

## RESULTS OF AGRONOMIC AND WEED SCIENCE RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA - 2015

Annual Report of the Investigations at and Administration of the  
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- PROJECT TITLE:** 2015 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.
- PROJECT LEADERS:** Kent A. McVay, Cropping System Specialist, SARC, Huntley  
Qasim A. Khan, Research Associate, SARC, Huntley  
Phil L. Bruckner, Winter Wheat Breeder, PSPP, Bozeman  
James E. Berg, Winter Wheat Research Associate, PSPP, Bozeman
- PROJECT PERSONNEL:** Tom A. Fischer, Research Specialist and Farm Foreman, SARC, Huntley  
Janna Kransky, Research Assistant III, SARC, Huntley  
Steve Lackman, Yellowstone County Extension, Billings  
Byron Hould, Rosebud/Treasure County Extension, Forsyth  
Lee Schmelzer, Stillwater County Extension, Columbus  
Molly Hammond, Big Horn County Extension, Hardin
- COOPERATORS:** Mike Brown, Fly Creek (Hardin)  
Greg Lackman, Hysham  
Dave Kelsey, Molt  
Gary Broyles, Rapelje
- 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 2015 off-station winter wheat trials were established under irrigation at Hardin and under dryland conditions near Molt under conventional summer fallow conditions; near Fort Smith, 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 (2014-15) and three year (2013-15) yield averages are provided for cultivars tested during previous years. Test weight (pounds per bushel) and grain

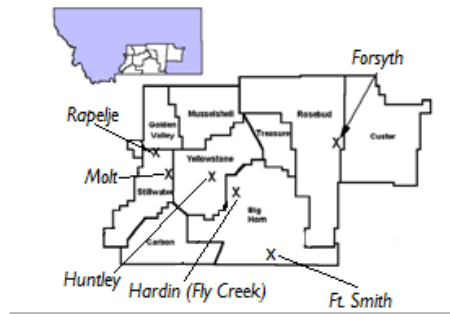


Figure1. 2015 off-station winter wheat trial locations in south central Montana.

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 2015 winter wheat test sites had below average rain or snow accumulation during winter months except in January. September and October precipitation provided some soil moisture at winter wheat planting and resulted in good crop stand. Below-average precipitation throughout the winter months and in early spring resulted in early season drought stress at dryland sites that accelerated wheat growth and caused early maturity. Rain shower from April onward provided the much needed moisture for wheat production. However, winter wheat never recovered from early drought stress that resulted in earliest winter wheat harvest in south eastern Montana. Winter wheat crop at Fort Smith location was lost to custom harvester.

Irrigated winter wheat trial was established at Hardin in 2015 instead of Huntley. Winter wheat stand was poor due to dry condition at planting and poor seedbed that drastically impacted the grain yield at this location. This location has the lowest grain yield among all location in 2015, just averaging 40 bu/ac (Table 2). Yields ranged from 51 bu/a for 'Colter' to 24 bu/a for 'WB-Quack'. Thirteen other entries produced yield that was statistically equal to the yield of highest yielding cultivar. Test weight values were low under irrigated conditions at Hardin in 2015, averaging only 52.9 lb/bu. All entries possessed test weight values less than 60 lb/bu. Grain protein content averaged 15.0 percent and all entries have grain protein over 14 percent.

Average yield under dryland conditions at Rapelje in 2015 was 77 bu/a (Table 3), about 8 bushels per acre lower than winter wheat yields observed at this site in 2014. Yields ranged from 57 bu/a for cultivar 'Rampart' to 89 bu/a for experimental line 'MT1117'. Fourteen other entries produced yield that was statistically equal to the yield of highest yielding cultivar. 'Yellowstone' was the highest yielding cultivar at this site. Test weight averaged 60.0 lb/bu, and ranged from 58.6 lb/bu for 'Broadview' and Rampart to 62.5 lb/bu for 'SY Wolf'. Grain protein was low and averaged 11.7 percent and ranged from 10.0 percent to 13.4 percent. Two-year average yield for winter wheat varieties tested at Rapelje during 2014 and 2015 was 80 bu/a. Three-year average yield from 2013 through 2015 was 70 bu/a. 'Yellowstone' was the highest yielding cultivar at Rapelje over the past three years.

Average winter wheat yield dryland condition at Hardin during 2015 was 63 bu/a (Table 4), slightly higher than the last year yield at this site. Yields was not

statistically significant at this site and ranged from 58 bu/a to 75 bu/a. A windstorm with some small hails just before wheat harvest at this site caused yield loss in some entries. Test weight values ranged from 58.3 for 'MT1078' to 61.3 'Judee' and averaged 59.4 lb/bu at Hardin in 2015. Grain protein content averaged 13.7 percent. Protein content ranged from 11.8 percent to 14.4 percent. Two-year average yield for winter wheat varieties tested during 2014 and 2015 was 60 bu/a. Three-year average yield for winter wheat varieties tested during 2013 to 2015 was 48 bu/a.

Average yield under dryland conditions at Molt in 2015 was 75 bu/a (Table 5) about 17 bu/a higher than last year. Yield ranged from 679 bu/a to 83 bu/a. Test weight was the highest at Molt in 2015 averaging 62.4 lb/bu. All entries produced test weight values higher than 60 lb/bu. Grain protein content was the lowest at Molt in 2015 and averaged only 10.2 percent. All entries have protein content 11 percent or lower. Two- and Three-year average yields for winter wheat varieties tested at Molt were 61 and 56 bu/a respectively. Experimental line 'MT0978' was the highest yielding entry, averaged over the past three year, at Molt.

Average yield under dryland conditions at Hysham was 51 bu/a (Table 6) about 16 bu/a lower than last year. Yield ranged from 46 bu/a for 'CDC Falcon' to 59 bu/a for experimental line 'MT1078'. Yellowstone was the highest yielding commercial cultivar with 54 bu/a yield. Test weight was good averaging 62.2 lb/bu. All entries at Hysham site have test weight over 60 lb/bu. Grain protein content averaged 13.7 percent with all entries having protein content higher than 13.0 percent. Two-year average yields for winter wheat varieties tested at Hysham was 59 bu/a

## **SUMMARY:**

In 2015 winter wheat suffered an early season drought stress that accelerated the wheat growth and resulted in early maturity and harvest. Rain shower later in growing season provided much needed moisture to boost grain production at all dryland test sites ranging from 51 bu/a at Hysham to 77 bu/a at Repelje (Table 6). Experimental line MT1078 produced the highest yield of 69 bu/a averaged across all five of the test locations in 2015. While Yellowstone was the highest yielding commercial cultivar producing about 65 bu/a. Grain yield suffered under irrigated conditions at Hardin due to poor soil condition for crop production. Winter wheat crop was lost to custom harvest at Fort Smith location.

Since 2013, experiments representing 13 location-years of testing have uniformly tested 13 cultivars at several dryland locations in south central Montana (Table 8). Experimental line MT1078 was the highest yielding entry averaged over the past two- and three-years across all dryland locations. While Colter and Yellowstone produced three-year average yield that was statistically equal to the yield of MT1078.

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 2015.

Cultivar	1/ Origin	Year of Release	2/ Market Class	3/ PVP Yes/No	4/ Maturity	5/ Coleoptile Length	Chaff Color	6/ Winter Survival 1-5	7/ Straw Strength	Solid Stem Type Yes/No	8/ Disease Resistance				9/ Quality		10/ Clearfield Type Yes/No
											Leaf Rust	Stem Rust	Stripe Rust	Dwarf Bunt	Milling	Baking	
															1-5	1-5	
<b>Commercial</b>																	
Bearpaw	MSU	2011	HRW	Y	M	M	White	2	M	Y	S	R	S	S	4	3	N
Broadview	Meridian	2009	HRW	N	M	S	White	5	S	N	R	R	S	S	3	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	MS	R	S	S	3	4	N
Genou	MSU	2004	HRW	Y	M	M	White	2	M	Y	M	S	S	S	4	4	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§	Syngenta	2012	HRW	Y	M	S	White	2	S	N	-	MR	R	S	3	3	Y
SY Wolf	Syngenta	2010	HRW	Y	M	M	White	2	S	N	-	R	R	S	3	2	N
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 §	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
<b>Experimental</b>																	
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
MT1265	MSU		HRW		M-L	-	White	3	MS	N	-	MR	R	S	3	4	N
MT1286	MSU		HRW		M	-	White	3	M	N	-	S	MR	S	2	3	N
MTCS1204	MSU		HRW		M	-	White	3	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/Meridian Seeds, Alberta, Ca; 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.

§ 'SY Clearstone', and 'WB3768' licensed for sale on an exclusive basis by Syngenta and WestBred LLC, respectively.

Table 2. Performance of 25 commercial and experimental winter wheat cultivars tested under no-till, irrigated conditions at Hardin, Montana during 2015. Cultivars listed alphabetically. (Exp. 153880).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein		Plant Height
	2015	2014-15	2013-15			%	%	
	----- bushels/acre -----			lb/bu	%	%	inches	
<u>Commercial</u>								
Bearpaw	<b>43.3*</b>			53.5	9.3	14.5	30.8	
Broadview	<b>43.1*</b>			52.7	9.6	14.5	33.6	
CDC Falcon	<b>40.8*</b>			52.3	9.4	15.3	28.5	
Colter	<b>51.4**</b>			54.2	9.5	14.8	34.3	
Decade	<b>49.0*</b>			54.1	9.8	14.1	30.3	
Genou	27.2			51.5	9.5	16.0	34.0	
Jerry	40.1			53.2	9.8	14.9	34.3	
Judee	35.5			52.7	9.7	14.7	31.9	
Rampart	29.2			54.4	9.4	15.8	34.1	
SY Clearstone	37.1			51.3	9.4	15.0	31.4	
SY Wolf	<b>44.2*</b>			57.5	10.1	14.1	29.0	
Warhorse	33.0			54.3	9.9	14.9	31.0	
WB3768	<b>45.2*</b>			53.9	9.9	15.7	30.8	
WB-Quake	24.7			52.4	9.1	15.0	31.0	
Yellowstone	<b>46.9*</b>			53.0	10.0	15.3	34.6	
<u>Experimental</u>								
MT0978	<b>46.0*</b>			52.9	9.4	15.8	32.0	
MT1078	<b>44.0*</b>			52.0	9.5	14.6	32.5	
MT1117	<b>49.3*</b>			54.3	9.8	14.6	34.1	
MT1138	<b>45.2*</b>			51.7	9.3	14.6	32.5	
MT1257	34.5			50.5	9.4	15.5	31.6	
MT1265	<b>51.0*</b>			53.2	9.8	15.4	32.9	
MT1286	<b>43.2*</b>			53.7	10.0	15.0	34.4	
MTCS1204	<b>41.4*</b>			48.9	9.2	15.2	34.1	
MTS0826-63	28.1			53.8	9.4	15.6	29.1	
MTS1224	36.1			49.8	9.6	15.7	29.3	
Average	40.4			52.9	9.6	15.0	32.1	
PLSD (p=0.05)	11.2			2.7	0.5		ns	
CV%	17.0			2.8	3.3		8.3	

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.

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 Irrigated Winter Wheat (Exp. 153880)

Planted:	October 06, 2014
Harvested:	July 20, 2015
Fertility:	100 N lbs/acre in fall + 60 lbs/acre top dressed in the spring as 46-0-0
Herbicide:	n/a
Previous crop:	n/a
Irrigation:	Flood
Precipitation:	n/a

Table 3. Performance of 25 commercial and experimental winter wheat cultivars tested under no-till, dryland conditions near Rapelje, Montana during 2015. Cultivars listed alphabetically. (Exp. 153881).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2015	2014-15	2013-15				
	----- bushels/acre -----			lb/bu	%	%	inches
<u>Commercial</u>							
Bearpaw	68.7	77.0	<b>68.7*</b>	59.8	9.9	11.7	35.0
Broadview	<b>80.2*</b>			58.6	9.8	12.6	34.7
CDC Falcon	75.9	<b>88.5*</b>	<b>74.3*</b>	60.1	10.0	10.7	33.2
Colter	<b>85.1*</b>	<b>83.3*</b>	<b>76.3*</b>	60.2	10.0	11.5	37.8
Decade	70.2	76.8	<b>68.7*</b>	59.8	10.3	10.7	35.7
Genou	62.4	71.5	61.2	60.9	10.4	11.4	39.1
Jerry	<b>80.7*</b>	<b>86.7*</b>	<b>73.7*</b>	59.4	10.1	11.9	42.4
Judee	65.8	76.1	68.2	59.5	10.0	12.3	32.9
Rampart	57.3	69.5	62.1	58.6	9.6	13.4	38.1
SY Clearstone	76.4	78.6		59.4	9.9	11.5	39.2
SY Wolf	<b>79.1*</b>			61.5	10.9	11.2	35.1
Warhorse	71.0	74.5	66.1	58.9	9.7	13.0	34.4
WB3768	<b>84.0*</b>			60.5	10.4	11.6	38.8
WB-Quake	64.7	71.6	65.2	60.4	10.1	11.3	32.6
Yellowstone	<b>86.2*</b>	<b>89.9*</b>	<b>79.0**</b>	60.2	11.3	10.5	37.6
<u>Experimental</u>							
MT0978	<b>79.6*</b>	79.9	<b>72.5*</b>	59.0	9.7	12.3	35.7
MT1078	<b>85.1*</b>	<b>85.1*</b>	<b>77.9*</b>	59.1	10.1	11.0	34.3
MT1117	<b>88.7**</b>	<b>85.0*</b>		61.2	10.4	11.4	37.8
MT1138	<b>86.9*</b>	<b>84.5*</b>		60.7	10.6	10.0	36.9
MT1257	<b>87.8*</b>			60.1	10.8	11.1	37.2
MT1265	<b>86.2*</b>			60.2	10.3	11.8	38.3
MT1286	<b>84.7*</b>	<b>96.9**</b>		61.1	10.6	11.9	36.5
MTCS1204	<b>82.2*</b>	<b>84.3*</b>		60.1	10.3	12.3	36.1
MTS0826-63	66.0	67.0		60.9	9.7	12.6	37.0
MTS1224	<b>77.7*</b>			59.3	10.6	12.0	33.9
Average	77.3	80.4	70.3	60.0	10.2	11.7	36.4
PLSD (p=0.05)	11.6	14.6	10.5	1.7	0.6		2.8
CV%	7.6	14.3	13.5	1.5	3.7		3.4

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. 153881)

Planted:	September 22, 2014
Harvested:	July 22, 2015
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 2015. Cultivars listed alphabetically. (Exp. 153884).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2015	2014-15	2013-15				
	----- bushels/acre -----			lb/bu	%	%	inches
<u>Commercial</u>							
Bearpaw	65.8	60.4	48.7	59.9	9.0	12.5	35.7
Broadview	64.1			59.0	8.5	14.1	40.9
CDC Falcon	64.7	56.6	45.0	59.3	8.5	13.5	36.8
Colter	62.0	59.8	48.0	60.0	8.8	13.5	41.8
Decade	58.0	62.7	50.6	58.8	8.7	13.9	35.9
Genou	58.2	54.9	44.5	59.7	8.8	13.4	41.0
Jerry	58.9	57.3	46.1	58.0	8.5	14.1	40.2
Judee	61.6	62.1	49.3	61.3	9.2	14.3	36.6
Rampart	58.3	56.2	45.8	58.7	8.6	14.3	38.9
SY Clearstone	66.5	61.3		59.4	8.9	13.5	40.5
SY Wolf	62.5			60.0	8.7	13.7	36.4
Warhorse	60.5	59.4	47.8	60.1	9.3	13.8	35.1
WB3768	67.2			59.3	8.7	12.9	42.4
WB-Quake	59.6	58.4	45.5	59.6	9.0	12.9	37.3
Yellowstone	57.8	61.3	49.4	59.7	8.8	14.4	40.5
<u>Experimental</u>							
MT0978	62.4	63.2	49.8	58.9	8.6	13.7	34.5
MT1078	74.7	64.5	52.7	58.3	8.5	11.8	36.2
MT1117	59.8	56.2		60.4	8.9	13.0	40.5
MT1138	68.5	68.4		60.0	8.6	13.0	39.5
MT1257	65.9			59.5	8.7	13.1	39.0
MT1265	67.0			59.4	8.9	13.2	41.5
MT1286	63.0	55.2		60.0	8.5	13.3	41.1
MTCS1204	60.0	56.6		59.4	8.8	13.0	38.5
MTS0826-63	63.8	64.1		58.5	8.9	13.6	38.4
MTS1224	62.8			58.2	8.6	13.3	33.9
Average	63.0	59.9	47.9	59.4	8.8	13.7	38.5
PLSD (p=0.05)	ns	ns	ns	1.0	0.3		3.7
CV%	<b>7.9</b>	10.0	10.6	1.0	2.0		5.8

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. 153884)

Planted: September 16, 2014  
Harvested: July 21, 2015  
Fertility: 100 lb N/a as 46-0-0 in fall 2014;  
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 2015. Cultivars listed alphabetically. (Exp. 153885).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2015	2014-15	2013-15				
	----- bushels/acre -----			lb/bu	%	%	inches
<u>Commercial</u>							
Bearpaw	77.8	62.4	<b>56.6*</b>	63.3	11.4	10.1	35.0
Broadview	79.2			63.4	11.6	10.2	36.4
CDC Falcon	77.7	68.6	<b>58.4*</b>	63.0	11.7	10.1	32.2
Colter	74.1	58.2	<b>56.0*</b>	60.3	12.9	10.0	36.1
Decade	71.0	64.4	<b>59.0*</b>	63.2	11.7	10.2	36.0
Genou	69.2	56.9	50.3	64.0	11.4	10.4	38.3
Jerry	68.3	56.3	51.1	62.0	12.0	10.6	38.7
Judee	79.2	63.6	<b>55.8*</b>	62.7	11.5	10.0	32.5
Rampart	69.0	54.8	49.3	61.9	11.1	11.1	39.0
SY Clearstone	66.8	56.1		61.5	11.9	9.8	36.4
SY Wolf	77.1			62.7	12.7	10.5	32.3
Warhorse	73.9	61.7	<b>55.6*</b>	62.8	11.9	10.5	35.8
WB3768	80.6			61.5	14.6	9.7	39.2
WB-Quake	74.7	59.0	52.4	63.2	11.4	9.4	35.6
Yellowstone	74.3	59.6	<b>57.4*</b>	61.8	12.3	9.7	36.1
<u>Experimental</u>							
MT0978	83.0	66.9	<b>62.1**</b>	62.6	12.8	10.0	36.6
MT1078	75.7	65.4	<b>59.2*</b>	60.8	13.1	9.3	35.2
MT1117	74.7	57.0		60.9	14.6	10.3	36.4
MT1138	79.0	61.6		62.5	11.7	9.6	37.1
MT1257	71.4			62.5	12.3	10.0	36.6
MT1265	80.1			61.1	13.7	9.9	37.8
MT1286	78.8	62.3		62.9	12.0	9.5	37.0
MTCS1204	78.0	59.7		62.8	12.2	10.9	36.7
MTS0826-63	70.9	56.0		63.8	11.7	10.2	37.0
MTS1224	75.8			62.7	12.4	10.4	32.5
Average	75.2	60.6	55.6	62.4	12.3	10.2	36.1
PLSD (p=0.05)	ns	ns	7.9	1.8	1.2		2.5
CV%	8.2	10.7	11.6	1.7	5.9		4.2

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. 15885)

Planted: September 22, 2014  
Harvested: July 22, 2015  
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 conventional, dryland conditions near Hysham, Montana during 2015. Cultivars listed alphabetically. (Exp. 153882).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2015	2014-15	2013-15				
	----- bushels/acre -----			lb/bu	%	%	inches
<u>Commercial</u>							
Bearpaw	51.8	58.1		62.4	10.7	13.9	33.1
Broadview	51.4			61.0	11.0	13.6	31.8
CDC Falcon	45.5	50.9		63.0	10.9	13.3	30.6
Colter	51.7	67.3		62.9	11.2	13.5	37.3
Decade	52.0	57.8		62.7	11.1	14.0	34.5
Genou	51.0	61.5		62.3	10.8	14.1	36.6
Jerry	48.7	57.5		62.0	11.1	13.6	39.0
Judee	47.5	48.5		63.4	11.0	14.4	32.5
Rampart	47.2	49.4		62.6	10.7	14.4	38.7
SY Clearstone	51.5	64.2		61.8	11.0	13.6	38.6
SY Wolf	50.7			63.6	11.1	13.6	34.6
Warhorse	49.5	56.0		62.3	10.7	13.3	32.8
WB3768	50.9			61.6	11.3	13.2	38.1
WB-Quake	47.0	58.5		62.2	10.6	13.7	32.5
Yellowstone	<b>54.1*</b>	59.1		62.3	11.0	13.8	36.5
<u>Experimental</u>							
MT0978	51.8	57.8		60.8	10.9	13.5	33.7
MT1078	<b>58.6**</b>	62.8		62.0	11.0	13.0	34.3
MT1117	46.7	60.7		61.7	11.2	14.1	36.0
MT1138	<b>55.0*</b>	65.1		62.6	11.0	13.3	37.4
MT1257	49.9			61.5	11.1	14.2	36.0
MT1265	51.5			62.2	11.2	13.4	36.9
MT1286	<b>53.0*</b>	62.3		62.8	11.2	13.3	36.2
MTCS1204	51.1	60.7		60.9	10.9	14.3	35.3
MTS0826-63	52.4	53.0		62.1	10.6	13.7	34.1
MTS1224	49.9			61.3	11.0	14.7	29.3
Average	50.8	58.5		62.2	11.0	13.7	35.0
PLSD (p=0.05)	6.1	ns		1.6	0.3		1.8
CV%	<b>5.5</b>	11.6		1.6	1.4		3.1

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. 153882)

Planted:	September 23, 2014
Harvested:	July 16, 2015
Fertility:	100 lb/a as 46-0-0 in spring.
Herbicide:	n/a
Previous crop:	Chemical fallow

Table 7. Grain yield<sup>1/</sup> of 25 commercial and experimental winter wheat cultivars tested at five locations in south central Montana during 2015. 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	Dryland Locations Average	Hardin Con-Till Irrigated	All Locations Average
-----bushels/acre -----							
MT1078	<b>85.1*</b>	<b>58.6**</b>	74.7	75.7	<b>74.9**</b>	<b>44.0*</b>	<b>68.7**</b>
MT1265	<b>86.2*</b>	51.5	67.0	80.1	<b>71.6*</b>	<b>51.0*</b>	<b>67.4*</b>
MT1138	<b>86.9*</b>	<b>55.0*</b>	68.5	79.0	<b>72.2*</b>	<b>45.2*</b>	<b>66.8*</b>
WB3768	<b>84.0*</b>	50.9	67.2	80.6	<b>70.5*</b>	<b>45.2*</b>	<b>65.5*</b>
MT1286	<b>84.7*</b>	<b>53.0*</b>	63.0	78.8	<b>70.7*</b>	<b>43.2*</b>	<b>65.2*</b>
MT0978	<b>79.6*</b>	51.8	62.4	83.0	<b>69.3*</b>	<b>46.0*</b>	<b>64.6*</b>
Yellowstone	<b>86.2*</b>	<b>54.1*</b>	57.8	74.3	<b>68.9*</b>	<b>46.9*</b>	<b>64.5*</b>
Colter	<b>85.1*</b>	51.7	62.0	74.1	67.5	<b>51.4**</b>	<b>64.3*</b>
Broadview	<b>80.2*</b>	51.4	64.1	79.2	<b>69.0*</b>	<b>43.1*</b>	<b>63.8*</b>
MT1117	<b>88.7**</b>	46.7	59.8	74.7	66.4	<b>49.3*</b>	<b>63.0*</b>
MTCS1204	<b>82.2*</b>	51.1	60.0	78.0	68.0	<b>41.4*</b>	<b>62.7*</b>
Bearpaw	68.7	51.8	65.8	77.8	66.9	<b>43.3*</b>	62.2
SY Wolf	<b>79.1*</b>	50.7	62.5	77.1	66.7	<b>44.2*</b>	62.2
CDC Falcon	75.9	45.5	64.7	77.7	66.5	<b>40.8*</b>	61.4
MT1257	<b>87.8*</b>	49.9	65.9	71.4	<b>68.1*</b>	34.5	61.4
MTS1224	<b>77.7*</b>	49.9	62.8	75.8	66.5	36.1	60.4
Jerry	<b>80.7*</b>	48.7	58.9	68.3	64.0	40.1	59.2
Decade	70.2	52.0	58.0	71.0	61.4	<b>49.0*</b>	58.9
SY Clearstone	76.4	51.5	66.5	66.8	63.6	37.1	58.3
Warhorse	71.0	49.5	60.5	73.9	64.3	33.0	58.0
Judee	65.8	47.5	61.6	79.2	63.3	35.5	57.7
MTS0826-63	66.0	52.4	63.8	70.9	62.7	28.1	55.7
WB-Quake	64.7	47.0	59.6	74.7	63.1	24.7	55.5
Genou	62.4	51.0	58.2	69.2	60.1	27.2	53.5
Rampart	57.3	47.2	58.3	69.0	58.1	29.2	52.3
Average	77.3	50.8	63.0	75.2	66.6	40.4	61.3
PLSD (p=0.05)	11.6	6.1	ns	ns	6.8	11.2	6.2
CV%	7.6	5.5	7.9	8.2	8.7	17.0	9.8

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 five locations in south central Montana during 2015. Cultivars listed alphabetically.

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2015	2014-15	2013-15				
	----- lb/bu -----			lb/bu	%	%	inches
<u>Commercial</u>							
Bearpaw	62.2	<b>64.0*</b>	54.1	59.7	10.1	12.5	33.8
Broadview	<b>63.8*</b>			58.8	10.1	13.0	35.3
CDC Falcon	61.4	<b>64.5*</b>	52.0	59.5	10.1	12.6	32.4
Colter	<b>64.3*</b>	<b>67.3*</b>	<b>57.8*</b>	59.4	10.5	12.7	37.1
Decade	58.9	<b>63.8*</b>	54.3	59.8	10.3	12.6	34.1
Genou	53.5	58.4	47.6	59.7	10.2	13.1	37.9
Jerry	59.2	<b>63.2*</b>	51.7	59.0	10.3	13.0	38.8
Judee	57.7	62.6	51.9	60.0	10.3	13.1	33.2
Rampart	52.3	55.7	46.3	59.2	9.9	13.8	38.1
SY Clearstone	58.3	<b>63.2*</b>		58.5	10.2	12.7	37.2
SY Wolf	62.2			61.1	10.7	12.6	33.4
Warhorse	58.0	61.1	51.1	59.6	10.3	13.1	33.9
WB3768	<b>65.5*</b>			59.3	11.0	12.6	37.9
WB-Quake	55.5	60.5	49.8	59.6	10.0	12.5	34.0
Yellowstone	<b>64.5*</b>	<b>67.0*</b>	<b>56.3*</b>	59.6	10.7	12.7	36.8
<u>Experimental</u>							
MT0978	<b>64.6*</b>	<b>67.0*</b>	<b>57.0*</b>	58.8	10.3	13.1	34.8
MT1078	<b>68.7**</b>	<b>68.8**</b>	<b>59.3**</b>	58.5	10.5	11.9	34.4
MT1117	<b>63.0*</b>	<b>65.0*</b>		59.7	11.0	12.7	37.0
MT1138	<b>66.8*</b>	<b>68.7*</b>		59.6	10.3	12.1	36.9
MT1257	61.4			58.8	10.4	12.8	36.0
MT1265	<b>67.4*</b>			59.3	10.8	12.7	37.6
MT1286	<b>65.2*</b>	<b>66.3*</b>		60.2	10.5	12.6	37.1
MTCS1204	<b>62.7*</b>	<b>64.9*</b>		58.5	10.3	13.1	36.5
MTS0826-63	55.7	56.8		59.7	10.1	13.1	35.0
MTS1224	60.4			58.3	10.4	13.2	31.7
Average	61.3	63.6	53.0	59.4	10.4	12.8	35.6
PLSD (p=0.05)	6.2	5.8	4.3	1.2	0.6		1.6
CV%	9.8	11.9	10.7	1.9	3.9		5.4
Location x	5	10	13	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).

Table 9. Performance of 25 commercial and experimental winter wheat cultivars tested under dryland conditions at five locations in south central Montana during 2015. Cultivars listed alphabetically.

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	2015	2014-15	2013-15				
	----- lb/bu -----			lb/bu	%	%	inches
<u>Commercial</u>							
Bearpaw	66.9	<b>66.3*</b>	58.3	61.4	10.2	12.1	34.5
Broadview	<b>69.0*</b>			60.4	10.2	12.6	35.8
CDC Falcon	66.5	<b>67.1*</b>	57.8	61.3	10.3	11.9	33.3
Colter	67.5	<b>69.1*</b>	<b>61.1*</b>	60.9	10.7	12.1	37.9
Decade	61.4	<b>65.4*</b>	57.8	61.2	10.4	12.2	35.1
Genou	60.1	61.9	53.7	61.7	10.3	12.3	38.9
Jerry	64.0	<b>65.8*</b>	57.2	60.4	10.4	12.6	39.9
Judee	63.3	<b>65.6*</b>	57.5	61.8	10.4	12.8	33.5
Rampart	58.1	58.6	52.1	60.4	10.0	13.3	39.1
SY Clearstone	63.6	<b>66.1*</b>		60.5	10.4	12.1	38.6
SY Wolf	66.7			62.0	10.8	12.3	34.5
Warhorse	64.3	64.2	56.4	61.0	10.4	12.7	34.6
WB3768	<b>70.5*</b>			60.7	11.3	11.9	39.7
WB-Quake	63.1	64.5	56.0	61.4	10.3	11.8	34.8
Yellowstone	<b>68.9*</b>	<b>69.2*</b>	<b>60.9*</b>	61.1	10.9	12.1	37.3
<u>Experimental</u>							
MT0978	<b>69.3*</b>	<b>69.3*</b>	<b>60.6*</b>	60.3	10.5	12.4	35.5
MT1078	<b>74.9**</b>	<b>71.6**</b>	<b>63.8**</b>	60.1	10.7	11.3	34.8
MT1117	66.4	<b>66.7*</b>		61.0	11.3	12.2	37.7
MT1138	<b>72.2*</b>	<b>71.4*</b>		61.5	10.5	11.5	37.9
MT1257	<b>68.1*</b>			60.9	10.7	12.1	37.1
MT1265	<b>71.6*</b>			60.7	11.0	12.1	38.7
MT1286	<b>70.7*</b>	<b>68.8*</b>		61.7	10.6	12.0	37.7
MTCS1204	68.0	<b>67.6*</b>		60.7	10.5	12.6	37.1
MTS0826-63	62.7	60.0		61.3	10.3	12.5	36.5
MTS1224	66.5			60.4	10.6	12.6	32.3
Average	66.6	66.3	58.0	61.0	10.6	12.3	36.5
PLSD (p=0.05)	6.8	6.2	4.5	1.1	0.7		1.6
CV%	8.7	11.6	11.6	1.5	4.0		4.6
Location x	4	9	12	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).