

PROJECT TITLE: 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 1999 Intrastate Winter Wheat Test was grown in Bozeman, Havre, Sidney, Kalispell, Moccasin, Huntley and Williston, ND. The Conrad nursery was abandoned in late spring due to poor stands resulting from poor fall emergence.

The 1999 crop year was the smallest winter wheat crop seeded since 1937. Poor prices and low moisture conditions present during seeding were to blame. November precipitation was above normal for most of the state. December through the first half of April, most areas of the state experienced mild and dry conditions, although most locations in Montana had average rainfall up to heading. After heading, drier weather conditions persisted in most locations, however Sidney and Kalispell had greater than average summer rainfall.

Yields in 1999 were greater than the 10-year average at all stations, except Huntley, which was average (Table 1). Test weights were average to above average at all locations (Table 2). Protein was average to below average at all locations except Huntley, which averaged 16% (Table 3). Huntley was the earliest location to head and Bozeman was the latest (Table 4). Williston had the shortest average plant height while Bozeman was the tallest (Table 5). Due to the relatively mild winter, there was very little winterkill or stand reduction at any of the locations except Williston (which had very little effect of final yields) (Table 6). Fidel (a herbicide resistant variety from France) showed the greatest winterkill and had severely reduced stands at all locations except Bozeman.

SUMMARY:

Experimental lines Quantum 7424, Quantum 7406, MT 9426 and AP7510 were the top yielding lines averaging better than 90.5 bu/a across all locations. All but three lines had test weights of 60 lbs/bu across locations, and Nuplains, Promontory, Erhardt and Crimson averaged 63 lbs/bu. Vanguard, Redwin, McGuire, Erhardt and Rampart all averaged 13.0% protein or more across the seven locations.

FUTURE PLANS:

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

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Table 1. 1999 Intrastate Winter Wheat Test (Exp. 35): 7 Location Yield (bu/a)

Entry	Cultivar/Line	Location							7 Loc Average	BYX	RSQ
		Jensen	Havre	Sidney	Williston	Kallispell	Moccasin	Huntley			
		LAT	LAT	LAT	LAT	LAT	LAT	LAT			
44	Quantum 7424	130.0	77.5	73.8	74.1	166.5	68.5	79.5	95.7	1.12	1.00
45	+ Quantum 7406	123.6	83.0	67.0	71.9	166.0	70.8	82.1	94.9	1.08	0.98
46	+ MT9426	111.2	70.0	75.7	77.4	166.3	71.1	70.4	91.7	1.05	0.96
28	+ AP7510	128.6	72.2	63.5	64.2	161.6	61.4	83.8	90.8	1.16	0.99
24	Akron	110.4	76.2	67.8	62.2	167.0	69.4	69.2	87.4	1.02	0.97
18	Promontory	130.7	78.3	56.4	51.1	156.8	60.3	75.5	87.0	1.18	0.94
19	Manning	128.6	70.7	56.0	54.6	161.3	57.0	80.6	87.0	1.23	0.97
49	+ MTS97104	113.6	76.2	62.0	74.1	154.8	59.4	68.8	87.0	1.02	0.96
6	Quantum 542	120.6	60.7	69.5	64.3	154.9	60.0	74.4	86.4	1.10	1.00
43	MT9409	103.2	72.5	67.4	73.0	155.7	63.2	67.9	86.1	0.98	0.96
47	+ MT9513	107.0	70.1	69.3	66.1	160.8	66.7	62.6	86.1	1.06	0.96
7	Kestrel	111.3	60.8	65.2	63.4	160.5	61.9	76.2	85.6	1.12	1.00
21	Utah 100	137.6	72.4	52.0	43.2	165.3	60.4	68.6	85.6	1.35	0.94
1	Neeley	113.8	64.6	65.4	67.5	157.6	63.4	65.2	85.4	1.09	0.99
23	Halt	114.3	66.6	61.3	67.1	148.7	62.5	74.4	85.0	1.00	1.00
17	MTS9720	98.1	70.6	74.2	68.3	153.9	60.5	62.1	83.9	0.96	0.93
26	+ Culver	110.9	63.3	56.1	64.2	153.2	56.9	78.1	83.2	1.07	0.98
42	MT9524	101.5	64.4	66.5	67.6	153.5	56.6	69.1	82.8	1.01	0.97
32	+ ID513	117.0	62.9	53.6	62.9	148.2	59.8	74.6	82.7	1.06	0.98
37	Nuwest	109.4	62.3	62.8	68.7	147.7	54.2	70.5	82.2	1.01	0.99
13	Bighorn	91.4	76.7	64.9	51.7	151.9	63.0	68.1	81.1	0.95	0.90
38	MTW9441	104.8	61.1	64.5	64.0	141.5	62.7	64.1	80.4	0.92	0.99
5	Judith	110.4	64.0	50.9	56.4	139.3	59.8	81.6	80.3	0.96	0.95
25	Pronghorn	109.9	58.0	58.2	59.7	142.6	54.6	76.7	80.0	1.00	0.99
34	Crimson	102.2	61.7	63.7	62.2	138.5	59.7	71.3	79.9	0.89	1.00
27	ND9257	100.6	49.1	71.5	58.4	147.6	62.0	68.0	79.6	0.99	0.95
48	+ MTW9724	122.4	47.2	63.8	55.8	146.0	54.9	65.7	79.4	1.13	0.97
41	BigSky (MT9432)	96.5	64.7	60.6	66.2	144.0	55.5	67.6	79.3	0.92	0.97
20	Blizzard	110.8	56.6	58.7	61.1	141.7	55.8	69.9	79.2	1.00	0.99
16	MTS9719	95.1	46.9	60.8	70.9	151.9	65.1	62.1	79.0	1.01	0.92
35	SD92107	101.8	64.6	65.4	64.2	134.6	50.1	69.0	79.0	0.88	0.98
8	Morgan	103.2	59.5	71.8	63.3	134.6	57.8	65.1	78.9	0.84	0.98
39	+ ID537	121.7	61.3	57.8	52.0	139.6	58.2	62.0	78.9	1.05	0.96
2	Rocky	110.3	57.4	58.7	54.8	141.9	54.7	72.5	78.6	1.02	0.99
3	Tiber	99.6	59.1	58.2	67.7	145.4	52.5	65.6	78.3	0.98	0.97
10	Erhardt	111.6	52.6	64.3	58.1	143.4	51.1	66.1	78.2	1.05	0.99
29	Windstar	99.5	46.4	57.8	57.4	155.1	50.8	74.6	77.4	1.13	0.96
22	McGuire	98.5	63.8	56.4	57.7	139.4	51.6	70.1	76.8	0.94	0.99
30	+ Ransom	108.8	42.0	64.9	66.4	130.1	54.6	67.4	76.3	0.90	0.92
40	+ Nuplains	110.6	55.1	61.1	52.5	132.7	48.9	69.6	75.8	0.96	0.97
36	SD93267	106.0	48.1	57.5	64.1	130.3	47.3	73.2	75.2	0.92	0.96
4	Redwin	99.1	52.0	55.7	59.9	132.8	52.0	65.3	73.8	0.91	0.99
33	Tandem	97.2	51.8	54.1	54.8	131.0	51.4	75.3	73.6	0.89	0.96
14	Vanguard	102.2	48.7	55.9	57.5	130.6	46.1	60.2	71.6	0.95	0.99
12	Roughrider	92.9	37.0	60.2	57.8	128.2	45.5	64.5	69.4	0.91	0.94
11	Elkhorn	86.1	38.8	62.3	62.7	125.7	47.7	57.6	68.7	0.83	0.91
15	Rampart	104.6	51.9	47.8	28.4	129.2	53.4	64.3	68.5	1.02	0.92
9	Norstar	76.9	36.0	64.1	65.5	126.0	50.4	55.1	67.7	0.79	0.84
31	+ Fidel	119.4	48.5	22.7	0.0	49.5	40.3	20.0	42.9	0.60	0.28
Average		108.5	60.3	61.2	60.4	144.4	57.2	68.7	80.1	1.00	1.00
LSD (0.05)		8.0	9.7	7.3	11.6	10.0	6.6	7.2			
C.V.		4.2	9.4	6.8	11.9	4.0	6.7	6.1			
F-Test Varieties		18.5**	11.7**	10.8**		28.2**	8.78**	14.9**			

** denotes statistical significance at P <= .01

Table 2. 1999 Intrastate Winter Wheat Test (Exp. 35): 7 Location Test Weight (lb/bu)

+ = new for 1999

ntry	Cultivar/Line	Bozeman RCB	Havre RCB	Sidney RCB	Williston RCB	Kalspell RCB	Moccasin LAT	Huntley LAT	7 Loc Average	BYX	RSQ
40	+ Nuplains	61.2	64.5	65.8	63.8	61.4	62.4	62.3	63.1	1.14	0.86
18	Promontory	61.9	64.0	65.0	64.0	60.8	61.1	61.9	62.7	1.06	0.82
10	Erhardt	61.3	63.0	64.8	63.3	61.7	61.9	62.0	62.6	0.85	0.96
34	Crimson	61.8	62.2	64.8	63.3	62.6	61.2	62.4	62.6	0.74	0.78
4	Redwin	61.5	62.2	62.8	63.0	62.1	60.0	62.6	62.0	0.46	0.41
20	Blizzard	61.3	62.1	62.2	63.5	61.8	60.3	63.0	62.0	0.37	0.24
41	BigSky (MT9432)	60.2	62.7	64.5	63.1	62.1	60.5	61.2	62.0	1.04	0.92
3	Tiber	61.1	61.5	63.0	63.5	61.3	60.5	62.2	61.9	0.61	0.65
36	SD93267	60.7	62.0	64.3	63.4	60.4	60.0	62.3	61.9	1.02	0.80
42	MT9524	60.4	61.9	64.0	63.4	62.4	60.6	60.9	61.9	0.92	0.84
1	Neeley	60.1	62.5	64.0	63.4	61.3	61.4	60.1	61.8	1.04	0.91
2	Rocky	61.0	62.1	64.3	62.2	60.7	60.9	61.1	61.8	0.85	0.87
28	+ AP7510	59.9	62.9	64.3	62.8	60.2	60.9	61.4	61.8	1.09	0.89
33	Tandem	61.1	61.7	63.7	62.6	60.0	61.5	62.4	61.8	0.63	0.56
45	+ Quantum 7406	60.3	62.7	64.7	62.3	60.0	61.7	60.1	61.7	1.10	0.80
7	Kestrel	59.6	61.8	64.0	62.9	61.4	60.6	60.6	61.6	1.04	0.96
6	Quantum 542	61.0	62.2	64.3	62.8	60.5	60.4	59.2	61.5	1.11	0.82
22	McGuire	60.6	62.2	63.7	62.4	60.6	60.5	60.6	61.5	0.87	0.96
23	Halt	59.4	62.3	64.8	62.4	59.9	61.5	60.2	61.5	1.25	0.86
25	Pronghorn	60.0	61.8	64.3	62.8	59.6	60.5	60.6	61.4	1.18	0.94
37	Nuwest	59.8	61.4	63.0	62.9	60.5	60.2	61.1	61.3	0.86	0.91
13	Bighorn	57.5	62.5	63.5	62.7	59.8	61.1	61.1	61.2	1.23	0.71
32	+ ID513	60.1	61.3	62.7	62.9	59.5	60.6	61.1	61.2	0.79	0.77
8	Morgan	59.3	61.5	63.5	62.6	59.6	60.3	60.8	61.1	1.06	0.93
38	MTW9441	59.9	61.3	62.7	62.7	60.5	60.0	60.5	61.1	0.81	0.94
44	Quantum 7424	59.8	62.2	63.7	62.3	59.8	60.5	59.6	61.1	1.09	0.92
9	Norstar	60.6	59.4	62.8	62.8	61.6	58.8	61.2	61.0	0.69	0.38
12	Roughrider	60.2	59.5	64.2	62.5	60.4	58.9	61.4	61.0	1.01	0.60
14	Vanguard	59.9	60.6	64.2	62.3	59.8	58.6	61.4	61.0	1.14	0.74
30	+ Ransom	60.4	61.1	63.7	62.1	60.0	59.9	60.1	61.0	0.95	0.91
5	Judith	59.6	61.7	62.7	61.4	60.2	60.8	59.8	60.9	0.74	0.86
11	Elkhorn	59.5	61.3	63.0	62.2	60.1	58.5	61.5	60.9	0.95	0.71
19	Manning	59.2	62.0	64.0	62.9	58.5	59.6	59.8	60.9	1.43	0.91
26	+ Culver	59.2	61.5	62.8	62.1	60.1	60.5	59.5	60.8	0.94	0.93
15	Rampart	59.6	60.8	63.7	60.4	60.1	59.5	61.0	60.7	0.80	0.63
27	ND9257	58.5	61.1	64.0	61.4	59.2	60.1	59.5	60.5	1.25	0.91
46	+ MT9426	57.6	61.5	63.3	62.0	60.8	61.1	57.2	60.5	1.31	0.65
16	MTS9719	57.6	60.9	63.0	61.6	60.0	59.7	59.0	60.3	1.20	0.90
29	Windstar	58.9	61.1	63.3	62.4	58.3	59.0	59.3	60.3	1.34	0.93
24	Akron	58.8	60.3	62.5	61.3	59.7	59.9	58.0	60.1	0.98	0.83
47	+ MT9513	57.3	60.7	63.0	61.9	59.9	60.3	57.4	60.1	1.34	0.78
35	SD92107	59.3	60.6	63.0	62.0	58.3	57.0	60.1	60.0	1.27	0.75
48	+ MTW9724	58.2	59.6	63.5	62.0	59.3	59.5	58.3	60.0	1.34	0.91
21	Utah 100	58.6	61.2	60.3	60.4	60.6	59.3	58.3	59.8	0.47	0.38
43	MT9409	56.7	60.7	62.5	61.1	60.0	59.8	58.1	59.8	1.22	0.78
17	MTS9720	56.9	60.1	62.8	61.6	59.8	59.6	56.1	59.5	1.47	0.75
39	+ ID537	58.2	59.3	61.7	60.2	59.8	58.6	57.5	59.3	0.86	0.77
49	+ MTS97104	57.8	60.2	60.5	61.0	59.5	57.9	58.0	59.3	0.85	0.77
31	+ Fidel	56.7	58.7	57.9	-	58.4	55.5	52.9	56.7	-	-
Average		59.6	61.5	63.4	62.4	60.3	60.1	60.1	61.0	1.00	1.00
LSD (0.05)		0.7	1.2	0.7	0.9	0.6	0.8	1.1			
C.V.		0.7	1.2	0.7	0.8	0.6	0.7	1.0			
F-Test Varieties		27.7**	7.16**	30.3**		23.1**	21.0**	26.8**			

** denotes statistical significance at P <= .01

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Table 3. 1999 Intrastate Winter Wheat Test (Exp. 35): 7 Location Protein (%)
 + = new for 1999

Entry	Cultivar/Line	Bozeman Bulk	Havre Bulk	Sidney LAT	Williston RCB	Kalispell Bulk	Moccasin Bulk	Huntley Bulk	7 Loc Average	BYX	RSQ
14	Vanguard	15.0	12.4	10.4	13.1	12.6	13.6	16.8	13.4	0.97	0.96
4	Redwin	15.0	12.5	10.6	13.3	12.5	12.9	16.4	13.3	0.90	0.97
22	McGuire	15.4	11.0	11.1	14.0	12.3	13.1	16.3	13.3	0.94	0.91
10	Erhardt	14.3	12.0	11.3	13.2	12.0	12.6	16.8	13.2	0.89	0.97
15	Rampart	14.8	10.3	10.0	13.6	*12.9	12.8	16.8	13.0	1.11	0.93
42	MT9524	14.2	11.9	10.0	13.2	11.9	11.8	17.0	12.9	1.06	0.96
12	Roughrider	14.2	12.5	10.0	12.8	11.8	11.9	16.5	12.8	0.96	0.92
31	+ Fidel	13.0	11.3	10.7	-	13.0	13.7	15.4	12.8	0.00	0.00
33	Tandem	15.0	11.1	11.0	12.4	12.3	12.6	15.5	12.8	0.82	0.93
36	SD93267	14.9	11.6	10.6	11.5	12.5	13.0	15.5	12.8	0.82	0.87
41	BigSky (MT9432)	14.4	11.8	9.8	12.9	12.0	11.9	17.1	12.8	1.11	0.97
40	+ Nuplains	13.7	11.2	10.9	12.9	11.4	12.5	16.4	12.7	0.90	0.95
11	Elkhorn	14.6	11.6	9.3	11.8	12.3	12.5	16.2	12.6	1.04	0.94
34	Crimson	14.2	11.5	10.8	12.0	11.6	12.1	15.8	12.6	0.85	0.97
35	SD92107	14.4	10.5	10.2	12.1	12.1	12.6	16.4	12.6	1.04	0.98
13	Bighorn	13.6	10.7	9.7	13.3	11.3	12.1	16.5	12.5	1.06	0.95
3	Tiber	14.1	11.0	9.0	12.0	12.2	12.1	16.1	12.4	1.07	0.96
9	Norstar	14.6	11.8	8.7	12.4	12.3	11.6	15.7	12.4	1.02	0.88
20	Blizzard	14.0	10.5	9.8	12.2	12.3	11.6	16.1	12.4	1.02	0.98
28	+ AP7510	13.6	11.4	10.8	12.6	11.3	12.0	15.3	12.4	0.74	0.96
38	MTW9441	13.6	10.0	10.1	13.6	11.1	11.6	16.9	12.4	1.13	0.90
25	Pronghorn	14.4	11.0	11.2	11.2	11.3	11.3	15.3	12.2	0.80	0.84
37	Nuwest	13.3	10.2	10.5	13.6	11.3	11.3	15.0	12.2	0.79	0.82
39	+ ID537	13.6	11.3	9.6	11.9	11.3	10.6	17.1	12.2	1.16	0.93
5	Judith	13.8	10.2	9.6	12.0	11.4	12.2	15.8	12.1	1.02	0.98
6	Quantum 542	13.3	11.5	10.0	10.7	11.1	12.0	15.9	12.1	0.90	0.89
17	MTS9720	14.0	9.5	9.6	12.1	11.0	11.2	17.1	12.1	1.29	0.98
27	ND9257	13.3	10.3	10.5	11.6	10.8	12.1	16.2	12.1	0.97	0.93
7	Kestrel	13.7	10.3	9.4	12.0	11.7	11.2	16.0	12.0	1.07	0.99
21	Utah 100	13.3	9.3	10.1	11.8	11.1	12.1	16.4	12.0	1.09	0.93
23	Halt	13.3	10.5	10.5	12.0	11.6	11.0	15.3	12.0	0.82	0.95
8	Morgan	13.8	9.9	8.4	12.4	11.1	11.9	15.8	11.9	1.16	0.96
43	MT9409	13.3	11.1	8.8	11.0	11.5	11.9	15.8	11.9	1.02	0.94
47	+ MT9513	14.0	9.5	9.4	12.0	10.6	10.7	17.1	11.9	1.32	0.97
2	Rocky	13.3	11.1	9.0	10.8	10.8	12.4	14.9	11.8	0.88	0.88
26	+ Culver	13.6	10.4	9.4	11.4	11.1	12.0	14.5	11.8	0.84	0.95
29	Windstar	13.2	11.1	9.1	11.3	11.0	11.4	15.5	11.8	0.97	0.97
30	+ Ransom	13.4	10.0	9.4	10.5	11.7	11.7	15.9	11.8	1.05	0.94
1	Neeley	14.1	9.6	8.2	11.4	11.2	11.1	16.6	11.7	1.35	0.99
16	MTS9719	13.5	9.9	9.1	11.9	11.0	11.0	15.2	11.7	1.01	0.98
48	+ MTW9724	12.7	10.1	10.1	11.9	10.7	10.5	15.8	11.7	0.96	0.92
49	+ MTS97104	13.2	10.7	8.4	11.0	11.3	11.5	15.5	11.7	1.04	0.95
44	Quantum 7424	13.6	9.5	9.9	11.2	10.9	11.1	14.3	11.5	0.84	0.93
46	+ MT9426	13.5	9.9	8.9	11.2	10.0	10.4	16.6	11.5	1.27	0.97
18	Promontory	12.7	9.2	8.3	10.8	11.1	11.9	15.7	11.4	1.14	0.94
32	+ ID513	13.2	9.4	8.3	11.2	10.7	11.3	15.4	11.4	1.13	0.99
45	+ Quantum 7406	12.9	9.6	9.3	11.9	10.5	10.6	14.7	11.4	0.91	0.96
24	Akron	12.6	9.7	9.5	10.7	10.1	10.7	15.5	11.3	1.01	0.96
19	Manning	12.6	9.9	8.6	10.7	10.5	10.6	15.3	11.2	1.05	0.99
Average		13.8	10.7	9.8	12.0	11.5	11.8	16.0	12.2	1.00	1.00
LSD (0.05)				0.9	0.8						
C.V.				5.6	3.5						
F-Test Varieties				6.39**							

** denotes statistical significance at P <= .01

Table 4. 1999 Intrastate Winter Wheat Test (Exp. 35): 6 Location Heading Date (Julian)
+ = new for 1999

ntry	Cultivar/Line	Bozeman RCB	Sidney RCB	Williston RCB	Kalspell RCB	Moccasin LAT	Huntley LAT	6 Loc Average	BYX	RSQ
9	Norstar	177.5	164.1	161.3	164.9	173.7	160.6	167.0	1.04	0.95
49	+ MTS97104	175.0	163.3	162.3	163.6	172.0	159.7	166.0	0.92	0.97
20	Blizzard	173.3	162.9	162.0	161.6	170.8	158.0	164.7	0.90	0.97
16	MTS9719	174.2	161.8	159.0	163.2	171.3	157.8	164.5	1.00	0.94
8	Morgan	173.2	161.6	159.0	161.7	171.4	159.0	164.3	0.96	0.97
31	+ Fldel	169.8	161.0	-	161.2	170.3	159.2	164.3	0.00	0.00
11	Elkhorn	174.0	161.3	159.3	161.4	171.1	158.3	164.2	1.01	0.99
39	+ ID537	171.3	162.3	161.0	160.9	169.6	157.3	163.7	0.83	0.96
1	Neeley	172.7	160.6	159.7	159.7	170.7	158.3	163.6	0.97	1.00
7	Kestrel	173.0	161.0	159.0	159.5	171.0	157.9	163.6	1.02	1.00
17	MTS9720	172.8	160.3	158.7	160.4	171.0	158.3	163.6	1.00	0.99
3	Tiber	172.5	161.8	159.0	161.1	169.4	156.6	163.4	0.93	0.96
38	MTW9441	171.9	160.4	158.7	160.0	170.9	158.0	163.3	0.97	0.99
21	Utah 100	172.6	160.4	159.7	158.6	170.1	158.0	163.2	0.98	0.99
32	+ ID513	173.3	160.1	159.3	159.5	170.0	156.5	163.1	1.05	0.99
43	MT9409	171.9	160.0	159.3	158.7	170.3	156.8	162.8	1.00	0.99
47	+ MT9513	171.8	160.4	159.3	157.3	169.7	156.6	162.5	1.00	0.99
4	Redwin	172.4	160.6	159.0	157.5	169.0	156.0	162.4	1.03	0.99
46	+ MT9426	172.0	160.1	158.7	158.1	168.6	156.7	162.4	0.97	1.00
37	Nuwest	171.3	160.1	158.7	158.4	169.3	156.0	162.3	0.98	1.00
12	Roughrider	172.6	159.3	157.3	157.7	169.4	157.0	162.2	1.07	1.00
42	MT9524	172.1	160.1	157.7	157.7	169.0	156.7	162.2	1.02	1.00
48	+ MTW9724	171.4	158.7	158.7	157.8	170.1	156.0	162.1	1.03	0.98
10	Erhardt	171.4	159.0	158.0	156.9	169.0	156.5	161.8	1.02	1.00
13	Bighorn	171.0	158.7	159.0	157.1	168.4	156.7	161.8	0.95	0.99
15	Rampart	171.1	159.0	159.3	156.5	169.3	155.9	161.8	1.01	0.98
27	ND9257	171.6	159.8	158.0	156.2	168.3	156.3	161.7	1.01	0.99
41	BigSky (MT9432)	171.4	159.4	157.7	156.8	169.1	155.9	161.7	1.04	1.00
14	Vanguard	170.5	159.0	158.7	155.7	168.7	156.0	161.4	0.99	0.98
19	Manning	171.4	158.1	158.0	156.6	168.7	155.7	161.4	1.04	0.99
40	+ Nuplains	170.9	158.8	158.7	155.2	167.6	155.6	161.1	1.00	0.97
18	Promontory	169.8	157.9	157.7	156.5	168.3	156.0	161.0	0.96	0.99
34	Crimson	169.9	157.3	157.0	156.1	168.6	156.0	160.8	1.00	0.98
35	SD92107	170.0	158.5	156.3	155.8	167.7	156.0	160.7	0.99	1.00
24	Akron	170.3	158.8	156.0	154.3	168.0	155.7	160.5	1.05	0.98
30	+ Ransom	170.2	157.6	156.0	156.1	168.3	155.0	160.5	1.05	1.00
6	Quantum 542	169.0	158.3	157.3	154.8	167.4	154.2	160.2	0.98	0.98
2	Rocky	169.9	158.1	155.7	154.9	166.0	154.0	159.8	1.01	0.99
29	Windstar	169.2	157.7	157.7	154.2	166.3	153.9	159.8	0.98	0.98
23	Halt	169.2	157.7	152.0	153.7	167.3	153.9	159.0	1.13	0.97
33	Tandem	169.0	156.6	153.0	153.1	166.3	154.0	158.7	1.09	0.98
44	Quantum 7424	169.0	156.8	154.3	153.5	165.4	152.7	158.6	1.06	1.00
22	McGuire	169.1	156.7	153.3	153.7	165.7	152.3	158.5	1.10	1.00
36	SD93267	167.9	157.3	154.7	152.2	163.5	153.0	158.1	0.95	0.96
26	+ Culver	168.6	156.9	153.3	152.3	164.3	152.8	158.0	1.05	0.98
25	Pronghorn	167.3	156.7	154.7	152.4	164.3	152.1	157.9	0.98	0.98
5	Judith	166.9	155.9	153.3	151.7	164.1	152.1	157.3	1.00	0.99
28	+ AP7510	167.0	156.0	153.0	151.2	164.0	152.1	157.2	1.02	0.98
45	+ Quantum 7406	166.7	155.6	152.0	151.1	164.3	152.0	156.9	1.04	0.98
Average		171.0	159.3	157.5	157.1	168.5	156.0	161.6	1.00	1.00
LSD (0.05)		0.9	1.1	1.2	1.3	0.9	1.0			
C.V.		0.3	0.4	0.4	0.5	0.3	0.4			
F-Test Varieties		48.5**	26.8**		53.6**	50.7**	39.5**			

** denotes statistical significance at $P < .01$

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Table 5. 1999 Intrastate Winter Wheat Test (Exp. 35): 7 Location Plant Height (In)

+ = new for 1999

Entry	Cultivar/Line	Bozeman LAT	Havre LAT	Sidney LAT	Williston RCB	Kalispell LAT	Moccasin LAT	Huntley LAT	7 Loc Average	BYX	RSQ
9	Norstar	51.1	52.3	43.6	38.0	48.4	38.9	47.6	45.7	1.14	0.78
12	Roughrider	48.6	51.3	39.7	34.0	44.6	41.7	41.5	43.0	1.22	0.88
11	Elkhorn	47.6	45.7	37.5	30.0	43.6	36.9	41.5	40.4	1.34	0.96
36	SD93267	46.7	45.6	34.3	32.3	43.1	39.0	41.6	40.4	1.22	0.97
3	Tiber	45.9	43.1	37.0	32.0	42.0	36.5	37.4	39.1	1.04	0.94
30	+ Ransom	45.1	42.4	34.0	32.0	41.5	39.0	39.1	39.0	1.03	0.97
41	BigSky (MT9432)	42.9	43.9	35.9	29.7	41.2	37.8	39.3	38.7	1.05	0.92
42	MT9524	44.4	44.0	35.0	30.3	42.1	36.7	38.5	38.7	1.15	0.97
20	Blizzard	46.3	41.4	34.5	30.7	41.9	36.0	38.2	38.4	1.17	0.98
27	ND9257	43.4	46.7	34.0	29.7	39.8	36.3	38.0	38.3	1.21	0.88
6	Quantum 542	45.0	42.0	35.0	31.7	40.7	35.4	37.8	38.2	1.03	0.98
16	MTS9719	43.4	42.8	33.5	34.0	40.7	33.8	38.1	38.1	0.91	0.85
4	Redwin	44.7	40.7	35.0	30.7	40.3	36.3	38.0	37.9	1.01	0.98
39	+ ID537	45.0	40.0	33.6	32.3	39.3	36.2	38.4	37.8	0.94	0.95
25	Pronghorn	43.5	39.5	32.0	28.7	40.4	38.3	39.3	37.4	1.10	0.89
34	Crimson	42.6	40.5	32.8	30.0	40.4	36.4	37.7	37.2	1.01	0.98
47	+ MT9513	42.4	44.1	33.6	29.3	37.2	35.8	37.3	37.1	1.08	0.90
7	Kestrel	42.6	39.4	34.1	29.3	39.5	34.3	39.8	37.0	0.98	0.90
35	SD92107	43.0	41.5	33.5	28.7	39.7	36.1	36.3	37.0	1.10	0.98
1	Neeley	43.6	40.4	32.9	31.0	39.1	33.8	37.2	36.8	1.00	0.96
2	Rocky	44.4	41.2	31.7	29.0	40.8	33.5	37.2	36.8	1.26	0.98
14	Vanguard	43.6	40.0	33.1	31.3	37.9	35.0	35.9	36.7	0.93	0.96
21	Utah 100	43.8	43.3	32.5	29.3	35.7	34.5	38.2	36.7	1.14	0.88
24	Akron	41.9	39.2	32.8	28.7	38.5	36.6	37.6	36.5	0.97	0.95
37	Nuwest	44.4	41.1	33.6	29.3	38.1	33.4	35.6	36.5	1.13	0.95
38	MTW9441	40.3	37.9	34.4	30.7	39.0	35.4	36.8	36.3	0.70	0.94
48	+ MTW9724	43.2	39.5	32.2	29.0	37.0	35.0	37.7	36.2	1.04	0.96
8	Morgan	41.1	40.2	33.3	31.3	37.4	34.1	34.9	36.0	0.80	0.95
22	McGuire	40.2	38.1	31.9	28.3	40.1	35.9	36.9	35.9	0.94	0.89
15	Rampart	43.4	38.8	32.0	26.7	37.9	35.0	37.2	35.8	1.18	0.96
33	Tandem	43.1	39.7	31.3	28.3	37.9	34.2	36.4	35.8	1.13	0.99
17	MTS9720	41.4	37.4	34.5	30.3	37.4	30.9	34.4	35.2	0.79	0.80
43	MT9409	41.8	36.7	30.6	27.7	39.9	31.6	33.1	34.5	1.10	0.89
19	Manning	41.7	38.5	29.3	27.3	35.9	33.6	34.9	34.4	1.11	0.97
10	Erhardt	41.5	37.3	31.2	27.3	36.4	31.5	34.8	34.3	1.04	0.96
23	Halt	39.7	37.7	30.3	27.3	35.6	33.2	32.4	33.7	0.95	0.97
29	Windstar	38.4	33.3	30.6	27.7	37.0	34.8	33.8	33.7	0.72	0.77
49	+ MTS97104	38.9	37.0	31.4	29.7	35.1	31.9	31.5	33.7	0.73	0.90
46	+ MT9426	38.8	37.2	31.9	29.7	35.2	30.5	32.3	33.6	0.73	0.88
18	Promontory	39.2	36.0	30.0	26.3	35.9	33.2	33.7	33.5	0.94	0.97
44	Quantum 7424	39.3	37.1	28.7	27.3	34.9	33.4	31.3	33.1	0.95	0.93
26	+ Culver	39.2	35.1	29.3	26.3	35.8	32.6	33.0	33.0	0.95	0.97
45	+ Quantum 7406	37.5	36.8	27.8	27.3	36.2	32.9	31.1	32.8	0.91	0.90
32	+ ID513	37.7	38.5	28.5	26.3	34.8	30.4	31.6	32.5	1.01	0.94
13	Blghorn	38.6	35.2	27.9	27.0	32.9	31.0	31.9	32.0	0.89	0.96
40	+ Nuplains	35.8	37.5	27.3	23.7	32.6	30.6	29.3	31.0	1.03	0.90
28	+ AP7510	35.3	34.4	24.2	22.7	32.3	30.8	30.9	30.1	1.05	0.92
5	Judith	33.8	32.2	24.8	22.3	32.5	31.0	30.2	29.5	0.91	0.87
31	+ Fidel	36.7	23.6	26.7	-	29.3	32.7	28.0	29.5	1.94	0.52
Average		42.1	39.8	32.4	29.2	38.3	34.6	36.0	36.0	1.00	1.00
LSD (0.05)		2.4	5.2	2.0	3.5	1.4	2.6	2.1			
C.V.		3.2	9.4	3.6	7.4	2.1	4.3	3.4			
F-Test Varieties		18.5**	6.37**	24.5**		51.4**	8.12**	25.5**			

** denotes statistical significance at P <= .01

Table 6. 1999 Intrastate Winter Wheat Test (Exp. 35): Stand/Winter Survival (%)

* = new for 1999

Entry	Cultivar/Line	Pedigree	Sidney	Williston	Moccasin	Average
			Stand	Stand/	Stand	
			Winter Surv.			
			RCB	LAT	RCB	
			21-May	21-May	04-May	
1	Neeley		95.0	54.4	90.7	80.0
2	Rocky		90.0	43.1	89.7	74.3
3	Tiber		93.3	49.9	86.7	76.6
4	Redwin		93.3	51.7	87.7	77.6
5	Judith		93.3	46.5	90.7	76.8
6	Quantum 542		93.3	42.7	75.0	70.3
7	Kestrel		96.7	44.5	88.7	76.6
8	Morgan		95.0	89.7	89.7	91.5
9	Norstar		93.3	45.9	84.3	74.5
10	Erhardt		96.7	62.9	92.7	84.1
11	Elkhorn		95.0	62.6	86.0	81.2
12	Roughrider		98.3	70.9	91.3	86.9
13	Bighorn		90.0	31.8	88.3	70.1
14	Vanguard		88.3	26.8	95.0	70.0
15	Rampart		83.3	11.2	85.7	60.1
16	MTS9719	Nuwest/MT88001//MT7863	95.0	65.1	94.0	84.7
17	MTS9720	Nuwest/MT88001//MT7863	98.3	71.1	93.3	87.6
18	Promontory		90.0	23.9	78.7	64.2
19	Manning		90.0	30.5	89.0	69.8
20	Blizzard		88.3	36.6	86.3	70.4
21	Utah 100	Utah, 1996	85.0	21.0	77.7	61.2
22	McGuire		98.3	59.8	89.3	82.5
23	Halt		88.3	39.1	93.0	73.5
24	Akron		88.3	43.8	88.3	73.5
25	Pronghorn		93.3	53.9	92.3	79.9
26	* Culver	Nebraska, 1998	91.7	52.4	93.7	79.2
27	ND9257	Roughrider/ND7571//Arapahoe	93.3	54.2	91.0	79.5
28	* AP7510	Quantum F1 hybrid	93.3	54.0	92.3	79.9
29	Windstar	Nebraska, 1996	93.3	29.1	91.3	71.3
30	* Ransom	North Dakota, 1998	90.0	55.9	86.3	77.4
31	* Fidel	American Cyanimid	30.0	2.0	7.3	13.1
32	* ID513		93.3	37.8	93.3	74.8
33	Tandem	(SD89119), SD 1997	90.0	50.6	91.0	77.2
34	Crimson	(SD89153), SD 1997	93.3	48.7	92.0	78.0
35	SD92107	Brule//Benet/Chisholm/3//Arapahoe	91.7	61.3	91.7	81.6
36	SD93267	SD8026/Roughrider//SD76598-7//Agassiz	91.7	57.2	94.7	81.2
37	Nuwest		91.7	61.6	91.0	81.4
38	MTW9441	Nuwest/Tiber	96.7	55.0	89.7	80.4
39	* ID537		86.7	22.0	91.0	66.6
40	* Nuplains	NW94L205, General Mills	95.0	45.9	89.7	76.9
41	BigSky (MT9432)	Nuwest/Tiber	91.7	65.6	91.0	82.8
42	MT9524	Nuwest/Tiber	95.0	59.4	89.3	81.2
43	MT9409	Tiber/MT8030	96.7	66.3	90.3	84.4
44	Quantum 7424	formerly, Quantum Exp. 1824, F1	96.7	56.5	96.3	83.2
45	* Quantum 7406	Quantum F1 hybrid	95.0	63.4	95.7	84.7
46	* MT9426	MT8030/Neeley	98.3	62.3	94.7	85.1
47	* MT9513	Nuwest/MT8030	98.3	52.3	93.7	81.4
48	* MTW9724	Nuwest/APW84223//MT7863	91.7	41.3	93.7	75.6
49	* MTS97104	Norstar/MT88002//Redwin	91.7	58.9	87.0	79.2
Average			91.6	48.8	88.2	76.2
LSD (0.05)			4.8	13.9	5.5	
C.V.			3.2	16.5	3.8	
F-Test Varieties			31.7**	11.23**	41.6**	

** denotes statistical significance at P <= .01