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Introduction

Nitrogen (N) is the most important nutrient for growth and development of pasture, giving the plant a faster growth rate and greater production (Roma *et al.* 2012). Despite proven effectiveness, there is restriction on its use by farmers due to high cost. On the other hand, the legume Estilozantes Campo Grande (*Stylosanthes* spp. (80% *S. capitata* + 20% *S. macrocephala*), capable of fixing nitrogen atmospheric has become a promising plant, as shown by the work of Ribeiro *et al.* (2011). However, there is still a lack of information about its use in association with grasses for animal production.

This study aims to evaluate livestock grazing in tanzânia grass (*Panicum maximum* Jacq cv. Tanzania-1) fertilized with nitrogen or grown with Estilozantes Campo Grande (Estilozantes CG).

Methods

The work was conducted in the northwest of Paraná, Brazil (22°50'16 "S latitude and 51°58'22" of longitude) with an altitude of 410 metres and Oxisol soil (Embrapa, 1999). The experimental design was blocks with split plots with three replications having as main treatments (plots): Tanzania + Estilozantes CG; Tanzania + 75; Tanzania + 150 and Tanzania + 225 kg N/ha. The swards were grazed continuously at variable stocking rates aiming to maintain the pasture at a height between 40 and 45 cm (residue). The animals used were Nellore (Zebu) with an initial average weight of 230 kg BW. In each paddock there were three test animals and additional regulator animals that were placed or removed depending on the height of the pasture, as the method "put and take" (Mott and Lucas 1952). Animal performance was assessed by average daily gain (ADG), estimated by the difference in weight of test animals at the beginning and end of the experiment, divided by the number of days in the pasture, with weighing every 28 days. Stocking rate (SR) was calculated from the average weight of the animals regulators, multiplied by the number of days remained in the pasture and divided by the number of days in the period, adding to the weight of the animal testers, estimated by quotient of live weight gain/ha, the animal unit (450 kg of LW = 1 Animal Unit

(AU)). The average production of dry matter (DM) of forage throughout the experimental period for tanzânia grass intercropped with Estilozantes (CG) and fertilized with 75, 150 and 225 kg of N was 3.350, 3.550, 3.730 and 4.160 kg of MS/ha, respectively. In spring, summer and fall average production was 3.890, 3.660 and 3.550 kg of DM/ha, respectively. Analysis of variance was performed with the aid of the Statistical Analysis System and Genetic/SAEG and the averages were submitted to Tukey test at 5% probability.

Results and Discussion

The pasture presented 13% of Estilozantes CG, in the total mass. There was no interaction between treatments and seasons for average daily gain (ADG) and stocking rate (SR) with a significant difference between treatments and between seasons (Table 1). The similarity in ADG between the consortium and the pastures fertilized with N may be related to animal consumption due to sward height between 40 to 45 cm with a good amount of leaves in the canopy, providing these gains. According to Almeida (2001), an increase in SR results in a decrease in the fraction of the green grassy available due to increased competition for the more nutritious forage, decreasing the chance of selection. Although pastures fertilized with higher doses of N, had greater SR due to increased forage production in response to nitrogen fertilizer (Roma *et al.* 2012), this did not affect ADG, because N promotes an increase in forage quality with growth digestibility and changes in the proportions tissue as reported in this study. The presence of Estilozantes CG, which presents a good nutritional value, may have caused this balance in ADG, with the other treatments.

Data of Embrapa (2010) show that with the fixation of N, Estilozantes CG presents 22% of CP content on leaves. The *in vitro* digestibility of organic material for legume varies from 55% to 70%. The larger SR and ADG in the spring compared to the summer was due to the presence of rain and temperatures conducive to plant growth and development, with a high leaf emergence and better quality forage. In autumn, due to changes in climate, there was less forage production and regrowth in turn reducing the SR and ADG.

Table 1. Animal performance on tanzania grass pasture intercropped with Estilozantes Campo Grande or fertilized with nitrogen, in the seasons

Seasons	Treatments				Mean
	Estilozantes	75 kg of N	150 kg of N	225 kg of N	
Average daily gain (ADG) (Kg animal/day)					
Spring	1.07±0.11	0.99±0.08	0.96±0.08	1.03±0.03	1.01±0.08 A
Summer	0.64±0.03	0.62±0.08	0.84±0.09	0.76±0.22	0.72±0.14 B
Autumn	0.46±0.12	0.44±0.16	0.48±0.09	0.52±0.05	0.48±0.10 C
Mean	0.72±0.28	0.69±0.26	0.76±0.23	0.77±0.25	
Stocking rate (SR) (A.U./ha)**					
Spring	2.31±0.11	3.45±1.01	3.75±0.81	4.62±0.18	3.5±1.03 A
Summer	1.78±0.12	2.07±0.05	2.95±0.37	4.43±0.85	2.8±1.15 B
Autumn	1.66±0.06	2.26±0.29	2.78±0.31	3.16±0.07	2.5±0.62 B
Mean	1.92±0.31 c	2.59±0.84 b	3.16±0.65 b	4.07±0.82 a	

Same letters, uppercase and lowercase letters in columns in rows do not differ by Tukey test ($P < 0.05$) * Standard deviation of the mean. ** Animal Unit per hectare.

Conclusions

The highest stocking rate was achieved at the highest dose evaluated (225 kg N), with intermediate values for the doses of 150 and 75 kg of N. The tanzânia grass intercropped with Estilozantes Campo Grande had the lowest value, but produced similar average daily gains to treatments containing nitrogen fertilizer.

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