MORPHOGENESIS OF BASAL AND AERIAL TILLERS OF ELEPHANT GRASS SUBJECTED TO STRATEGIES OF ROTATIONAL STOCKING MANAGEMENT

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INTRODUCTION

Growth and senescence are influenced by combinations between defoliation frequency and severity, which could have different impacts on basal and aerial tillers, specially for elephant grass.

OBJECTIVE

The objective of this experiment was to evaluate the effect of contrasting defoliation strategies on the morphogenetic responses of basal and aerial tillers of elephant grass (*Pennisetum purpureum* cv. Napier) under rotational stocking.

MATERIAL AND METHODS

→ January to March 2011, Piracicaba, SP, Brazil (22º43'S, 47º25'W and 580m a.s.l.).

→ Treatments: two pre- (95% and maximum canopy light interception – $IL_{95\%}$ and IL_{Max}) and two post-grazing (35 and 45 cm stubble height) targets, assigned to experimental units (800 m^2 paddocks) according to a 2x2 factorial arrangement and a complete randomised block design, with four replications.

→ Canopy light interception (A and B, 30 readings) was performed using a canopy analyser LAI 2000 (LI-COR, Lincoln, Nebraska, USA) and sward height (D, 80 readings) using a sward stick.

→ Leaf elongation (LER) and senescence rates (SER) of basal and aerial tillers were carried out every grazing cycle, which was divided up into thirds (initial, intermediate and final). 30 tillers (C) were tagged and monitored every five days.

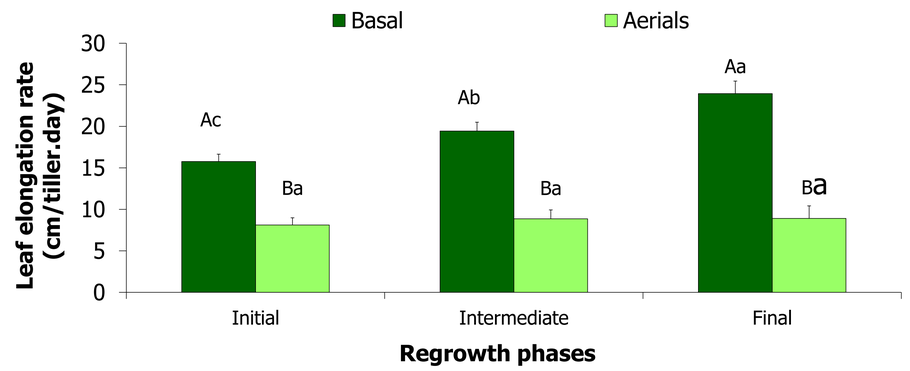
→ The average grazing interval was 17.4, 20.0, 26.2 and 29.0 days for treatments 95/45, 95/35, 100/45 and 100/35, respectively.

→ Data were analysed using the Mixed Procedure of SAS® (Statistical Analysis System).

Figure 1. Ligh interception (A and B), tiller measurement (C), sward height (D) and animals grazing (E)

RESULTS

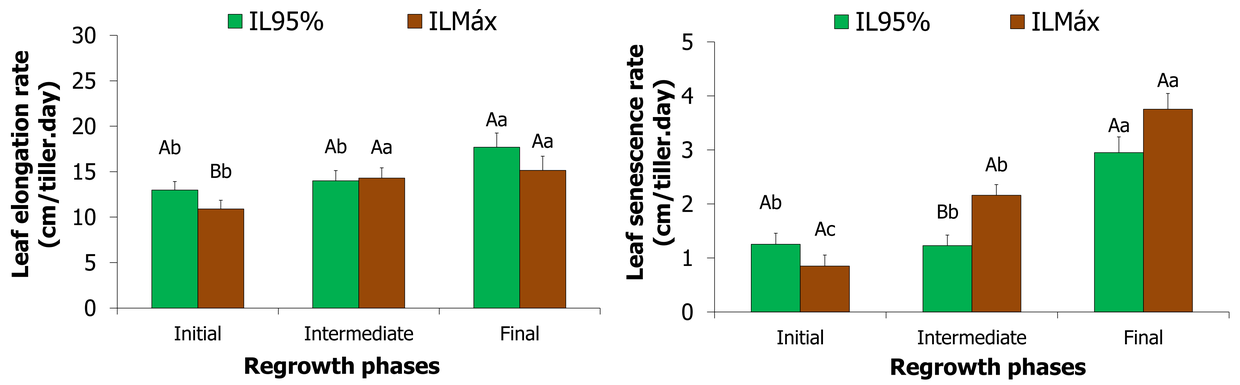
LER increased steadily on basal tillers throughout the regrowth period (Fig.2). On aerial tillers, LER remained stable, with lower values relative to basal tillers during the entire regrowth period. Basal tillers had larger SER than aerial tillers (2.23 and 1.83 cm/tiller.day; P<0.05).



Uppercase letters compare tillers category within regrowth phases
Lowercase letters compare regrowth phases within tillers category

Figure 2. Leaf elongation rate (cm/tiller.day) on initial (A), intermediate (B) and final (C) phases of regrowth in basal and aerial tillers of elephant grass subjected to strategies of rotational stocking management

Swards managed at $LI_{95\%}$ showed larger LER than those managed at LI_{max} during the initial third of regrowth (Fig.3). SER did not vary between initial and intermediate thirds of regrowth on swards managed at $LI_{95\%}$, with larger values recorded during the final third. On the other hand, there was a steady increase in SER on swards managed at LI_{max}. Differences between defoliation frequencies were observed only during the intermediate third of regrowth.



Uppercase letters compare sward targets within regrowth phases
Lowercase letters compare regrowth phases within sward targets

Figure 3. Leaf elongation and leaf senescence rates (cm/tiller.day) on phases of regrowth of elephant grass subjected to strategies of rotational stocking management

CONCLUSIONS

Basal tillers showed larger growth potential than aerial tillers, with defoliation frequency being a key feature in determining morphogenetic responses and growth of individual tillers. Overall, LER was larger on swards managed at $LI_{95\%}$, indicating that it corresponded to an adequate pre-grazing condition for maintaining sward leafiness and productivity of elephant grass subjected to rotational stocking management.