

PROJECT TITLE: Intra-State Winter Wheat Variety Performance.

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PROJECT PERSONNEL:

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OBJECTIVES:

To evaluate the agronomic performance of new and existing varieties and experimental lines of winter wheat under various growing conditions and environments in Montana.

RESULTS:

The 1996 Montana Intra-State Winter Wheat Yield Trial was grown at seven rainfed (dryland) Montana locations in replicated multi-row plots. Fall and spring soil moisture conditions were generally good to excellent. Spring temperatures were cool to cold. Late spring and summer moisture was below average at most locations. Sidney had good June precipitation. Conrad received marginal but timely June precip. Havre, Moccasin, and Kalispell's June and July precipitation was well below long term averages.

The winter wheat produce respectable to high **yields**, depending on soil water holding capacity, apparently due to a moderate evaporative demand during the growing season. Kalispell and Bozeman had the high and Moccasin the low location mean yield (Table 1). Quantum 542 had the overall high mean yield and was one of the top producers at all locations except at Conrad where it was just slightly better than the nursery mean. Snow mold resistant varieties Blizzard and Promontory had high overall mean yields. Possibly due to more tolerance of the cold wet spring conditions. Over all mean **Test weights** of Garland, Dynamic I, and Dynamic 2 were sub-standard (Table 2). The Moccasin and Huntley had several varieties with <58 lbs/bu test weight. Montana developed lines and varieties top the overall **protein** ranking with McGuire on top at 14.9% (table 3). Protein levels were generally above above long term averages. **Plant heights** overall mean ranged from 40" for Norstar to 20.4" for Garland (Table 4). Rocky and McGuire had the median heights at 31.8" and 31.7", respectively. **Heading dates** were recorded at all seven locations (Table 5) and **winter survival** was evaluated at 4 locations (Table 6). A two year summary of **coleoptile lengths** is presented in Table 7.

SUMMARY:

The 1996 Montana Intra-State Winter Wheat Variety Trial provided an excellent indication of relative performance of several wheat varieties under marginal and good growing conditions.

FUTURE PLANS:

The Montana Intra-State Winter Wheat Variety Trial will be continue in 1997.

Table 1. 1996 Intrastate Winter Wheat Test (Exp. 35): 7 Location Yield (bu/ac)

* = new for 1996

Entry	Cultivar/	Bozeman	Havre	Sidney	Kalispell	Mocassin	Huntley	Conrad	7 Loc	BYX	RSQ
		LAT	LAT	LAT	RCB	RCB	LAT	RCB	Avg		
7	Quantum 542	91.6	49.1	39.2	112.0	51.9	70.7	56.9	67.4	1.18	0.98
45	MT91192	94.6	49.7	40.0	106.4	42.8	63.0	70.1	66.6	1.16	0.97
15	Blizzard	89.4	45.4	39.9	108.5	49.6	63.4	60.5	65.3	1.13	0.97
2	Rocky	84.6	51.4	28.3	106.0	46.4	71.2	65.9	64.8	1.16	0.97
17	Promontory	89.0	49.2	12.8	117.3	49.4	65.0	65.9	64.1	1.46	0.93
16	Manning	92.4	42.6	25.3	113.7	43.6	68.7	62.1	64.0	1.40	0.99
34*	Dynamic I	82.9	45.1	37.5	120.3	45.5	58.6	55.2	63.6	1.27	0.92
48*	MT9441	85.4	50.9	49.6	95.7	40.0	56.4	66.1	63.4	0.88	0.90
18	NuWest	83.5	50.6	35.6	100.2	47.8	59.4	64.4	63.1	1.00	0.97
5	Judith	86.3	48.3	45.5	110.5	45.3	52.3	52.2	62.9	1.10	0.89
23	Kestrel	79.3	51.4	43.1	99.6	41.9	61.0	63.8	62.9	0.93	0.96
31	Quantum 547	87.5	50.8	29.3	95.5	43.0	64.0	67.6	62.5	1.06	0.96
47	MT9432	81.5	50.7	44.0	95.2	46.8	59.6	58.6	62.3	0.86	0.97
33	XNH1643	98.7	54.7	39.8	74.0	44.1	60.8	58.7	61.5	0.78	0.74
8	Bighorn	79.3	48.2	38.4	102.0	42.7	61.0	55.2	61.0	1.02	0.97
32	Quantum 566	90.1	46.8	41.3	84.1	38.9	64.6	61.4	61.0	0.89	0.92
39*	Akron	85.8	45.7	33.7	86.2	45.8	68.7	58.5	60.6	0.92	0.95
26	Alliance	78.2	51.0	34.7	87.1	42.2	67.2	62.9	60.5	0.85	0.96
14	Winridge	79.2	47.6	34.4	102.1	37.9	58.7	62.2	60.3	1.08	0.97
6	Centurk	77.6	45.3	26.9	100.1	43.1	65.4	63.3	60.2	1.09	0.96
46	MT9222	80.1	50.5	35.5	98.1	41.1	56.5	57.3	59.9	1.00	0.98
24	Meridian	84.2	50.9	34.7	98.1	41.4	54.8	55.3	59.9	1.04	0.98
35*	Dynamic II	78.3	47.1	41.5	99.9	37.8	54.7	59.7	59.8	0.99	0.94
1	Neeley	86.9	48.6	22.5	106.8	35.6	58.4	59.8	59.8	1.32	0.99
10	Norwin	76.2	47.3	41.1	93.8	44.1	53.3	61.4	59.6	0.85	0.94
36*	S89-142	80.3	48.8	44.5	93.0	39.9	52.0	57.6	59.4	0.87	0.93
41*	Nekota	75.9	47.2	34.5	77.4	46.6	75.8	54.5	58.8	0.72	0.82
25	Vista	80.4	48.4	29.4	95.1	46.3	62.2	47.3	58.4	1.01	0.96
12	Erhardt	81.7	43.7	41.7	91.0	45.6	52.6	51.8	58.3	0.88	0.94
29	Halt	81.4	47.6	27.9	93.3	36.5	66.1	53.5	58.0	1.07	0.98
27	Jules	80.2	47.6	28.7	86.1	33.4	59.0	62.9	56.8	0.97	0.94
22	AC Readymade	78.0	46.0	30.0	90.8	43.5	57.0	51.9	56.7	0.96	0.99
40*	Niobrara	76.7	47.9	31.6	86.7	40.7	65.4	46.3	56.5	0.90	0.95
9	Norstar	76.1	45.2	43.2	78.1	39.1	58.5	50.5	55.8	0.70	0.94
3	Tiber	79.4	46.6	28.1	88.1	41.3	57.4	48.9	55.7	0.97	0.99
30	Ike	77.9	43.2	22.4	72.3	45.6	72.8	50.6	55.0	0.81	0.77
44*	Bonneville	80.5	37.7	31.2	95.8	34.4	54.1	48.4	54.6	1.12	0.98
19	McGuire	72.3	43.6	29.2	88.3	39.3	60.0	47.3	54.3	0.93	0.98
4	Redwin	73.7	41.7	34.4	80.8	40.0	62.9	44.7	54.0	0.81	0.94
43*	Elkhorn	62.4	41.2	46.9	78.0	40.5	58.5	48.3	53.7	0.57	0.85
49*	MT9453	76.4	43.7	31.5	79.1	35.3	59.4	50.5	53.7	0.85	0.97
13	Agassiz	72.1	44.7	43.8	74.9	41.8	55.4	42.1	53.5	0.62	0.88
20	Vanguard	79.1	40.6	21.1	93.6	33.9	56.2	46.0	52.9	1.17	1.00
28	Yuma	87.6	47.4	6.0	94.1	28.6	62.2	41.4	52.5	1.39	0.93
42*	Garland	82.6	49.4	8.8	80.8	30.8	55.5	55.9	52.0	1.12	0.87
21	Rampart	75.0	36.4	16.6	92.4	31.9	53.4	57.9	51.9	1.17	0.96
11	Roughrider	68.2	43.7	38.2	71.7	40.2	52.0	37.0	50.1	0.62	0.88
38*	BZ9W92-712-b	81.8	34.2	20.2	95.8	23.4	55.0	39.2	50.0	1.32	0.98
37*	BZ9W92-712-a	77.0	40.1	19.8	76.0	23.5	49.3	32.7	45.5	1.03	0.93
Average		81.2	46.4	32.7	93.2	40.6	60.2	54.9	58.5	1.00	1.00
LSD (0.05)		7.7	8.3	15.6	16.7	11.9	7.9	10.6			
CV		5.5	7.6	29.5	11.1	18.0	7.5	11.9			

Table 2. 1996 Intrastate Winter Wheat Test (Exp. 35): 7 Location Test Weight

* = new for 1996

Entry	Cultivar/	Bozeman	Havre	Sidney	Kalispell	Mocassin	Huntley	Conrad	7 Loc	BYX	RS
		LAT	RCB	LAT	1 rep	RCB	LAT	1 rep	Avg		
12	Erhardt	62.8	63.2	62.2	62.8	60.6	59.6	64.0	62.2	0.81	0.9
17	Promontory	62.6	62.8	62.3	62.5	60.0	60.4	64.2	62.1	0.80	0.9
44*	Bonneville	62.8	63.9	62.4	63.4	59.0	60.1	62.3	62.0	0.87	0.7
22	AC Readymade	62.2	63.1	61.6	62.2	59.3	61.1	63.7	61.9	0.77	0.9
15	Blizzard	62.1	62.6	61.5	62.5	59.5	60.6	63.2	61.7	0.70	0.9
38*	BZ9W92-712-b	62.3	63.9	61.7	63.3	57.4	61.3	62.1	61.7	0.93	0.6
2	Rocky	62.5	62.5	61.4	62.0	58.8	60.4	63.6	61.6	0.85	0.9
47	MT9432	62.3	62.8	62.4	62.7	58.8	59.2	63.3	61.6	0.99	0.9
4	Redwin	62.1	63.3	61.1	62.2	59.2	60.7	62.6	61.6	0.70	0.8
37*	BZ9W92-712-a	62.0	62.0	63.4	63.0	58.9	60.6	61.4	61.6	0.56	0.4
3	Tiber	62.5	62.8	60.9	62.4	59.7	60.4	62.1	61.5	0.59	0.7
9	Norstar	62.1	62.1	60.4	62.5	59.1	61.2	62.8	61.5	0.59	0.6
41*	Nekota	61.2	63.0	61.8	60.9	58.5	62.1	63.1	61.5	0.64	0.5
6	Centurk	62.0	62.6	62.5	61.3	58.3	59.8	63.9	61.5	1.01	0.9
49*	MT9453	62.1	62.4	61.4	61.4	59.2	60.7	62.5	61.4	0.61	0.9
10	Norwin	61.2	62.7	62.4	62.0	58.7	58.4	64.2	61.4	1.13	0.9
11	Roughrider	62.5	61.7	60.7	62.0	59.5	59.9	62.7	61.3	0.65	0.8
30	Ike	60.8	61.7	61.3	60.9	59.4	61.4	63.0	61.2	0.46	0.5
20	Vanguard	62.2	61.6	60.8	61.7	57.5	59.9	62.5	60.9	0.89	0.8
13	Agassiz	61.9	61.9	60.8	62.0	58.3	58.6	63.1	60.9	0.99	0.9
19	McGuire	61.2	62.3	60.6	62.2	58.5	59.9	61.8	60.9	0.69	0.8
21	Rampart	62.1	61.7	60.0	61.7	58.2	59.8	62.6	60.9	0.80	0.8
28	Yuma	60.8	63.1	61.5	60.9	57.6	58.9	63.0	60.8	1.09	0.9
7	Quantum 542	61.4	61.9	59.9	62.0	58.2	59.3	63.0	60.8	0.91	0.9
8	Bighorn	61.2	62.2	60.9	60.7	58.8	58.5	62.5	60.7	0.84	0.9
43*	Elkhorn	61.5	61.0	59.8	61.5	58.5	59.7	62.3	60.6	0.67	0.8
16	Manning	61.4	62.1	60.9	60.0	57.1	57.9	64.0	60.5	1.30	0.9
25	Vista	60.1	62.1	61.3	61.4	57.1	57.6	63.1	60.4	1.23	0.9
31	Quantum 547	60.9	62.7	61.4	59.5	57.3	57.4	63.7	60.4	1.30	0.8
46	MT9222	60.6	61.9	60.6	61.3	57.7	57.3	63.2	60.4	1.17	0.9
1	Neeley	61.8	61.4	58.8	62.4	57.8	57.4	62.5	60.3	1.08	0.7
24	Meridian	60.7	62.3	61.6	60.6	57.9	57.7	61.2	60.3	0.90	0.8
18	NuWest	60.8	62.1	60.0	60.8	58.1	57.9	62.3	60.3	0.94	0.9
39*	Akron	60.6	62.0	61.3	58.1	58.3	57.9	63.5	60.2	0.99	0.6
36*	S89-142	60.2	61.9	59.6	61.5	57.7	57.5	62.7	60.1	1.07	0.9
29	Halt	60.0	61.9	60.6	59.8	56.4	58.6	62.9	60.0	1.14	0.9
48*	MT9441	60.8	62.4	61.2	60.0	57.2	57.4	61.1	60.0	1.01	0.8
26	Alliance	59.9	61.6	58.9	59.6	57.3	59.4	63.5	60.0	0.94	0.7
33	XNH1643	61.3	62.1	60.8	57.6	56.0	57.8	63.8	59.9	1.37	0.7
14	Winridge	60.1	61.3	60.2	61.2	56.1	57.3	62.4	59.8	1.25	0.9
32	Quantum 566	60.4	61.5	60.7	59.6	56.9	56.8	63.0	59.8	1.24	0.9
23	Kestrel	59.9	60.9	58.6	59.9	56.2	57.7	62.6	59.4	1.13	0.9
40*	Niobrara	60.4	61.5	58.6	58.4	55.9	57.9	61.8	59.2	1.09	0.8
27	Jules	59.6	59.9	60.0	57.4	55.3	55.9	64.2	58.9	1.49	0.7
45	MT91192	58.9	60.5	58.8	60.5	55.5	54.9	62.4	58.8	1.47	0.9
5	Judith	59.5	60.9	58.9	59.9	55.8	55.7	60.9	58.8	1.20	0.9
42*	Garland	55.5	60.1	57.8	58.2	53.5	52.0	60.3	56.8	1.63	0.8
35*	Dynamic II	57.0	57.3	56.2	58.3	52.0	50.7	59.7	55.9	1.73	0.8
34*	Dynamic I	56.5	57.2	55.8	58.4	51.7	50.0	59.4	55.6	1.79	0.8
Average		61.0	61.9	60.6	61.0	57.6	58.4	62.7	60.4	1.00	1.0
LSD (0.05)		0.8	1.0	1.6		1.5	1.3				
CV		0.7	1.0	1.6		1.6	1.3				

Entry	Cultivar/	Bozeman bulk	Havre bulk	Sidney bulk	Kalispell bulk	Mocassin RCB	Huntley bulk	Conrad bulk	7 Loc Avg	BYX	RSQ
19	McGuire	16.4	14.0	14.8	12.4	15.7	15.2	16.5	15.0	0.87	0.82
49*	MT9453	15.8	14.4	13.3	12.1	16.2	15.4	15.4	14.7	0.95	0.94
44*	Bonneville	15.9	13.5	13.0	12.1	15.6	15.9	15.2	14.5	1.00	0.94
21	Rampart	15.5	13.5	14.3	11.2	15.2	15.6	15.9	14.5	1.05	0.91
22	AC Readymade	15.9	13.7	13.6	12.1	15.6	15.6	15.1	14.5	0.92	0.97
4	Redwin	15.8	13.5	13.7	11.6	15.6	15.1	15.3	14.4	0.99	0.97
12	Erhardt	15.4	12.9	13.6	12.1	14.9	15.9	15.9	14.4	0.93	0.85
30	Ike	14.7	13.5	16.0	11.3	14.4	14.5	16.0	14.3	0.70	0.43
20	Vanguard	15.3	13.3	13.9	10.7	15.0	15.1	16.0	14.2	1.11	0.89
13	Agassiz	15.8	12.6	12.6	10.8	15.3	15.6	15.7	14.1	1.30	0.95
47	MT9432	15.0	13.5	13.0	11.5	15.1	15.6	14.6	14.0	0.95	0.98
11	Roughrider	15.5	13.2	11.8	11.2	15.1	15.3	15.9	14.0	1.18	0.86
43*	Elkhorn	15.5	13.0	12.6	11.2	15.7	15.1	15.0	14.0	1.13	0.96
3	Tiber	15.1	13.2	13.3	11.1	15.2	15.2	14.2	13.9	0.98	0.98
42*	Garland	14.8	12.8	13.2	10.8	15.2	15.7	13.8	13.8	1.07	0.93
48*	MT9441	14.7	12.8	12.9	10.8	15.3	15.5	14.4	13.8	1.11	0.99
25	Vista	14.4	12.8	13.3	11.6	14.8	14.8	14.0	13.7	0.76	0.96
46	MT9222	14.8	12.5	12.8	11.2	14.8	15.4	14.7	13.7	1.01	0.95
32	Quantum 566	14.2	13.8	12.4	10.4	15.3	15.0	15.1	13.7	1.12	0.90
15	Blizzard	15.2	12.6	12.0	11.5	14.2	15.1	14.5	13.6	0.94	0.86
38*	BZ9W92-712-b	14.4	13.1	12.7	11.0	15.7	14.7	13.4	13.6	0.95	0.88
1	Neeley	14.6	12.8	13.8	10.2	14.6	15.1	13.9	13.6	1.04	0.89
9	Norstar	15.1	12.7	12.0	11.0	15.1	14.8	14.4	13.6	1.07	0.94
24	Meridian	14.6	12.6	12.3	10.3	15.7	15.2	14.0	13.5	1.24	0.97
35*	Dynamic II	14.0	13.3	12.8	11.2	14.9	15.5	13.1	13.5	0.84	0.80
31	Quantum 547	14.0	12.7	13.1	10.2	15.3	15.3	13.9	13.5	1.12	0.93
6	Centurk	14.5	13.5	12.7	10.1	14.3	14.5	14.1	13.4	1.01	0.93
18	NuWest	14.5	13.2	11.8	10.5	14.4	14.8	14.3	13.4	1.04	0.93
8	Bighorn	14.4	12.2	12.8	10.1	14.9	14.9	14.4	13.4	1.17	0.98
5	Judith	14.2	13.0	12.0	10.2	15.2	15.1	14.1	13.4	1.17	0.96
41*	Nekota	14.2	12.6	13.3	11.2	14.1	13.9	14.4	13.4	0.72	0.90
45	MT91192	14.3	13.0	11.7	10.6	15.3	15.0	13.8	13.4	1.10	0.92
29	Halt	14.1	12.8	12.7	11.2	14.3	13.9	14.1	13.3	0.74	0.98
36*	S89-142	14.2	12.6	11.7	11.0	14.5	14.5	14.5	13.3	0.95	0.92
7	Quantum 542	14.3	12.5	12.8	10.6	14.1	14.3	13.9	13.2	0.89	0.98
37*	BZ9W92-712-a	13.6	13.2	12.6	11.8	14.1	13.9	12.9	13.2	0.48	0.81
2	Rocky	14.5	12.3	11.8	10.4	14.3	14.3	14.2	13.1	1.05	0.97
14	Winridge	14.3	12.4	11.8	10.8	15.4	14.2	12.9	13.1	0.97	0.84
10	Norwin	13.7	12.1	11.8	10.4	13.4	14.2	13.9	12.8	0.90	0.95
16	Manning	13.3	12.1	12.5	9.4	14.1	14.7	13.3	12.8	1.10	0.93
33	XNH1643	13.4	11.8	11.2	9.8	15.0	14.6	13.6	12.8	1.21	0.93
40*	Niobrara	13.7	11.5	12.8	9.3	14.5	13.7	14.2	12.8	1.17	0.91
39*	Akron	13.5	12.0	12.2	9.8	13.5	13.9	13.8	12.7	0.96	0.97
34*	Dynamic I	13.4	12.0	12.1	10.2	13.8	14.1	13.2	12.7	0.89	0.99
23	Kestrel	14.0	11.8	11.4	9.8	14.7	13.6	12.6	12.6	1.07	0.91
17	Promontory	13.6	12.0	12.6	9.9	13.7	13.9	12.8	12.6	0.88	0.92
27	Jules	13.3	11.8	11.8	8.8	14.5	14.0	12.8	12.4	1.23	0.95
26	Alliance	13.5	12.0	11.6	9.0	13.7	13.1	13.0	12.3	1.05	0.95
28	Yuma	13.1	11.6	11.9	9.4	13.6	12.6	13.2	12.2	0.91	0.93
Average		14.5	12.8	12.7	10.7	14.8	14.8	14.3	13.5	1.00	1.00
LSD (0.05)						0.9					
CV						3.6					

Table 4. 1996 Intrastate Winter Wheat Test (Exp. 35): 6 Location Plant Height (in)

* = new for 1996

Entry	Cultivar/	Bozeman	Havre	Sidney	Kalispell	Mocassin	Conrad	6 Loc	BYX	RSQ
		LAT	LAT	LAT	RCB	RCB	RCB	Avg		
9	Norstar	42.9	29.7	35.2	56.2	34.7	41.3	40.0	1.44	0.90
13	Agassiz	42.2	32.0	31.4	53.2	34.3	37.3	38.4	1.31	0.93
11	Roughrider	40.9	28.4	30.8	51.6	31.0	40.3	37.1	1.40	0.94
43*	Elkhorn	40.5	27.1	31.0	51.5	31.0	40.0	36.9	1.42	0.93
44*	Bonneville	42.4	29.2	29.1	48.6	34.0	35.0	36.4	1.24	0.96
47	MT9432	38.1	28.2	28.5	44.1	34.3	35.7	34.8	0.98	0.98
15	Blizzard	36.2	27.3	26.7	46.1	32.3	37.0	34.2	1.16	0.95
3	Tiber	39.9	26.5	24.8	47.9	31.3	35.0	34.2	1.42	0.99
7	Quantum 542	38.3	27.8	26.4	43.3	32.3	35.7	34.0	1.05	0.99
23	Kestrel	40.0	27.5	30.7	43.8	26.7	34.3	33.8	1.04	0.84
14	Winridge	38.0	27.1	28.2	46.9	28.7	33.7	33.8	1.21	0.94
22	AC Readymade	37.9	28.1	24.4	45.2	31.0	35.0	33.6	1.21	0.98
4	Redwin	37.7	26.0	27.1	46.1	30.3	34.3	33.6	1.22	0.98
38*	BZ9W92-712-b	38.6	27.2	26.6	43.7	29.3	35.3	33.5	1.12	0.98
18	NuWest	37.9	26.7	25.8	42.9	31.0	34.0	33.0	1.09	1.00
5	Judith	37.1	23.0	28.2	40.9	33.3	33.7	32.7	0.98	0.88
21	Rampart	38.6	24.8	23.6	43.2	32.7	33.0	32.6	1.22	0.95
6	Centurk	37.8	24.7	24.6	44.8	30.0	34.0	32.6	1.29	1.00
20	Vanguard	37.1	27.1	25.2	42.5	31.0	32.7	32.6	1.04	0.98
48*	MT9441	36.6	26.9	28.9	42.4	27.7	32.7	32.5	0.95	0.92
34*	Dynamic I	34.6	27.6	29.3	40.8	30.3	32.3	32.5	0.76	0.94
1	Neeley	36.7	25.4	25.2	43.7	29.7	34.0	32.4	1.18	1.00
36*	S89-142	36.3	24.0	27.9	41.3	29.7	35.0	32.4	1.01	0.95
46	MT9222	37.1	28.0	25.1	40.2	31.0	32.0	32.2	0.90	0.95
2	Rocky	36.5	25.3	23.4	43.0	31.0	31.7	31.8	1.17	0.97
19	McGuire	36.4	28.3	23.4	39.9	29.3	32.7	31.7	0.94	0.93
12	Erhardt	35.5	24.7	25.7	40.7	30.0	32.3	31.5	0.99	0.99
32	Quantum 566	36.0	26.8	25.2	39.4	27.3	33.0	31.3	0.92	0.96
39*	Akron	34.6	24.8	24.7	38.2	30.7	34.0	31.2	0.88	0.95
49*	MT9453	36.5	25.0	22.3	41.7	27.7	32.3	30.9	1.20	0.99
45	MT91192	34.7	23.1	27.0	39.9	26.3	34.7	30.9	1.01	0.91
33	XNH1643	35.7	25.2	25.5	37.7	27.7	32.3	30.7	0.87	0.97
16	Manning	36.7	25.1	22.9	37.1	31.7	31.0	30.7	0.89	0.86
40*	Niobrara	34.9	25.7	25.3	38.1	29.0	30.7	30.6	0.83	0.99
35*	Dynamic II	32.0	25.1	27.1	37.8	29.0	31.0	30.3	0.71	0.95
31	Quantum 547	34.8	26.0	24.9	37.5	27.3	31.3	30.3	0.83	0.98
17	Promontory	35.0	24.4	22.0	36.1	29.3	31.0	29.6	0.89	0.92
26	Alliance	31.4	23.9	23.2	36.2	29.0	33.3	29.5	0.80	0.89
25	Vista	32.6	23.5	23.1	34.0	27.3	31.3	28.6	0.75	0.94
27	Jules	33.0	22.7	24.1	37.4	24.7	29.7	28.6	0.94	0.97
24	Meridian	31.7	23.7	24.5	34.9	26.3	29.7	28.5	0.72	1.00
28	Yuma	33.6	23.5	19.5	33.8	26.7	31.3	28.1	0.89	0.86
30	Ike	31.2	24.3	23.2	34.1	26.0	29.7	28.1	0.70	0.99
8	Bighorn	31.9	22.4	22.3	35.6	26.3	29.7	28.0	0.87	0.99
41*	Nekota	31.6	23.7	21.5	34.8	25.0	29.7	27.7	0.83	0.97
37*	BZ9W92-712-a	32.1	23.6	19.1	33.6	25.0	30.7	27.3	0.87	0.88
29	Halt	31.0	20.5	19.7	31.2	24.3	27.0	25.6	0.79	0.93
10	Norwin	27.6	18.1	22.5	30.0	27.3	26.3	25.3	0.60	0.72
42*	Garland	22.9	17.5	16.7	24.0	20.3	21.0	20.4	0.46	0.94
Average		35.8	25.4	25.4	40.8	29.2	32.9	31.6	1.00	1.00
LSD (0.05)		2.5	3.1	3.5	2.0	4.4	4.0			
CV		3.9	7.6	8.6	3.1	9.4	7.5			

Table 5. 1996 Intrastate Winter Wheat Test (Exp. 35): 7 Location Heading Date (Julian)

Entry	Cultivar/	Bozeman	Havre	Sidney	Kalispel	Mocassin	Huntley	Conrad	7 Loc	BYX	RSQ
		LAT	RCB	LAT	RCB	RCB	avg	1 rep	Avg		
41 *	Nekota	167.3	164.0	165.7	162.7	169.0	161.0	166.0	165.1	0.61	0.94
25	Vista	167.7	165.0	166.6	163.3	169.0	161.0	167.0	165.7	0.61	0.94
30	Ike	167.3	165.0	167.9	163.3	169.3	161.0	168.0	166.0	0.65	0.90
26	Alliance	167.7	165.0	167.8	162.7	170.0	162.0	167.0	166.0	0.62	0.88
29	Halt	168.3	166.0	166.1	163.3	170.0	161.0	168.0	166.1	0.66	0.88
40 *	Niobrara	168.3	165.7	167.9	163.0	170.3	162.0	167.0	166.3	0.63	0.87
39 *	Akron	169.3	165.7	168.3	164.7	171.7	161.5	168.0	167.0	0.73	0.92
19	McGuire	169.0	165.3	168.4	164.7	172.0	161.5	169.0	167.1	0.77	0.94
28	Yuma	168.3	165.3	169.2	163.3	172.0	161.5	171.0	167.2	0.85	0.89
31	Quantum 547	170.3	165.7	169.2	164.3	172.0	162.0	169.0	167.5	0.80	0.96
7	Quantum 542	171.0	165.0	169.7	165.0	172.0	162.0	169.0	167.7	0.83	0.97
6	Centurk	171.3	166.0	168.7	165.3	173.0	162.0	169.0	167.9	0.84	0.96
32	Quantum 566	170.7	165.3	170.9	165.3	172.7	163.5	171.0	168.5	0.81	0.95
5	Judith	171.3	166.3	170.9	167.3	174.3	163.0	169.0	168.9	0.79	0.87
2	Rocky	172.7	165.7	170.4	166.3	173.0	162.5	174.0	169.2	0.98	0.95
16	Manning	175.7	167.7	169.8	166.0	173.3	162.0	172.0	169.5	1.02	0.92
46	MT9222	172.7	166.0	170.4	166.0	175.3	164.0	173.0	169.6	0.97	0.97
27	Jules	174.3	166.7	171.8	168.3	176.0	163.0	168.0	169.7	0.91	0.77
17	Promontory	174.0	167.0	172.1	166.0	173.0	163.5	172.0	169.7	0.91	0.96
8	Bighorn	173.7	167.0	171.1	167.3	174.3	163.0	174.0	170.1	0.98	0.97
12	Erhardt	174.3	167.0	169.9	168.0	175.3	163.0	173.0	170.1	0.99	0.96
33	XNH1643	174.1	166.3	169.7	167.3	174.7	164.5	175.0	170.2	0.96	0.93
47	MT9432	176.0	166.0	170.3	167.0	175.3	165.0	174.0	170.5	1.03	0.95
20	Vanguard	173.7	166.3	173.8	166.7	176.3	165.0	173.0	170.7	1.00	0.94
18	NuWest	173.7	166.7	171.7	167.3	176.0	165.0	175.0	170.8	0.99	0.97
37 *	BZ9W92-712-a	172.7	168.3	173.4	167.3	177.7	162.5	175.0	171.0	1.13	0.91
4	Redwin	177.0	166.0	172.0	167.3	176.7	164.5	175.0	171.2	1.18	0.97
21	Rampart	174.7	167.3	173.6	166.7	176.7	165.0	176.0	171.4	1.09	0.96
23	Kestrel	175.7	167.3	171.3	169.3	176.7	165.5	174.0	171.4	0.95	0.96
11	Roughrider	178.0	166.7	169.8	168.0	177.0	166.0	175.0	171.5	1.09	0.89
48 *	MT9441	176.7	167.7	170.8	169.3	177.0	166.0	174.0	171.6	0.96	0.94
13	Agassiz	178.0	166.3	172.2	167.7	177.0	166.0	174.0	171.6	1.10	0.93
22	AC Readymade	177.7	166.7	173.3	167.7	177.0	163.5	177.0	171.8	1.31	0.98
49 *	MT9453	178.0	166.0	173.9	168.3	178.0	164.0	175.0	171.9	1.29	0.97
45	MT91192	177.3	169.0	171.1	168.0	178.0	165.5	175.0	172.0	1.08	0.95
34 *	Dynamic I	177.7	169.3	172.0	167.7	177.0	165.0	175.0	172.0	1.09	0.97
36 *	S89-142	176.0	169.0	171.8	170.0	177.3	165.0	176.0	172.2	1.01	0.96
42 *	Garland	176.3	169.0	174.1	167.3	179.3	165.0	175.0	172.3	1.18	0.97
1	Neeley	178.0	167.3	175.0	167.7	177.7	165.0	176.0	172.4	1.24	0.98
10	Norwin	178.0	169.0	173.1	170.0	178.0	165.5	174.0	172.5	1.04	0.96
43 *	Elkhorn	178.3	168.0	172.3	168.3	178.3	166.0	176.0	172.5	1.16	0.97
3	Tiber	177.7	167.0	177.3	168.7	176.7	163.5	177.0	172.5	1.30	0.91
38 *	BZ9W92-712-b	177.3	169.3	175.5	167.3	178.0	164.0	179.0	172.9	1.32	0.95
35 *	Dynamic II	179.3	169.7	173.9	169.3	178.3	166.0	176.0	173.2	1.13	0.98
24	Meridian	178.3	168.7	174.2	168.3	178.7	166.0	179.0	173.3	1.25	0.97
15	Blizzard	179.0	168.3	175.0	168.7	179.0	165.5	180.0	173.6	1.35	0.96
14	Winridge	180.0	169.0	176.1	171.0	179.3	166.0	178.0	174.2	1.24	0.98
9	Norstar	181.0	169.7	174.3	171.7	179.0	166.0	179.0	174.4	1.23	0.94
44 *	Bonneville	179.7	170.0	176.0	169.3	180.0	166.0	180.0	174.4	1.33	0.98
Average		174.4	167.0	171.4	166.9	175.3	163.9	173.3	170.3	1.00	1.00
LSD (0.05)		1.4	1.0	3.9	1.7	1.3					
CV		0.5	0.4	1.4	0.6	0.4					

Table 6. 1996 Intrastate Winter Wheat Test (Exp. 35): 4 Location Winter Survival (%)

* = new for 1996

Entry	Cultivar/	Havre LAT	Sidney LAT	Mocassin RCB	Conrad RCB	4 Loc Avg	BYX	RSQ
11	Roughrider	89.9	63.9	81.7	51.7	71.8	0.60	0.93
45	MT91192	90.4	48.7	76.7	50.0	66.4	0.74	1.00
9	Norstar	92.1	50.4	83.3	38.3	66.0	0.91	0.96
13	Agassiz	94.0	61.1	76.7	31.7	65.9	0.85	0.80
36*	S89-142	82.5	62.4	90.0	28.3	65.8	0.81	0.67
23	Kestrel	85.3	58.4	81.7	36.7	65.5	0.75	0.84
43*	Elkhorn	92.3	51.9	81.7	35.0	65.2	0.92	0.94
12	Erhardt	90.6	50.0	76.7	33.3	62.7	0.90	0.94
32	Quantum 566	89.1	41.8	80.0	35.0	61.5	0.97	0.99
8	Bighorn	87.8	33.9	78.3	41.7	60.4	0.95	0.98
47	MT9432	81.8	38.5	80.0	36.7	59.2	0.88	0.96
48*	MT9441	84.9	48.0	78.3	23.3	58.6	0.96	0.88
2	Rocky	87.7	47.5	76.7	21.7	58.4	1.00	0.88
31	Quantum 547	82.9	29.4	73.3	46.7	58.1	0.84	0.91
25	Vista	86.0	32.9	83.3	28.3	57.6	1.11	0.97
18	NuWest	91.3	34.7	71.7	31.7	57.3	1.04	0.99
15	Blizzard	88.3	37.5	65.0	38.3	57.3	0.86	0.97
26	Alliance	86.3	40.5	76.7	25.0	57.1	1.02	0.95
5	Judith	89.2	36.8	66.7	35.0	56.9	0.92	0.97
14	Winridge	85.5	19.9	78.3	43.3	56.8	1.04	0.88
41*	Nekota	90.3	31.1	83.3	21.7	56.6	1.25	0.97
19	McGuire	88.3	33.5	68.3	35.0	56.3	0.96	0.99
39*	Akron	85.2	45.8	68.3	25.0	56.1	0.90	0.90
10	Norwin	89.7	33.0	70.0	31.7	56.1	1.03	1.00
22	AC Readymade	84.6	34.4	73.3	30.0	55.6	0.98	0.99
1	Neeley	89.2	15.0	80.0	38.3	55.6	1.20	0.91
46	MT9222	88.4	35.2	68.3	30.0	55.5	0.99	0.99
40*	Niobrara	86.7	28.8	75.0	28.3	54.7	1.10	1.00
49*	MT9453	88.7	23.2	68.3	38.3	54.6	1.03	0.95
6	Centurk	88.0	32.3	68.3	28.3	54.2	1.03	0.99
24	Meridian	86.5	31.0	73.3	23.3	53.5	1.11	0.99
44*	Bonneville	85.1	40.7	61.7	25.0	53.1	0.90	0.92
4	Redwin	85.3	31.7	73.3	21.7	53.0	1.11	0.99
16	Manning	82.6	11.1	75.0	43.3	53.0	1.06	0.82
33	XNH1643	82.5	28.9	75.0	25.0	52.9	1.08	0.99
7	Quantum 542	82.9	23.7	73.3	31.7	52.9	1.05	0.98
34*	Dynamic I	78.9	32.3	76.7	16.7	51.1	1.09	0.93
27	Jules	87.1	15.2	65.0	35.0	50.6	1.10	0.92
30	Ike	85.0	20.5	68.3	28.3	50.5	1.11	0.99
3	Tiber	89.3	11.9	70.0	26.7	49.5	1.28	0.97
35*	Dynamic II	76.2	17.5	73.3	15.0	45.5	1.20	0.97
29	Halt	86.1	7.2	50.0	31.7	43.7	1.09	0.83
17	Promontory	84.9	-0.6	68.3	18.3	42.7	1.42	0.95
20	Vanguard	75.9	9.8	55.0	23.3	41.0	1.05	0.95
21	Rampart	80.6	12.9	45.0	25.0	40.9	1.00	0.88
28	Yuma	77.5	0.9	41.7	18.3	34.6	1.12	0.88
42*	Garland	81.8	-0.6	38.3	16.7	34.0	1.19	0.86
38*	BZ9W92-712-b	58.4	-2.5	38.3	10.0	26.0	0.96	0.95
37*	BZ9W92-712-a	35.1	10.9	38.3	6.7	22.8	0.56	0.91
Average		84.5	30.7	70.2	29.8	53.8	1.00	1.00
LSD (0.05)		9.1	18.8	14.0	17.1			
CV		6.3	34.6	12.3	35.3			

Table 7. 1996 Intrastate Winter Wheat Test (Exp. 35) Coleoptile Length

Entry #	Cultivar/ Line * = new for 1996	Coleoptile Length				2 year average in
		1996		1995		
		mm RCB	in RCB	mm RCB	in RCB	
14	Winridge	117.3	4.6	100.9	4.0	4.3
21	Rampart	116.5	4.6	118.4	4.7	4.6
11	Roughrider	106.6	4.2	107.1	4.2	4.2
19	McGuire	105.8	4.2	97.2	3.8	4.0
15	Blizzard	105.8	4.2	107.4	4.2	4.2
20	Vanguard	105.6	4.2	88.6	3.5	3.8
3	Tiber	104.7	4.1	86.1	3.4	3.8
1	Neeley	104.6	4.1	90.2	3.6	3.8
46	MT9222	103.1	4.1	105.4	4.1	4.1
47	MT9432	99.6	3.9	103.1	4.1	4.0
43 *	Elkhorn	99.0	3.9			
6	Centurk	98.9	3.9	87.5	3.4	3.7
44 *	Bonneville	96.0	3.8			
13	Agassiz	92.5	3.6	94.5	3.7	3.7
9	Norstar	92.1	3.6	88.1	3.5	3.5
7	Quantum 542	92.0	3.6	88.0	3.5	3.5
2	Rocky	91.6	3.6	87.7	3.5	3.5
49 *	MT9453	91.3	3.6			
22	AC Readymade	91.0	3.6	85.7	3.4	3.5
4	Redwin	91.0	3.6	79.4	3.1	3.4
8	Bighorn	88.8	3.5	81.7	3.2	3.4
34 *	Dynamic I	86.8	3.4			
16	Manning	86.7	3.4	86.3	3.4	3.4
33	XNH1643	84.9	3.3	80.9	3.2	3.3
41 *	Nekota	84.2	3.3			
38 *	BZ9W92-712-b	84.0	3.3			
24	Meridian	81.1	3.2	76.3	3.0	3.1
39 *	Akron	80.9	3.2			
30	Ike	80.2	3.2	78.7	3.1	3.1
12	Erhardt	79.7	3.1	87.1	3.4	3.3
40 *	Niobrara	79.3	3.1			
35 *	Dynamic II	79.2	3.1			
29	Halt	77.4	3.0	79.0	3.1	3.1
45	MT91192	77.1	3.0	78.8	3.1	3.1
32	Quantum 566	75.4	3.0	81.7	3.2	3.1
5	Judith	73.7	2.9	67.2	2.6	2.8
27	Jules	73.2	2.9	75.1	3.0	2.9
23	Kestrel	73.0	2.9	73.5	2.9	2.9
17	Promontory	72.8	2.9	75.4	3.0	2.9
42 *	Garland	71.4	2.8			
18	NuWest	71.2	2.8	65.6	2.6	2.7
25	Vista	71.0	2.8	67.3	2.6	2.7
31	Quantum 547	70.9	2.8	71.4	2.8	2.8
26	Alliance	70.4	2.8	64.7	2.5	2.7
48 *	MT9441	68.6	2.7			
37 *	BZ9W92-712-a	67.7	2.7			
10	Norwin	65.9	2.6	65.1	2.6	2.6
28	Yuma	65.5	2.6	66.2	2.6	2.6
36 *	S89-142	65.5	2.6			
	Average	86.0	3.4	87.0	3.4	
	LSD (0.05)	7.2	0.3	8.1	0.3	
	CV	5.2	5.2	6.7	6.7	