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High impact grazing enhances grass forage quality in Northern Argentina

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INTRODUCTION

Natural grasslands are the major feed source for livestock in the Province of Corrientes, northern Argentina. Traditional extensive management with low stocking rates favours the accumulation of low quality, grazing deterrent standing dead biomass.

- Biomass elimination with machines is impracticable due to waterlogged soils (Figure 1).
- Biomass burning has been out-lawed and farmers need alternatives to eliminate dead biomass and stimulate regrowth of nutritious grass.

Figure 1. High impact grazing in Corrientes, Argentina.

- High impact grazing (HIG): Large herds eliminate standing biomass by trampling and forage intake during short term high intensity grazing (Figure 1).
- The aim of this study was to evaluate the effects of HIG applied in different seasons on fodder quality.

RESULTS

Compared to control, HIG in winter produced more CP, 6.0 vs 4.9 (p=0.004); more ME, 5.2 vs 4.7 (p<0.0001) and more DOM, 40 vs 37 (p=0.0002). HIG in spring did not affect CP 5.6 vs 4.8 (p=0.0624); but increased ME, 5 vs 4.8 (p=0.0284) and DOM, 39 vs 37 (p=0.017). HIG in autumn increased CP, 6 vs 4.9 (p=0.0026); ME, 5.1 vs 4.7 (p=0.0003) and DOM 39.7 vs 37.2 (p=0.0021) (Figures 3, 4 and 5).

CONCLUSIONS

- **Timely managed HIG delivered increased fodder quality. Forage quality was enhanced during autumn, winter and spring after HIG.**
- **HIG in summer did not affect grass quality; nevertheless, it still could be favourable as it reduced the dead biomass pool.**
- **The positive effects lasted for up to 4 months, enough to improve fodder quality for livestock throughout the unfavourable winter.**
- **Further studies should assess the effects of repetitive HIG that could maintain these positive effects.**

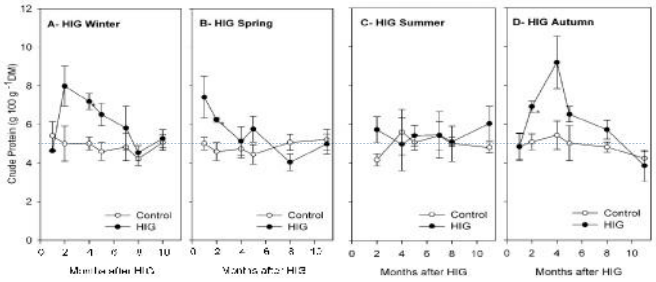

Figure 3. Crude protein (g 100 g^{-1} DM) of aboveground green biomass, after HIG applied in different seasons (error bars = s.e.). Slashed line indicates concentration of CP 5 g 100 g^{-1} DM, threshold for normal rumen fermentation (Crowder 1985; Golding 1985; McDowell 1985).

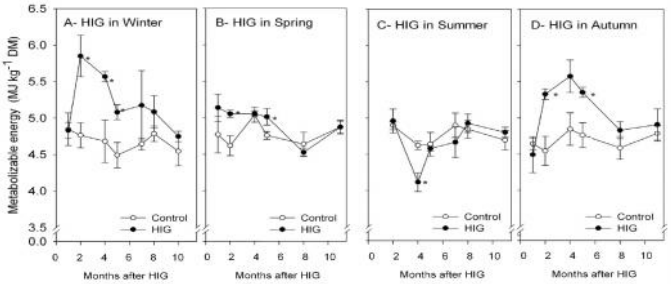

Figure 4. Metabolizable energy (MJ kg^{-1} DM) of aboveground green biomass, after HIG applied in different seasons and control (error bars = s.e.).

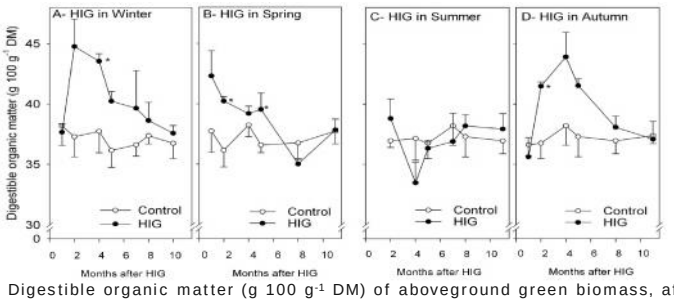

Figure 5. Digestible organic matter (g 100 g^{-1} DM) of aboveground green biomass, after HIG applied in different seasons (error bars = s.e.).

Materials and Methods

The experiment was established on a 24-ha natural grassland area in Corrientes, Northeast Argentina. The HIG treatment was applied in three replicates of 6 ha following a monthly sequence on adjacent sub-plots of 12×0.5 ha in each replicate. A mixed 75-animal herd of Braford, Hereford, and Brahman cattle breeds was used to trample down all biomass in different seasons (Figure 2). HIG was compared to a control site with no HIG but continuous grazing with 0.5 animal units per ha^{-1} year^{-1}.

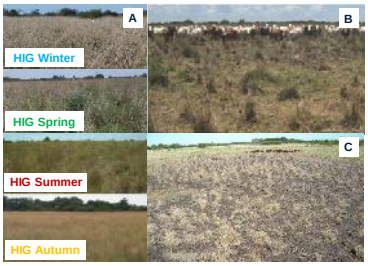

Figure 2. HIG was applied in all seasons (A). During HIG (B) and after HIG treatment (C).

Aboveground plant biomass was cut every month, in two 1 m^2 areas per sub-plot, between February 2013 and June 2014 and sent to the Laboratory. Quality parameters crude protein (CP, in g 100 g^{-1} DM), metabolizable energy (ME, in MJ kg^{-1} DM), and digestible organic matter (DOM, in g 100 g^{-1} DM) were analysed up to one year after HIG and compared to control sub-plots under standard grazing regime.