MONTANA STATE UNIVERSITY
MONTANA AGRICULTURAL EXPERIMENT STATION

RESULTS OF AGRONOMIC AND WEED SCIENCE RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA - 2014

The Annual Report of the Investigations at the
Southern Agricultural Research Center, Huntley, Montana
http://www.sarc.montana.edu/

PROJECT TITLE:

2014 Off-Station Winter Wheat Variety Performance Trials in South Central Montana. This research is partially supported by Montana farmers through the Montana Wheat and Barley Committee.

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Greg Lackman, Hysham
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OBJECTIVES:

To provide wheat growers in south central Montana with a reliable, unbiased and up-to-date source of information that will permit valid comparisons among improved winter wheat varieties. This information should help winter wheat producers in south central Montana select varieties best suited to their particular area and growing conditions.

METHODS:

The 2014 off-station winter wheat trials were established under irrigation at Huntley and under dryland conditions near Molt under conventional summer fallow conditions; near Hardin, Hysham, and Rapelje under no-till, chemical fallow conditions (Fig. 1). Each trial contained 25 winter wheat cultivars (15 commercial, 10 experimental), and was planted using a partially-balanced lattice design under dryland and irrigated conditions with three replications. All entries were seeded at approximately 1 million seeds per acre under dryland conditions (~60 lb/a) and 1.5 million seeds per acre under irrigation (~90 lb/a). Dryland test plots consisted of a 15-foot, 4-row plot with 14-inch row spacing. Irrigated test plots consisted of a 15-foot, 7-row plot with 7-inch row spacing. All rows of each harvested test plot were trimmed 36 inches and harvested using a plot combine. Information pertaining to the traits and characteristics of the winter wheat entries are provided in Table 1.

Recorded grain yields were adjusted to 13% grain moisture content, and are reported in bushels per acre based on a 60 pound standard bushel weight. Two year (2013-14) and three year (2012-14) yield averages are provided for cultivars tested during previous years. Test weight (pounds per bushel) and grain

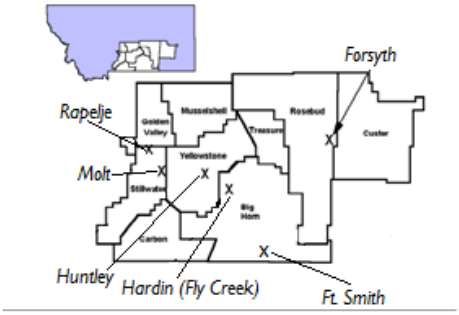

Figure1. 2014 off-station winter wheat trial locations in south central Montana.

moisture content (percent) were obtained for each plot using a Dickey-john™ GAC 2100 grain analyzer. Grain protein content (percent) was determined by near-infrared reflectance for each harvested sample, and adjusted to 12% grain moisture content. Plant height was measured in inches from the soil surface to the top of the head, excluding the awns if present. Corresponding calendar dates also are presented. Information pertaining to the specific cultural management of each study site is listed at the bottom of their respective data table (Tables 2 through 6).

RESULTS:

The 2014 spring wheat test sites had above average rain or snow accumulation during winter months except in November with below average precipitation. September and October precipitation provided ample soil moisture at winter wheat planting and resulted in good crop stand. Below-average precipitation occurred during April, May and July. This may have resulted in early season drought stress at some dryland sites. However, adequate moisture was available through-out the winter wheat growing season that resulted in higher grain yield in 2014 compared to last couple of years. Above average rainfall in August not only delayed harvesting at some sites but also enhanced lodging.

Average winter wheat yield under irrigated condition at Huntley during 2014 was 84 bu/a about 26 bu/a lower than last year (Table 2). The lower yield mainly attributed to strip rust infestation that ranged from 0 to 57%. 'Cowboy', 'Decade' and 'Jerry' suffered heavy strip rust infestation (≥50%). Lodging was moderate in most entries averaging a 2.4 score out of 9. 'Rampart' showed highest lodging score (6.7) among commercial cultivars. Yields ranged from 54 bu/a for 'Genou' to 109 bu/a for 'Jagalene'. Eight other entries produced yield that was statistically equal to the yield of highest yielding cultivar. Test weight values were low under irrigated conditions at Huntley in 2014, due to stripe rust, averaging only 56.7 lb/bu. All entries possessed test weight values less than 60 lb/bu. Grain protein content averaged 14.4 percent and ranged from 12.8 for Genou to 16.1 percent for experimental line 'MTS0826-63'. Two-year average yield for winter wheat varieties tested during 2013 and 2014 was 99 bu/a. Three-year average yield for winter wheat varieties tested during 2012 to 2014 was 103 bu/a. Jegalene and 'CDC Falcon' were top yielding cultivars at Huntley over the past two and three years respectively.

Average yield under dryland conditions at Rapelje in 2014 was 85 bu/a (Table 3), about 32 bushels per acre higher than winter wheat yields observed at this site in 2013. Yields ranged from 75 bu/a for cultivar 'Warhorse' to 102 bu/a for experimental line 'MT1286' though statistically non-significant. Test weight was excellent averaging 63.2 lb/bu, with all of the entries producing test weights above 62 lb/bu. Grain protein averaged 13.5 percent and ranged from 12.4 percent to 14.6. Two-year average yield for winter wheat varieties tested at Rapelje during 2013 and 2014 was 69 bu/a. Three-year average yield from 2012

through 2014 was 61 bu/a. 'Yellowstone' was the highest yielding cultivar at Repelje over the past three years.

Average winter wheat yield at Hardin during 2014 was 57 bu/a (Table 4), doubling the last year yield at this site. Yields ranged from 48 bu/a for 'Accipiter' to 68 bu/a for 'MT1138'. Decade was the highest yielding (67.9 bu/a) commercial entry. Five other commercial entries produced yield that was statistically equal to the yield of MT1138. Test weight values ranged from 59.7 for Jerry to 63.1 'Judee' and averaged 61.0 lb/bu at Hardin in 2014. Grain protein content averaged 18.2 percent. Protein content ranged from 11.1 percent to 14.6 percent. Two-year average yield for winter wheat varieties tested during 2013 and 2014 was 48 bu/a. Three-year average yield for winter wheat varieties tested during 2012 to 2014 was 39 bu/a.

Average yield under dryland conditions at Molt in 2014 was 48 bu/a (Table 5), Yield ranged from 39 bu/a for 'MT1117' to 68 bu/a for the Jagalene. Six other entries produced yield statistically equal with the yield of Jagalene. Average test weight was 60.0 lb/bu, and ranged from 58.0 lb/bu for Yellowstone to 64.1 lb/bu for Jagalene. Grain protein content was the highest at Molt in 2014 and averaged 16.1 percent. All entries have protein content 14 percent or more. Two- and Three-year average yields for winter wheat varieties tested at Molt were 48 and 39 bu/a respectively. Jagalene was the highest yielding cultivars, averaged over the past three year, at Molt.

Hysham was the new winter wheat test site in 2014 replacing Forsyth. Average yield under dryland conditions at Hysham was 67 bu/a (Table 6), Yield ranged from 54 bu/a for Rampart to 83 bu/a for experimental line 'MTS1024'. 'Colter' was the highest yielding commercial cultivar with 82 bu/a yield. Test weight was good averaging 62.3 lb/bu. All entries at Hysham site have test weight over 60 bu/a. Grain protein content averaged 11.9 percent and ranged from 10 percent for Cowboy 13.5 percent for MTS0826-63.

SUMMARY:

The 2014 growing season was favorable for winter wheat production. Adequate soil moisture during the growing season resulted in high grain yield at all dryland test sites ranging from 49 bu/a at Molt to 85 bu/a at Repelje (Table 6). Commercial cultivar Jegalene produced the highest yield of 79 bu/a averaged across all six of the test locations. Grain yield suffered under irrigated conditions at Huntley in 2014 due to strip rust and excessive lodging at harvest.

Since 2012, experiments representing 12 location-years of testing have uniformly tested 13 cultivars at several dryland locations in south central Montana (Table 8). Jegalene was the highest yielding cultivar averaged over the past two- and three-years across all dryland locations. Colter and Yellowstone produced three-year average yield that was statistically equal to the yield of Jegalene.

Table 1. Selected characteristics and traits of 25 commercial and experimental winter wheat cultivars performance tested at six off-station sites in south central Montana during 2014.

Cultivar	1/ Origin	Year of Release	2/ Market Class	3/ PVP	4/ Maturity	5/ Coleoptile Length	Chaff Color	6/ Winter Survival	7/ Straw Strength	Solid Stem Type	8/ Disease Resistance				9/ Quality		10/ Clearfield Type
											Leaf Rust	Stem Rust	Stripe Rust	Dwarf Bunt	Milling	Baking	
				Yes/No				1-5		Yes/No					1-5	1-5	Yes/No
Commercial																	
Accipiter	CDC	2008	HRW	Y	M-L	M	White	5	S	N	R	MR	S	S	2	3	N
Bearpaw	MSU	2011	HRW	Y	M	M	White	2	M	Y	S	R	S	S	4	3	N
CDC Falcon	CDC	1999	HRW	Y	M	S	White	4	S	N	R	R	S	S	3	3	N
Colter	MSU	2013	HRW	Y	M	S	White	3	S	N	-	R	R	S	3	4	N
Cowboy	CSU/WY	2012	HRW	Y	M	M	White	2	S	-	-	R	R	S	2	3	N
Genou	MSU	2004	HRW	Y	M	M	White	2	M	Y	M	S	S	S	4	4	N
Jagalene	AgriPro	2002	HRW	Y	E	M	White	2	S	N	S	MR	MR	S	3	3	N
Jerry	NDSU	2001	HRW	N	M-L	M	White	5	M	N	R	R	S	S	3	3	N
Judee	MSU	2011	HRW	Y	M	M	White	2	S	Y	S	S	R	S	3	4	N
Rampart	MSU	1996	HRW	N	M	L	Brown	2	W	Y	S	MR	MR	S	4	4	N
SY Clearstone	MSU/Syngenta	2012	HRW	Y	M	S	White	2	S	N	-	MR	R	S	3	3	Y
Warhorse	MSU	2013	HRW	Y	M	M	White	3	S	Y	MR	R	R	S	3	3	N
WB Quake	WestBred	2011	HRW	Y	M	S	White	3	S	Y	R	MR	R	S	4	3	N
WB3768 §	MSU/WestBred	2013	HWW	Y	L	M	White	3	M	N	-	R	R	S	3	3	N
Yellowstone	MSU	2005	HRW	Y	M	S	White	4	MS	N	MS	S	R	S	3	4	N
Experimental																	
MT0978	MSU		HRW		M-L	S	White	3	MS	N	-	R	R	S	3	3	N
MT1078	MSU		HRW		M	M	White	2	S	N	-	MR	R	S	3	3	N
MT1090	MSU		HRW		M	S	White	3	S	N	-	MR	R	S	3	3	N
MT 1117	MSU		HRW		M-L	M	White	2	S	N	-	R	R	S	3	3	N
MT1138	MSU		HRW		M	S	White	3	S	N	-	R	R	S	3	3	N
MT1286	MSU		HRW		M	-	White	-	M	N	-	S	MR	S	2	3	N
MTCS1204	MSU		HRW		M	-	White	-	S	Y	-	R	R	S	4	3	Y
MTS0826-63	MSU		HRW		M-L	M	White	3	MW	Y	-	R	R	S	4	4	N
MTS1024	MSU		HRW		M	M	White	2	S	Y	-	MS	MR	S	3	3	N

1/AgriPro=AgriPro Seeds Inc. Berthoud, Colorado; CDC=Crop Development Centre, University of Saskatchewan; CSU = Colorado State University; MSU=Montana State University; NDSU=North Dakota State University; WestBred=WestBred LLC, Twin Falls, Idaho, WY=Wyoming.

2/ HRW=hard red winter wheat market class, HWW=hard white winter wheat market class .

3/ Indicates a cultivar is protected under the Federal Plant Variety Protection Act of 1970 and amended in 1995.

4/ E=early maturity, M=medium maturity, L=late maturity.

5/ L=long coleoptile length, M=medium coleoptile length, S=short coleoptile length.

6/ Winter survival rated from 1 to 5 where 1=poor and 5=best winter survival, respectively, based on years of observations at Sidney, Moccasin and Williston, North Dakota.

7/ S=strong straw strength, MS=moderately strong straw strength, M=medium straw strength, MW=moderately weak straw strength, W=weak straw strength.

8/ R=resistant, MR=moderately resistant, MS=moderately susceptible, S=susceptible, VS=very susceptible.

9/ Milling and baking quality rated from 1 to 5 where 1=poor and 5=superior quality, respectively.

10/ Signifies a cultivar possessing the Clearfield trait imparting tolerance to products containing imazamox herbicide.

§ 'WB3768' licensed for sale on an exclusive basis by WestBred LLC, Twin Falls, ID.

Table 2. Performance of 25 commercial and experimental winter wheat cultivars tested under conventional, irrigated conditions near Huntley, Montana during 2014. Cultivars listed alphabetically. (Exp. 143880).

	1/ Grain Yield			Test	Grain	2/ Grain	Plant	Lodging	Stripe Rust	Heading Date	
Cultivar	2014	2013-14	2012-14	Weight	Moisture	Protein	Height	Index	%	Julian	Calendar
	---------- bushels/acre ----------			lb/bu	%	%	inches	0-9			
Commercial											
Accipiter	74.4	90.7	**103.8***	55.9	9.9	13.7	37.3	1.0	25.0	165.7	14-Jun
Bearpaw	71.7	84.1	99.2	56.3	10.0	14.6	31.6	5.3	36.7	162.0	11-Jun
CDC Falcon	88.7	**106.9***	**119.1****	56.5	11.0	13.9	37.5	0.0	13.3	162.3	11-Jun
Colter	91.5	**105.7***	**113.2***	57.0	10.0	15.1	38.8	0.0	1.7	166.7	15-Jun
Cowboy	77.0			56.7	10.6	12.8	34.1	5.0	56.7	161.7	10-Jun
Decade	68.9	87.1	**104.6***	54.0	9.8	13.8	35.6	3.7	56.7	162.0	11-Jun
Genou	54.2	81.3	88.1	56.0	10.2	15.7	34.9	5.0	26.7	164.7	13-Jun
Jagalene	**109.0****	**116.3***	**118.1***	59.4	11.0	13.3	37.3	0.7	3.3	161.3	10-Jun
Jerry	58.6	81.7	87.4	55.2	10.5	14.3	41.1	3.3	50.0	162.7	11-Jun
Judee	66.8	89.5	**103.4***	57.5	10.4	14.8	34.0	4.3	0.0	162.7	11-Jun
Rampart	73.3	85.1	90.8	57.9	10.1	16.0	39.1	6.7	2.7	164.7	13-Jun
SY Clearstone	**94.9***			56.2	9.4	14.4	37.7	1.0	0.3	166.3	15-Jun
Warhorse	79.5	97.0	**101.8***	56.5	9.9	15.8	33.5	2.3	0.3	167.0	16-Jun
WB-Quake	72.5	92.5	101.5	56.1	10.0	14.9	33.9	6.0	1.0	167.0	16-Jun
Yellowstone	**94.6***	97.9	**110.3***	56.8	10.3	14.2	40.2	0.0	1.0	167.0	16-Jun
Experimental											
MT0978	89.8	**101.1***		56.4	10.1	14.1	37.5	2.0	0.0	166.0	15-Jun
MT1078	**105.5***	**116.6***		56.1	10.4	13.4	34.0	0.3	1.0	166.3	15-Jun
MT1090	86.3	**114.2***		55.9	9.8	14.2	41.3	0.3	2.0	164.7	13-Jun
MT1117	**92.1***			58.2	9.9	14.1	40.2	0.0	0.7	166.3	15-Jun
MT1138	**105.3***			56.4	9.9	14.3	41.2	0.7	0.7	166.7	15-Jun
MT1286	87.7			58.2	10.2	13.8	37.9	2.7	6.7	164.7	13-Jun
MTCS1204	**98.4***			58.7	10.3	14.1	40.4	2.0	4.7	163.3	12-Jun
MTS0826-63	64.1			57.4	10.5	16.1	34.9	7.7	0.3	168.3	17-Jun
MTS1024	**99.8***	**108.6***		54.9	9.6	13.7	34.5	0.0	1.0	165.3	14-Jun
MTW08168	**101.8***	**117.9****		57.2	10.2	14.3	41.1	0.7	1.7	168.7	17-Jun
Average	84.3	98.6	103.2	56.7	10.2	14.4	37.2	2.4	11.8	165.0	14-Jun
PLSD (p=0.05)	17.1	19.9	17.5	1.8	0.6	0.5	3.5	2.6	9.2	1.3	
CV%	12.3	14.1	13.0	1.9	3.4	2.1	5.3	64.5	47.6	0.5	

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13 percent moisture content.
2/ Grain protein values adjusted to 12 percent grain moisture content.

3/ Lodging severity scores of 0 to 9 represent no lodging to all stems flat on the ground, respectively.

Table 2 continued.

ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).

** Indicates highest yielding cultivar within a column. * Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).

Huntley Irrigated Winter Wheat (Exp. 143880)

Planted:	October 26, 2013
Harvested:	August 19, 2014
Fertility:	175 N lbs/acre in Fall 2013 as 46-0-0
Herbicide:	Huskie@12 oz/ac + osprey 4.7 oz/a on May 12, 2014
Previous crop:	spring barley
Irrigation:	overhead sprinkler
Precipitation:	17.88 inches.

Table 3. Performance of 25 commercial and experimental winter wheat cultivars tested under no-till, dryland conditions near Rapelje, Montana during 2014. Cultivars listed alphabetically. (Exp. 143881).

Cultivar	Grain Yield 1/ 2014	Grain Yield 1/ 2013-14	Grain Yield 1/ 2012-14	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height
	---------- bushels/acre ----------			lb/bu	%	%	inches
Commercial							
Accipiter	79.8	63.0	58.3	63.2	10.0	13.2	39.8
Bearpaw	85.8	67.9	**61.9***	62.6	10.0	14.0	42.6
CDC Falcon	94.5	72.5	**65.8***	63.1	10.2	14.5	39.8
Colter	88.6	73.7	**66.6***	63.3	10.1	13.7	38.2
Cowboy	86.3			63.1	10.1	13.5	40.9
Decade	91.6	69.2	59.7	63.5	10.2	13.6	39.7
Genou	80.4	60.6	52.3	63.4	10.3	13.1	37.4
Jagalene	89.5	62.8	59.7	64.0	10.3	13.3	37.4
Jerry	92.3	71.2	**63.2***	63.5	10.4	13.0	37.3
Judee	85.3	69.5	60.8	62.9	10.1	13.1	39.5
Rampart	80.4	64.7	58.4	63.1	10.1	13.2	34.8
SY Clearstone	86.1			63.3	10.4	13.1	36.4
Warhorse	74.5	64.1	58.1	63.4	10.3	13.0	36.7
WB-Quake	82.5	63.8	57.7	62.7	10.0	14.2	38.8
Yellowstone	84.6	75.2	**70.0****	62.9	9.9	13.5	38.2
Experimental							
MT0978	77.4	68.4		63.4	10.1	13.3	38.2
MT1078	78.9	73.1		63.3	10.0	14.4	39.6
MT1090	95.3	83.4		63.1	9.8	14.4	38.9
MT1117	79.6			62.4	10.2	13.3	35.7
MT1138	82.9			63.8	10.0	13.9	37.4
MT1286	102.1			63.1	10.0	13.2	37.8
MTCS1204	87.3			62.6	10.1	13.6	38.6
MTS0826-63	77.9			63.7	10.4	12.4	37.7
MTS1024	78.1	65.7		63.0	10.3	13.0	39.1
MTW08168	83.0	67.6		62.9	9.9	14.6	39.4
Average	85.0	68.7	61.0	63.2	10.1	13.5	38.4
PLSD (p=0.05)	ns	ns	9.1	1.2	0.4	ns	ns
CV%	16.4	14.4	15.9	1.1	2.5	6.8	7.5

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13 percent moisture content.
2 Grain protein values adjusted to 12 percent grain moisture content.
ns Indicates no significant difference between cultivars within a column of data based on Fisher's protected LSD (p=0.05).
** Indicates highest yielding cultivar within a column.
* Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).

Rapelje Dryland Winter Wheat (Exp. 143881)

Planted:	October 3, 2013
Harvested:	August 10, 2014
Fertility:	11-52-00, 75 lb/a in-furrow at planting
Herbicide:	n/a
Previous crop:	chemical fallow

Table 4. Performance of 25 commercial and experimental winter wheat cultivars tested under no-till, dryland conditions near Hardin, Montana during 2014. Cultivars listed alphabetically. (Exp. 143884).

Cultivar	Grain Yield 1/ 2014	Grain Yield 1/ 2013-14	Grain Yield 1/ 2012-14	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height
	---------- bushels/acre ----------			lb/bu	%	%	inches
Commercial							
Accipiter	47.9	33.0	36.2	61.7	12.5	12.1	32.3
Bearpaw	54.0	39.6	**43.8***	60.9	12.4	13.2	33.6
CDC Falcon	49.1	35.5	41.1	60.7	12.7	12.6	32.3
Colter	56.7	40.6	**44.3***	60.8	11.2	12.7	36.4
Cowboy	**63.1***			61.6	12.4	11.1	37.5
Decade	**67.9***	47.1	**48.4****	60.6	12.7	13.0	36.2
Genou	50.7	37.2	39.3	61.6	12.9	12.5	37.7
Jagalene	56.8	41.2	**48.0***	62.4	11.8	13.3	35.4
Jerry	55.7	39.7	**43.5***	59.7	11.7	12.6	40.3
Judee	**62.9***	43.3	**43.5***	63.1	11.9	12.8	36.1
Rampart	54.1	39.7	41.5	61.1	12.5	13.6	35.8
SY Clearstone	**58.2***			60.0	11.2	12.8	40.2
Warhorse	56.4	40.5	**43.4***	61.5	12.2	13.8	32.5
WB-Quake	55.2	37.4	40.9	61.6	12.2	12.7	34.4
Yellowstone	**62.4***	44.1	**44.8***	60.1	11.8	12.6	37.1
Experimental							
MT0978	**65.0***	44.1		61.2	11.7	13.2	35.6
MT1078	52.5	40.8		60.4	12.6	12.6	35.0
MT1090	**62.4***	42.0		60.4	11.5	12.5	37.9
MT1117	55.2			60.8	11.1	13.2	37.5
MT1138	**68.3****			60.7	11.1	12.2	38.7
MT1286	46.9			61.1	12.5	12.4	36.1
MTCS1204	53.7			60.7	12.2	14.6	34.9
MTS0826-63	**64.7***			61.0	12.8	13.9	37.7
MTS1024	55.5	40.8		60.0	11.7	12.0	32.8
MTW08168	54.6	39.8		60.9	12.7	13.1	39.4
Average	57.2	40.4	43.0	61.0	12.1	12.8	36.1
PLSD (p=0.05)	10.6	ns	6.7	0.8	0.8	0.9	2.7
CV%	11.3	13.1	12.0	0.8	4.1	4.0	4.5

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13 percent moisture content.
2 Grain protein values adjusted to 12 percent grain moisture content.
ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).
** Indicates highest yielding cultivar within a column.
* Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).

Hardin Dryland Winter Wheat (Exp. 143884)

Planted:	September 26, 2013
Harvested:	August 06, 2014
Fertility:	100 lb N/a as 46-0-0 in fall 2013;
Pesticide:	n/a
Previous crop:	chemical fallow

Table 5. Performance of 25 commercial and experimental winter wheat cultivars tested under no-till, dryland conditions near Molt, Montana during 2014. Cultivars listed alphabetically. (Exp. 143885).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2014	2013-14	2012-14				
	---------- bushels/acre ----------			lb/bu	%	%	inches
Commercial							
Accipiter	**54.9***	47.7	39.2	59.4	9.6	15.2	30.6
Bearpaw	47.0	46.0	38.0	60.5	9.4	16.7	28.7
CDC Falcon	**59.5***	48.7	**40.5***	60.7	9.7	15.1	28.7
Colter	42.4	47.0	**41.8***	58.6	9.3	16.9	31.5
Cowboy	**58.0***			59.8	9.6	15.0	31.8
Decade	**57.7***	53.0	**45.6***	62.3	9.6	16.6	31.2
Genou	44.5	40.9	34.0	60.0	9.7	16.9	32.8
Jagalene	**67.5****	60.0	**48.8****	64.1	10.0	15.5	33.5
Jerry	44.3	42.5	36.2	59.2	9.7	16.4	33.9
Judee	47.9	44.1	36.4	60.0	9.6	16.5	32.0
Rampart	40.7	39.4	33.7	60.4	9.3	17.0	31.1
SY Clearstone	45.5			59.5	9.2	16.0	33.2
Warhorse	49.5	46.4	39.9	60.2	9.3	16.4	29.5
WB-Quake	43.2	41.3	35.3	60.1	9.7	16.4	30.2
Yellowstone	44.9	49.0	**42.8***	58.0	9.3	16.3	32.0
Experimental							
MT0978	50.9	51.7		59.9	9.4	16.5	29.3
MT1078	**55.1***	50.9		60.1	9.6	14.8	32.5
MT1090	42.5	42.1		58.8	9.3	16.2	30.7
MT1117	39.2			59.3	9.4	16.8	31.6
MT1138	44.2			58.9	9.3	16.4	33.5
MT1286	45.8			60.1	10.0	15.5	29.8
MTCS1204	41.4			60.6	10.0	16.3	31.5
MTS0826-63	41.1			60.3	9.6	16.8	30.3
MTS1024	53.8	51.5		59.5	9.5	15.1	29.4
MTW08168	**55.2***	53.4		60.3	9.5	16.2	34.6
Average	48.7	47.5	39.4	60.0	9.5	16.1	31.4
PLSD (p=0.05)	13.3	ns	8.5	1.7	0.5	1.2	3.4
CV%	16.7	15.1	18.0	1.7	3.0	4.6	6.6

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13 percent moisture content.
2 Grain protein values adjusted to 12 percent grain moisture content.
ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).
** Indicates highest yielding cultivar within a column.
* Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).

Molt Dryland Winter Wheat (Exp. 143885)

Planted:	October 03, 2013
Harvested:	August 10, 2014
Fertility:	100 lb/a as 46-0-0 in spring.
Herbicide:	n/a
Previous crop:	summer fallow

Table 6. Performance of 25 commercial and experimental winter wheat cultivars tested under no-till, dryland conditions near Hysham, Montana during 2014. Cultivars listed alphabetically. (Exp. 143882).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2014	2013-14	2012-14				
	---------- bushels/acre ----------			lb/bu	%	%	inches
Commercial							
Accipiter	65.2			62.7	9.5	10.5	30.5
Bearpaw	64.4			62.6	9.3	12.1	32.1
CDC Falcon	56.4			61.6	9.4	12.6	26.4
Colter	**82.4***			62.4	9.1	12.5	34.5
Cowboy	70.4			61.8	9.7	10.0	31.9
Decade	66.2			62.6	9.2	12.7	30.6
Genou	69.0			62.3	9.3	10.7	37.1
Jagalene	67.0			64.2	9.4	12.4	31.1
Jerry	64.8			61.9	9.5	11.5	35.5
Judee	57.3			63.2	9.4	11.9	29.6
Rampart	54.3			62.0	9.1	11.4	32.5
SY Clearstone	72.3			61.7	9.0	12.6	36.0
Warhorse	59.5			62.3	8.9	12.6	30.9
WB-Quake	67.9			62.7	9.1	11.9	32.6
Yellowstone	65.5			62.4	9.4	11.0	32.9
Experimental							
MT0978	64.6			62.7	9.0	12.1	30.0
MT1078	67.0			61.9	9.4	11.2	31.9
MT1090	**72.8***			62.3	9.3	12.6	37.9
MT1117	**76.9***			62.5	9.2	13.0	35.6
MT1138	71.4			62.2	9.3	10.9	34.7
MT1286	66.1			61.9	9.3	11.5	33.0
MTCS1204	70.1			62.1	9.0	13.1	34.1
MTS0826-63	57.1			62.0	9.1	13.5	33.0
MTS1024	**83.3****			60.8	9.1	11.4	34.3
MTW08168	64.9			62.3	9.5	12.7	34.9
Average	67.1			62.3	9.3	11.9	33
LSD (p=0.05)	10.7			1.2	0.3	1.6	5.5
CV%	12.5			1.1	2.1	8.8	11.1

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13 percent moisture content.
2 Grain protein values adjusted to 12 percent grain moisture content.
ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).
** Indicates highest yielding cultivar within a column.
* Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).

Hysham Dryland Winter Wheat (Exp. 143882)

Planted:	September 26, 2013
Harvested:	August 08, 2014
Fertility:	100 lb/a as 46-0-0 in spring.
Herbicide:	n/a
Previous crop:	Chemical fallow

Table 7. Grain yield[1/] of 25 commercial and experimental winter wheat cultivars tested at five locations in south central Montana during 2014. Varieties listed by declining average yield across all locations.

Cultivar	Rapelje No-Till Dryland	Hysham No-Till Dryland	Hardin No-Till Dryland	Molt No-Till Dryland	Fort Smith No-Till Dryland	Dryland Locations Average	Huntley Min. Till Irrigated	All Locations Average
				bushels/acre				
Jagalene	89.5	67.0	56.8	**67.5****	92.8	73.2	**109.0****	**79.1****
Cowboy	86.3	70.4	**63.1***	**58.0***	**107.4****	78.0	77.0	**77.8***
MT1138	82.9	71.4	**68.3****	44.2	83.0	70.7	**105.3***	**76.4***
MT1078	78.9	67.0	52.5	**55.1***	88.6	68.9	**105.5***	**75.0***
MTS1024	78.1	**83.3****	55.5	53.8	89.8	70.0	**99.8***	**75.0***
MT1090	95.3	**72.8***	**62.4***	42.5	85.9	72.5	86.3	**74.8***
Colter	88.6	**82.4***	56.7	42.4	84.6	70.3	91.5	**73.9***
Yellowstone	84.6	65.5	**62.4***	44.9	83.1	69.4	**94.6***	**73.6***
MT0978	77.4	64.6	**65.0***	50.9	87.9	69.3	89.8	**72.7***
SY Clearstone	86.1	72.3	**58.2***	45.5	74.4	68.1	**94.9***	**72.6***
MTCS1204	87.3	70.1	53.7	41.4	85.5	67.2	**98.4***	**72.4***
MTW08168	83.0	64.9	54.6	**55.2***	62.4	65.4	**101.8***	**71.4***
MT1117	79.6	**76.9***	55.2	39.2	82.9	67.0	**92.1***	**71.2***
CDC Falcon	94.5	56.4	49.1	**59.5***	74.6	67.5	88.7	**71.0***
MT1286	102.1	66.1	46.9	45.8	66.3	67.4	87.7	**70.7***
Decade	91.6	66.2	**67.9***	**57.7***	65.5	68.7	68.9	**68.7***
Judee	85.3	57.3	**62.9***	47.9	89.4	67.4	66.8	67.3
Bearpaw	85.8	64.4	54.0	47.0	81.1	65.9	71.7	66.9
WB-Quake	82.5	67.9	55.2	43.2	85.9	65.6	72.5	66.8
Warhorse	74.5	59.5	56.4	49.5	74.9	64.1	79.5	66.7
Accipiter	79.8	65.2	47.9	**54.9***	78.1	64.6	74.4	66.2
Jerry	92.3	64.8	55.7	44.3	76.2	67.2	58.6	65.8
Genou	80.4	69.0	50.7	44.5	67.3	63.3	54.2	61.8
Rampart	80.4	54.3	54.1	40.7	67.5	59.0	73.3	61.4
MTS0826-63	77.9	57.1	**64.7***	41.1	60.2	58.0	64.1	59.0
Average	85.0	67.1	57.2	48.7	79.8	67.5	84.3	70.3
PLSD (p=0.05)	ns	10.7	10.6	13.3	6.4	ns	17.1	10.8
CV%	16.4	12.5	11.3	16.7	4.9	13.1	12.3	12.9

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.

** Indicates highest yielding cultivar within a column.

* Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).

Table 8. Performance of 25 commercial and experimental winter wheat cultivars tested under dryland and irrigated conditions at six locations in south central Montana during 2014. Cultivars listed alphabetically.

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2014	2013-14	2012-14				
	---------- lb/bu ----------			lb/bu	%	%	inches
Commercial							
Accipiter	66.2	61.4	58.7	60.5	10.5	13.2	36.1
Bearpaw	66.9	62.0	61.3	60.4	10.5	14.2	35.1
CDC Falcon	**71.0***	**65.7***	65.1	60.4	10.9	13.7	34.8
Colter	**73.9***	**70.2***	67.5	60.4	10.2	14.3	37.5
Cowboy	**77.8***			60.5	10.8	12.5	36.4
Decade	**68.7***	64.5	61.9	60.2	10.6	14.0	36.0
Genou	61.8	58.0	54.7	60.1	10.7	14.3	38.3
Jagalene	**79.1****	**72.4****	**73.6****	62.4	10.8	13.5	36.1
Jerry	65.8	61.2	59.0	59.8	10.7	13.7	39.4
Judee	67.3	63.2	59.1	61.2	10.5	13.9	35.2
Rampart	61.4	57.6	56.2	60.5	10.5	14.7	37.0
SY Clearstone	**72.6***			60.0	10.1	14.1	38.7
Warhorse	66.7	63.2	61.5	60.8	10.4	14.6	34.5
WB-Quake	66.8	62.5	59.7	60.3	10.5	14.1	35.4
Yellowstone	**73.6***	**67.9***	66.0	60.2	10.5	13.7	38.1
Experimental							
MT0978	**72.7***	**68.2***		60.7	10.4	14.0	36.0
MT1078	**75.0***	**71.7***		60.1	10.6	13.4	36.1
MT1090	**74.8***	**71.9***		60.3	10.3	14.0	39.0
MT1117	**71.2***			60.8	10.3	14.2	38.1
MT1138	**76.4***			60.4	10.3	13.6	38.9
MT1286	**70.7***			61.1	10.7	13.5	37.3
MTCS1204	**72.4***			60.9	10.6	14.3	37.2
MTS0826-63	59.0			60.6	10.7	14.8	36.2
MTS1024	**75.0***	**70.3***		59.7	10.3	13.2	34.5
MTW08168	**71.4***	**68.6***		60.8	10.7	14.2	39.3
Average	70.3	65.6	61.9	60.5	10.5	13.9	36.8
PLSD (p=0.05)	10.8	7.2	5.0	1.0	0.3	0.7	2.3
CV%	12.9	13.7	14.0	1.3	3.0	5.3	7.2
Year x Location	6	10	15	6	6	6	6

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.
2/ Grain protein values adjusted to 12 percent grain moisture content.
** Indicates highest yielding cultivar within a column.
* Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).

Table 9. Performance of 25 commercial and experimental winter wheat cultivars tested under dryland conditions at five locations in south central Montana during 2014. Cultivars listed alphabetically.

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2014	2013-14	2012-14				
	---------- lb/bu ----------			lb/bu	%	%	inches
Commercial							
Accipiter	64.6	54.1	51.3	61.4	10.7	13.1	35.9
Bearpaw	65.9	**56.5***	54.7	61.2	10.6	14.1	35.7
CDC Falcon	67.5	55.4	54.4	61.2	10.8	13.7	34.2
Colter	70.3	**61.3***	**58.2***	61.1	10.3	14.2	37.2
Cowboy	78.0			61.2	10.9	12.4	36.8
Decade	68.7	**58.8***	54.4	61.4	10.7	14.1	36.1
Genou	63.3	52.2	48.0	61.0	10.8	14.0	39.0
Jagalene	73.2	**61.4****	**60.1****	63.0	10.7	13.6	35.9
Jerry	67.2	**56.0***	53.7	60.7	10.7	13.6	39.1
Judee	67.4	**56.7***	52.3	61.9	10.6	13.8	35.4
Rampart	59.0	50.7	49.0	61.0	10.5	14.4	36.6
SY Clearstone	68.1			60.8	10.2	14.0	39.0
Warhorse	64.1	54.8	52.4	61.6	10.5	14.4	34.8
WB-Quake	65.6	55.0	52.2	61.1	10.6	14.0	35.7
Yellowstone	69.4	**60.4***	**57.9***	60.9	10.5	13.7	37.7
Experimental							
MT0978	69.3	**60***		61.6	10.4	14.0	35.7
MT1078	68.9	**60.5***		60.9	10.7	13.5	36.5
MT1090	72.5	**61.3***		61.2	10.4	14.0	38.5
MT1117	67.0			61.3	10.4	14.2	37.6
MT1138	70.7			61.3	10.3	13.5	38.5
MT1286	67.4			61.6	10.8	13.4	37.1
MTCS1204	67.2			61.4	10.6	14.4	36.5
MTS0826-63	58.0			61.2	10.8	14.5	36.4
MTS1024	70.0	**60.7***		60.6	10.4	13.1	34.5
MTW08168	65.4	**56.3***		61.5	10.8	14.2	39.0
Average	67.5	57.3	53.7	61.3	10.6	13.8	36.8
PLSD (p=0.05)	ns	6.6	4.6	1.0	0.4	0.8	2.4
CV%	13.1	12.7	13.1	1.2	3.0	5.8	7.2
Year x Location	5	8	12	5	5	5	5

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.
2/ Grain protein values adjusted to 12 percent grain moisture content.
** Indicates highest yielding cultivar within a column.
* Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).