world congress on integrated crop-livestock-forest systems
3rd International Symposium on Integrated Crop-Livestock Systems
towards sustainable intensification • brasília • brazil • 2015

# # #

Economic evaluation of integrated livestock-forest systemat the establishment phase in the southern region of Rio Grande do Sul – Brazil.

Melissa BATISTA MAIA[1*], Alexandre COSTA VARELLA[2], Vinicius do NASCIMENTO LAMPERT[2], Jorge RIBASKI[3],Ricardo Willians MACIEL TADEO[4], Ana Cecília da LUZ FRANTZ[4], Ivone Maria BARP PAIM VIEIRA[5],

[1] Embrapa-Capes e IDEAU, [2]Embrapa South Livestock; [3]Emprapa Forestry, [4]Federal University of Pampa;[5]Institution for Development of High Uruguay River- IDEAU Faculty

E-mail addressofpresentingauthor*: melissa.maia@colaborador.embrapa.br

Introduction The integrated livestock-forest system (ILF) is cost effective and sustainable systems to the Pampa region at Rio Grande do Sul State. The ILF allows integrating traditional beef cattle system to forestry systems in this region. This work aims to evaluate the economic performance at the early stages a ILF with eucalypt and beef cattle in the south region of Rio Grande do Sul State.

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 splinted into two levels of pasture intensification: native grassland (NG) invaded by AnnoniGrass 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. In December 2013, the ING paddocks were harvested as hay. From August 2014 to April 2015, all pasture treatments were continuously grazed by Brangus Ibage calves, starting with 90 weaned calves averaging 120kg of live weight. The stocking rate was adjusted every 30 days, maintaining a forage allowance of about 14 kg of pasture dry matter per 100 kg live weight. The daily live weight gain (LWG) per head was evaluated monthly. All deployment and maintenance costs as well as the incomes obtained were evaluated during the experimental period from April2013 to April2015 and an economic evaluation was performed, looking at the applied systems. The exchange rate used for these calculations was 1 Brazilian Real ($R) equaled to 3,25 American Dollar ($US).

Results and Conclusions Investment costs and maintenance of the trees establishment totaled US$18,830.77 and consisted of: herbicide desiccation (glyphosate, 5 l ha^{-1}); soil preparation; Limestone application (4 ton ha^{-1}); 17,000 eucalyptus seedlings; planting labor; NPK fertilization (6:30:6 formula at 50g per seedling); Gel forest application for drought period; control of ants; post planting herbicide application. The total costs of pasture establishment and maintenance was US$7,793.85 and included: herbicide desiccation of native AnnoniGrass weed(glyphosate 5 l ha^{-1}); First year NPK fertilizer (2:30:15 formulaat500 kg ha^{-1}), Winter forage seeds (30 kg ryegrass+10 kg red clover+10 kg Birdsfoot Trefoil per ha); seeds inoculation, labor sowing procedures; Second year NPK fertilization (5:20:20 formula at 300kg ha^{-1}); urea covering fertilization (50 kg ha^{-1}); Herbicide local control for AnnoniGrass(glyphosate at 5 l ha^{-1}, "Campo Limpo" Technology). The out puts at the first year of ILF was based on hay rolls production (88 bales of 250kg and 23 bales of 75 kg, totaling US$ 3,649.85. At the second year, the ILF output was calculated from calves total LWG, resulting in US$ 16,941.54. The mean LWG was: 1.5 kg per head per day 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. Therefore, the total gross margin of this ILF was US$6,033.23 up to the second year of establishment, allowing the conclusion that all investment and maintenance costs may be payable at the third year of this ILF, keeping similar beef cattle performance within the system.#