

<b><u>PROJECT TITLE:</u></b>	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 weather on the plains east of the Rocky Mtns., from September 1997 to May 1998, provided mild temperatures and low precipitation levels followed by above average precipitation and cool temperatures in June. July had above average precipitation and temperatures. Bozeman and Kalispell had generally good conditions for winter wheat throughout the crop year. Winter survival was not a significant factor in any of the nurseries. Hail wiped out the Huntley trial.

Winter wheat yields were above average at Bozeman, Conrad and Moccasin, near average at Havre and Williston, and below average at Kalispell (Table 1). The dry conditions, in Sept.-May, apparently enhanced root growth without limiting yield potential. The June and July precipitation levels enhanced plumpness and test weights (Table 2). Protein levels, surprisingly, were at or above average at all locations except Williston and Kalispell (Table 3). The mild winter and warm spring temperatures contributed to earlier than average heading dates at all locations (Table 4). Winter wheat plant heights were shorter than average except for Moccasin (Table 5). Rhizoctonia, was a significant problem at Kalispell (no data presented). It caused a general thinning and stunting of plants instead of the typical bare patches. Stem rust evaluations observed at Ft. Ellis (Bozeman) are the only disease data presented (Table 6).

**SUMMARY:**

Lines H1881 and MT 9409 along with QT 7424, QT 542 and Neeley had overall high average yields at 73 bu/a or higher. With the exception of Boundary, all mean (overall) test weights were above 60 lbs/bu with Crimson, MT9432 and MT9524 averaging above 63 lbs/bu. McGuire, Vanguard, Erhardt, and Tandem topped the 49 entries for protein levels, averaging 13.7% protein or above across the six locations.

**FUTURE PLANS:**

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

Table 1. 1998 Intrastate Winter Wheat Test (Exp. 35): 6 Location Yield (bu/ac)

Entry	Cultivar/Line	+ = new for 1998						6 Loc Average	BYX	RSQ
		Bozeman LAT	Havre LAT	Williston RCB	Kalispell RCB	Moccasin LAT	Conrad LAT			
36	+ H1881	123.5	45.5	50.2	71.4	76.3	89.7	76.1	1.23	0.97
47	+ MT9409	124.7	48.2	55.4	62.6	75.9	83.9	75.1	1.20	0.99
35	Quantum 7424	121.9	51.1	49.0	64.8	74.3	87.4	74.7	1.19	1.00
10	Quantum 542	117.4	50.9	56.5	64.9	68.3	89.8	74.6	1.08	0.98
1	Neeley	119.1	51.2	56.1	58.4	66.9	86.7	73.1	1.12	0.98
6	Judith	119.0	47.8	50.5	55.0	73.3	83.9	71.6	1.19	1.00
37	MT9514	117.6	50.2	49.8	56.4	73.6	81.5	71.5	1.13	0.99
21	Jules	126.4	46.5	47.4	55.5	67.7	80.1	70.6	1.31	0.98
5	Kestrel	119.1	49.2	49.3	55.0	65.6	84.6	70.5	1.19	0.99
38	MT9524	110.9	49.5	47.9	56.9	71.4	86.2	70.5	1.07	0.99
25	Morgan	112.7	46.2	52.3	53.5	69.9	87.8	70.4	1.11	0.98
2	Rocky	107.4	48.3	52.8	59.1	70.6	82.4	70.1	0.97	1.00
17	Blizzard	111.4	48.8	48.4	56.1	68.8	82.9	69.4	1.07	1.00
48	+ MTS9719	109.1	46.4	46.2	61.0	67.8	85.2	69.3	1.06	0.99
13	Promontory	119.8	44.7	40.4	59.4	69.5	79.1	68.8	1.26	0.99
22	MT9432	109.9	48.3	41.9	54.1	74.3	83.0	68.6	1.11	0.98
3	Tiber	104.9	47.7	49.5	59.1	65.6	83.3	68.3	0.96	0.99
23	MTW9441	108.4	47.8	45.4	57.0	68.1	83.3	68.3	1.05	0.99
49	+ MTS9720	112.1	48.6	41.8	61.3	68.0	75.5	67.9	1.08	0.97
28	Akron	113.0	46.8	45.0	58.5	66.5	73.8	67.3	1.08	0.98
18	NuWest	101.7	43.4	45.3	62.2	68.3	80.9	67.0	0.95	0.96
8	Bighorn	110.1	46.4	44.4	53.6	70.2	76.7	66.9	1.08	0.99
9	Norstar	102.9	51.6	53.2	53.2	63.8	73.3	66.3	0.85	0.97
31	ND9272	104.6	48.8	46.8	53.4	64.3	79.9	66.3	0.98	0.99
30	ND9257	101.7	48.7	49.9	52.0	70.6	74.2	66.2	0.89	0.98
15	Manning	114.8	42.7	37.9	55.3	67.9	77.9	66.1	1.23	0.99
44	+ Boundary	107.8	46.8	45.4	54.1	64.6	75.0	65.6	1.03	1.00
33	Crimson	91.9	42.3	53.9	53.5	68.6	82.3	65.4	0.79	0.90
43	+ Utah 100	118.0	41.7	41.6	53.5	62.8	74.1	65.3	1.25	0.99
46	+ S93-7	105.7	45.0	48.6	51.6	64.0	76.7	65.3	1.00	0.99
34	S86-1533	103.9	42.7	49.9	46.4	72.3	75.5	65.1	1.00	0.95
12	Rampart	105.4	48.2	42.4	55.6	66.3	70.2	64.7	0.97	0.97
42	+ Windstar	100.9	44.7	46.5	58.4	61.7	74.9	64.5	0.91	0.99
45	+ ID479	106.4	46.4	45.1	52.5	63.3	72.3	64.3	1.00	0.99
41	+ SD93380	99.3	43.5	44.0	51.8	64.4	79.0	63.6	0.96	0.99
11	Vanguard	103.7	44.8	45.2	52.4	63.2	72.0	63.5	0.98	1.00
39	+ SD92107	99.9	43.3	45.9	49.2	64.4	78.1	63.5	0.97	0.99
26	Niobrara	93.3	44.0	47.2	56.9	61.0	72.8	62.6	0.79	0.98
19	Alliance	96.2	46.1	45.9	55.4	63.2	67.9	62.4	0.82	0.99
32	Tandem	98.2	42.5	44.7	53.5	62.7	71.9	62.2	0.91	1.00
24	Elkhorn	91.2	44.0	50.8	55.7	59.1	71.9	62.1	0.74	0.98
16	Erhardt	99.4	45.5	41.8	42.5	63.0	78.8	61.8	1.00	0.95
40	+ SD93267	88.9	43.8	51.4	52.8	59.3	74.8	61.8	0.73	0.97
29	Pronghorn	89.4	43.5	47.7	54.0	61.7	72.2	61.4	0.75	1.00
4	Redwin	92.7	41.8	40.4	52.0	60.3	77.1	60.7	0.89	0.97
20	Halt	94.9	40.7	41.3	56.3	61.4	69.1	60.6	0.87	0.98
7	Roughrider	89.4	45.2	45.8	53.0	58.9	64.0	59.4	0.71	0.98
14	McGuire	93.9	40.5	42.0	47.2	55.3	75.8	59.1	0.92	0.97
27	Nekota	79.0	42.1	46.0	53.4	50.2	62.1	55.5	0.57	0.94
Average		106.0	46.0	47.1	55.5	66.1	78.0	66.4	1.00	1.00
LSD (0.05)		7.8	4.8	6.1	10.3	7.1	6.9			
C.V.		4.4	5.9	8.0	11.5	6.2	5.1			
F-Test Varieties		15.8**	3.0**	4.0**	1.8*	4.7**	7.0**			

\*\* denotes statistical significance at P &lt;= .01, \* at P &lt;= .05

Table 2. 1998 Intrastate Winter Wheat Test (Exp. 35): 6 Location Test Weight (lb/bu)

+ = new for 1998

Entry	Cultivar/Line	Bozeman	Havre	Williston	Kalispell	Moccasin	Conrad	6 Loc	BYX	RSQ
		RCB	LAT	RCB	Bulk	LAT	Bulk	Average		
33	Crimson	63.6	64.1	64.2	60.7	62.4	64.4	63.2	0.69	0.94
22	MT9432	63.6	64.2	63.7	59.9	62.9	64.0	63.0	0.77	0.95
38	MT9524	63.6	63.9	63.5	60.5	62.6	63.9	63.0	0.64	0.96
13	Promontory	64.8	64.2	63.9	58.5	62.9	63.0	62.9	1.07	0.89
2	Rocky	63.8	64.4	63.7	58.6	61.7	63.7	62.7	1.08	0.99
16	Erhardt	63.5	63.7	63.5	59.8	61.9	63.0	62.6	0.75	0.99
46	+ S93-7	63.7	64.7	64.0	58.0	61.3	63.8	62.6	1.25	0.99
3	Tiber	63.3	64.4	63.5	59.0	61.7	63.1	62.5	0.95	0.99
9	Norstar	62.9	63.9	63.8	60.0	61.7	62.7	62.5	0.71	0.95
10	Quantum 542	63.4	64.1	63.0	58.7	61.8	63.8	62.5	0.98	0.95
40	+ SD93267	62.9	64.1	63.6	58.8	61.3	63.7	62.4	0.99	0.97
7	Roughrider	62.5	63.4	63.3	59.6	61.5	62.5	62.1	0.70	0.98
11	Vanguard	63.2	63.5	63.6	57.9	61.1	63.1	62.1	1.10	1.00
12	Rampart	63.0	64.2	63.2	58.5	60.9	63.0	62.1	1.03	0.97
32	Tandem	63.0	64.2	63.1	58.0	61.6	63.0	62.1	1.09	0.98
17	Blizzard	62.7	63.1	63.0	59.0	61.0	63.2	62.0	0.83	0.98
19	Alliance	62.8	64.2	63.7	57.2	61.4	63.0	62.0	1.27	0.99
25	Morgan	62.4	63.3	62.9	59.5	60.5	63.2	62.0	0.75	0.91
45	+ ID479	63.3	63.4	63.2	58.0	61.1	63.3	62.0	1.07	0.99
21	Jules	63.4	62.9	63.2	56.8	62.0	63.1	61.9	1.21	0.92
28	Akron	63.0	63.6	63.2	57.7	61.0	63.2	61.9	1.13	0.99
29	Pronghorn	62.3	64.1	63.4	58.6	60.3	62.9	61.9	1.00	0.94
35	Quantum 7424	62.8	63.5	63.3	58.3	61.0	62.4	61.9	0.97	0.99
36	+ H1881	62.9	63.7	63.9	57.5	60.0	63.5	61.9	1.27	0.97
4	Redwin	62.6	63.1	62.7	58.3	61.1	63.3	61.8	0.93	0.96
8	Bighorn	62.8	63.5	63.2	57.5	61.2	62.7	61.8	1.13	1.00
18	NuWest	62.6	62.5	62.5	59.6	61.2	62.4	61.8	0.60	0.98
15	Manning	63.9	63.5	63.1	55.9	61.3	62.5	61.7	1.43	0.95
27	Nekota	62.3	64.2	63.2	57.2	60.5	62.5	61.7	1.22	0.97
20	Halt	62.6	63.9	63.4	56.4	60.1	63.0	61.6	1.41	0.99
24	Elkhorn	62.3	62.8	63.2	58.9	60.7	62.0	61.6	0.78	0.97
37	MT9514	62.5	64.0	63.7	57.4	60.4	61.7	61.6	1.18	0.95
48	+ MTS9719	62.4	63.3	62.9	58.7	59.6	62.5	61.6	0.91	0.91
14	McGuire	62.0	63.1	62.7	58.3	60.5	62.6	61.5	0.89	0.98
23	MTW9441	62.2	62.5	62.6	58.3	61.1	62.3	61.5	0.81	0.98
31	ND9272	62.3	63.0	62.8	57.7	60.7	62.2	61.5	0.99	1.00
26	Niobrara	62.1	63.7	62.8	56.9	60.5	62.3	61.4	1.19	0.98
42	+ Windstar	62.6	62.4	62.5	57.7	60.4	62.1	61.3	0.96	0.98
1	Neeley	62.2	63.1	63.0	57.4	60.3	60.8	61.1	1.02	0.92
30	ND9257	62.4	63.0	62.6	56.9	59.8	61.8	61.1	1.16	0.99
34	S86-1533	62.4	62.7	62.6	56.8	60.1	62.1	61.1	1.15	0.99
49	+ MTS9720	61.9	62.3	62.3	58.6	60.4	61.3	61.1	0.70	0.97
41	+ SD93380	61.8	62.8	62.2	56.9	60.0	62.0	61.0	1.09	1.00
47	+ MT9409	61.4	62.5	62.8	57.7	60.2	61.6	61.0	0.92	0.97
5	Kestrel	62.2	62.7	62.9	56.4	60.1	60.9	60.9	1.19	0.96
6	Judith	62.4	62.4	62.2	56.8	60.1	61.8	60.9	1.08	0.99
39	+ SD92107	61.8	62.9	62.2	56.3	59.6	61.7	60.8	1.21	0.99
43	+ Utah 100	61.8	61.6	61.1	59.0	59.9	60.8	60.7	0.50	0.87
44	+ Boundary	61.6	59.4	61.8	54.3	58.9	60.3	59.4	1.24	0.84
Average		62.7	63.3	63.1	58.1	60.9	62.6	61.8	1.00	1.00
LSD (0.05)		7.8	0.8	0.7		0.7				
C.V.		4.4	0.8	0.6		0.6				
F-Test Varieties		15.8**	9.5**	5.4**		13.8**				

\*\* denotes statistical significance at P <= .01

**Table 3. 1998 Intrastate Winter Wheat Test (Exp. 35): 6 Location Protein (%)**  
 += new for 1998

Entry	Cultivar/Linc	Bozeman Bulk	Havre Bulk	Williston Bulk	Kalispell Bulk	Moccasin Bulk	Conrad Bulk	6 Loc Average	BYX	RSQ
14	McGuire	15.9	15.6	15.5	11.2	13.6	13.4	14.2	1.22	0.98
11	Vanguard	15.3	13.9	16.0	11.2	13.2	12.9	13.8	1.10	0.87
16	Erhardt	14.6	15.1	15.5	11.3	13.5	12.3	13.7	1.10	0.95
32	Tandem	16.3	14.2	14.3	11.1	13.5	12.9	13.7	1.06	0.82
4	Redwin	15.4	14.8	14.2	11.7	13.5	11.7	13.6	0.98	0.85
12	Rampart	14.9	14.5	14.7	11.0	13.4	13.1	13.6	0.98	0.97
29	Pronghorn	15.6	14.5	13.9	10.8	13.6	13.1	13.6	1.01	0.85
41	+ SD93380	15.1	14.6	15.2	10.8	12.7	13.0	13.6	1.14	0.95
27	Nekota	15.4	13.2	13.4	10.9	14.2	14.0	13.5	0.70	0.47
39	+ SD92107	15.0	14.2	14.4	11.3	13.4	12.7	13.5	0.90	0.97
33	Crimson	15.0	14.7	15.3	10.8	13.3	11.4	13.4	1.28	0.95
40	+ SD93267	15.7	15.0	13.3	10.6	13.3	12.4	13.4	1.11	0.80
3	Tiber	14.7	13.7	14.8	10.8	13.1	12.8	13.3	0.97	0.93
7	Roughrider	14.6	14.7	14.0	10.5	13.1	12.8	13.3	1.03	0.93
20	Halt	14.6	13.6	13.2	10.7	14.3	13.0	13.2	0.75	0.63
8	Bighorn	13.9	14.1	14.1	10.7	13.9	11.9	13.1	0.92	0.88
17	Blizzard	14.5	14.8	15.0	10.5	12.5	11.6	13.1	1.26	0.96
22	MT9432	14.2	14.5	15.5	10.9	12.1	11.2	13.1	1.21	0.86
31	ND9272	14.1	14.7	14.7	11.1	13.1	11.1	13.1	1.07	0.88
38	MT9524	14.3	14.3	15.7	10.7	12.0	11.8	13.1	1.22	0.88
43	+ Utah 100	13.2	13.6	15.3	11.1	13.6	11.7	13.1	0.87	0.72
42	+ Windstar	13.8	13.7	14.6	10.8	12.8	12.6	13.0	0.87	0.93
49	+ MTS9720	13.8	14.2	15.1	10.0	12.2	12.5	13.0	1.17	0.90
18	NuWest	13.9	14.3	15.2	10.7	12.3	11.1	12.9	1.17	0.89
23	MTW9441	14.0	14.4	15.5	10.5	11.6	11.6	12.9	1.24	0.86
24	Elkhorn	14.6	14.1	13.2	10.7	13.0	12.0	12.9	0.91	0.89
30	ND9257	14.3	13.9	13.7	11.0	12.6	12.1	12.9	0.84	0.97
19	Alliance	14.6	12.8	12.9	9.9	13.7	12.7	12.8	0.85	0.63
25	Morgan	14.0	13.9	15.0	10.6	12.6	10.7	12.8	1.17	0.88
35	Quantum 7424	13.8	13.9	13.8	10.0	12.6	13.0	12.8	0.94	0.86
45	+ ID479	14.5	13.7	13.4	10.4	13.2	11.5	12.8	0.99	0.91
9	Norstar	14.0	13.6	14.2	10.9	12.0	11.8	12.7	0.90	0.94
26	Niobrara	14.6	12.8	13.0	10.1	13.3	12.2	12.7	0.87	0.74
6	Judith	14.1	13.8	13.9	10.3	12.4	11.1	12.6	1.08	0.97
10	Quantum 542	14.1	13.9	13.3	10.2	12.3	11.7	12.6	0.99	0.96
15	Manning	13.2	13.2	14.3	10.8	12.8	11.4	12.6	0.82	0.88
28	Akron	13.2	13.2	14.4	10.0	12.3	11.5	12.4	1.01	0.93
34	S86-1533	13.5	13.8	13.1	10.5	11.9	11.4	12.4	0.86	0.94
13	Promontory	12.8	13.1	14.1	10.7	11.9	11.5	12.3	0.77	0.86
44	+ Boundary	12.7	14.1	13.1	10.6	11.8	11.5	12.3	0.76	0.80
48	+ MTS9719	13.4	13.3	14.2	9.3	12.0	11.0	12.2	1.22	0.98
2	Rocky	13.8	13.5	12.9	9.9	11.7	10.4	12.0	1.06	0.91
46	+ S93-7	13.2	13.1	13.2	9.6	11.9	10.2	11.9	1.07	0.95
47	+ MT9409	12.9	13.2	14.4	9.6	11.1	10.4	11.9	1.18	0.88
5	Kestrel	12.6	13.3	11.8	9.3	11.4	11.4	11.6	0.83	0.80
36	+ H1881	12.6	12.2	12.6	9.4	12.1	10.8	11.6	0.83	0.93
21	Jules	11.8	12.6	12.2	9.5	11.3	11.7	11.5	0.65	0.77
1	Neeley	12.4	12.8	12.8	9.0	10.9	10.3	11.4	1.05	0.98
37	MT9514	11.8	12.8	12.3	8.3	11.1	11.1	11.2	1.00	0.86
Average		14.1	13.9	14.1	10.5	12.7	11.9	12.8	1.00	1.00

Table 4. 1998 Intrastate Winter Wheat Test (Exp. 35): 6 Location Heading Date (Julian)

+ = new for 1998

Entry	Cultivar/Line	Bozeman LAT	Havre LAT	Williston RCB	Kalispell RCB	Moccasin LAT	Conrad 1 rep	6 Loc Average	BYX	RSQ
9	Norstar	174.0	160.4	154.0	156.3	167.5	163.0	162.5	0.93	0.93
44	+ Boundary	173.5	158.3	151.0	149.7	170.2	159.0	160.3	1.26	0.98
48	+ MTS9719	170.9	158.6	151.0	152.3	166.8	161.0	160.1	1.01	0.98
17	Blizzard	171.5	157.3	151.0	150.7	167.1	162.0	159.9	1.10	0.98
37	MT9514	170.4	160.3	152.7	149.7	165.2	161.0	159.9	0.99	0.97
24	Elkhorn	170.4	157.6	149.3	153.7	164.9	161.0	159.5	0.96	0.93
25	Morgan	170.7	156.3	149.0	152.0	166.8	162.0	159.5	1.08	0.95
23	MTW9441	169.5	158.9	150.3	151.0	165.8	161.0	159.4	1.00	0.99
49	+ MTS9720	168.0	159.0	152.0	151.3	166.5	159.0	159.3	0.91	0.99
1	Neeley	167.8	157.7	150.7	152.7	165.5	160.0	159.1	0.88	0.98
43	+ Utah 100	168.0	157.0	149.3	150.0	167.5	160.0	158.6	1.06	0.99
18	NuWest	168.2	158.9	148.3	150.3	165.1	159.0	158.3	1.01	0.98
3	Tiber	167.3	158.6	149.3	149.3	164.1	160.0	158.1	0.97	0.99
5	Kestrel	167.2	158.1	151.3	149.3	163.8	159.0	158.1	0.90	0.99
47	+ MT9409	169.0	158.5	149.7	148.0	163.7	160.0	158.1	1.04	0.98
4	Redwin	168.1	158.5	148.7	148.0	164.2	160.0	157.9	1.05	0.98
7	Roughrider	167.3	156.9	147.3	148.7	164.7	160.0	157.5	1.06	0.98
38	MT9524	167.4	156.7	149.7	148.0	163.8	158.0	157.3	0.99	1.00
30	ND9257	167.4	155.2	147.7	148.0	164.7	160.0	157.2	1.08	0.98
16	Erhardt	165.8	156.4	148.0	147.3	164.4	160.0	157.0	1.03	0.98
22	MT9432	167.0	157.8	147.3	148.3	164.2	157.0	156.9	1.04	0.98
12	Rampart	164.5	156.5	147.3	146.3	164.3	158.0	156.1	1.02	0.98
8	Bighorn	164.5	155.0	147.0	148.7	164.0	157.0	156.0	0.95	0.98
15	Manning	164.4	154.4	147.3	146.7	164.4	159.0	156.0	1.03	0.98
33	Crimson	163.8	154.4	147.0	147.3	163.4	158.0	155.6	0.96	0.98
21	Jules	164.5	155.5	147.3	146.3	162.5	157.0	155.5	0.98	0.99
11	Vanguard	164.7	155.2	147.0	145.3	163.5	157.0	155.4	1.05	0.99
39	+ SD92107	164.4	155.4	147.0	147.0	162.7	155.0	155.3	0.97	0.99
13	Promontory	163.4	153.2	147.7	146.3	162.7	158.0	155.2	0.95	0.98
6	Judith	164.0	153.7	146.7	146.0	162.5	158.0	155.1	1.00	0.98
2	Rocky	164.0	154.2	146.7	145.7	162.2	157.0	154.9	1.00	1.00
34	S86-1533	163.1	153.9	147.0	146.0	162.4	157.0	154.9	0.96	0.99
31	ND9272	164.0	154.5	146.7	145.7	162.5	155.0	154.7	1.00	1.00
45	+ ID479	163.4	154.5	146.7	145.7	161.7	154.0	154.3	0.95	0.99
42	+ Windstar	163.3	154.5	146.3	145.7	160.8	154.0	154.1	0.94	0.99
10	Quantum 542	163.3	151.7	146.7	145.0	161.4	154.0	153.7	0.97	0.99
35	Quantum 7424	162.4	153.3	146.0	141.7	160.8	154.0	153.0	1.05	0.98
28	Akron	162.4	152.5	146.0	144.0	159.8	152.0	152.8	0.94	0.98
32	Tandem	162.6	153.9	146.0	142.7	160.8	151.0	152.8	1.01	0.95
41	+ SD93380	162.8	152.3	146.0	143.3	159.9	151.0	152.5	0.98	0.97
14	McGuire	161.7	149.8	144.7	143.7	160.0	152.0	152.0	0.98	0.99
46	+ S93-7	161.3	151.1	145.7	142.7	158.1	153.0	152.0	0.92	0.98
26	Niobrara	161.6	151.6	145.3	140.7	159.8	152.0	151.8	1.04	0.98
40	+ SD93267	161.9	151.4	146.0	141.7	159.1	150.0	151.7	0.98	0.95
36	+ H1881	160.9	150.0	145.7	141.7	159.7	150.0	151.3	0.98	0.96
27	Nekota	161.0	150.9	144.0	140.0	159.6	151.0	151.1	1.07	0.98
29	Pronghorn	160.0	148.1	144.3	142.3	158.9	152.0	150.9	0.95	0.97
19	Alliance	160.4	151.0	144.7	139.0	158.4	151.0	150.7	1.03	0.96
20	Halt	160.4	150.7	144.7	140.0	157.3	150.0	150.5	0.97	0.96
Average		165.5	155.1	147.8	146.8	163.1	156.7	155.8	1.00	1.00
LSD (0.05)		1.0	2.7	2.1	1.1	1.2				
C.V.		0.3	1.0	4.6	0.4	0.4				
F-Test Varieties		110.4**	10.1**	9.8**	106.4**	43.3**				

\*\* denotes statistical significance at  $P \leq .01$

Table 5. 1998 Intrastate Winter Wheat Test (Exp. 35): 6 Location Plant Height (in)

+ = new for 1998

Entry	Cultivar/Line	Bozeman	Havre	Williston	Kalispell	Moccasin	Conrad	6 Loc	BYX	RSQ
		LAT	RCB	RCB	RCB	LAT	LAT	Average		
9	Norstar	52.5	28.1	33.1	44.2	44.6	40.4	40.5	1.27	0.97
7	Roughrider	44.5	24.5	28.1	41.6	41.6	38.0	36.4	1.18	0.96
24	Elkhorn	45.5	22.6	26.5	40.6	38.5	40.9	35.8	1.32	0.97
48	+ MTS9719	43.3	24.1	28.1	38.0	37.0	36.3	34.5	1.04	1.00
4	Redwin	43.1	23.7	26.8	38.2	37.5	36.4	34.3	1.09	0.99
38	MT9524	42.1	23.4	28.2	37.7	36.9	35.7	34.0	1.01	0.99
37	MT9514	43.2	25.3	26.7	34.9	37.2	36.0	33.9	0.99	0.98
5	Kestrel	42.8	23.3	25.9	34.4	36.3	37.1	33.3	1.07	0.98
1	Necley	42.9	22.6	27.3	34.4	35.1	36.7	33.2	1.05	0.97
22	MT9432	41.7	21.9	26.7	37.3	36.6	35.0	33.2	1.09	0.99
30	ND9257	42.9	22.5	25.9	32.8	38.7	35.9	33.1	1.11	0.94
40	+ SD93267	41.9	25.3	26.5	36.0	34.2	34.7	33.1	0.91	0.98
3	Tiber	43.3	22.7	24.9	36.4	34.7	36.0	33.0	1.14	0.99
43	+ Utah 100	40.6	23.2	28.1	35.3	35.9	34.0	32.8	0.91	0.98
49	+ MTS9720	41.2	20.6	26.3	37.3	36.7	34.7	32.8	1.13	0.98
18	NuWest	40.4	23.7	25.1	35.8	35.1	36.0	32.7	0.98	0.98
6	Judith	41.6	23.5	25.5	33.3	35.9	36.0	32.6	1.00	0.97
10	Quantum 542	40.9	21.1	26.3	37.9	34.8	34.6	32.6	1.08	0.96
17	Blizzard	42.3	22.0	26.1	34.2	35.0	34.6	32.4	1.06	0.99
25	Morgan	39.0	22.5	26.7	33.6	35.6	37.3	32.4	0.92	0.93
23	MTW9441	39.6	22.3	25.5	35.2	35.1	35.3	32.1	0.99	0.99
2	Rocky	40.0	20.7	23.7	36.4	34.0	34.9	31.6	1.11	0.98
11	Vanguard	39.6	21.0	25.7	33.0	35.7	33.0	31.3	0.99	0.98
12	Rampart	39.5	22.3	24.8	33.3	35.0	33.0	31.3	0.96	1.00
39	+ SD92107	40.4	19.7	23.4	34.1	34.1	33.8	30.9	1.14	0.99
31	ND9272	40.3	22.0	22.7	31.5	34.9	32.7	30.7	1.03	0.96
33	Crimson	38.9	21.4	23.1	34.3	34.5	32.4	30.7	1.02	0.99
29	Pronghorn	38.0	22.5	24.7	34.9	31.2	32.2	30.6	0.86	0.96
42	+ Windstar	38.2	22.3	24.4	33.2	32.3	32.3	30.5	0.88	1.00
15	Manning	39.7	22.2	24.5	31.5	32.7	31.7	30.4	0.91	0.97
26	Niobrara	40.4	22.0	23.4	32.4	32.7	31.4	30.4	0.99	0.97
45	+ ID479	37.4	20.6	24.8	35.0	32.6	31.7	30.4	0.93	0.97
46	+ S93-7	39.9	20.3	23.1	33.1	32.2	33.6	30.4	1.07	0.99
32	Tandem	41.1	20.0	21.9	34.0	33.1	31.1	30.2	1.16	0.98
16	Erhardt	39.2	21.5	23.1	31.5	32.3	33.0	30.1	0.97	0.98
13	Promontory	39.4	20.7	25.5	31.5	32.4	30.7	30.0	0.93	0.97
47	+ MT9409	37.9	20.4	24.4	32.0	33.0	32.3	30.0	0.94	0.99
28	Akron	39.4	19.5	22.7	32.2	31.7	30.7	29.4	1.05	0.99
36	+ H1881	36.2	21.4	23.9	32.7	30.7	31.3	29.4	0.82	0.98
41	+ SD93380	38.2	20.1	21.4	32.4	33.1	31.0	29.4	1.04	0.99
14	McGuire	36.6	21.5	22.2	32.8	31.6	31.3	29.3	0.89	0.98
34	S86-1533	37.0	18.7	22.6	29.9	33.8	32.4	29.0	1.02	0.96
19	Alliance	36.2	21.6	22.7	29.7	31.7	30.7	28.8	0.82	0.99
21	Jules	35.9	20.6	22.6	31.0	31.3	30.7	28.7	0.86	0.99
35	Quantum 7424	37.0	19.7	21.8	31.1	31.2	31.4	28.7	0.97	0.99
44	+ Boundary	34.8	19.4	21.9	29.1	28.9	29.6	27.3	0.83	1.00
8	Bighorn	35.1	19.4	21.9	28.7	29.5	28.4	27.2	0.83	0.99
27	Nekota	35.8	19.7	21.3	29.7	29.0	27.6	27.2	0.86	0.97
20	Halt	33.5	19.7	20.8	30.4	26.6	26.7	26.3	0.76	0.93
Average		40.0	21.8	24.8	34.1	34.2	33.5	31.4	1.00	1.00
LSD (0.05)		2.2	1.9	2.4	2.5	1.9	1.8			
C.V.		3.2	5.4	6.1	4.5	3.3	3.3			
F-Test Varieties		17.6**	7.2**	7.3**	13.4**	21.7**	20.8**			

\*\* denotes statistical significance at  $P \leq .01$

Table 6. 1998 Intrastate Winter Wheat Test (Exp. 35):

## Ft. Ellis Stem Rust Evaluations

Entry	Cultivar/Line + = new for 1998	Stem Rust 11-Aug
1	Neeley	S
2	Rocky	R
3	Tiber	S
4	Redwin	S
5	Kestrel	S
6	Judith	R
7	Roughrider	R
8	Bighorn	R
9	Norstar	S
10	Quantum 542	S
11	Vanguard	MS
12	Rampart	MR
13	Promontory	S
14	McGuire	R
15	Manning	S
16	Erhardt	R
17	Blizzard	S
18	NuWest	R
19	Alliance	R
20	Halt	S
21	Jules	R
22	MT9432	R
23	MTW9441	R
24	Elkhorn	R
25	Morgan	R
26	Niobrara	MS
27	Nekota	R
28	Akron	MS
29	Pronghorn	R
30	ND9257	R
31	ND9272	R
32	Tandem	R
33	Crimson	MR
34	S86-1533	MR
35	Quantum 7424	R
36	+ H1881	R
37	MT9514	R
38	MT9524	R
39	+ SD92107	R
40	+ SD93267	R
41	+ SD93380	R
42	+ Windstar	R
43	+ Utah 100	S
44	+ Boundary	S
45	+ ID479	S
46	+ S93-7	S
47	+ MT9409	R
48	+ MTS9719	MS
49	+ MTS9720	R

<b>R = resistant</b>
<b>MR = moderately resistant</b>
<b>MS = moderately susceptible</b>
<b>S = susceptible</b>