

Effect of Fluid Fertilization on Coastal Bermudagrass

I. Spacing Between Dribble Bands of Urea-Ammonium Nitrate

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Summary

Urea-ammonium nitrate (UAN) was dribble banded to Coastal bermudagrass in 10 × 20 foot plots at spacings of 7, 14, 21, and 28 inches between bands. Rates of nitrogen were 40, 80, and 120 lbs N/A prior to each flush of growth. Data from both 1984 and 1985 indicated that dry matter yields were equal for all dribble band spacings. Initially, the grass contacted by the fluid nitrogen turned yellow. New growth in the band area turned dark green, leaving the between band spaces with a nitrogen deficient pale green appearance. All evidence of streaking had disappeared by harvest time.

Introduction

Although the fluid fertilizer market is expanding nationwide, the use of these fertilizers is almost negligible on Coastal bermudagrass in the East Texas area. Fluid fertilizers offer alternative sources to the standard solid materials presently dominating the forage market. Apparently, fluids were tried as broadcast spray applications in the early 1960's, and fear of excessive loss of nitrogen by the application method turned the producer off on the use of fluid fertilizers. Results in this report are an evaluation of dribble banding fluid urea-ammonium nitrate (32 percent nitrogen) for Coastal bermudagrass production.

Procedure

Fluid urea-ammonium nitrate (UAN, 32-0-0) was applied to Coastal bermudagrass at dribble band spacings of 7, 14, 21, and 28 inches at N rates of 40, 80, and 120 lb N/A prior to each new growth of grass. Three N applications and harvests were made in 1984 and four in 1985. The N rates and band spacings were applied in a randomized complete block design. All treatments were replicated three times at each of two research locations. The soils were Gallime and Sawtown fine sandy loams. Initially, all plots received 100 lb P₂O₅ and 160 lb K₂O/A, followed by 200 lb K₂O/A in early October 1984. In mid-April 1985, 200 lb K₂O and 100 lb P₂O₅/A were applied to all plots. Harvests were made by cutting a swath 4.92 feet × 18 feet through the middle of each plot. A dry matter sample was collected from each plot for moisture and chemical analysis.

Results and Discussion

Response of Coastal bermudagrass to dribble band spacings of UAN on both soils is presented in Table 1. Total yields for 1984 and 1985 on both soils indicated no differences due to band spacings of 7 to 28 inches. This was evident even at the individual rates of nitrogen on both sites.

Apparently, Coastal bermudagrass stolons growing across the UAN band put roots into the fertilizer band area and continued growing across the non-fertilized soil. The new growth received nutrients which were translocated through the stolon from the roots growing in the fertilizer band.

Streaking was observed within a day following application, regardless of the band spacing. This occurred first as a yellowing of existing vegetation that was contacted by the UAN. New, dark green grass later defined the band and a pale green nitrogen deficiency existed in grass between bands. The grass outgrew this deficiency. The narrower the band spacing, the faster this occurred, until even the grass between the 28-inch bands was uniformly dark green 3 and 4 weeks following fertilizer application, when the grass was growing vigorously. The fertilizer band streaks remained until harvest if the grass was not vigorously growing due to a stress condition such as drought.

Nitrogen rates, averaged over all band spacings, indicated that Coastal bermudagrass yields continued to increase significantly up to the 80 and 120 lb/A levels, though not significantly at the 120 lb/A rate in all cases. The Gallime soil was much more productive than was the Sawtown soil. Band spacings at individual nitrogen rates had no differing effect on dry matter yield at either site for either year.

TABLE 1. RESPONSE OF COASTAL BERMUDAGRASS TO DRIBBLE BANDED RATES OF NITROGEN AS UAN APPLIED AT FOUR BAND SPACINGS AND THREE NITROGEN RATES AT TWO SITES

Band spacing inches	Dry Matter Yield ¹			
	Sawtown Soil		Gallime Soil	
	1984	1985	1984	1985
	Tons/Acre			
7	4.2 a	5.4 a	6.6 a	8.2 a
14	4.2 a	6.0 a	6.6 a	8.0 a
21	3.8 a	5.3 a	6.6 a	8.0 a
28	4.0 a	5.5 a	6.7 a	8.0 a
Nitrogen rates lb/A				
40	3.4 a	4.4 a	5.5 a	6.7 a
80	4.2 b	5.7 b	7.0 b	8.4 b
120	4.5 b	6.5 c	7.4 c	9.0 b

¹Dry matter yields within individual sets of data by site, year, band spacing, or nitrogen rate, followed by the same letter are not significantly different, statistically, at p < .05 level of probability.

KEYWORDS: Urea-ammonium nitrate/Coastal Bermudagrass/fluid fertilizer/dribble banded.