

PROGRESS REPORT ON GRASS SEED PRODUCTION RESEARCH

prepared by

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Grass-Legume Seed Institute
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**Table 1. Monthly precipitation and average 'Park' kentucky bluegrass experimental plot seed yields
Roseau ,Mn 1967-2004**

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Yearly Total	DEVIATION FROM AVERAGE	Park' blg. test plot lbs/A
1967	1.13	0.39	0.59	2.89	0.89	2.23	4.95	1.69	0.83	1.11	0.70	1.76	19.16	-2.77	
1968	0.62	T	1.25	0.63	1.46	6.47	6.13	8.49	2.35	1.26	1.06	0.21	29.93	8.00	650
1969	3.07	0.11	0.05	1.27	3.31	2.29	3.70	4.28	3.29	1.91	0.30	0.73	24.31	2.38	488
1970	0.71	0.41	1.38	2.56	5.93	4.07	3.55	0.83	2.77	1.49	1.21	0.37	25.28	3.35	673
1971	0.54	0.13	0.26	1.50	2.24	2.29	3.58	0.69	3.33	2.97	0.29	0.50	18.32	-3.61	492
1972	0.68	0.76	0.50	0.70	1.66	5.03	1.92	1.53	4.22	1.40	0.38	0.32	19.10	-2.83	405
1973	0.09	0.17	1.18	0.90	2.46	2.21	4.04	2.09	5.67	1.19	0.67	0.75	21.42	-0.51	422
1974	0.88	0.87	0.16	2.72	4.12	1.56	2.56	11.00	0.42	0.66	0.15	1.40	26.47	4.54	642
1975	1.10	0.29	0.64	1.40	1.52	4.96	2.26	1.75	1.79	1.49	0.20	0.65	18.05	-3.88	504
1976	1.13	0.50	1.05	0.77	0.54	5.82	1.52	3.72	0.34	0.07	T	0.37	15.83	-6.10	146
1977	0.14	0.62	1.02	0.27	2.43	3.71	2.28	1.74	3.83	0.87	2.27	0.26	19.44	-2.49	140
1978	0.36	0.26	0.17	1.00	1.97	1.92	6.25	3.25	3.44	0.23	0.98	0.79	20.62	-1.31	507
1979	0.50	1.01	1.06	2.77	1.89	1.91	3.70	1.59	0.45	1.40	1.02	0.16	17.46	-4.47	415
1980	0.55	0.82	0.35	0.00	0.24	1.75	3.35	5.19	4.12	1.66	0.94	0.18	19.15	-2.78	62
1981	0.27	0.16	0.66	0.56	2.79	6.85	2.63	2.41	3.63	1.75	0.90	0.99	23.60	1.67	625
1982	1.30	0.45	0.74	0.24	1.38	2.00	5.53	2.71	1.92	2.91	0.46	0.57	20.21	-1.72	595
1983	1.31	1.26	1.17	0.53	2.76	4.03	1.62	3.34	2.91	2.26	0.66	0.10	21.95	0.02	605
1984	T	0.95	T	0.72	0.72	4.46	3.78	0.99	0.37	4.32	0.10	1.02	17.43	-4.50	613
1985	0.12	0.33	0.06	1.07	4.35	4.62	1.08	8.72	1.60	1.04	1.68	0.38	25.05	3.12	525
1986	0.30	0.90	0.26	2.96	1.40	2.43	3.59	2.04	2.52	0.65	1.97	0.36	19.38	-2.55	488
1987	0.47	0.30	0.10	0.59	4.37	2.25	4.80	2.22	0.82	0.92	0.73	0.35	17.92	-4.01	288
1988	0.60	0.09	1.75	0.00	1.74	1.34	5.53	1.70	2.24	0.12	0.77	1.05	16.93	-5.00	152
1989	3.27	0.32	2.86	0.10	2.82	5.46	1.60	2.56	1.24	0.41	0.62	0.45	21.71	-0.22	320
1990	0.55	0.20	1.12	1.09	0.46	3.19	2.48	0.62	0.91	0.16	0.18	0.72	11.68	-10.25	160
1991	0.56	0.64	0.58	2.87	3.19	5.94	3.40	1.99	7.42	1.64	1.36	0.70	30.29	8.36	210
1992	0.61	0.68	0.45	2.27	1.99	2.36	2.72	4.51	2.76	0.12	1.27	0.88	20.62	-1.31	630
1993	0.68	0.05	0.27	1.01	1.63	5.06	5.87	4.69	0.72	0.71	0.45	0.65	21.79	-0.14	490
1994	0.21	0.33	0.47	0.02	0.16	2.54	3.03	3.48	3.94	1.38	2.72	0.32	18.60	-3.33	230
1995	0.57	0.59	1.23	0.61	2.50	2.13	4.59	3.59	1.81	1.33	1.54	1.46	21.95	0.02	300
1996	0.94	0.48	0.22	1.65	4.62	1.64	7.34	1.78	1.77	1.75	2.73	1.07	25.99	4.06	250
1997	1.06	0.14	1.02	0.84	2.02	3.36	4.02	1.31	4.01	2.45	0.19	0.25	20.67	-1.26	350
1998	0.69	1.05	0.21	0.77	4.55	5.39	3.01	2.20	0.31	4.42	1.39	0.95	24.94	3.01	275
1999	0.15	0.77	0.23	1.31	4.09	6.97	3.46	1.38	3.16	0.43	0.38	0.56	22.89	0.96	400
2000	0.45	0.14	0.79	0.38	1.83	7.38	1.63	6.45	2.14	2.89	3.41	0.74	28.23	6.30	550
2001	0.21	0.52	0.46	1.89	3.27	1.76	4.74	1.40	0.72	1.76	1.50	0.56	18.79	-3.14	575
2002	0.19	0.10	0.45	1.44	2.79	9.94	2.96	4.47	1.62	1.02	0.30	0.54	25.82	3.89	300
2003	0.80	0.77	1.60	1.75	2.95	3.56	1.92	1.78	4.55	1.32	1.52	1.95	24.47	2.54	550
2004	2.85	0.70	2.14	2.61	8.19	2.98	2.42	5.50	2.97	2.36	0.08	1.33	34.13	12.20	650
2005	2.33	0.67	0.82	0.73	3.62	7.55	3.37	3.24	1.77	3.48	2.06	1.65	31.29	9.36	400
2006	2.52	0.95	1.01	1.23	1.97	1.00	0.94	2.18	2.42	1.54	0.17	0.56	16.49	-5.44	300
40 year average													21.93		

Table 2.
2001 Kentucky Bluegrass Variety Trial
Magnusson Research Farm - Roseau, MN Field F5

Variety	Seed lot #	Seed Yield (#/ac.)				% of Mean			Harvest	
		2003	2004	2005	2006*	2003-6	2003-6	2003-5	Date	Seed source
Park	3021	611	1084	629	339	666	132	143	30-Jun	Check variety
Minnfine	3252	680	1077	564	535	714	142	143	30-Jun	Check variety
A99-2981	3420	555	852	752	531	673	133	133	7-Jul	Rutgers/U of M
A99-2893	3419	682	934	448	NH	NA	NA	127	NH	Rutgers/U of M
Abbey	2606	658	781	591	NH	NA	NA	125	NH	Check variety
A99-2628	3417	685	876	439	NH	NA	NA	123	NH	Rutgers/U of M
A99-2626	3416	709	760	421	NH	NA	NA	116	NH	Rutgers/U of M
A99-2679	3418	640	836	397	NH	NA	NA	115	NH	Rutgers/U of M
A97-1510	3316	421	845	582	NH	NA	NA	114	NH	Rutgers/U of M
1646S	1646	629	716	484	326	539	107	113	30-Jun	U of Minn
Unique	3411	624	809	388	350	543	108	112	13-Jul	Turf-Seed
A97-1436	3315	352	874	584	513	581	115	112	13-Jul	Rutgers/U of M
A99-3240	3421	328	979	477	NH	NA	NA	110	NH	Rutgers/U of M
1628S exp	1628	618	705	381	301	501	99	105	30-Jun	U of Minn
2073S exp	2073	444	807	446	464	540	107	105	30-Jun	U of Minn
Trenton	3047	241	894	553	243	483	96	104	30-Jun	Check variety
484S exp	484	425	714	473	NH	NA	NA	99	NH	U of Minn
3075R	3075	533	691	326	381	483	96	96	30-Jun	U of Minn
A97-1523	3317	452	707	390	NH	NA	NA	96	NH	Rutgers/U of M
490S	490	372	658	417	NH	NA	NA	89	NH	U of Minn
cell7	c7	105	694	584	NH	NA	NA	85	NH	U of Minn
Opti-Green	3410	469	531	372	123	374	74	84	3-Jul	Turf-Seed
3073R exp	3073	508	566	277	404	439	87	83	30-Jun	U of Minn
Lato	3408	223	713	397	176	377	75	82	30-Jun	Turf-Seed
Midnight	3254	421	529	381	NH	NA	NA	82	NH	Check variety
cell5	c5	168	653	426	357	401	80	77	3-Jul	U of Minn
cell120	c120	420	455	321	NH	NA	NA	74	NH	U of Minn
1621S	1621	401	506	274	NH	NA	NA	73	NH	U of Minn
cell111	c111	282	531	294	NH	NA	NA	68	NH	U of Minn
A97-1433	3314	226	459	238	NH	NA	NA	57	NH	Rutgers/U of M
Northstar	3409	270	502	129	107	252	50	55	7-Jul	Turf-Seed
LSD @5%		106	123	128	72	64	12	14		

4 year average 504#/ac.

*NH,NA=data not reported in 2006 because of shattering or contamination.

**Lodging- 1= none; 9 severe lodging

Table 3. 2002 Kentucky Bluegrass Variety Trial
Magnusson Research Farm - Field F1: Roseau, MN

Variety	Seed lot #	Seed yield (#/ac.)				2004-6 % of mean	2006 Harvest		2006%heading		Seed source
		2004	2005	2006	2004-6		Date	Height	27-May	5-Jun	
Abbey	2606	892	656	586	711	169	28-Jun	18	1	30	Check variety
1844s	1844	716	417	562	565	135	30-Jun	17	1	24	U of Minn
1646s	1646	881	357	446	561	134	28-Jun	18	0	19	U of Minn
484s	3355	680	464	484	543	129	28-Jun	18	3	21	U of Minn
Bluestar	3362	776	453	395	541	129	3-Jul	18	1	30	PST-Turf-Seed
Park	3324	716	524	379	540	128	28-Jun	29	43	88	Check variety
A99-2674	3475	687	486	439	537	128	11-Jul	17	0	8	Rutgers/U of M
484S	335	678	459	467	535	127	5-Jul	18	3	28	U of Minn
1628s	3429	669	421	459	516	123	28-Jun	17	4	26	U of Minn
453r	4531	698	448	399	515	123	28-Jun	18	1	28	U of Minn
59r	591	702	442	399	514	122	28-Jun	17	0	20	U of Minn
A99-3124	3477	564	553	426	514	122	10-Jul	18	0	10	Rutgers/U of M
3073r	3356	785	352	399	512	122	3-Jul	17	1	19	U of Minn
A97-1289	3470	558	573	397	509	121	8-Jul	23	8	34	Rutgers/U of M
A99-2670	3474	491	560	468	506	121	9-Jul	18	0	10	Rutgers/U of M
A97-1436	3469	640	508	337	495	118	11-Jul	19	0	36	Rutgers/U of M
Midnight	3254	475	419	573	489	116	28-Jun	20	0	14	check variety
Park 2000	2000	694	455	315	488	116	28-Jun	29	48	90	Check variety
3075r	3075	809	306	337	484	115	1-Jul	14	0	14	U of Minn
A99-2628	3473	671	401	357	476	113	28-Jun	20	1	31	U of Minn
132s	1321	613	390	426	476	113	10-Jul	18	0	8	Rutgers/U of M
A97-2306	3447	658	408	346	471	112	28-Jun	17	1	24	Rutgers/U of M
Brilliant	3358	482	475	439	465	111	8-Jul	19	0	8	PST-Turf-Seed
Unique	3411	464	486	442	464	110	9-Jul	18	0	12	Turf-Seed
A99-2950	3476	455	455	473	461	110	28-Jun	23	1	28	Rutgers/U of M
2073s	3430	656	335	381	457	109	28-Jun	18	8	38	U of Minn
A97-1510	3445	553	459	308	440	105	7-Jul	17	2	24	Rutgers/U of M
A97-1523	3446	618	343	332	431	103	5-Jul	19	0	19	Rutgers/U of M
Trenton	3047	319	522	357	399	95	30-Jun	27	8	48	Check variety
490s	3431	647	261	259	389	93	30-Jun	17	0	15	U of Minn
1775s	1775	578	259	232	356	85	7-Jul	16	0	12	U of Minn
A99-2235	3472	406	308	343	352	84	10-Jul	18	1	26	Rutgers/U of M
Lato	3408	372	435	192	333	79	28-Jun	29	23	68	Turf-Seed
1621s	1621	564	174	219	319	76	30-Jun	16	0	16	U of Minn
cell 116	116	444	319	156	306	73	3-Jul	20	0	21	U of Minn
A97-1433	3444	401	223	288	304	72	9-Jul	18	0	19	Rutgers/U of M
Moonlight	3359	385	274	245	301	72	7-Jul	17	1	23	PST-Turf-Seed
Washington	3239	214	430	227	290	69	28-Jun	29	28	80	Norfarm
Opti-Green	3410	225	388	187	267	63	30-Jun	18	1	21	Turf-Seed
cell132	132	270	317	132	240	57	7-Jul	20	1	18	U of Minn
cell139	139	270	272	172	238	57	3-Jul	18	0	23	U of Minn
Blackstone	3357	181	361	156	233	55	5-Jul	20	2	26	U of Minn
cell135	135	335	190	127	217	52	5-Jul	18	1	23	U of Minn
Northstar	3360	350	152	103	202	48	10-Jul	12	4	20	PST-Turf-Seed
cell141	141	254	254	67	192	46	3-Jul	18	0	18	U of Minn
Serene	3361	67	196	69	111	26	30-Jun	20	3	26	PST-Turf-Seed
LSD @5%		100	102	78	62		4	2	3	9	

3 year average 420#/ac.

*Lodging; 1=none, 9=severe

Table 4. 2003 Kentucky Bluegrass Variety Trial
Magnusson Research Farm- F7

Variety	Seed lot#	Seed yield				2006								
		2006	2006	2005		Mildew* 26-May	Height(in.) at harvest	Harvest Date	%Heading					
		(lbs/A.)	% of mean	(lbs/A)*	estimated#/ac				22-May	26-May	31-May	9-Jun	22-May	
SR 2284	3571	923	140	NH	300	0.8	28	7-Jul	0	0	26	53	76	
Brooklawn	3569	856	130	NH	375	1.3	28	3-Jul	0	6	38	63	93	
Dragon	3607	838	127	633	575	4.0	27	29-Jun	1	15	55	75	100	
Kelly	3579	823	125	NH	525	3.5	28	3-Jul	0	0	11	30	56	
Merit	3580	814	123	NH	525	5.5	25	1-Jul	0	0	9	33	35	
Midnight Star	3552	809	122	727	650	0.5	28	1-Jul	0	1	21	43	84	
A99-2674	3475	792	120	NH	600	0.8	24	11-Jul	0	0	1	15	48	
3.0009	3574	781	118	NH	350	5.3	31	29-Jun	8	38	65	88	66	
Abbey	3608	776	117	629	450	3.3	26	29-Jun	0	0	15	33	98	
Perfection	3577	747	113	NH	400	7.0	24	5-Jul	0	0	1	11	53	
A99-2679	3564	740	112	566	525	0.0	23	11-Jul	0	0	0	14	43	
Awesome	3576	743	112	NH	300	7.0	25	5-Jul	0	0	1	16	81	
A97-1289	3470	736	111	482	625	0.0	28	11-Jul	0	4	23	45	58	
Boutique	3570	727	110	NH	225	0.0	27	7-Jul	0	3	24	50	53	
A99-2893	3565	720	109	647	650	0.0	23	11-Jul	0	0	0	10	63	
484S	3355	716	108	NH	525	3.5	27	3-Jul	0	3	11	29	75	
Pick 2	3582	716	108	508	575	0.0	26	7-Jul	0	2	30	63	96	
Raven	3584	700	106	562	575	5.5	26	5-Jul	0	0	10	26	38	
Apollo	3586	671	106	401	475	0.8	29	9-Jul	0	2	13	26	55	
A99-2670	3474	696	105	401	550	1.3	23	9-Jul	0	0	2	19	76	
Atlantis	3581	658	100	NH	450	5.8	24	3-Jul	0	0	14	36	45	
Miracle	3550	638	97	NH	350	0.8	23	5-Jul	8	28	45	69	48	
Pick 4	3583	636	96	NH	350	3.8	29	1-Jul	0	8	33	66	63	
Clearwater	3578	620	94	584	525	4.5	25	7-Jul	0	0	8	26	64	
3.001	3575	618	93	455	500	1.0	28	1-Jul	0	3	14	30	90	
A99-2950	3476	611	92	419	425	1.5	27	4-Jul	0	0	9	33	94	
Midnight	3539	591	89	317	300	6.3	25	5-Jul	0	0	3	13	70	
A99-2628	3563	589	89	348	425	0.0	23	9-Jul	0	0	3	20	70	
Famous	3585	582	88	410	500	3.8	30	1-Jul	3	30	55	80	68	
Rambo	3588	584	88	NH	350	3.3	30	5-Jul	0	3	16	38	73	
A99-2626	3590	582	88	437	500	0.0	24	10-Jul	0	0	2	14	96	
3.0008	3573	569	86	NH	350	0.5	28	3-Jul	0	4	19	44	53	
3.0007	3572	562	85	NH	350	0.8	27	29-Jun	0	6	18	36	69	
A99-2235	3472	553	84	NH	350	0.0	24	11-Jul	0	0	11	30	70	
3073R	3356	542	82	NH	575	3.0	23	7-Jul	0	3	10	29	90	
Voyager	3551	502	76	419	375	1.0	30	29-Jun	0	8	31	63	28	
Park	3540	406	62	500	475	4.8	29	29-Jun	6	28	55	79	38	
Washington	3587	319	48	NH	525	3.3	30	29-Jun	8	40	68	88	65	
Alene	3589	292	44	335	425	4.3	30	29-Jun	13	43	68	85	84	
LSD @5% level		149	22	262	213	2.0	2	4	3	7	9	8	12	

2006 average yield 661#/ac.

* Only 2 reps of best yielding varieties and checks were harvested in 2005.

** Powdery Mildew; 0=none;9=severe

Table 5. 2005 Kentucky Bluegrass Variety Trial
Field 7SE Magnusson Research Farm

Variety	Seed lot #	Estimated Seed Yield* (lbs/A.)	Powdery mildew**		Height(in.)		% Heading		
			5/19/2006	6/9/2006	7/1/2006	22-May	27-May	31-May	9-Jun
Minnfine	3672	425	2.8	0.0	28	30	63	80	100
A99-3124	3700	325	0.5	0.0	20	0	0	1	35
Sonic	3673	313	2.5	2.3	28	3	25	44	93
A99-2674	3475	275	0.0	0.0	21	0	0	1	33
Dragon	3671	263	3.5	1.5	24	1	19	33	85
A99-2626	3633	250	0.0	0.0	22	0	0	1	30
A99-2628	3634	250	0.0	0.0	20	0	0	1	30
Midnight Star	3552	250	3.5	2.0	26	0	5	20	85
A97-1436	3629	238	0.8	0.5	22	0	1	11	53
A99-2893	3636	225	0.0	0.0	21	0	0	1	30
Voyager II	3674	200	0.0	0.0	21	0	0	1	30
A99-2235	3696	188	0.5	0.0	21	0	0	1	30
A99-2670	3697	188	0.0	0.0	21	0	0	2	28
A99-2679	3737	188	0.0	0.0	18	0	1	7	48
Brilliant	3670	188	0.0	1.5	21	0	0	2	28
A99-2950	3699	180	2.5	0.5	24	0	0	4	43
A97-1289	3470	163	0.0	0.0	22	0	3	13	60
Nublue	3727	138	2.8	1.8	25	0	3	14	73
Park	3540	88	3.5	0.5	25	3	16	25	68
Avalanche	3647	80	2.0	0.0	27	1	7	14	45
Miracle	3550	75	0.0	0.0	20	0	9	19	50
Midnight	3539	55	6.5	8.5	21	0	0	1	28
Abbey	3608	45	4.8	4.3	20	0	1	7	30
Nuglade	3728	35	5.8	8.8	20	0	0	1	23
LSD @5% Level		140	1.0	1.2	2	2	8	12	20

*Visual seed yield estimate based on head counts and morphology 6/15/06.

** Powdery mildew ratings based on incidence and severity; 0=none observed , 9=severe

Table 6. 2005 Tall Fescue Variety Trial
F5 Magnusson Research farm

Variety	Seed Lot #	% Heading seed yield	
		6/10/2006	lbs/A
Bingo	3714	40	767
Corgi	3715	35	912
Rebel Exeda	3716	40	894
SR 8250	3717	43	830
Wolfpack	3718	50	783
LSD @ 5% level		12	92

Management:

Seeded 5/26/05 under spring wheat @ 6#/ac.
Sprayed 9/10/06 with 2 pt.Curtail + 3/4 pt.Clarity
Fertilized 10/16/05 - 80+50+80+20 sulfur

Table 7. 2003 Reed Canarygrass Variety Trial
Magnusson Reseach Farm-F7

Variety	Seed lot #	Seed Yield			
		2005	2006	2005-6	2005-6 % of mean
Chiefton	3301	685	446	565	112
Venture	3493	662	384	523	104
Palaton	3433	689	343	516	103
Marathon	3406	615	415	515	103
Vantage	2925	595	312	454	91
Rival	3295	562	301	431	86
LSD @ 5%level		124	122	79	15
2 year average yield				501	

Harvest date= 7/7/06

Table 8. 2005 Perennial Ryegrass Winter Hardiness Variety Trial
Roseau & St.Paul ,Mn

Variety	Seed lot	Source	Roseau	St.Paul	Comments
			WI* 4/26/2006	WI** mean	
FF x PR	3520	U of Minn	1.0	1.0	Creeping red fescue x perennial ryegrass -hybrid cross
MHT	3729	U of Minn	1.0	2.3	AOPP tolerant ryegrass- improved turf quality
NK-200	3538	check	1.0	2.4	Winter hardy check
WHC MB Bulk-00	3734	Pickseed	1.5	2.6	
PR PEI Bulk -00	3732	Pickseed	1.0	3.0	
Survivor	3648	U of Minn	1.0	3.0	Winter survival germplasm
Top Gun	3726	Jacklin	1.3	3.0	
Spreader III	3645	U of Minn	1.3	3.1	Winter hardy selection from Spreader II
TQ x Spread sel.	3637	U of Minn	1.0	3.1	Winter hardy selection from TQ x Spread
WHC A-04	3733	Pickseed	1.0	3.1	
P201 x Rutgers 'MR'	3708	U of Minn	1.0	3.3	MHT germplasm
PolarGreen(WH x TQ)	3372	U of Minn	1.0	3.3	Winter hardy+turf quality selection
WH x TQ sel.	3639	U of Minn	1.3	3.3	Winter hardy selection from WH x TQ
MSP x Rutgers '03	3610	U of Minn	1.0	3.5	MHT germplasm
WHC PSC-1-00	3735	Pickseed	1.0	3.5	
TQ x Spread	3414	U of Minn	1.5	3.6	Spreading growth habit+turf quality+rust resistance
Pick PR C-97	3731	Pickseed	1.5	3.8	
Brightstar SLT	3661	check	1.3	3.9	
Ragnar II (P201)	3611	U of Minn	1.3	4.0	Turf quality/winter hardy selection from P101
Spreader II	3393	U of Minn	1.0	4.0	Spreading growth habit germplasm
Citation Fore	3663	check	1.5	4.1	
Ragnar (P101)	3366	U of Minn	1.3	4.6	AOPP(Assure II) tolerant ryegrass
Affinity	3500	check	1.0	4.8	
Brightstar II	3660	check	1.0	4.8	
Fiesta 3	3730	Pickseed	1.3	5.4	
Chaparral II	3662	check	1.5	6.6	
Accent	3725	Jacklin	1.3	7.0	
Ribeye(annual)	3689	check	8.8	9.0	Annual ryegrass check
LSD @ 5% level			0.5	1.7	

Experimental Design: RCB with 4 replications

* Roseau winter injury; 1=none, 9= all dead - very little injury at Roseau location in 2006

** St.Paul winter injury; 1=none, 9=all dead - average of 2 rating (4/11 & 4/17/06)

Table 9. 2005 Perennial Ryegrass Seed Production Variety Trial
Field 7 - Magnusson farm-Roseau

Variety	Seed Lot	Seed Yield (#/ac.)	Harvest date	Lodging* at harvest	height(in.) 7/15/2006	% Heading		
						5-Jun	11-Jun	18-Jun
Ragnar(P101)	3366	970	13-Jul	2.8	28	10	48	91
Ragnar II(P201)	3611	923	14-Jul	2.8	27	8	38	79
Spreader 3	3645	859	17-Jul	3.5	24	0	9	50
MHT	3729	847	15-Jul	2.5	24	2	19	68
Affinity	3500	812	14-Jul	3.3	29	14	53	93
NK-200	3538	801	21-Jul	2.0	32	0	2	28
Survivor	3648	774	15-Jul	3.3	30	0	18	55
Brightstar II	3660	729	15-Jul	1.5	24	3	16	58
Citation Fore	3663	691	13-Jul	2.0	25	5	31	78
PolarGreen(WHxTQ)	3372	613	15-Jul	2.0	26	1	13	53
Pizzazz	3680	562	14-Jul	1.8	25	3	19	53
WH x TQ sel.	3639	410	15-Jul	1.3	25	0	5	35
LSD @5% level		215	1	1.4	2	4	13	14

Experimental design: RCB with 4 replications

*lodging- 1=no lodging; 9=severe lodging

Table 10. Annual Bluegrass (poa annua) post emergent control in Ragnar(P101) Perennial Ryegrass Lake of the Woods County - 2006

Trade name	common	Product Rate/ac	Ai/Ac Rate	Surfactant	poa annua	ryegrass	poa annua
					% control*	injury**	% control*
					6/16/2006	7/31/2006	7/31/2006
Assure II .88	quizalofop	12 oz.	.078#	.25%NIS	50	20	55
Fusilade DX 2.0	fluoziop	16 oz.	.25#	.25%NIS	88	0	45
Velocity 17%	bispyribac	6 oz.	1#	none	25	35	20
Nortron SC 4.0	ethofumesate	32 oz.	1#	none	45	30	25
Silverado 2%	mesosulfuron	2 oz	0.125#	1.5 pt.MSO	30	20	25
Olympus 70%	propoxycarbazone	.75 oz.	0.525#	.25%NIS	0	35	5
Liberty1.67#	glufosinate-ammonium	2 pt	.35#	3 pts-28%	75	65	45
Untreatment check					0	0	0

*poa annua control - annual bluegrass as per cent of check

** ryegrass injury as % of untreated check

Applications made 5/17/06- 12:00

Poa annua about 20% headed perennial ryegrass growth stage: late vegetative

Applications made with CO2 bicycle sprayer with 8002 XR T-Jet nozzels @ 28PSI and 12GPA output

Treatments not used because treatment duplication:

Olympus Flex	propoxycarboazone+mesosulfuron	(Silverado + Olympus)
Rimfire	propoxycarboazone+mesosulfuron	(Silverado + Olympus)
Rely 1.0	glufosinate-ammonium	(Liberty)

Table 11. Fungicides applied to Ragnar II (P201) perennial ryegrass Dan/Bob Pieper- South shore - Lake of the Woods

Fungicide Treatments	Rates	Seed Yield(#/ac.) lbs/A	%Rust* 7/5/2006	Rust** at harvest	Test Wt./bu.***
Quilt+Quilt(6/13+7/5)	12 oz.+12 oz.	755	13	2.0	31.6
Quilt-late(6/20)	12 oz.	740	10	2.0	31
Tilt (6/13)	4 oz.	681	13	5.0	30
Quilt (6/13)	12 oz	678	10	3.7	31.3
Headline (6/13)	8 oz.	589	23	5.0	29.7
No treatment		107	92	8.7	29.5
LSD @ 5% level		302	9	0.6	

Experimental design:RCB w/ 3 replications

*%Rust- as % of stem and leaves infected

**Rust observed-1=none, 9=severe infection

***Test weight per bushel is a composite of all 3 samples harvested for each treatment and is not replicated.

Quilt Late= 6/20/06 growth stage: 80% headed

Second Quilt application(Quilt+Quilt)= July 5 growth stage: fully headed- pollinating

All other treatments applied 6/13/06- 7:00pm 65F wind 5-8 WNW :growth stage 5% headed

Heavy rust infestation observed 6/13/06

Harvest date 7/12/06

Applications made with CO2 bicycle sprayer with 8002 XR T-Jet nozzels @ 28PSI and 12GPA output

Table 12. 2006 Growth Regulator/Fungicide Trial Applied to 'Quest' Perennial Ryegrass - Helmstetter Farm

Treatment#	Treatment	common name	Application Rate	Application Timing	Harvest		Test Wt./Bu.	Seed Yield lbs/A
					Ht.(in.)	Lodging*		
1	No Treatment				24.8	4.0	32.6	867
2	Palisade	trinexapac-ethyl	1 pt.	6/2/2006	21.3	2.0	32.3	988
3	Apogee	prohexadione calcium	10 oz.	6/2/2006	17.8	1.3	32.8	1044
4	Palisade	trinexapac-ethyl	1 pt.	5/26/2006	24.0	2.0	32.2	1032
5	Apogee	prohexadione calcium	10 oz.	5/26/2006	20.3	1.0	32.3	923
6	Quilt	azoxystrobin+propiconazole	12 oz.	6/13/2006	25.0	3.0	32.8	870
7	Quilt	azoxystrobin+propiconazole	12 oz.	6/27/2006	25.3	5.0	31.9	979
8	Quilt	azoxystrobin+propiconazole	12 oz.	6/13+7/5	25.3	5.8	32.1	894
9	Headline	pyroclostrobin	8 oz.	6/13/2006	25.3	3.5	32.2	999
10	Headline	pyroclostrobin	8 oz.	6/27/2006	25.3	4.8	32.5	995
11	Headline	pyroclostrobin	8 oz.	6/13+7/5	25.3	4.8	32.2	852
12	Quadris	azoxystrobin	8 oz.	6/13/2006	26.0	3.8	32.5	963
13	Tilt	propiconazole	4 oz.	6/13/2006	26.0	5.0	32.5	876
14	2 + 6	Palisade+ 1x Quilt	1 pt.+12 oz.	6/2+6/13	23.8	2.3	32.6	1037
15	2 + 8	Palisade + 2x Quilt	1 pt.+12 oz.x2	6/2+6/13+7/5	22.0	1.0	32.6	986
16	3 + 9	Apogee + 1x Headline	10 oz.+8 oz.	6/2+6/13	19.0	1.0	33.2	1008
17	3 + 11	Apogee + 2x Headline	10 oz.+8 oz.x2	6/2+6/13+7/5	21.0	1.5	32.5	1068
LSD @ 5% level					1.8	1.9	0.7	158

Treatment timing:

Growth Regulator applications:

First application- 1-2 nodes -May 26

nw 0-5mph clear 71F =flag leaf emerged-boot

Second application- 2-3 nodes- June 2

wind wnw 2-6mph 65F 9:00pm

Fungicide applications=

First application- 5%heading - June 13

Second application= 100% headed - June 27 -3:00pm wind nw 5 65F

2x applications=June 13 and July 5

Harvest date:7/14/06 Applications made with CO2 bicycle sprayer with 8002 XR T-Jet nozzels @ 28PSI and 12GPA output

Table 13. 2006 Growth Regulator/Fungicide Trial Ragnar (P101) Perennial Ryegrass - Magnusson Farms

Treatment#	Treatment	common name	Application Rate	Application Timing	Harvest			16-Jun	Test Wt./Bu.	Seed Yield lbs/A
					Rust**	Ht.(inches)	Lodging*	Lodging*		
1	No Treatment				6.8	32	7.3	6.3	29.8	1313
2	Palisade	trinexapac-ethyl	1 pt.	5/31/2006	6.5	32	6.5	4.3	30.3	1425
3	Apogee	prohexadione calcium	10 oz.	5/31/2006	6.5	29	4.0	1.5	29.8	1367
4	Palisade	trinexapac-ethyl	1 pt.	5/23/2006	6.8	30	6.3	5.3	29.6	1122
5	Apogee	prohexadione calcium	10 oz.	5/23/2006	6.0	29	5.0	1.5	30.4	1405
6	Quilt	azoxystrobin+propiconazole	12 oz.	6/14/2006	3.0	32	7.3	6.3	32.0	1690
7	Quilt	azoxystrobin+propiconazole	12 oz.	6/29/2006	2.5	33	7.8	6.8	33.7	1821
8	Quilt	azoxystrobin+propiconazole	12 oz.	6/14+7/5	2.3	32	8.0	6.5	32.1	1797
9	Headline	pyroclostrobin	8 oz.	6/14/2006	3.3	32	7.5	6.5	32.9	1739
10	Headline	pyroclostrobin	8 oz.	6/29/2006	4.8	33	8.0	6.8	32.5	1619
11	Headline	pyroclostrobin	8 oz.	6/14+7/5	2.3	33	8.0	7.3	33.1	1722
12	Quadris	azoxystrobin	8 oz.	6/14/2006	2.3	32	7.8	4.0	32.3	1757
13	Tilt	propiconazole	4 oz.	6/14/2006	5.8	32	7.8	5.0	33.3	1612
14	2 + 6	Palisade+ 1x Quilt	1 pt.+12 oz.	5/31+6/14	4.8	31	7.0	1.5	33.5	1708
15	2 + 8	Palisade + 2x Quilt	1 pt.+12 oz.x2	5/31+6/14+7/5	2.0	32	7.8	1.5	32.9	2011
16	3 + 9	Apogee + 1x Headline	10 oz.+8 oz.	5/31+6/14	2.8	31	6.3	6.3	33.5	1873
17	3 + 11	Apogee + 2x Headline	10 oz.+8 oz.x2	5/31+6/14+7/5	2.5	29	6.0	6.8	32.2	2007
LSD @5% level					1.0	2	0.9	1.3	1.4	347

* Lodging- 1=None; 9=severe

**Rust rating- 1=None; 9=severe

Harvest Date:7/16/06 Applications made with CO2 bicycle sprayer with 8002 XR T-Jet nozzels @ 28PSI and 12GPA output

Growth regulator-

First application- 1-2 nodes - May 23

Second application=Full flag leaf/boot 5/31/06 8:30 am

Fungicide:

First application(Optimum)= 6/14/06 - 5% headed

Late application= 6/29 full heading wind nw 10-15mph 65F 10am

2x application=6/14 + 7/5 (target 2-3 weeks after first application) pollination-early filling

Trade name	common name	Application Rate	Active Ingredient	Ai/ac.	Adjuvants
Palisade EC	trinexapac-ethyl	1 pt.	2.1#/gal.	.2625#	none
Apogee	prohexadione calcium	10 oz.+	27.5 DF%	.172#	.25%NIS+2pts.28% 'N'
Tilt	propiconazole	4 oz.	3.72#/gal.	.1163#	none
Quadris	azoxystrobin	8 oz.	2.08#/gal.	.13#	none
Headline	pyroclostrobin	8 oz.	2.09#/gal.	.131#	none
Quilt	azoxystrobin+propiconazole	12 oz.	1.04#+.62#/gal	.0975#+.056#	none

Table 14. 2006 Growth Regulator/Fungicide Perennial Ryegrass On Farm Trial Summary of 2 locations --Magnusson Farms- Roseau and Helmstetter Farm- Lake of the Woods

Treatment#	Treatment	Application Timing	Cost analysis*	Mean Seed Yield Across Locations	
17	3 + 11	Late Apogee+2X Headline	97.30	1538	A**
15	2 + 8	Late Palisade+2X Quilt	92.15	1499	AB
16	3 + 9	Late Apogee+Early Headline	77.10	1441	ABC
7	Quilt	Late	98.00	1400	ABCD
14	2 + 6	Late Palisade+Early Quilt	58.55	1373	ABCDE
9	Headline	Early	83.90	1369	ABCDE
12	Quadris	Early	78.87	1360	ABCDE
8	Quilt	2X	68.60	1346	BCDEF
10	Headline	Late	62.20	1307	CDEF
11	Headline	2X	41.45	1287	CDEF
6	Quilt	Early	56.00	1280	CDEF
13	Tilt	Late	45.60	1244	DEFG
2	Palisade	Late	10.95	1207	EFG
3	Apogee	Late	8.60	1206	EFG
5	Apogee	Early	-6.10	1164	FG
1	No Treatment		0.00	1090	G
4	Palisade	Early	-34.55	1077	G
LSD @5%				185	

*Cost analysis-Figures use the no treatment as the base. \$.35/LB ryegrass and no pesticide application cost figured.

**Treatments with the same letters are not statistically different

Cost per acre	Trade name	common name	Application Rate	Active Ingredient	Active Ai/ac.	Adjuvants
\$30	Palisade EC	trinexapac-ethyl	1 pt.	2.1#/gal.	.2625#	none
\$31+\$2	Apogee	prohexadione calcium	10 oz.+	27.5 DF%	.172#	.25%NIS+2pts.28% 'N'
\$8.30	Tilt	propiconazole	4 oz.	3.72#/gal.	.1163#	none
\$15.63	Quadris	azoxystrobin	8 oz.	2.08#/gal.	.13#	none
\$13.75	Headline	pyroclostrobin	8 oz.	2.09#/gal.	.131#	none
\$10.50	Quilt	azoxystrobin+propiconazole	12 oz.	1.04#+.62#/gal	.0975#+.058#	none

Table 15. Herbicide and Growth Regulator Effects When Applied Alone and Tank Mixed Inspire' Perennial Ryegrass - Rice Farm: Roseau, MN.

Treatment*	Method applied	Height	Lodging**	Seed
		inches 7/16/2006	score 7/16/2006	Yield lbs/A
2,4-D+Banvel+Puma	tank mixed	28	6.3	1112
Puma	Alone	27	5.7	1043
Puma + Palisade	tank mixed	24	2.0	954
Palisade	Alone	24	2.3	949
Paramount	Alone	27	5.7	928
NO TREATMENT	None	28	6.3	904
2,4-D+Banvel	tank mixed	27	6.3	889
Puma/Palisade	sequential	25	2.7	865
	LSD @5%	1	1.4	NS

All treatments applied 5/25/06 11:00am growth stage: 2 nodes
Sequential Puma/Palisade treatments made approximately 1 hour apart.

* -Grass and broadleaf weed control was good- excellent with all

2,4-D + Banvel applications for broadleaf weeds and all Puma applications for grass weeds
Paramount generally appeared weak on weeds present but may have application for some specific
hard to control weed problems on grasses grown for seed and is currently labeled for use.

** Lodging- 1=none;9=severe

Harvest date- 7/16/06

Table 16. 2006 Callisto Applied to 'Ragnar' (P101) Per.Ryegrass for weed control Magnusson Farms-

Application Timing	Treatments:	Seed Yield Ryegrass	Plant height (inches)		Test wt.	Seed	
		lbs/A	Injury*	6/16/2006	at harvest	(bushel)	germination
	1)No Treatment	1679	1.0	15.3	32.5	28.9	96.8
pre-emergent	2)Callisto 4SC-- 6 oz./ac	1661	1.8	14.8	32.5	28.7	95.8
pre-emergent	3)Callisto 4SC-- 12 oz./ac	1490	2.0	13.8	32.3	28.4	96.5
post	4)Callisto 4SC-- 3 oz./ac + 1%COG	1592	1.0	15.3	32.0	28.5	96.3
post	5)Callisto 4SC-- 6 oz./ac + 1%COG	1532	1.0	15.0	32.8	29.2	96.0
post	6)Callisto 4SC-- 3 oz. + .25%NIS	1400	1.0	15.5	32.5	27.6	96.3
post	7)Callisto 4SC-- 3 oz./ac + 1%COG+2.5%UAS	1670	1.0	15.0	33.3	29.8	96.5
pre+post	8)Callisto 4SC--6 oz+3 oz.+1%COG	1570	1.0	14.5	32.5	28.0	97.8
post	9) 3/4pt.Clarity + 3/4pt. 2,4-D Amine	1644	1.0	14.8	33.0	30.0	97.5
	LSD @5% level	188	0.2	0.9	0.8	1.3	1.9

*Ryegrass Injury 1=none, 9= severe bleaching

Post: 5/18/06 Vegetative-1 node stage application 2:00pm. Light rain 30 minutes later (trace) 60F

Pre: 4/26/06 2:00 pm wind SW 5mph. Sunny -65F

Treatments applied with bicycle sprayer - 12.5 gpa @ 28psi- 8002XR flat fan nozzels

Harvest Date: 7/15/06

General management:

Seeding: Into existing wheat stubble after harvest 8/26/05

Fertilizer: 100+20+30 applied 10/20/05

Fungicide: 10oz. Quilt applied 6/27/06

Weed control: none except plot treatments

Growth regulator: none applied- all plots lodged

**Table 17. Fungicide Trial on 'Inspire' perennial ryegrass
Rice Farm**

Treatment	Rate oz/A	Application		Seed Yield
		Timing	Date	lbs/A
Headline+Tilt+Headline	4+4+8	1+2+3	1+2+3	1062
Headline	4	(1)2-3 Node	24-May	1053
Headline	8	(2)Full flag leaf	16-Jun	1053
No treatment				1046
Tilt	4	(2)Full flag leaf	16-Jun	1041
Tilt	2	(1)2-3 Node	24-May	975
Tilt+Headline+Headline	2+8+8	1+2+3	1+2+3	972
Headline+Headline+Tilt	4+8+4	1+2+3	1+2+3	913
Tilt	4	(3)Heading	2-Jul	907
Quilt	12	(3)Heading	2-Jul	904
Headline	8	(3)Heading	2-Jul	901
Quilt	12	(2)Full flag leaf	16-Jun	850
LSD @5% level				209

Objectives:

Determine if there is benefit to early season(preventative) and sequential applications of fungicides to perennial ryegrass.

Application timing(1) 5/24/2006 wind NNW 10-15mph - overcast 76F
 Application timing(2) 6/16/2006 6:00pm wind calm fully headed some pollen shed on main tillers
 Application timing(3) 7/2/2006 7 am 64F wind wnw 0-5 dry surface soil conditions
 pollen shedding on tillers- main stems are pollinated

Applications made with CO2 bicycle sprayer with 8002 XR T-Jet nozzels @ 28PSI and 12GPA output

**Table 18. Late Growth Regulator Applications alone and in combination with Fungicides -
Inspire' perennial ryegrass- Rice Farm**

Treatment	Rate (oz.)	Timing**	Harvest Lodging	Harvest Height(in.)	Seed Yield lbs/A
Headline	8	Pollen shed(2)	7.0	28	1175
Apogee*	15	Full Flag(1)	1.0	23	1142
Headline	8	Full Flag(1)	7.0	28	1065
Apogee*+Headline	15+8	Full Flag(1)	1.0	22	1059
Apogee*+Headline	15+8	Pollen shed(2)	2.3	24	1059
none			7.0	28	1026
Apogee*	15	Pollen shed(2)	1.3	24	1011
LSD @5%			0.5	1.5	NS

Objectives:

Determine effects of late season applications of growth regulator and fungicides on perennial ryegrass.

Experimental design:RCB w/ 3 replications

*- All Apogee treatments have .25%NIS + 2 qts./ac. 28%N added to tank mix

** Timing -(1)full flag=5/31/06 11:00am. Wind WSW 5-10 mph Plant height =8"-14"

(2) Pollen shedding=6/16/06 6:00pm wind calm Plant height=12"- 18"

Applications made with CO2 bicycle sprayer with 8002 XR T-Jet nozzels @ 28PSI and 12GPA output

**Table 19. Tolerance of underseeded grasses to wild oat herbicides applied to spring wheat
Magnusson Research farm- F2B -Roseau,Mn**

Species	Variety	Herbicide Treatment							
		Achieve	Everest	Puma	Discover	Avenge	Silverado	Axial	No treat
		%Stand 5/26/06							
Ky. bluegrass	Park	100	95	2	100	95	90	95	100
Ky. bluegrass	Midnight	90	100	4	95	100	93	90	100
Reed canarygrass	Palaton	70	2	18	50	100	30	1	100
Timothy	Climax	100	95	10	80	100	88	70	100
Per. Ryegrass	Ragnar	90	1	95	95	100	15	3	100
Per .Ryegrass	PolarGreen	70	5	98	95	100	50	0	100

Injury rating 9/14/05 (1 = no injury to 9 = dead)									
Ky. bluegrass	Park	2.0	3.0	8.5	2.0	2.0	6.5	3.0	1.0
Ky. bluegrass	Midnight	4.0	3.0	8.0	2.0	1.0	6.5	2.5	1.0
Reed canarygrass	Palaton	3.0	9.0	7.0	4.0	1.0	2.5	9.0	1.0
Timothy	Climax	2.0	3.0	7.5	2.0	1.0	2.0	1.5	1.0
Per. Ryegrass	Ragnar	1.0	8.0	1.0	1.0	1.0	8.0	8.0	1.0
Per .Ryegrass	PolarGreen	2.0	8.0	1.0	2.0	1.0	6.5	9.0	1.0

*= Limited data- Only 1-2 reps because of drown out.

Trade name/Rates	Common name	Product	Active	Ai/ac
1)Achieve .5# +2/3pt. Supercharge + 3.5 pt.28%N	tralkoxydim	40%DG	.2#/ac.	
2)Everest .61oz. +.25% NIS	flucarbazone	70%WDG	.027#/ac.	
3)Puma .66pt.	fenoxypop	1#/gal.	.0825#/ac.	
4)Discover 4 oz. + 1 pt. DSV adjuvant	clodinafop	2#/gal.	.0625#/ac.	
5)Avenge 3 pt. + .25% NIS	difenzoquat	2#/gal.	.75#/ac.	
6)Silverado 1.78oz. + 2 pt. Destiny	mesosulfuron	2%WDG	.0022#/ac.	
7)Axial 8.2 oz.+ 2.5 pt. A12127 adjuvant	pinoxaden	.83#/gal	.053#/ac.	
8) No Treatment				

Variety/Species	Lot #	Seeding rate/equiment
Park Kentucky bluegrass	3324	3 lbs/A in 6 inch rows/forage seeder
Midnight Kentucky bluegrass	3721	3 lbs/A in 6 inch rows/forage seeder
Climax Timothy	3537	1 lbs/A in 10 inch rows/Truax drill
Palaton reed canarygrass	3433	3 lbs/A in 10 inch rows/Truax drill
P101 perennial ryegrass	3366	5 lbs/A in 10 inch rows/Truax drill
WH x TQ perennial ryegrass	3372	5 lbs/A in 10 inch rows/Truax drill

Objectives:

Evaluate the tolerance of various cool season grasses, planted under spring wheat, to post emergent grass control herbicides.

Herbicide applications made 6/23/05 with CO2 bicycle sprayer @ 14GPA and 27psi sunny and 65F. Light winds 5mph NW.

Ground saturated, some standing water. All grasses emerged aggressively. Wheat is water stressed and stunted. Rep 1 entirely drown out. Rep 2 water damaged also but 3 treatments applied in dryer areas.

Table 20. 2006 Fungicide applications made to 'Park' kentucky bluegrass Helmstetter farm-Roosevelt, Mn.

Treatment/Rate	Date	Seed Yield	
		lbs/A	% of check
1) Headline 6 oz.	5/17/2006	930	142
2) Tilt 3 oz.	5/17/2006	823	126
3) Headline 6oz.	6/2/2006	758	116
4) Tilt 3 oz.	6/2/2006	834	128
5) No Treatment		653	100
LSD @5% level		204	31

Harvest Date: 6/27/06

Experimental Design: RCB with 4 reps

Applications made with CO2 bicycle sprayer with 8002 XR T-Jet nozzels @ 28PSI and 12GPA output

5/17/06- no heading observed- 4:00 pm sunny and 65F

6/2/06- 90% headed some flowering 9:00am calm wind 69F

Low levels of powdery mildew infestations observed throughout season

Objectives:

- 1) determine if any seed yield/quality reduction with late fungicide applications.
- 2) determine if later fungicide applications are effective in powdery mildew control.

Table 21. Establishment of 'Park' ky.bluegrass under wheat using 'Everest' herbicide for control of wild oats- 2005 NW corner of F5 Magnusson farm

Treatments:	% Herbicide injury*		%Stand	2006 Seed yield	
	7/12/2005	7/29/2005	9/13/2005	lbs/A	
1)No treatment	0	0	68	62	
2)Everest 0.4 oz.preemergent(5/18/05)	45	50	23	33	
3)Everest 0.6 oz.preemergent(5/18/05)	77	77	7	27	
4)Everest 0.3 oz. Preemergent-5/18+0.3 oz.+25%NIS post(2-4lf stage)	75	75	33	92	
5)Everest 0.4 oz. Post(2-4 lf) +.25%NIS +2#AMS(2pt.-28%)	15	17	72	134	
6)Everest 0.6 oz. Post(2-4 lf) +.25%NIS +2#AMS(2pt.-28%)	30	30	75	137	
7)Everest 0.4 oz. Post +.25%NIS +8 oz. 2,4-D Amine	27	27	67	122	
8)Everest 0.6 oz. Post +.25%NIS +8 oz. 2,4-D Amine	55	50	63	86	
LSD @ 5%		38	32	12	54

Objectives:

Evaluate effects of preemergent and post emergent treatments of Everest when applied to wheat that has been under seeded with ky.bluegrass.

General management:

Fertilized 5/5/05 60+20+30+10s

seeded @ 1.5 bu/ac Alsen 5/17/05

Seed 'Park' ky.bluegrass @ 3#/ac

Apply treatments when wheat is in the 2-4 leaf stage

Design:RCB w/3 reps

3/4pt.2,4-D amine+3/4 pt.Barvel applied to all plots 9/8/05-

Fertilizer= 40+30+40(+10sulfur) 10/15/05 and 40+0+0 applied 5/17/06

Treatments:

Formulation: Everest 70WG

Mixed- 2qt.@12GPA= 1/24ac.(.04167ac.)

sprayed 6/23/05 wind SSW 3-6mph

Applications made with CO2 bicycle sprayer with 8002 XR T-Jet nozzels @ 28PSI and 12GPA output

*Herbicide injury- 0=none; 100= all dead

Experimental Design: RCB with 4 reps

Table 22. Everest and Beacon herbicide applied to A99-2626 kentucky bluegrass in the year of production for control of grassy weeds
F5 NW corner Magnusson Research Farm

Post Treatments:	Seed Yield	% Foxtail	Plant height
	lbs/A	barley control**	inches*
	7/11/2006	7/10/2006	6/15/2006
1)No treatment	250	0	22
2)Everest 0.4 oz.+ .25%NIS+1.0 #AMS	580	60	19
3)Everest 0.6 oz.+ .25%NIS+1.0 #AMS	398	43	17
4)Everest 0.4 oz. + 1.0% Quad 7	446	43	19
5)Everest 0.6 oz. + 1.0% Quad 7	529	50	18
6)Beacon 0.4 oz. + 1.0% Quad 7	565	80	19
7)Beacon 0.4 oz. + Everest 0.4oz.+ 1.0% Quad 7	470	73	18
LSD @5% level	172	28	2

Objectives:

- 1)Evaluate seed production year effects of Everest when applied at different rates and with different adjuvuncts.
- 2)Evaluate Beacon when used alone or in combination with Everest.

Experimental Design:RCB w/3 reps

*Some height suppression related to herbicide application

** foxtail barley(hordeum jubatum) was the predominant weed present.

Ratings are expressed as a percentage of check. Untreated areas had more mature foxtail barley. Foxtail barley has become prevalent in much of northern Minnesota grass seed production area mainly because of the wet conditions.

General management:

A99-2626 breeder seed ky. bluegrass seeded 8/17/05

50+38+50(+12sulfur) applied 10/15/05

2pt.Curtail+1pt.Clarity applied to entire area 9/8/05

Stand excellent- tall off-type plants spot treated with Roundup 5/20/06

Field, outside plot area, was treated with Beacon @ .5oz./ac + .25%NIS

Treatment application:

Date=5/18/06 growth stage= early boot

10:00am p cldy 55F wind 3-5 nw

CO2 bicycle sprayer @ 28psi and 12 GPA output 8002 XR T-JET nozzels

formulation: Everest 70WG

Table B1. 2006 Nitrogen Fertilizer Trial Applied to 'Park' Kentucky Bluegrass - Magnusson Farms

Nitrogen Formulation	Application Rate	Application Timing	Harvest		Seed Yield lbs/A
			Ht.(in.)	Lodging*	
No Treatment	0	--	26.5	1.0	122
Urea	60	10/24/2006	32.0	2.8	261
Urea	60 + 40	10/24 + 5/15	31.5	6.5	221
Urea	100	10/24/2006	31.8	3.8	307
Urea	100 + 40	10/24 + 5/15	31.3	5.8	260
Urea	120	10/24/2006	31.5	5.5	269
Urea	140	10/24/2006	29.3	4.8	330
Ammonium Sulfate	60	10/24/2006	30.8	1.0	196
Ammonium Sulfate	60 + 40	10/24 + 5/15	32.0	7.5	324
Ammonium Sulfate	100	10/24/2006	32.5	6.3	336
Ammonium Sulfate	100 + 40	10/24 + 5/15	30.0	8.0	311
Ammonium Sulfate	120	10/24/2006	31.3	7.3	341
Ammonium Sulfate	140	10/24/2006	31.3	7.8	315
Ammonium Nitrate	60	10/24/2006	31.5	1.3	288
Ammonium Nitrate	60 + 40	10/24 + 5/15	31.3	6.8	294
Ammonium Nitrate	100	10/24/2006	32.3	4.0	374
Ammonium Nitrate	100 + 40	10/24 + 5/15	31.5	7.0	358
Ammonium Nitrate	120	10/24/2006	31.5	3.7	294
Ammonium Nitrate	140	10/24/2006	31.3	3.8	301
Coated Urea	60	10/24/2006	29.8	4.5	138
Coated Urea	60 + 40	10/24 + 5/15	30.8	6.8	201
Coated Urea	100	10/24/2006	29.5	5.5	185
Coated Urea	100 + 40	10/24 + 5/15	30.8	5.3	201
Coated Urea	120	10/24/2006	31.8	6.0	220
Coated Urea	140	10/24/2006	30.3	6.0	163
LSD @ 5% level					44

3 oz. Tilt applied on 5/17/06

Harvest date- 6/27/06

Table B2. 2006 Nitrogen Fertilizer Trial Applied to 'Park' Kentucky Bluegrass - Helmstetter Farm

Nitrogen Formulation	Application Rate	Application Timing	Harvest		Seed Yield lbs/A
			Ht.(in.)	Lodging*	
Control	0	--	30.0	1.5	386
Urea	60	10/25/2006	31.3	2.3	655
Urea	60 + 40	10/25 + 5/15	32.3	3.0	775
Urea	100	10/25/2006	32.3	3.0	794
Urea	100 + 40	10/25 + 5/15	32.0	6.0	767
Urea	120	10/25/2006	32.8	5.8	704
Urea	140	10/25/2006	31.8	5.8	651
Ammonium Sulfate	60	10/25/2006	32.5	3.5	788
Ammonium Sulfate	60 + 40	10/25 + 5/15	32.0	5.3	665
Ammonium Sulfate	100	10/25/2006	32.3	6.0	697
Ammonium Sulfate	100 + 40	10/25 + 5/15	32.8	5.8	716
Ammonium Sulfate	120	10/25/2006	32.3	5.0	728
Ammonium Sulfate	140	10/25/2006	31.8	5.5	823
Ammonium Nitrate	60	10/25/2006	32.3	2.8	705
Ammonium Nitrate	60 + 40	10/25 + 5/15	24.8	5.8	750
Ammonium Nitrate	100	10/25/2006	33.3	3.8	699
Ammonium Nitrate	100 + 40	10/25 + 5/15	32.5	5.0	631
Ammonium Nitrate	120	10/25/2006	32.5	3.5	564
Ammonium Nitrate	140	10/25/2006	32.0	5.5	718
Coated Urea	60	10/25/2006	31.8	4.8	610
Coated Urea	60 + 40	10/25 + 5/15	31.8	4.3	617
Coated Urea	100	10/25/2006	32.0	4.0	700
Coated Urea	100 + 40	10/25 + 5/15	32.0	7.0	662
Coated Urea	120	10/25/2006	31.5	6.0	638
Coated Urea	140	10/25/2006	33.5	7.3	729
LSD @ 5% level					71

3 oz. Tilt applied on 5/16/06

Harvest date: 6/27/06

Table B3. 2006 Nitrogen Fertilizer Trial Applied to 'Ragnar' Perennial Ryegrass - Magnusson Farms

Nitrogen Formulation	Application Rate	Application Timing	Harvest		Seed Yield lbs/A
			Ht.(in.)	Lodging'	
Control	0	--	28.6	4.0	1436
Urea	60	10/24/2006	29.5	5.5	1738
Urea	60 + 40	10/24 + 5/15	30.3	7.0	1819
Urea	100	10/24/2006	31.5	6.5	1684
Urea	100 + 40	10/24 + 5/15	29.8	6.3	1854
Urea	120	10/24/2006	28.8	5.5	1618
Urea	140	10/24/2006	30.0	6.5	1844
Ammonium Sulfate	60	10/24/2006	28.5	4.0	1510
Ammonium Sulfate	60 + 40	10/24 + 5/15	30.0	6.5	1915
Ammonium Sulfate	100	10/24/2006	29.8	4.8	1677
Ammonium Sulfate	100 + 40	10/24 + 5/15	30.5	6.5	1780
Ammonium Sulfate	120	10/24/2006	30.3	5.5	1646
Ammonium Sulfate	140	10/24/2006	30.8	6.5	1849
Ammonium Nitrate	60	10/24/2006	31.0	5.8	1712
Ammonium Nitrate	60 + 40	10/24 + 5/15	30.8	6.8	1925
Ammonium Nitrate	100	10/24/2006	31.0	6.5	1787
Ammonium Nitrate	100 + 40	10/24 + 5/15	30.0	8.0	1796
Ammonium Nitrate	120	10/24/2006	29.8	7.3	1827
Ammonium Nitrate	140	10/24/2006	31.3	7.3	1852
Coated Urea	60	10/24/2006	30.0	6.3	1585
Coated Urea	60 + 40	10/24 + 5/15	30.3	6.8	1807
Coated Urea	100	10/24/2006	30.3	6.5	1898
Coated Urea	100 + 40	10/24 + 5/15	30.5	6.8	1752
Coated Urea	120	10/24/2006	30.0	6.3	1681
Coated Urea	140	10/24/2006	31.0	7.5	1641
LSD @ 5% level					106

General Management:

5/18/2006 3/4 pt. 2,4-D + 3/4 pt. Banvel + 8oz Assurell

(Assure II applied sequentially-not tank mixed)

5/26/2006 1 pt. Palisade

6/14/2006 10 oz. Quilt(Areas of rust infestation at harvest)

Harvest date:7/15/06 and 7/17/2006 based on maturity level

Table B4. 2006 Nitrogen Fertilizer Trial Applied to 'Quest' Perennial Ryegrass - Helmstetter Farm

Nitrogen Formulation	Application Rate	Application Timing	Harvest		Seed Yield lbs/A
			Ht.(in.)	Lodging*	
Control	0	--	20.9	1.0	723
Urea	60	10/25/2006	22.8	1.5	976
Urea	60 + 40	10/25 + 5/15	23.0	2.5	1185
Urea	100	10/25/2006	24.3	1.8	1110
Urea	100 + 40	10/25 + 5/15	24.3	4.0	1165
Urea	120	10/25/2006	24.3	1.8	1038
Urea	140	10/25/2006	25.0	1.0	1110
Ammonium Sulfate	60	10/25/2006	23.0	1.0	949
Ammonium Sulfate	60 + 40	10/25 + 5/15	20.5	3.5	1315
Ammonium Sulfate	100	10/25/2006	25.0	1.5	1155
Ammonium Sulfate	100 + 40	10/25 + 5/15	24.8	5.0	1294
Ammonium Sulfate	120	10/25/2006	25.3	1.8	1114
Ammonium Sulfate	140	10/25/2006	25.0	4.8	1162
Ammonium Nitrate	60	10/25/2006	22.3	1.0	927
Ammonium Nitrate	60 + 40	10/25 + 5/15	23.8	2.3	1176
Ammonium Nitrate	100	10/25/2006	25.0	1.3	1034
Ammonium Nitrate	100 + 40	10/25 + 5/15	24.5	4.0	1165
Ammonium Nitrate	120	10/25/2006	24.0	2.0	1094
Ammonium Nitrate	140	10/25/2006	24.0	1.5	1099
Coated Urea	60	10/25/2006	24.0	1.8	1243
Coated Urea	60 + 40	10/25 + 5/15	24.5	2.3	1126
Coated Urea	100	10/25/2006	25.8	3.5	1296
Coated Urea	100 + 40	10/25 + 5/15	25.0	5.3	1169
Coated Urea	120	10/25/2006	26.8	5.5	1264
Coated Urea	140	10/25/2006	26.0	6.8	1177
LSD @ 5% level					69

General Management:

5/18/2006 3/4 pt. 2,4-D + 3/4 pt. Banvel

5/25/2006 1 pt. Palisade

6/15/2006 10 oz. Quilt

Harvest date:7/14/06

Table B5. 2006 Nitrogen Fertilizer Trial Applied to 'Ragnar' Perennial Ryegrass - Magnusson Farms

Nitrogen Formulation	Application Rate	Harvest		Seed Yield (#/ac)
		Ht.(in.)	Lodging*	
Control	0	28.9	3.7	1403
Urea	60	27.8	5.0	1452
Urea	100	30.0	5.8	1482
Urea	120	29.5	5.8	1780
Urea	140	31.5	6.3	1666
Ammonium Sulfate	60	29.5	5.3	1593
Ammonium Sulfate	100	30.5	6.5	1655
Ammonium Sulfate	120	29.0	6.3	1709
Ammonium Sulfate	140	28.8	5.8	1597
Ammonium Nitrate	60	30.0	5.5	1513
Ammonium Nitrate	100	29.3	6.3	1504
Ammonium Nitrate	120	28.3	5.5	1642
Ammonium Nitrate	140	28.8	6.0	1460
Coated Urea	60	27.5	4.0	1484
Coated Urea	100	29.8	4.5	1187
Coated Urea	120	29.3	4.8	1389
Coated Urea	140	29.8	4.5	1378
LSD @ 5% level				136

General Management:

5/18/2006 3/4 pt. 2,4-D + 3/4 pt. Banvel + 8oz Assurell
 (Assure II applied sequentially-not tank mixed)
 5/26/2006 1 pt. Palisade
 6/14/2006 10 oz. Quilt(Areas of rust infestation at harvest)

Fertilizer Application Date: 5/16/2006

Harvest date:7/15/06 and 7/17/2006 based on maturity level

Table B6. 2006 Nitrogen Fertilizer Trial Applied to 'Quest' Perennial Ryegrass - Helmstetter Farm

Nitrogen Formulation	Application Rate	Harvest		Seed Yield lbs/A
		Ht.(in.)	Lodging*	
Control	0	21.9	1.2	768
Urea	60	25.3	4.0	1142
Urea	100	25.5	5.8	1397
Urea	120	25.8	6.3	1386
Urea	140	24.8	5.8	1409
Ammonium Sulfate	60	24.0	4.3	1342
Ammonium Sulfate	100	25.8	6.0	1183
Ammonium Sulfate	120	24.3	5.5	1182
Ammonium Sulfate	140	25.8	7.2	1566
Ammonium Nitrate	60	25.3	4.8	1192
Ammonium Nitrate	100	26.0	5.5	1294
Ammonium Nitrate	120	25.0	6.5	1289
Ammonium Nitrate	140	23.7	7.0	1351
Coated Urea	60	22.3	2.0	995
Coated Urea	100	22.8	3.8	1092
Coated Urea	120	23.8	3.3	1163
Coated Urea	140	24.5	3.3	1289
LSD @ 5% level				123

General Management:

5/18/2006 3/4 pt. 2,4-D + 3/4 pt. Banvel
 5/25/2006 1 pt. Palisade
 6/15/2006 10 oz. Quilt

Fertilizer Application Date: 5/16/2006

Harvest date: 7/14/06