IMPACT OF PURELY PRO N AND VARIOUS NITROGEN RATES AND SOURCES ON TURFGRASS QUALITY, 2016.

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INTRODUCTION

Many cultural practices have been shown to have an effect on turfgrass quality, including nitrogen fertilization. Reducing fertilization inputs while maintaining turfgrass quality is one goal of current fertilization programs. The objective of this study was to evaluate the impact of a nitrogen enhancement product on the quality of golf course fairway turfgrass when used alone or in combination with various nitrogen sources and rates.

MATERIALS & METHODS

This one-year field study was initiated at the Valentine Turfgrass Research Center located in University Park, PA. Soil was a sandy loam with a pH of 7.2 and 2.3% organic matter. Turfgrass used for the fungicide evaluation was a 60/40 mixed stand of creeping bentgrass (*Agrostis stolonifera*)/annual bluegrass (*Poa annua*). The area was maintained as a golf course fairway and mowed three times per week to a height of 0.5 in. On 23 Sep 2015, 1.0 lb of N 1000 ft^{-2} was applied using granular fertilizer with 45% slow release nitrogen (The Andersons, Contec DG 24-0-17). Prior to the initiation of the trial, the area was preventatively sprayed with fungicides as well as fertilized with 0.1 lb N 1000 ft^{-2} on a 14-day rotation. All liquid treatments were applied with a CO_2 pressurized (40 psi) sprayer equipped with an air-induction flat fan nozzle (TeeJet, AI9504EVS) calibrated to deliver 1.0 gal of water 1000 ft^{-2}. Granular treatments were applied to individual plots using a shake container. Treatments initially were applied on 30 Jun and reapplied according to the application schedule. All treatments and application dates are listed in the data tables.

Figure 1. Nitrogen source and uptake enhancement study at the Joseph Valentine Research Center, 2016.

Plots measured 3 ft x 6 ft and were arranged in a randomized complete block design with four replications. Turfgrass quality and/or color were visually rated on a 1 to 9 scale where 1 = entire plot brown or dead and 9 = optimum greenness and/or density. All data were subjected to analysis of variance and means were separated at $P \leq 0.05$ according to Tukey's Protected least significant difference test.

RESULTS & DISCUSSION

Throughout the duration of the trial there were few agronomic differences among treatments (Tables 1 and 2). On 2 Aug, plots treated with Purely Pro N + urea (0.125 lb N) had significantly higher color (7.5) when compared to the nontreated control or plots treated with Purely Pro N (6.5) (Table 1). On 16 Aug, plots treated with Purely Pro N + urea (0.125 lb N) had significantly higher color ratings (7.8) when compared all other treatments (Table 1).

On the final rating date (16 Aug), plots treated with urea (0.125) + Purely Pro had the highest color rating among all treatments (7.8). Plots treated with Purely Pro alone had the lowest color rating (6.3) (Table 1). All other treatments had color ratings similar to the nontreated control. Unlike color, few differences in quality were observed in the study (Table 2).

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Table 1. Color on a creeping bentgrass and annual bluegrass fairway following the application of various fertilizer products, 2016.

			Color[z]				
	Treatment and rate	Application code[y]	27 Jun	5 Jul	19 Jul	2 Aug	16 Aug
1	Purely Pro 1.0 lb/a	AC	7.0 a[x]	7.3 a	7.5 a	7.5 a	7.8 a
	Urea 0.125 lb N/1000 ft^2	ABCD					
2	Purely Pro 1.0 lb/a	AC	7.0 a	7.0 a	7.3 a	7.0 ab	7.3 b
	Milorganite 0.25 lb N/1000 ft^2	AC					
3	Purely Pro 1.0 lb/a	AC	7.0 a	7.3 a	7.3 a	7.0 ab	7.3 b
	Urea 0.094 lb N/1000 ft^2	ABCD					
4	Purely Pro 1.0 lb/a	AC	7.0 a	7.0 a	7.0 a	7.0 ab	7.0 b
	Milorganite 0.188 lb N/1000 ft^2	AC					
5	Purely Pro 1.0 lb/a	AC	7.0 a	7.0 a	7.0 a	7.0 ab	7.0 b
	Urea 0.063 lb N/1000 ft^2	ABCD					
6	Purely Pro 1.0 lb/a	AC	7.0 a	7.0 a	6.8 a	7.0 ab	7.0 b
	Milorganite 0.125 lb N/1000 ft^2	AC					
7	Purely Pro 1.0 lb/a	AC	7.0 a	6.8 a	6.5 a	6.5 b	6.3 c
8	Urea 0.125 lb N/1000 ft^2	ABCD	7.0 a	7.0 a	7.0 a	7.0 ab	7.0 b
9	Milorganite 0.25 lb N/1000 ft^2	AC	7.0 a	7.0 a	7.0 a	7.0 ab	7.0 b
10	Urea 0.094 lb N/1000 ft^2	ABCD	7.0 a	7.0 a	7.0 a	7.0 ab	7.0 b
11	Milorganite 0.188 lb N/1000 ft^2	AC	7.0 a	6.8 a	7.0 a	6.8 ab	7.0 b
12	Urea 0.063 lb N/1000 ft^2	ABCD	7.0 a	6.8 a	6.5 a	7.0 ab	7.0 b
13	Milorganite 0.125 lb N/1000 ft^2	AC	7.0 a	6.8 a	6.8 a	6.8 ab	7.0 b
14	Nontreated	-	7.0 a	6.5 a	6.5 a	6.5 b	7.0 b

[z] Color was visually assessed on a 1 to 9 scale where 1 = entire plot brown and 9 = optimum greenness.

[y] Treatments were applied on the following dates: A = 30 Jun, B= 14 Jul, C = 28 Jul and D = 9 Aug.

[x] Means in a column followed by the same letter are not significantly different at $P \leq 0.05$ according to the Tukey's least significant difference test.

Table 2. Quality on a creeping bentgrass and annual bluegrass fairway following the application of various fertilizer products, 2016.

			Quality[z]				
	Treatment and rate	Application code[y]	27 Jun	5 Jul	19 Jul	2 Aug	16 Aug
1	Purely Pro 1.0 lb/a	AC	7.0 a[x]	7.0 a	7.3 a	7.3 a	7.5 a
	Urea 0.125 lb N/1000 ft^2	ABCD					
2	Purely Pro 1.0 lb/a	AC	7.0 a	7.0 a	7.3 a	7.3 a	7.3 a
	Milorganite 0.25 lb N/1000 ft^2	AC					
3	Purely Pro 1.0 lb/a	AC	7.0 a	7.0 a	7.0 a	7.0 a	7.3 a
	Urea 0.094 lb N/1000 ft^2	ABCD					
4	Purely Pro 1.0 lb/a	AC	7.0 a	7.0 a	7.0 a	7.0 a	7.0 ab
	Milorganite 0.188 lb N/1000 ft^2	AC					
5	Purely Pro 1.0 lb/a	AC	7.0 a	7.0 a	7.0 a	7.0 a	7.0 ab
	Urea 0.063 lb N/1000 ft^2	ABCD					
6	Purely Pro 1.0 lb/a	AC	7.0 a	7.0 a	7.0 a	7.0 a	7.0 ab
	Milorganite 0.125 lb N/1000 ft^2	AC					
7	Purely Pro 1.0 lb/a	AC	7.0 a	7.0 a	7.0 a	7.0 a	7.0 ab
8	Urea 0.125 lb N/1000 ft^2	ABCD	7.0 a	7.0 a	7.0 a	7.0 a	7.0 ab
9	Milorganite 0.25 lb N/1000 ft^2	AC	7.0 a	7.0 a	7.0 a	7.0 a	7.0 ab
10	Urea 0.094 lb N/1000 ft^2	ABCD	7.0 a	7.0 a	7.0 a	7.0 a	7.0 ab
11	Milorganite 0.188 lb N/1000 ft^2	AC	7.0 a	7.0 a	7.0 a	7.0 a	6.8 ab
12	Urea 0.063 lb N/1000 ft^2	ABCD	7.0 a	7.0 a	7.0 a	7.0 a	6.8 ab
13	Milorganite 0.125 lb N/1000 ft^2	AC	7.0 a	7.0 a	7.0 a	7.0 a	6.8 ab
14	Nontreated	-	7.0 a	7.0 a	7.0 a	7.0 a	6.3 b

[z] Quality was visually assessed on a 1 to 9 scale where 1 = entire plot brown and 9 = optimum uniformity and density.

[y] Treatments were applied on the following dates: A = 30 Jun, B= 14 Jul, C = 28 Jul and D = 9 Aug.

[x] Means in a column followed by the same letter are not significantly different at $P \leq 0.05$ according to the Tukey's least significant difference test.