RESULTS OF CROPPING SYSTEMS RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA – 2013
Southern Agricultural Research Center, Huntley, MT
http:www.sarc.montana.edu

PROJECT TITLE:

2013 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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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 2013 off-station winter wheat trials were established under irrigation at Huntley and under dryland conditions near Molt under conventional summer fallow conditions; near Hardin, 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-

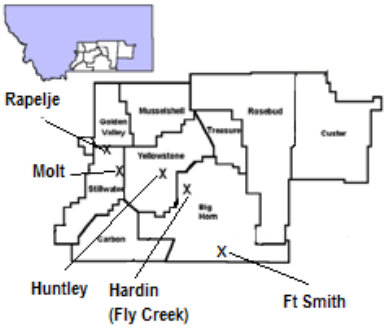

Figure 1. 2013 Off-station winter wheat trial locations in south central Montana.

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 (2012-13) and three year (2011-13) yield averages are provided for cultivars tested during previous years. Test weight (pounds per bushel) and grain 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 7).

RESULTS:

Surface soil moisture conditions were dry at all winter wheat test locations planted in the fall of 2012. In July and August 2012 only 0.58 inches of rain occurred followed by no rain in September resulted in extremely dry conditions at winter wheat planting. Winter wheat was not planted at Forsythe and Fort Smith. The 2013 winter wheat test sites were dry with below average rain or snow accumulation from November through July except in May. Above average precipitation occurred in May (5.16 inches) that boosted wheat growth and enhanced grain yield. Drought stress at planting and during early winter wheat growth coupled with above averaged temperatures resulted in poor stand causing yield reduction under all dryland sites. Overall, winter wheat yields were average to below average under dryland. Test weight values were also average to below average. Grain protein content fluctuated greatly from site-to-site.

Average winter wheat yield under irrigated condition at Huntley during 2013 was 110 bu/a (Table 2). Lodging was limited in most entries averaging a 0.7 score out of 9. 'Rampart' showed highest lodging score (4.7). Yields ranged from 73 bu/a for 'MTS0832' to 142 bu/a for 'MT1090'. "WB3768" was the highest yielding commercial entry producing 134 bu/a under irrigation at Huntley. Four other commercial cultivars produced yield that was statistically equal to the yield of highest yielding experimental line MT1090. Test weight values were good under irrigated conditions at Huntley in 2013, averaging 61.8 lb/bu. All commercial entries possessed test weight values heavier than 60 lb/bu except 'Pryor' and 'Yellowstone'. Grain protein content averaged 13.6 percent and ranged from 11.7 for 'Genou' to 16.1 percent for experimental line MTS0832. Two-year average yield for winter wheat varieties tested during 2012 and 2013 was 114 bu/a. Three-year average yield for winter wheat varieties tested during 2011 to 2013 was 106 bu/a. CDC Falcon and Jeglene were top yielding cultivars at Huntley over the past two and three years respectively.

Average yield under dryland conditions at Rapelje in 2013 was 53 bu/a (Table 3), about 3 bushels per acre higher than winter wheat yields observed at this site in 2012. Yields ranged from 40 bu/a for cultivar Genou to 64 bu/a for experimental line MT1090. 'Colter' was the highest yielding commercial cultivars with 58 bu/a yield. Four other commercial cultivars produced yields statistically equal to MT1090. Test weight averaged 60.5 lb/bu, with most of the entries producing test weights of about 60 lb/bu. Grain protein averaged 12.8 percent and ranged from 10.4 percent for 'Decade' to 14.8 percent for 'MTCS1202' Two-year average yield for winter wheat varieties tested at Rapelje during 2012 and 2013 was 51 bu/a. Three-year average yield from 2011 through 2013 was 45 bu/a.

Average winter wheat yield at Hardin during 2013 was only 24 bu/a (Table 4), about half of last year yield at this site. At this site winter wheat did not emerged until early spring, due to drought stress, leading to poor stand establishment and

reduced yield. Yields ranged from 18 bu/a for 'Accipiter' to 28 bu/a for 'MT1078'. Overland was the highest yielding (27 bu/a) commercial entry. Seven other commercial entries produced yield ranging from 24.9 to 26.2 bu/a that was statistically equal to the yield of MT1078. Test weight values were also low at Hardin in 2013, averaging only 55.7 lb/bu and ranged from 53 lb/bu for MT1090 to 58.7 lb/bu for Jagalene. All entries possessed test weight values lower than 60 lb/bu. Grain protein content was the highest at this site in 2013 and averaged 18.2 percent. Protein content ranged from 16.5 percent to 20.0 percent. Two-year average yield for winter wheat varieties tested during 2012 and 2013 was 37 bu/a. Three-year average yield for winter wheat varieties tested during 2011 to 2013 was 56 bu/a.

Average yield under dryland conditions at Molt in 2013 was 45 bu/a (Table 5), about 45% higher than winter wheat yields observed at this site in 2012. Yield ranged from 36 bu/a for Ledger to 53 bu/a for the Yellowstone. Twelve other entries produced yield statistically equal with the yield of Yellowstone. Average test weight was 58.2 lb/bu, and only Jegalene has test weight value heavier than 60 lb/bu. Grain protein content averaged 13.6 percent. All entries except Norris and Pryor have protein content 13 percent or more. Two- and Three-year average yields for winter wheat varieties tested at Molt were 35 and 37 bu/a respectively. Yellowstone was the highest yielding cultivars, averaged over the past two year, at Molt.

SUMMARY:

Over the last two years (2012 and 2013) winter wheat production suffered due to drought stress. On average, 2012 dryland winter wheat yield was lower compared to winter wheat yield in 2013. In 2012 drought occurred during the grain filling period that drastically reduced winter wheat yield. In 2013 May and June precipitation boosted yield. Significant differences in yield among cultivars tested in 2013 were obtained under irrigated and dryland conditions (Tables 2 to 8). Experimental line MT1090 produced the highest yield of 67.5 averaged across all six of the test locations. While Colter and WB3768 were the highest yielding commercial cultivars producing 64 bu/a in 2013 (Table 6). Overland was the top yielding cultivars in 2012. Two experimental winter wheat entries MT1090 and MT1078 were among the top performer in 2013 trials. Excellent yields were obtained under irrigated conditions at Huntley in 2013. Overhead sprinkler irrigation prevented severe lodging as it allows frequent incremental water application.

Since 2011, experiments representing 13 location-years of testing have uniformly tested 16 cultivars at several dryland locations in south central Montana (Table 8). Overland and Jegalene were the highest yielding cultivars averaged over the past two- and three-years respectively across all dryland locations. Five other entries including Decade, Norris, Pryor, WB Quake, and Yellowstone produced three year average yields that were 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 2013.

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: Leaf Rust	Stem Rust	Stripe Rust	Dwarf Bunt	9/ Quality: Milling	Baking	10/ Clearfield Type
				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
Decade	MSU	2010	HRW	Y	M	M	White	4	S	N	S	R	R	S	3	4	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
Ledger	WestBred	2005	HRW	Y	M-L	M	White	2	S	Y	MS	S	S	S	4	3	N
Norris§	MSU	2005	HRW	Y	E	M	Brown	3	S	N	MS	S	S	S	3	3	Y
Overland	Nebraska	2007	HRW	Y	E	M	White	4	S	N	R	R	S	S	3	2	N
Pryor	WestBred	2002	HRW	Y	M	S	White	3	S	N	S	S	S	S	3	3	N
Rampart	MSU	1996	HRW	N	M	L	Brown	2	W	Y	S	MR	MR	S	4	4	N
SY Clearstone CL2	MSU/Syngenta	2012	HRW	Y	M	S	White	2	S	N	-	MR	R	S	3	3	Y
Warhorse	MSU	2013	HRW		M	M	White	3	S	Y	MR	R	R	S	3	3	N
WB3768	MSU/WestBred	2013	HWW		M-L	S	White	3	MS	N	-	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
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
MTCS1202	MSU		HRW		M	-	White	-	S	Y	-	MR	S	S	3	3	Y
MTS0832	MSU		HRW		M-L	S	White	4	S	Y	S	R	VS	S	3	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; MSU=Montana State University; NDSU=North Dakota State University; UNL=University of Nebraska-Lincoln; USU=Utah State University; WestBred=WestBred LLC, Bozeman, Montana.

2/ HRW=hard red 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.

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.

§ 'Norris' and 'WB3768' licensed for sale on an exclusive basis by WestBred LLC, Bozeman, Montana.

Table 2. Performance of 25 commercial and experimental winter wheat cultivars tested under no-till, irrigated conditions near Huntley, Montana during 2013. Cultivars listed alphabetically. (Exp. 133880).

	1/ Grain Yield					2/			Heading Date	
Cultivar	2013	2012-13	2011-13	Test Weight	Grain Moisture	Grain Protein	Plant Height	Lodging Index	Julian	Calendar
	---------- bushels/acre ----------			lb/bu	%	%	inches	0-9		
Commercial										
Accipiter	107.0	**118.4***	**110.0***	61.8	9.5	13.1	40.4	0.0	159.0	8-Jun
Bearpaw	96.5	**112.9***	**110.2***	60.3	9.2	14.8	33.9	2.0	155.0	4-Jun
CDC Falcon	**125.1***	**134.3****	**116.8***	62.9	9.8	12.3	36.0	0.0	155.7	4-Jun
Colter	**125.4***	**128.6***		61.7	9.4	13.6	40.6	0.0	158.3	7-Jun
Decade	105.4	**122.4***	**116.4***	62.3	9.7	14.7	33.7	0.3	155.7	4-Jun
Genou	108.4	**105.1***	**101.0***	63.8	10.1	11.7	39.9	1.0	154.3	3-Jun
Jagalene	**123.6***	**122.7***	**121.4****	63.9	9.8	13.0	36.6	0.7	155.0	4-Jun
Jerry	104.8	101.8	98.0	61.7	9.9	13.9	44.1	0.7	156.3	5-Jun
Judee	112.3	**121.6***	**116.1***	62.9	9.9	12.5	39.1	0.0	157.7	6-Jun
Ledger	105.5	**110.2***	**105.0***	62.5	9.6	13.6	37.9	2.7	156.0	5-Jun
Norris	110.5	**108.1***	95.1	62.6	9.5	13.9	39.2	0.0	155.0	4-Jun
Overland	**118.4***	**119.6***		63.3	9.9	12.3	38.2	0.7	155.0	4-Jun
Pryor	74.6	**107.8***	**99.3***	59.5	9.2	14.1	35.2	0.0	157.3	6-Jun
Rampart	96.9	99.6	95.4	61.8	9.2	15.3	40.3	4.3	157.0	6-Jun
SY Clearstone	109.5	**121.2***		60.7	9.3	12.7	38.1	0.0	157.3	6-Jun
Warhorse	109.5	**109.1***		62.9	9.5	13.7	40.3	0.0	157.7	6-Jun
WB 3768	**133.9***			63.0	10.1	13.2	44.2	1.0	159.0	8-Jun
WB Quake	112.6	**116.1***		62.4	9.3	13.6	38.1	1.0	158.0	7-Jun
Yellowstone	101.3	**118.1***	**113.6***	58.5	9.1	14.7	40.0	0.0	158.0	7-Jun
Experimental										
MT0978	112.4			60.3	9.1	13.3	35.3	0.0	158.0	7-Jun
MT1078	**127.7***			60.8	9.6	13.3	36.5	0.0	157.3	6-Jun
MT1090	**142.0****			62.6	9.9	12.3	42.3	1.7	158.0	7-Jun
MTCS1202	97.3			61.7	9.5	13.7	33.3	2.0	155.7	4-Jun
MTS0832	73.6	96.5	94.7	60.2	9.5	16.1	37.0	0.0	158.0	7-Jun
MTS1024	**117.5***			60.2	9.3	14.3	33.2	0.0	157.3	6-Jun
Average	110.1	114.4	106.7	61.8	9.6	13.6	38.1	0.7	156.9	5-Jun
PLSD (p=0.05)	26.7	29.3	22.4	2.7	0.5	2.0	4.7	ns	1.2	
CV%	14.8	12.3	14.2	2.6	3.2	9.0	7.5	204.0	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. 133880)

Planted:	September 2, 2012	Harvested:	July 26, 2013
Fertility:	11-52-00, 75 lb/a + 200-25-30 mix 80 lbs/acre at planting.		
Herbicide:	Roundup RT3, 22 oz/a, Preplant. Bronate adv 16oz/ac on May 9, 2013		
Previous crop:	spring barley		
Irrigation:	overhead sprinkler		
Precipitation:	11.05 inches.		

Table 3. Performance of 25 commercial and experimental winter wheat cultivars tested under no-till, dryland conditions near Rapelje, Montana during 2013. Cultivars listed alphabetically. (Exp. 133881).

Cultivar	Grain Yield 1/ 2013	Grain Yield 1/ 2012-13	Grain Yield 1/ 2011-13	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height
	---------- bushels/acre ----------			lb/bu	%	%	inches
Commercial							
Accipiter	51.0	49.9	48.6	61.4	13.2	11.4	31.6
Bearpaw	52.2	51.1	44.7	59.9	12.7	14.1	32.6
CDC Falcon	46.1	49.2	46.3	59.8	13.2	12.4	30.9
Colter	**58.4***	57.2		60.8	13.8	13.1	33.8
Decade	52.3	46.4	44.4	60.3	13.0	10.4	32.9
Genou	40.4	38.0	38.2	58.1	14.3	13.8	34.8
Jagalene	47.1	50.3	45.9	62.7	13.0	12.7	31.0
Jerry	47.7	47.5	44.9	59.8	13.3	13.9	36.4
Judee	52.5	47.9	37.2	63.2	12.6	12.4	32.8
Ledger	**57.3***	52.4	47.9	60.0	12.9	12.7	32.8
Norris	**55.9***	57.2	50.0	60.9	12.2	13.2	36.8
Overland	50.6	61.9		60.5	12.7	12.9	33.0
Pryor	**56.4***	50.7	44.6	60.1	13.1	12.5	31.3
Rampart	47.3	46.7	40.7	60.2	12.8	13.4	36.3
SY Clearstone	50.3	56.6		58.6	14.0	14.1	35.3
Warhorse	50.3	48.8	46.4	61.0	13.4	12.9	32.3
WB3768	47.0			62.0	14.7	11.7	37.2
WB-Quake	52.6	49.0	39.8	60.1	12.8	12.6	33.2
Yellowstone	**57.1***	58.3	52.2	60.9	13.4	12.2	33.5
Experimental							
MT0978	**57.6***			61.2	13.0	13.4	33.0
MT1078	**63.3***			59.5	13.2	12.2	31.8
MT1090	**64.4****			60.9	14.0	12.8	34.2
MTCS1202	**58.5***			59.5	12.6	14.8	31.1
MTS0832	53.8	48.6	46.3	60.1	13.3	12.6	34.8
MTS1024	**60.4***			60.0	13.2	12.1	32.0
Average	53.2	50.9	44.9	60.5	13.2	12.8	33.4
PLSD (p=0.05)	8.6	ns	ns	2.2	0.9	ns	2.0
CV%	9.8	10.8	16.0	2.3	4.1	12.5	3.7

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. 133881)

Planted:	September 28, 2012
Harvested:	August 1, 2013
Fertility:	11-52-00, 75 lb/a in-furrow at planting; 100 lb/a as 46-0-0 fall.
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 2013. Cultivars listed alphabetically. (Exp. 133884).

Cultivar	Grain Yield 1/ 2013	2012-13	2011-13	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height
	---------- bushels/acre ----------			lb/bu	%	%	inches
Commercial							
Accipiter	18.4	30.3	54.2	54.0	11.2	19.4	25.3
Bearpaw	**25.3***	38.7	55.7	55.9	10.5	19.0	27.0
CDC Falcon	21.9	37.1	59.2	55.2	10.8	18.1	25.5
Colter	23.8	35.6		54.3	11.2	19.3	29.9
Decade	**26.2***	38.7	61.8	56.0	10.7	19.1	27.7
Genou	23.7	33.6	47.3	56.3	10.6	18.7	30.7
Jagalene	**26.1***	43.6	65.9	58.7	11.9	16.6	25.3
Jerry	23.4	37.4	55.8	57.3	11.3	17.1	29.1
Judee	22.8	33.8	46.7	56.1	11.9	18.2	26.1
Ledger	22.6	38.3	56.5	57.0	11.5	17.2	24.0
Norris	23.2	36.6	56.7	58.1	10.9	16.8	28.1
Overland	**27.2***	48.1		58.2	11.3	16.8	25.2
Pryor	22.2	38.0	59.3	56.8	11.9	18.1	25.6
Rampart	**24.9***	35.2	49.6	56.5	10.7	19.2	31.2
SY Clearstone	22.8	37.6		55.1	12.7	17.5	29.1
Warhorse	**25.1***	36.9	56.4	53.7	10.8	19.8	26.1
WB3768	**25.1***			54.9	13.9	19.0	30.7
WB-Quake	19.6	33.7	59.8	57.2	10.9	18.5	27.0
Yellowstone	**25.9***	36.1	59.5	54.0	12.7	18.6	29.7
Experimental							
MT0978	23.0			55.0	12.2	18.2	26.9
MT1078	**28.5****			55.9	11.4	16.5	28.2
MT1090	22.0			53.0	11.5	18.8	29.4
MTCS1202	**25.3***			54.4	10.8	18.5	24.5
MTS0832	21.0	34.6	54.9	53.7	11.3	20.0	28.7
MTS1024	**26.1***			55.9	11.1	16.9	25.9
Average	23.8	37.1	56.2	55.7	11.4	18.2	27.5
PLSD (p=0.05)	4.3	ns	ns	2.4	1.7	1.7	3.0
CV%	11.1	10.5	11.1	2.6	9.1	6.1	6.7

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. 133884)

Planted:	September 18, 2012
Harvested:	July 24, 2013
Fertility:	11-52-0, 75 lb/a, at planting; 100 lb N/a as 46-0-0 in fall 2012;
Pesticide:	n/a
Previous crop:	chemical fallow

Table 5. Performance of 25 commercial and experimental winter wheat cultivars tested under conventional, dryland conditions near Molt, Montana during 2013. Cultivars listed alphabetically. (Exp. 133885).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2013	2012-13	2011-13				
	---------- bushels/acre ----------			lb/bu	%	%	inches
Commercial							
Accipiter	40.5	31.3	38.2	56.4	13.7	14.4	29.5
Bearpaw	**45.1***	33.5	40.2	58.0	13.5	14.0	26.8
CDC Falcon	37.9	31.0	32.7	57.4	14.3	14.7	26.1
Colter	**48.9***	**39.1***		58.9	13.4	13.5	30.2
Decade	**48.4***	**39.6***	38.6	58.2	13.3	14.2	26.5
Genou	37.2	28.7	31.4	56.8	13.8	14.2	28.6
Jagalene	**52.6***	**39.4***	37.3	61.1	13.0	12.9	28.7
Jerry	40.8	32.1	34.0	57.9	13.8	13.6	28.3
Judee	40.3	30.7	37.5	59.6	13.2	9.8	27.2
Ledger	36.1	30.6	35.8	58.6	13.2	13.8	26.6
Norris	**46.0***	**35.6***	37.7	59.8	12.3	13.6	29.7
Overland	**51.3***	**40.8***		59.5	13.2	12.6	26.5
Pryor	**50.5***	**38.7***	37.9	59.4	12.5	11.8	28.3
Rampart	38.2	30.2	29.1	58.9	13.1	14.8	30.3
SY Clearstone	**48.3***	**36.1***		56.0	15.3	13.0	31.4
Warhorse	42.1	34.1	37.1	57.3	13.0	14.8	26.2
WB3768	**51.6***			59.1	13.9	14.2	31.4
WB-Quake	39.4	31.4	35.2	57.9	13.5	13.9	26.9
Yellowstone	**53.1****	**41.8****	42.4	58.7	13.4	12.2	31.4
Experimental							
MT0978	**52.4***			59.7	13.5	13.7	29.7
MT1078	**46.8***			55.9	13.6	15.0	27.0
MT1090	41.8			56.3	15.2	13.6	28.7
MTCS1202	40.4			57.5	13.5	13.7	26.9
MTS0832	37.6	32.7	39.0	58.0	14.0	13.9	20.1
MTS1024	**49.2***			57.0	13.6	13.5	26.1
Average	44.7	34.6	36.5	58.2	13.6	13.6	28.0
PLSD (p=0.05)	8.4	6.6	ns	2.3	ns	ns	ns
CV%	11.4	13.5	17.7	2.4	8.6	12.2	12.0

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. 133885)	
Planted:	September 28, 2012
Harvested:	August 1, 2013
Fertility:	11-52-00, 75 lb/a in furrow at planting; 105 lb/a as 46-0-0 in spring.
Herbicide:	n/a
Previous crop:	summer fallow

Table 6. Grain yield[1/] of 25 commercial and experimental winter wheat cultivars tested at five locations in south central Montana during 2013. Varieties listed by declining average yield across all locations.

Cultivar	Rapelje No-Till Dryland	Hardin No-Till Dryland	Molt No-Till Dryland	Dryland Locations Average	Huntley Min. Till Irrigated	All Locations Average
	---------- bushels/acre ----------					
MT1090	**64.4****	22.0	41.8	**42.6***	**142.0****	**67.5****
MT1078	**63.3***	**28.5****	**46.8***	**46.4****	**127.7***	**66.8***
WB3768	47.0	**25.1***	**51.6***	**41.2***	**133.9***	**64.4***
Colter	**58.4***	23.8	**48.9***	**43.6***	**125.4***	**64.1***
MTS1024	**60.4***	**26.1***	**49.2***	**45.3***	**117.5***	**63.3***
Jagalene	47.1	**26.1***	**52.6***	**41.7***	**123.6***	**62.2***
Overland	50.6	**27.2***	**51.3***	**43.2***	**118.4***	**62.0***
MT0978	**57.6***	23.0	**52.4***	**44.4***	112.4	**61.4***
Yellowstone	**57.1***	**25.9***	**53.1****	**45.3***	101.3	**59.3***
Norris	**55.9***	23.2	**46.0***	**41.8***	110.5	**59.0***
Decade	52.3	**26.2***	**48.4***	**42.3***	105.4	**58.1***
SY Cleastone	50.3	22.8	**48.3***	**40.6***	109.5	**57.8***
CDC Falcon	46.1	21.9	37.9	35.3	**125.1***	**57.7***
Judee	52.5	22.8	40.3	38.8	112.3	**57.2***
Warhorse	50.3	**25.1***	42.1	39.2	109.5	**56.7***
WB-Quake	52.6	19.6	39.4	37.2	112.6	**56.0***
MTCS1202	**58.5***	**25.3***	40.4	**41.3***	97.3	55.3
Ledger	**57.3***	22.6	36.1	38.5	105.5	55.2
Bearpaw	52.2	**25.3***	**45.1***	**40.8***	96.5	54.8
Accipiter	51.0	18.4	40.5	36.6	107.0	54.2
Jerry	47.7	23.4	40.8	37.4	104.8	54.2
Genou	40.4	23.7	37.2	33.8	108.4	52.4
Rampart	47.3	**24.9***	38.2	36.9	96.9	51.9
Pryor	**56.4***	22.2	**50.5***	**43.0***	74.6	50.9
MTS0832	53.8	21.0	37.6	37.3	73.6	46.3
Average	53.2	23.8	44.7	40.6	110.1	57.9
PLSD (p=0.05)	8.6	4.3	8.4	7.1	26.7	11.9
CV%	9.8	11.1	11.4	11.0	14.8	15.5

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 7. Performance of 25 commercial and experimental winter wheat cultivars tested under dryland and irrigated conditions at six locations in south central Montana during 2013. Cultivars listed alphabetically.

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2013	2012-13	2011-13				
	---------- lb/bu ----------			lb/bu	%	%	inches
Commercial							
Accipiter	54.2	44.1	54.2	58.4	12.0	14.5	31.7
Bearpaw	54.8	46.3	54.4	58.5	11.4	15.5	30.0
CDC Falcon	**57.7***	47.7	**55.9***	58.8	12.0	14.4	29.6
Colter	**64.1***	**51.2***		58.8	11.9	15.0	33.6
Decade	**58.1***	48.4	**58.0***	59.2	11.7	14.6	30.2
Genou	52.4	41.3	48.2	58.7	12.3	14.6	33.6
Jagalene	**62.2***	**52.2***	**60.5****	61.5	11.9	13.9	30.5
Jerry	54.2	44.7	52.6	59.1	12.0	14.9	34.4
Judee	**57.2***	44.4	49.1	60.5	11.9	14.2	31.2
Ledger	55.2	46.4	54.1	59.6	11.8	14.2	30.4
Norris	**59.0***	49.9	**57.3***	60.5	11.3	14.1	33.3
Overland	**62.0***	**56.2****		60.4	11.8	13.7	30.7
Pryor	50.9	46.5	55.4	58.8	11.6	14.3	30.1
Rampart	51.9	42.5	48.9	59.3	11.4	15.6	34.5
SY Clearstone	**57.8***	50.1		57.6	12.8	14.4	33.5
Warhorse	**56.7***	46.6	54.8	58.7	11.7	15.3	31.3
WB3768	**64.4***			59.7	13.2	14.4	36.0
WB-Quake	**56.0***	45.1	55.3	59.4	11.6	14.5	31.2
Yellowstone	**59.3***	50.3	**58.8***	58.0	12.1	14.6	33.7
Experimental							
MT0978	**61.4***			59.1	12.0	14.5	31.2
MT1078	**66.8***			58.1	11.9	14.0	30.8
MT1090	**67.5***			58.2	12.7	14.4	33.7
MTCS1202	55.3			58.3	11.6	15.2	29.0
MTS0832	46.3	42.5	51.8	58.0	12.1	15.6	30.2
MTS1024	**63.3***			58.3	11.9	14.2	29.4
Average	57.9	47.2	54.3	59.0	11.9	14.6	31.8
PLSD (p=0.05)	11.9	5.3	4.8	1.6	0.7	ns	2.4
CV%	15.5	14.6	13.5	2.5	7.1	8.7	7.8
Year x	4	10	15	4	4	4	4

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 8. Performance of 25 commercial and experimental winter wheat cultivars tested under dryland conditions at five locations in south central Montana during 2013. Cultivars listed alphabetically.

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2013	2012-13	2011-13				
	---------- lb/bu ----------			lb/bu	%	%	inches
Commercial							
Accipiter	36.6	39.0	45.8	57.3	12.8	14.9	28.7
Bearpaw	**40.8***	43.1	46.1	57.9	12.2	15.7	28.7
CDC Falcon	35.3	41.0	46.1	57.4	12.7	15.1	27.4
Colter	**43.6***	44.7		57.9	12.7	15.5	31.3
Decade	**42.3***	43.5	**49.1***	58.2	12.3	14.6	29.1
Genou	33.8	35.6	40.3	57.1	13.0	15.6	31.5
Jagalene	**41.7***	46.5	**50.9****	60.7	12.6	14.2	28.4
Jerry	37.4	39.8	44.4	58.2	12.7	15.2	31.2
Judee	38.8	38.8	41.6	59.7	12.5	14.8	28.6
Ledger	38.5	41.6	45.8	58.6	12.6	14.4	27.9
Norris	**41.8***	45.4	**47.9***	59.8	11.9	14.1	31.4
Overland	**43.2***	**51.6****		59.5	12.4	14.1	28.2
Pryor	**43.0***	45.4	**48.7***	58.6	12.4	14.4	28.4
Rampart	36.9	38.3	41.0	58.5	12.1	15.7	32.5
SY Clearstone	**40.6***	46.0		56.5	13.9	15.0	31.9
Warhorse	39.2	41.2	45.5	57.3	12.4	15.9	28.3
WB3768	**41.2***			58.6	14.2	14.8	33.2
WB-Quake	37.2	39.3	**46.7***	58.4	12.4	14.9	29.0
Yellowstone	**45.3***	46.4	**49.3***	57.8	13.1	14.6	31.6
Experimental							
MT0978	**44.4***			58.6	13.0	14.8	29.9
MT1078	**46.4****			57.2	12.7	14.3	29.0
MT1090	**42.6***			56.8	13.6	15.1	30.8
MTCS1202	**41.3***			57.2	12.3	15.6	27.5
MTS0832	37.3	40.4	45.4	57.3	12.9	15.5	28.0
MTS1024	**45.3***			57.7	12.7	14.1	28.1
Average	40.6	42.5	45.9	58.1	12.7	14.9	29.6
PLSD (p=0.05)	7.1	4.5	4.7	1.8	0.9	ns	2.5
CV%	11.0	10.7	12.7	2.4	7.5	8.7	7.8
Year x	3	8	13	3	3	3	3

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).