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Is High Impact Grazing-Trampling a Management Option to Reduce Excess Standing Biomass in Argentinean Grasslands?

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Abstract

Northern Argentinean grasslands are very productive but, due to low stocking rates, standing dead biomass accumulates every year. Fire with negative effects on the system's carbon and nitrogen balance 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 be used as an alternative to reduce standing dead biomass thereby improving grassland productivity and green / standing dead biomass ratios. At the INTA Corrientes experimental station we designed a three times replicated 18 ha grazing- experiment. In each month of the year, a different area of 0.5 ha was subjected to three days high animal impact with 150 cattle ha⁻¹ and traditionally grazed thereafter with 0.5 cattle ha⁻¹. Grass re-growth was monthly sampled inside and outside moving exclosure cages. We analysed the effect of trampling and impact timing (spring, summer, autumn and winter) on accumulated green and standing dead biomass compared to biomass pools on adjacent traditionally managed grassland.

Independent of timing, the trampling resulted in up to 60% reduced standing dead biomass pools compared to the control. The effect was significant for at least 3 months after the impacts in winter and spring. At peak biomass time (December - February) standing dead to green biomass ratios were between 1.4 and 13.8 for the control site and between 0.1 and 4.4 on treated paddocks. However, none of the trampling impacts resulted in higher green biomass accumulation compared to the control site. High impact grazing-trampling is an alternative management tool to reduce standing dead excess biomass. Best effects were attained for the winter and spring impacts. Surprisingly, accumulated standing dead biomass seems not to interfere with net primary production of northern Argentinean grasslands. However, improved green biomass accessibility and fodder quality via species composition change might be key effects of trampling or fire impacts, which deserve further analysis.

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