

Project Title: 2007 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 2010 Intrastate Winter Wheat Evaluation nursery was grown at Bozeman, Havre, Huntley, Conrad, Kalispell, Moccasin, and Sidney, Montana and Williston, North Dakota. The Bozeman and the Williston locations were not harvested due hail and winter kill, respectively.

Overall mean yield, across the six harvested locations, was 84.3 bushels per acre with Kalispell having a the high trial mean at 142.3 bu/a and the cultivar Yellowstone had the overall high mean yield at 94.2 bu/a (Table 1). Test weights were near the standard for all locations with the overall mean test weight of 60.7 lbs/bu. Jagalene, the perennial high grain density cultivar, had the top overall mean test weight at 62.3 lbs/bu. Wahoo and Pryor had the low mean test weights at 59.0 and 59.2 lbs/bu, respectively (Table 2). Overall mean heading date had seven day interval across the 49 trial entries with Art being the earliest cultivar to head (Table 3). Mean plant height ranged from 32.7" for Carter up to 43.6" for Peregrine and the overall mean height was 36.9". Grain protein content across all locations was slightly below the standard at 11.9% with Bynum and Rampart having over high protein contents of 13.1 and 12.8, respectively. Accipiter, CDC Falcon, Promontory and Wahoo were the low protein cultivars at 11.2 % (Table 5). Winter survival ratings were recorded for Williston and Sidney with locations having over survival means of 2.7% and 50.1%, respectively. Peregrine had the high survival rate at both locations and the high grain yield at Sidney (Table 6). Rampart's stem solidness score of 19.5, across five locations, ranked 8th of 21 entries scored (Table 7). All entries scoring higher than Rampart, for stem solidness, were development lines with overall mean yields greater than Rampart and Genou. Stripe rust was scored at Kalispell and leaf rust scored at Sidney. Some entries exhibited resistance to both rust and some are susceptible to both (Table 8).

Summary:

Great strides have been made in winter lines for the characters presented here. New cultivars and development lines far surpass old standards Rocky and Neeley for all categories. The 2010 crop year exhibited the high end yield potential of modern wheat very well.

Future Plans:

The intras-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. 2010 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Yield (bu/a)

Cultivar/Line	Bozeman no harv.	Have LAT	Sidney LAT	Williston no harv	Kalispell RCB	Moccasin LAT	Huntley LAT	Conrad LAT	6 Loc Avg.
lattice efficiency		124%	104%			207%	133%	119%	
Yellowstone		73.3*	62.1*		162.2*	70.1**	88.6	108.9*	94.2**
Overland		81.8**	65.3*		143.9	67.7*	90.5	112.5*	93.6*
+ MT0871	Hail	76.8*	63.0*	wntkrkl	162.4**	61.3	85.3	109.9*	93.1*
+ MTS0819		77.2*	59.2		155.0*	60.2	87.0	114.0**	92.1*
Settler CL		79.6*	53.0		148.1*	61.3	102.5**	99.8	90.7*
+ MT0890		72.3*	50.2		161.1*	56.8	101.0*	101.8*	90.5*
Promontory		78.3*	58.1		155.7*	59.5	83.8	102.8*	89.7*
MT0861		68.1	53.0		161.1*	62.5	88.0	103.6*	89.4*
Hyalite (CL, HWW)		72.9*	58.8		143.3	59.4	96.8*	99.9	88.5*
Wahoo		74.6*	69.5*		135.2	57.6	96.1*	97.5	88.4*
NI04421 (Robidoux)		71.2	54.3		150.2*	63.6	88.6	100.2	88.0*
+ MT0866		80.6*	63.9*		136.5	59.8	83.0	103.2*	87.8*
+ Broadview		73.5*	67.6*		132.6	60.8	77.7	112.6*	87.5*
Curlew		62.0	49.9		158.4*	56.4	97.2*	100.0	87.3*
CDC Falcon		72.3*	60.9		139.5	58.2	84.6	106.8*	87.1*
Jagalene		77.8*	48.2		153.4*	63.1	84.4	94.6	86.9*
+ MTS0808		71.6	55.1		153.1*	58.6	79.9	103.1*	86.9*
Accipiter		73.6*	70.3**		138.1	52.3	78.3	103.8*	86.1*
MTS0721		68.0	49.4		151.3*	58.1	89.3	100.6	86.1*
Decade		72.1	60.2		127.7	60.6	92.1	98.7	85.2
+ # Art		81.1*	47.8		145.8	67.7*	85.7	81.5	84.9
MTS0713		72.4*	52.0		147.8*	54.0	87.4	96.0	84.9
MTS0532 (HWW)		76.8*	57.5		133.1	49.7	86.0	100.7	84.0
Norris (CL)		65.7	56.1		138.0	56.3	92.5	95.5	84.0
+ # BZ9W05-2043		70.5	49.6		161.8*	50.0	73.2	95.3	83.4
MT06103		68.4	37.8		149.1*	56.4	89.1	98.8	83.3
+ MTS0826		63.5	55.9		145.3	43.8	84.7	105.7*	83.2
Peregrine		67.6	56.0		155.1*	49.9	76.6	93.3	83.1
Ledger		69.9	47.3		139.8	51.5	93.5	96.1	83.0
Rocky		66.6	60.3		140.5	54.2	84.1	90.9	82.8
+ # CA9W07-817 (WB Matlock)		65.7	64.7*		129.0	54.6	82.5	99.0	82.6
+ # BZ9W05-2039		71.4	51.2		133.4	61.6	82.6	90.4	81.8
+ MTS0827		65.6	49.0		146.8	46.5	84.9	97.7	81.8
# AP 503 CL2		74.7*	46.6		144.4	53.6	86.9	84.1	81.7
+ MTS0532L		70.2	49.7		142.5	48.3	84.0	89.3	80.7
# Radiant		64.6	56.4		146.6	39.5	78.5	98.5	80.7
MTS0705		69.8	55.7		133.4	50.6	78.2	96.0	80.6
+ # Boomer		69.8	59.2		128.2	53.6	71.8	100.5	80.5
+ MTS0832		70.2	50.0		129.4	52.8	79.3	99.3	80.2
+ # Striker		67.5	63.5*		119.2	58.7	76.4	95.9	80.2
Carter		74.6*	49.4		135.5	62.5	72.6	86.1	80.1
Genou		61.7	48.9		139.5	55.9	75.7	95.2	79.5
+ MTS04114L		65.6	51.6		141.9	41.2	83.9	92.1	79.4
r MTS04114 (HWW)		69.6	50.1		145.8	42.6	80.9	86.0	79.2
Pryor		73.5*	45.7		113.2	62.4	78.5	102.0*	79.2
Neeley		66.5	52.3		127.7	54.0	79.1	93.9	78.9
Jerry		68.6	64.3*		116.7	61.1	76.1	86.1	78.8
Bynum (CL)		62.6	42.6		136.9	44.7	89.2	89.3	77.6
Rampart		58.7	40.9		135.2	48.6	70.7	82.6	72.8
Average		70.9	54.8		142.3	55.8	84.5	97.8	84.3
LSD (0.05)		9.7	9.4		14.8	6.4	9.6	12.2	8.1
C. V. (%)		7.9	10.1		6.2	6.4	6.5	7.2	8.5
P-value (Varieties)		0.0002	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001

+ = new for 2010, # = paid entry, r = return from 2006-08

** = 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. 2010 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Test Weight (lb/bu)

Cultivar/Line	Bozeman no harv.	Have LAT	Sidney LAT	Williston no harv.	Kalispell LAT	Moccasin RCB	Huntley LAT	Conrad LAT	6 Loc Avg.
lattice efficiency		129%	113%		131%		121%	104%	
Jagalene		64.0**	61.0*		63.1	61.9**	63.1**	60.4	62.3**
+ MT0866	Hail	63.0*	60.7*	WntrKll	64.3**	61.3	62.0*	62.0**	62.2*
# AP 503 CL2		62.2	61.2*		62.7	60.5	62.4*	60.6	61.6*
Overland		63.4*	60.6*		62.0	61.2	62.4*	59.8	61.6*
MT0861		62.9*	59.9		63.1	60.9	62.2*	60.2	61.5*
Promontory		63.4*	60.1		63.7*	60.0	61.7*	60.1	61.5*
Settler CL		62.3	60.3*		63.0	61.3	63.1*	59.1	61.5*
MT06103		62.3	61.0*		63.3	60.6	61.6*	59.6	61.4*
Hyalite (CL, HWW)		63.0*	59.3		63.1	61.1	61.5	59.5	61.3
MTS0705		60.3	60.6*		62.3	61.2	61.6*	61.6*	61.3
+ # Art		62.4	59.8		61.8	61.1	61.9*	60.1	61.2
Bynum (CL)		62.8*	60.1		61.8	61.2	61.1	60.1	61.2
+ # CA9W07-817 (WB Matlock)		62.4	59.3		61.8	61.9**	61.2	60.3	61.2
r MTS04114 (HWW)		62.6	60.9*		62.4	61.3	60.8	58.7	61.1
Norris (CL)		60.3	61.4**		63.7*	60.2	62.2*	58.9	61.1
+ MT0890		62.2	60.0		62.3	60.0	61.4	60.0	61.0
+ MTS0826		61.5	59.3		61.5	60.9	61.6*	60.9*	61.0
Rocky		62.7*	60.1*		62.4	59.8	60.6	60.5	61.0
+ # BZ9W05-2039		62.0	60.3*		61.5	61.5*	61.1	58.7	60.9
Peregrine		60.1	59.5		62.9	60.3	61.0	61.3*	60.9
+ MTS04114L		62.5	60.5*		62.5	60.4	60.7	58.1	60.8
+ MTS0827		61.1	58.8		61.8	60.5	61.9*	60.4	60.8
NI04421 (Robidoux)		61.2	58.7		62.2	60.7	61.5	60.2	60.8
+ # Striker		62.9*	60.2*		61.3	59.0	60.8	60.5	60.8
Accipiter		61.3	59.4		61.3	60.9	60.3	60.7	60.7
Carter		62.6	59.8		61.1	60.6	61.0	59.1	60.7
Genou		60.7	59.3		62.7	61.2	60.8	59.6	60.7
MTS0532 (HWW)		61.5	60.1*		61.6	60.7	61.3	59.1	60.7
MTS0721		61.2	59.0		62.3	60.7	60.7	60.0	60.7
Ledger		61.7	59.3		61.6	60.0	61.6*	59.6	60.6
+ MTS0532L		61.6	59.6		62.3	60.6	60.9	58.6	60.6
MTS0713		61.3	58.3		62.6	60.7	60.7	60.0	60.6
CDC Falcon		61.2	59.4		61.9	59.0	60.0	60.6	60.4
+ MTS0808		61.4	58.9		62.3	60.9	58.7	60.1	60.4
Neeley		61.4	59.2		61.4	61.2	60.7	58.5	60.4
+ Broadview		61.7	59.4		61.1	60.1	59.2	60.3	60.3
+ # BZ9W05-2043		62.0	59.0		62.3	60.5	58.2	59.9	60.3
Rampart		60.4	59.3		62.0	59.8	60.1	60.2	60.3
Decade		62.4	59.0		58.9	61.4*	60.8	58.7	60.2
+ MTS0819		61.5	59.2		62.2	59.1	58.3	60.8*	60.2
# Radiant		61.4	59.1		61.9	59.9	60.2	58.8	60.2
Jerry		61.1	58.6		61.0	59.7	60.4	59.9	60.1
Curlew		61.1	58.1		61.7	60.0	60.2	57.8	59.8
Yellowstone		61.5	58.3		61.2	58.9	59.0	60.0	59.8
+ MT0871		60.6	57.2		61.8	60.1	59.0	59.4	59.7
+ MTS0832		61.0	57.0		59.8	60.3	59.7	59.1	59.5
+ # Boomer		59.8	58.1		59.9	60.1	58.6	59.9	59.4
Pryor		61.3	57.0		57.2	61.1	59.3	59.4	59.2
Wahoo		61.5	57.6		59.9	59.4	60.1	55.3	59.0
Average		61.8	59.4		61.9	60.5	60.8	59.7	60.7
LSD (0.05)		1.4	1.3		0.9	1.3	1.5	1.3	1.0
C. V. (%)		1.3	1.3		0.8	1.1	1.4	1.3	1.4
P-value (Varieties)		<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001

+ = new for 2010, # = paid entry, r = return from 2006-08

** = 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. 2010 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Heading Date (Julian)

Cultivar/Line	Bozeman RCB	Havre LAT	Sidney LAT	Williston winterkill	Kalispell LAT	Moccasin RCB	Huntley RCB	Conrad 1 rep	7 Loc Avg.
lattice efficiency		103%	112%		112%				
+# Art	174.7	167.7	161.2		159.9	174.0	157.3	172	166.7
NI04421 (Robidoux)	175.0	167.6	160.9		160.4	174.0	156.3	173	166.7
Settler CL	173.7	168.1	161.1		161.5	174.3	158.7	172	167.1
Wahoo	174.7	167.2	161.2		161.2	173.7	160.7	172	167.2
Overland	174.0	167.3	162.3		162.8	174.0	159.3	173	167.5
Norris (CL)	175.7	169.1	160.9		162.6	175.3	158.0	174	167.9
Jagalene	175.3	168.7	162.1		162.5	175.0	158.3	174	168.0
+# BZ9W05-2039	177.3	167.2	162.6		161.8	175.0	159.7	173	168.1
Rocky	176.7	168.4	162.4		162.9	175.3	159.7	173	168.3
Decade	176.3	167.3	163.2		162.0	174.7	161.0	175	168.5
Hyalite (CL, HWW)	177.0	167.3	162.1		163.1	176.0	159.3	175	168.5
MT06103	176.3	167.5	165.6		162.5	175.0	160.0	173	168.6
# AP 503 CL2	175.7	168.3	162.1		164.2	175.7	159.0	177	168.9
Bynum (CL)	175.7	169.2	166.1		163.3	175.3	160.3	175	169.3
Ledger	176.0	169.6	163.1		163.1	176.0	161.7	176	169.4
Promontory	176.0	170.5	162.8		163.9	177.0	161.0	176	169.6
+# Striker	176.3	169.4	162.0		165.4	175.7	164.0	175	169.7
Carter	176.3	170.5	163.6		164.8	175.3	165.0	174	169.9
CDC Falcon	176.7	169.3	162.9		164.8	177.7	163.3	175	170.0
r MTS04114 (HWW)	176.7	169.2	164.9		163.8	176.7	161.7	177	170.0
MTS0532 (HWW)	176.7	169.9	165.2		165.1	177.0	161.0	176	170.1
+ Broadview	175.7	169.4	163.3		164.8	176.7	165.3	176	170.2
+ MT0890	176.7	170.0	166.3		164.9	176.7	162.0	175	170.2
MTS0713	177.0	170.6	164.2		164.7	176.7	164.3	174	170.2
MTS0721	176.7	170.1	163.6		164.9	176.0	164.7	176	170.3
+ MTS0532L	178.0	170.4	164.8		164.3	176.3	162.3	177	170.4
Curlew	177.7	170.0	166.5		164.2	176.3	161.7	177	170.5
+ MTS04114L	177.3	169.0	164.3		165.2	176.3	164.7	177	170.5
+ MTS0819	178.3	170.8	165.6		163.1	179.0	160.7	176	170.5
MT0861	176.7	171.3	164.2		164.6	176.0	165.3	176	170.6
+ MT0866	178.0	169.8	165.6		165.4	177.0	165.7	175	170.9
Peregrine	179.7	171.1	165.1		165.3	177.0	164.0	175	171.0
+# Boomer	178.0	170.7	164.6		165.9	177.0	165.3	177	171.2
+# CA9W07-817 (WB Ma	178.7	171.1	164.2		166.8	178.3	162.3	177	171.2
Genou	179.0	170.5	167.0		165.7	176.7	162.7	177	171.2
Jerry	178.7	171.0	165.4		166.9	177.0	164.0	176	171.3
+ MT0871	178.0	171.3	166.8		165.6	177.7	164.7	176	171.4
# Radiant	179.3	171.6	165.6		166.4	179.0	163.0	175	171.4
Rampart	178.3	171.4	167.4		164.2	177.0	165.0	177	171.5
Yellowstone	178.7	171.7	165.7		166.3	178.0	164.0	176	171.5
+ MTS0808	178.0	170.4	165.8		166.0	177.7	166.0	177	171.6
Pryor	178.7	171.6	167.0		165.5	178.7	163.7	177	171.7
Neeley	179.3	171.9	165.6		166.1	177.7	166.3	177	172.0
+# BZ9W05-2043	179.0	171.5	166.4		166.3	178.3	165.0	179	172.2
Accipiter	179.0	171.5	166.6		168.4	179.7	164.7	178	172.6
MTS0705	180.7	171.3	166.2		168.5	179.0	165.3	177	172.6
+ MTS0832	180.0	173.4	166.6		169.5	178.7	164.3	179	173.1
+ MTS0826	180.7	172.2	167.3		169.3	179.0	164.7	179	173.2
+ MTS0827	180.3	173.4	167.4		169.7	180.0	166.7	178	173.6
Average	177.3	170.0	164.4		164.7	176.7	162.5	175.6	170.2
LSD (0.05)	0.9	1.5	1.7		1.5	1.0	1.5		1.1
C. V. (%)	0.3	0.5	0.6		0.5	0.4	0.6		0.6
P-value (Varieties)	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001		<.0001

+ = new for 2010, # = paid entry, r = return from 2006-08

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

Table 4. 2010 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Plant Height (inches)

Cultivar/Line	Bozeman	Have	Sidney	Williston	Kalispell	Moccasin	Huntley	Conrad	7 Loc
	LAT	LAT	LAT	winterkill	LAT	LAT	LAT	LAT	Avg.
lattice efficiency	101%	179%	103%		108%	103%	104%	120%	
Carter	34.9	33.4	28.6		36.7	32.6	31.9	31.1	32.7
# AP 503 CL2	34.0	34.2	26.4		39.3	32.2	34.2	31.4	33.1
Settler CL	34.5	33.3	28.1		39.3	33.2	34.9	30.5	33.4
CDC Falcon	35.5	32.4	29.4		39.6	33.1	34.3	32.2	33.8
+# Striker	36.6	34.2	27.7		37.9	33.4	35.1	32.3	33.9
+# Art	36.0	34.2	28.7		39.3	35.2	35.0	31.8	34.3
+ MTS0532L	37.0	33.9	30.7		39.0	32.9	35.4	31.2	34.3
+ MTS0819	36.3	34.9	29.9		37.6	32.7	36.1	34.0	34.5
Pryor	36.5	34.9	31.7		39.6	31.8	35.3	33.0	34.7
r MTS04114 (HWW)	36.8	34.7	30.3		40.2	33.0	35.0	33.4	34.8
Ledger	36.8	35.0	29.4		40.9	34.0	35.7	33.3	35.0
MTS0721	38.0	35.2	26.8		40.6	34.0	36.3	34.4	35.0
MTS0713	37.2	34.3	30.9		39.0	34.5	36.8	33.3	35.1
Jagalene	35.8	34.7	31.2		40.2	35.3	38.0	33.3	35.5
MTS0532 (HWW)	36.1	35.4	30.2		40.7	34.0	37.1	34.8	35.5
Wahoo	32.0	36.1	32.1		40.6	35.2	38.7	33.7	35.5
+ MTS04114L	36.2	35.0	31.1		42.0	33.9	38.8	32.5	35.6
NI04421 (Robidoux)	37.3	35.0	30.3		42.7	34.2	37.3	33.2	35.7
+# BZ9W05-2043	38.8	35.6	30.1		41.4	33.0	36.5	35.0	35.8
Decade	36.0	36.0	30.6		39.9	33.8	39.1	35.5	35.8
+ MTS0808	39.0	35.8	30.6		41.8	33.1	36.6	34.3	35.9
+ Broadview	37.3	35.8	31.4		41.3	35.7	36.0	35.9	36.2
+# Boomer	38.5	38.3	30.4		40.9	34.1	35.6	36.0	36.3
+# BZ9W05-2039	38.4	36.1	30.6		41.6	37.4	36.2	34.2	36.4
Promontory	38.8	34.9	31.7		39.9	35.5	38.9	35.2	36.4
Overland	38.8	36.0	31.0		42.7	36.7	37.3	35.8	36.9
Accipiter	38.2	36.5	30.3		43.0	35.8	38.4	36.6	37.0
MT06103	39.3	37.3	29.6		41.4	37.2	39.2	35.2	37.0
+ MT0871	37.3	37.3	32.2		42.5	36.3	37.6	35.9	37.0
+ MT0890	38.8	38.8	30.7		42.4	35.3	38.9	35.7	37.2
Yellowstone	39.0	38.3	30.4		41.4	36.2	40.0	35.9	37.3
MT0861	39.9	38.3	31.5		43.3	37.3	38.7	35.5	37.8
Hyalite (CL, HWW)	39.7	38.4	32.9		42.8	36.5	39.3	37.1	38.1
+# CA9W07-817 (WB Ma)	40.0	39.4	31.9		43.8	36.5	39.9	35.9	38.2
+ MT0866	40.7	37.6	33.3		43.8	37.6	38.2	36.9	38.3
+ MTS0827	40.4	37.8	32.2		44.0	37.6	40.3	39.4	38.8
+ MTS0826	40.7	37.2	33.4		45.2	35.6	40.2	39.9	38.9
# Radiant	41.9	38.9	34.8		44.0	35.5	39.3	37.8	38.9
Curlew	40.3	38.6	32.9		45.5	37.5	42.2	36.9	39.1
Bynum (CL)	42.4	37.9	30.2		44.8	39.1	42.1	37.8	39.2
Genou	41.9	38.8	32.0		43.9	40.7	40.3	38.5	39.4
Norris (CL)	42.5	40.0	31.4		45.0	38.9	39.4	38.4	39.4
+ MTS0832	43.0	38.8	33.8		45.3	35.5	40.6	39.2	39.5
Rampart	42.8	39.7	30.7		45.1	39.1	40.2	38.7	39.5
Neeley	41.5	39.4	33.0		46.3	38.8	42.3	39.4	40.1
MTS0705	44.1	39.1	33.8		44.1	39.9	42.3	41.0	40.6
Rocky	41.1	40.8	33.0		46.3	41.4	41.6	40.1	40.6
Jerry	43.9	40.7	34.5		47.6	40.6	44.4	39.9	41.7
Peregrine	45.7	43.5	35.9		51.9	41.1	44.8	42.6	43.6
Average	38.7	36.8	31.1		42.2	35.8	38.2	35.6	36.9
LSD (0.05)	2.3	2.2	2.9		2.3	2.2	3.0	2.2	1.2
C. V. (%)	3.7	3.4	5.5		3.1	3.7	4.7	3.5	3.1
P-value (Varieties)	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001

+ = new for 2010, # = paid entry, r = return from 2006-08

** = indicates highest value within a column

Table 5. 2010 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Protein (%)

Cultivar/Line	Bozeman no harv.	Have Bulk	Sidney Bulk	Williston no harv.	Kalispell Bulk	Moccasin Bulk	Huntley Bulk	Conrad Bulk	6 Loc Avg.
lattice efficiency									
Bynum (CL)		13.0	10.7		14.2	13.0	14.1	13.3	13.1**
MT06103		12.3	11.7		13.5	11.7	14.3	13.2	12.8*
MTS0705	Hail	12.9	11.9	Wntrkl	13.2	12.2	13.9	12.8	12.8*
Rampart		12.9	10.7		13.9	12.8	13.1	13.4	12.8*
+ MTS04114L		13.0	10.7		13.0	11.3	13.1	13.2	12.4
+# BZ9W05-2039		12.4	11.5		12.6	11.2	13.2	12.6	12.3
+# CA9W07-817 (WB Matlock)		11.7	11.7		12.0	11.3	13.6	13.3	12.3
+ MTS0532L		12.1	11.3		12.7	11.5	13.4	12.6	12.3
+ MTS0827		12.0	10.9		12.8	13.0	12.8	12.2	12.3
# AP 503 CL2		12.7	11.3		12.5	11.2	12.5	13.0	12.2
+# Art		12.4	10.9		12.0	11.6	13.0	13.0	12.2
Jerry		11.6	12.3		11.9	11.7	12.6	13.0	12.2
+ MT0890		12.0	9.8		12.6	12.6	13.2	12.8	12.2
Norris (CL)		12.6	9.9		12.3	12.3	13.2	12.4	12.1
Curlew		12.3	10.9		12.5	11.4	12.3	12.8	12.0
Decade		11.5	11.4		12.1	11.4	13.4	12.0	12.0
+ MT0866		11.7	11.3		12.7	10.9	12.3	13.1	12.0
MTS0532 (HWW)		11.7	11.8		12.6	10.9	13.2	11.9	12.0
+ MTS0808		11.7	10.6		12.6	11.1	13.3	12.5	12.0
+ MTS0819		11.9	11.4		12.5	10.5	13.6	11.8	12.0
+ MTS0826		10.6	10.9		13.2	12.0	13.5	12.0	12.0
+# Striker		11.3	10.8		11.9	12.2	13.2	12.7	12.0
Genou		12.4	11.1		12.5	10.9	12.6	12.0	11.9
r MTS04114 (HWW)		11.3	10.1		12.8	10.8	12.9	13.3	11.9
MTS0713		12.5	11.6		12.7	10.9	12.4	11.3	11.9
+# BZ9W05-2043		11.0	10.2		12.1	11.3	14.0	12.2	11.8
Hyalite (CL, HWW)		10.9	10.6		12.3	11.4	12.8	12.6	11.8
+ MT0871		11.9	11.9		12.1	10.5	12.6	11.6	11.8
MTS0721		11.6	9.3		12.5	12.5	12.6	12.0	11.8
Rocky		11.9	10.6		11.7	12.6	12.3	11.9	11.8
+ Broadview		11.4	10.7		11.6	12.1	12.8	11.7	11.7
Carter		11.5	11.1		11.9	11.5	12.2	12.0	11.7
Jagalene		11.6	10.4		12.4	11.3	12.5	12.1	11.7
MT0861		12.3	9.2		12.7	11.7	12.6	11.5	11.7
Overland		11.5	11.0		12.2	11.0	12.5	11.4	11.6
Settler CL		11.2	11.1		12.2	10.6	12.3	12.1	11.6
Yellowstone		11.8	10.3		11.7	11.4	12.8	11.6	11.6
+# Boomer		12.0	9.5		11.7	11.3	12.3	12.3	11.5
Peregrine		12.0	10.7		12.0	11.3	11.5	11.7	11.5
+ MTS0832		11.2	10.2		11.2	11.2	13.3	11.5	11.4
Pryor		12.0	10.4		12.4	10.9	12.5	10.3	11.4
# Radiant		10.7	10.0		11.8	10.3	13.1	12.4	11.4
Ledger		11.5	10.2		11.4	10.9	12.5	11.5	11.3
NI04421 (Robidoux)		11.5	10.7		11.8	10.1	11.9	11.7	11.3
CDC Falcon		11.1	9.3		11.6	11.5	12.0	11.4	11.2
Neeley		11.0	9.8		11.3	9.5	13.7	11.6	11.2
Promontory		11.0	11.0		11.4	10.3	12.2	11.4	11.2
Wahoo		11.4	10.4		11.7	10.6	12.0	11.3	11.2
Accipiter		10.6	9.9		11.7	10.6	12.1	11.3	11.0
Average		11.8	10.7		12.3	11.4	12.9	12.2	11.9
LSD (0.05)									0.6
C. V. (%)									4.7
P-value (Varieties)									<.0001

+ = new for 2010, # = paid entry, r = return from 2006-08

** = 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. 2010 Intrastate Winter Wheat Test (Exp. 35): Winter Survival (%)

Cultivar/Line	Sidney LAT	Williston RCB	2 Loc Avg.
lattice efficiency	120%		
Peregrine	78.1**	40.0**	59.1**
Accipiter	71.8*	10.0	40.9
Jerry	69.1*	12.4	40.8
+ Broadview	71.5*	8.7	40.1
# Radiant	61.8	13.3	37.6
+ MTS0832	66.2*	5.4	35.8
CDC Falcon	66.1*	4.0	35.1
+# Boomer	56.7	8.4	32.6
+# Striker	61.1	2.4	31.8
Wahoo	58.6	0.5	29.6
Yellowstone	50.5	8.3	29.4
+# CA9W07-817 (WB M)	54.7	3.6	29.2
Decade	55.3	2.0	28.7
+ MT0871	52.8	3.8	28.3
Hyalite (CL, HWW)	55.2	0.8	28.0
MTS0713	54.5	0.4	27.5
+ MTS0819	53.9	1.1	27.5
Norris (CL)	53.1	0.6	26.9
Overland	52.9	0.0	26.5
MT0861	51.1	0.6	25.9
Neeley	48.0	3.8	25.9
Rocky	51.5	0.0	25.8
+ MTS0827	50.5	0.2	25.4
+# BZ9W05-2043	50.0	0.6	25.3
+# BZ9W05-2039	48.0	2.0	25.0
Genou	48.3	0.0	24.2
MTS0721	47.3	0.3	23.8
+ MTS0826	47.5	0.0	23.8
MTS0532 (HWW)	45.9	0.3	23.1
+ MT0866	46.0	0.0	23.0
+ MTS04114L	45.7	0.0	22.9
NI04421 (Robidoux)	45.4	0.0	22.7
+ MTS0808	44.3	0.0	22.2
Promontory	43.7	0.6	22.2
Settler CL	44.3	0.0	22.2
Curlew	44.0	0.0	22.0
+ MTS0532L	43.8	0.1	22.0
MTS0705	43.9	0.0	22.0
# AP 503 CL2	43.4	0.1	21.8
r MTS04114 (HWW)	43.0	0.6	21.8
Pryor	43.3	0.0	21.7
Ledger	43.2	0.0	21.6
+ MT0890	42.3	0.0	21.2
Jagalene	40.6	0.4	20.5
Carter	39.8	0.0	19.9
+# Art	36.6	0.1	18.4
Bynum (CL)	35.1	0.0	17.6
Rampart	31.7	0.0	15.9
MT06103	23.2	0.0	11.6
Average	50.1	2.7	26.4
LSD (0.05)	10.5	4.7	11.2
C. V. (%)	12.1	105	21.0
P-value (Varieties)	<.0001	<.0001	<.0001

+ = new for 2010, # = paid entry, r = return from 2006-08

** = 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 7. 2010 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Stem Solidness (5-25)

Cultivar/Line		Bozeman	Sidney	Havre	Moccasin	Conrad	5 Loc Avg.
MTS0705	MT9524/G15048//Rampart	18.1**	24.4**	22.9*	23.1*	23.8**	22.4**
MTS0721	DMS/Rampart//Pronghorn/3/2*Rampart	17.7*	23.1*	23.8*	22.0*	23.2*	22.0*
+ MTS0827	MT9524/G15048//Rampart	16.9*	22.7*	22.0*	23.7**	22.9*	21.6*
+ MTS0832	92X73E70/MTW9911	17.9*	22.0*	24.1**	19.9	23.2*	21.4
+ MTS0808	MT9908//Nuplains/MTS9862	14.9	23.2*	24.1**	21.8*	21.9	21.2
+ MTS0826	MT9524/G15048//Rampart	17.8*	21.8*	22.1*	22.1*	21.4	21.0
+# BZ9W05-2043	Rampart/Kestrel	17.3*	21.4	19.8	17.0	22.1*	19.5
	Rampart	15.2	22.8*	21.3	17.4	20.9	19.5
+ MTS04114L	L'Govskaya 167/Rampart//MT9409 (low ppo)	15.2	20.0	22.6*	18.0	20.3	19.2
	MTS0713	15.5	22.8*	19.0	17.9	19.3	18.9
+ MTS0532L	L'Govskaya 167/Rampart//MT9409 (low ppo)	16.4*	19.8	19.6	17.3	20.3	18.7
	MTS0532 (HWW)	14.9	20.6	20.0	16.8	20.5	18.6
r MTS04114 (HWW)	L'Govskaya 167/Rampart//MT9409	15.4	20.0	20.5	16.9	19.7	18.5
+ MTS0819	93X312E14/NuHorizon	16.5*	19.4	18.5	17.3	17.3	17.8
	Bynum (CL)	13.3	19.3	19.1	15.5	20.6	17.5
	Genou	12.6	19.2	17.5	15.5	16.9	16.3
	Carter	11.2	17.2	16.5	14.9	15.4	15.0
+# BZ9W05-2039	Vanguard/CDC Falcon	11.3	14.2	15.4	14.2	15.2	14.1
	Ledger	9.9	11.8	11.9	9.9	10.4	10.8
	Neeley	5.8	8.6	10.8	7.5	9.3	8.4
	CDC Falcon	5.1	6.7	9.1	8.3	8.5	7.5
Average		14.2	19.1	19.1	17.0	18.7	17.6
LSD (0.05)		1.8	2.6	2.5	2.1	1.7	1.0
C. V. (%)		7.7	8.4	7.9	7.7	5.6	7.5
P-value (Varieties)		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
% stems with tunneling		none	none	15.9	4.4	13.3	

Locations were significant ($P = <.0001$)

+ = new for 2010, # = paid entry, r = return from 2006-08

** = 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 8. 2010 Intrastate Winter Wheat Test (Exp. 35): Plant Disease Assessment

Cultivar/Line	Kalispell - Stripe Rust		Sidney - Leaf Rust	
	%	Rating ^{1/}	0-4, 4 = worst	Rating ^{2/}
	Stougaard -7/15	Grey	Berg - 7/9	Grey
Accipiter	11	R	1.0	R
# AP 503 CL2	1	R	2.7	S
+# Art	10	R	1.9	M
+# Boomer	23	MR	0.7	R
+ Broadview	33	MR	0.6	R
Bynum (CL)	5	R	2.4	S
+# BZ9W05-2039	46	MS	3.9	S
+# BZ9W05-2043	4	R	1.3	M
+# CA9W07-817	46	MS	1.3	M
Carter	13	R	2.0	M
CDC Falcon	4	R	1.0	R
Curlew	0	R	2.4	S
Decade	74	S	2.6	S
Genou	30	MR	1.6	M
Hyalite (CL, HWW)	8	R	1.4	M
Jagalene	20	MR	2.7	S
Jerry	40	MS	1.0	R
Ledger	23	MR	2.0	M
MT06103	1	R	2.0	M
MT0861	0	R	2.7	S
+ MT0866	14	R	1.0	R
+ MT0871	6	R	1.3	M
+ MT0890	1	R	2.0	M
r MTS04114 (HWW)	3	R	1.3	M
+ MTS04114L	1	R	1.0	R
MTS0532 (HWW)	4	R	1.3	M
+ MTS0532L	2	R	1.4	M
MTS0705	8	R	1.1	M
MTS0713	3	R	1.3	M
MTS0721	11	R	2.3	S
+ MTS0808	0	R	1.4	M
+ MTS0819	1	R	2.7	S
+ MTS0826	5	R	1.4	M
+ MTS0827	13	R	1.7	M
+ MTS0832	67	S	2.3	S
Neeley	36	MS	1.0	R
NI04421 (Robidoux)	0	R	2.7	S
Norris (CL)	65	S	1.6	M
Overland	35	MS	0.7	R
Peregrine	4	R	1.0	R
Promontory	1	R	2.6	S
Pryor	67	S	3.0	S
# Radiant	2	R	1.7	M
Rampart	6	R	1.4	M
Rocky	62	S	1.1	M
Settler CL	29	MR	2.3	S
+# Striker	43	MS	0.7	R
Wahoo	33	MR	2.0	M
Yellowstone	2	R	2.0	M
Average	18.7		1.7	
LSD (0.05)	16.3		1.0	
C. V. (%)	52		34	
P-value (Varieties)	<.0001		<.0001	

1/ R = Resistant, MR = Mod. Resis., MS = Mod. Susc., S = Susceptible

2/ R = Resistant, M = Moderate, S = Susceptible

+ = new for 2010, # = paid entry, r = return from 2006-08

** = 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)