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Does High Impact Grazing Change Plant Species Composition or Diversity of Northern Argentinean Grasslands?

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Abstract

Rangelands of northern Argentina are core areas for livestock production but the seasonality of net primary productivity with a high accumulation of standing dead biomass is limiting the stocking rates of cattle. High impact grazing has been shown to be a promising management tool to reduce standing dead biomass as an alternative to the burning practice, however, effects on plant species composition and grassland diversity were not analysed so far.

A grazing experiment was established on the experimental station (INTA-Corrientes) on a 24 ha large grassland area, split into three paddocks with 12 plots and a control area without high impact grazing. Heavy impact grazing with 150 cattle ha^{-1} day^{-1}stocking rate was conducted in spatially confined paddocks and within different seasons of the year. To investigate the changes in botanical composition, we assessed species abundance and plant cover during the main growing season in February.

The analysis of biodiversity parameters showed no significant variation of species richness. The Shannon-Wiener diversity index (H) and Shannon's equitability (EH) were at the same level in the heavy impact grazing plots and the control, also the plant species composition did not change. Analysing the plant functional groups, we found a shift in the green biomass proportions towards C3 species. The proportion of mono- and dicotyledonous species did not change after a heavy impact grazing. Seasonal impact timing had no effects on plant species composition. The repeated bunch trampling by grazing cattle enhanced the growth of new patterns with more favoured C3 fodder plants (Poaceae species: *Leersia hexandra*, *Paspalum notatum*).

We conclude that intensive trampling and grazing disturbance does not change the composition of the existing flora of the grassland of Corrientes. A slight shift towards C3 plants might contribute to the cold season rangeland productivity. However, more detailed studies are needed to cover long term effects of high impact grazing disturbance and to analyse the species composition during the winter. High impact grazing seems to be a promising alternative to the extensively used burning practice and could therefore contribute to a sustainable management of northern Argentinean rangelands.

Keywords: Grassland management, intensive grazing, natural pasture

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