# STOCKING RATES OF NELLORE STEERS IN INTENSIVELY MANAGED PASTURES AND SILVOPASTORAL SYSTEMS IN SOUTHEAST BRAZIL DURING BACKGROUNDING

Rolando Pasquini Neto*[1]; Annelise Aila Gomes Lobo[1]; Gabriele Voltareli da Silva[1]; Lucas Avilé Colosso[2]; André de Faria Pedroso[2]; Paulo Henrique Mazza Rodrigues[1]

[1]University of São Paulo, Pirassununga, SP, Brazil;
[2]Embrapa Southeast Livestock, São Carlos, SP, Brazil.
*Corresponding author: netopasquini@alumni.usp.br

## Abstract

The adjustment of stocking rates of production systems is a technique used to increase animal productivity per area, by defining the availability of forage mass per animal in a predefined time. This study evaluated the effects of stocking rates in different intensive animal production systems, including an integrated system with Brazilian native trees. The experiment was carried out from September 2019 to September 2020 at Embrapa Southeast Livestock, São Carlos, SP, Brazil. Thirty Nellore steers (375 ± 30 kg live weight; 22 ± 23 months old) were randomly distributed in five treatments, with two replicates: 1) intensively managed and irrigated Megathyrsus maximus cv. Tanzânia pasture with a high stocking rate, overseeded in the dry season with Avena byzantina and Lolium multiflorum (IHS); 2) intensively managed pasture of rainfed M. maximus cv. Tanzânia with high stocking rate (RHS); 3) intensively managed rainfed pasture with a mix of Urochloa decumbens cv. Basilisk and Urochloa brizantha cv. Marandu with a moderate stocking rate (RMS); 4) intensively managed silvopastoral system with U. decumbens cv. Basilisk pasture and Brazilian native trees (345 trees ha-1), with a moderate stocking rate (LFS); and 5) extensively managed degraded pasture with a mix of U. brizantha cv. Marandu and U. decumbens cv. Basilisk, with a low stocking rate (DP). All pastures were submitted to stocking rate adjustments using the "put and take" technique. Grazing was continuous in DP and rotational in IHS, RHS, RMS and LFS, with grazing cycles of 36 days (intermittently grazed, with three days of occupation and 33 days of rest). All pastures, except DP (2.0 ha), received liming and corrective fertilization with P, K, S, and micronutrients. Pastures in IHS and RHS (1.8 ha each) were fertilized, respectively, with 600 and 400 kg N ha-1 year-1. Pastures in RMS and LFS (3.1 and 3.5 ha, respectively) received 200 kg N ha-1 year-1. Animals were weighed at regular intervals of approximately 28 days during the experimental period to evaluate the number of animal units (AU = 450 kg live body weight) per area (AU ha-1). The average stocking rate was calculated according to the area, total number of days of the experimental period and for the four seasons of the year. Data were submitted to analysis of variance and comparison of means by the Fisher test at 5%, using the PROC MIXED of SAS. Interaction was observed between treatments and seasons (P≤.0001). In spring, a higher stocking rate was observed in IHS (3.63 AU ha-1), followed by RMS, DP and RHS (1.83, 1.81 and 1.73 AU ha-1, respectively) with similar (P>0.05) values, while LFS (1.04 AU ha-1) presented the lowest value. In summer, with the highest forage mass availability, the stocking rate increased in all systems: IHS (8.91 AU ha-1) was able to maintain the highest value, followed by RHS (6.07 AU ha-1), RMS (3.02 AU ha-1), while LFS and DP (2.45 and 2.29 AU ha-1, respectively) presented the lowest and similar values. In autumn, IHS and RHS (5.85 and 5.60 AU ha-1, respectively) presented the highest and similar values, followed by RMS (3.72 AU ha-1), DP (2.51 AU ha-1), and by LFS (1.02 AU ha-1). In winter, IHS and RHS (2.91 and 2.83 AU ha-1, respectively) continued to present the highest and similar values, followed by DP and RMS (1.78 and 1.70 AU ha-1, respectively) with intermediate and similar values, while LFS (0.74 AU ha-1) continued to present the lowest value. We concluded that the more intensive systems allowed higher stocking rates in relation to the DP system, considering the forage mass availability in the different seasons of the year. In the LFS system, the competition for natural resources (light and water) between the system's components (pasture and trees), in addition to low temperatures and soil moisture during the dry period (autumn and winter seasons), determined the low stocking rates observed.

## Keywords

Stocking rate, grazing systems, intensification, sustainability.