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Economic Impacts of Nitrogen Fertilizer Use into Tropical Pastures for Beef Cattle in Brazil

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Abstract : Brazilian beef cattle production systems are an important profitability source for the national gross domestic product. The main characteristic of these systems is forage utilization as the exclusive feed source. Forage utilization had been causing on owners the false feeling of low production costs. However, this low cost is followed to low profit causing a lot times worst animal index what can result in activities changes or until land sold. Aiming to evaluate economic impacts into Brazilian beef cattle systems were evaluated four nitrogen fertilizer (N) application levels (0, 90, 180 and 270 kg per hectare [kg.ha-1]). Research was developed during 2015 into Forage Crops and Grasslands section of São Paulo State University, "Júlio de Mesquita Filho" (Unesp) (Jaboticabal, São Paulo, Brazil). Pastures were seeded with Brachiaria brizantha Stapf. 'Marandu' (Palisade grass) handled using continuous grazing system, with variable stocking rate, sward height maintained at 25 cm. The economic evaluation was developed in rearing e finishing phases. We evaluated the cash flows inside each phase on different N levels. Economic valuations were considering: cost-effective operating (CEO), cost-total operating (CTO), gross revenue (GR), operating profit (OP) and net income (NI), every measured in US$. Complementary analyses were developed, profitability was calculated by [OP/GR]. Pay back (measured in years) was calculated considering average capital stocktaking pondered by area in use (ACS) divided by [GR-CEO]. And the internal rate of return (IRR) was calculated by 100/(pay back). Input prices were prices during 2015 and were obtained from Anuário Brasileiro da Pecuária, Centro de Estudos Avançados em Economia Aplicada and quotation in the same region of animal production (northeast São Paulo State) during the period above mentioned. Values were calculated in US$ according exchange rate US$1.00 equal R$3.34. The CEO, CTO, GR, OP and NI per hectare for each N level were respectively US$1,919.66; US$2,048.47; US$2,905.72; US$857.25 and US$986.06 to 0 kg.ha-1; US$2,403.20; US$2,551.80; US$3,530.19; US$978.39 and US$1,126.99 to 90 kg.ha-1; US$3,180.42; US$3,364.81; US$4,985.03; US$1,620.23 and US$1,804.62 to 180 kg.ha-1andUS$3,709.14; US$3,915.15; US$5,554.95; US$1,639.80 and US$1,845.81 to 270 kg.ha-1. Relationship to another economic indexes, profitability, pay back and IRR, the results were respectively 29.50%, 6.44 and 15.54% to 0 kg.ha-1; 27.72%, 6.88 and 14.54% to 90 kg.ha-1; 32.50%, 4.08 and 24.50% to 180 kg.ha-1 and 29.52%, 3.42 and 29.27% to 270 kg.ha-1. Values previously presented in this evaluation allowing to affirm that the best result was obtained to N level 270 kg.ha-1. These results among all N levels evaluated could be explained by improve occurred on stocking rate caused by increase on N level. However, a crucial information about high N level application into pastures is the efficiency of N utilization (associated to environmental impacts) that normally decrease with the increase on N level. Hence, considering all situations (efficiency of N utilization and economic results) into tropical pastures used to beef cattle production could be recommended N level equal to 180kg.ha-1, which had better profitability and cause lesser environmental impacts, proved by other studies developed in the same area.

Keywords : Brachiaria brizantha, cost-total operating, gross revenue, profitability
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