Tiller population density and sward stability of Brachiaria brizantha continuously stocked by cattle

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Introduction Tiller population density is one the most important parameters of sward structure and its evaluation is normally included in studies of sward dynamics. Moreover, a greater level of understanding is achieved when the survival of successive tiller generations is monitored. (Matthew *et al*., 2000). This would help to explain seasonal variation in tiller populations based on tiller appearance and death rates. While *Brachiaria brizantha c.v.* Marandu occupies up to 70 million hectares of cultivated grassland in Brazil, little is known of its ecophysiology. The objective of this work was to calculate survival probability of *B. brizantha* tillers and identify seasonal variation on sward stability.

Materials and methods Treatments corresponded to four sward surface heights (SSH) (10, 20, 30 and 40 cm), maintained by continuous stocking and variable stocking rate with cattle, and were assigned to experimental units (1200 m^2) according to a complete randomised block design, with four replications. Tillering dynamics were evaluated on 4 circular plastic frames (30 cm diam.) in each paddock. Initially all tillers inside the frames were counted and tagged with plastic rings. New counts and taggings were performed on a monthly basis using different colours. Tiller population density was evaluated separately in 0.25 m^2 quadrats. Survival probability was calculated as proposed by N.R. Sackville Hamilton (non published manuscript) (Bahmani *et al*., 2003).

Results Tall swards had consistently lower tiller populations (TP) than short ones, with highest and lowest values registered during summer (rainy season) and winter/early spring (dry season), respectively (Table 1). This decrease in TP with time of the year was relatively larger for the 10 cm swards, probably due to their greater susceptibility to shortage of rainfall at that time of the year. Despite the highest tiller population density during summer, the 10 cm swards had the lowest survival probability (Dec, Jan and Feb) (Figure 1), indicating that the high tiller appearance rates of those swards were not enough to compensate for the reduced survival of tillers. On the other hand, tall swards were relatively more stable than short swards throughout the experiment.

Table 1 Seasonal tiller population density (tillers/m^2) of *B. brizantha* swards continuously stocked by cattle

Season	Sward surface height (cm)				Mean	s.e.m.
	10	20	30	40		
Summer	1301	1178	1059	914	1113 ^{A}	22.3
Autumn	1081	1009	969	746	951 ^{B}	22.3
Winter	958	877	656	523	753 ^{D}	22.3
Early Spring	949	831	665	486	732 ^{D}	22.3
Late Spring	934	881	830	658	826 ^{C}	22.3
Mean	1069 ^{a}	978 ^{b}	865 ^{c}	692 ^{d}		
SEM	18.1	18.1	18.1	18.1		

Means followed by the same lower case letters in lines and upper case letters in columns are not different (P>0.10)

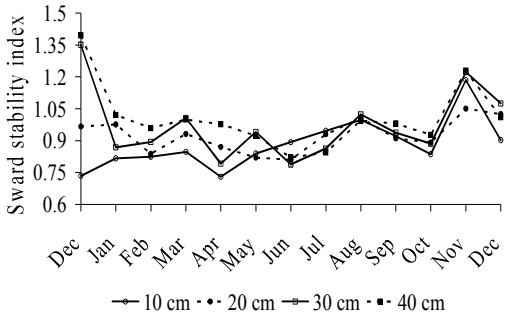

Figure 1 Tiller survival probability diagram

Conclusions Results of tiller population density need to be interpreted carefully, since stability is an important feature of population dynamics and resistance to grazing. *B. brizantha* should not be grazed shorter than 10 cm during summer.

References

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