

Progress Report of Seed Production Research

prepared by

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Table a. Monthly precipitation at Roseau, MN 1966-1983, with some average Kentucky bluegrass seed yields from 1968-1983.

Month	Year																	
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
January	.56	1.13E*	.62	3.07	.71	.54	.68	.09	.88	1.10E	1.13	.14	.36	.50	.55	.27	1.30	.71
February	.31	.39	T	.11	.41	.13	.76	.17	.87	.29E	.50	.62	.26	1.01	.82	.16	.45	1.26
March	1.70	.59	1.25	.05	1.38	.26E	.50E	1.18	.16	.64E	1.05	1.02	.17	1.06	.35	.66	.74	1.17
April	1.63	2.89	.63	1.27	2.56	1.50	.70	.90	2.72	1.40	.77	.27	1.00	2.77	0	.56	.24	.53
May	2.04	.89	1.46	3.31	5.93	2.24	1.66	2.46	4.12	1.52	.54	2.43	1.97	1.89	.24	2.79	1.38	2.76
June	3.81	2.23	6.47	2.29	4.07	2.29	5.03	2.21	1.56	4.96	5.82	3.71	1.92	1.91	1.75	6.85	2.00	4.03
July	3.71	4.95	6.13	3.70	3.55	3.58	1.92	4.04	2.56E	2.26	1.52	2.28	6.25	3.70	3.35	2.63	5.53	1.62
August	3.30	1.69	8.49	4.28	.83	.69	1.53	2.09	10.97	1.75	3.72	1.74	3.25	1.59	5.19	2.41	2.71	3.34
September	.99	.83	2.35	3.29	2.77	3.33	4.22	5.67	.42	1.79	.34	3.83	3.44	.45	4.12	3.63	1.92	2.81
October	1.17	1.11	1.26	1.91	1.49	2.97	1.40	1.10	.66	1.49	.07	.87	.23	1.40	1.66	1.75	2.91	2.26
November	.62E	.70	1.06	.30	1.21	.29	.38	.67	.15	.20	T	2.27	.98	1.02	.94	.90	.46	.55E
December	1.70E	1.76E	.21	.73	.37	.50E	.32	.75	1.40	.65E	.37	.26	.79	.16	.18	.99	.57	.65E
Total	21.54	19.16	29.98	24.31	25.28	19.02	19.10	21.40	26.47	18.05	15.83	19.44	20.62	17.46	19.15	23.60	20.21	21.69
Departure from normal	+1.82	-.56	+10.26	+4.59	+5.56	-.70	-.62	+1.68	+5.43	-2.94	-5.16	-1.55	+0.35	-3.53	-1.84	+2.61	-.78	+70
Kentucky bluegrass seed yields***			650	448	673	492	405	422	642	504	146	140	507	415	62	625	595	605

* E = estimated rainfall.

** NA = not available.

*** All from Park variety, July burn treatment, with 80 to 100 lbs of nitrogen per acre.

Table b. Some winter soil temperatures near Roseau, MN 1972-73 through 1982-83. Y. B. Magnusson farm - 1-1/2 mile west of Roseau, MN on Highway 11 and Welin farm - 1 mile west and 1/2 mile north of Roseau, MN.

1972-73		1977-78		1982-83		1982-83		1982-83		1982-83	
		High	Low	Current	High	Low	Current	High	Low	Current	Current
November 25		32	21	25	34	28	28	October 14	63	42	54
December 20		31	12	28	29	24	25	December 13	54	12	20
January 9		31	10	26	25	22	25	December 26		16	
February 24		27	22	26	42	29	42	February 25	28	20	28
March 6		31	24	31	65	39	48	March 12	30	22	28
<u>1973-74</u>											
October 26		56	42	46	1978-79			March 29	32	20	32
November 28		33	32	33	October 20	76	40	May 17	58	28	54
December 25		27	23	28	December 16	55	29	1983-84			
January 19		28	8	27	March 19	31	5?	October	68	39	40
February 10		29	28	29	April 28	52	30	December	69	31	31
March 16		31	29	30	1979-80			These temperatures are ° F, recorded at 3 to 4 inches below bluegrass sod.			
March 29		31	17	30	October 21	49	40	First three years from Y.B. Magnusson farm, and rest from Welin farm.			
<u>1975-76</u>											
October 27		46	41	43	March 20	30	18	January 19, 1974	temperature of 8		
December 14		33	30	32	April 7	50	25	degrees appears out of place, but			
January 4		30	25	29	April 22	61	33	there was no snow for a time with			
January 11		31	29	29	1981-82			severe temperatures.			
February 16		31	31	31	December 12	49	31	Same can be said of March 15, 1982			
March 8		31	31	31	December 30	30	24	reading of 8 degrees. This tempera-			
ture may have occurred in January or											
February but was not recorded until											
March.											
Five degrees on March 19, 1979 is an											
error, we think, but we do not know											
why.											

(4)

1983 Weather at Roseau

Severe cold temperatures with little snow cover in December, 1982 caused winter kill and winter injury in many situations. The soil temperature, 3 to 4 inches under sod, was 12°F on December 12, 1982.

Orchardgrass and Perennial Ryegrass nurseries were particularly hard hit. With some snow later and continued limited ground cover the soil temperature rose to 20 in February and 22 in March. To the contrary the soil temperature on December 5, 1983 was 31°F. This is higher than normal, but with good snow cover the soil temperature is not so low.

The 1982 July-August-September-October rainfall plus the March-April-May precipitation produced good grass yields on bluegrass, timothy and reed canarygrass. To the contrary the low precipitation in late June-July-August in 1983 caused poor establishment in the new seedings. The August-September-October, 1983 rainfall (totaling 8.41 inches) should provide good production in 1984, provided adequate rain falls in March-April-May, 1984.

Table a warrants some attention. These data suggest that fall and spring rainfall is critical for good grass seed yields. Dr. Benson's report supports this.

1983 Kentucky Bluegrass Data

The yields from all three established nurseries appear very satisfactory with Park averaging about 500 lbs/A for the three seedings. We have numerous varieties which yield as well as Park and some better, but none seems to be as easy to produce and with as few production problems as Park. We are interested that in the 1981 seeding (Table 3), Mosa, Vanessa and other mildew susceptible varieties produced normal yields in 1983, compared to the very low yields produced in 1982.

Table 5 shows the data from six varieties treated with five chemical treatments plus check plot. This was planned to study the control of Powdery Mildew. Mildew ratings recorded at time of spraying show that Enmundi and Rugby were infected, but one month after spraying, we could find no mildew infection in these plots. This suggests that one, or more, of the chemical treatments was sufficiently volatile to control mildew in the untreated plots. This also appeared in a field study and in the 1981 and 1982 variety trials.

Table 6 presents the data on Residue Management on Park and Parade varieties on peat soil. Two items of interest appear, 1) Clipping and removing residue does not increase seed yield, as it does on the mineral soil; and 2) Burning 4 or 14 days after spraying with Paraquat or Dinitro produces good yields, but not burning does not. Also, burning without desiccation produces good yield, but not burning produces yields about the same as the two chemical treatments which are not burned.

Tables 7 and 8 show data from the 1983 Growth Regulator trials. The chemicals, Parlay (PP-133) and EL-500 both reduce lodging significantly, and in most cases the Harvest Index (final seed weight over sample weight) is significantly higher in most growth regulator treatments. In 1983 we sprayed without "washing" the growth regulators into the soil and found that this worked satisfactorily.

Table 1. Plant height, percent headed, desirability ratings, lodging, harvest date, and seed yields for 80 Kentucky bluegrass strains seeded in 1979 on the Melin Farm, Roseau, MN. 1983 data plus 1981 and 1982 seed yields.

Strain	MSP no.	Plant height (cm)		Percent headed			Desirability* (6/23)	Lodging** 7/8	Harvest date	Seed yield (lb/A)				
		6/6	7/8	6/2	6/9	6/17				6/20	1981	1982	1983	3 year average
Aquila	1345	13	35	0	17	68	100	3.1	1.0	7-11	416	350	297	354
Arista	1573	13	40	2	20	83	100	1.9	1.0	7-15	659	454	481	531
Aspen	1204	7	48	0	6	47	87	3.2	1.0	7-15	716	353	371	480
Banff	1355	12	48	2	15	68	100	3.1	1.0	7-13	615	490	389	498
Baron	1550	8	40	0	6	48	87	2.1	1.0	7-14	989	630	582	734
Claudia	1545	17	52	T	13	73	100	2.7	1.0	7-11	585	422	457	488
Dornie	1303	20	53	9	32	93	100	2.8	1.0	7-11	612	579	437	543
Emmundi	1147	10	37	0	2	15	73	3.4	1.0	7-15	546	303	297	382
Entopper	1570	12	53	0	7	58	100	1.9	1.0	7-15	644	523	446	538
Escort	1571	17	67	2	22	97	100	2.7	2.3	7-11	463	312	401	392
Gardi	1106	13	33	2	9	75	100	2.5	1.0	7-18	413	184	362	320
Geronimo	1546	13	58	2	28	97	100	1.4	1.0	7-10	873	790	805	823
Glade	1574	7	42	0	T	7	53	3.0	1.0	7-15	443	347	371	387
Granada	1194	15	47	2	7	45	100	3.5	1.0	7-11	434	169	318	307
Holt	1565	15	45	25	50	100	100	4.0	1.0	7-8	481	116	107	235
Kimono	1547	12	37	T	12	52	93	3.0	1.0	7-14	535	404	463	467
Mentor	1346	15	43	0	5	42	83	3.1	1.0	7-11	359	107	226	231
MLM-18011	1531	10	42	0	5	43	85	2.9	1.0	7-18	849	377	493	573
Mom Pp H519	1283	13	43	0	20	78	100	2.8	1.0	7-13	692	425	463	527
Mom Pp 1417	1543	15	43	0	15	73	100	2.7	1.0	7-14	832	493	463	596
Mom Pp 1765	1544	12	48	0	10	68	100	1.7	1.0	7-13	858	600	576	678
Mosa	1548	15	48	0	4	55	93	2.0	1.0	7-14	731	463	549	581
Nugget	1464	8	32	T	23	92	100	2.9	1.0	7-16	434	267	347	349
Parade	1347	12	58	0	15	82	100	2.6	1.0	7-13	591	324	404	440
Park	1461	25	72	3	40	100	100	1.5	1.0	7-8	647	573	621	614
P-141	1305	17	45	5	40	97	100	2.5	1.0	7-13	386	303	336	342
P-143	1356	12	52	0	4	42	93	3.5	1.0	7-13	446	175	157	259
Ram I	1551	8	33	2	15	53	93	3.1	1.0	7-16	680	339	404	474

Table 1. (continued)

Strain	MSP no.	Plant height (cm)				Percent headed			Desirability* (6/23)	Lodging** 7/8	Harvest date	Seed yield (lb/A)		
		6/6	7/8	6/2	6/9	6/17	6/20	1981				1982	1983	3 year average
N-1213	1462	10	27	2	20	83	100	3.1	1.0	7-15	496	294	347	379
Rugby	1007	13	47	2	23	82	100	2.9	1.0	7-13	671	380	416	489
Tivoli	1105	12	27	0	12	77	100	3.1	1.0	7-18	511	89	312	304
Trenton	1579	12	57	T	20	83	100	2.9	1.0	7-13	517	359	392	423
Troy	936	35	68	30	60	100	100	2.5	1.0	7-8	460	434	469	454
Touchdown	934	15	55	2	27	87	100	3.8	1.0	7-13	273	247	160	227
Vanessa	1549	12	45	0	4	63	100	2.4	1.0	7-14	701	395	410	502
Welcome	1403	13	43	2	27	83	100	2.8	1.0	7-13	223	339	321	294
K3-162	1575	30	62	37	70	100	100	2.3	1.1	7-8	523	446	538	502
K3-167	1401	22	70	3	38	93	100	1.9	1.0	7-10	454	345	339	379
K3-168	1576	23	68	5	50	98	100	1.7	1.0	7-10	324	303	321	316
K3-170	1402	23	73	4	53	98	100	1.5	1.0	7-10	374	336	347	352
K3-178	1577	17	65	T	23	88	100	2.2	1.0	7-13	558	401	407	455
K3-179	1578	15	72	0	12	83	100	2.0	1.1	7-15	306	184	264	251
K7-103	1404	15	63	0	7	82	100	2.2	1.2	7-13	279	178	255	237
K7-104	1405	25	72	4	37	100	100	2.4	2.8	7-13	695	460	446	534
K7-105	1406	27	68	T	32	100	100	2.3	2.8	7-13	695	508	451	551
K7-138	1410	13	50	0	7	75	100	1.8	1.0	7-15	778	561	698	679
78033	1411	15	43	2	10	90	100	2.7	1.0	7-10	570	552	514	545
78037	1412	23	75	2	33	100	100	1.8	1.1	7-10	636	493	561	563
78038	1413	23	75	7	50	98	100	2.1	1.0	7-11	576	404	377	452
78053	1414	25	78	8	57	100	100	1.6	1.0	7-11	576	416	448	480
78054	1415	20	72	2	30	93	100	2.3	1.1	7-11	342	327	309	326
78055	1416	30	63	27	63	100	100	1.3	1.0	7-10	514	481	552	516
78056	1417	27	75	5	47	97	100	2.9	1.0	7-10	582	362	339	428
78059	1420	23	77	2	30	93	100	2.6	1.0	7-13	475	469	350	431
78060	1421	28	67	5	57	100	100	2.0	1.0	7-13	448	448	416	437
78061	1422	15	70	T	5	63	100	3.3	1.2	7-14	327	181	244	251

Table 1. (continued)

Strain	MSP no.	Plant height (cm)		Percent headed			Desirability* (6/23)	Lodging** 7/8	Harvest date	Seed yield (lb/A)				
		6/6	7/8	6/2	6/9	6/17				6/20	1981	1982	1983	3 year average
78063	1424	23	70	3	53	100	100	2.6	1.0	7-13	674	347	356	459
78064	1425	25	73	5	55	100	100	2.6	1.2	7-11	639	342	410	464
78065	1426	20	77	2	7	82	100	2.8	1.0	7-13	481	276	279	345
78066	1427	22	70	T	30	100	100	2.1	1.0	7-13	502	443	350	432
78067	1428	23	75	2	50	100	100	2.0	1.0	7-10	695	437	413	515
78068	1429	23	72	2	48	100	100	2.0	1.5	7-10	722	374	419	505
78069	1430	25	73	2	50	100	100	2.1	2.1	7-13	677	377	371	475
78070	1431	25	72	2	53	100	100	1.9	1.4	7-11	722	431	356	503
78071	1432	25	75	4	43	100	100	2.1	1.2	7-11	630	413	353	465
78072	1433	25	70	2	47	100	100	1.9	1.4	7-11	698	446	374	506
78073	1434	27	77	2	50	100	100	2.1	1.3	7-11	653	359	443	485
78074	1435	23	72	2	47	100	100	2.1	1.8	7-10	609	437	422	489
78075	1436	27	72	2	53	100	100	2.0	1.3	7-11	606	451	451	503
78076	1437	28	72	5	57	100	100	1.7	1.0	7-13	478	380	425	428
78077	1438	27	72	5	53	100	100	1.8	1.4	7-11	573	356	395	441
78078	1439	22	68	4	30	97	100	2.0	3.0	7-14	321	309	276	302
78079	1440	22	68	4	33	100	100	2.0	2.3	7-14	446	342	288	359
78080	1441	22	67	2	20	97	100	3.0	2.3	7-13	365	291	214	290
78081	1442	23	70	3	27	100	100	2.6	2.4	7-13	345	306	270	307
78082	1443	22	70	4	30	100	100	2.1	2.1	7-14	386	324	276	329
78083	1444	20	70	2	32	100	100	2.4	2.0	7-14	404	327	226	319
78084	1445	20	68	2	30	100	100	2.7	2.2	7-13	425	279	249	318
78085	1446	22	67	2	30	100	100	2.3	2.2	7-14	345	362	244	317
78086	1447	22	73	2	27	100	100	2.0	1.5	7-13	377	247	345	323

* 1 = best plant, 5 = poorest.

**1 = no lodging, 5 = severe lodging.

LSD at 5% level

LSD at 1% level

143

189

145

191

125

165

20

B O

Table 2. Plant height, percent headed, desirability, lodging, harvest date and seed yields for 28 Kentucky *Agropyron* strains seeded in 1980 on the Welin Farm, Roseau, MN. 1983 data plus 1982 seed yields.

Strain	MSP no.	Plant height (cm)				Percent headed		Desirability** (6-23)	Lodging* (7-8)	Harvest date	Seed yields (lb/A)		
		6/6	7/8	6/2	6/9	6/17	6/20				1982	1983	2-year average
America	1695	7	47	0	4	35	90	3.1	1.0	7-18	297	359	328
Aquila	1038	22	47	4	13	58	100	3.2	1.1	7-13	511	279	395
Barblue	1672	13	48	T	7	55	92	3.4	1.0	7-16	410	267	339
Baron	1673	10	42	0	T	43	95	2.1	1.0	7-17	624	454	539
BAR Pp 80-T	1674	13	35	2	30	85	100	3.4	1.0	7-18	226	157	192
Bartissimo	1675	13	52	0	T	15	30	3.5	1.0	7-14	356	193	275
Caroline	1633	10	55	0	T	25	73	3.1	1.0	7-15	356	261	309
Cynthia	1634	15	52	0	8	65	100	3.0	1.0	7-13	683	407	545
Enmundi++	1603	25	70	T	30	92	100	2.5	1.0	7-8	499	353	426
Escort	1571	23	67	2	20	87	100	2.6	1.4	7-13	333	273	303
Gardi	1106	13	35	2	T	18	100	2.6	1.0	7-20	377	140	259
ISI-128	1693	18	48	2	17	73	100	3.0	1.1	7-14	327	336	332
Merit	1694	15	50	0	5	37	88	2.6	1.0	7-14	665	600	633
Miranda	1635	22	50	2	23	87	100	2.5	1.1	7-14	475	356	416
MLM-18011	1657	15	50	2	5	47	93	3.1	1.0	7-20	190	232	211
Monopoly	1586	22	67	0	4	80	100	1.6	2.3	7-14	419	285	352
Newport	1248	22	58	0	10	83	100	1.9	1.0	7-13	564	558	561
Nugget	1589	12	35	T	8	38	100	4.0	1.0	7-20	166	175	171
Parade	1347	17	57	2	10	63	100	2.5	1.0	7-14	154	318	236
Park	1461	27	70	2	25	100	100	2.2	1.1	7-8	609	410	510
P-141	1649	18	55	2	17	68	100	2.8	1.0	7-13	392	255	324
PPT6	1651	10	32	7	25	78	100	3.4	1.0	7-18	291	137	214
Ram I	1652	13	45	0	4	33	100	3.4	1.0	7-15	353	238	296
RR-10	1591	15	48	T	13	57	100	2.5	1.0	7-18	428	350	389
Rugby	1738	15	53	T	8	63	100	2.4	1.0	7-13	160	312	236
Saskia	1636	17	45	0	12	55	100	2.2	1.0	7-11	668	600	634
Tivolli	1105	10	37	0	2	28	100	3.2	1.1	7-20	386	160	273
Touchdown	934	17	52	0	12	57	100	3.8	1.2	7-14	297	80	189

* 1 = no lodging, 5 = severe lodging.
 ** 1 = best plants, 5 = poorest plants.
 ++ This seed lot did not perform as Enmundi.

LSD at 5% level 137 112
 LSD at 1% level 183 150

Table 3. Plant height, percent headed, powdery mildew reaction, lodging, harvest date, and seed yields for 50 Kentucky bluegrass strains seeded in 1981 on Welin Farm, Roseau, MN. 1983 data plus 1982 seed yields.

Strain	MSP no.	Plant height (cm)		Percent headed			Powdery mildew* 6/9	Lodging at harvest**	Harvest date	Seed yield (lb/A)			
		6/6	7/8	6/2	6/9	6/17				6/20	1982	1983	2-year average
America	1695	18	58	2	12	70	100	0	1.1	7-17	457	567	512
Aquila	1915	30	58	5	22	85	100	0	1.7	7-10	327	538	433
Barblue	1837	27	63	2	10	90	100	0	2.1	7-17	327	508	418
Baron	1765	18	57	2	18	93	100	0	1.1	7-16	86	820	453
Bartissimo	1675	30	58	0	T	52	92	0	2.8	7-17	324	350	337
Bristol	1767	25	63	2	7	78	100	0	1.8	7-20	330	591	461
BAR Pp 80-T	1872	22	50	15	30	82	100	0	1.0	7-18	27	407	217
BAR Pp 81-E	1871	25	63	2	15	98	100	0	2.2	7-11	395	555	475
Claudia	1545	25	65	0	13	85	100	T	1.3	7-13	202	517	360
Eclipse	1740	23	65	T	4	67	98	0	3.0	7-20	303	511	407
Emundi++	1603	33	78	8	40	97	100	T	2.4	7-10	300	526	413
Enprima	1898	25	65	4	20	87	100	0	1.9	7-14	466	686	576
Entopper	1570	25	63	0	5	78	100	0	1.3	7-19	457	781	619
Escort	1571	30	78	T	25	100	100	0	3.9	7-17	303	493	398
Geronimo	1546	30	70	T	17	100	100	1.3	2.0	7-10	154	927	541
Harmony	1712	23	57	0	10	80	100	0	1.0	7-16	532	588	560
Holiday	1752	28	72	0	4	62	98	0	2.2	7-18	386	285	336
Holt	1808	33	63	70	80	100	100	0	1.0	7-7	45	541	293
ISI-128	1693	27	73	10	23	85	100	0	1.4	7-13	80	639	360
Kimono	1547	22	53	4	15	85	100	0	2.4	7-15	193	665	429
Merit	1840	20	58	2	15	83	100	T	1.0	7-13	83	915	499
Mierille	1754	22	55	0	12	88	100	0.8	2.1	7-20	36	368	202
MLM-18011	1657	22	60	T	12	78	100	0	1.4	7-20	104	475	290
Monopoly	1586	32	70	0	4	78	100	0	3.1	7-19	606	520	563
Mom Pp 1417	1543	30	62	0	7	82	100	0	2.8	7-20	609	680	645
Mom Pp 1765	1544	28	65	0	13	100	100	0	2.2	7-14	324	745	535
Mosa	1548	25	60	2	10	90	100	0.7	1.3	7-15	18	674	346
NK-Exp. K1-76	1742	45	78	20	67	100	100	0	2.0	7-8	639	621	630

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Table 3. (continued)

Strain	MSP no.	Plant height (cm)		Percent headed			Powdery mildew* 6/9	Lodging at harvest**	Harvest date	Seed yield (lb/A)		
		6/6	7/8	6/2	6/9	6/17				6/20	1982	1983
NK-Exp.	K1-152	25	72	0	20	93	100	2.4	7-15	187	591	389
	K3-157	28	78	0	13	100	100	2.4	7-16	457	413	435
	K3-160	30	75	0	10	92	100	2.1	7-13	395	347	371
	K3-162	40	67	17	47	95	100	3.6	7-15	285	327	306
K3-178	1815	27	80	2	23	100	100	2.1	7-14	178	665	422
	1816	27	77	T	23	97	100	2.2	7-13	104	416	260
	1817	35	85	7	53	98	100	1.8	7-8	356	440	398
	1587	45	78	42	67	100	100	2.7	7-10	434	517	476
N6-106	1588	40	73	20	57	88	100	2.5	7-8	440	356	398
	1589	20	45	7	20	65	92	1.0	7-20	163	291	227
	1916	35	85	2	37	95	100	2.4	7-13	333	472	403
	1461	37	75	7	40	98	100	2.9	7-10	282	523	403
Plush	1753	32	67	4	40	100	100	2.4	7-16	270	472	371
	1650	20	48	17	43	100	100	1.0	7-18	27	404	216
	1769	27	58	3	15	87	100	2.4	7-15	282	463	373
	1809	23	68	2	23	95	100	1.4	7-13	125	606	366
Sophia	1755	27	65	0	8	73	100	2.1	7-20	431	674	553
	934	28	73	0	32	93	100	2.7	7-18	193	247	220
	1810	27	73	0	17	97	100	1.8	7-16	131	493	312
	1549	23	60	0	10	88	100	1.8	7-17	18	603	311
Victoria	1768	22	60	0	10	77	100	1.0	7-15	62	891	477
	1713	27	60	0	5	50	88	2.4	7-16	371	285	328

* 1 = best plant, 5 = poorest plant.

** 1 = no lodging, 5 = severe lodging.

++ This seed lot did not perform as Emmundi.

LSD at 5% level

LSD at 1% level

Table 4. Percent stand, plant height, percent headed and powdery mildew reaction for 65 Kentucky bluegrass strains seeded in 1982 on Melin Farm, Roseau, MN. 1983 data plus 1982 percent stands.

Strain	MSP no.	Percent stand		Plant height (cm)		Percent headed		Powdery mildew* 6/9/83
		8/31/82	5/9/83	6/2	7/9	6/6	6/11	
Adelphi	2063	53	25	12	47	17	22	100
America	1695	12	20	8	43	20	50	100
Aspen	2064	57	35	12	52	13	22	100
Balin	2137	72	67	25	68	35	47	100
Baron	1936	60	47	8	47	20	42	100
BAR Pp-81-E	2044	73	50	8	37	30	47	100
Bel 20	1930	50	35	8	50	10	23	100
Bel 21	1931	37	13	20	68	40	35	100
Bel 22	1932	70	37	20	67	38	63	100
Bristol	1767	60	47	10	48	10	27	100
Camilla	2138	83	70	8	37	17	29	100
Charlotte	2139	77	77	12	47	5	4	100
Cynthia	2015	53	37	10	37	27	37	100
Eclipse	1740	30	13	5	40	5	10	100
Emundi	2051	73	57	5	32	2	9	100
Enprima	2052	70	48	10	52	23	40	100
Entopper	2053	63	23	10	45	20	38	100
Erte	2140	73	67	28	57	32	15	100
Escort	1571	40	22	13	65	17	32	100
Granada	2065	80	80	22	53	27	33	100
Harmony	1992	80	52	13	33	25	33	100
Holiday	1752	55	43	12	42	7	15	93
Julia	2054	63	40	17	63	23	43	100
Kimono	1280	70	43	13	47	23	30	100
Kyosti	2100	63	38	10	45	25	43	100

Table 4. (continued)

Strain	MSP no.	Percent stand		Plant height (cm)		Percent headed			Powdery mildew* 6/9/83
		8/31/82	5/9/83	6/2	7/9	6/6	6/11	6/20	
Leikra	2050	67	53	27	77	42	70	100	0
Melba	1934	50	40	10	33	23	27	100	0
Mer Pp-43	1948	77	57	12	43	9	8	100	T
Monopoly	1711	60	48	18	67	13	43	97	0
Mosa	1548	57	18	10	43	7	15	100	1.1
Mystic	1937	60	45	17	55	35	60	100	0
Parade	2066	33	18	8	47	7	10	100	T
Park	1461	63	28	20	67	43	43	100	0.4
Plush	1753	53	35	18	57	25	35	100	T
Prato	2067	47	43	28	83	43	60	100	0.4
P.O. 3132	1978	67	50	12	38	7	35	100	T
P.O. 3232	1979	70	50	12	47	10	22	100	0
P.O. 3332	1980	63	43	10	48	13	33	100	0
P.O. 3432	1981	73	58	8	45	15	22	100	0.4
P.O. 30232	1977	73	60	12	47	33	50	100	0
Ram I	1938	73	63	12	30	12	23	100	0
Rugby	2068	75	43	10	53	13	47	100	1.5
Sophia	2141	75	79	8	43	12	25	100	0.4
Trampas	1935	50	32	7	28	15	30	100	0
Trenton	2069	83	50	12	55	13	47	100	1.4
Welcome	1993	80	73	13	45	8	18	100	0.7
243	1939	60	22	7	42	12	12	100	0.4
NK-Exp. K1-138	2070	17	3	13	45	23	45	100	T
K1-152-7	2071	63	47	10	60	17	37	100	0.7
K1-160-5	2072	67	60	20	60	47	40	100	1.8
K3-157-5	2073	72	27	15	65	27	38	100	0
K3-160-6	2074	50	27	15	58	23	35	100	0
K3-162-5	2075	80	87	17	42	22	17	100	0.9

Table 4. (continued)

Strain	MSP no.	Percent stand		Plant height (cm)		Percent headed			Powdery mildew* 6/9/83	
		8/31/82	5/9/83	6/2	7/9	5/31	6/6	6/11		6/20
NK-Exp. K3-166	2076	57	50	10	42	2	13	20	100	1.0
K3-174-3	2077	60	57	23	70	12	42	30	100	1.0
K3-178	2078	67	37	12	58	0	13	27	100	1.4
K3-179-5	2079	70	60	15	55	5	17	20	100	3.0
K3-180-1	2080	15	3	-	48	0	-	-	-	T
K3-187-2	2081	25	7	13	58	0	25	25	100	T
K3-222-2	2082	12	23	10	60	0	15	-	-	T
K6-32-2	2083	63	43	12	52	0	12	20	100	1.3
K6-80-1	2084	67	47	22	70	27	40	60	100	0
K6-87-1	2085	55	23	17	47	10	33	50	100	T
N6-106	1588	43	30	22	57	30	67	33	100	0
K0-140	1587	43	45	35	68	60	68	83	100	0

* 0 = no infection, 5 = severe infection. T = trace.

Table 5. Powdery mildew infection, plant height, lodging, harvest date and seed yield for six Kentucky bluegrass varieties under six fungicide treatments at Welin Farm, Roseau, Minnesota, 1983.

Chemical and rate	Varieties						Average	Rugby	Ram 1	Park	Fmndi	Baron	America	Chemical and rate	Lodging**	Average
	America	Baron	Fmndi	Park	Ram 1	Rugby										
-----Mildew June 10, 1983-----																
No treatment	0	0.3	3.0	0	0	0	0.7	0	1.3	2.5	4.1	1.7	3.0	2.4b+		
Parlay	0	0	2.3	0	0	0	0.4	1.0	1.0	2.1	3.8	1.9	1.7	2.0a		
Tilt - low	0	0	1.3	0	0	0.3	0.3	1.0	1.0	3.5	4.0	2.2	2.9	2.8bc		
- high	0	0	1.7	0	0	0	0.3	1.0	1.0	2.1	3.8	1.1	2.0	2.0a		
Bayleton - low	0	0	1.7	0	0	0	0.3	1.3	1.3	4.0	4.2	3.1	4.3	3.4c		
- high	0	0	2.0	0	0	0	0.3	1.0	1.0	2.3	4.0	2.3	3.1	2.3ab		
Average	0	0.1	2.0	0	0	0.2		2.2b	1.1a	2.8c	4.0d	2.1b	2.8c			
-----Mildew July 8, 1983*-----																
No treatment	0	0	0	0	0	0	0	7-21	7-20	7-18	7-14	7-14	7-18	7-18		
Parlay	0	0	0	0	0	0	0	7-21	7-18	7-20	7-14	7-20	7-21	7-19		
Tilt - low	0	0	0	0	0	0	0	7-21	7-18	7-20	7-14	7-16	7-18	7-18		
- high	0	0	0	0	0	0	0	7-20	7-20	7-18	7-14	7-14	7-14	7-17		
Bayleton - low	0	0	0	0	0	0	0	7-20	7-20	7-20	7-14	7-16	7-21	7-19		
- high	0	0	0	0	0	0	0	7-20	7-16	7-20	7-14	7-16	7-18	7-17		
Average	0	0	0	0	0	0		7-21	7-19	7-19	7-14	7-16	7-18	7-17		
-----Seed yield (grams/m ²)-----																
No treatment	57	62	60	77	58	72	64	70	90	66	82	44	62	69a		
Parlay	52	42	60	80	55	58	58	56	83	69	80	55	57	67a		
Tilt - low	62	62	65	80	62	68	67	69	100	63	91	59	61	74a		
- high	57	53	55	78	57	68	61	67	93	61	78	46	72	70a		
Bayleton - low	62	67	65	78	63	72	68	63	102	68	92	51	66	74a		
- high	60	63	58	77	60	73	65	74	90	71	94	47	68	74a		
Average	58	58	61	78	59	69		67b	93c	66b	86c	50a	64b			

* Powdery mildew was read June 10 and July 8, after fungicide treatments on June 8.

** Lodging scored as 1 = no lodging, to 5 = prostrate.

+ Numbers followed by same letter do not differ significantly.

Table 10. Plant height, percent headed, lodging, harvest date and seed yields for 51 Timothy strains seeded in 1980 on the Melin Farm, Roseau, MN. 1983 data plus 1981 and 1982 seed yields.

Strains	MSP no.	Plant height (cm)		Percent headed			Lodging*		Seed yield (lb/A)			3-year average			
		6/22	7/20	6/13	6/20	6/24	6/29	7/4	7/13	7/23	harvest		1981	1982	1983
Early maturing varieties															
Alphage	1532	60	100	2	10	40	75	85	100	1.3	1.4	383	386	184	318
Barmidi	1670	52	100	0	2	15	62	77	100	1.1	1.2	273	208	116	199
Bartimi	1671	57	107	0	3	13	62	78	100	1.0	1.0	324	339	175	279
Basho	1501	70	103	15	37	87	90	100	100	1.0	1.0	330	258	249	279
Bottnia II	1469	60	98	0	8	50	77	90	100	2.4	2.7	422	434	232	363
Canada 009	1528	75	105	33	57	97	100	100	100	1.0	1.0	214	238	163	205
Champlain	1745	53	115	0	3	13	57	77	100	1.0	1.2	270	238	149	219
Climax	1743	62	112	0	5	30	77	88	100	1.0	1.0	339	356	223	306
Eskimo	1072	62	102	T	17	70	80	92	100	1.0	1.1	350	339	172	287
Goliath	1594	53	97	0	8	20	77	85	100	1.7	1.7	345	353	229	309
Hokuo	1698	63	105	5	30	83	85	95	100	1.0	1.0	356	288	151	265
Itasca	1144	65	108	0	8	37	80	87	100	1.0	1.1	276	276	113	222
Kampe II	1699	60	98	3	30	73	85	97	100	1.3	1.7	425	395	226	349
Kandsberger	1700	70	102	7	37	83	92	100	100	1.0	1.0	353	291	282	309
Liam	1537	27	55	0	12	97	80	95	100	1.0	1.0	134	45	24	68
Lischover	1080	70	105	5	33	77	88	95	100	1.0	1.3	327	454	330	370
MLM-17018	1530	70	107	12	27	67	87	98	100	1.0	1.0	345	413	327	362
Phoenix	1701	65	108	T	12	40	77	87	100	1.3	1.3	374	359	267	333
NAPB 447502	1622	68	107	0	17	47	80	90	100	1.5	2.3	410	437	395	414
NAPB 447605	1623	62	103	0	10	43	75	83	100	1.4	2.1	368	389	244	334
NFG-#1	1714	77	110	23	47	100	97	100	100	1.0	1.0	362	380	383	375
Nosappu	1593	68	108	0	13	60	77	93	100	1.3	2.0	428	505	264	399
Omnia	1476	60	100	T	12	47	82	93	100	1.3	1.8	404	434	232	357
SS-79057	1667	65	105	T	17	67	83	90	100	1.8	2.3	454	428	294	392

Table 10. (continued)

Strains	MSP no.	Plant height (cm)		Percent headed					Lodging*		Seed yield (lb/A)		3-year average		
		6/22	7/20	6/13	6/20	6/24	6/29	7/4	7/13	7/23	harvest	1981		1982	1983
Richmond	1658	75	107	7	30	87	87	100	100	1.0	1.1	321	353	258	311
Saxo	1692	57	103	0	5	23	78	87	100	1.7	1.7	294	392	217	301
Senpoku	1703	67	105	2	22	67	87	95	100	1.0	1.0	425	345	288	353
Tiiti	1704	65	95	0	10	43	80	88	100	2.9	3.7	493	538	270	434
Timfor	1160	63	110	0	13	50	78	90	100	1.0	1.0	431	288	187	302
Topas ofote	1477	68	102	T	12	43	82	95	100	1.0	1.0	312	368	264	315
Toro	1143	65	108	2	30	67	87	95	100	1.0	1.0	318	291	166	258
Talstad	1705	63	98	T	22	67	85	97	100	1.9	2.7	419	446	389	418
Verdant	540	62	107	0	5	15	72	87	100	1.8	2.2	330	291	157	259
WMT-94	1534	70	105	T	28	70	83	90	100	1.2	1.3	356	419	392	389
WMT-95	1690	65	102	0	12	57	80	97	100	1.5	2.0	422	496	359	426
ZW 42-79	1533	65	97	2	17	47	82	98	100	2.2	3.0	446	609	398	484
Intermediate maturing varieties															
Arabella	1689	55	97	0	5	50	75	85	100	1.0	1.0	140	223	74	146
Bahu	1398	50	100	0	7	13	73	82	100	1.1	1.0	353	324	187	288
Budor	1535	63	102	0	13	37	77	90	100	1.3	1.0	149	261	110	173
Delora	1715	48	100	0	0	0	43	73	100	1.3	1.9	258	208	143	203
Lotim	1595	57	100	0	3	17	63	78	100	1.8	2.3	416	258	181	285
Leno	1538	33	70	2	7	77	80	88	100	1.0	1.1	137	33	65	78
Late maturing varieties															
Bariton	1669	50	93	0	0	3	37	67	100	2.1	2.7	377	368	217	321
Barvonti	1676	32	78	0	0	0	2	5	37	3.2	4.0	282	199	125	202
Leidemi	1744	45	95	0	0	0	4	23	72	1.0	2.0	425	345	169	313
Lokushu	1511	55	97	0	0	2	42	65	100	2.0	2.3	460	342	232	345
Intenso	1714	47	90	0	0	0	T	10	65	1.9	2.6	288	244	184	239
Iga	1397	40	83	0	0	0	0	5	40	3.1	4.3	413	282	178	291
Aviour	1395	25	63	0	2	70	67	80	100	1.0	1.0	50	3	---	---
-48	1051	43	87	0	0	0	T	7	58	1.8	2.7	356	285	134	258
Busso	1691	42	78	0	0	0	7	22	52	3.2	4.0	285	196	98	193

T = no lodging, 5 = severe lodging.

LSD at 5% level
LSD at 1% level

Table 14. Plant height, percent headed, Karmex injury and 1982 average seed yields for 24 fine fescue strains seeded in 1980 on the Welin Farm, Roseau, MN.

Strain	MSP no.	Plant height (cm)		Percent headed			Karmex* injury 6/9	1982 average seed yields (1b/A)
		6/2	7/9	5/31	6/6	6/13		
Atlanta	1164	17	80	0	2	15	3.4	285
Barfalla	1685	18	73	0	0	17	4.0	343
Barcota	1683	20	82	0	T	37	3.2	498
Bar-Frc-79-Lau	1684	18	72	0	15	70	4.4	523
Bar Frc HI	1686	17	77	0	0	27	4.3	112
Checker	1608	22	77	0	17	75	4.1	510
Reliant (FL-1)	1655	22	73	2	63	88	3.7	884
Jamestown	1656	23	82	0	2	55	3.3	409
Longfellow	1609	23	80	0	2	47	3.2	732
Mom Frc-57	1638	22	78	0	3	65	3.4	490
Mom Frc-61	1639	17	75	0	2	58	3.9	666
Mom Frc-64	1640	22	75	0	0	35	3.5	593
Mom Frr-38	1641	25	77	0	0	55	3.1	557
Mom Frr-205	1642	22	80	0	0	27	2.9	428
Moncorde	1637	18	77	0	0	17	2.6	232
U of M 79-66354	1721	25	85	0	3	40	3.0	563
6673	1722	23	82	0	0	28	2.8	505
66111	1723	27	87	0	0	28	2.3	483
66136	1726	23	82	0	0	25	2.5	428
66218	1727	23	87	0	2	28	2.3	655
66223	1728	27	82	0	0	33	2.8	554
66233	1729	25	80	0	0	27	2.3	370
67123	1724	28	80	0	T	27	3.1	548
67135	1725	40	85	37	75	100	1.5	908

* Karmex sprayed at 1 lb/A at.

T = no injury, 5 = severe injury.

LSD at 5% level
LSD at 1% level

176
235

Table 15. Plant height, percent headed, lodging, harvest date, and seed yields for 38 fine fescue strains seeded in 1981 on the Melin Farm, Roseau, MN. 1983 data plus 1982 seed yields.

Strain	MSP no.	Plant height (cm)		Percent headed				Lodging* 7/8	Harvest date	Seed yields (lb/A)			
		6/6	7/8	5/31	6/6	6/11	6/17			6/20	1982	1983	2-year average
1900	32	72	0	7	47	62	92	2.7	7-15	392	505	449	
1337	25	73	0	7	22	60	77	2.0	7-13	177	321	249	
1685	25	77	0	10	20	55	72	2.4	7-12	222	208	215	
1683	27	75	0	7	30	68	100	2.8	7-13	236	454	345	
1684	25	70	0	13	50	75	93	2.7	7-10	416	368	392	
1830	30	77	0	14	50	75	97	2.2	7-12	277	419	348	
1831	27	73	0	12	40	82	100	3.2	7-13	296	448	372	
1832	25	78	0	5	25	60	87	3.4	7-15	360	425	393	
1833	37	73	0	18	77	85	100	2.0	7-9	166	594	380	
1834	30	70	0	1	50	72	90	2.5	7-14	303	413	358	
1686	18	72	0	2	30	50	73	2.5	7-14	39	255	147	
1880	23	78	0	8	37	78	100	3.4	7-14	293	636	465	
1881	23	75	0	13	27	80	100	3.0	7-11	107	324	216	
1888	32	70	10	70	77	98	100	1.4	7-9	211	493	352	
1887	37	53	83	100	93	100	100	2.0	7-7	55	469	262	
1608	30	73	0	12	77	90	100	3.0	7-13	232	505	369	
1901	37	68	0	7	77	85	100	2.4	7-14	483	763	623	
1840	30	68	0	1	33	63	87	4.0	7-15	258	371	315	
1655	35	70	33	77	83	100	100	1.8	7-8	481	612	547	
1903	28	68	0	20	47	92	100	2.8	7-10	256	347	302	
1656	32	80	0	20	60	90	100	3.4	7-12	152	707	430	
1609	27	77	0	17	67	83	100	3.2	7-12	394	766	580	
1284	25	70	0	4	23	62	87	2.8	7-14	213	318	266	
1639	25	75	0	8	63	82	100	2.7	7-13	348	633	491	

Table 15. (continued)

Strain	MSP no.	Plant height (cm)		Percent headed				Lodging* 7/8	Harvest date	Seed yields (lb/A)			
		6/6	7/8	5/31	6/6	6/11	6/17			6/20	1982	1983	2-year average
Mom Frc-62	1285	33	78	2	20	80	90	100	2.8	7-12	377	615	496
Mom Frr-38	1641	32	78	0	10	60	73	100	2.7	7-13	459	419	439
Mom Frr-205	1642	33	72	0	2	23	60	93	2.8	7-17	585	588	587
Oase	1904	32	68	0	12	83	85	100	3.5	7-9	80	306	193
U of M-79	66354	35	75	0	12	60	75	100	3.0	7-18	207	642	425
6673	1722	37	67	0	2	47	73	100	3.7	7-18	422	636	529
66111	1723	33	73	0	4	47	73	100	2.5	7-17	394	558	476
66136	1726	35	73	0	T	38	68	100	3.7	7-18	428	517	473
66218	1727	32	77	0	5	53	68	100	3.0	7-17	532	680	606
66223	1728	33	70	0	T	37	65	100	2.2	7-18	342	674	508
66233	1729	35	73	0	2	60	75	100	3.0	7-18	367	564	466
67123	1724	38	72	0	4	53	75	100	2.8	7-16	397	647	522
67135	1725	43	77	18	70	93	100	100	2.5	7-12	129	674	402
Pennlawn	1237	37	70	0	2	47	62	100	2.6	7-17	461	597	529
											149	141	
											199	188	

* 1 = no lodging, 5 = severe lodging.

LSD at 5% level
LSD at 1% level

Table 21. Winter injury, percent stand, percent heading, and seed yields for 20 orchardgrass strains seeded in 1982 on the Welin Farm, Roseau, MN.

Strain	MSP no.	Winter injury* 5/6	Percent stand 6/11	Percent heading		Seed yield (lb/A)
				6/13	6/17	
Akimidori	1502	4.8	6	T	5	NH
Aonami	1503	5.0	5	T	2	NH
Barata	2030	5.0	2	0	T	NH
Barbridge	2031	4.3	40	2	5	NH
Hawk	1846	4.7	43	5	9	NH
Bartyle	2032	4.4	32	4	4	NH
Barvita	2033	4.3	17	0	T	NH
Dakta	1966	4.5	12	T	T	NH
Hera	1967	4.5	18	T	2	NH
Ina	2001	4.8	18	T	4	NH
Juno	2000	4.4	48	14	19	NH
Kitamidori	1504	5.0	25	4	4	NH
Mobite	2002	4.2	27	T	2	NH
NAPB 417501	1847	4.8	27	6	6	NH
417901	1848	4.4	38	2	7	NH
417902	1849	4.7	25	11	15	NH
Nordstern	942	3.3	60	32	42	244
Okamidori	1505	4.4	53	15	22	NH
Piedmont Syn-2	1542	5.0	4	T	2	NH
Phylox	1968	5.0	T	T	T	NH

* 1 = no injury, 5 = severe injury.

Table 22. Vigor, plant height, percent headed and seed yields for 11 reed canarygrass strains seeded in 1981 on the Melin Farm, Roseau, MN. Seed yields harvested on two dates.

Strain	MSP no.	Vigor* 6/2	Plant height (cm)		Percent headed		Seed yield (lb/A)			
			6/22	7/9	6/13	6/17	6/22	7/12	7/15	
Flare	1826	2.0	105	160	0	T	5	25	187	160
Hansvo11	1541	3.0	58	67	0	0	T	3	NH	NH
Mn-76	1534	3.1	80	143	0	T	7	15	76	48
Mn-7904	1540	3.0	62	92	0	0	0	2	NH	NH
NAPB 427901	1851	2.1	113	160	0	T	7	37	312	226
NAPB 427902	1852	2.6	98	155	0	0	3	25	149	181
Palaton (PS-3)	1828	1.7	105	162	0	2	13	73	493	413
Rise	1853	2.3	100	163	0	T	5	27	187	172
Rovik	1615	2.2	67	80	0	0	0	2	NH	NH
Vantage	1854	2.3	112	157	T	T	7	40	241	255
Venture (PS-2A)	1827	2.0	117	157	0	T	12	60	386	318

* 1 = best vigor, 5 = least vigor.

LSD at 5% level 189 98
LSD at 1% level NS 136

Table 23. Percent headed, plant height, percent alkaloids, and seed yields for 12 strains of reed canarygrass strains seeded in 1982 on the Melin Farm, Roseau, MN. Seed yields harvested on two dates.

Strain	MSP no.	Plant height (cm)		Percent headed		Percent total alkaloids		Seed yield (lb/A)			
		6/23	7/9	6/11	6/13	6/17	6/20	Kalton	Kalton	7/8	7/12
Flare	1983	137	150	5	20	55	57	.275ab	.310c	252	151
Hansvo11	1541	---	---	0	0	7	T				
Mn-76	1734	132	147	7	18	43	30		.185a	62	18
Mn-7904	1540	---	---	T	5	9	5			9	12
NAPB 427901	1851	132	147	5	17	53	53			279	199
NAPB 427902	1852	133	147	7	22	54	60			270	160
Palaton (PS-3)	1985	127	142	5	20	47	57		.164a	.207a	.183a
PS-2	1302	128	150	5	23	62	67			202	193
Rise	1853	130	147	5	18	45	43			255	187
Rovik	1539	---	65	2	7	12	2			NH*	NH
Vantage	1854	133	145	5	18	47	43		.222a	.374bc	.257bc
Venture (PS-2A)	1984	133	138	4	18	43	47		.179a	.225a	.204ab
Venture (PS-2A)	1827	128	147	5	17	52	53			154	101

* Not harvested.

LSD at 5% level .134

LSD at 1% level NS

Table 24. Plant height, percent headed, lodging and seed yields for 8 smooth bromegrass strains seeded in 1982 on Melin Farm, Roseau, MN. 1983 data.

Strain	MSP no.	Plant height (cm)		Percent headed		Lodging at harvest* (7-25)	Seed yield (1b/A)
		6/2	7/9	6/9	6/20		
Barton	1982	47	133	7	72	1.2	446
Bromex	1914	50	137	4	73	1.4	570
Deborah	2016	(winter killed)		-----		---	---
Exp. 13011	1998	58	137	9	80	1.5	686
Jubilee	1999	53	135	9	82	1.4	395
NAPB 407601	1311	47	138	4	72	1.0	734
NAPB 407602	1312	48	135	12	77	1.1	671
NAPB 407603	1313	53	138	12	80	1.4	633

* 1 = no lodging, 5 = severe lodging.

LSD at 5% level
LSD at 1% level

Table 25. Plant height, percent headed, lodging and seed yields for 8 smooth bromegrass strains seeded in 1981 on the Melin Farm, Roseau, MN. 1983 data plus 1982 seed yields.

Strain	MSP no.	Plant height (cm)		Percent headed		Lodging at harvest* (7-25)	Seed yields (1b/A)	
		6/23	7/9	6/13	6/17		1982	1983
Barton	1825	107	138	5	8	1.2	858	392
Baylor	1855	108	137	T	5	1.2	870	451
Blair	1856	108	138	T	7	1.4	787	333
Bromex (K1-105)	167	113	138	5	10	1.9	1087	615
NAPB 407601	1857	110	137	2	5	1.4	995	365
NAPB 407602	1606	115	145	5	12	1.6	909	535
NAPB 407603	1607	112	138	T	5	1.7	1060	463
Wisconsin B-8	1662	120	142	5	15	1.2	743	457

* 1 = no lodging, 5 = severe lodging.

LSD at 5% level

NS NS

Lodging at harvest* (7-25)

Seed yields (1b/A)

2-year average

Table 26. Effects of seeding rate on establishment and seed yields of birdsfoot trefoil.

Data	Seeding rate (lb/A)									
	'Norcen'			'Viking'						
	0.5	1.0	2.0	4.0	8.0	0.5	1.0	2.0	4.0	8.0
Plants per square yard on June 22, 1981	16	35	62	93	197	11	26	49	80	153
Plants per square yard on May 6, 1982	13	20	30	39	64	11	18	30	47	60
Plants per square yard on May 5, 1983	16	22	32	49	64	5	9	13	26	28
Seed yields harvested on August 31, 1982	496	385	335	267	178	447	374	338	240	187
Seed yields harvested on August 9, 1983	359	402	342	336	323	208	239	182	287	318

Plots of 'Norcen' and 'Viking' birdsfoot trefoil were seeded with a Brillion seeder at 0.5, 1.0, 2.0, 4.0 and 8.0 lbs/A at Roseau, MN on May 6, 1981. On June 22, 1981 the number of plants established per square yard were counted. The following year, May 6, 1982, the number of plants that survived the winter were counted. Percentage of stand loss was much greater in the plots seeded at the highest rates. Simazine was applied in the spring of each year to control volunteer birdsfoot trefoil seedlings. On May 5, 1983, the number of plants surviving the second winter were again counted. Little difference was noted in the winter hardy Norcen cultivar. Stand losses of 50% or greater were observed in the less winter hardy Viking cultivar. Seed yields were taken in 1982 and 1983. In 1982, the highest seed yields were obtained from the 0.5 lb/A seeding rate for both cultivars. Seed yields decreased progressively to the highest seeding rate of 8.0 lb/A. In 1983, little difference in seed yields were observed in the Norcen cultivar; however, the lower seeding rates still tended to have higher yields. In the less winter hardy Viking cultivar, the highest seed yield came from the higher seeding rates; however, these stands were now reduced to only 26 to 28 plants per square yard.