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Influence of Fertilizer Source and Rate on Buffalograss Divot Recovery

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Influence of Fertilizer Source and Rate on Buffalograss Divot Recovery

Abstract

Application of quick-release nitrogen fertilizer increased buffalograss divot recovery. A quick-release fertilizer at 1 lb N/1,000 ft^2 resulted in 50% divot recovery 6.3 days quicker compared to the untreated control.

Keywords

turfgrass, fertilizer source, fertilizer rate, buffalograss, divot recovery, quick-release fertilizer

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Influence of Fertilizer Source and Rate on Buffalograss Divot Recovery

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Summary. Application of quick-release nitrogen fertilizer increased buffalograss divot recovery. A quick-release fertilizer at 1 lb N/1,000 ft^2 resulted in 50% divot recovery 6.3 days quicker compared to the untreated control.

Rationale. Buffalograss [*Buchloe dactyloides* (Nutt.) Engelm] is utilized as an acceptable turfgrass on golf courses due to its low input characteristics and its ability to survive under minimal irrigation. The slow growth of buffalograss creates concerns with recuperative capacity when damaged from normal golfing activities.

Objectives. Determine if nitrogen sources and application rates influence the divot recovery potential of 'Cody' buffalograss.

Study Description. Field studies were conducted at the Rocky Ford Turfgrass Research Center in Manhattan, Kansas, and the Council Grove Country Club in Council Grove, Kansas, from July through September 2014 on a 'Cody' buffalograss fairway (0.625 in. mowing height). Research study was a randomized complete block, with a 2 × 4 factorial treatment structure. Treatments consisted of two nitrogen fertilizer sources and four fertilizer application rates. Fertilizer sources were a quick-release 46-0-0 (N-P-K) urea and a slow-release 43-0-0 (N-P-K) 120-day controlled release polymer-coated urea. Fertilizers were applied at 0, 1, 2, and 3 lb N/1,000 ft^2. Quick-release nitrogen treatments were applied at two half-rate applications at one and four weeks after initiation. Slow-release treatments were applied once at trial initiation. Divots were made using a modified lawn edger (Figure 1). Divot recovery was visually rated weekly on a 0% to 100% scale. Data were subjected

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to an analysis of variance using the Proc Mixed procedure in SAS (SAS Institute Inc., Cary, North Carolina). Data were analyzed using a three-parameter sigmoidal regression model where parameter estimates equal 50% divot recovery.

Results. All treatments achieved 100% recovery by trial termination, although it was observed that the recovery rates were different. Nitrogen application rates of 1, 2, and 3 lb N/1,000 ft^2 (quick-release treatments) resulted in faster recovery rates than the control (Table 1). The 1 lb N/1,000 ft^2 treatment of the quick-release product resulted in the quickest recovery rate of all treatments, reaching 50% divot recovery 6.3 days faster when compared to the untreated area. Recovery of all slow-release nitrogen treatments was no different from the control (Figure 2). Applications of nitrogen also increased buffalograss color and quality (data not shown).

Table 1. Parameter estimates (± standard errors) from fitting Equation 1 to data for quick- and slow-release rates % recovery across all locations.[†]

Source	Rate	*a*[‡]	*b*	R_{50}	*Adj* R^2
--[§]	0lb N/1000ft^2	99.51 ± 3.12	1.17 ± 0.12	3.40 ± 0.14	0.85
Slow	1lb N/1000ft^2	97.42 ± 4.96	1.17 ± 0.18	3.82 ± 0.21	0.85
Slow	2lb N/1000ft^2	99.18 ± 4.41	1.08 ± 0.18	3.30 ± 0.19	0.83
Slow	3lb N/1000ft^2	99.91 ± 2.89	0.97 ± 0.12	3.17 ± 0.12	0.90
Quick	1lb N/1000ft^2	99.48 ± 2.42	0.91 ± 0.12	2.50 ± 0.11	0.89
Quick	2lb N/1000ft^2	98.09 ± 3.15	0.91 ± 0.14	2.98 ± 0.14	0.86
Quick	3lb N/1000ft^2	99.64 ± 3.01	0.94 ± 0.14	2.66 ± 0.14	0.86

[†] Sigmoid regression model defined by equation.
[‡] Abbreviations: *a*, maximum recovery; *b*, slope; R_{50}, weeks after injury to achieve 50% recovery; *Adj*, adjusted.
[§] During this field study two untreated plots (Slow 0 lb N/1,000 ft^2 and Quick 0 lb N/1000 ft^2) were used to attain a randomized complete block design, with a 2 × 4 factorial treatment structure. For the purpose of nonlinear regression analysis, data from the two control treatments were combined and treated as one treatment.

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Figure 1. Divots were made using a modified lawn edger. The standard edger blade was removed and replaced with 13, 7.25 in carbide tip circular saw blades 0.079 in. thick. The modified lawn edger created a standardized divot (5.5 in. × 2.125 in. × 0.125 in.) in each plot.

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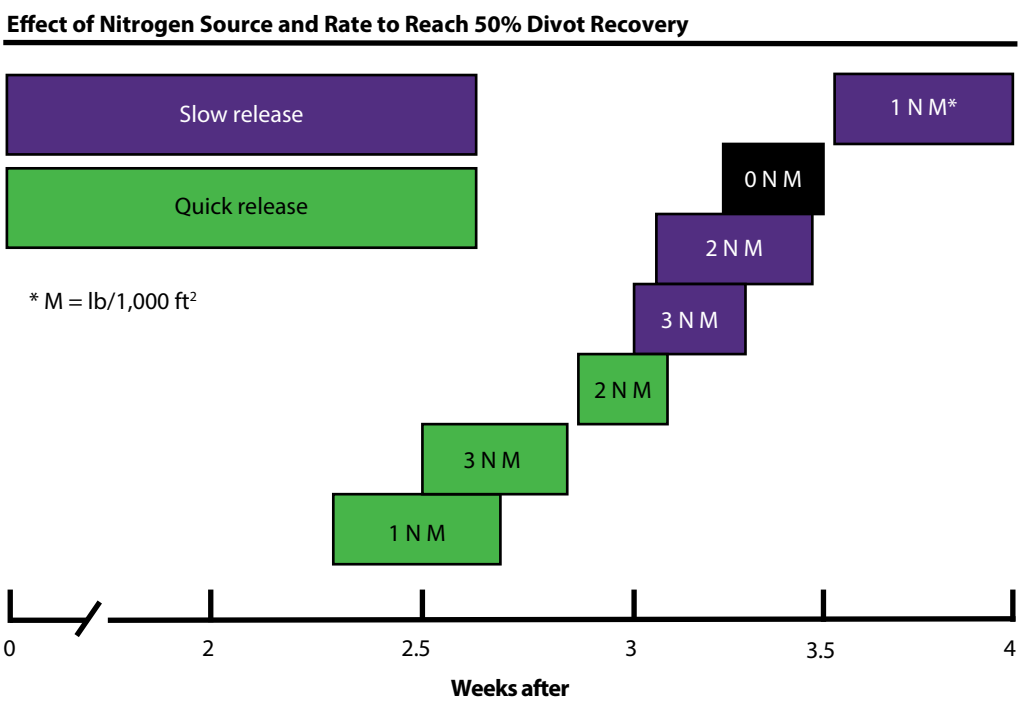

Figure 2. Data presented in this table are the nonlinear regression parameter estimates to reach 50% divot recovery ± the standard error. Treatments are determined to be statistically different if the standard error boxes do not overlap.

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