Effect of Rate and Method of Applying Different Sources of Nitrogen upon the Yield and Chemical Composition of Bermuda Grass, Cynodon dactylon (L) Pers., Hay†

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Most cattlemen in the southeastern United States agree that producing winter feed is their number one problem. The winter feeds which they desire must be palatable and nutritious, must be dependable, and must be cheaper than the feeds now being used. Of the many summer growing crops that may be used for hay or silage, few seem to meet these requirements as well as Coastal Bermuda grass. The superiority of this hybrid developed at the Georgia Coastal Plain Experiment Station has been well established (6). The high yield potential, the consistent production from year to year, and the ability to grow over a wide range of soil and climatic conditions are important characteristics of this grass. Perhaps the feature that makes it best suited for hay production in the humid Southeast is the ease with which it may be cured. The writers know of no other adapted hay plant that can be cured so quickly and handled so easily.

The long summer growing season (225 to 275 frost free days) and the high rainfall (usually in excess of 30 inches) during this period make the Southeast an area with a high climatic potential for plant growth. Soil fertility is usually the first factor to limit the growth of plants in this region. Grasses capable of making sustained growth throughout the growing season can utilize large quantities of plant nutrients, particularly nitrogen.

The amount of nitrogen that a plant can efficiently use is dependent upon many factors including the yield potential of the plant in question. The fact that Coastal and several other Bermuda grass hybrids had produced more than twice as much forage as common Bermuda grass at moderate fertility levels suggested that they may use greater quantities of nitrogen than common Bermuda. The investigation reported here was designed to ascertain the nitrogen requirements of these hybrids.

REVIEW OF LITERATURE

The effect of nitrogen fertilization upon the chemical composition of grasses and pastures has been extensively investigated. Many workers, including most of those cited in this paper, have shown that applying nitrogen fertilizer to pure stands of grass has increased yields on most soils. Increased yields have been accompanied with increased protein in the herbage (1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13). Occasionally, when the nitrogen fertilization rate was low, little or no increase in protein percentage has been noted.

Split applications of N spread over the growing season have been suggested for obtaining a better seasonal distribution of growth (4, 6, 13), or for maintaining higher protein in the grass throughout the season (6, 9, 12). Robinson and Pierre (13) observed that the percentage of nitrogen decreased in a pasture (largely bluegrass) after splitting the nitrogen application four times.

McClure (11) found ammonium nitrate to be effective as nitrogen sources for bluegrass sod. Brown (3) reported that nitrate of soda was superior to ammonium nitrate in increasing the TDN in bluegrass pasture. Over a 5-year period they obtained an average recovery of 23% of the nitrogen applied to two bluegrass pastures in West Virginia. Other workers (9, 11, 12, 13) have obtained from 26 to 46% recovery.

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Materials and Methods

A 2-year old sod of Bermuda grass hybrid number 104 (similar to Coastal Bermuda) growing on a Tifton sandy loam was chosen for this study. Cropping and fertilizer practices...