

Barenbrug Seeding Trial

RFR-A1036

Andrew Hoiberg, graduate student
Dave Minner, professor
Department of Horticulture

Introduction

Various proprietary seeding mixtures from Barenbrug, USA were examined to determine their effectiveness during both a spring and autumn establishment period under various levels of traffic. RPR perennial ryegrass (*Lolium perenne* L.), SOS annual ryegrass (*Lolium multiflorum* Lam.), and TurfBlue Kentucky bluegrass (*Poa pratensis* L.) were mixed at various ratios to examine how they performed under traffic stress. Also of interest was to determine if annual ryegrass and Kentucky bluegrass could be used as an alternating dominant species.

Materials and Methods

The two studies were conducted on a disturbed Nicollet soil (fine-loamy, mixed, mesic Aquic Hapludoll) with 43 ppm P (Bray 1), 83 ppm K, a pH of 6.8, and 4.0 percent organic matter at the Horticulture Research Station, Ames, IA. The spring trial was seeded on April 19, 2010 and the fall trial on September 9, 2010 by hand with premeasured bags provided by Barenbrug USA.

Traffic levels of zero, four, and eight passes wk^{-1} were striped across the replications in a north-south direction. During the seeding process, the seed was spread by hand over individual treatment plots and cleated-in with four passes of traffic over the entire study with a GA-SCW traffic simulator. For the spring study, plots were allowed a 10–14 day establishment period, followed by weekly traffic for the next 12 weeks. Spring traffic treatments started on May 3, 2010 and ceased

after traffic applied on July 19, 2010. Traffic totals were 48 passes for 4 passes wk^{-1} and 96 passes for 8 passes wk^{-1} . For the autumn study, plots were allowed a six-day establishment period, followed by weekly traffic for the next ten weeks. Autumn traffic treatments started on September 15, 2010 and ceased on November 15, 2010. Traffic totals were 40 passes for 4 passes wk^{-1} and 80 passes for 8 passes wk^{-1} .

Percent turfgrass cover was evaluated on seven dates for the spring study and five dates for the autumn study using Digital Image Analysis. Photos were taken with a standardized lightbox to prevent variation in photographic lighting conditions and to provide the most consistent data from date to date. Digital images were analyzed for percentage green cover with a specialized Turf evaluation macro in SigmaScan Pro 5 for Windows. Data were analyzed using PROC GLM of the SAS software, version 9.1.3 of the SAS system for Windows.

Results and Discussion

Main effect of treatment was significant for all sample dates except July 15, 2010. Traffic had a significant main effect on evaluations for all sample dates. It is likely that the attrition caused by excessive traffic was responsible for the lack of significance during the July 15 sampling date. After plots were allowed to recover, the effects of treatment were present again for the final sample date.

Through May 25, 2010, treatments 1 and 5 (SOS + RPR and SOS only) did not differ from one another and ranked as the top treatment for percentage turf cover. For a brief period on June 1, treatment 6 (RPR) joined the top rank of treatments. However, soon the effect of high temperatures showed and the Panterra annual ryegrass died, and plots

containing SOS ended the season ranked in the bottom for percentage cover. By the end of the evaluation period, treatments 6, 3, and 7 (RPR, RPR+TurfBlue, TurfBlue) contained the highest percentage cover. Treatments 3 and 7, however, were subject to weed infestation and this is likely what contributed to the anomalously high turf cover readings in these analyses. For all intents and purposes, treatment 6 was the most consistently performing and ended with the highest percentage turf cover for the spring establishment study. Due to the influence of summer temperature on the annual ryegrass, mixtures containing RPR are necessary to perpetuate turf cover during a spring and summer traffic season.

Main effect of treatment was significant during all sampling periods. Main effect of traffic was also significant for all sampling periods except the initial evaluation before traffic started.

Prior to traffic, on September 22, 2010, treatment 5 (SOS) was the quickest to establish and ranked 1 and differed from the remainder of treatments, followed by treatments 6 and 1 (RPR and RPR+SOS) that did not differ from each other and ranked

second and third, respectively. It is clear from these data that in order to establish any sort of significant cover prior to traffic, ryegrass needs to be included in mixtures. Any treatments containing TurfBlue (2, 3, 4, and 7) were consistently the bottom four performing mixtures. Treatment 7 (TurfBlue) was consistently in last place and by the end of the study; it differed from all other treatments.

After the initial sampling date, after traffic began, treatments 6, 5, and 1 (RPR, RPR+SOS, and SOS, respectively) did not differ significantly and were the top performing treatments with regard to percentage cover.

We will continue to monitor these plots starting again next spring to see if any bluegrass becomes established in any of the plots that contained it.

Acknowledgements

Thanks to Barenbrug, USA for their participation and funding of this research. Also thanks to Rob Eland and CJ Gaston for assistance in data collection, treatment application, and analysis.

Table 1. Mean percentage turfgrass cover for treatments sown April 19, 2010 over seven sampling dates.¹

Treatment	Turfgrass cover, %						
	May 17	May 21	May 25	Jun 1	Jun 30	Jul 15	Aug 18
1. SOS + RPR	52.2	63.2	55.8	80.6	35.4	28.4	15.9
2. SOS + TurfBlue	20.8	37.5	34.2	61.3	29.0	27.7	11.5
3. RPR + TurfBlue	8.6	21.4	19.7	43.6	31.5	29.8	23.8
4. SOS + RPR + TurfBlue	22.1	38.4	35.3	63.5	31.2	27.0	18.3
5. SOS	51.9	62.0	52.5	79.2	34.4	26.3	7.7
6. RPR	42.2	52.0	47.1	72.7	41.8	33.8	28.0
7. TurfBlue	3.2	10.7	9.3	24.5	25.7	31.7	22.1
LSD _{0.05}	4.6	7.4	6.3	9.1	6.8	NS	6.9

¹Means are averaged over three replications and three traffic levels. Means are separated by Fisher's least significant difference with an alpha level of 0.05.

Table 2. Mean percentage turfgrass cover for treatments sown September 9, 2010 over seven sampling dates.¹

Treatment	Turfgrass cover, %				
	Sep 22	Sep 30	Oct 11	Oct 28	Nov 15
1. SOS + RPR	34.1	69.7	71.4	53.7	41.7
2. SOS + TurfBlue	5.1	19.8	39.9	37.6	37.3
3. RPR + TurfBlue	3.3	12.7	31.5	35.9	36.1
4. SOS + RPR + TurfBlue	7.3	23.5	44.1	39.8	38.4
5. SOS	37.0	67.7	70.7	50.6	42.5
6. RPR	34.9	68.1	69.3	52.3	43.6
7. TurfBlue	2.8	7.3	16.8	24.0	22.9
LSD _{0.05}	1.4	6.4	4.9	4.9	3.5

¹Means are averaged over three replications and three traffic levels. Means are separated by Fisher's least significant difference with an alpha level of 0.05.