

Project Title: 2012 Intra-State Winter Wheat Variety Performance

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Project Personnel:

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Objectives:

To evaluate new and existing winter wheat lines and varieties in dryland under various growing conditions in Montana and Western North Dakota.

Results:

The 2012 Intrastate Winter Wheat Evaluation nursery was grown at Bozeman, Havre, Huntley, Conrad, Kalispell, Moccasin, and Sidney, Montana and Williston, North Dakota. Low precipitation was prevalent in Montana, but some sites have deep soils that produced excellent yields from well charged soils.

The overall mean yield, across the eight harvested locations, was 58.3 bushels per acre with Conrad having the high trial mean at 87.3 bu/a. Yellowstone and Clearstone were the only named cultivars ranking in the top ten for yield across all locations (Table 1). Test weights were below the standard with the overall mean of 58.8 lbs/bu. Jagalene, again, the high mean test weight at 61.2 lbs/bu. Huntley had a 63.2 lbs/bu mean test weight (Table 2). The mean heading date had a 9 day range with Art being the earliest to head at Julian day158.2 and WB Quake the last at day167.6 (Table 3). There was an 8.5 inch range in the eight location mean height between 28.8" Carter to 37.4" Peregrine (Table 4). Solid stem cultivars Genou, Bynum, Judee, Rampart, and WB Quake ranked at the top for grain protein content have eight location means \geq 13.7%. Pryor had the lowest protein at 12.3% (Table 5). Thirteen entries were evaluated for stem solidness at four locations. CDC Falcon and Ledger had the least stem solidness, scores 6.8 and 9.8 respectively, while cultivars Rampart and Bearpaw scored 21.5 and 21.3, respectively. Development line MTS0808 scored 21.6 (Table 6).

Summary:

The development of improved winter wheat lines and cultivars continues with improvements in yield, disease resistance and tolerance advances, combined with improved stem solidness to combat sawfly. New challenges arrive or former pest mutate to circumvent the remedies develop to thwart their damage and renew their attack on wheat and other crop species.

Future Plans: The intra-state winter wheat trial is not a component of the research center's umbrella project. This information is presented here for the convenience of the Mt Wheat & Barley Committee and the growers who generate the MWBC check-off dollars.

Table 1. 2012 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Yield (bu/a)

Cultivar/Line	Bozeman LAT	Hare LAT	Sidney RCB	Williston LAT	Kalispell LAT	Moccasin LAT	Huntley LAT	Conrad LAT	8 Loc Avg.	7 Loc Avg.
lattice efficiency	154%	143%		125%	105%	193%	169%	139%		no KS
+ MT1090	77.6	58.3	66.0*	57.9*	83.2	36.3*	80.2**	101.1**	70.1**	68.2**
MT08172	75.0	70.7**	62.5*	41.7	95.3*	36.3*	67.1	95.3*	68.0*	64.1*
+ MT1078	90.9**	62.0*	60.1*	43.6	63.0	36.1*	77.8*	95.8*	66.2*	66.6*
Yellowstone	79.3	52.1	63.7*	43.9	84.5	35.5*	69.4	96.2*	65.6*	62.9*
MTW08168	78.0	52.1	59.7*	52.9*	97.6*	33.5	60.9	88.8*	65.4*	60.8
+ MT10116	75.3	54.5	56.3	44.6	84.1	34.0	72.8*	95.2*	64.6*	61.8
+ MT1091	83.2	56.3	64.0*	42.3	72.4	37.6*	64.3	92.6*	64.1*	62.9*
+ MTCL1077 (Clearst	82.7	59.6	62.9*	38.6	76.2	34.8*	70.3*	86.8*	64.0*	62.2
+ MT1092	81.7	51.9	60.4*	38.5	84.4	37.7**	68.0	89.7*	64.0*	61.1
+ MTS1024	89.1*	55.3	60.1*	34.7	67.6	35.3*	74.4*	93.9*	63.8*	63.3*
+ MT1156	86.3*	53.1	54.4	51.2*	73.4	34.1	68.7	87.3*	63.6*	62.2
+ MT1105	78.5	61.1*	62.0*	42.4	64.8	36.1*	72.1*	90.7*	63.5*	63.3*
Promontory	75.7	45.4	64.3*	30.1	108.3**	28.7	70.1	79.8	62.8*	56.3
+ MT1088	73.3	46.9	59.6*	43.6	77.0	36.4*	68.2	88.7*	61.7*	59.5
MT0978	78.6	54.8	63.5*	41.2	60.2	34.7*	62.3	97.0*	61.5*	61.7
MT0871	72.7	58.4	63.7*	48.0	52.9	33.8	70.3*	89.3*	61.1*	62.3
Jagalene	87.9*	53.8	57.3*	38.1	64.5	32.6	56.2	92.9*	60.4*	59.8
Robidoux	80.9	54.5	56.4	40.8	49.8	34.4*	71.5*	94.2*	60.3*	61.8
MTS0808	73.3	51.7	50.9	46.7	74.6	31.5	65.4	84.5	59.8*	57.7
# WB-Quake	75.7	48.4	49.4	47.5	71.8	30.0	62.7	87.7*	59.2	57.3
CDC Falcon	70.8	53.3	61.9*	59.6*	38.8	34.6*	61.1	92.9*	59.1	62.0
# SY Wolf	84.4*	56.2	54.1	27.3	60.2	33.5	68.7	88.3*	59.1	58.9
MTCL1067	81.8	57.0	59.8*	32.2	55.6	32.6	68.4	84.0	58.9	59.4
+ MT1155	80.8	49.6	55.0	40.3	50.3	32.8	74.7*	87.1*	58.8	60.0
Pryor	74.0	57.6	62.4*	43.9	35.3	37.7**	63.6	92.5*	58.4	61.7
# Radiant	62.2	47.2	55.9	49.5	86.1	27.1	56.5	81.2	58.2	54.2
Curlew	76.6	44.6	58.4*	25.3	73.3	29.8	69.6	83.7	57.7	55.4
+ MTS0819-98 (HWW	71.8	54.0	52.6	27.0	74.0	30.2	57.5	91.7*	57.4	55.0
Overland	90.5*	49.0	56.8	49.4	17.2	34.2	73.0*	87.0*	57.1	62.8*
Peregrine	63.7	43.9	54.4	59.3*	54.0	28.7	65.7	79.5	56.2	56.5
Norris (CL)	77.2	55.0	54.7	44.2	31.8	31.3	66.2	85.0	55.7	59.1
Judee	71.8	48.9	51.9	21.5	60.7	30.4	62.5	95.4*	55.4	54.6
# Art	85.5*	56.4	46.7	29.6	44.9	32.4	59.3	85.4	55.0	56.5
Accipiter	71.8	47.5	59.4*	46.7	21.9	31.0	59.9	96.9*	54.4	59.0
MTS0819	68.8	46.7	54.3	42.1	36.2	31.4	63.1	88.6*	53.9	56.4
Broadview	64.1	52.8	58.1*	62.6**	12.0	32.9	60.5	87.7*	53.8	59.8
McGill	75.3	56.9	53.5	43.7	20.8	31.5	62.5	84.6	53.6	58.3
+ MT10113	81.8	58.0	53.2	40.0	12.3	34.8*	58.9	88.1*	53.4	59.3
Jerry	75.6	44.2	65.9*	53.7*	15.5	29.1	57.9	78.6	52.6	57.9
Decade	78.5	55.8	55.3	43.4	9.1	31.9	64.7	81.5	52.5	58.7
Bearpaw	74.2	55.4	60.3*	46.6	14.9	32.0	54.1	78.1	52.0	57.2
# AP 503 CL2	66.8	54.0	55.3	33.4	47.6	28.1	54.3	70.5	51.3	51.8
Ledger	74.1	48.1	46.3	34.6	43.6	28.7	54.9	78.2	51.1	52.1
Carter	70.7	52.1	49.8	41.9	10.3	35.3*	60.4	85.1	50.7	56.5
Rampart	69.9	46.6	43.9	36.0	48.6	28.5	55.8	73.4	50.3	50.6
Bynum (CL)	71.3	43.4	48.3	33.3	48.8	26.2	55.7	66.6	49.2	49.3
Genou	68.1	43.5	53.4	29.3	16.1	28.1	53.7	77.3	46.2	50.5
Average	76.5	52.9	57.4	42.2	53.1	32.7	64.8	87.2	58.3	59.1
LSD (0.05)	7.6	9.7	9.6	12.9	14.6	3.5	9.0	15.4	10.3	5.8
C. V. (%)	5.6	10.5	8.3	17.6	16.2	6.0	8.0	10.1	18.0	9.3
P-value (Varieties)	<.0001	<.0001	0.0003	<.0001	<.0001	<.0001		0.0069	<.0001	<.0001

+ = new for 2012, # = paid entry

** = indicates highest value within a column

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

Table 2. 2012 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Test Weight (lb/bu)

Cultivar/Line	Bozeman LAT	Have LAT	Sidney 1 rep	Williston RCB	Kalispell LAT	Moccasin RCB	Huntley LAT	Conrad LAT	8 Loc Avg.	7 Loc Avg.
lattice efficiency	142%	216%			103%		122%	106%		no KS
Jagalene	61.3*	61.6**	60.5	59.4**	55.9	62.8*	65.1*	62.9*	61.2**	61.9**
Promontory	60.6	61.2*	60.5	57.3	59.9**	59.3	65.2**	62.9*	60.9*	61.0
# AP 503 CL2	60.5	60.1*	60.0	59.2*	55.2	62.9**	65.0*	63.1**	60.8*	61.5*
# SY Wolf	61.6**	60.7*	60.5	57.5	53.2	61.1	62.9	61.9*	59.9*	60.9
Bynum (CL)	61.3*	59.3	59.5	57.3	58.4*	59.1	63.8	60.8	59.9*	60.2
Ledger	60.0	60.0*	58.5	57.9	56.5	59.3	63.3	62.3*	59.7*	60.2
# Art	61.0*	60.7*	60.5	57.8	47.4	61.8*	64.6*	61.9*	59.5*	61.2*
Rampart	60.1	58.7	57.5	58.1*	59.0*	59.0	63.2	60.3	59.5*	59.6
MT08172	58.0	58.7	59.0	57.2	59.1*	60.0	62.5	61.1	59.5*	59.5
+ MTS0819-98 (HWW)	59.0	58.4	61.0	56.9	53.6	58.9	64.2	62.4*	59.3	60.1
MTW08168	58.2	59.0	58.0	57.9	58.8*	59.2	62.0	61.3	59.3	59.4
+ MT1088	58.2	58.3	57.5	57.5	57.1	60.1	63.0	60.2	59.0	59.3
+ MT10116	58.0	58.0	59.0	57.3	57.4*	58.6	62.6	60.8	59.0	59.2
Peregrine	59.5	56.9	57.5	58.2*	58.4*	57.7	63.0	60.6	59.0	59.1
Norris (CL)	60.4	59.4	60.5	59.0*	45.5	59.3	64.4*	62.4*	58.9	60.8
+ MT1156	59.3	57.4	58.5	57.6	55.5	59.5	62.3	60.9	58.9	59.4
# WB-Quake	59.1	58.8	56.5	56.7	57.4*	57.3	63.7	61.5	58.9	59.1
MTS0808	58.8	57.6	56.0	56.6	58.5*	60.0	62.9	61.0	58.9	59.0
Pryor	58.1	58.0	57.5	57.1	57.1	59.4	62.8	60.6	58.8	59.1
+ MT1092	58.3	57.7	58.0	55.6	57.3*	59.9	63.3	60.5	58.8	59.0
Overland	61.4*	59.0	60.5	59.0*	43.2	60.2	63.9	62.1*	58.7	60.9
Decade	59.0	59.7	60.0	58.7*	44.3	61.6*	63.5	62.4*	58.7	60.7
Carter	59.2	58.8	59.5	58.4*	48.2	60.5	63.4	61.4	58.7	60.2
Yellowstone	57.6	58.1	59.5	55.8	57.0	58.3	62.4	60.6	58.7	58.9
# Radiant	58.7	57.5	56.0	57.3	59.4*	58.3	62.3	60.0	58.7	58.6
+ MT10113	59.2	59.6	58.5	58.5*	48.0	59.9	63.1	62.0*	58.6	60.1
CDC Falcon	57.8	59.3	58.5	59.2*	51.2	57.7	63.3	61.8*	58.6	59.7
MT0978	57.7	58.5	60.0	56.7	53.9	58.2	62.6	60.7	58.5	59.2
Robidoux	59.5	59.1	58.5	56.6	48.6	58.6	63.9	62.4*	58.4	59.8
MTCL1067	57.9	58.2	57.5	55.7	54.4	60.0	62.7	60.9	58.4	59.0
+ MT1105	57.3	58.1	57.0	56.2	56.1	59.0	62.7	60.4	58.4	58.7
Curlew	57.9	56.8	59.0	53.4	58.0*	58.0	63.2	60.9	58.4	58.5
Accipiter	57.5	57.8	56.0	58.3*	53.0	57.7	63.8	62.1*	58.3	59.0
Bearpaw	59.2	58.8	58.0	57.5	47.8	59.3	63.3	61.4	58.2	59.6
Broadview	57.4	58.2	57.5	58.9*	50.3	58.8	63.1	61.2	58.2	59.3
+ MT1090	56.8	56.3	57.0	57.9	56.7	57.2	62.5	61.0	58.2	58.4
Genou	59.6	58.1	59.0	55.9	50.4	56.3	63.8	61.6	58.1	59.2
Judee	58.3	56.9	58.0	55.0	52.4	56.4	63.7	63.0*	58.0	58.8
+ MT1078	57.9	57.0	56.5	55.5	55.8	58.8	62.0	59.9	57.9	58.2
+ MTS1024	58.0	57.2	57.5	55.0	56.6	57.3	61.4	60.3	57.9	58.1
McGill	57.4	59.3	58.5	56.9	46.8	59.2	63.6	60.9	57.8	59.4
Jerry	58.4	57.7	58.0	58.0	49.1	58.5	62.5	60.5	57.8	59.1
+ MTCL1077 (Clearst)	56.7	57.1	57.0	54.9	56.0	57.8	61.8	60.2	57.7	57.9
+ MT1155	59.3	57.8	55.0	55.3	53.2	59.2	62.2	59.1	57.6	58.3
+ MT1091	56.5	57.2	55.5	55.6	55.0	58.6	62.1	60.2	57.6	58.0
MT0871	56.2	57.8	58.5	56.0	51.8	57.1	61.5	60.2	57.4	58.2
MTS0819	56.4	55.8	59.0	57.1	47.4	57.8	63.0	60.4	57.1	58.5
Average	58.8	58.5	58.4	57.2	53.7	59.1	63.2	61.2	58.8	59.5
LSD (0.05)	0.8	1.7		1.4	2.7	1.4	0.8	1.3	1.9	0.9
C. V. (%)	0.8	1.6		1.2	3.0	1.2	0.7	1.2	3.2	1.5
P-value (Varieties)	<.0001	<.0001		<.0001	<.0001	<.0001		<.0001	0.0020	<.0001

+ = new for 2012, # = paid entry

** = indicates highest value within a column

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

Table 3 2012 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Heading Date (days after Jan 1)

Cultivar/Line	Bozeman LAT	Have LAT	Sidney RCB	Williston RCB	Kalispell RCB	Moccasin RCB	Huntley LAT	Conrad LAT	7 Loc Avg.
lattice efficiency	157%	204%					101%	105%	
# Art	164.4	158.3	155.5	150.0	161.7	162.3	149.7	164.0	158.2
Norris (CL)	167.0	158.9	155.0	151.5	163.3	166.0	152.0	166.0	160.0
Robidoux	166.2	161.8	156.0	152.0	164.0	165.7	150.7	165.8	160.3
McGill	165.4	159.3	156.0	152.5	166.0	165.0	153.3	164.4	160.2
# SY Wolf	166.6	161.2	156.0	153.0	163.7	166.0	153.0	166.0	160.7
Jagalene	166.2	159.7	155.5	153.0	165.6	166.0	152.7	167.0	160.7
Overland	165.4	164.0	156.0	154.5	164.7	164.0	151.7	166.0	160.8
# AP 503 CL2	165.9	160.9	155.5	155.0	166.6	166.0	153.7	166.6	161.3
Bynum (CL)	167.3	164.1	156.5	155.0	164.3	166.0	154.7	165.9	161.7
+ MT10113	167.8	162.6	156.5	154.0	164.4	166.0	158.3	165.9	161.9
Promontory	168.2	162.6	156.5	155.5	165.7	167.3	154.3	167.0	162.1
CDC Falcon	168.8	164.7	155.5	153.0	166.7	166.7	156.0	166.8	162.3
Decade	168.0	168.5	157.0	153.0	165.3	166.0	154.7	166.3	162.3
Curlew	168.7	165.3	157.0	156.5	165.0	167.3	155.0	167.0	162.7
Bearpaw	168.7	164.9	156.5	154.5	168.7	166.0	156.0	167.3	162.8
Ledger	167.9	166.6	158.0	155.5	165.3	166.0	155.7	167.5	162.8
Broadview	168.8	164.3	157.0	154.0	171.3	168.7	156.0	167.8	163.5
MTCL1067	169.1	165.0	157.5	156.0	167.0	168.7	155.7	168.4	163.4
+ MT1090	170.5	166.4	156.5	155.5	168.0	170.0	154.7	167.8	163.7
Carter	167.6	167.5	158.0	156.0	169.0	166.0	155.3	167.1	163.3
+ MT1078	169.2	165.6	157.5	157.0	167.0	168.7	156.0	168.8	163.7
+ MT1105	170.1	166.1	157.5	156.0	168.7	170.0	155.7	168.5	164.1
Judee	169.3	167.2	158.0	158.0	167.3	165.3	155.3	168.3	163.6
+ MT1088	170.0	166.3	158.5	156.0	169.0	169.3	155.0	168.3	164.0
+ MTCL1077 (Clearstone)	170.4	165.9	158.0	156.5	168.0	170.0	156.3	169.2	164.3
+ MTS0819-98 (HWW)	169.4	167.3	157.5	156.5	168.7	168.7	156.7	168.3	164.1
Yellowstone	170.5	166.3	157.0	156.0	170.0	170.0	156.3	168.6	164.3
Genou	169.7	166.8	156.5	157.0	171.4	167.3	156.3	167.7	164.1
Jerry	170.7	166.0	157.0	154.5	171.4	170.0	157.7	168.2	164.4
+ MT1091	170.4	166.8	158.0	157.0	168.7	168.7	156.3	167.9	164.2
MTS0808	169.7	166.0	158.0	156.5	168.4	168.7	158.3	168.2	164.2
+ MT1155	170.6	167.0	159.0	156.5	169.0	170.0	155.0	168.7	164.5
Peregrine	170.7	166.3	159.0	155.5	171.3	168.7	156.3	167.1	164.4
# Radiant	171.2	166.7	157.5	156.0	170.0	170.0	157.3	168.0	164.6
Rampart	169.6	166.6	159.0	156.5	170.7	167.3	156.0	168.6	164.3
MTS0819	170.3	168.0	160.0	155.5	169.0	170.0	156.3	169.0	164.8
+ MTS1024	170.0	167.0	158.0	156.5	169.0	170.0	158.7	169.0	164.8
Accipiter	171.0	167.4	159.5	155.5	171.7	170.0	155.3	168.2	164.8
+ MT1092	170.6	165.8	158.5	158.0	169.7	169.3	157.3	169.5	164.8
+ MT10116	170.6	167.5	159.0	156.0	170.7	171.3	156.7	169.3	165.1
MT08172	170.3	167.2	160.0	156.5	170.3	168.7	157.7	168.9	165.0
Pryor	170.9	167.0	158.0	157.0	172.0	168.7	157.3	169.2	165.0
MT0978	171.0	167.0	158.0	156.5	169.6	170.0	159.3	170.6	165.2
+ MT1156	171.5	168.0	161.0	156.0	169.7	170.0	158.3	169.4	165.5
# WB-Quake	170.7	169.9	159.0	157.5	170.6	170.0	158.3	169.2	165.6
MT0871	171.2	168.3	159.0	158.0	171.7	168.7	160.3	171.2	166.0
MTW08168	174.0	168.7	160.0	157.5	172.0	171.0	160.7	173.3	167.2
Average	169.2	165.4	157.5	155.5	168.2	168.0	155.8	167.9	163.4
LSD (0.05)	0.8	3.2	1.9	2.1	2.4	2.7	2.8	1.4	
C. V. (%)	0.3	1.1	0.6	0.7	0.9	1.0	1.1	0.5	
P-value (Varieties)	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	

+ = new for 2012, # = paid entry

** = indicates highest value within a column

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

Table 4. 2012 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Plant Height (in)

Cultivar/Line	Bozeman LAT	Havre LAT	Sidney RCB	Williston RCB	Kalispell LAT	Moccasin LAT	Huntley LAT	Conrad LAT	8 Loc Avg.
lattice efficiency	116%	129%			112%	122%	105%	113%	
Carter	31.6	28.1	26.2	25.6	35.2	24.7	29.1	29.8	28.8
+ MTS0819-98 (HWW)	32.2	27.4	28.0	26.5	38.6	23.2	30.9	30.2	29.6
# AP 503 CL2	34.2	29.1	26.6	26.4	40.4	22.1	30.5	27.9	29.7
Pryor	33.2	30.1	28.9	26.9	36.5	24.0	30.4	31.5	30.2
CDC Falcon	33.3	28.4	27.8	26.8	38.1	25.9	32.0	30.1	30.3
Bearpaw	35.1	30.2	28.0	25.3	40.6	23.9	30.4	30.8	30.5
+ MT10113	36.0	29.4	27.4	25.2	39.2	24.4	30.9	31.7	30.5
MTS0808	34.7	30.0	28.0	26.7	38.8	21.4	32.7	31.9	30.5
MTS0819	32.8	30.4	27.0	27.8	39.4	22.9	31.9	31.5	30.5
# Art	35.4	29.9	26.6	26.5	41.0	24.1	32.5	30.4	30.8
Broadview	34.6	32.1	28.5	26.8	38.9	23.9	31.1	31.5	30.9
# SY Wolf	33.9	31.4	28.0	25.7	42.6	24.0	32.3	29.2	30.9
Ledger	35.7	27.4	28.3	27.8	40.6	24.1	32.3	31.4	31.0
Decade	35.1	30.9	28.0	27.6	40.1	24.5	32.7	29.8	31.1
+ MTS1024	32.8	30.7	30.7	27.8	39.8	25.2	32.2	30.7	31.2
Robidoux	35.2	29.8	26.6	27.1	42.1	25.5	31.8	31.6	31.2
Jagalene	35.3	29.5	28.0	25.7	41.8	24.9	32.8	32.9	31.4
+ MT1078	33.8	29.1	29.7	27.6	42.0	24.0	33.5	31.3	31.4
Judee	34.6	30.5	28.5	27.0	40.9	25.5	32.7	32.3	31.5
MT0871	34.5	29.9	28.7	26.5	43.1	24.9	32.4	32.2	31.5
MT0978	34.8	30.2	29.3	27.2	41.5	24.8	32.1	32.3	31.5
# WB-Quake	34.2	30.2	29.3	28.1	41.4	23.8	33.4	32.0	31.6
+ MT10116	34.7	30.7	28.1	27.5	42.1	24.4	33.5	32.9	31.7
Accipiter	36.8	29.5	29.7	27.2	40.4	25.0	32.7	33.4	31.8
+ MT1105	35.3	30.1	30.1	26.3	41.9	26.0	33.7	30.6	31.8
+ MT1156	34.4	30.6	29.9	28.6	42.8	24.0	33.1	32.6	32.0
+ MT1155	34.9	31.8	29.7	28.8	41.1	24.1	34.8	33.2	32.3
Overland	36.8	28.9	28.7	26.8	44.5	25.5	35.2	31.9	32.3
+ MT1088	35.9	30.8	31.3	28.7	41.2	23.1	34.8	33.5	32.4
McGill	37.2	31.0	29.7	28.2	40.6	24.7	35.8	33.3	32.6
+ MT1092	35.9	29.4	29.9	26.9	44.1	26.5	35.2	33.8	32.7
Promontory	36.8	30.5	29.7	27.4	45.3	24.2	35.5	32.2	32.7
+ MT1091	35.7	30.6	29.3	29.4	42.7	27.1	34.0	33.2	32.8
MT08172	36.2	31.1	30.9	27.2	44.0	24.6	35.7	33.5	32.9
Yellowstone	36.2	31.7	31.3	28.7	43.4	26.3	34.6	32.4	33.1
+ MTCL1077 (Clearston)	37.7	32.2	29.9	29.8	43.8	25.5	35.7	33.1	33.5
Rampart	38.8	31.1	31.1	28.8	43.2	25.7	36.0	33.3	33.5
+ MT1090	36.5	31.7	30.7	29.1	44.4	27.0	36.1	34.6	33.8
Bynum (CL)	41.2	32.7	30.7	28.5	45.9	26.0	33.7	32.4	33.9
# Radiant	35.7	33.2	31.3	29.7	47.5	24.5	34.0	35.0	33.9
Genou	39.8	34.1	33.3	26.8	42.6	26.4	35.3	34.4	34.1
Norris (CL)	40.8	33.4	30.7	27.6	44.9	25.3	36.8	33.1	34.1
MTW08168	36.3	35.2	33.1	29.3	47.5	24.7	37.0	33.6	34.6
MTCL1067	38.6	33.1	33.3	28.6	46.4	26.1	37.6	34.1	34.7
Curlew	40.1	33.5	32.7	31.0	43.7	24.9	37.5	35.2	34.8
Jerry	41.8	33.8	33.7	29.8	44.6	25.6	37.8	36.5	35.5
Peregrine	42.1	39.4	36.4	31.8	48.4	26.5	37.0	37.7	37.4
Average	36.1	31.0	29.7	27.7	42.1	24.8	33.7	32.4	32.2
LSD (0.05)	1.7	2.4	2.6	3.0	2.3	2.5	2.2	2.4	1.2
C. V. (%)	2.7	4.5	4.4	6.6	3.2	5.7	3.9	4.4	3.9
P-value (Varieties)	<.0001	<.0001	<.0001	0.0073	<.0001	0.0061		<.0001	<.0001

+ = new for 2012, # = paid entry

** = indicates highest value within a column

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

Table 5. 2012 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Grain Protein (%)

Cultivar/Line	Bozeman bulk	Have bulk	Sidney bulk	Williston bulk	Kalispell bulk	Moccasin bulk	Huntley bulk	Conrad bulk	x Loc Avg.
Genou	16.2	14.3	14.0	14.7	15.9	15.4	11.3	12.0	14.2**
Bynum (CL)	15.9	13.8	12.9	15.1	14.0	15.4	11.9	13.0	14.0*
Judee	16.2	14.6	11.4	16.1	14.6	14.9	12.6	11.8	14.0*
Rampart	16.4	13.5	11.8	13.9	14.5	15.1	12.5	12.8	13.8*
MT0871	15.8	14.1	11.3	13.8	15.3	15.4	11.7	11.8	13.7*
# WB-Quake	15.7	14.3	13.5	14.3	13.9	14.7	11.6	11.7	13.7*
Carter	15.8	13.5	11.9	14.6	16.1	13.3	11.8	11.8	13.6*
Curlew	14.9	13.9	12.2	15.8	13.9	13.8	11.2	11.9	13.5
Decade	15.7	12.6	12.2	14.1	15.3	13.5	11.3	12.7	13.4
Bearpaw	15.4	13.1	11.5	13.5	16.8	13.3	10.9	12.0	13.3
MT0978	15.1	13.3	11.9	14.5	14.8	14.3	11.2	11.6	13.3
+ MT10113	15.3	13.3	11.4	13.6	16.3	13.6	10.7	12.3	13.3
MTS0819	15.4	14.5	12.1	14.7	14.5	13.3	10.1	11.9	13.3
# Art	14.7	12.5	12.5	14.5	14.4	13.5	10.9	12.2	13.2
+ MT1088	15.5	14.2	12.0	13.6	13.1	13.8	11.2	11.8	13.2
+ MT1155	14.9	14.3	11.7	14.3	14.5	13.8	10.6	11.4	13.2
MTS0808	15.6	13.1	11.4	14.1	14.3	13.4	11.8	11.6	13.2
Overland	14.0	13.1	11.7	13.4	15.4	13.6	12.2	12.2	13.2
Yellowstone	15.4	13.5	12.4	14.6	13.2	14.0	11.0	11.1	13.2
+ MT10116	15.5	14.4	11.0	13.8	12.9	13.8	11.5	12.1	13.1
MTCL1067	15.3	13.5	10.6	15.2	14.1	13.5	10.8	11.9	13.1
+ MTS0819-98 (HWW)	15.1	12.7	11.0	14.7	14.5	13.8	11.2	11.6	13.1
Norris (CL)	14.8	12.5	11.9	13.9	15.1	14.2	11.0	11.7	13.1
# AP 503 CL2	15.3	12.9	11.1	14.3	13.8	13.9	10.3	12.2	13.0
Jagalene	14.8	13.3	11.9	13.8	14.1	12.9	10.5	12.3	13.0
Jerry	14.9	13.2	11.8	13.1	13.8	14.4	10.9	11.6	13.0
+ MT1156	14.5	14.6	11.7	13.1	13.2	14.0	11.5	11.3	13.0
+ MTCL1077 (Clearsto	15.2	13.3	11.0	14.9	13.6	13.4	10.8	11.9	13.0
Robidoux	14.5	13.3	12.1	14.1	13.7	14.1	10.6	11.2	13.0
# SY Wolf	14.7	13.3	11.2	14.0	15.1	13.5	10.9	11.5	13.0
McGill	15.2	11.8	11.9	14.1	13.8	13.4	10.6	12.0	12.9
MTW08168	15.5	13.1	11.1	13.3	12.9	14.4	11.1	12.1	12.9
# Radiant	14.9	14.3	11.0	13.1	12.6	14.2	10.7	12.1	12.9
Broadview	15.6	11.9	11.3	12.6	14.0	14.2	11.1	11.4	12.8
+ MT1091	15.2	13.4	11.8	13.3	13.4	13.2	10.6	11.3	12.8
+ MT1092	15.1	12.9	11.4	14.4	12.4	13.6	10.9	11.8	12.8
MT08172	15.4	11.9	10.9	14.3	13.2	13.4	11.1	11.6	12.7
+ MT1105	15.2	12.5	11.7	13.6	13.1	13.3	10.6	11.7	12.7
+ MTS1024	14.1	12.6	11.9	14.5	14.3	13.0	9.7	11.2	12.7
Peregrine	15.0	13.0	12.7	13.4	11.9	13.9	10.5	10.9	12.7
Promontory	14.5	12.4	11.9	13.9	11.7	14.2	11.4	11.2	12.7
CDC Falcon	14.8	13.2	12.8	11.9	13.1	13.7	10.3	11.3	12.6
+ MT1090	15.0	13.4	10.9	13.0	12.7	13.2	11.3	11.3	12.6
Accipiter	15.6	13.2	11.6	12.5	12.6	13.7	10.1	10.6	12.5
Ledger	13.8	12.2	11.8	13.5	13.0	13.6	10.4	11.2	12.4
+ MT1078	14.2	12.0	10.1	13.5	14.5	13.2	10.1	11.3	12.4
Pryor	15.6	12.2	10.6	12.7	13.7	12.3	10.0	11.4	12.3
Average	15.2	13.2	11.7	13.9	14.0	13.8	11.0	11.7	13.1
LSD (0.05)									0.6
C. V. (%)									4.9
P-value (Varieties)									<.0001

+ = new for 2012, # = paid entry

** = indicates highest value within a column

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

Table 6. 2012 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Stem Solidness (5-25)						
Cultivar/Line		Bozeman	Havre	Moccasin	Conrad	4 Loc Avg.
		score	score	score	score	score
MTS0808	MT9908//Nuplains/MTS9862	19.9**	22.9*	19.6*	23.9*	21.6**
Rampart	Montana, 1996	19.5*	24.1*	17.9	24.5**	21.5*
Bearpaw	Montana, 2011	19.4*	23.6*	19.6**	22.5*	21.3*
# WB-Quake	WestBred, 2011	17.5	24.1**	17.0	22.9*	20.4
Bynum (CL)	Montana/WestBred, 2005	15.7	23.1*	16.6	22.4*	19.4
Genou	Montana, 2004	14.3	23.1*	16.9	23.0*	19.3
Judee	Montana, 2011	15.1	21.6*	16.8	22.7*	19.1
+ MTS0819-98 (HWV)	white off-type from line row plots	14.5	22.9*	16.3	20.2	18.5
+ MTS1024	MT02113*4/MTS0359	12.8	21.1	14.5	22.4	17.7
MTS0819	93X312E14/NuHorizon	14.2	19.7	16.3	19.4	17.4
Carter	WestBred, 2006	11.4	16.6	13.0	14.5	13.9
Ledger	WestBred, 2004	8.5	12.0	9.1	9.5	9.8
CDC Falcon	Sask/WestBred, 1999	5.2	8.6	6.1	7.1	6.8
Average		14.4	20.3	15.3	19.6	17.4
LSD (0.05)		2.1	2.9	1.4	2.2	1.1
C. V. (%)		8.6	8.5	5.3	6.8	7.6
P-value (Varieties)		<.0001	<.0001	<.0001	<.0001	<.0001

Locations were significant ($P = <.0001$), there was a significant Entry x Location Interaction ($P = <.0001$)

+ = new for 2012, # = paid entry

** = indicates highest value within a column

* = indicates varieties with values equal to highest variety within a column based on Fisher's Protected LSD ($p = 0.05$)