PRODUCTIVITY OF GRASSES IN A PASTURE IN THE CERRADO AREA OF THE "TRIANGULO MINEIRO"

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ABSTRACT
A grazing trial using guinea and coloniao (*Panicum maximum*), setaria (*Setaria sphacelata*), andropogon (*Andropogon gayanus*), and signalgrass (*Brachiaria decumbens*) was conducted during three grazing cycles: 1st cycle - Apr. 5, 1984 to Jul. 23, 1984; 2nd - Dec. 4, 1984 to Oct. 30, 1985 and 3rd - Jan. 16, 1986 to Jan. 15, 1987. It was also used with four stocking rates- T1= 0.8, T2= 1.0, T3= 1.2, and T4= 1.4 animal units/ha (AU/ha). In the 2nd period signalgrass was discarded because of poor condition of the pastures, and in the last grazing cycle only andropogon and setaria were used because the other grasses presented a very poor stand. LWG/ha varied from grass to grass, and according to the grazing period. Andropogon always allowed poor cattle performance. The other grasses did not present a great variation, except for the 1st period, which was a short period.

KEYWORDS
Beef cattle, grazing, coloniao, Guinea, setaria, andropogon, signalgrass, stocking rate

INTRODUCTION
Many tropical areas of the world are characterized by two distinctive seasons, a wet and a dry season. During the wet season, plants can usually grow vigorously and the production of forage can be very high. However, the quality of the forage produced is adequate only for a short period of time, due to a rapid rate of maturation which is characteristic of these plants. In the dry period, however, the growth of plants slows down or even ceases and the nutrition of the herd is generally very poor. Several research papers have shown an increase in beef production through the use of improved pastures (Escuder, 1981, Andrade, 1993, Fonseca *et al.*, 1988 and Fonseca and Escuder, 1983). One of the objectives of the producers in these areas should be the transference of part of the forage produced during the wet season through a management or forage conservation program so it can be used in the dry season. The objective of the experiment was to evaluate the potential of production of five forage grasses as related to stocking rate

METHODS
The experiment was conducted at "Fazenda Experimental Getulio Vargas" in Uberaba-MG, on an acrustox soil of low fertility and it was the continuation of the experiment reported by Andrade and Oliveira (1984) and Andrade (1993). The trial went from Apr. 5 1984 to Jan. 15 1987. The experimental period was subdivided into three periods: 1st - Apr. 5, 1984 to Jul. 23, 1984; 2nd - Dec.4, 1984 to Oct. 30, 1985; 3rd - Jan. 16, 1986 to Jan. 15, 1987. The grazing period from Apr. 5, 1984 to Jul. 23, 1984 was interrupted due to an occurrence of a wild fire. In November, '81 the pastures were fertilized with 300 kg/ha of superphosphate and 200 kg/ha of potassium chloride. Rainfall in the area is poorly distributed and the total reaches 1,500 mm, annually. Minimum and maximum temperature are 19° and 23°C, respectively. The experimental design was a randomized complete block with two replications, where the treatments studied were four stocking rates and the number of grasses varying within grazing cycles. In the grazing period from Apr. 5, 1984 to Jul. 23, 1984, the grasses utilized were guinea, coloniao, setaria, andropogon, and signalgrass. The stocking rates were: T1= 0.8; T2= 1.0; T3= 1.2; and T4= 1.4 animal units (AU) per hectare for all grazing cycles. Each AU represented an animal weighing 450 kg. Used in the experiment were zebu cattle, a cross between Nelore, Guzerá, Indubrasil, and Gir of good quality. The steers used were castrated, and grouped according to their liveweight, age, and external characteristics. They were kept in their paddock during each grazing period, and a new group was used as a substitute at the end of each grazing period. The animals were weighed at the beginning, and at the end after 14 hours fasting, and at 28 day interval without fasting. They were also weighed at 28 day interval without fasting. Animals were sprayed periodically for external parasites and drenched for helminth control. Mineral salts were offered permanently. In the period from Dec. 4, 1984 to Oct. 30, 1985 the grasses utilized were the same as in the first period, except for signalgrass that was in poor condition. In the period from Jan. 16, 1986 to Jan. 15, 1987 only the grasses setaria and Andropogon were utilized. The parameters studied were: liveweight gain, gain per hectare, pasture dry matter availability, and protein, calcium and phosphorus contents of grasses studied in each period. Forage grasses were sampled at about 3 month intervals, according to the method described by Campbell and Arnold, 1973 and were analyzed for dry matter, crude protein, calcium, and phosphorus. The area in each paddock was 1.25 ha and each one was grazed by at least 2 steers.

RESULTS AND DISCUSSION
On Apr. 5, 1984, 93 experimental steers were distributed in 40 pastures of 5 grasses (5 grasses, 4 stocking, and 2 replications). The initial LW of cattle placed in pastures of guinea, coloniao, andropogon, setaria, and signalgrass were 229, 215, 212, 215, and 217 kg/head, respectively. On Jul. 23, steers were taken out from their pastures weighing 257, 254, 217, 246, and 229 kg/head, respectively for the same grasses. The statistical analysis for this period showed an effect ($P<0,01$) for grasses, for parameters LWG/ha, and LWG/animal. There was no correlation effect for LWG and stocking rates. Table 1 presents LWG/head and per ha for the 108 day period. Andropogon was the grass with the smallest LWG and coloniao and setaria were the grasses with the highest LWG. For the period from Dec. 4, 1984 to Oct. 30, 1985 the animals weighed 217, 215, 214, and 215 kg/head for coloniao, guinea, setaria, and andropogon, respectively. On Oct. 30 their weights were 294, 302, 290, and 284 kg/head, respectively. There was no statistical difference for any of the sources of variation. The mean LWG/animal for each of the four grasses was: setaria 78.5, andropogon 67.4, Guinea 83.3, and coloniao 80.4 kg/head. The CV for the period was 36.12% and the LWG/ha for the same grasses were: 155.4, 137.3, 166.6, and 140.9 kg/ha. Andropogon was again the grass with the smallest LWG. The same results were found by EMBRAPA/CNPGC (1989), Kornelius (1985), and Andrade and Oliveira (1984). The regression analysis did not show any effect. For the last grazing cycle (Jan. 16, 1986 to Jan. 15, 1987), there was no effect ($P<0.01$) for forage grasses, for stocking rate nor their interaction, neither for LWG/animal nor per ha. The LWG\animal for andropogon was 124 kg and for setaria was 135.4 kg. LWG in this period was bigger than the one for the previous period. LWG/ha was 290.7 kg for andropogon and 319.7 kg for setaria, respectively. The CV was 25.7% for LWG/animal and 27.46% for LWG/ha. The lack of statistical differences was probably due to the small number of error degrees of freedom. Both setaria and andropogon pastures were in good condition in 1987. While the animals kept on setaria pastures presented a constant gain over the

year, the ones kept on andropogon lost weight during the dry season. The forage availability and the chemical composition from the samples taken in each pasture showed the following results: During the period (Apr. 5, 1984 to Jul. 3, 1984), the forage on each pasture was sampled only once, on Apr. 12, 1984, because of the wild fire on Jul. 23. CP levels were 9.7, 9.2, 7.8, 4.4, and 3.9% respectively for setaria, guinea, coloniao, signalgrass, and andropogon. The forage availability at that point was 11.9, 10.8, 9.3, 7.6, and 6.8t/ha for andropogon, setaria, guinea, coloniao, and signalgrass, respectively. Calcium and phosphorus content ranged from 0.56 to 0.91 and from 0.11 to 0.15%, respectively. For the period of Dec. 4, 1984 to Oct. 30, 1985 the DM content varied with sampling dates and the average for all grasses ranged from 23.6% on Dec. 12, 1984 to 72.2% on Oct. 23, 1985. There was a statistical effect ($P<0.01$) for grasses, sampling dates, and its interaction, as is usually the case (Andrade, 1993). CP also presented effect for grasses, for sampling dates, and for its interaction. The mean CP content ranged from 6.6% on Dec. 12, 1984 to 3.3% on Oct. 10, 1985. Average CP for guinea, coloniao, setaria, andropogon, and signalgrass was 6.3, 6.2, 4.2, 3.6, and 3.2%, respectively. The forage availability was also affected by grasses, stocking rate, sampling date, and for the interactions grasses Vs stocking rate, grasses Vs sampling date, and stocking rate Vs sampling date. Andropogon was the grass with the greater amount of forage availability (6.9t/ha) and setaria, Guinea, coloniao, and signalgrass followed with 5.2, 3.5, 3.0, and 2.3t/ha, respectively. In spite of the fact that andropogon and setaria presented the highest forage availability, they produced the lowest LWG/ha and per animal. For grazing period from Jan. 16, 1986 to Jan. 15, 1987 it was observed for the mean of five samplings, the effect of grasses for DM content ($P<0.01$) and for CP content ($P<0.05$). For the other parameters studied there was no effect. The grasses with the poorest nutritive value, based on CP content, were also the ones with the lowest LWG. In conclusion, it is possible to increase meat production from Cerrado areas, throughout cultivated pastures.

Table 1
LWG/animal and per ha for beef cattle grazing coloniao, guinea, andropogon, setaria, and signalgrass (108 days)

Grasses	LWG/animal	LWG/ha
Setaria	31.5a	76.7a
Andropogon	4.9c	12.4c
Guinea	28.3b	65.7b
Coloniao	39.5a	101.1a
Signalgrass	11.7c	29.1c
CV (%)	36.7	41.1

Mean of two replications and four stocking rates. Means followed by the same letter in the same column did not differ according to Duncan ($P<0.05$).

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