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Integrated livestock-forest system in southern region of Rio Grande do Sul: a suitable alternative for degraded pasture recovering with Annoni Grass weed (*Eragrostis plana* Ness.)

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Introduction The low shade tolerance of the main invasive weed of Brazilian southern grasslands, the Annoni Grass (*Eragrostis plana* Ness) is well recognized. The Integrated Livestock-Forestry system (ILF) can play an important role on the recovery of degraded grasslands severely occupied by this weed in southern Brazil. This study aims to evaluate ILF alternative to store the yield capacity of grasslands severely invaded by Annoni Grass weed.

Material and Methods

The Technological Reference Unit (TRU) of 34 hectares was established in April 2013 within the experimental area of Embrapa South Livestock (31°21'09"S and 54°00'57"W). The experimental design was a randomized blocks distributed in a factorial 3x2 with two replications, where the treatments were: three pasture systems: ILF1 with *Eucalyptus grandis* trees in triple rows and density of 750 trees ha⁻¹ (3x2x14m); ILF2 with *E. grandis* with 375 trees ha⁻¹ (3mx2mx34m) and open pasture systems (OP). Each pasture system was splitted into two levels of pasture intensification: native grassland (NG) invaded by Annoni Grass weed (Ness *Eragrostis plana*) and improved natural grassland (ING) with annual ryegrass (*Lolium multiflorum*), red clover cv. LE116 (*Trifolium pratense*) and Birdsfoot Trefoil cv. Sao Gabriel (*Lotus corniculatus*) sown in June 2013. From August 2014 to April 2015, all pasture treatments were continuously grazed by Brangus/Bageweaned calves. The stocking rate was adjusted every 30 days, maintaining a forage allowance of about 14 kg of pasture dry matter per 100 kg liveweight. The daily liveweight gain (LWG) per head was evaluated monthly. All deployment and maintenance costs as well as the incomes obtained were evaluated during the experimental period. Dry matter (DM) yield was measured every 30 days within 3 transects per experimental unit. Each transect was established between the external tree rows and had 5 sampling points, totaling 15 points per treatment. Botanical composition (%) was measured in all treatments, separating native and cultivated grasses, native and cultivated legumes, Annoni Grass weed and other species. Tree height was measured in May 2014 and April 2015 in each ILF, totaling a sample of 10% of the trees planted.

Results and Conclusions

Total DM yield from October 2013 - March 2015 was 4,090 kg ha⁻¹ at ILF1/ING treatment, 3,857 kg ha⁻¹ at ILF1/NG, 4,094 kg ha⁻¹ at ILF2/ING, 4,000 kg ha⁻¹ at ILF2/NG, 4,335 kg ha⁻¹ at OP/ING and 4,316 kg ha⁻¹ at OP/NG. The botanical composition showed 20% of Annoni Grass weed at ILF1/ING, 82% at ILF1/NG; 27% at ILF2/ING, 91% at ILF2/NG, 30% at OP/ING and 80% at OP/NG (P<0,05). Trees were similar with an average 2.35m height in May 2014 and 5.47 m in March 2015. The mean LWG per day was 1.5 kg from 90 calves between August and October 2014; 0.67 kg from 44 calves between November and December 2014; 0.541 kg from 16 calves between January and April 2015. By this stage, Annoni Grass weed was unaffected by trees shading. On the other hand, intensive pastures were more effective to control Annoni Grass than the type of pasture system. As tree shade increases, recovery of degraded grasslands by Annoni Grass weed may be more effective in the future.#