DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
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Effect of Nitrogen Sources and Rates on Dry Matter Yield of Hybrid Bermudagrass

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Introduction:

The effectiveness of different nitrogen fertilizer sources for summer forage production is often discussed. There is debate whether urea nitrogen is less effective than ammonium nitrate for bermudagrass production. Most research shows either no or small differences in forage yield between these sources, yet the belief persists that much of the N in urea will be lost during hot summer weather. Further, new additives are available that reduce N volatilization losses from urea potentially improving its effectiveness for summer forage production. This study was initiated to compare the forage yield response of hybrid bermudagrass to ammonium nitrate, urea, urea with two N loss preventative additives, and urea ammonium nitrate (UAN 32%) applied at three N rates.

Objective:

To compare different N sources and additives for N effectiveness on warm-season forage yield.

Materials and Methods:

Research site was a hay field of primarily hybrid (Tifton 44) bermudagrass mixed with common bermudagrass in White County (silt loam). Treatments were arranged as a randomized complete block design with four replications. Plot size was 6 x 20 feet.

Nitrogen sources were ammonium nitrate, urea, urea treated with NBPT, urea treated with ANVOL, and UAN (32% N). Each N source was applied at rates equivalent to 30, 60, and 90 lbs N per acre. A 0-N control was also included. All plots received P and K according to soil test recommendations in split applications after each harvest. Fertilizer was applied by hand except for liquid UAN which was applied with a backpack sprayer.

The first fertilizer treatments were applied on May 7. Subsequent fertilizer applications were made immediately after the harvest of first, second, and third cuttings. Plots were harvested in June, July, August, and October. The first three harvests were managed similarly to hay production. The fourth harvest was delayed until October to simulate stockpiled bermudagrass production.

Results:

Each site was harvested four times. Plots were clipped to a stubble height of approximately 3” Dry matter (DM) yield varied by harvest with the lowest yield observed during June . This was unexpected since this time period is often the most productive for bermudagrass. The low yield was likely due to hot temperatures and lower than normal rainfall. Armyworms were found during the summer but were kept largely under control by insecticide application.

Conclusion:

- Nitrogen sources were not significantly different for dry matter yield.(Table 1).
- Nitrogen rate did significantly influence yield with dry matter increasing with increasing N rate.
- The biggest DM increase per unit of N was from the 30 lb N per acre rate followed by the 60 lb N rate (Table 2).
- It should be noted that each nitrogen application received rainfall within 5 days after nitrogen application.

Table 1. Mean total dry matter yield of Tifton 44 bermudagrass fertilized with 5 different nitrogen sources. White County 2021 (n=4)

N Source	DM Yield (lbs/acre)*
Urea + ANVOL	9674 a
UAN	9266 a
Urea + NBPT	9265 a
Urea	9130 a
Ammonium Nitrate	8669 a

* Means followed by the same letter are not significantly different at p = 0.05

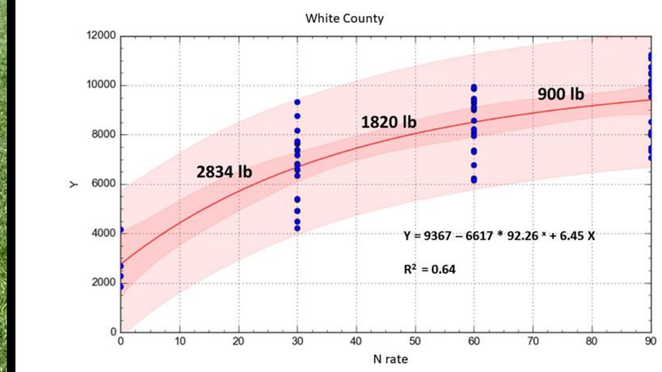

Table 2. Mean total dry matter yield of Tifton 44 bermudagrass fertilized at three N rates. White County 2021

N rate (lbs. N/acre)	DM Yield (lbs./acre)*
30	7342 a
60	9530 b
90	10730 c

* Means followed by the same letter are not significantly different at p = 0.05