

PROGRESS REPORT ON GRASS SEED PRODUCTION RESEARCH

prepared by

N. Ehlke and D. Vellekson

Department of Agronomy and Plant Genetics

University of Minnesota

St. Paul, Minnesota 55108

Grass-Legume Seed Institute Presentation Roseau, MN - February 16, 2010

Table 1. Weather Data 1967-2009.

Variety Performance Trials:

Table 2. Kentucky bluegrass seeded in 2005.

Table 3. Kentucky bluegrass seeded in 2007.

Table 4. Tall Fescue seeded in 2007.

Table 5. Fine Fescue seeded in 2008.

Table 6. Perennial Ryegrass Seed Production Trial 2008.

Table 7. Perennial Ryegrass Winter Hardiness Trial 2007.

Kentucky Bluegrass Management Trials:

Table 8. Nitrogen Fertility Rate x Source on Kentucky Bluegrass at 2 Locations.

Table 9. Fertility Timing x Source on Kentucky Bluegrass at 2 Locations.

Table 10. Residue Management on Kentucky Bluegrass at 2 Locations

Table 11. Fungicides and Growth Regulators Applied to Kentucky Bluegrass at 3 Locations

Table 12. Fungicides and Growth Regulators Applied to 'Midnight' Kentucky Bluegrass.

Table 13. Post emergent Grass Weed Control in Kentucky Bluegrass

Perennial Ryegrass Management Trials:

Table 14. Stand Evaluation-Magnusson Farms

Table 15. Date of Seeding-Fall 2007 and 2008.

Table 16. Top Dress Spring Nitrogen Applications-Tveit/Magnusson

Table 17. Fertility Applications- Magnusson Plots

Table 18. Nortron Applications-Magnusson Plots

Table 19. Application Timing of Assure II to Arctic Green Perennial Ryegrass-Magnusson Farms

Table 20. Application Timing of Assure II to Arctic Green Perennial Ryegrass-Tveit Farms

Table 21. Grass Weed Control- Magnusson Plots

Table 22. Nortron Applications- Tveit Farms

Table 23. Fungicide and Growth Regulator Applications- Magnusson Plots

**Table 1. Monthly and year end total precipitation*
Roseau ,Mn 1967-2009.**

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Yearly Total(in.)	DEVIATION FROM MEAN	Park' big. mean yield 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	-3.06	
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	7.71	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	2.09	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	3.06	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	-3.90	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	-3.12	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	-0.80	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	4.25	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	-4.17	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	-6.39	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	-2.78	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	-1.60	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	-4.76	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	-3.07	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	1.38	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	-2.01	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	-0.27	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	-4.79	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	2.83	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	-2.84	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	-4.30	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	-5.29	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	-0.51	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	-10.54	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	8.07	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	-1.60	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	-0.43	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	-3.62	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	-0.27	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	3.77	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	-1.55	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	2.72	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	0.67	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	6.01	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	-3.43	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	3.60	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	2.25	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	11.91	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	9.07	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	-5.73	300
2007	0.44	0.56	1.25	0.95	2.75	7.75	2.92	1.37	0.92	5.14	0.39	0.86	25.30	3.08	200
2008	0.25	1.29	0.46	2.17	1.56	3.93	4.33	3.63	3.06	2.37	2.00	1.47	26.52	4.30	275
2009	1.25	1.75	4.45	1.37	3.59	3.72	1.28	3.92	2.67	1.06	0.28	1.22	26.56	4.34	375

43 year average precipitation 22.22"

*Precipitation amounts used are from the Roseau research site when possible and from the State Climatology High Density Network.

Table 2.
2005 Kentucky Bluegrass Variety Trial
Field 7SE Magnusson Research Farm

Variety	Seed lot #	Seed Yield					2009 Harvest			2009 % Heading				Fall Regrowth**
		2007-9 % of mean	#/AC.				Height(in.)	Lodging*	Date	7-Jun	11-Jun	19-Jun	24-Jun	9/4/2009
			2007-9	2009	2008	2007								
Miracle	3550	142	557	678	482	511	19	1.5	28-Jul	0	9	60	97	1.5
Minnfine	3672	142	557	738	495	437	32	2.5	14-Jul	43	73	100	100	5.0
A99-2893	3636	124	486	446	504	508	19	1.5	31-Jul	0	0	11	50	2.0
Dragon	3671	124	486	595	390	473	25	1.0	16-Jul	1	8	80	100	3.3
A99-3124	3700	123	482	384	506	555	20	1.8	31-Jul	0	0	14	55	1.5
Brilliant	3670	123	482	401	624	419	20	1.0	31-Jul	0	0	14	58	1.8
A99-2628	3634	122	479	446	513	479	20	1.3	26-Jul	0	0	8	55	2.0
A99-2679	3737	119	468	442	508	455	20	1.3	28-Jul	0	0	13	48	2.0
Abbey	3608	119	466	502	248	649	20	1.0	22-Jul	0	0	21	70	3.0
A99-2674	3475	117	458	359	482	533	20	2.0	31-Jul	0	0	11	50	1.3
A99-2626	3633	113	446	437	502	399	20	2.0	29-Jul	0	0	8	53	1.8
A99-2670	3697	113	443	355	491	484	20	1.5	29-Jul	0	0	9	55	2.0
Park	3540	112	442	566	363	395	31	1.8	14-Jul	20	43	93	100	5.0
Voyager II	3674	109	427	421	459	401	20	1.5	29-Jul	0	0	18	55	2.0
A97-1289	3470	94	369	332	357	419	21	1.8	24-Jul	0	1	38	81	1.3
Nubblue	3727	84	329	299	359	330	22	1.0	22-Jul	0	0	33	78	2.8
Nuglade	3728	82	323	230	370	368	21	1.0	22-Jul	0	0	4	38	1.5
Midnight	3539	81	317	268	326	357	20	1.8	31-Jul	0	0	9	40	1.8
Sonic	3673	70	276	256	321	250	25	1.0	14-Jul	0	1	55	91	4.9
Midnight Star	3552	64	251	248	167	339	21	1.0	24-Jul	0	0	25	74	3.3
A99-2950	3699	63	248	198	285	259	20	1.0	24-Jul	0	0	19	60	1.5
A99-2235	3696	59	232	210	207	279	17	1.5	28-Jul	0	0	23	61	2.0
A97-1436	3629	59	230	176	230	285	19	2.5	31-Jul	0	0	14	61	1.0
Avalanche	3647	47	186	145	210	203	27	3.0	16-Jul	0	1	43	92	2.5
LSD @5% Level		11	44	70	68	65	2	0.8	3	3	3	7	9	0.6

Mean yield 2007-9=393#/ac

* Lodging-1=erect ;9=flat

**Fall Regrowth rating=1=none;5=vigorous, normal regrowth

All plots cut 8/8/09, desiccated with Gramoxone Max+NIS 8/12/09, and burned 8/23/09

Management:

100+25+40+15s applied 10/17/08

2 pts. Curtail+.75pt Banvel applied 9/18/08

2 oz. Tilt applied 6/3/09

Table 3.
2007 Kentucky Bluegrass Variety Trial
Field 1 Magnusson Research Farm

Variety	Seed lot#	Source	Seed Yield		Harvest			% Heading					Fall
			(#/ac.)	%of mean	Height(in.)	Lodging*	Date	11-Jun	15-Jun	19-Jun	24-Jun	28-Jun	Regrowth**
Midnight	3539	check	740	146	23	1.0	31-Jul	0	0	1	35	68	2.5
Rhythm	3804	Int'I-DLF	703	139	24	2.0	31-Jul	0	0	1	43	70	2.8
Dragon	3671	N. excel	650	128	26	1.0	22-Jul	0	9	60	97	100	3.5
A97-1287	3802	Int'I-DLF	638	126	22	1.0	31-Jul	0	0	8	63	85	2.0
Diva	3853	ProseedN. excel	622	123	26	1.0	27-Jul	0	2	38	85	98	2.8
Evora	3803	Int'I-DLF	608	120	25	1.0	29-Jul	0	1	30	88	96	2.3
A99-3124	3777	UM	588	116	21	1.3	31-Jul	0	0	3	43	63	2.0
A99-2626	3792	Mag-plots	568	112	22	1.8	31-Jul	0	0	3	43	65	2.0
Park	3540	check	562	111	30	1.0	14-Jul	8	25	76	98	100	5.0
A99-2679	3774	UM	554	109	21	1.3	31-Jul	0	0	2	38	63	1.8
157	3805	UM/soma	544	108	21	1.0	25-Jul	0	0	8	53	83	3.8
A99-2950	3771	UM	541	107	23	1.3	27-Jul	0	0	11	63	88	2.5
Unique	3794	check	526	104	21	1.5	31-Jul	0	0	3	38	65	2.0
Abbey	3608	check	481	95	21	1.0	22-Jul	0	0	15	59	83	3.5
PpH8510	3851	ProseedN. excel	468	92	22	1.3	23-Jul	0	3	30	80	90	3.3
BAR Pp 0468	3799	Barenbrug	444	88	22	1.0	31-Jul	0	0	6	43	70	1.8
A97-1436	3764	Tveit	439	87	23	1.5	31-Jul	0	0	8	53	84	1.8
Huntington	3854	ProseedN. excel	426	84	29	1.3	22-Jul	1	10	60	98	100	4.5
1949	3808	UM/soma	411	81	23	1.0	23-Jul	0	0	26	75	86	2.3
A93-201	3850	ProseedN. excel	377	75	25	1.0	24-Jul	2	11	48	86	95	2.5
Mystere	3855	ProseedN. excel	329	65	27	1.0	27-Jul	0	1	29	75	90	2.8
Thorough-blue	3852	Proseed/Nexcel	311	61	27	1.0	23-Jul	1	15	65	95	100	3.3
Bariris	3798	Barenbrug	303	60	29	1.0	25-Jul	1	4	29	83	94	2.3
640	3806	UM/soma	303	60	22	1.0	25-Jul	0	0	19	63	84	2.0
LSD @5% level			91	18	3	0.5	3	1	3	6	11	8	0.7

* Lodging-1=erect ;9=flat

**Fall Regrowth rating=1=none;5=vigorous, normal regrowth

All plots cut 8/8/09, desiccated with Gramoxone Max+NIS 8/12/09, and burned 8/23/09

Management:

100+25+40+15s applied 10/18/08

2 pts. Curtail+.75pt Banvel applied 9/18/08

2 oz. Tilt applied 6/3/09

Mean seed yield 2009=506#/ac.

Table 6.
2008 Perennial Ryegrass Seed Production Variety Trial
Magnusson Research Farm- Roseau,Mn

Variety	seed lot#	Seed Yield (#/ac.)	Winter* injury 5/23	Harvest			% Heading				
				Date	Ht.(in.)	Lodging	24-Jun	28-Jun	2-Jul	6-Jul	12-Jul
Arctic Green(MHT)	3809	1244	3.8	12-Aug	27	3.5	5	19	54	75	97
Ragnar(p101)	3366	1093	2.5	12-Aug	31	3.3	13	29	73	88	100
Ragnar II (p201)	3611	1075	3.0	12-Aug	30	3.5	8	26	71	88	100
Quest III	3896	1068	4.3	12-Aug	26	2.5	5	18	40	69	100
Affinity	3500	1037	3.0	12-Aug	28	4.3	10	20	56	81	100
Survivor	3848	874	2.3	17-Aug	31	4.3	1	7	20	48	94
Brightstar SLT	3661	861	3.8	14-Aug	24	2.0	3	15	43	63	96
Spreader III	3791	798	4.8	18-Aug	25	1.3	1	5	20	45	94
Polar Green(wh x tq)	3372	787	2.0	17-Aug	32	4.8	2	9	30	53	94
Hugo I	3894	765	4.3	21-Aug	31	5.0	0	0	1	5	40
Regal V	3895	725	3.8	18-Aug	25	1.8	1	9	18	43	88
NK-200	3538	564	5.8	25-Aug	34	2.3	0	0	0	4	40
LSD @ 5% level		153	1.6	3	2	2.0	4	7	14	14	6

Experimental Design=RCB with 4reps

Plot size: 5' x 20'

*Winter Injury- visually rated, 1=no injury;9=dead

Management: 2,4-D+Banvel / Assurell / Quilt

Fertility: 40+20+30+10s(summer fallow)

Seeded 9/2/08 with spring wheat for cover on summer fallow

XX

Table 7.
2008 Perennial Ryegrass Winter Hardiness Variety Trial
Roseau Mn. Seeded 9/2/08, St.Paul 9/10/08

Variety	seed lot#	Winter Injury*				Mean St.Paul 5/18 Roseau 5/23	
		St.Paul			Roseau		
		42209	5409	51809	51609		52309
Survivor	3848	5.8	5.5	4.0	5.3	6.0	5.0
Arctic Green(MHT)	3809	5.5	4.0	3.5	8.0	7.8	5.6
Polar Green(WHxTQ)	3372	5.8	5.3	4.3	6.8	7.3	5.8
Affinity	3500	6.3	6.3	5.0	8.0	8.3	6.6
Quebec	3893	6.0	4.5	4.5	8.3	8.8	6.6
Brightstar SLT	3661	5.8	5.5	5.3	8.3	8.3	6.8
FTS	3892	6.3	5.5	5.5	7.8	8.3	6.9
Ragnar II (P201)	3611	6.0	5.8	5.5	7.8	8.5	7.0
FTM	3891	7.0	6.0	5.8	8.8	8.5	7.1
Spreader 3	3791	7.8	6.8	7.0	8.0	8.0	7.5
NK-200	3538	8.0	7.0	6.5	9.0	8.8	7.6
Ribeye(annual)	3689	9.0	9.0	9.0	9.0	9.0	9.0
LSD @ 5% level		1.8	2.5	2.5	1.4	1.0	1.3

*Winter Injury- visually rated, 1=no injury;9=dead

Experimental design=RCB with 4 reps

Plots seeded in bare ground with no cover

Table 8.
Applications of Nitrogen Fertilizer Rates and Sources to 'Park' Kentucky Bluegrass
At 2 Locations-Rice Farms- Roseau and Helmstetter Farm- Lake of the Woods
 2008-2009 Data

Trt#	Source	Nitrogen Rate	Seed yield* %of check		Seed yields(#/ac)					
			2 location 2year ave	2 location 2year ave	Rice 2year ave	Rice 2008	Rice 2009	Helmstetter 2year ave	Helmstetter 2008	Helmstetter 2009
1	Urea(46-0-0)	0	31	148	180	71	289	115	53	176
2	Urea(46-0-0)	60	75	352	445	289	600	260	206	314
3	Urea(46-0-0)	100	100	471	506	376	640	435	364	505
4	Urea(46-0-0)	140	115	543	585	432	739	501	428	574
5	Amm. Nitrate(34-0-0)	0	31	148	184	63	305	112	48	176
6	Amm. Nitrate(34-0-0)	60	93	440	487	299	675	392	285	499
7	Amm. Nitrate(34-0-0)	100	123	579	617	402	832	542	453	630
8	Amm. Nitrate(34-0-0)	140	120	565	598	390	806	533	473	592
LSD @5%			10	48	77	103	108	91	117	127

Trt#	Source	Nitrogen Rate	Lodging**			Height(in.)		
			Rice 2008	Rice 2009	Helmstetter 2009	Rice 2008	Rice 2009	Helmstetter 2009
1	Urea(46-0-0)	0	1.0	1.0	1.0	27	26	27
2	Urea(46-0-0)	60	2.3	1.0	1.8	33	32	32
3	Urea(46-0-0)	100	4.3	2.3	4.0	35	33	35
4	Urea(46-0-0)	140	7.3	4.0	6.8	36	33	33
5	Amm. Nitrate(34-0-0)	0	1.0	1.5	1.0	26	27	27
6	Amm. Nitrate(34-0-0)	60	3.5	1.8	4.5	33	33	35
7	Amm. Nitrate(34-0-0)	100	5.8	3.5	4.3	36	33	35
8	Amm. Nitrate(34-0-0)	140	6.5	4.0	7.0	36	32	34
LSD @5%			1.6	1.8	1.9	3	3	2

*Check= 100#/ac. Urea
 ** lodging-1=none;9=flat

Bulk fertilizer applied to all plots:
 10/13/07(2008 harvest) 0+30+40
 10/17/08 (2009 harvest) 5+24+33
 Experimental design: RCB with 4 replications

Soil Test Nitrate Nitrogen #/acre:							
2008 harvest	0 - 6 inches	6 - 24 inches	P	K	S	%OM	PH
Rice	5	6	14	168	18	1.7	8
Helmstetter	2	6	20	118	24	5	7.8

Soil Test Nitrate Nitrogen #/acre:							
2009 harvest	0 - 6 inches	6 - 24 inches	P	K	S	%OM	PH
Rice	6	2	18	252	22	2.2	8.4
Helmstetter	10	16	20	172	22	3	8.1

Objective:

Determine effect of nitrogen rates and sources on seed yield of kentucky bluegrass at 2 locations

Table 9.2008-9 'Park' Kentucky Bluegrass Fertility SourceTiming Trial-
Location 1.**Helmstetter Farms- North of Roosevelt,Mn.**

	Fertilizer		2009 #/AC.	Seed Yield			Treatment Explanation	Total fertilizer added
	Treatment Rate	Application Date		% of mean				
				2008-9	2009	2008		
1)	15+70+100 115+0+0	8/21/2008 10/16/2008	559	112	97	126	very early 15+70+100+remainder Oct.16	130+70+100
2)	0+70+100 130+0+0	10/16/2008 10/16/2008	576	91	99	83	Normal(check) fertility-Roseau	130+70+100
3)	0+70+100 20+0+0+22s 110+0+0	10/16/2008 10/16/2008 10/16/2008	542	91	94	88	Normal(check) fertility+AMS-LOW	130+70+100+22s
4)	130+0+0	10/16/2008	547	90	94	86	Urea only Oct.16	130+0+0
5)	0+70+100 130+0+0	10/31/2007 10/31/2007	497	NA	86	NA	Normal Roseau- Late	130+70+100
6)	20+0+0+22s 0+70+100 110+0+0	8/21/2008 10/16/2008 10/16/2008	597	103	103	103	AMS very early+remainder Oct.16	130+70+100+22s
7)	90+0+0 0+70+100 20+0+0+22 20+0+0	10/16/2008 10/16/2008 4/22/2008 4/22/2009	690	NA	119	NA	Spring fertilizer added	130+70+100+22s
8)	0+70+100 20+0+0+22s 110+0+0	9/28/2008 9/28/2008 9/28/2008	623	114	108	119	All fertilizer- early Oct.	130+70+100+22s
	LSD @5% level		189	22	32	27		
	test mean #/ac		579					

2008-9 'Park' Kentucky Bluegrass Fertility SourceTiming Trial-
Location 2.**Rice Farms- North of Roseau**

	Fertilizer		2009 #/AC.	Seed Yield			Treatment Explanation	Total fertilizer added
	Treatment Rate	Application Date		% of mean				
				2008-9	2009	2008		
1)	15+70+100 85+0+0	8/22/2008 10/15/2008	635	99	93	104	very early 15+70+100+remainder Oct.15	100+70+100
2)	0+70+100 100+0+0	10/15/2008 10/15/2008	742	112	109	115	Normal(check) fertility-Roseau	100+70+100
3)	0+70+100 20+0+0+22s 80+0+0	10/15/2008 10/15/2008 10/15/2008	687	117	101	132	Normal(check) fertility+AMS-LOW	100+70+100+22s
4)	100+0+0	10/15/2008	569	75	83	66	Urea only Oct.15	100+0+0
5)	0+70+100 100+0+0	10/31/2008 10/31/2008	635	76	93	59	All fertilizer- Late Oct.	100+70+70
6)	20+0+0+22s 0+70+100 80+0+0	8/22/2008 10/15/2008 10/15/2008	742	117	109	124	AMS very early+remainder Oct.15	100+70+100+22s
7)	80+0+0 0+70+100 20+0+0+22s	10/15/2008 10/15/2008 4/20/2009	758	NA	111	NA	Spring fertility added	100+70+100+22s
	LSD @5% level		113	16	16	12		
	test mean #/ac		682					

Soil Test Results:

Oct-07

Soil Test Nitrate Nitrogen(N), P2O5,K2O,and S #/acre:

	0 - 6 inches	6 - 24 inches	P	K	S	PH
Rice	5	2	14	168	8	8.1
Helmstetter	2	6	20	118	24	8.1

Oct-08

Soil Test Nitrate Nitrogen(N), P2O5,K2O,and S #/acre:

	0 - 6 inches	6 - 24 inches	P	K	S	PH
Rice	6	2	18	252	20	8.4
Helmstetter	10	16	20	172	22	8.1

Table 10.**2008 Residue Management- Ky.Bluegrass var. 'Park'**

Location 1- Helmstetter Farm- north of Roosevelt

Location 2- Rice Farm- west of Magnusson Research Farm-Roseau

Residue Treatment	Treat#	Seed Yield (#/acre)			Dry Matter tons/acre			Harvest Index*		
		Helmstetter	Rice	Average	Helmstetter	Rice	Average	Helmstetter	Rice	Average
Clip 2" remove straw	1	279	284	281	2.29	1.18	1.55	6.8	12.1	10.3
Clip 2" remove straw-nutrient/fert.replace	2	368	309	339	2.06	1.32	1.57	9.8	11.9	11.2
Clip 2" September 17 remove straw	3	240	214	227	1.8	0.93	1.22	7.8	11.6	10.3
No treatment	4	99	93	96	1.43	1.01	1.15	4.0	4.5	4.3
Remove straw- desiccate burn	5	608	541	574	2.44	1.51	1.82	14.0	18.5	17.0
Desiccate burn	6	645	623	634	2.5	1.71	1.97	14.8	18.6	17.3
Burn straw only	7	640	615	628	2.44	1.62	1.9	15.0	19.0	17.7
LSD @5% level		131	105	85	0.35	0.33	0.28	2.7	2.0	1.8

Residue Treatment	Treat#	Height at harvest(in.)			Lodging at Harvest**		
		Helmstetter	Rice	Average	Helmstetter	Rice	Average
Clip 2" remove straw	1	32	29	31	6.8	2.0	4.4
Clip 2" remove straw-nutrient/fert.replace	2	33	30	31	6.8	3.3	5.0
Clip 2" September 17 remove straw	3	33	30	31	4.3	1.5	2.9
No treatment	4	30	28	29	2.8	2.5	2.6
Remove straw- desiccate burn	5	35	31	33	6.0	1.3	3.6
Desiccate burn	6	35	32	33	5.5	1.8	3.6
Burn straw only	7	35	32	33	5.3	1.8	3.5
LSD @5% level		2	2	2	2.0	1.0	1.1

*Harvest Index= Seed yield as % of total dry matter.

**Lodging-1= no lodging; 9=flat

Treatment# 1,2,and 5 clipped and raked off 8/1/08.

1pt. Gramoxone Extra + .25%NIS applied to treatments 5& 6 8/1/08 on Rice location and 8/6/08 at Helmstetter locatio

10+15+90 applied to treatment #2 on 8/13/08

Rice location treatments# 5-7 burned 8/8/08

Helmstetter location treatments# 5-7 burned 8/19/08

Rice fertility 90-20-20 applied in Oct.

Helmstetter fertility 110-20-20-10s applied in Oct.+ 20-0-0 applied in May

Objectives-

Determine effect on ky.bluegrass seed yield when residue is removed from field after harvest versus standard burning practices.

Determine effect of replacing fertility to treatment with straw removed

Table 11.
Growth Regulator and Fungicide Applications to Kentucky Bluegrass
at 3 locations.

Treatment	treat#	Seed Yield (#/ac.)				At Harvest							
		mean of				Lodging				Ht.(in.)			
		3 locations	Rice	Dahlgren	Helmstetter	3 locations	Rice	Dahlgren	Helmstetter	3 locations	Rice	Dahlgren	Helmstetter
No Treatment	1	721	680	952	533	4.1	2.3	4.5	5.5	32	32	32	31
Apogee late	2	675	629	843	553	2.7	2.0	1.0	5.0	31	31	29	32
Apogee	3	667	716	794	491	3.4	1.8	1.8	6.8	31	31	30	33
Palisade	4	685	660	852	542	2.6	1.0	3.8	3.0	31	31	32	30
Headline	5	708	636	937	551	3.3	1.5	3.3	5.3	32	32	32	33
Tilt	6	668	566	917	522	3.7	1.8	2.5	6.8	31	31	30	33
Absolute	7	688	586	879	600	2.8	2.3	1.0	5.3	31	32	29	33
Apogee+Headline	8	695	580	903	602	2.8	1.0	2.8	4.8	31	30	30	32
Palisade+Tilt	9	670	618	818	575	2.0	1.0	2.5	2.5	30	30	30	31
		NS	NS	NS	NS	0.9	0.8	1.7	2.4	1	1	2	2

Dahlgren south of Roseau

Var. Minnfine ky.bluegrass
 treatments 3&4 other treatments
 5/29/2009 6/4/2009
 wind calm sunny 52F wind 5-10w overcast 56F
 blg.3-6" 1 node bluegrass 5% heading
 6/12/09- 75% heading- no treatment effects observed

Rice farm northwest of Roseau

var. Park ky.bluegrass
 treatments 3&4 5/29
 other applications 6609 ene wind 5mph 48F 11:00am
 trace heading 6609
 6/12 10% heading no injury and no mildew observed
 6/27 fully headed no injury or treatment effects observed

Helmstetter Farm- Lake of the Woods

var. Park ky.bluegrass
 treatments 3 &4 5/31
 other treatments 6/5

Application Rates per acre:

Apogee- 6oz.+ .25%NIS+2.5% 28%N
 Palisade- 1pt.
 Headline- 6 oz.
 Tilt - 3oz.

Objective:

Determine effects of growth regulators and fungicides on kentucky bluegrass
 grown for seed at 3 locations

Table 12.
Apogee and Tilt Applications to 'Midnight' Kentucky Bluegrass
F 5 Magnusson Research Farm- Roseau,Mn

Treatment	Rates	Harvest	
		Ht	Seed Yield (#/ac.)
Apogee	6 oz.+ .25%NIS+2.5%N	21	395
Apogee	12 oz.+ .25%NIS+2.5%N	20	392
Tilt	3 oz.	23	410
Apogee+Tilt	6 oz. + 3oz.	21	422
No Treatment		23	398
LSD @5% level		1	NS

No Lodging observed on any plots
Treatments applied 6/10/09
clear 58F wind wnw 5mph
Growth stage-Mid- boot 5" crop height

Objective:

Determine growth regulator and fungicide effects on to Midnight kentucky bluegrass

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Table 13.
Post emergent Foxtail Barley control
Park Ky.bluegrass- F8
A99-3124 Ky.bluegrass-F3

Treatment	Rate	Application Date	Park Field 8					A99-3124- F3 Injury 7/9/09
			vegetative suppression*		Foxtail ***		sloughgrass***	
			6/29/2009	7/9/2009	Weediness** 6/29/2009	Barley control 7/9/2009	control 7/9/2009	
1 Beacon	.4 oz+.25%NIS	22-May	10.0	7.7	1.0	10.0	10.0	3.5
2 Beacon	.4 oz+.25%NIS	2-Jun	4.6	4.3	2.3	7.0	10.0	4.5
3 Beacon	.4 oz+.25%NIS	12-Jun	7.4	5.7	1.7	4.0	9.0	6.0
4 check	No Treatment		1.0	1.0	9.0	1.0	1.0	1.0
5 Everest	.61 oz. +.25%NIS	22-May	7.4	5.3	3.3	8.0	9.0	2.8
6 Everest	.61 oz. +.25%NIS	2-Jun	3.0	3.3	5.3	5.0	8.0	4.3
7 Everest	.61 oz. +.25%NIS	12-Jun	3.0	3.3	4.6	7.3	8.3	2.5
8 2,4-D amine+Express		2-Jun	1.0	1.0	8.0	2.0	2.0	3.0
9 2,4-D amine+Express+ Malathion		2-Jun	1.0	2.0	8.0	2.0	2.0	3.5
10 2,4-D amine+Express+ Warrior		2-Jun	1.0	1.0	9.0	2.0	2.0	3.0
11 2,4-D amine+Express+ Asana		2-Jun	1.0	1.0	8.0	2.0	2.0	3.3
13 2,4-D amine+Express/Everest****		6/2+6/12	4.6	3.7	4.6	6.3	6.7	4.3
LSD @5% Level			1.6	1.8	2.1	1.3	1.1	2.4

*Vegetative suppression-1= none;10=dead (insufficient seed produced to harvest yields)

** Weediness- 1=clean, no weeds;10=no weed suppression

*** Foxtail barley and sloughgrass control- 1=no weed control;10=complete control

**** 2,4-D+Express applied on 6/2- Everest applied 6/12

Pesticide Application Rates / acre:

5/22/09	Ambush	6 oz.
wind N 8-12 mph	Asana	6 oz.
	Malathion-5	1.5 pt.
6/2 wind NW 5-15 cldy 73F	Warrior with Zenon	2 oz.
blg 2-3" fox barley 2-4"	2,4-D amine+Express TotalSol	.15oz.+ .75 pt+2.5%N

6/12 Wind nnw 5-10 mph
69F 50% sun
Bluegrass 3-4 inches tall, late tillering to jointing
Broadleaf weeds 1-2 inches tall

Objective:

- 1)Examine crop tolerance of Everest and Beacon when applied at different times for grass weed control in bluegrass
- 2)Evaluate weed control of Everest and Beacon when applied at different times to bluegrass
- 3)2,4-D+Express+Malathion is known to cause injury when applied as a tank mix to bluegrass. Warrior and Asana are mixed with 2,4-D+Express to evaluate injury in this study comparing to Malathion

Table 14.

2009 Ryegrass stand evaluation- Magnusson Farms
Fall Seeded 'Quest' Perennial ryegrass 1.5 mi. west of Roseau

Stand* Density	Seed Yield (#/ac.)
73.3%	1066
55.6%	1048
39.4%	553

* % Stand as determined using grid frame method 6/4/09

Stand losses due to drowned out / winter kill

Plots not replicated

Objective:

- 1) Determine seed yield of somewhat naturally occurring stand densities of perennial ryegrass.
- 2) determine if stand of a given density is economical to maintain for harvest

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Table 15.

2008 Date of Seeding Trial- Arctic Green perennial ryegrass
Magnusson Research Farm- 2009 data and means of 2008-9 harvests

Seeding Date	2009				2008-2009 harvests*** Average of all treatments	
	Tilled**		Wheat stubble*		Yield (#/ac)	Dry matter (T/ac.)
	Yield (#/ac)	Dry matter (T/ac.)	Yield (#/ac)	Dry matter (T/ac.)		
8/25/2008	736	1.81	1405	2.96	1314	2.70
9/1/2008	599	1.61	1135	2.71	1281	2.76
9/9/2008	545	1.07	714	2.05	953	2.00
9/17/2008	173	0.71	466	1.27	665	1.43
9/22/2008	67	0.92	377	1.08	365	0.95
LSD @5%	444	1.10	444	1.10	320	0.78

* Ryegrass seeded into wheat stubble after harvest

** Ryegrass seeded into bare ground without cover

***Mean of 2007&2008 seedings in tilled and wheat stubble planting
2007 seeding dates similar to 2008 dates listed

Objective:

Determine seed yield and dry matter effects of fall planting dates
of perennial ryegrass when planted into grain stubble and tilled ground

Table 16.

2009 Top Dressing of Nitrogen Fertilizer on 'Arctic Green'
Perennial ryegrass at 2 on farm locations in the Roseau and Lake of the Woods area

Application Date	Seed Yield (#/Ac.)			Harvest data		Magnusson Color**
	Magnusson	Tveit	Mean of 2 locations	2 location mean Height(in.)	Lodging*	
1) 5/14/2009	1006	540	773	23.8	1.8	3.8
2) 5/30/2009	1117	609	863	25.4	4.9	6.0
3) no spring added	562	306	434	21.0	1.1	3.0
4) 6/11/2009	865	462	664	24.5	4.0	7.3
5) 6/25/2009	807	475	641	23.9	2.6	7.3
6) 7/9/2009	928	448	688	23.0	1.8	6.3
7) 5/14+6/17	1204	756	980	25.3	3.5	5.5
LSD @5%	150	80	102	1.2	0.9	0.6

* Lodging-1=none;9=flat

**Color 8/10/09- 1=light green;9=dark green

Tveit location is in the Lake of the Woods area north of Roosevelt.

The ryegrass was fall seeded into wheat stubble 9/08.

50# of nitrogen was applied in late November of 2008.

60# of additional nitrogen was applied on listed application dates.

Treatment #7 also had 60# additional N in 2- 30# increments on listed dates.

Magnusson location is near Roseau just north of the county fair grounds.

The ryegrass was fall seeded into wheat stubble 9/08.

No fall application of fertilizer done.

Treatment 1 had 60# nitrogen applied 5/14/09 and 40# applied 5/30/09

Treatment 7 had 30# N applied 5/14,40# N applied 5/30 and 30# N applied 6/17

All other treatments had 100# nitrogen applied on listed application dates

Objective:

Determine effect of spring nitrogen fertilizer application dates and rates on perennial ryegrass at 2 locations.

Table 17.

2008-9 Perennial Ryegrass Fertility Trial
 Spring planted Arctic Green under wheat- Magnusson Research Farm

	Additional* Fertilizer Rate:	Application timing	Seed Yield (#/Ac.)	Harvest	
				Lodging	Height(in.)
1	0	No added	646	1.0	20.8
2	60+0+0	Fall	1046	2.0	22.8
3	100+0+0	Fall	1291	3.3	23.5
4	100+0+0+22s	Fall	1271	2.0	22.8
5	140+0+0	Fall	1369	1.5	24.5
7	60+0+0	Split**	1222	1.5	23.5
8	100+0+0	Split**	1414	3.5	25.5
9	100+0+0+22s	Split**	1300	2.5	24.0
10	140+0+0	Split**	1258	4.0	24.8
12	60+0+0	Spring	1220	1.8	22.5
13	100+0+0	Spring	1514	3.3	24.8
14	100+0+0+22s	Spring	1405	3.0	23.8
15	140+0+0	Spring	1608	3.0	24.3
LSD @5%			201	1.5	2.1

Treatment Means:

Application timing(all rates)	Seed Yield(#/Ac.)
Fall	1244
Split	1299
Spring	1437

Added N amount(all dates)

60#	1163
100#	1406
100# +AMS	1325
140#	1412

*All plots received 6+30+40 10/19/08

** Split=applied 1/2 in fall and 1/2 spring

Fall fertilizer applied 10/19/08

Spring fertilizer applications applied 5/23/09

Experimental Design: RCB with 4 reps

Management - 2,4-D +Banvel /Assurell/ 1xapplication of Quilt
 at standard time and application rates

Soil test results: PH 7.9

10/8/2009 OM 2%

phosphorous(P2O5) 10#/ac.

potassium(K2O) 310#/ac.

sulfur 14#/ac.

Objective:

Determine optimum timing and fertility level for spring planted
 perennial ryegrass

Table 18.

2008-9 Nortron Applications to 'Arctic Green' Perennial Ryegrass
Magnusson Research Farm

Treatments**:	Rate	Timing	Seed yield (#/ac) Harvest ht.		Weed control	
					Foxtail barley	Slough grass
1 Nortron	1 pt.	9/5/2008	1219	28.7	50	30
2 Nortron	2 pt.	9/5/2008	1288	29.7	87	73
3 Nortron	4 pt.	9/5/2008	1356	27.7	100	100
4 Nortron	1 pt.	10/17/2008	1002	26.7	27	17
5 Nortron	2 pt.	10/17/2008	1047	25.7	67	73
6 Nortron	4 pt.	10/17/2008	960	26.7	100	73
7 Nortron	1 pt.	5/20/2009	1073	26.0	0	10
8 Nortron	2 pt.	5/20/2009	1050	25.3	67	57
9 Nortron	4 pt.	5/20/2009	1145	26.3	97	77
10 Prowl H2O	2.5 pt.	10/17/2008	942	26.7	0	0
11 No Treatment			847	26.3	0	0
12 Prowl H2O	2.5 pt.	5/20/2009	972	27.3	7	0
13 2pt.Norton+2,4-D Ester		5/20/2009	1123	26.0	80	50
14 2pt.Nortron+2,4-D+Banvel		5/30/09	957	25.3	73	40
15* Assure II / 2,4-D+Banvel		5/30+6/20	993	24.7	100	100
16* Fusilade / 2,4-D+Banvel		5/30+6/20	877	24.7	100	100
LSD @5%			310	2.6	24	34

9/1/08-Ryegrass seeded into wheat stubble
 9/5/08 treatments- wheat beginning to emerge
 overcast 60F wind N 5mph moist topsoil
 10/17/08 treatments- volunteer wheat 5"-8" ryegrass 1"-2"
 11:00am 50F wind 0-5mph topsoil moist
 10/18/08 fertilized 60+16+24+9s
 5/15/09 fertilized 40+0+0
 5/20/09 NW wind 5-15 56F ptcldy- few weeds emerged
 Ryegrass vegetative 3" tall
 5/30/2009 about 1 node on main stem

*6/20/09 Treatments 15 & 16 - 2,4-D+Banvel
 Ryegrass in late boot to early heading
 **No post emergent broadleaf weed applications to treatments 1-12

Trade Name	common name #ai/gal	Rate/additive
Nortron SC	ethofumesate 1#	1-4 pts.
Prowl H2O	pendamethalin 3.8#	2.5pt.
Assure II	quizalofop .88#	10oz.+ .25%NIS
Fusilade DX	fluazifop 2#	12 oz. + 1%COG
2,4-D LV4	2,4-D 3.8#	.75pt.
2,4-D Amine	2,4-D 3.8#	.75pt.
Banvel	dicamba 4#	.75pt.

Objective:

Determine effect of Nortron applied to perennial ryegrass at different times and rates.

Table 19.

2009 Pesticide Applications to Arctic Green Perennial Ryegrass
Magnusson Farm- Fall seeding just north of Roseau county fairgrounds

Treatment#	Treatment	Rate	Date	Seed Yield (#/ac.)	At Harvest	
					Ht.(in.)	Lodging*
1	Fusilade DX+Banvel+2,4-D LV4		6/26/2009	937	28.7	6.3
2	Assure II / 2,4-D + Banvel		6/3+6/21	1002	29.3	7.0
3	Assure II / 2,4-D + Banvel		6/19+6/21	870	28.0	2.3
4	2,4-D + Banvel / Assure II		6/19+6/26	1038	29.3	6.0
5	Assure II+Banvel+2,4-D LV4		6/26/2009	1047	28.3	7.7
6	Assure II+Banvel+2,4-D		6/19/2009	954	29.0	5.0
7	No Treatment			853	29.3	7.0
8	Fusilade DX / 2,4-D+Banvel		6/19+6/21	1133	29.0	7.0
9	Fusilade DX / 2,4-D+Banvel		6/19+6/21	1118	28.3	7.3
10	2,4-D+Banvel / Fusilade DX / Fusilade DX		6/19+6/21+6/26	1056	25.3	6.7
12	Assure II / 2,4-D+Banvel / Assure II		6/3+6/21+6/26	1097	29.0	5.7
13	Assure II+ Apogee / 2,4-D+Banvel		6/19+6/21	937	25.3	1.3
14	2,4-D+Banvel / Apogee		6/21+6/26	1228	24.7	2.0
15	Assurell / Huskie	13.5 oz.	6/19+6/21	937	27.0	3.3
16	Assurell / Huskie	27 oz.	6/19+6/21	901	28.0	5.3
17	Assurell / Rage D-tech + Banvel		6/19+6/21	960	28.0	5.0
18	Banvel+2,4-D		6/21/2009	1160	30.0	7.7
LSD @5%				256	2.1	1.8

*Lodging- 1=no lodging;9=flat

Plot design: RCB with 3 Reps

Plot size:10' x 30'

Harvest Date: 8/19/09

6/3 65FWNW 5-7 1 node stage

6/19 clear, 77 F, wind wnw 5-10 mph-Ryegrass late boot to early head

6/21 40% sun, 80F, wind se 5-15 mph- Ryegrass growth stage=late boot/early head

6/26 81F cldy wind 5-10mph- ryegrass headed

Assure II = 10 oz/A+.25%NIS

Apogee = 6 oz/A+.25%NIS+2.5% N

Banvel + 2, 4-D and ester(LV4) = 0.75 + 0.75 pint

Fusilade DX = 0.75 pint(+COC typically)

Rage D-Tech=1.5 pt+.25%NIS (carfentrazone+2,4-Dester)

Huskie= 13.5 oz. +2.5%AMS

Note-if broadleaf herbicide is applied first it is advised to wait at least 7 days to apply Assure II

Objective:

Determine effects of herbicide/growth regulator timing on perennial ryegrass yield

Table 20.

2009 Application Timing of Assure II to Perennial Ryegrass (Arctic Green)
Tveit Farm- Just south of Rocky Pt. Lake of the Woods area

Treatment#	Treatment	Date	Seed Yield (#/ac.)	At Harvest	
				Wild Oat control	Lodging*
1	Assure II / 2,4-D+Banvel	6/18+6/24	517	23	4.3
2	2,4-D+Banvel / Assure II	6/18+6/24	788	47	4.0
3	Assure II+2,4-D+Clarity	6/18/2009	702	30	6.0
4	Fusilade DX / 2,4-D+Banvel	6/18+6/24	785	92	4.0
5	2,4-D + Clarity	6/18/2009	880	0	8.0
6	No Treatment		541	0	8.0
15	Assure II / Huskie 13.5oz	6/12+6/18	993	18	7.0
16	Assure II / Huskie 27 oz	6/12+6/18	930	25	7.6
17	Assure II / 2,4-D + Clarity	6/12+6/18	952	20	7.0
	LSD @5%		299	29	2.0

Plot size:10' x 30'

6/12/09 vegetative growth stage 1-2 nodes

6/18/09 5:00 pm cldy 65F wind se 3-6mph ryegrass in boot stage

6/24/09 ryegrass in elongation/boot stage

* Lodging; 1=none,9=severe

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Table 21.

2009 Grass Weed Control in Fall Seeded 'Arctic Green'
Perennial Ryegrass Magnusson Research Farm

Treat#	Treatment	Rate/adjuvunct	Application Date	Seed Yield (#/Ac.)	%control Foxtail Barley	Ht.(in.) 3-Aug	Ht.(in.) harvest	Lodging** at harvest
2	Callisto	3 oz.+ .5%HCCOC+2.5%N	6/22/2009	916	23	26.3	24.3	3
3	Huskie/Assure II	13.5 oz/10oz.	6/18+6/22	636	100	24	22.7	1.7
4	Huskie/Assure II	27 oz./10oz.	6/18+6/22	678	100	24.3	23.3	1.7
5	Assure II	10 oz.+ .25%NIS	6/18/2009	657	100	24	22.7	1.7
6	Assure II + 2,4-D+Clarity	10oz.+ .75pt+.75pt	6/18/2009	818	80	25.3	23.7	2.3
7	Nortron	2 pt.	6/18/2009	874	27	27.3	24	4
8	Nortron	4 pt.	6/18/2009	868	33	26.7	24.7	2.3
9	Nortron+2,4-D+Clarity	2+.75pt+.75pt	6/18/2009	972	20	26.7	24.3	3.7
10	Callisto+2,4-D+Clarity	3 oz.+ .75pt+.75pt	6/22/2009	907	57	26.7	25	5.7
11	2,4-D+Clarity	.75pt+.75pt	6/22/2009	993	27	26.7	25.7	5.7
12	No Treatment			936	0	27.3	25.3	6
	LSD @5%			201	28	2.3	1.5	2.2

Experimental design: RCB with 3 reps

Plot size:10' x 30'

Heavy weed infestations and variable stands may have caused yield variations

*Laudis caused chlorosis and stunting of plants and seed heads

**Lodging;1=none,9=flat

6/18/2009 76F wind NW 5-10 clear

ryegrass 7"-11" in boot

6/22/2009 79F wind WNW 0-5 clear

ryegrass 8"-12" late boot/early heading

Harvest date-8/12

Product rates/adjuvuncts:

Assure II = 10 oz/A.+ .25%NIS

Banvel + 2, 4-D = 0.75 + 0.75 pint

Fusilade DX = 0.75 pint

Huskie =13.5 oz.+2.5%AMS

Huskie =27 oz. +2.5%AMS

Callisto 3 oz.+ .5%HCCOC+2.5%N

Laudis 3 oz.+ .5%HCCOC+2.5%N

Objective:

Determine effects on yield components of herbicides applied to perennial ryegrass

Table 22.

2009 Nortron Applications to Quest Perennial Ryegrass
Tveit Farm located North of Roosevelt

Treatment	Rate/adjuvunct		%white cockle control	%wild oat control	%foxtail barley control
Nortron	1 pt.	1	25	NA*	60
Nortron	2 pt.	2	33	68	65
Nortron	4 pt.	3	65	97	95
Nortron+2,4-D+Clarity	2 pt+.75pt+.75pt.	4	97	20	NA*
Nortron/2,4-D+Clarity	2/ .75+.75	5	83	30	NA*
Nortron+Huskie	2+13.5oz+2.5%N	6	NA*	NA*	NA*
2,4-D+Clarity	.75pt+.75pt	7	97	0	2
Nortron late 6/2/09	2 pt.	8	23	20	70
Laudis		9	55	0	0
No Treatment		10	0	0	0
Callisto		11	50	NA*	0

* Insufficient weed competition to rate.
Stands too variable for seed yield data and analysis.

5/19/09 applied all treatments (except treatment 8 and 2,4-D in treatment 5)
ese wind 5-10 52F ryegrass vegetative about 4" tall

6/2/09 All plots broadcast 2,4-D + Clarity
growth stage variable- 1-3 nodes

Trade Name	Common name-active ingredients	Active	Rate/adjuvuncts
Huskie	pyrasulfotole+bromoxynil	3.3%+26.3%	13.5 oz.+2.5%AMS
Banvel+2,4-D	dicamba+2,4-D	4#+3.8#	.75pt+.75pt
Callisto	mesotrione	4.0#	3 oz.+ .5%HCCOC+2.5%N
Laudis	tembotrione	3.5#	3 oz.+ .5%HCCOC+2.5%N
Nortron SC	ethofumesate	1.0#	1-4 pt.

Objective:

Determine weed control of herbicides applied to perennial ryegrass with high weed infestation

Table 23.

2009 Fungicides Applied to Spring Seeded 'Arctic Green'
 Perennial Ryegrass- Magnusson Research Farm -Roseau,Mn

Treatment	Rate	Application	Seed Yield (#/Ac.)	At Harvest	
				Color**	green tillers***
1 Quilt	10 oz.	7/7/2009	1207	5.7	5.7
2 Quilt+Quilt	8 oz. / 8 oz.	6/25+7/13	1133	5.7	5.3
3 Apogee/Quilt	6oz./10 oz.	6/24+7/7	1584	3.7	4.3
4 Apogee/Absolute	6oz./6 oz.+5% HC COC	6/24+7/7	1234	3.7	2.7
5 Apogee/Folicur	6 oz./5 oz.	6/24+7/7	1308	4.0	5.0
6 Apogee+Headline/ Tilt	6 oz.+4 oz./ 3 oz.	6/24+6/25+7/13	1180	4.0	5.0
7 No treatment			1109	3.7	5.3
8 Apogee 6oz.+Folicur 5 oz.		6/24/2009	1231	4.0	4.3
9 Apogee 6oz.+Quilt 10 oz.		6/24/2009	1332	4.3	4.0
10 Apogee 6 oz.		6/24/2009	1433	3.7	3.7
11 Apogee 6oz.+Quilt 8oz./ Tilt		6/24+6/25+7/13	1451	3.7	4.0
LSD @5%			361	1.6	2.3

Average of all treatments with Apogee application- **1344#/ac.**
 Average of fungicide only (treatments 1 and 2) **1171#/ac.**

Fertility: 6+30+40 applied 10/17/08
 80# N applied 6/11/09

Weed control:2,4-D+ Banvel and Assure II at standard time and application rate

6/24/09 Ryegrass Headed, 12 to 16 inches tall
 Clear, wind nw 5 mph 76F
 7/7/09 clear 78F ene 5-10mph fully headed
 7/13/09 late sequential fungicide treatments

Treatments	Common name/active ingredients	Application rate/adjuvunct
Apogee	prohexadione 27.5%	6 oz.+25%NIS+ 2.5%N
Quilt	propiconazole+azoxystrobin 1.04#+.62#	10 oz(8oz. Sequential)
Folicur	tebuconazole 3.6#	5 oz.
Absolute	tebuconazole+triflozystrobin2.18#+2.18#	6 oz.+5%HCCOC
Tilt	propiconazole 3.6#	3 oz.

Objective:

Determine effects of growth regulator and fungicides applied to spring seeded perennial ryegrass with late applications of fertilizer