

**EFFECT OF NITROGEN FERTILIZATION AND FORAGE
MATURITY ON THE NUTRITIVE VALUE OF BAHIAGRASS**

A Senior Scholars Thesis

by

NICOLE MARION KENNEY

Submitted to the Office of Undergraduate Research
Texas A&M University
in partial fulfillment of the requirements for the designation as

UNDERGRADUATE RESEARCH SCHOLAR

April 2010

Major: Animal Science

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Approved by:

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Associate Dean for Undergraduate Research:

Tryon A. Wickersham

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ABSTRACT

Effect of Nitrogen Fertilization and Forage Maturity on the Nutritive Value of Bahiagrass. (April 2010)

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Bahiagrass (*paspalum notatum*), a forage resource in the southern United States, often has lower forage quality than other forages, but may require fewer nutrient inputs. Our objectives were to determine the effects of N fertilization and maturity on nutritive value and yield of bahiagrass. Treatments were arranged as a 4×4 factorial with 4 levels of N fertilization (0, 45, 90, and 135 kg N/ha) and 4 maturities (3, 5, 7, and 9 wk after N fertilization). An established stand of Bahiagrass located in Brazos County, TX, was divided into 3 blocks with all treatment combinations contained in each block.

Increasing provision of N tended ($P = 0.06$) to quadratically increase in DM yield (3354, 4386, 4876, and 5182 kg DM/ha for 0, 45, 90, and 135 kg N, respectively). Advancing maturity increased DM yield quadratically ($P < 0.01$; 3206, 4580, 4894, and 5119 kg DM/ha for 3, 5, 7, and 9 wk, respectively). A maturity \times N interaction ($P = 0.02$) was observed for forage CP concentration. Increasing N resulted in more rapid declines in CP with advancing maturity. At 3 wk CP was 8.0% for 0 N and 11.6% for 135 N. At 9 wk the CP was 5.0% for 0 N and 6.6% for 135 N. In situ OM digestibilities were

determined on samples from wk 5, 7, and 9. A maturity by N interaction ($P = 0.03$) was observed for the rapidly degraded (A) fraction of OM. At 5 wk maturity the A fraction decreased with increasing N, whereas at 9 wk maturity the A fraction increased with increasing N. The B fraction was linearly reduced ($P < 0.01$) and the C fraction was linearly increased ($P < 0.01$) with advancing maturity. At a fixed passage rate of 3%/h, the calculated extent⁶ of OM degradation was 58.6, 54.9, and 53.4% for maturities 5, 7, and 9, respectively (linear, $P < 0.01$). Overall, additional fertility increased bahiagrass CP content, despite more rapid declines with advancing maturity, and maturity was the primary driver of bahiagrass degradability.

