Herbage production of Tanzania grass (*Panicum maximum* cv. Tanzania) submitted to combinations of frequencies and intensities of grazing by cattle

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Introduction Animal production from pastures is a complex process comprising three main stages: herbage growth, consumption by grazing animals and conversion into animal products (Hodgson, 1990). Utilisation is the stage where the grazier finds greater flexibility for management, probably because most processes related to harvest of the produced herbage by the grazing animals are very responsive to manipulation and control of defoliation practices. The objective of this study was to evaluate herbage production of a *Panicum maximum* cv. Tanzania pasture submitted to combinations of frequencies and intensities of grazing.

Material and methods Treatments comprised six rotational grazing systems characterised by combinations of three grazing intervals (time interval after grazing for the grass canopy to reach 90, 95 or 100% of incident light - LI) and two post-grazing residues (25 and 50 cm). These were allocated to experimental units (2500 m^2) according to a complete randomised block design with three replications. Sward light interception was monitored during regrowth with a canopy analyser (AccuPAR Linear PAR / LAI ceptometer) and grazing was carried out by a variable number of 200 kg Nelore steers depending on the herbage mass available. Grazings lasted no longer than three days. Herbage accumulation was determined by cutting all herbage at ground level within six 1 m^2 quadrats, randomly located in each experimental unit. Cuts were taken pre and post-grazing. Herbage samples were hand-sorted into leaf, stem and dead material. The samples were then dried in an oven at 65 ^oC and weighed. Total and leaf herbage accumulation were calculated as the difference between successive post and pre-grazing herbage masses. The experimental period lasted 309 days, from 11 July, 2003 until 15 May, 2004.

Results Highest herbage accumulation was recorded for the 95% LI and 25 cm residue treatment. At 90% LI production was lower than at 95 and 100% LI, probably due to the smaller leaf area available for capturing all the incident radiation, limiting the growth process. Treatments with 100% LI had a higher proportion of dead material at grazing than the 90 and 95% LI (24.8 and 11.9%, respectively). Leaf lamina accumulation did not differ between the 90 and 95% LI, suggesting that the herbage accumulated in 90% LI was practically all leaf lamina. Treatments with 100% LI resulted in the lowest values of leaf lamina accumulation, with a higher proportion of stems compared to 90 and 95% LI (17.6 and 15.3%, respectively), particularly when associated with the 50 cm post-grazing residue (17%).

Table 1 Total herbage accumulation (kg DM/ha)

Residue	Light interception (%)			
cm	90	95	100	Mean
25	11740^{Ab} (770)	15120^{Aa} (770)	11620^{Ab} (770)	12830^{A} (444)
50	9440^{Bb} (770)	11940^{Ba} (770)	12710^{Aa} (770)	11360^{B} (444)
Mean	10590^{b} (544)	13530^{a} (544)	12170^{a} (544)	12100 (314)

Numbers within parentheses correspond to standard error of mean
Means followed by the same upper letter in columns are not different (P>0.10). Means followed by the same lower letter in lines are not different (P>0.10)

Table 2 Total leaf accumulation (kg DM/ha)

Residue	Light interception (%)			
cm	90	95	100	Mean
25	9000^{Ab} (392)	10600^{Aa} (392)	8030^{Ab} (392)	9210^{A} (226)
50	8360^{Aa} (352)	8060^{Ba} (392)	6750^{Bb} (392)	7720^{B} (226)
Média	8680^{a} (277)	9330^{a} (277)	7390^{b} (277)	8470 (160)

Numbers within parentheses correspond to standard error of mean
Means followed by the same upper letter in columns are not different (P>0.00). Means followed by the same lower letter in lines are not different (P>0.10)

Conclusions Herbage as well as leaf lamina accumulation in Tanzania grass under rotational grazing can be controlled by means of adjustments in grazing interval and intensity. Optimum regrowth interval was associated with the pre-grazing condition of 95% LI and grazing intensity with the post-grazing residue of 25 cm.

References

Hodgson, J. (1990). Grazing Management: Science into practice. New York: John Wiley & Sons, 203p