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Hybrid Bermudagrass Fertilization for the Southeastern Piedmont

Why Does it matter?

Hybrid bermudagrass is a valuable perennial warm-season forage grown in improved pastures in the Southeast. Both 'Coastal' and 'Tifton 44' are cultivars that are adapted to the Southeastern Piedmont. Producers need guidelines for applications of nitrogen to effectively utilize the investment in these grasses and to prevent excessive application of nitrogen fertilizer, which is not only costly but can be a concern for water quality.

What was done?

A three-year grazing study was conducted by Agricultural Research Service Scientists from Watkinsville, GA, and Raleigh, NC to compare the productivity of 'Coastal' and 'Tifton 44' bermudagrass under grazing conditions at three rates of nitrogen fertilization (90, 180, and 270 lbs/acre; in 2 to 3 split applications). Pastures were stocked from approximately mid-May to the first week in September. Stocking was initiated and managed at about 3 to 5 inches to favor per animal performance and yet maintain adequate per acre performance based on the results of previous experiments. To explain the impact of increasing nitrogen fertility on per animal and per acre performance we also measured the weight of forage present, the chemical composition of the forage offered to the grazing animal, and the way in which the forages were chewed by the grazing animal.

What was found?

Averaged over nitrogen rates, animal performance was marginally better on 'Tifton 44' (1.39 lbs/animal/day) than with 'Coastal' (1.25 lbs/animal/day). However, the total gain per acre was similar for the two cultivars. The 'Tifton 44' was leafier, more digestible, provided more protein, and was less fibrous. However, these effects were not large and consequently only produced a response per animal without any cultivar response per unit land area. As nitrogen fertilization increased from 90 to 270 lbs per acre the total animal weight gain per acre increased from 646 to 958 lbs per acre and stocking rate increased from 4 to 5.5 steers per acre. The digestibility of the forage and the crude protein level also increased with nitrogen fertility.

What is the impact?

Producers must be good forage managers to realize the potential benefits of hybrid bermudagrass. Adding nitrogen fertilizer without harvesting the forage efficiently reduces system profitability. The response of animal weight produced to nitrogen fertilization was about 7 lbs of gain for every pound of nitrogen up to approximately 100 lbs of nitrogen fertilizer per acre. Above 100 lbs of nitrogen per acre the return drops off to approximately 3 to 4 lbs of gain per lb of nitrogen. If the purchase cost of nitrogen fertilizer is similar to the value of animal gain (as it is now) then even the return of 3 to 4 lbs of gain per lb of nitrogen at the highest rate of fertilization (270 lbs/acre) is an attractive return on investment. However, it is critical that the management of the grazing system must be adapted to efficiently harvest the increased production resulting from nitrogen applications. Supplemental feed or additional pasture must be provided to reduce animal demand for feed during periods of reduced growth so that the hybrid bermudagrass will respond with increased growth when drought or cool temperatures are no longer limiting.

Research Team and Contact information

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