

<u>PROJECT TITLE:</u>	2004 Intra-State Winter Wheat Variety Performance		
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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 2004 Intrastate Winter Wheat Evaluation nursery was grown at Bozeman, Havre, Huntley, Kalispell, Moccasin, and Sidney, Montana and Williston, North Dakota.

The 2004 Montana winter wheat crop varied widely across research locations due to extremes in winter survival, precipitation and growing season temperatures. The eastern portion of Montana had harsh winter conditions that caused pockets of winter kill. Severe drought conditions persisted in eastern Montana south of highway 200. Northwest Montana and north central conditions were much improved over the 2003 crop year. Cool June weather compensated for below average precipitation in central Montana. Dry conditions during grain fill reduced test weights at all locations except Bozeman. Harvest weather, in general, was good.

MT00159 had the highest statewide mean yield at 73.7 bu/a and its yield was statistically similar to the highest yielding variety at five of the eight test locations. Experimental lines, MT9982-53 and MT9982-65, along with Pryor ranked 2nd, 3rd and 3rd, respectively, overall for yield (Table 1). Pryor had the high yield at three locations and MT00159, a Promontory/Judith cross, had the high yield at two locations. Jagalene, an early maturing variety, and NuHorizon (HWWW), had the highest overall mean test weights and had the heaviest test weights at all locations except Bozeman and Huntley (Table 2). MTS0222 had the highest protein content overall and the highest protein content at five of eight locations (Table 3). Rampart had the second highest overall mean protein content. Huntley had the shortest plants with height numbers that look like protein content numbers (Table 4) NuHorizon had the shortest overall mean height. For the second year in a row Kalispell had the earliest mean heading date (154 Julian calendar day). Norstar winter survival at Williston was 30.7 % compared to a nursery mean of 7.0 (Table 6). At other locations, winter kill was not as great and the top variety rankings varied.

SUMMARY:

The environmental conditions across the intra-state winter wheat locations provided for an ideal range of yields for good assessment of yield potential. These conditions provided an excellent range of yields and test weights. Grain protein levels were high. Conditions were suitable for good winter survival evaluations at Sidney and Williston.

FUTURE PLANS:

MAES will continue to evaluate winter wheat lines and varieties in uniform statewide trials.

Table 1. 2004 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Yield (bu/a)

Cultivar/Line	Bozeman LAT	Havre LAT	Sidney LAT	Williston LAT	Kalispell LAT	Moccasin RCB	Huntley LAT	Conrad LAT	8 Loc Avg
Above (IMI)	80.6	69.5*	42.8	23.8	107.2	42.5	2.0	68.7	54.6
Bighorn	121.3	66.2	49.3	33.4	124.1*	52.7	12.6*	71.7	66.4*
BigSky	113.4	66.4	55.0	35.1	102.4	49.5	10.8	78.6*	63.9
# BZ9W96-788	117.8	67.6	44.1	27.4	122.5*	54.7*	5.0	77.2*	64.5
CDC Falcon	120.7	71.0*	56.7	37.0	117.9	55.5*	10.2	72.0	67.6*
Elkhorn	102.7	53.7	47.8	47.3*	92.2	44.7	11.7*	56.8	57.1
Expedition	89.1	67.2	42.0	24.6	119.9	40.4	2.2	74.7*	57.5
Genou (MTS0031)	113.8	68.4*	48.7	31.7	109.2	51.9	10.7	69.9	63.0
# GM10004 (HWW)	118.5	59.8	48.6	27.5	104.7	41.7	7.8	61.5	58.8
# Golden Spike (HWW)	129.3*	65.7	40.5	23.2	113.6	50.4	11.7*	66.8	62.6
# Jagalene	102.9	67.7	44.0	25.3	113.6	48.3	4.4	69.0	59.4
Jerry	119.2	63.0	58.4	49.4*	107.1	52.2	8.5	70.9	66.1
Judith	125.9	61.8	59.7*	43.1	115.5	50.0	8.5	70.3	66.9*
Millenium	102.0	66.5	53.3	28.6	112.8	45.1	5.5	76.9*	61.3
Morgan	111.5	59.8	57.3	54.1*	103.3	51.7	9.4	69.3	64.5
MT00159	130.7*	70.4*	68.1*	39.6	137.8**	60.2**	11.6	71.4	73.7**
MT0097	132.3*	64.8	62.4*	44.4*	120.4	49.2	13.8*	77.4*	70.6*
MT01148	129.2*	68.1*	59.3*	39.6	109.9	58.0*	14.6*	75.3*	69.2*
MT0177	119.4	71.2*	57.6	34.0	100.4	53.5*	8.0	65.4	63.7
+ MT02113	131.4*	70.2*	58.3	16.3	108.5	46.2	4.9	82.4**	64.8
+ MT02136	124.1	70.7*	55.6	42.9	107.5	56.3*	9.1	70.2	67.1*
+ MT0245	122.7	69.8*	50.6	33.3	118.1	49.2	5.3	66.1	64.4
+ MT0277	131.4*	60.9	55.6	26.6	112.7	51.7	12.5*	65.7	64.6
+ MT9982-53	132.3*	71.0*	60.5*	49.9*	132.4*	59.1*	7.1	74.6*	73.4*
+ MT9982-65	139.8**	68.9*	62.6*	33.9	126.0*	58.7*	9.7	76.9*	72.1*
+ MTCL01159 (IMI)	88.8	60.0	44.3	23.4	87.4	48.3	3.9	60.3	52.1
+ MTS0023-58	111.6	60.7	42.7	32.0	108.1	48.8	12.9*	63.2	60.0
+ MTS0222	98.0	64.5	50.7	24.9	107.8	47.0	5.1	65.2	57.9
MTW01133	106.7	73.1*	55.0	41.7	102.0	50.1	7.0	72.1	63.5
MTW01143	127.2	68.1*	55.2	31.4	109.6	50.8	8.7	68.6	64.9
+ MTW02111 (HWW)	131.4*	65.0	61.4*	30.6	95.0	53.4*	10.3	78.3*	65.7
+ MTW02115 (HWW)	129.1*	59.6	52.0	32.4	110.4	51.7	7.8	64.6	63.4
Neeley	128.1	65.5	58.0	40.3	112.1	53.5*	10.8	71.7	67.5*
Norstar	109.3	49.8	52.8	56.5**	89.9	45.2	11.4	56.4	58.9
# NuFrontier (HWW)	114.3	69.7*	47.4	32.3	121.1*	56.0*	5.2	71.9	64.7
# NuHorizon (HWW)	116.3	72.9*	49.8	24.0	127.3*	55.8*	9.3	76.7*	66.5*
NuSky (HWW)	136.2*	63.0	52.6	35.4	89.6	53.3*	12.2*	69.8	64.0
NuWest (HWW)	117.9	63.8	56.3	35.7	81.1	46.4	13.7*	72.8*	61.0
Paul	131.5*	65.4	54.1	37.2	86.9	55.3*	11.1	71.7	64.1
Promontory	132.0*	65.1	57.9	18.6	123.4*	57.6*	3.5	67.9	65.8
# Pryor	134.4*	74.7**	68.4**	35.6	119.3	59.2*	14.9**	70.8	72.1*
Quantum 542	116.2	63.0	35.4	23.9	119.5	54.6*	9.1	75.3*	62.1
Rampart	99.3	63.3	48.2	20.2	103.3	45.8	11.3	62.9	56.8
Rocky	114.3	74.2*	60.0*	25.6	116.7	50.8	5.8	76.3*	65.5
Tiber	116.2	62.7	56.0	39.9	108.5	49.8	12.7*	64.9	63.8
Vanguard	103.3	61.4	42.1	33.2	105.3	43.6	6.7	65.8	57.7
+ WA7936 (HWW)	132.3*	48.1	61.3*	33.5	119.3	50.1	14.9*	66.6	65.8
+ WA7939	137.8*	51.1	60.1*	33.8	117.6	55.0*	14.4*	63.3	66.6*
Wahoo	122.0	70.9*	54.1	39.0	113.0	48.8	3.9	71.2	65.4
Average	118.7	65.2	53.4	33.7	110.5	51.1	9.1	70.0	64.0
LSD (0.05)	10.7	6.9	9.6	12.9	17.3	7.8	3.2	9.6	7.4
C.V. (%)	5.1	6.1	10.3	23.6	9.2	9.5	20.2	7.8	11.8
P-value (Varieties)	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		0.0010	<.0001

+ = new for 2004, # = paid entry

Table 2. 2004 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Test Weight (lb/bu)

Cultivar/Line	Bozeman LAT	Havre LAT	Sidney LAT	Williston bulk	Kalispell 1 rep	Moccasin RCB	Huntley Bulk	Conrad 1 rep	7 Loc No HU	8 Loc Avg
Above (IMI)	62.2	61.1*	59.6	60.5	62.1	58.9	58.3	62.7	61.0	60.7
Bighorn	63.4	59.8	60.5	60.6	61.8	59.2	61.0	61.8	61.0	61.0
BigSky	63.5	59.0	61.1*	61.2	62.4	57.8	59.5	63.0	61.1	60.9
# BZ9W96-788	64.2	60.8	60.9*	60.5	61.4	60.0*	57.9	63.8	61.7	61.2
CDC Falcon	63.1	60.0	59.6	60.0	60.6	58.0	58.3	63.7	60.7	60.4
Elkhorn	62.7	58.6	59.1	59.4	60.9	58.8	60.1	61.5	60.1	60.1
Expedition	63.5	62.0*	60.4	60.2	62.0	59.5	55.1	63.4	61.6	60.8
Genou (MTS0031)	63.4	59.4	59.5	60.2	61.1	58.4	60.6	62.7	60.7	60.7
# GM10004 (HWW)	62.8	59.3	59.8	60.8	61.3	57.9	57.1	61.7	60.5	60.1
# Golden Spike (HWW)	62.5	57.8	57.7	58.9	61.6	56.3	60.7	61.1	59.4	59.6
# Jagalene	64.3	62.8**	61.8**	62.8	63.1	60.8*	54.0	64.9	62.9**	61.8*
Jerry	62.5	58.7	59.8	60.4	59.9	57.8	59.2	62.5	60.2	60.1
Judith	62.2	58.2	59.7	59.5	61.4	58.4	58.8	61.4	60.1	60.0
Millenium	63.2	61.0*	60.7	61.1	61.4	59.4	56.3	63.6	61.5	60.8
Morgan	62.1	58.3	58.8	60.1	60.2	58.3	58.9	62.6	60.1	59.9
MT00159	62.5	58.4	59.3	59.4	61.3	59.5	59.1	60.6	60.1	60.0
MT0097	62.6	57.6	60.0	60.4	59.6	57.5	61.7	62.7	60.0	60.2
MT01148	63.9	58.6	59.9	59.8	61.7	59.8*	58.6	62.7	60.9	60.6
MT0177	63.5	60.1	59.9	60.8	61.4	59.6	58.3	61.9	61.0	60.7
+ MT02113	62.9	57.5	59.0	56.8	60.4	57.5	56.9	61.6	59.4	59.1
+ MT02136	61.8	57.2	57.7	58.7	58.9	56.7	59.5	60.0	58.7	58.8
+ MT0245	62.2	58.3	60.1	60.4	61.8	58.4	61.1	62.4	60.5	60.6
+ MT0277	62.5	57.8	59.8	58.1	61.3	58.6	57.5	61.4	59.9	59.6
+ MT9982-53	63.1	60.6	60.9*	60.7	61.8	59.7*	58.0	60.9	61.1	60.7
+ MT9982-65	62.7	58.0	60.2	59.6	61.2	58.1	58.8	61.8	60.2	60.0
+ MTCL01159 (IMI)	61.3	58.2	58.8	58.1	59.3	57.7	50.6	59.4	59.0	57.9
+ MTS0023-58	62.0	56.6	58.8	58.9	59.0	57.1	57.3	60.1	58.9	58.7
+ MTS0222	61.6	59.2	59.4	59.4	60.7	57.4	57.8	61.8	59.9	59.7
MTW01133	62.4	60.9	60.0	60.5	58.7	58.8	59.7	61.7	60.4	60.3
MTW01143	62.9	59.5	59.5	59.1	60.3	58.2	59.4	62.0	60.2	60.1
+ MTW02111 (HWW)	63.1	57.9	60.2	59.5	59.7	59.9*	59.5	61.3	60.2	60.1
+ MTW02115 (HWW)	63.7	60.4	59.8	61.1	61.9	58.7	61.0	62.9	61.2	61.2
Neeley	63.7	58.8	60.1	60.3	62.1	57.6	58.2	62.8	60.8	60.5
Norstar	63.1	59.9	59.7	60.8	61.8	58.0	61.3	61.7	60.7	60.8
# NuFrontier (HWW)	64.6*	61.8*	60.5	61.5	62.4	60.2*	55.1	64.2	62.2*	61.3
# NuHorizon (HWW)	64.6*	62.7*	60.9*	61.5	63.0	61.2**	62.6	65.1	62.7*	62.7**
NuSky (HWW)	62.5	58.7	60.0	60.5	59.8	58.6	61.3	61.0	60.1	60.3
NuWest (HWW)	62.7	60.0	59.7	60.0	60.3	59.2	61.5	60.2	60.3	60.4
Paul	62.4	57.7	58.6	58.4	57.3	55.2	59.6	61.3	58.7	58.8
Promontory	65.2**	61.2*	60.8*	60.9	64.1	59.5	53.3	63.2	62.1*	61.0
# Pryor	63.2	58.9	60.2	58.9	60.8	58.9	59.4	61.4	60.3	60.2
Quantum 542	63.9	60.8	58.5	60.4	61.8	57.5	59.8	63.3	60.9	60.7
Rampart	63.1	59.4	59.8	59.3	60.6	56.3	60.7	62.5	60.1	60.2
Rocky	64.2	61.9*	60.9*	60.6	62.2	59.5	58.4	63.7	61.8	61.4
Tiber	63.9	59.9	61.0*	61.4	62.2	58.4	59.8	62.0	61.2	61.1
Vanguard	63.2	59.4	60.3	60.6	61.2	56.1	58.7	62.7	60.5	60.3
+ WA7936 (HWW)	61.1	55.4	56.2	57.0	59.1	54.4	58.9	56.3	57.1	57.3
+ WA7939	60.1	52.0	56.9	55.6	57.2	55.5	58.6	55.1	56.1	56.4
Wahoo	62.0	59.5	58.9	59.2	60.6	58.1	58.5	62.4	60.1	59.9
Average	62.9	59.2	59.7	59.9	61.0	58.3	58.7	61.9	60.4	60.2
LSD (0.05)	0.5	1.8	1.1			1.5			0.8	1.2
C.V. (%)	0.5	9.2	1.1			1.3			1.3	2.0
P-value (Varieties)	<.0001	<.0001	<.0001			<.0001			<.0001	<.0001

+ = new for 2004, # = paid entry

Table 3. 2004 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Protein (%)

Cultivar/Line	Bozeman Bulk	Havre Bulk	Sidney RCB	Williston Bulk	Kalispell Bulk	Moccasin Bulk	Huntley Bulk	Conrad Bulk	8 Loc Avg
Above (IMI)	14.5	12.5	13.4	13.0	12.6	13.4	18.1	12.8	13.8
Bighorn	12.3	14.3	14.1	13.9	12.4	13.3	16.5	12.4	13.7
BigSky	13.4	15.2	14.9	15.1	12.7	13.4	17.2	12.2	14.3
# BZ9W96-788	12.8	13.5	14.1	13.6	12.5	14.4	17.1	11.9	13.7
CDC Falcon	11.8	12.5	13.8	12.6	12.3	14.2	15.9	12.7	13.2
Elkhorn	13.6	15.1	14.4	13.9	13.0	13.6	15.4	12.7	14.0
Expedition	14.0	12.4	13.9	14.0	13.5	13.2	18.2	12.0	13.9
Genou (MTS0031)	13.0	13.5	14.7	14.5	13.0	13.8	17.9	12.8	14.2
# GM10004 (HWW)	13.1	13.1	14.4	13.5	11.7	14.5	17.8	12.4	13.8
# Golden Spike (HWW)	11.3	14.2	14.5	13.1	11.2	13.8	16.2	11.6	13.2
# Jagalene	14.1	13.7	14.1	13.8	13.8	13.4	18.1	13.2	14.3
Jerry	12.6	12.3	13.9	13.6	13.0	13.5	16.7	12.4	13.5
Judith	13.0	15.0	14.6	13.9	12.5	13.8	17.5	12.5	14.1
Millenium	13.7	13.5	13.9	14.1	13.0	13.6	18.0	12.3	14.0
Morgan	12.9	14.0	14.5	14.0	12.6	13.6	16.1	11.4	13.6
MT00159	12.5	15.0	13.7	13.4	12.3	13.6	15.1	12.8	13.6
MT0097	12.4	14.2	13.8	13.9	12.9	13.6	14.6	12.7	13.5
MT01148	12.8	13.6	14.3	13.9	12.9	13.4	14.8	11.6	13.4
MT0177	12.6	13.0	13.5	13.1	12.5	13.4	17.2	12.8	13.5
+ MT02113	12.6	14.1	13.3	13.4	13.5	13.5	16.5	11.3	13.5
+ MT02136	11.6	14.4	13.2	12.9	12.1	14.1	16.8	11.4	13.3
+ MT0245	13.1	14.2	15.0	15.1	13.5	13.8	18.8	12.7	14.5*
+ MT0277	12.9	15.6	14.4	14.4	13.0	13.9	16.8	12.0	14.1
+ MT9982-53	12.9	14.6	13.8	13.7	13.0	13.9	17.2	12.2	13.9
+ MT9982-65	12.3	14.3	14.2	13.4	12.5	13.7	16.9	12.1	13.7
+ MTCL01159 (IMI)	13.2	14.4	14.7	14.5	12.7	13.0	17.6	13.2	14.2
+ MTS0023-58	13.4	17.0	14.6	14.4	13.6	14.8	16.0	12.4	14.5*
+ MTS0222	14.5	15.2	15.6	15.5	14.3	14.0	18.5	14.1	15.2**
MTW01133	13.0	13.6	14.0	13.0	12.6	13.9	18.3	12.0	13.8
MTW01143	12.1	12.6	14.0	14.2	12.4	14.4	15.5	12.2	13.4
+ MTW02111 (HWW)	12.1	14.1	13.0	13.7	11.6	13.9	16.7	11.4	13.3
+ MTW02115 (HWW)	12.4	12.0	14.5	13.5	12.9	13.6	15.6	12.1	13.3
Neeley	12.5	14.0	13.5	14.0	12.2	13.5	16.2	12.1	13.5
Norstar	13.1	14.5	14.5	14.5	13.4	14.3	14.8	12.3	13.9
# NuFrontier (HWW)	11.7	9.9	12.9	11.9	11.8	14.8	17.6	12.0	12.8
# NuHorizon (HWW)	12.5	12.4	14.1	13.9	12.2	14.7	15.8	12.2	13.5
NuSky (HWW)	13.0	14.7	14.1	14.0	12.5	13.6	15.5	12.2	13.7
NuWest (HWW)	12.9	13.0	14.4	13.7	12.4	14.4	16.3	11.5	13.6
Paul	12.5	14.6	14.2	14.0	13.3	14.2	16.3	11.3	13.8
Promontory	11.9	13.9	14.1	13.5	12.0	13.6	17.4	12.8	13.7
# Pryor	11.8	13.6	13.6	13.8	11.9	13.6	15.8	11.9	13.3
Quantum 542	12.5	14.4	14.2	14.5	12.9	13.7	17.3	11.6	13.9
Rampart	13.9	15.7	15.3	15.1	13.9	14.0	16.4	14.2	14.8*
Rocky	12.4	11.5	13.4	13.1	12.7	13.3	17.5	11.0	13.1
Tiber	13.1	14.2	14.7	14.6	12.6	14.1	16.3	13.1	14.1
Vanguard	13.9	14.5	14.9	14.9	13.7	13.9	17.6	12.7	14.5
+ WA7936 (HWW)	12.4	12.7	14.8	14.2	12.9	14.1	15.4	11.4	13.5
+ WA7939	12.4	16.4	14.3	13.9	12.7	14.0	15.5	11.6	13.9
Wahoo	12.6	12.5	13.7	13.2	12.6	14.5	18.4	12.9	13.8
Average	12.8	13.9	14.2	13.9	12.7	13.8	16.7	12.3	13.8
LSD (0.05)			0.5						0.7
C.V. (%)			2.3						5.1
P-value (Varieties)			<.0001						<.0001

+ = new for 2004, # = paid entry

Table 4. 2004 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Plant Height (in)

Cultivar/Line	Bozeman LAT	Havre LAT	Sidney LAT	Williston RCB	Kalispell LAT	Moccasin RCB	Huntley LAT	Conrad 1 rep	8 Loc Avg
Above (IMI)	35.1	28.3	21.5	24.7	39.9	26.9	12.4	32.0	27.6
Bighorn	35.0	31.4	25.3	24.9	39.7	30.4	14.3	35.0	29.5
BigSky	40.4	36.9	29.8	31.6	48.4	29.4	16.7	43.0	34.5
# BZ9W96-788	37.6	30.7	24.1	24.7	39.8	30.3	14.4	36.0	29.7
CDC Falcon	35.1	30.3	25.2	24.7	39.0	32.8	12.8	35.0	29.4
Elkhorn	47.2	39.0	33.4	35.6	48.0	33.7	15.9	48.0	37.6
Expedition	35.4	30.8	23.2	25.2	40.9	28.3	14.8	37.0	29.5
Genou (MTS0031)	40.0	34.6	29.1	29.0	42.2	32.7	16.1	40.0	32.9
# GM10004 (HWW)	38.1	34.7	28.0	29.7	44.7	32.6	16.5	41.0	33.2
# Golden Spike (HWW)	41.7	36.6	25.5	30.1	44.1	33.5	16.0	38.0	33.2
# Jagalene	33.3	28.5	24.6	25.2	39.4	27.6	13.0	33.0	28.1
Jerry	45.5	34.9	29.6	31.2	48.1	31.6	14.9	45.0	35.1
Judith	40.2	35.5	28.1	32.7	44.4	32.1	14.5	40.0	33.4
Millenium	36.2	33.2	26.7	27.2	42.7	29.6	14.4	41.0	31.4
Morgan	41.0	35.7	29.7	32.2	43.3	34.5	15.3	41.0	34.1
MT00159	39.9	33.9	27.4	29.5	42.9	31.4	17.8	41.0	33.0
MT0097	39.9	35.0	28.3	29.4	43.9	30.5	15.4	40.0	32.8
MT01148	40.3	35.1	28.5	32.3	43.8	30.7	17.6	41.0	33.7
MT0177	39.5	31.9	27.4	28.9	44.1	32.0	14.5	39.0	32.2
+ MT02113	37.6	33.0	26.4	26.6	40.7	30.2	16.5	38.0	31.1
+ MT02136	36.5	31.4	25.3	27.4	41.2	28.9	13.5	37.0	30.2
+ MT0245	37.0	31.3	23.7	29.4	41.5	28.4	13.4	37.0	30.2
+ MT0277	37.6	32.9	29.2	28.6	41.1	32.0	15.7	39.0	32.0
+ MT9982-53	39.1	34.1	27.5	28.5	44.2	33.6	15.9	38.0	32.6
+ MT9982-65	39.3	34.0	27.9	27.8	41.1	32.5	16.7	41.0	32.5
+ MTCL01159 (IMI)	34.2	31.3	26.1	26.9	38.0	30.7	14.1	36.0	29.7
+ MTS0023-58	41.6	36.6	33.0	33.5	44.7	31.9	19.3	45.0	35.7
+ MTS0222	36.1	33.0	27.4	29.7	40.0	30.5	13.7	37.0	30.9
MTW01133	33.5	28.6	24.3	26.4	35.5	25.1	12.3	33.0	27.3
MTW01143	39.6	34.8	27.2	31.8	43.6	33.7	16.5	40.0	33.4
+ MTW02111 (HWW)	36.3	33.0	27.1	28.9	42.4	30.9	16.0	38.0	31.6
+ MTW02115 (HWW)	41.4	33.0	27.5	32.0	44.5	34.0	16.1	40.0	33.6
Neeley	37.4	34.5	30.7	30.2	43.1	31.1	14.7	41.0	32.8
Norstar	52.7	42.9	36.4	43.0	52.1	37.1	18.0	50.0	41.5
# NuFrontier (HWW)	35.8	32.2	26.4	25.3	40.3	31.4	12.9	35.0	29.9
# NuHorizon (HWW)	32.3	28.9	23.2	25.3	36.7	25.4	14.0	33.0	27.4
NuSky (HWW)	41.2	34.9	30.4	31.5	42.0	32.5	17.2	42.0	34.0
NuWest (HWW)	38.8	36.1	28.5	30.8	42.9	29.4	17.2	40.0	32.9
Paul	37.0	32.6	27.2	28.2	40.7	29.5	13.7	37.0	30.7
Promontory	37.2	32.2	27.4	26.6	41.9	32.5	13.8	35.0	30.8
# Pryor	37.3	33.1	27.1	27.4	38.3	30.5	13.3	36.0	30.4
Quantum 542	40.6	35.1	28.5	30.4	46.6	31.9	16.4	43.0	34.0
Rampart	37.3	34.8	30.6	26.5	43.3	31.4	16.9	40.0	32.6
Rocky	40.1	35.1	31.0	31.2	46.4	31.9	14.2	45.0	34.4
Tiber	43.1	36.5	30.1	32.7	46.7	34.3	17.6	45.0	35.7
Vanguard	37.2	33.9	28.7	30.3	43.7	30.6	15.7	43.0	32.9
+ WA7936 (HWW)	37.3	33.8	27.5	26.9	40.1	29.9	15.8	37.0	31.0
+ WA7939	37.6	33.0	26.3	28.0	41.4	30.7	16.8	37.0	31.4
Wahoo	34.3	30.4	26.0	26.0	40.5	28.1	14.8	34.0	29.3
Average	38.5	33.5	27.6	29.1	42.5	31.0	15.3	39.1	32.1
LSD (0.05)	2.4	1.7	2.8	3.5	2.4	3.8	2.1		1.5
C.V. (%)	3.6	2.9	5.9	7.4	3.3	7.6	8.2		4.8
P-value (Varieties)	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001			<.0001

+ = new for 2004, # = paid entry

Table 5. 2004 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Heading Date (Julian)

Cultivar/Line	Bozeman LAT	Havre LAT	Sidney LAT	Williston	Kalispell LAT	Moccasin RCB	Huntley LAT	Conrad 1 rep	7 Loc Avg
Above (IMI)	156.8	151.6	161.1		148.8	155.3	164.0	164.0	157.4
Bighorn	163.3	156.5	169.0	no	154.6	160.3	154.9	169.0	161.1
BigSky	164.5	156.5	169.0	data	155.1	161.3	155.1	170.0	161.6
# BZ9W96-788	161.3	155.5	167.2		151.1	159.3	155.0	168.0	159.6
CDC Falcon	163.3	156.6	166.8		155.4	161.0	155.1	168.0	160.9
Elkhorn	169.3	157.9	171.3		156.8	165.3	156.5	175.0	164.6
Expedition	157.6	150.3	161.7		149.7	153.3	155.4	165.0	156.1
Genou (MTS0031)	163.2	156.1	168.1		155.0	160.3	154.4	172.0	161.3
# GM10004 (HWW)	163.7	156.9	169.3		153.2	161.0	154.2	168.0	160.9
# Golden Spike (HWW)	168.2	158.3	172.1		157.5	161.7	155.6	174.0	163.9
# Jagalene	157.1	151.8	162.9		148.9	156.7	155.6	166.0	157.0
Jerry	166.9	158.7	167.3		154.3	162.3	154.5	169.0	161.9
Judith	164.7	157.1	166.3		153.4	160.3	155.4	168.0	160.7
Millenium	159.7	153.3	163.5		152.4	158.3	154.5	166.0	158.2
Morgan	167.8	159.5	170.5		156.1	166.3	156.3	173.0	164.2
MT00159	167.0	158.2	169.0		155.7	161.0	155.4	172.0	162.6
MT0097	167.7	159.3	169.6		156.2	164.7	155.8	171.0	163.5
MT01148	167.3	159.0	170.4		156.6	164.0	155.4	172.0	163.5
MT0177	162.6	156.9	168.5		154.7	160.3	155.7	169.0	161.1
+ MT02113	164.5	158.0	167.8		154.5	161.0	155.7	168.0	161.4
+ MT02136	161.3	155.0	167.3		151.5	157.7	155.0	169.0	159.5
+ MT0245	163.8	156.7	168.8		153.6	159.0	155.5	170.0	161.1
+ MT0277	161.3	155.4	164.8		151.3	161.0	154.4	167.0	159.3
+ MT9982-53	168.4	160.1	170.1		155.7	162.3	155.9	175.0	163.9
+ MT9982-65	167.6	158.7	169.3		155.7	163.0	155.8	170.0	162.9
+ MTCL01159 (IMI)	161.4	156.6	167.9		154.1	162.3	157.2	169.0	161.2
+ MTS0023-58	170.3	161.6	172.4		159.5	169.3	156.3	173.0	166.1
+ MTS0222	160.9	155.2	165.7		152.6	159.0	155.0	167.0	159.3
MTW01133	158.9	153.4	163.3		150.0	156.3	154.7	166.0	157.5
MTW01143	168.9	160.0	170.7		156.7	166.0	155.9	173.0	164.4
+ MTW02111 (HWW)	169.9	159.6	171.9		159.4	164.0	156.3	174.0	165.0
+ MTW02115 (HWW)	163.7	157.2	168.8		154.4	161.7	154.7	170.0	161.5
Neeley	166.8	157.8	169.7		155.8	162.7	155.9	172.0	163.0
Norstar	172.2	161.8	173.4		161.3	169.0	157.6	174.0	167.0
# NuFrontier (HWW)	158.4	152.6	164.4		151.0	156.3	155.9	165.0	157.7
# NuHorizon (HWW)	158.8	153.3	162.7		150.0	157.0	154.6	165.0	157.3
NuSky (HWW)	167.2	158.7	169.7		156.2	164.7	155.2	172.0	163.4
NuWest (HWW)	165.6	158.4	168.9		155.3	162.7	155.5	170.0	162.3
Paul	166.8	158.5	170.2		155.0	161.7	155.6	171.0	162.7
Promontory	162.3	156.3	165.2		154.1	160.0	156.7	168.0	160.4
# Pryor	166.2	160.1	168.7		155.0	163.3	154.8	171.0	162.7
Quantum 542	160.3	155.0	168.3		152.4	159.7	154.0	168.0	159.7
Rampart	163.3	156.5	169.2		154.8	161.0	154.9	169.0	161.2
Rocky	161.0	154.6	163.5		153.3	158.3	154.9	167.0	158.9
Tiber	168.1	157.0	170.0		156.1	165.3	156.0	171.0	163.4
Vanguard	163.8	155.1	168.9		154.0	160.7	154.9	169.0	160.9
+ WA7936 (HWW)	171.8	165.5	173.1		161.0	171.7	156.7	172.0	167.4
+ WA7939	172.2	163.8	174.6		160.2	169.7	156.5	175.0	167.4
Wahoo	159.0	152.8	163.3		149.5	156.0	154.1	167.0	157.4
Average	164.4	157.0	168.1		154.5	161.5	155.6	169.7	161.5
LSD (0.05)	1.5	1.6	1.7		1.8	2.9	1.1		1.7
C.V. (%)	0.5	0.6	0.6		0.7	1.1	0.4		1.0
P-value (Varieties)	<.0001	<.0001	<.0001		<.0001	<.0001			<.0001

+ = new for 2004, # = paid entry

Table 6. 2004 Intrastate Winter Wheat Test (Exp. 35): Multi-Location Winter Survival (%)

Cultivar/Line	Sidney LAT	Williston LAT	Moccasin LAT	Conrad LAT	4 Loc Avg.
	17-May	18-May	6-May	4-May	
Above (IMI)	44.8	5.5	70.3	54.6	43.8
Bighorn	41.3	6.3	84.9	53.6	46.5
BigSky	53.0*	5.3	88.0*	61.9*	52.0*
# BZ9W96-788	36.8	8.5	88.2*	50.1	45.9
CDC Falcon	55.0*	11.8	84.9	60.3*	53.0*
Elkhorn	47.2	11.9	82.1	54.6	49.0*
Expedition	49.9	6.7	80.0	60.5*	49.3*
Genou (MTS0031)	44.0	7.3	83.8	50.8	46.5
# GM10004 (HWW)	39.8	3.1	84.6	51.3	44.7
# Golden Spike (HWW)	28.0	2.1	78.5	51.4	40.0
# Jagalene	42.8	10.2	81.7	51.0	46.4
Jerry	53.9*	15.5	88.2*	57.7*	53.8*
Judith	53.3*	7.7	87.1*	57.8*	51.4*
Millenium	52.5*	5.6	86.9*	57.1	50.5*
Morgan	47.3	19.3	87.8*	63.2*	54.4*
MT00159	53.5*	5.9	89.5*	44.7	48.4
MT0097	60.0*	7.4	83.4	61.0*	52.9*
MT01148	58.2*	4.0	86.6*	62.8*	52.9*
MT0177	47.4	8.2	84.5	54.2	48.6*
+ MT02113	49.2	2.2	83.3	54.2	47.2
+ MT02136	45.3	6.5	85.1	51.1	47.0
+ MT0245	47.2	6.0	83.0	58.5*	48.7*
+ MT0277	59.6*	2.9	83.8	44.9	47.8
+ MT9982-53	44.0	11.9	80.1	47.0	45.7
+ MT9982-65	44.2	6.1	87.1*	49.4	46.7
+ MTCL01159 (IMI)	30.3	6.7	72.2	44.3	38.4
+ MTS0023-58	41.1	4.3	78.7	40.3	41.1
+ MTS0222	43.1	2.8	79.8	44.6	42.6
MTW01133	57.5*	12.4	88.3*	52.1	52.6*
MTW01143	46.0	3.3	81.6	57.8*	47.2
+ MTW02111 (HWW)	51.5*	2.5	84.9	53.8	48.2
+ MTW02115 (HWW)	51.9*	8.9	88.3*	58.7*	51.9*
Neeley	48.5	9.8	86.5*	54.1	49.7*
Norstar	48.1	30.7**	91.8**	53.1	55.9**
# NuFrontier (HWW)	44.9	2.5	86.6*	48.9	45.7
# NuHorizon (HWW)	39.2	3.5	85.1	58.4*	46.5
NuSky (HWW)	44.3	7.6	84.8	49.2	46.5
NuWest (HWW)	41.7	9.0	88.3*	48.3	46.8
Paul	51.2*	2.8	88.8*	58.9*	50.4*
Promontory	42.0	1.2	78.1	46.0	41.8
# Pryor	53.1*	2.8	87.0*	55.8	49.7*
Quantum 542	15.2	4.9	85.1	45.5	37.7
Rampart	33.7	2.7	82.8	52.2	42.9
Rocky	61.6**	2.5	82.0	57.4	50.9*
Tiber	56.8*	7.5	83.4	52.8	50.1*
Vanguard	38.1	7.1	83.4	52.6	45.3
+ WA7936 (HWW)	51.1*	6.2	75.4	45.4	44.5
+ WA7939	46.6	6.0	79.8	46.4	44.7
Wahoo	53.3*	8.3	89.5*	70.1**	55.3*
Average	46.7	7.0	84.0	53.3	47.7
LSD (0.05)	12.6	9.2	5.8	12.6	7.5
C.V. (%)	15.5	78.2	4.1	13.8	11.2
P-value (Varieties)	<.0001	<.0001	<.0001	0.0082	<.0001

+ = new for 2004, # = paid entry