

**PERENNIAL RYEGRASS SEED PRODUCTION RESEARCH  
ROSEAU/LAKE OF THE WOODS ,MINNESOTA- 2010**

Perennial Ryegrass Seed Production Meeting -Roseau December 15, 2010  
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**Table 1.**

2010 Perennial Ryegrass Stand Modification/Assessment Trial  
Magnusson Research Farm-Roseau,Mn  
Fall Seeded Variety Arctic Green into wheat stubble

Stand* Treatment (%squares w/plants)	Seed Yield (#/ac.)
15%	838
33%	1010
50%	1118
100%	1186
LSD @5% level	299

\* 1-2 remaining plants in each 6" x 7.5" grid square; all other plants hand pulled  
100% stand is natural solid stand in 7.5" rows  
4- 2.5' x 2.5' grids per plot established 4/9/2010. 3 replications  
Harvest Date- 7/29/10

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2009 Ryegrass stand evaluation- Richard Magnusson Farm  
Quest' Perennial ryegrass 1.5 mi. west of Roseau

Natural stand using grid frame

Stand	Seed Yield (#/ac.)
39%	553
56%	1048
73%	1066

**Table 2.**

2009 Planting Date/Seeding Rate of Fall Planted Perennial Ryegrass  
Magnusson Research Farm-Roseau,Mn.

Seeding Date	Seeding Rate	Seed Yield (#/ac.)	Maturity Date	Lodging 7/22/2010
13-Jul	5	1368	26-Jul	5.0
13-Jul	8	1371	25-Jul	3.7
27-Jul	5	1502	25-Jul	5.3
27-Jul	8	1481	26-Jul	5.0
11-Aug	5	1501	23-Jul	5.0
11-Aug	8	1472	23-Jul	6.7
27-Aug	5	1543	22-Jul	5.3
27-Aug	8	1475	22-Jul	6.7
3-Sep	5	1487	24-Jul	7.7
3-Sep	8	1478	25-Jul	8.0
10-Sep	5	833	27-Jul	4.0
10-Sep	8	764	26-Jul	4.3
17-Sep	5	1273	27-Jul	6.0
17-Sep	8	1299	27-Jul	7.0
24-Sep	5	630	2-Aug	1.0
24-Sep	8	821	1-Aug	1.3
LSD @5% level		326	2	2.1

seeding rate 5#/acre=Mean yield 1267#/ac.

seeding rate 8#/acre=Mean yield 1270#/ac.

Granite spring wheat planted @ 20#/ac. In all plots

Arctic Green Per.ryegrass seeded at 5# or 8#/ac.

57+31+40+8s to all 10/09

50+0+0 applied 4/23/10

Experimental Design: RCB with 3 reps

Plot size= 6' x 15'

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**Table 3.**

2009 'Arctic Green' Perennial Ryegrass Seeded at 3 Rates  
with 'Granite' Spring Wheat Cover \*

Seeding Rate (#/ac.)	Seed Yield (#/ac.)
3#	<b>1028</b>
5#	<b>970</b>
8#	<b>943</b>
LSD @5% level	<b>NS</b>

\* Granite spring wheat planted at 20#/ac.

into summer fallow black ground

Experimental design= RCB with 4 reps

Seeding Date- 9/14/2009

**Table 4.**

## 2009 Perennial Ryegrass Winter Hardiness Variety Trial

Variety	seed lot	Winter Injury*	
		St.Paul 4/20/2010	Roseau 4/24/2010
St.Paul ,Mn	seeded 9/14/09		
Roseau	seeded 9/3/09		
Affinity	3500	1	1
Arctic Green(MHT)	3900	1.1	1
Brightstar SLT	3661	1.3	1
FTM blue c1-09	3914	1	1
FTM red c1-08	3915	1	1
FTM white c1-09	3916	1.5	1
NK-200	3538	1.3	1
Quebec	3913	1	1
Ragnar II (P201)	3611	1	1
Ribeye(annual)	3689	5	3.8
Spreader III x P201	3910	1	1
Survivor	3848	1	1
WH x TQ(Polar Green)	3372	1	1
MSP comp. Watkins	3912	1.8	1
LSD @5% level		0.6	0.6

\*Winter Injury- 1=no injury;9=dead  
 Experimental design=RCB with 4 reps  
 Plots =1' x 20'

**Table 5 .**

Control of Overwintered Spring Wheat in Non-Assure Tolerant Perennial Ryegrass  
Magnusson Farm- Just southwest of Magnusson Research Farm-Roseau,Mn

Treatment	Adjuvunt	Yield* (#/ac.)	Crop** Injury	Wheat** Control	Ht.(in.)
<b>1</b> Callisto	3 oz.+COC	NH*	3	43	25
<b>2</b> 2,4-DE+Nortron	1pt+2pt	785	0	57	24.7
<b>3</b> Nortron	2 pt.	NH*	0	50	25
<b>4</b> Nortron	2pt.	NH*	0	43	25
<b>5</b> 2,4-D E+Nortron	.5pt+2pt.	NH*	3	43	24
<b>6</b> check*		633	0	0	25
<b>7</b> 2,4-D Ester+Callisto	.5 pt.+3oz.+MSO+28%N	871	0	83	24.3
<b>8</b> 2,4-D Ester+Callisto	.5pt.+3oz.+MSO	NH*	0	63	24.3
<b>9</b> Callisto	3 oz.+MSO+28%N	785	2	85	24
<b>10</b> Callisto	3oz.+MSO	657	0	27	23.7
<b>11</b> Callisto	5oz.+MSO	NH*	0	60	23.7
<b>12</b> Callisto	5oz.+MSO+28%	NH*	7	90	24
<b>13</b> Sharpen	2oz+MSO	654	13	47	23
<b>14</b> Sharpen	1oz+MSO	NH*	0	20	24
<b>15</b> Sharpen	1oz+NIS	NH*	0	20	24.3
		128	9	22	1.3

\* Harvested only selected plot treatments

\*\*Crop injury and wheat control- 6/19/10-- wheat in milk stage

treatments 1,2 &3 applied 4/11/10

temp 52f wind 5-10 nw

ryegrass 1/4"-1/2"

All other Treatments 4/23/10 9am

wind 5-12SW 50F ryegrass 3" wheat 7"

Plot size= 10' x 30'

Adjuvunt solution rates:

MSO=1%

COC= 1%

NIS=.25%

28%N=2.5%

**Table 6.**

2010 Fungicide Application to 'Arctic Green' Perennial Ryegrass

Locations=Dan Pieper - Lake of the Woods

Magnusson Research Farm

Treatment	Rate	2 Location			Pieper location only		
		Pieper	MagPlots	mean	Rust*	Color**	Lodging***
		Seed Yield (#/ac)			6/30/2010	7/21/2011	7/21/2010
1) Folicur ****	4 oz.	<b>663</b>	NA	NA	4	1.3	5.7
2)Folicur	4 oz.+ .25%NIS	<b>740</b>	1014	877	3.3	2.7	7
3)Tilt	4 oz.	<b>693</b>	880	787	3	2	5.3
4)Quilt	12oz.	<b>907</b>	1088	998	3	4.3	6.7
5)No Treatment		<b>226</b>	951	589	6	1	4
6)Absolute	6oz.+ .5%HCCOC	<b>1094</b>	1103	1099	2	6.3	4
LSD @5% level		<b>238</b>	202	167	1.6	0.9	NS

Location 1 = Dan Pieper Farm- Sandy Shores ,Lake of the Woods

Location 2= Magnusson Research Farm

\*Rust- 1=least;9=worst

\*\*Color- 1=green;9=brown - visual rating

\*\*\*Lodging-1=erect;9=flat

\*\*\*\* - Folicur with no adjuvant -Pieper only

Pieper Applications 6/22/10. Harvested 7/21/10  
 cldy wind 0-5 ese 65F Heavy pollen shedding

MagPlots Applications 6/24/10.

Harvest date 7/29/10- All plots severely lodged- no observed differences among treatments

Trade name	common name	Active (#/gal.)
Folicur	tebuconazole	3.6#
Tilt	propiconazole	3.6#
Quilt	propiconazole+azoxystrobin	1.04#+.62#
Absolute	tebuconazole+triflozystrobin	2.18#+2.18#

**Table 7.**

2010 Fungicide x Growth Regulator Applied to  
Arctic Green Perennial Ryegrass- Magnusson Research Farm

	Treatment	Rate	Application dates	Seed* Yield (#/ac.)	Lodging** at harvest
1	Quilt	12 oz.	6/29/2010	922	8.3
2	Quilt+Quilt	6 oz. + 6 oz.	6/4 + 6/22	856	8.0
3	Folicur	5 oz.	6/29/2010	931	8.0
4	Headline/ Tilt	4 oz. + 3 oz.	6/4 + 6/22	957	7.3
5	No treatment			845	8.3
6	Apogee /Folicur	6oz.+5oz.	6/4 + 6/29	1204	5.0
7	Apogee /Quilt	6oz.+12oz	6/4 + 6/29	1127	5.0
8	Apogee only no fungicide	6oz.	6/4/2010	1148	5.0
9	Apogee +Headline / Tilt	6oz+4oz/3oz	6/4 + 6/29	1100	5.0
10	Radiate /Quilt	2oz+12oz.	6/4 + 6/29	1002	8.3
11	Apogee /Quilt	6oz.+12oz.	6/14+ 6/29	1109	5.3
12	Apogee/Quilt	6oz.+12oz.	6/22+ 6/29	821	7.0
LSD @5% level				198	1.5

\*Mean of Apogee treatments= 1138#/ac.

Mean of Fungicide only treatments= 916#/ac.

\*\* Lodging;1=none,9=flat

6/4/2010 - ryegrass 12 to 16 inches tall, early heading

Temp 69F, Wind SW 5-15 mph

6/14/2010, ryegrass begin of shedding pollen

ryegrass 16-22" tall

Temp 68 F, wind 0 - 5 mph NE

6/22/2010,ryegrass light pollen shedding

ryegrass 20-24" tall

6/29/2010,ryegrass mostly pollenated-early milk stage filling

This date was the scout, rust application date

Harvest Date=7/28/10

Experimental Design= RCB with 3 reps

Treatments	Common name	Active	adjuvant
Apogee	prohexadione	27.5%DF	.25%NIS+ 2.5%N
Quilt	propiconazole+azoxystrobin	1.04#+.62#	
Folicur	tebuconazole	3.6#	.25%NIS
Absolute	tebuconazole+triflozostrobin	2.18#+2.18#	1%COG
Tilt	propiconazole	3.6#	
Headline	pyraclostrobin	2.09#	
Radiate	IBA+Cytokinetin	.85%+.15%	

**Table 8.**

2010 Late Apogee and Fungicide Applications  
Arctic Green Perennial Ryegrass- Magnusson Research farm

Treatment	Rate	Date	Seed Yield (#/ac.)	Lodging* at harvest
1 Apogee/Folicur	4 oz./5oz.	6/14+ 6/22	1029	5.3
2 Apogee/Folicur	6 oz./5oz.	6/14+ 6/22	776	3.7
3 Apogee/Folicur	8 oz./5oz.	6/14+ 6/22	928	2.7
4 No treatment			880	6.7
5 Apogee only	6 oz.	14-Jun	779	4.3
6 Folicur only	6 oz.	22-Jun	794	7.7
7 Apogee+Quilt	6+10	22-Jun	818	6.0
8 Apogee+Folicur	6+6	22-Jun	928	7.0
	LSD 5% level		NS	2.0

\* Lodging; 1=none, 9=flat

6/14/2010, ryegrass begin of shedding pollen  
ryegrass 16 to 22 inches tall  
Temp 68 F, wind 0 - 5 mph NE

6/22/2010, light Pollen shed  
Ryegrass 20-24 inches tall  
Temp 77 F, wind South 5-10 mph

Harvest Date=7/28/10  
Experimental Design= RCB with 3 reps







**Table 11.**

2009-10 Top Dress Fertility - Arctic Green Perennial Ryegrass  
Magnusson Research Farm

trt #	10/20/2009 Fertilizer	Urea source		Total # nitrogen spring+fall	Spring application timing	Seed Yield (#/ac.)	Lodging at harvest	Height	Harvest date
		Spring-N Application Rate	Liquid* foliar applications						
1	7+30+40	0		7	0	816	1.0	21.8	20-Jul
2	7+30+40	100#		107	10-May	1224	8.5	25.3	25-Jul
3	57+30+40	0		57	0	968	2.0	22	20-Jul
4	57+30+40	0		57	0	950	2.8	22	20-Jul
5	57+30+40	38#	4 x 3#	107	5/21/2010	1133	7.3	24.8	25-Jul
6	57+30+40	44#	2 x 3#	107	5/21/2010	1345	7.5	25.3	25-Jul
7	57+30+40	25#		82	5/10/2010	1133	2.5	23	21-Jul
8	57+30+40	50#		107	6/1/2010	1195	4.5	23	24-Jul
9	57+30+40	25#		82	6/1/2010	1099	3.8	23	21-Jul
10	57+30+40	50#		107	5/10/2010	1180	8.3	25.5	25-Jul
11	57+30+40	25#+25#		107	5/10+6/10	1218	7.5	25	25-Jul
12	57+30+40	50#		107	6/10/2010	1264	4.3	24.5	25-Jul
13	57+30+40	50#		107	6/22/2010	1162	2.3	23	23-Jul
14	57+30+40	25#+25#		107	5/10+6/10	1296	6.3	24.5	25-Jul
15	57+30+40	16+16+16		105	4/17+6/1+6/22	1247	7.3	25	25-Jul
16	57+30+40	16+16	1 x 15#	104	4/17+6/1+(6/22 liquid)	1291	6.3	24.8	25-Jul
17	57+30+40	47#+Npact	1 x 3#	107	5/10+(6/22 liquid)	1265	8.0	25.8	25-Jul
18	57+30+40	47#+BlackLabelZn	1 x 1#	105	5/10+(6/22 liquid)	1251	8.0	25.5	25-Jul
LSD @5% level						222	2.0	1.6	2

All plots received 7+31+40 10/14/09

Ryegrass fall seeded into wheat stubble

\* Liquid foliar applications:(# of applications x # nitrogen/application)

Treatment#

- 5 4 x 3# applications(28-0-0) timing=Broadleaf ,grass ,growth regulator,and fungicide
- 6 2 x 3# applications(28-0-0) timing=Broadleaf and fungicide
- 16 1 x 15# application(28-0-0) on 6/22
- 17 1 x 3# Nortrace N-Pact (26-0-0) on 6/22
- 18 1 x 1# N BlackLabel ZN (6-20-0-.77zn)on 6/22

**Table 12.**

2009-10 Fertility Source x Rate x Timing

Perennial Ryegrass v. 'Arctic Green' spring planting under wheat- Magnusson Research Farm

Fertilizer Rate:	Application timing*	Seed Yield (#/ac.)	Ht. at harvest
1 0	14-Oct	348	19.0
2 60+0+0	14-Oct	934	21.5
3 100+0+0	14-Oct	1135	24.0
4 50urea+50ESN	14-Oct	1148	23.3
5 100+0+0+22s	14-Oct	1175	23.5
6 140+0+0	14-Oct	1242	25.5
7 90urea+50ESN	14-Oct	1300	25.5
8 60+0+0	10/14+6/1**	789	22.0
9 100+0+0	10/14+6/1**	1135	23.0
10 (25+25ESN)+(25+25ESN)	10/14+6/1**	1086	22.3
11 100+0+0+22s	10/14+6/1**	1153	22.5
12 140+0+0	10/14+6/1**	1296	23.5
13 60+0+0	6-May	1110	23.5
14 100+0+0	6-May	1224	25.0
15 75+25ESN	6-May	1206	23.5
16 100+0+0+22s	6-May	1220	24.5
17 140+0+0	6-May	1371	24.8
18 60+0+0	10/14+4/14+6/1	1106	22.3
19 100+0+0	10/14+4/14+6/1	1231	25.5
20 (17+17ESN)+(17+17ESN)+33	10/14+4/14+6/1	1151	25.0
21 100+0+0+22s	10/14+4/14+6/1	1293	26.0
22 140+0+0	10/14+4/14+6/1	1331	25.8
LSD @5% level		155	1.5

All plots received 7+31+40 10/14/09

\*Split fertility rates applied equally between fall and spring dates

\*\* 6/1/10 applications later than scheduled

Fertilizer used:

7+30+40 11-52-0(MAP) & 0-0-60)

AMS 21-0-0-24

Urea 46-0-0

coated Urea(ESN) 44-0-0

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**Table 13.**

2009 Starter Fertilizer Applications to Late Planting of 'Arctic Green' Perennial Ryegrass

Seeded 9/20/2009

Fertilizer rate	Seed Yield (#/ac.)
1) 0	1324
2) 7+31+12	1002
3) 5+24+0	1084
4) 5+24+30	1074
LSD @5% level	NS

Ryegrass seeded in 3 -6" rows/ plot x 4 replications

2 rows of spring wheat seeded between plots