EFFECT OF VARIOUS NITROGEN SOURCES, ORGANIC AMENDMENTS, AND BIOLOGICAL CONTROL AGENTS ON TURFGRASS QUALITY AND DISEASE DEVELOPMENT, 1990

BENTGRASS (CREEPING) (A grostis palustris Penncross') Dollar spot; Sclerotinia homoeocarpa; Brown patch; Rhizoctonia solani

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This study was conducted at the Valentine Turfgrass Research Center, University Park, PA, on creeping bentgrass maintained under golf course greens management conditions at 0.16 inch cutting height. The test area was fertilized on 4 Apr with LESCO 32-3-10 at 3 lb. per 1000 sq ft. Individual plots, 3 ft x 15 ft, were arranged in a randomized complete block design with five replications. On 9 May and 1 Aug, three core samples were taken from each individual plot for pre- and post-treatment soil analysis and thatch measurement. The test area was core-cultivated on 15 May, and aerified holes were left open to facilitate movement of biological and organic amendments into the soil. The experimental area was inoculated on 11 Jun and 10 Jul by hand-scattering S. homoeocarpa-infected rye grain over the entire test area. Treatments were applied with a CO_2-powered boom sprayer, using T-jet 8004 nozzles, at 30 psi, in water equivalent to 2 gal per 1000 sq ft. Granular materials were hand-scattered from shaker-top jars. Applications were made on 5 Jun, 3 Jul, and 1 Aug, except as noted in the table. The checks and treatments without a fertilizer component were fertilized with 0.2 lb N per 1000 sq ft (urea/46-0-0) on 11 and 25 Jul and 9 Aug. Dollar spot and brown patch were visually evaluated on 17 Jul. Turfgrass quality was rated on 14 Aug. Data obtained were subjected to analysis of variance and Waller-Duncan K-ratio t test.

Excellent suppression of brown patch was obtained with Ringer Experimental 1, Ringer Experimental 2, **Sustane**, and ASC 66912. Ringer Experimental 1 and ASC 66912 provided suppression of dollar spot that was statistically different from the check, and not statistically different from the Dyrene standard. **Sustane** was not significantly different from Ringer Experimental, or ASC 66912 on Dollar Spot. Plots treated with Dyrene and ASC 66912 were rated highest in overall turf quality. Average thatch depth was unchanged (2.0 cm) during the May-Aug period of the experiment.

Treatment	Formulation	Rate/1000 sq ft	Disease Severity 17 July		Turfgrass Quality[3] 14 August	
			Dollar spot[1]	Brown Patch[2]		
KNO_3	13.7%N	0.73 lb	7.9 a[4]	4.8 abcd[4]	2.9	i[4]
Nitroform	38-0-0	5.26 lb[5]	6.7 ab	4.2 bcde	4.4	defgh
Soil Inoculant I	G	9.0 lb[5]	6.7 ab	5.0 abc	4.8	cdef
ASC 66899	G	6.6 lb	6.4 ab	3.8 de	4.6	cdefg
Urea	46%N	0.22 lb	6.3 abc	3.2 e	4.4	defgh
Kickstart	8-0-0	4.0 fl oz				
+ Turf Micro	0-5-0	1.0 fl oz				
+ Potassium	0-0-30	5.0 fl oz	6.3 abc	5.0 abc	3.3	hi
NH_4NO_3	33.5%N	0.3 lb	6.3 abc	5.0 abc	2.9	i
Karsten Rx	L	by precscription[7]	5.4 bcd	5.2 ab	2.8	i
Soil Inoculant I	G	6.0 lb[6]	5.4 bcd	5.4 a	4.2	efgh
Check	N/A	N/A	5.3 bcd	5.4 a	5.3	cde
Sustane	5-2-4	10.0 lb[8]	4.9 bcde	4.0 cde	4.1	fgh
$(NH_4)_2SO_4$	21%N	0.48 lb	4.7 bcde	5.8 a	3.6	ghi
Sustane	5-2-4	20.0 lb[8]	4.5 bcde	1.8 f	5.4	cd
Ringer EXP 2	G	10.0 lb[8]	4.5 bcde	1.6 f	4.9	cdef
NH_4Cl	26%N	0.38	4.1 cde	5.0 abc	3.9	fghi
ASC 66912	G	6.6 lb	3.3 de	1.8 f	6.9	b
Ringer EXP 1	G	10.0 lb[8]	2.9 ef	0.8 fg	5.7	c
Dyrene	4F	4.0 fl oz	0.6 f	0.3 g	8.6	a

[1]Number of infection centers per sq ft, mean of 5 replications.
[2]0-10 visual rating scale, where 0 = no disease, 5 = 50% infection, and 10 = complete infection of all grass in plot; mean of 5 replications.
[3]1-10 visual rating scale, where 1 = extremely poor quality turf and 10 = highest quality (no disease, excellent color, and high density).
[4]Within columns, means followed by the same letter are not significantly different, using Waller-Duncan K-ratio t test.
[5]Two applications (5 Jun and 1 Aug)
[6]One application (5 Jun)
[7]Application levels determined by bi-weekly foliar analyses.
[8]Treatments applied on a 28-day schedule (5 Jun, 3 Jul, 1Aug).