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High Impact Grazing as Management Option for Excess Standing Biomass in Argentinean Grasslands

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Abstract

Despite northern Argentinean grasslands are very productive, farmers of large scale cattle ranches stock their rangeland with comparably low rates due to low winter forage availability. As a result low quality standing dead biomass accumulates with negative impact on the next year's grass growth. Although being prohibited, fire is often used to eliminate dead biomass and therefore, alternative sustainable management options are highly requested. By implementing elements from the holistic grassland management approach, short-term high-intensity grazing could improve grassland productivity and standing dead/green biomass ratios due to high feed intake, trampling, excrements, and the impact-timing.

At the INTA Corrientes experimental station we designed a three times replicated 18 ha grazing experiment, where in each month of the year a different area is subjected to three days high impact grazing (150 cattle ha⁻¹ day⁻¹). A control site with traditional management is monitored additionally. Grass re-growth was monthly sampled inside moving cages. Monthly outside cage biomass harvests were separated for green and dead biomass. Cattle behaviour was continuously monitored with GPS collars.

Impact-timing had minor effects on the monthly inside cages mean biomass growth rates (60–80 g m²) from July-March. Green biomass outside cages accumulated linearly until reaching peak values of 400–500 g m². However, the standing dead biomass also increases rapidly up to 350–500 g m², indicating fast turnover rates and underestimated re-growth based on inside cage measurements. The control site had comparable green biomass amounts but more than 700 g m² standing dead biomass, suggesting that about 30–50 % of the dead material was build up in the previous growing season. Cattle were preferentially grazing at sites with impact treatment 2–3 month ago.

High impact grazing offers options with regard to biomass- and animal management. Impact timing will affect residual dead biomass during the winter time, which however could promote C3 cold season species growth. This in turn could support cattle during winter grazing with additional biomass and, thus, finally increase ecosystem carrying capacity. High impact grazing will be on the other hand discussed for potential negative effects and applicability.

Keywords: Carrying capacity, cattle, grazing experiment, rangeland, vegetation dynamics