Fertilization Management to Optimize Yield and Quality of Bana Grass

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ABSTRACT

Fertilizers containing nitrogen (N) : phosphorus (P) : potassium (K) ratios of 46:0:0, 16:20:0 and 16:12:8 were applied in combinations. Each fertilizer in both the first and the second application was provided at a rate of 75 kg ha^{-1}. The trial comprised 3 defoliation frequencies at 45, 55 and 65 d according to a randomized completed block design. Forage in four 1-m^2 areas in each plot was cut and weighed in the field. Crude protein content (P<0.05) and dry matter (DM) yield (P<0.01) of bana grass were greater with an application of fertilizer containing higher proportions of N. At only a 45 d defoliation frequency, leaf proportions (P<0.01) and the 48 h in sacco DM and neutral detergent fiber digestibility (P<0.05) were greater when the initial application of N:P:K was 16:12:8. Application of a fertilizer containing 16:12:8 10 d after cutting, followed by 46:0:0 20 d before harvesting at a 45 d defoliation frequency resulted in optimum DM yield and quality.

Keywords: Bana grass, Fertilization, Defoliation, Leaf ratio

INTRODUCTION

Growing forage with a high yield potential and good quality is important to overcome limited supply of roughage during annual drought and reduce the amounts of concentrate needed for cattle farming in the tropics. Cultivars of napier grass have been improved for yield and quality. They differ widely in terms of botanical fractions and nutritive value (Islam et al., 2003). Bana grass (*Pennisetum purpureum x Pennisetum glaucum*) is a hybrid cultivar that grows well on many soil types and is more persistent and drought resistant than napier grass (Pieterse and Rethman, 2002). It also has a high yield potential with high crude protein (CP) and digestibility (Gupta and Mhere, 1997). However, DM yield of napier grass is positively correlated with soil fertility (Bogdan, 1977) and rainfall (Pieterse and Rethman, 2002), and digestibility is negatively correlated with maturity (Chen et al., 2006).

The decline in yield with time after cutting is well documented in tropical pastures and is attributed mainly to the removal of nutrients through harvesting, and to a lesser extent also to the tie-up of the soil N (Robbins et al., 1986), P and