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The 21st International Grassland Congress / 8th International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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Beef cattle performance on *Panicum maximum* pastures under two levels of fertilization in Brazil

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Key words : guineagrass forage mass, savanna nutritive value, Oxisol

Introduction The low soil fertility is the most important limiting factor hampering the intensification of beef production in Savannah areas. According to Macedo (1995) the low base saturation and low P soil content are the two factors directly related to pastures productivity and its sustainability. After having these two deficiencies corrected the productivity is dependent on nitrogen fertilization. Thus, the objective of this work was to evaluate levels of fertilization on *Panicum maximum* pastures.

Materials and methods The experiment was carried out on an Oxisol at the National Beef Cattle Research Center, Campo Grande, Brazil, from October 2004 to May 2006. The experimental design was a randomized block design with subdivided plots with three replications. The main plots were formed by two levels of soil fertility: LFL to maintain fertility on 50% base saturation, 8 mg/L of phosphorus and 80 mg/L of potassium; HLF to maintain fertility on 70% base saturation, 12 mg/L of phosphorus and 100 mg/L of potassium. The subplots were formed by 150 (N150) and 300 (N300) kg/ha of nitrogen. Twelve modules, of *Panicum maximum* cv. Tanzania, measuring 1.125 ha each were utilized, and divided into six paddocks (0.188 ha). Each module was submitted to a rotational grazing characterized by pre-grazing condition of 70cm sward height and a post-grazing residue of 40 cm height, and was grazing by four yearling steers. Additional steers were allocated and removed from each paddock according to forage mass to assure the planned residues. Forage samples, before and after grazing, were taken. The animals were weighted at 28-day intervals. Data was analyzed according to GLM-SAS and averages were compared by the Tukey test.

Results There was no interaction involving the main effects ($P > 0.05$) for average daily gain (ADG), stocking rate (SR), liveweight gain (LWG) per area and all sward characteristics. The ADG and SR on LFL were similar to those observed on HLF pastures. However, the pastures that received N300 accumulated more forage with higher nutritive value than those which received N150 (Table 1). Consequently, N300 pastures sustained higher SR and the steers performed better, which resulted in greater productivity than those pastures with N150 (Table 2).

Table 1 Means for forage dry matter (DM), percentages of leaf blade (LB), stem (S), crude protein (CP) and *in vitro* organic matter digestibility (IVOMD).

Cultivars	N150	N300
DM (kg/ha)	4640 ^b	5210 ^a
LB(%)	69.8 ^a	70.0 ^a
S(%)	16.5 ^a	17.8 ^a
CP(%)	16.0 ^b	18.2 ^a
IVOMD(%)	68.0 ^b	70.6 ^a

Means followed by the same letter in the row are not different ($P < 0.05$), by the Tukey.

Table 2 Means for average daily gain (ADG), stocking rate (SR), gain per area (GA), rest period (RP) and grazing cycles (GC).

Cultivars	N150	N300
ADG(g/day)	685 ^b	770 ^a
SR(AU* /ha)	5.03 ^b	6.59 ^a
GA(kg/ha)	845 ^b	1264 ^b
RP(days)	30.1 ^b	24.9 ^a
GC(no.)	5.8 ^b	7.4 ^a

Means followed by the same letter in the row are not different ($P < 0.05$), by the Tukey.

* Animal unit

Conclusion After correcting soil fertility, assuring 50% of base saturation, 8 mg/L of P and 80 mg/l of K the guineagrass production is dependent on nitrogen fertilization.

Reference

MACEDO, M. C. M. (1995). Pastagens no ecossistema cerrados. In: SIMPÓSIO SOBRE PASTAGENS NOS ECOSISTEMAS BRASILEIROS: pesquisas para o desenvolvimento sustentável, 1995, Brasília. *Anais ... Brasília: SBZ*, p 28-62.