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Cattle Production under Grazing with Improved Forages in the Lowland Tropics of Colombia

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Abstract

The increase in global population and changes in people’s lifestyles and diets during the last years have generated a high demand for animal protein sources. In Colombia, most of the area dedicated to livestock production is managed under extensive and inefficient production systems. The International Center for Tropical Agriculture (CIAT) is working on the sustainable intensification of livestock systems through improving their efficiency and productivity while mitigating negative environmental effects such as deforestation, and greenhouse gas emissions. A critical pathway to achieve sustainable intensification of livestock systems is through the selection and breeding and subsequent adoption of improved forages, which can either be used as stand-alone technology or be part of a (e.g., silvo-pastoral) system. Silvo-pastoral systems have shown excellent results in terms of higher biomass production, better nutritional quality, positive environmental effects and higher animal stocking rates.

At CIAT’s headquarters in Colombia, we evaluated the live-weight gains (kg/ha) of twelve steers (age: two years) randomly distributed in three groups, applying one grazing treatment to each group. The three treatments under evaluation were: T1 - *Brachiaria* Hybrid, CIAT BR02/1752 cv. Cayman, T2 - cv. Cayman plus *Canavalia brasiliensis* CIAT 17009, and T3 - cv. Cayman plus *C. brasiliensis* CIAT 17009 plus *Leucaena diversifolia* ILRI 15551. In an experimental block design, each treatment was applied on plots of 3,300 m² with three repetitions during a period of seven months.

The highest average live-weight gains were observed for T3 (552 kg ha⁻¹), followed by T2 (392 kg ha⁻¹) and T1 (227 kg ha⁻¹), respectively. This suggests stocking rates (LU = 450 kg) of 2.5 (T1; 1,104 kg ha⁻¹), 2.7 (T2; 1,219 kg ha⁻¹), and 3.2 (T3, 1,423 kg ha⁻¹) animals per hectare, respectively. Multiple comparisons with Duncan and Turkey tests show significant differences among the three treatments, with T3 being the best performing ($p \leq 0.05$), followed by T2 and T1.

The results suggest that multi-strata silvo-pastoral systems, such as the one evaluated in T3, can be an excellent alternative for improving the productive parameters of the cattle sector and in addition to that, can provide valuable environmental benefits.

Keywords: Improved forages, live-weight gain, silvo-pastoral systems, stocking rate