P+)	5	6.7	0.7	6.7	3.7	0.3	3.6	146.0	<b>3.6</b>
0150042-10 BRENNAN (P+)	4		0.3	2.3	8.3	10.0	5.2	286.2	<b>7.1</b>
PI574642 McNEAL	4	20.0	0.7	10.0	11.7	0.0	10.6	352.7	<b>8.7</b>
PI671855 EGAN (+)	4		0.7	3.7	15.0	6.7	6.5	354.4	<b>8.7</b>
ND 695 REEDER (+)	5	15.0	0.7	10.0	18.3	10.0	10.8	437.8	<b>10.8</b>
01S0263-28 SY SOREN (P+)	3			6.7	20.0	6.7	11.1	526.1	<b>13.0</b>
PI676978 LANNING (++)	3			28.3	21.7	8.3	19.4	920.7	<b>22.7</b>
MEANS (For Entries Listed)		6.9	0.4	5.6	7.1	3.4			<b>5.7</b>
5/ Growing Season Precipitation (in.)		9.0	5.1	n/a	6.0	n/a	6.7		
Soil PAW (in.) to SD @ Planting		9.1	10.4	8.8	8.7	n/a	9.3		
Total Plant Available Water (in.)		18.1	15.5	n/a	14.8	n/a	16.1		
Soil NO3 (lbs.) to SD at Planting		51	85	126	194	n/a	114		
SD (Sampling Depth in Inches)		48	48	48	48	n/a	48		
Fertilizer Applied	(# N)	100	100	100	125	100	105		
	(# P <sub>2</sub> O <sub>5</sub> )	20	20	20	20	20	20		
	(# K <sub>2</sub> O)	10	10	10	10	10	10		
	(#S)	0	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.

**TABLE 9. Dryland Fallow Spring Wheat Cultivar Evaluation Nursery Grown Off-Station at the Kammerzell Farm, Chester. Northern Agricultural Research Center. Havre, Montana. 2017. (Exp# 17-9953-SW)**

ID	CULTIVAR or SELECTION	STAND %	PLNT HT Inches	1/ YIELD Bu/Ac	TEST WT Lbs/Bu	2/ PROTEIN %	3/ FN Seconds	4/ SAWFLY %
WSCIA	ALUM	98.7	22.7	24.1	<b>58.4</b>	17.3	316	3.7
AGRIPR10	BRENNAN	97.4	22.5	30.4	57.5	17.1	330	6.7
PI633974	CHOTEAU	97.7	24.3	26.4	55.3	17.7	311	2.0
BZ996434	CORBIN	99.3	27.9	<b>35.2</b>	55.7	17.8	311	0.7
PI660981	DUCLAIR	100.0	25.1	<b>33.7</b>	53.6	17.8	312	3.7
PI671855	EGAN	99.3	23.2	27.2	54.4	<b>19.2</b>	<b>351</b>	13.3
CI 13596	FORTUNA	99.7	27.7	26.1	56.6	17.5	323	2.3
PI676978	LANNING	99.3	21.4	30.8	53.9	18.0	311	13.3
LIMAGR143	LCS PRO	99.7	26.0	26.1	54.0	17.6	316	11.7
PI679964	NS PRESSER CLP	100.0	24.3	29.1	54.4	17.5	302	6.7
BZ999592	ONEAL	98.0	23.6	27.6	57.4	17.9	332	3.7
ND 695	REEDER	99.7	23.3	31.6	55.4	17.6	307	13.3
AGRIPR141	SY INGMAR	99.7	21.9	27.0	55.1	17.8	332	6.7
AGRIPR14	SY SOREN	99.3	23.8	28.8	54.6	18.1	329	15.0
PI642366	VIDA	96.4	23.6	<b>33.0</b>	55.7	17.1	312	2.3
BZ92413R	WB GUNNISON	99.7	26.0	<b>35.1</b>	56.0	16.6	324	0.3
WB9879CLP	WB9879CLP	99.0	24.2	28.3	55.7	17.5	308	1.0
Winfield-1	HRS 3361	98.4	23.0	27.0	54.5	17.5	327	10.0
Winfield-2	HRS 3504	99.3	23.5	25.9	55.0	16.9	321	8.3
Winfield-3	HRS 3616	99.0	24.6	27.6	54.7	18.0	329	11.7
MT 1525	MT1015/MT1007 (BULK)	98.0	21.9	<b>32.0</b>	<b>59.1</b>	17.1	314	1.0
MT 1543	CHOTEAU/YELLOWSTONE-26//K	100.0	25.4	<b>32.2</b>	55.4	16.8	304	2.3
MT 1570	CHOTEAU/MT0516//CAP151-3	99.0	23.7	31.6	56.9	17.1	315	2.3
EXPERIMENTAL MEANS		99.0	24.1	29.4	55.6	17.5	319.1	6.2
LSD (0.05)		2.3	2.0	3.5	0.9	0.4	9.2	6.0
C.V.%		1.4	4.9	7.3	0.9	1.4	1.7	58.8
P-VALUE (Varieties)		0.2003	<.0001	<.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 (17-9953-SW)

Seeding Date: May 9, 2017  
 Harvest Date: August 14, 2017  
 Fertility: 100-20-10 side banded  
 System: no till  
 Herbicide: none  
 Insecticide: none  
 Previous Crop: Chemical Fallow - Winter Wheat  
 Precipitation: 2.75" seeding to harvest maturity

**TABLE 10. Four-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. 2014-2017. (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	AVE. YEARS TESTED	% CHECK YIELD 3/	4-YR COMP. AVE. YIELD 4/	2014	2015	2016	2017	AVE. YEARS TESTED	% CHECK TEST WT 3/	4-YR COMP. AVE. TEST WT 4/
0150042-10 BRENNAN (P+)	4	43.0	24.3	31.3	30.4	32.2	125.9	<b>32.2</b>	56.5	58.2	53.1	57.5	56.3	101.2	<b>56.3</b>
PI660981 DUCLAIR (+)(saw fly tol)	4	40.3	16.1	34.2	33.7	31.1	121.4	<b>31.1</b>	52.6	53.6	50.5	53.6	52.6	94.5	<b>52.6</b>
BZ996434 CORBIN (P+)	4	36.4	21.3	26.8	35.2	29.9	116.8	<b>29.9</b>	54.3	55.5	50.6	55.7	54.0	97.1	<b>54.0</b>
PI676978 LANNING (++)	3		24.5	23.8	30.8	26.4	114.7	<b>29.4</b>		54.4	47.4	53.9	51.9	93.0	<b>51.7</b>
PI671855 EGAN (+)	4	33.9	22.6	32.4	27.2	29.0	113.2	<b>29.0</b>	53.3	55.5	49.8	54.4	53.2	95.7	<b>53.2</b>
PI642366 VIDA (+)	4	37.0	22.8	23.0	33.0	28.9	113.0	<b>28.9</b>	52.8	56.7	48.5	55.7	53.5	96.0	<b>53.5</b>
BZ92413R WB GUNNISON (P+)(sf tol)	4	38.3	23.1	18.3	35.1	28.7	112.1	<b>28.7</b>	54.5	56.8	51.8	56.0	54.8	98.4	<b>54.8</b>
ND 695 REEDER (+)	4	34.4	22.0	23.1	31.6	27.8	108.4	<b>27.8</b>	54.0	56.6	50.2	55.4	54.0	97.1	<b>54.0</b>
01S0263-28 SY SOREN (P+)	3		16.9	25.9	28.8	23.9	103.7	<b>26.5</b>		54.9	49.0	54.6	52.8	94.7	<b>52.7</b>
PI574642 McNEAL	3	34.6	22.3	20.3		25.7	101.2	<b>25.9</b>	53.7	56.1	48.3		52.7	95.2	<b>53.0</b>
04S0515-2-2 SY TYRA (P+)	3	34.7	21.5	20.9		25.7	101.0	<b>25.9</b>	53.7	57.1	47.7		52.8	95.4	<b>53.1</b>
C113596 FORTUNA (saw fly tol)	4	33.4	18.3	24.6	26.1	25.6	100.0	<b>25.6</b>	55.2	57.7	53.2	56.6	55.7	100.0	<b>55.7</b>
IMICHT-79 WB9879CLP (P+)	4	33.1	18.1	21.4	28.3	25.2	98.5	<b>25.2</b>	54.1	56.6	48.9	55.7	53.8	96.7	<b>53.8</b>
NDSW0449 MOTT (+)(saw fly tol)	3	36.4	18.3	19.8		24.8	97.6	<b>25.0</b>	53.9	58.7	49.5		54.0	97.7	<b>54.3</b>
PI633974 CHOTEAU (+)(saw fly tol)	4	29.9	18.3	24.8	26.4	24.9	97.1	<b>24.9</b>	53.3	55.7	49.6	55.3	53.5	96.1	<b>53.5</b>
BZ999592 ONEAL (P+)	4	33.6	19.8	15.3	27.6	24.1	94.0	<b>24.1</b>	55.8	58.4	50.1	57.4	55.4	99.6	<b>55.4</b>
MEANS (For Entries Listed)		35.6	20.6	24.1	30.3			<b>27.5</b>	54.1	56.4	49.9	55.5			<b>53.9</b>
5/ Growing Season Precipitation (in.)		n/a	5.0	8.3	2.8	5.3									
Soil PAW (in.) to SD @ Planting		13.7	9.8	n/a	n/a	11.7									
Total Plant Available Water (in.)		n/a	14.8	n/a	n/a	14.8									
Soil NO3 (lbs.) to SD at Planting		257	251	n/a	n/a	254									
SD (Sampling Depth in Inches)		48	48	48	n/a	48									
Fertilizer Applied															
	(# N)	100	100	125	100	106									
	(# P2O5)	20	20	20	20	20									
	(# K2O)	10	10	10	10	10									
	(# S)	0	0	10	0	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 average or test weight for the same data years as those in which a given entry was tested.

4/ 4-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 = 4-Yr average yield or test weight for the check variety Fortuna.

5/ Seeding to 14 days prior to harvest maturity.

**TABLE 11. Four-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. 2014-2017. (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/	4-YR COMP. AVE SAWFLY 4/
		2014	2015	2016	2017				
BZ92413R WB GUNNISON (P+)(sf tol)	4	3.7	0.0	4.0	0.3	2.0	38.7	<b>2.0</b>	
PI633974 CHOTEAU (+)(saw fly tol)	4	5.7	0.0	5.3	2.0	3.2	62.9	<b>3.2</b>	
IMICHT-79 WB9879CLP (P+)	4	3.7	0.0	10.3	1.0	3.7	72.5	<b>3.7</b>	
BZ996434 CORBIN (P+)	4	1.0	0.0	13.3	0.7	3.7	72.5	<b>3.7</b>	
PI660981 DUCLAIR (+)(saw fly tol)	4	5.0	0.0	6.7	3.7	3.8	74.2	<b>3.8</b>	
0150042-10 BRENNAN (P+)	4	5.0	0.0	3.7	6.7	3.8	74.2	<b>3.8</b>	
NDSW0449 MOTT (+)(saw fly tol)	3	15.0	0.0	2.0		5.7	92.7	<b>4.8</b>	
04S0515-2-2 SY TYRA (P+)	3	13.3	0.0	3.7		5.7	92.7	<b>4.8</b>	
CI13596 FORTUNA (saw fly tol)	4	6.7	0.0	11.7	2.3	5.2	100.0	<b>5.2</b>	
BZ999592 ONEAL (P+)	4	3.7	0.0	15.0	3.7	5.6	108.0	<b>5.6</b>	
PI 671855 EGAN (+)	4	6.7	0.0	5.0	13.3	6.3	121.1	<b>6.3</b>	
PI642366 VIDA (+)	4	18.3	0.0	5.3	2.3	6.5	125.8	<b>6.5</b>	
PI574642 McNEAL	3	7.0	0.0	16.7		7.9	129.1	<b>6.7</b>	
01S0263-28 SY SOREN (P+)	3		0.0	6.7	15.0	7.2	154.7	<b>8.0</b>	
ND 695 REEDER (+)	4	6.7	0.0	16.7	13.3	9.2	177.4	<b>9.2</b>	
PI 676978 LANNING (++)	3		0.0	18.3	13.3	10.6	226.1	<b>11.7</b>	
MEANS (For Entries Listed)		7.2	0.0	9.0	6.0			<b>5.6</b>	
5/ Growing Season Precipitation (in.)		n/a	5.0	8.3	2.8	5.3			
Soil PAW (in.) to SD @ Planting		13.7	9.8	n/a	n/a	11.7			
Total Plant Available Water (in.)		n/a	14.8	n/a	n/a	14.8			
Soil NO3 (lbs.) to SD at Planting		257	251	n/a	n/a	254			
SD (Sampling Depth in Inches)		48	48	48	n/a	48			
Fertilizer Applied	(# N)	100	100	125	100	106			
	(# P2O5)	20	20	20	20	20			
	(# K2O)	10	10	10	10	10			
	(# S)	0	0	10	0	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/ 4-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 = 4-Yr average saw fly rating for the check variety Fortuna.

5/ Seeding to 14 days prior to harvest maturity.