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“Solidarity in a competing world —
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Economic Analysis of Tropical Forages in Livestock Systems in the Eastern Plains of Colombia

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Abstract

70% of the Colombian livestock production are characterised by extensive production systems, which usually show low productivity levels, low land use efficiency and often lack environmental sustainability. This is related to native grasses and degraded pastures that generate limited forage supply, both in volume and quality, especially in the dry season. The International Center for Tropical Agriculture (CIAT) is working on the development of improved forages able to adapt to various adverse soil and climatic conditions of the lower tropics, while increasing productivity levels and reducing the environmental impact of livestock production. However, the establishment of these new forage technologies implies higher investment and management costs for the producer, which limits in many cases their adoption.

This paper evaluates the financial viability of the implementation of new forage technologies, in this case of improved pastures and scattered trees in livestock systems, and compares them to the traditional production system with native pastures. The developed model is based on a cash flow analysis and a Monte Carlo simulation, and includes uncertainty factors in the variables identified as critical (e.g., meat price, productivity). Research took place in 2015 in the Casanare Department in the Eastern Plains of Colombia.

The results indicate that investment in improved pastures is profitable with an incremental net present value (NPV) of US\$ 45 and an internal rate of return of 18%. The system in association with scattered trees was not profitable due to the high initial investment costs and time expectations for achieving improvements in production parameters. Both evaluated alternatives were only evaluated for livestock income, not taking into account additional income that might arise from the trees (e.g., fruits, wood). The feasibility of investment is highly sensitive to changes in the selling prices of the meat and expected returns. The technologies evaluated in this study showed to be an alternative to improve production efficiency and profitability of livestock farms. However, strategies and / or incentives need to be developed that aim at reducing the high initial costs of systems in association with scattered trees.

Keywords: Improved forages, Monte Carlo simulation, profitability analysis, risk analysis, silvo-pastoral systems