Seasonality of forage production of coastcross-1 with different sources and applications of phosphorus

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Introduction Brazil presents high potential for meat production from pastures. However, the feeding of ruminants depends on the conditions and the climate. Approximately 80% of the annual production of dry matter (DM) occurs in the period October to March (spring - summer). In the autumn and winter production is low associated with high humidity and low temperatures in the south and low rainfall in the tropical north. The situation is exacerbated by inadequate management practices and low soil fertility, particularly low levels of phosphorus (P). The objective of this experiment was to evaluate the seasonality of production of DM of coastcross-1 (*Cynodon dactylon*) with different sources and applications of P for two consecutive years.

Materials and methods The field experiment was conducted from August 2000 to October 2003 in an area of the Universidade Federal de Lavras, Lavras, Minas Gerais, Brazil at 21º14 ' S and 40º00 ' W, with an average altitude of 919 m, characterised by a climate Cwb, with two very defined seasons; a wet one, from October to March, and a dry one, from April to September. Mean temperature and precipitation are 19.4ºC and 1,526.7 mm, respectively (Brasil, 1992). The experimental design was a complete randomised block with split plots. The main plots received different sources of P [Triple superphosphate (TS); Reactive phosphate (RP), Arad, and Natural phosphate (NP), Araxa] and the subplots received different applications of P (0, 40, 80 and 120 kg/ha of P_2O_5). Dry matter production was measured for two consecutive years with cuts every 35 days in the wet season and one cut at the end of the dry season, after about 200 days of poor growth.

Results The DM production in the wet season increased linearly with increase in P application rate ($Y = 12.1 + 0.010X$; $R^2 = 0.74$; $p<0.01$). However, DM production in the dry season and total for the year were affected by the interaction between source and application rate of P ($p<0.01$) (Figure 1 a and b). There was a linear increase in DM production in the dry season for the plants fertilised with NP ($Y = 4.3 + 0.0067X$; $R^2 = 0.53$; $p<0.05$) whereas there were quadratic relationships with RP ($Y = 3.9 + 0.0346X - 0.00015X^2$; $R^2 = 0.71$; $p<0.05$) and TS ($Y = 4.1 - 0.020X + 0.0003X^2$; $R^2 = 0.99$; $p<0.001$). Annual DM production increased by 30.8 and 19.2 kg/ha for each kg of P_2O_5 supplied by RP ($Y = 16.2 + 0.031X$; $R^2 = 0.54$; $p<0.05$) and TS ($Y = 15.4 + 0.019X$; $R^2 = 0.92$; $p<0.001$), respectively. There was a quadratic relationship for NP ($Y = 16.0 + 0.062X - 0.00042X^2$; $R^2 = 0.99$; $p<0.001$). The maximum production of 18.25 t/ha was obtained with 73.9 kg/ha of P_2O_5 supplied by NP (Figure 1b). Averaged across treatments in the wet and dry seasons were 12.7 and 4.7 t/ha, representing 73% of the annual production in the wet season and 27% in the dry season.

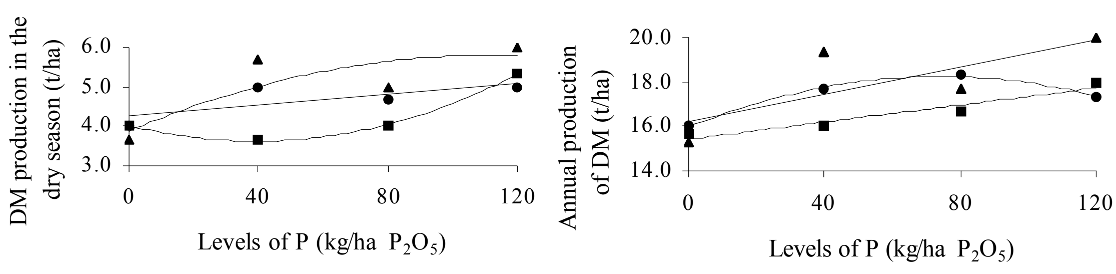

Figure 1 Dry matter production in the dry season (a) and the complete year (b) as a function of the sources [TS (■), RP (▲) and NP (●)] and application rates of P

Conclusions Phosphorus fertilisation increased DM production by coastcross-1 independent of the season and the reactive phosphate (Arad) gave higher production. Some 70-80% of the production occurred in the wet season.

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Reference

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