

PROJECT TITLE: 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 2000 Intrastate Winter Wheat Test was grown in Bozeman, Havre, Sidney, Kalispell, Moccasin, and Huntley, Montana and Williston, ND. The Moccasin nursery was abandoned due to July 9 hailstorm.

The Montana 2000 winter wheat crop was smaller than average due to low prices and marginal moisture conditions during seeding. Eastern Montana had above average crop year precipitation while central and western Montana generally had below average crop year precipitation.

Yields in 2000 were generally good (Table 1). The mild winter coupled with moderate spring temperatures contributed to good to excellent grain yields in a year without exceptional precipitation levels at most locations. Test weights were average to above average at all locations (Table 2). Few entries fell below the 60 lbs/ bu standard at any location. Six entries averaged more than 63 lbs/bu across all locations. Protein content was above the standard 12% at Bozeman, Williston, Kalispell, Huntley and Conrad with nursery means of 13.2, 14.0, 12.3, 14.1 and 14.7 respectively. Montana varieties McGuire along with sawfly resistant lines Rampart and Vanguard had high mean protein contents at 14.7, 14.1, and 14.0 %, respectively (Table 3). The mean heading date had a 10 day spread ranging from day 153 for Halt to day 163 for Norstar. Norstar and Elkhorn were the tallest entries with mean heights of 42 and 38 inches, respectively. Halt, GM10003 and GM10002 were the shortest entries with mean heights slightly under 30 inches (Table 4). The Huntley location had the earliest mean head date at day 150 and Bozeman was the latest with a mean heading date of day of 165 (Table 5). Winter survival information is presented for the Sidney and Williston locations which were the only two with significant winter kill. The winter survival ranged from 57-76 percent and 68-93 percent at Williston and Sidney, respectively (Table 6).

SUMMARY:

Neeley, Promontory and QT 542 had the over all high mean grain yields for variety entries, Development lines BZ9w96-919, MT 9426 and BZ9W96-895 were among the top overall grain producers.

FUTURE PLANS:

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

Table 1. 2000 Intrastate Winter Wheat Test (Exp. 35): 7 Location Yield (bu/a)

+ = new for 2000, # = paid entry

Entry	Cultivar/Line	Bozeman RCB	Havre LAT	Sidney RCB	Williston RCB	Kalispell RCB	Huntley LAT	Conrad LAT	7 Loc. Average	BYX	RSQ
48	#+ BZ9W96-919	119.2	71.0	76.4	68.3	133.8	67.5	52.8	84.1	1.04	0.97
1	Neeley	117.7	69.0	69.9	71.3	120.3	71.9	46.5	80.9	0.95	0.98
15	Promontory	124.9	59.1	68.0	58.2	137.4	69.2	46.8	80.5	1.24	0.99
36	MT9426	117.9	65.4	74.0	66.7	123.8	61.6	49.9	79.9	1.01	0.99
47	#+ BZ9W96-895	111.1	67.0	68.5	63.5	124.4	78.0	46.0	79.8	0.96	0.96
10	Quantum 542	124.7	64.7	66.4	58.8	124.7	63.6	52.4	79.3	1.09	0.99
37	MT9513	113.3	64.0	66.5	63.3	120.6	75.8	49.7	79.0	0.94	0.98
29	ID537 (HWW)	123.6	62.7	71.6	49.2	132.2	60.2	50.8	78.6	1.19	0.97
31	#+ GM10001 (HWW)	119.6	63.5	63.3	62.9	125.7	65.2	45.8	78.0	1.09	0.99
18	Utah 100	122.3	61.1	54.5	48.5	129.1	77.0	51.8	77.8	1.16	0.94
43	+ MTS9882	109.5	59.2	72.2	66.4	113.1	69.2	48.8	76.9	0.86	0.98
16	Manning	125.8	59.1	65.5	54.2	107.5	78.5	47.2	76.8	0.99	0.92
46	#+ CDC Falcon, (S94-4)	115.5	66.0	71.0	64.6	115.2	60.8	43.7	76.7	0.96	0.98
22	Pronghorn	118.0	60.9	62.2	57.2	135.4	59.0	42.4	76.5	1.23	0.99
42	+ MT98110	116.0	63.2	71.4	65.7	115.1	55.8	46.9	76.3	0.96	0.96
23	Culver	121.3	60.5	58.0	51.9	130.1	66.9	43.9	76.1	1.21	0.99
32	#+ GM10002 (HWW)	126.6	61.0	68.3	51.5	111.4	64.7	49.2	76.1	1.04	0.95
38	MTW9724 (HWW)	116.2	57.5	71.6	63.9	116.9	58.4	47.8	76.0	0.99	0.98
4	Rocky	114.3	62.7	68.2	59.6	115.0	62.7	48.6	75.9	0.95	1.00
21	Akron	120.5	62.9	61.6	54.0	129.7	60.4	41.9	75.9	1.20	0.99
9	Judith	111.5	62.2	63.0	57.2	122.3	58.1	49.7	74.9	1.01	0.98
20	Halt	119.0	66.6	67.1	52.9	116.3	55.4	47.1	74.9	1.04	0.97
39	MTS9720	102.5	60.3	63.8	59.1	123.0	72.7	42.8	74.9	0.95	0.94
27	NuWest (HWW)	113.3	57.9	64.3	59.6	111.1	74.5	42.2	74.7	0.94	0.96
40	+ MT9822	119.9	60.3	56.0	50.9	128.8	62.7	42.5	74.4	1.21	0.98
24	Windstar	114.9	57.4	66.0	54.2	116.7	65.3	42.8	73.9	1.04	1.00
35	+ ID550 (HWW)	123.5	55.5	68.6	59.3	97.4	65.5	47.2	73.9	0.90	0.90
44	Harding, (SD92107)	106.9	57.0	56.2	52.0	132.9	67.4	45.0	73.9	1.12	0.94
6	Vanguard	117.3	52.4	59.4	53.9	123.7	67.0	42.3	73.7	1.15	0.99
41	+ MT9857	112.2	58.8	66.6	64.3	114.5	54.2	45.7	73.7	0.96	0.97
25	ID513	115.3	56.6	65.1	58.7	113.9	58.8	46.6	73.6	1.00	0.99
34	+ Golden Spike (HWW)	118.8	59.1	61.7	58.3	106.9	71.5	38.7	73.6	0.99	0.96
45	+ Prowers 99	119.2	57.7	56.6	55.2	124.3	59.6	41.0	73.4	1.18	1.00
8	Bighorn	111.4	58.0	63.3	55.8	114.1	61.4	48.6	73.2	0.96	1.00
2	Tiber	102.0	61.8	64.5	59.0	112.4	73.9	37.5	73.0	0.88	0.94
30	NuPlains (HWW)	118.2	57.2	62.2	54.5	125.4	52.7	39.5	72.8	1.19	0.99
26	BigSky	105.2	54.5	61.4	59.5	110.6	70.6	46.3	72.6	0.87	0.97
17	Blizzard	116.3	63.3	59.8	56.6	104.2	59.7	46.3	72.3	0.92	0.97
33	#+ GM10003 (HWW)	106.1	64.9	65.4	54.9	117.7	48.7	48.3	72.3	0.96	0.94
5	Morgan	119.2	56.3	70.0	62.6	91.1	54.9	49.6	71.9	0.80	0.84
49	#+ BZ9W97-761 (HWW)	104.9	59.1	61.0	54.7	116.3	65.4	41.5	71.8	0.96	0.98
3	Rampart	112.6	55.8	58.0	50.4	113.3	67.3	44.1	71.6	1.01	0.98
28	MTW9441 (HWW)	110.6	59.7	63.8	60.9	103.2	54.8	43.4	70.9	0.88	0.97
19	McGuire	106.1	57.2	53.9	46.0	122.2	59.2	39.6	69.2	1.10	0.97
12	Erhardt	102.9	52.3	59.0	53.6	112.4	59.8	39.9	68.5	0.96	0.99
14	Ransom	102.2	52.2	64.2	59.7	104.9	53.5	41.6	68.3	0.87	0.98
7	Redwin	100.8	55.2	57.3	53.0	101.2	62.7	40.9	67.3	0.84	1.00
13	Elkhorn	93.5	48.7	62.9	57.5	90.7	56.6	37.0	63.8	0.72	0.95
11	Norstar	85.9	49.0	66.6	62.3	77.9	60.3	38.5	62.9	0.50	0.79
	Average	113.7	59.7	64.4	57.9	116.6	63.7	45.1	74.4	1.00	1.00
	LSD (0.05)	8.0	5.3	8.3	5.3	19.9	19.3	6.7			
	C.V.	4.3	5.0	7.4	5.7	10.6	17.4	8.4			
	F-Test Varieties	8.93**	6.60**	3.19**	8.54**	2.93**	1.32ns	3.20**			

** denotes statistical significance at P <= .01; ns = no significant difference at P <= .05

Table 2. 2000 Intrastate Winter Wheat Test (Exp. 35): 7 Location Test Weight (lbs/bu)

+ = new for 2000, # = paid entry

Entry	Cultivar/Line	Bozeman LAT	Havre LAT	Sidney RCB	Williston RCB	Kalispell 1 rep	Huntley LAT	Conrad 1 rep	7 Loc. Average	BYX	RSQ
32	#+ GM10002 (HWW)	62.6	63.9	64.1	64.0	63.0	63.6	62.6	63.4	0.58	0.37
4	Rocky	62.7	62.4	63.3	63.1	64.4	63.7	63.1	63.3	0.59	0.38
30	NuPlains (HWW)	63.1	63.5	64.0	63.5	64.4	63.3	61.2	63.3	1.21	0.65
31	#+ GM10001 (HWW)	63.3	63.6	62.6	63.6	63.3	64.0	62.7	63.3	0.11	0.02
45	+ Prowers 99	63.0	62.7	63.6	63.7	64.8	64.0	61.0	63.3	1.54	0.76
15	Promontory	62.8	62.6	64.0	63.3	63.8	63.7	61.9	63.2	1.07	0.92
12	Erhardt	62.2	62.0	63.3	62.5	63.2	62.6	61.5	62.5	0.88	0.88
10	Quantum 542	62.0	61.2	63.1	62.3	62.3	62.9	62.7	62.4	0.42	0.20
22	Pronghorn	61.6	61.7	62.3	62.8	63.5	63.2	61.8	62.4	0.84	0.58
26	BigSky	61.8	61.3	63.4	63.1	63.5	62.7	60.1	62.3	1.77	0.94
7	Redwin	62.4	62.0	63.0	62.0	63.5	62.1	60.3	62.2	1.12	0.58
8	Bighorn	61.3	62.2	62.9	62.1	62.7	62.6	61.5	62.2	0.76	0.70
48	#+ BZ9W96-919	61.0	61.8	62.9	63.2	61.9	62.1	62.3	62.2	0.56	0.27
2	Tiber	62.2	61.3	63.8	62.7	63.4	63.0	58.5	62.1	2.36	0.80
6	Vanguard	61.9	60.1	62.9	62.5	63.6	62.5	61.2	62.1	1.36	0.64
21	Akron	61.4	62.3	63.0	62.7	62.3	63.2	60.0	62.1	1.37	0.72
47	#+ BZ9W96-895	61.1	62.1	63.1	62.7	61.6	62.5	61.7	62.1	0.65	0.41
1	Neeley	61.8	61.7	62.9	62.9	62.2	62.9	59.6	62.0	1.50	0.76
3	Rampart	62.0	59.8	62.7	61.7	63.3	62.4	62.0	62.0	0.86	0.29
25	ID513	61.5	61.2	62.7	62.9	62.6	62.3	60.6	62.0	1.24	0.94
16	Manning	61.8	61.0	62.8	62.9	62.4	62.6	60.1	61.9	1.43	0.87
19	McGuire	61.1	61.5	62.3	61.5	63.2	62.4	61.4	61.9	0.77	0.50
40	+ MT9822	61.9	61.4	63.1	61.7	62.5	61.5	61.5	61.9	0.60	0.41
11	Norstar	61.2	61.0	63.1	62.7	62.5	62.2	59.6	61.8	1.73	0.95
17	Blizzard	62.4	62.6	62.8	61.1	63.4	62.4	57.7	61.8	1.78	0.40
43	+ MTS9882	60.6	60.3	63.1	62.5	62.6	62.3	60.9	61.8	1.53	0.86
35	+ ID550 (HWW)	61.1	61.2	62.2	62.9	61.1	62.1	61.4	61.7	0.58	0.32
41	+ MT9857	61.9	60.1	63.0	63.2	61.4	60.9	61.3	61.7	0.83	0.26
5	Morgan	60.6	60.8	62.5	62.4	61.7	61.6	61.4	61.6	0.80	0.58
13	Elkhorn	61.0	60.5	62.2	62.0	62.8	62.3	60.3	61.6	1.33	0.88
20	Halt	61.1	61.5	61.9	62.6	62.2	62.0	59.8	61.6	1.17	0.75
28	MTW9441 (HWW)	61.0	61.8	62.7	61.9	61.5	61.8	60.5	61.6	0.83	0.66
34	+ Golden Spike (HWW)	60.9	61.2	62.3	62.1	61.8	61.8	61.4	61.6	0.59	0.71
49	#+ BZ9W97-761 (HWW)	61.3	61.2	62.5	62.0	63.1	62.1	59.2	61.6	1.66	0.82
36	MT9426	60.2	60.6	62.8	62.1	62.0	60.5	62.0	61.5	0.64	0.19
46	#+ CDC Falcon, (S94-4)	60.3	61.5	61.1	62.3	61.0	62.3	61.7	61.5	0.20	0.03
24	Windstar	60.4	60.6	61.4	62.6	60.7	62.2	61.0	61.3	0.65	0.27
23	Culver	60.8	61.5	61.6	61.4	62.4	62.6	57.9	61.2	1.79	0.61
27	NuWest (HWW)	61.1	61.7	62.4	61.9	61.9	61.0	58.4	61.2	1.49	0.59
14	Ransom	60.4	60.5	61.0	61.8	61.0	61.2	61.3	61.0	0.25	0.13
33	#+ GM10003 (HWW)	59.6	61.3	60.6	61.2	62.5	59.8	61.8	61.0	-0.02	0.00
42	+ MT98110	59.9	61.0	62.4	62.2	60.2	60.0	61.1	61.0	0.45	0.09
37	MT9513	59.2	60.0	62.6	61.6	60.3	61.2	61.4	60.9	0.77	0.22
18	Utah 100	60.0	60.5	61.4	60.8	60.6	61.2	61.1	60.8	0.27	0.15
38	MTW9724 (HWW)	60.3	59.8	61.9	61.3	60.0	61.4	61.1	60.8	0.48	0.17
9	Judith	60.2	59.8	61.4	60.5	61.2	61.7	58.7	60.5	1.38	0.81
44	Harding, (SD92107)	60.4	59.0	61.0	60.9	62.5	62.2	57.7	60.5	2.11	0.72
39	MTS9720	58.0	60.4	62.1	61.4	62.0	60.7	58.1	60.4	2.27	0.82
29	ID537 (HWW)	60.1	57.4	60.1	58.0	60.0	59.4	60.7	59.4	-0.16	0.01
	Average	61.2	61.3	62.5	62.2	62.3	62.1	60.8	61.8	1.00	1.00
	LSD (0.05)	0.5	0.7	0.5	0.7		1.3				
	C.V.	2.8	0.7	0.5	0.5		1.2				
	F-Test Varieties	34.4**	23.2**	22.3**	18.8**		3.86**				

** denotes statistical significance at P <= .01

Table 3. 2000 Intrastate Winter Wheat Test (Exp. 35): 7 Location Protein (%)

+ = new for 2000, # = paid entry

Entry	Cultivar/Line	Bozeman Bulk	Havre Bulk	Sidney RCB	Williston Bulk	Kalispell Bulk	Huntley Bulk	Conrad Bulk	7 Loc. Average	BYX	RSQ
19	McGuire	15.2	12.1	14.3	15.9	14.0	15.3	16.0	14.7	0.98	0.80
7	Redwin	14.6	12.3	12.6	15.9	14.2	14.7	15.2	14.2	0.95	0.80
12	Erhardt	14.4	13.1	13.6	15.3	13.1	14.6	15.5	14.2	0.76	0.90
3	Rampart	13.8	12.8	13.0	15.4	13.2	15.2	15.6	14.1	0.95	0.95
6	Vanguard	14.1	12.0	13.0	15.3	13.1	14.9	15.5	14.0	1.04	0.96
41	+ MT9857	14.1	13.1	11.9	14.9	12.6	15.8	14.8	13.9	0.99	0.77
17	Blizzard	14.2	12.2	12.2	15.0	13.3	15.1	14.6	13.8	0.93	0.88
26	BigSky	14.3	12.2	12.7	14.8	12.8	14.6	15.4	13.8	0.98	0.97
44	Harding, (SD92107)	14.2	12.6	12.7	14.5	13.4	13.9	15.7	13.8	0.81	0.85
11	Norstar	14.5	11.9	12.3	14.2	13.2	14.2	14.7	13.6	0.83	0.85
13	Elkhorn	15.0	11.2	12.3	13.9	13.5	14.7	14.6	13.6	0.93	0.69
27	NuWest (HWW)	13.8	11.8	13.5	14.6	12.4	13.5	15.4	13.6	0.83	0.72
2	Tiber	13.7	11.9	12.3	15.0	12.6	14.2	14.5	13.5	0.92	0.91
22	Pronghorn	13.0	10.4	12.7	14.7	12.9	14.5	15.5	13.4	1.25	0.85
30	NuPlains (HWW)	13.4	11.5	13.6	12.9	12.0	14.6	15.8	13.4	0.92	0.60
39	MTS9720	14.2	11.7	12.1	14.3	12.3	14.3	15.0	13.4	1.04	0.95
40	+ MT9822	13.3	11.5	12.7	14.3	11.7	14.6	15.8	13.4	1.21	0.91
49	#+ BZ9W97-761 (HWW)	13.6	11.4	13.1	13.8	12.6	14.3	15.3	13.4	0.92	0.85
5	Morgan	14.2	12.1	11.1	14.1	12.5	14.8	14.5	13.3	1.04	0.82
8	Bighorn	13.0	11.7	12.9	14.3	12.0	14.7	14.6	13.3	0.91	0.85
9	Judith	13.4	12.0	12.5	14.2	11.7	14.1	14.9	13.3	0.93	0.90
28	MTW9441 (HWW)	13.6	11.1	13.2	12.7	12.7	14.8	14.7	13.3	0.78	0.58
29	ID537 (HWW)	13.7	12.6	11.2	13.9	12.7	15.1	14.2	13.3	0.87	0.71
45	+ Prowers 99	13.2	11.6	12.1	14.0	13.0	14.3	14.8	13.3	0.92	0.96
42	+ MT98110	13.2	11.1	11.6	13.8	12.3	15.4	14.8	13.2	1.22	0.90
14	Ransom	13.6	11.0	11.1	14.8	12.7	14.0	14.6	13.1	1.19	0.91
23	Culver	13.1	11.2	11.5	14.0	12.6	13.5	15.7	13.1	1.17	0.90
36	MT9426	13.4	11.7	10.7	13.7	12.0	15.0	14.4	13.0	1.15	0.85
37	MT9513	13.6	11.5	11.2	14.2	12.6	12.9	15.1	13.0	1.02	0.82
1	Neeley	13.8	11.3	10.9	13.6	12.2	14.4	14.3	12.9	1.09	0.89
25	ID513	12.7	11.1	11.2	14.2	12.2	14.8	14.2	12.9	1.15	0.91
18	Utah 100	12.5	11.2	12.2	13.9	11.5	13.6	14.6	12.8	0.98	0.91
47	#+ BZ9W96-895	12.8	11.5	11.5	14.0	11.5	13.8	14.5	12.8	1.04	0.96
4	Rocky	12.5	10.7	11.5	13.6	12.5	13.9	14.5	12.7	1.05	0.94
20	Halt	12.6	10.9	11.5	14.2	12.0	12.8	15.0	12.7	1.09	0.87
16	Manning	12.2	11.4	10.9	15.1	11.7	12.9	14.3	12.6	1.09	0.76
21	Akron	11.4	10.8	12.1	14.8	11.4	12.3	15.0	12.5	1.07	0.63
24	Windstar	12.4	10.7	11.5	14.0	12.0	12.7	14.5	12.5	1.01	0.88
32	#+ GM10002 (HWW)	12.5	11.0	11.6	13.8	11.8	12.3	14.6	12.5	0.92	0.81
38	MTW9724 (HWW)	12.3	11.0	11.5	12.8	11.9	13.6	14.3	12.5	0.90	0.92
46	#+ CDC Falcon, (S94-4)	12.4	11.0	10.8	12.6	11.7	14.5	14.6	12.5	1.14	0.85
48	#+ BZ9W96-919	12.5	11.5	10.7	13.4	11.3	14.4	13.5	12.5	0.99	0.81
10	Quantum 542	13.0	11.2	10.5	13.5	11.7	13.5	13.8	12.4	1.01	0.91
15	Promontory	11.6	11.3	10.4	13.6	11.3	14.0	13.7	12.3	1.06	0.83
35	+ ID550 (HWW)	12.2	11.0	10.4	13.3	11.6	13.6	13.9	12.3	1.05	0.94
34	+ Golden Spike (HWW)	11.6	11.3	11.0	13.1	10.9	13.0	14.0	12.1	0.92	0.87
43	+ MTS9882	12.8	11.9	10.1	12.6	11.1	12.6	13.7	12.1	0.78	0.67
33	#+ GM10003 (HWW)	11.5	10.7	10.4	11.7	10.6	12.9	14.1	11.7	0.99	0.82
31	#+ GM10001 (HWW)	11.1	9.4	9.9	12.0	10.7	13.0	13.5	11.4	1.20	0.94
	Average	13.2	11.5	11.8	14.0	12.3	14.1	14.7	13.1	1.00	1.00
	LSD (0.05)			0.8							
	C.V.			3.8							
	F-Test Varieties			13.7**							

** denotes statistical significance at P <= .01

Table 4. 2000 Intrastate Winter Wheat Test (Exp. 35): 7 Location Plant Height (in)

+ = new for 2000, # = paid entry

Entry	Cultivar/Line	Bozeman LAT	Havre LAT	Sidney RCB	Williston RCB	Kalispell RCB	Huntley LAT	Conrad 1 rep	7 Loc. Average	BYX	RSQ
11	Norstar	50.0	36.9	38.8	38.3	55.1	38.2	37.0	42.0	1.00	0.93
13	Elkhorn	44.7	32.9	33.7	34.4	53.1	35.5	32.0	38.0	1.10	0.97
2	Tiber	43.6	33.9	33.0	31.8	51.7	36.1	31.0	37.3	1.07	0.99
29	ID537 (HWW)	42.6	33.6	31.8	31.6	51.7	36.3	31.0	36.9	1.08	0.99
17	Blizzard	43.8	32.6	31.7	32.3	53.0	33.9	30.0	36.8	1.19	0.99
18	Utah 100	41.5	34.0	33.3	32.0	51.6	33.4	32.0	36.8	1.03	0.99
10	Quantum 542	41.9	34.9	32.9	29.1	49.6	36.8	32.0	36.7	0.96	0.95
26	BigSky	41.5	32.2	32.6	31.0	49.6	35.7	31.0	36.2	0.98	0.99
9	Judith	42.1	34.7	31.4	29.5	49.5	34.6	30.0	36.0	1.02	0.97
40	+ MT9822	39.1	33.7	31.4	31.9	49.3	35.0	29.0	35.6	0.95	0.97
1	Neeley	40.3	33.7	31.4	27.6	49.7	32.7	33.0	35.5	1.01	0.95
5	Morgan	40.1	31.9	32.4	32.0	48.3	30.8	33.0	35.5	0.88	0.94
4	Rocky	38.9	33.6	31.0	27.6	50.3	34.9	31.0	35.3	1.04	0.96
37	MT9513	40.8	31.9	30.8	32.6	48.2	33.2	30.0	35.3	0.93	0.97
44	Harding, (SD92107)	39.8	31.9	31.6	30.7	49.7	33.7	29.0	35.2	1.02	0.99
28	MTW9441 (HWW)	41.8	31.2	31.6	31.1	48.7	30.1	31.0	35.1	0.99	0.94
45	+ Prowers 99	39.8	31.2	31.7	29.0	50.1	35.0	29.0	35.1	1.07	0.99
22	Pronghorn	39.6	30.1	32.4	28.9	49.3	35.0	30.0	35.0	1.02	0.97
27	NuWest (HWW)	39.6	31.5	30.9	30.6	48.7	33.9	30.0	35.0	0.97	1.00
49	#+ BZ9W97-761 (HWW)	40.6	32.5	31.3	28.9	48.4	34.6	29.0	35.0	1.00	0.98
35	+ ID550 (HWW)	41.6	30.8	30.7	30.7	50.1	29.5	30.0	34.8	1.10	0.95
38	MTW9724 (HWW)	39.9	32.7	31.2	28.9	50.0	32.0	29.0	34.8	1.08	1.00
7	Redwin	41.9	34.4	31.5	30.7	50.7	32.8	21.0	34.7	1.23	0.86
34	+ Golden Spike (HWW)	40.5	33.3	30.9	29.4	48.2	30.8	30.0	34.7	0.98	0.97
14	Ransom	40.5	29.9	30.3	29.5	48.9	32.9	29.0	34.4	1.06	0.99
15	Promontory	38.1	32.4	29.9	28.1	47.9	32.9	31.0	34.3	0.94	0.97
6	Vanguard	40.6	30.2	30.2	28.9	49.9	32.0	28.0	34.2	1.14	1.00
24	Windstar	37.6	32.6	30.5	28.0	47.4	32.0	31.0	34.2	0.91	0.97
16	Manning	39.7	31.8	28.9	27.6	48.7	33.8	28.0	34.1	1.08	0.98
39	MTS9720	38.4	30.3	30.5	31.0	47.3	30.7	31.0	34.1	0.89	0.96
12	Erhardt	38.5	30.1	29.4	28.5	46.6	32.8	28.0	33.4	0.96	0.99
3	Rampart	38.8	30.9	30.7	29.8	48.8	33.1	21.0	33.3	1.15	0.89
23	Culver	38.3	29.7	29.8	27.8	46.2	33.2	28.0	33.3	0.95	0.99
21	Akron	36.3	30.3	30.3	28.7	47.9	31.7	27.0	33.2	1.00	0.99
42	+ MT98110	38.9	30.3	29.5	26.5	47.1	31.0	27.0	32.9	1.05	0.99
47	#+ BZ9W96-895	37.4	30.1	28.4	27.3	45.5	31.5	29.0	32.7	0.92	0.99
36	MT9426	37.5	29.3	29.4	28.2	45.9	29.0	29.0	32.6	0.93	0.97
19	McGuire	34.6	30.3	29.7	26.9	47.7	32.4	25.0	32.4	1.03	0.95
25	ID513	38.6	30.0	27.5	26.0	46.2	31.9	26.0	32.3	1.05	0.97
31	#+ GM10001 (HWW)	35.4	29.6	28.3	26.3	46.3	32.1	25.0	31.9	1.01	0.97
48	#+ BZ9W96-919	34.7	29.3	28.2	27.6	45.0	29.5	28.0	31.7	0.89	0.99
8	Bighorn	36.1	28.9	27.6	25.3	44.9	29.3	26.0	31.2	0.99	1.00
46	#+ CDC Falcon, (S94-4)	32.7	28.0	27.4	27.2	43.4	29.6	27.0	30.8	0.83	0.98
41	+ MT9857	33.7	26.3	28.5	26.5	47.0	27.9	25.0	30.7	1.07	0.97
43	+ MTS9882	34.1	27.7	26.5	27.3	44.3	28.1	27.0	30.7	0.91	0.97
30	NuPlains (HWW)	34.0	27.0	26.9	24.5	45.1	28.4	26.0	30.3	1.01	0.99
20	Halt	30.6	27.3	27.0	24.9	44.1	29.0	26.0	29.8	0.90	0.94
33	#+ GM10003 (HWW)	29.6	28.4	28.6	24.5	43.6	27.0	26.0	29.7	0.85	0.89
32	#+ GM10002 (HWW)	30.6	26.8	27.9	25.1	42.8	26.9	27.0	29.6	0.82	0.92
	Average	38.8	31.2	30.4	29.0	48.2	32.3	28.8	34.1	1.00	1.00
	LSD (0.05)	1.9	2.1	1.4	2.1	4.0	3.2				
	C.V.	2.8	3.9	2.6	4.4	5.2	5.7				
	F-Test Varieties	34.4**	9.54**	19.5**	13.1**	3.40**	4.37**				

** denotes statistical significance at P <= .01

Table 5. 2000 Intrastate Winter Wheat Test (Exp. 35): 8 Location Heading Date (Julian)

+ = new for 2000, # = paid entry

Entry	Cultivar/Line	Boz RCB	Havre LAT	Sidney RCB	Williston RCB	Kalispell RCB	Moccasin LAT	Huntley RCB	Conrad 1 rep	8 Loc. Average	BYX	RSQ
11	Norstar	172.0	157.7	160.3	161.0	162.7	169.6	156.7	165.0	163.1	1.05	0.93
13	Elkhorn	168.3	156.2	157.0	159.0	160.3	168.2	152.7	164.0	160.7	1.13	0.98
41	+ MT9857	167.3	155.8	157.3	158.7	160.3	166.7	154.7	165.0	160.7	0.96	0.93
17	Blizzard	168.7	156.9	158.7	160.7	160.3	167.1	151.7	161.0	160.6	1.05	0.94
5	Morgan	168.7	156.5	154.0	159.7	160.3	168.5	152.0	162.0	160.2	1.19	0.94
18	Utah 100	166.7	158.1	157.0	159.0	160.0	165.2	153.0	161.0	160.0	0.87	0.98
43	+ MTS9882	166.7	157.2	157.0	158.0	159.3	166.2	152.7	163.0	160.0	0.97	0.99
39	MTS9720	166.7	156.8	156.7	159.0	158.7	166.3	152.3	163.0	159.9	0.99	0.97
2	Tiber	167.3	155.5	156.7	158.0	159.7	166.0	150.7	164.0	159.7	1.13	0.98
34	+ Golden Spike	167.0	156.5	156.7	158.3	159.7	164.8	152.3	162.0	159.7	0.96	1.00
36	MT9426	166.7	156.7	156.7	158.3	159.7	165.9	152.7	161.0	159.7	0.94	0.98
27	NuWest	166.0	155.9	156.7	158.0	159.0	165.5	151.7	164.0	159.6	1.01	0.97
1	Neeley	167.7	156.2	157.0	156.7	160.3	167.0	150.7	160.0	159.5	1.11	0.96
12	Erhardt	166.7	155.8	156.0	157.0	159.3	164.9	149.7	166.0	159.4	1.16	0.94
26	BigSky	167.3	156.2	156.3	157.3	159.7	165.1	152.0	161.0	159.4	1.00	0.98
37	MT9513	166.3	155.6	156.7	159.3	159.0	165.3	151.7	161.0	159.4	0.96	0.97
28	MTW9441	166.7	156.1	157.3	158.7	160.3	165.5	153.0	157.0	159.3	0.85	0.82
35	+ ID550 (HWW)	166.3	156.7	156.7	157.7	159.3	165.1	151.7	161.0	159.3	0.95	0.99
7	Redwin	167.0	155.5	154.7	158.0	161.0	165.4	149.0	163.0	159.2	1.20	0.98
25	ID513	167.0	157.0	156.0	157.0	159.0	165.5	150.3	162.0	159.2	1.08	0.99
48	#+ BZ9W96-919	166.0	155.4	157.0	158.7	159.0	165.6	150.3	160.0	159.0	1.01	0.96
14	Ransom	165.7	154.4	155.7	157.3	159.7	165.6	150.7	161.0	158.8	1.05	0.98
49	#+ BZ9W97-761	165.7	155.6	157.0	157.3	158.0	165.1	150.0	161.0	158.7	1.02	0.98
8	Bighorn	165.3	156.2	156.7	158.3	158.0	164.6	151.0	159.0	158.6	0.90	0.95
16	Manning	164.7	156.3	156.0	156.3	158.3	163.3	150.7	162.0	158.5	0.92	0.98
38	MTW9724	164.7	155.9	155.3	156.7	159.7	164.2	150.3	161.0	158.5	0.97	0.99
29	ID537 (HWW)	165.0	155.7	156.0	160.0	158.7	163.2	148.7	160.0	158.4	0.97	0.92
3	Rampart	164.3	155.4	156.0	158.3	158.7	164.3	149.0	160.0	158.2	0.98	0.96
44	Harding,	164.0	154.8	155.3	156.3	159.7	164.9	148.7	161.0	158.1	1.07	0.99
15	Promontory	164.7	156.4	155.0	155.0	158.0	163.7	150.3	159.0	157.8	0.93	0.96
46	#+ CDC Falcon,	164.0	154.2	155.3	155.7	159.0	163.3	150.7	160.0	157.8	0.92	0.99
42	+ MT98110	164.0	154.7	153.7	156.7	158.7	163.7	149.0	160.0	157.6	1.02	0.99
47	#+ BZ9W96-895	165.0	154.9	153.0	157.3	158.0	163.5	149.3	160.0	157.6	1.04	0.98
6	Vanguard	163.0	154.0	156.0	155.3	157.3	162.0	149.3	163.0	157.5	0.94	0.92
30	NuPlains	162.7	154.1	154.3	158.3	158.0	163.8	147.7	159.0	157.2	1.00	0.94
9	Judith	164.0	154.4	152.7	155.7	158.3	163.3	147.3	160.0	157.0	1.11	0.98
4	Rocky	162.3	153.5	154.3	155.7	157.0	162.2	148.0	159.0	156.5	0.95	0.99
45	+ Prowers 99	160.3	152.2	154.7	153.3	155.7	160.1	147.0	160.0	155.4	0.90	0.92
10	Quantum 542	162.7	152.3	152.7	152.7	156.0	161.2	146.7	158.0	155.3	1.05	0.99
24	Windstar	162.0	151.9	151.3	154.0	157.7	160.1	147.0	158.0	155.3	0.99	0.96
40	+ MT9822	160.7	152.1	153.0	153.0	156.3	159.8	147.0	158.0	155.0	0.91	0.98
19	McGuire	160.7	152.9	151.0	151.0	157.3	160.2	146.3	159.0	154.8	1.01	0.93
31	#+ GM10001	160.7	152.7	150.7	153.0	155.7	159.6	146.3	160.0	154.8	0.99	0.94
21	Akron	161.0	152.7	150.7	151.7	156.7	160.6	146.0	158.0	154.7	1.03	0.96
33	#+ GM10003	160.3	153.9	150.7	151.3	156.0	159.4	147.0	158.0	154.6	0.90	0.92
23	Culver	160.0	151.8	150.7	153.3	155.7	160.0	145.7	157.0	154.3	0.97	0.98
32	#+ GM10002	160.0	152.1	150.7	151.7	155.7	159.8	147.0	157.0	154.2	0.91	0.97
22	Pronghorn	160.0	150.6	151.0	151.0	155.3	158.9	146.0	156.0	153.6	0.94	0.98
20	Halt	159.0	151.3	149.3	150.0	155.3	158.2	144.0	157.0	153.0	1.01	0.94
	Average	164.7	154.9	154.9	156.4	158.5	163.8	149.8	160.6	157.9	1.00	1.00
	LSD (0.05)	0.9	1.4	1.1	2	1.9	1.3	1.8				
	C.V.	0.3	0.5	0.4	3.5	0.7	0.5	0.7				
	F-Test Varieties	83.7**	14.3**	39.7**	15.4**	6.33**	34.3**	15.7**				

** denotes statistical significance at P <= .01

Table 6. 2000 Intrastate Winter Wheat Test (Exp. 35): Winter Survival (%)

+ = new for 2000, # = paid entry

Entry	Cultivar/Line	Pedigree or Origin & Release Year	Sidney RCB	Williston LAT	2 Location Avg.	
47	+	MT98110	Roughrider/MT8713//Redwin	83.5	76.4	84.0
31	#+	GM10001 (HWW)	General Mills, experimental white line	89.7	79.4	84.6
14		Ransom	North Dakota, 1998	86.9	79.8	83.3
48	#+	BZ9W96-919	WPB, Hatten/Abilene	86.6	76.5	81.6
28		MTW9441 (HWW)	NuWest/Tiber	84.8	77.9	81.4
2		Tiber	Montana, 1988	91.7	70.9	81.3
27		NuWest (HWW)	Montana/General Mills, 1994	85.2	77.3	81.2
39		MTS9720	Nuwest/MT88001//MT7863	90.1	69.8	80.0
20		Halt	Colorado, 1994	90.4	69.5	79.9
41	+	MT9857	Neeley/MT8713	83.8	76.1	79.9
24		Windstar	Nebraska, 1996	81.8	76.6	79.2
12		Erhardt	Montana, 1996	92.2	66.2	79.2
46	#+	CDC Falcon (S94-4)	Western Plant Breeders/Sask., 1998	89.9	66.7	78.3
35	+	ID550 (HWW)	Manning*2/Survivor	85.1	70.4	77.7
43	+	MTS9882	S86-736/Vanguard	86.4	68.9	77.7
13		Elkhorn	North Dakota, 1995	89.7	65.5	77.6
45	+	Prowers 99	Colorado, 1999	83.3	71.4	77.4
5		Morgan	Western Plant Breeders/Sask., 1996	83.4	70.4	76.9
11		Norstar	Alberta, 1977	88.2	65.4	76.8
47	#+	BZ9W96-895	WPB, male sterile population	84.9	68.4	76.7
32	#+	GM10002 (HWW)	General Mills, experimental white line	86.8	65.9	76.3
25		ID513	A81710SW-54/Blizzard	83.0	69.4	76.2
19		McGuire	Montana, 1996	88.4	63.8	76.1
26		BigSky	NuWest/Tiber, Montana, 2001	78.6	73.2	75.9
30		NuPlains (HWW)	Nebraska, 1998	90.1	59.6	74.9
38		MTW9724 (HWW)	Nuwest/APW84223//MT7863	83.2	65.6	74.4
10		Quantum 542	Hybritech, 1988	84.7	63.3	74.0
34	+	Golden Spike	General Mills, (Utah, 1999)	81.4	65.9	73.6
4		Rocky	Agripro, 1978	79.9	66.9	73.4
1		Neeley	Idaho, 1980	83.4	61.9	72.6
33	#+	GM10003 (HWW)	General Mills, experimental white line	81.7	63.1	72.4
37		MT9513	Nuwest/MT8030	81.5	63.1	72.3
36		MT9426	MT8030/Neeley	86.7	57.8	72.2
7		Redwin	Montana, 1979	80.2	63.7	72.0
44		Harding (SD92107)	South Dakota, 2000	80.3	61.0	70.6
9		Judith	Montana, 1989	83.2	57.2	70.2
22		Pronghorn	NE, SD, WY, 1995	84.9	55.5	70.2
21		Akron	Colorado, 1994	73.8	65.9	69.8
49	#+	BZ9W97-761	WPB, Nuwest*2/solid stem line	81.4	53.0	67.2
6		Vanguard	Montana, 1995	83.4	47.7	65.6
8		Bighorn	Hybritech, 1985	83.2	47.4	65.3
23		Culver	Nebraska, 1998	78.3	50.6	64.4
15		Promontory	Utah, 1990	74.8	53.9	64.3
16		Manning	Utah, 1979	70.2	54.8	62.5
3		Rampart	Montana, 1996	79.8	39.6	59.7
40	+	MT9822	Judith/Kestrel//Judith/Vanguard	75.1	43.9	59.5
17		Blizzard	Idaho, 1989	68.0	47.4	57.7
18		Utah 100	Utah, 1996	71.8	43.5	57.7
29		ID537 (HWW)	Tk/Burt/5/Sm6/4/2*It/UT175a-53//Bdls Burt/	83.4	30.5	57.0
		Average		83.4	63.2	73.3
		LSD (0.05)		10.0	13.2	
		C.V.		7.2	12.4	
		F-Test Varieties		2.55**	5.74**	

** denotes statistical significance at P <= .01