



## Enteric Methane emission per hectare of backgrounding *Nellore* cattle in a *Cajanus cajan* legume-grass consortium

Althieres José Furtado<sup>1\*</sup>, Annelise Aila Gomes Lobo<sup>1</sup>, Gabriele Voltareli da Silva<sup>1</sup>, Rolando Pasquini Neto<sup>1</sup>, Alexandre Berndt<sup>2</sup>, Paulo Henrique Mazza Rodrigues<sup>1</sup>

<sup>1</sup>University of Sao Paulo, Pirassununga/ SP, Brazil;

<sup>2</sup>Embrapa Pecuária Sudeste, São Carlos/ SP, Brazil;

\* Master's Degree student – althieresjf@usp.br

Brazil has been under great pressure to reduce greenhouse gas emissions, especially enteric methane (CH<sub>4</sub>) emissions emitted by cattle. Intensified systems and nutritional strategies improve production efficiency while reducing enteric CH<sub>4</sub> emissions. The objective of this experiment is to reduce the enteric CH<sub>4</sub> emission of *Nellore* cattle through grazing in three different systems, including a grass-legume consortium. The experiment was carried out during July 2020 to July 2021 at Embrapa Southeast Livestock, in São Carlos, SP. Twenty-seven *Nellore* steers, weighing approximately 280 kg and aged between 15 and 16 months were used. The animals were distributed in 3 treatments with 3 spatial replications (paddocks): 1) pasture fertilized with 200 kg N-urea ha<sup>-1</sup> year<sup>-1</sup> in the rainy season, containing a mixture of *Urochloa* (syn. *Brachiaria*) *decumbens* Stapf cv. Basilisk and *Urochloa* (syn. *Brachiaria*) *brizantha* (Hochst ex A. Rich) Stapf cv. Marandu (REC); 2) degraded pasture of *U. decumbens* Stapf cv. Basilisk (DEG) and 3) Mixture of grasses and legumes, *U. decumbens* Stapf cv. Basilisk, *U. brizantha* Stapf cv. Marandu and *Cajanus cajan* cv. BRS Mandarin (MIX). Each paddock had 1.5 ha<sup>-1</sup>, where stocking rate was adjusted by the “put-and-take” technique. The enteric CH<sub>4</sub> emission dosage was determined by the sulfur hexafluoride (SF<sub>6</sub>) tracer gas technique. Two samplings were carried out to represent the emissions per year, one during the rainy season (January) and another during the dry season (June). The enteric CH<sub>4</sub> emission data per hectare were subjected to analysis of variance using SAS PROC MIXED and comparison of means by Fisher's test (5%). In general, the treatments differed (P=0.0291): 178.67<sup>a</sup> g ha<sup>-1</sup> in DEG, 178.40<sup>a</sup> g ha<sup>-1</sup> in REC and 159.08<sup>b</sup> g ha<sup>-1</sup> in MIX. The climatic periods also differed (P<.0001), the average emission in the rainy season was 193.25<sup>A</sup> g ha<sup>-1</sup> and in the dry season it was 150.85<sup>B</sup> g ha<sup>-1</sup>. The results demonstrate lower emission in the dry season and the efficiency of the intercropped system in mitigating the emission of CH<sub>4</sub> per hectare.

**Keywords:** backgrounding, *Cajanus cajan*, grazing, methane per hectare

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