

Mineral composition of *Brachiaria brizantha* cv. MG5 irrigated and non-irrigated subjected to grazing

Rita C R Carvalho^A, Wellington W Rocha^B, Bruno S Pires^A, Luziney D Silva^A, César T Piza^A, Paulo R V Leite^A and Eliel A Ferreira^A

^A Faculdades Integradas do Sudoeste Mineiro, Brazil www.fespmg.edu.br

^B Universidade Federal do Vales do Jequitinhonha e Mucuri, Brazil www.ufvjm.edu.br

Contact email: rita.carvalho@fespmg.edu.br

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Introduction

Brachiaria brizantha cv. MG5 is an important component of pastures in Brazil. Past studies (Corsi and Marta Jr. (1998), Maya (2003)) have shown significant pasture and animal production increases can be obtained through irrigation and associated grazing management. Such systems can significantly increase economic viability of production systems based on these pastures (Cedeño 2003). However, past studies have not measured possible differences in mineral composition of such pastures throughout the year with and without irrigation. Such differences, if present, may have implication for animal productivity.

This study had the objective of evaluating the mineral composition of *Brachiaria brizantha* cv. MG5 with and without irrigation in different times of the year.

Methods

The experiment was conducted at the Experimental Farm at FESP - Minas Gerais – Brazil. The study area was 4 ha divided into 32 paddocks of *Brachiaria brizantha* cv. MG5, seeds developed and provided by Matsuda. Two hectares

were irrigated by conventional sprinkler and the other two without irrigation. For the quantitative and qualitative forage evaluation, samples of each paddock grazing were collected before and after the entrance of animals with the help of a 1.0 m² quadrat launched randomly, cutting the forage to within 20 cm from the soil. These data were collected between Jun-August, 2011 (winter) and November 2011 – January, 2012 (summer).

The production of green mass (PGM) was recorded and the content of the total dry matter (TDM) was determined from the sampling. Samples were analyzed for P, K, Ca, Mg, S, B, Cu, Fe, Mn and Zn, and compared to treatments with or without irrigation at the animals' entrance in the paddocks. The data were analysed using the GENES program, (Cruz 2006).

Results

There were no statistical differences based on Scott and Knott test (1974) for macro and micro-minerals between the summer and winter times (Table 1), as well as with or without irrigation (Table 2). It was observed that the production of green and dry mass as well as its consumption

Table 1. Averages of macro and micro-minerals (P, K, Ca, Mg) and (S, B, Fe, Mn, and Zn) respectively in *Brachiaria brizantha* cv. MG5 in summer and winter. Means in columns followed by the same letter do not differ at $P < 0.05$.

Treatment	P	K	Ca	Mg	S	B	Cu	Fe	Mn	Zn
	g/kg					mg/kg				
winter	1.22a	14.11a	3.38a	2.32a	0.39a	13.67a	4.13a	284a	286a	24a
summer	1.18a	13.54a	3.16a	1.90a	0.35a	14.11a	3.97a	277a	267a	23a

Table 2. Averages of macro and micro-minerals (N, P, K, Ca, Mg) and (S, B, Cu, Fe, Mn, and Zn) Irrigated (I) and Non Irrigated (NI) for *Brachiaria brizantha* cv. MG5. Means in columns followed by the same letter do not differ at $P < 0.05$.

Treatment	P	K	Ca	Mg	S	B	Cu	Fe	Mn	Zn
	g/kg					mg/kg				
Irrigated	1.28a	14.69a	3.23a	2.11a	0.41a	14.01a	3.97a	283a	269a	24a
Non-irrigated	1.11b	12.96a	3.30a	2.11a	0.33a	13.77a	4.13a	278a	283a	24a

Table 3. Media of Dry Matter (DM), Production of Green Mass (PGM), consumption of Green Mass (CGM), Production of Dry Mass (PDM) and Consumption of Dry Mass (CDM) of *Brachiaria brizantha* cv. MG5, Irrigated (I) and Non Irrigated (NI) in winter (W) and summer. Means in columns followed by the same letter do not differ at $P < 0.05$.

Treatment	DM	PGM	CGM	PDM	CDM
	(%)	kg/ha			
Winter	33.0a	1917b	552b	591b	171b
Summer	33.7a	2605a	764a	806a	238a
Irrigation	33.6a	2371a	664a	740a	208a
Non-irrigation	33.0a	2153b	652a	657b	201a

were superior in the summer. It was also observed that, when the behavior of irrigated and non-irrigated pastures was analyzed, the production of green and dry mass were superior with irrigation, (Table 3).

Conclusion

The content of macro and micro-minerals did not differ with time or with the use of irrigation. Regarding the time of the year, the mass production in the summer was significantly greater than in the winter. When irrigation is used the mass production was significantly higher than in the absence of irrigation. Irrigation is a valuable management tool to increase the production of these pastures and as a consequence potentially increase animal production.

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