Presence and control of Annoni Grass weed at the early stages of integrated livestock-forest systems in Pampa biome.

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The integrated livestock-forest system (ILF) is a sustainable alternative to recover degraded grasslands severed occupied with Annoni Grass weed (*Eragrostis plana*) at the Pampa biome in Southern Brazil. This is because Annoni Grass has been stated as a shade intolerant plant. Therefore, the ILF would promote a rapid decrease of Annoni population while allowing other palatable and shade tolerant forages to be established. An ILF experimental area of 34 hectares was established in April 2013 at Embrapa Pecuária Sul (31°21'09"S and 54°00'57"W). The experimental design was an randomized blocks distributed in a factorial 3x2 with two replications, where the main plots were three pasture systems: ILF1 or pasture integrated with *Eucalyptus grandis* at 750 trees ha^{-1} (3x2x14m), ILF2 or pasture with *E. grandis* at 375 trees ha^{-1} (3mx2mx34m) and an open pasture system (OP). Each pasture system was splitted into two Annoni weed control strategies: (i) NG or Native Grassland invaded by Annoni Grass and controlled with local chemical application or "Campo Limpo" method (glyphosate 720 g kg^{-1} sprayed out at 1.5 l ha^{-1}) and (ii) NG + improved pasture (ING) oversown with annual ryegrass (*Lolium multiflorum*), red clover cv. E116 (*Trifolium pratense*) and Birdsfoot Trefoil cv. Sao Gabriel (*Lotus corniculatus*). Pasture dry matter yield (DM) and pasture species frequencies (% on dry weight basis) were performed following cutting samples in the field from October 2013 to December 2015. DM was measured every 30 days using the double sampling method (15 visual + 3 cutting samples per treatment). Grazing with Brangus Ibagé calves was carried out from August 2014 to April 2015 and then from August to September 2015. The stocking rate was adjusted every 30 days, keeping a forage allowance of 14 kg of dry matter per 100 kg live weight. Trees were planted in April 2013. Mean trees height was 4m and diameter at breast height was 400 mm measured in April 2015. Mean DM was 4.6 t ha^{-1} at OP+NG, 4.2 at OP+ING, 3.7 at ILF1+NG and ILF1+ING, 3.8 at ILF2+NG and ILF2+ING over the experimental period. Further, results showed a marked decrease on % of Annoni Grass within treatments. For instance, Annoni presence within NG treatments decreased from 77% at the start to 21% at the end of the experimental period. In contrast, within ING treatment % of Annoni reduced from 28 to 12%. Cattle grazing was key to reduce the presence of Annoni Grass weed within all treatments and this was consistent after September 2014. The trees effect on the presence of Annoni Grass was unclear over the evaluation period. Possibly, the shade effect was only restricted to the area adjacent to tree rows and this may increase within the following years as tree height and crown grows. The conclusion of this work was that improving natural grassland with winter pastures, grazing management and strategic chemical control (local application by "Campo Limpo") are the main tools to control Annoni Grass weed at the establishment stage of wide spaced ILF systems or in open pastures in Pampa biome.

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