

SOIL CHEMICAL ATTRIBUTES ON *BRACHIARIA SPP* IN INTEGRATED CROP LIVESTOCK SYSTEM

CARACTERÍSTICAS QUÍMICAS DO SOLO EM PASTAGENS DE *BRACHIARIA* EM SISTEMA INTEGRADO LAVOURA-PECUÁRIA

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Integrated crop-livestock systems have attracted more interest in the last few years due to their capacity of improving stability and sustainability of agricultural systems when compared to more specialized production ones. The crop-livestock integration is an effective technique, but complex to maintain pasture productivity and its recovery, whose efficiency depends on soil physical management and its chemical fertility. Regarding the soil fertility, the corrective practices generally begin with the liming due to the high acidity of most Brazilian soils and low levels of Ca and Mg in the exchange complex and high Al saturation. In areas of crop-livestock systems, liming corrects the surface acidity potential. However, this practice can leave the subsoil with excess aluminum and lack of calcium, which inhibit root growth and affect the absorption of water and nutrients. The application of gypsum allows the improvement of the subsoil, reducing Al saturation and increasing levels of calcium and sulfur. The aim of this study was to investigate changes in the soil chemical properties of a Haplorthox soil in integrated crop-livestock system (ICL) with *Brachiaria brizantha* cv. Marandu and Piatã, *Brachiaria ruziziensis* with gypsum and liming application. This study was conducted at the Instituto de Zootecnia, Nova Odessa/SP, a pasture established on a soil with medium texture (61.4% sand, silt 14.6% and 24.0% clay). The treatment plots consisted on integration crop-livestock (ICL) cultivated - maize and B. Marandu, ICL - maize and B. *ruziziensis*, ICL - maize and B. Piatã and an untreated control group (control - without liming and fertilization) grazed pasture throughout the year, located immediately adjacent to the ICL evaluation, which was cultivated for 25 years with B. *brizantha* cv. Marandu. All pastures were desiccated in October with glyphosate-based herbicide (4 liters per hectare). Then gypsum (1.2 Mg ha⁻¹) and liming (1.2 Mg ha⁻¹) were applied surface and incorporate with soil scarifier. Maize was sown in November; fertilized rates were 28-39-46 kg ha⁻¹ of N-P-K and broadcast fertilization with 18-31-60 kg ha⁻¹ of N-P-K at 20 days of age. Harvesting maize for silage was in March. The management system adopted was maize in summer in no-till established and the pastures used for grazing in winter. An untreated control group (control - without liming and fertilization) was allocated to experimental units according to a complete randomised block design, with five replications. Soil sampling, one year after the liming and gypsum application was conducted at the layers of 0-5, 5-10, 10-20, 20-30 and 30-40 cm deep in pastures. The samples were analysed for pH, H⁺ + Al³⁺, total organic carbon (TOC), P, K⁺, Ca²⁺, Mg²⁺, exchangeable and calculated exchangeable cations (CEC = Ca²⁺, Mg²⁺, K⁺), BS% (base saturation) and aluminium saturation. Data were analyzed by the method of least squares, using the Proc GLM of SAS program. Correcting acidity with lime topdressing and gypsum on the pasture increased the pH, Ca, Mg, BS and CEC levels and reduced the potential acidity and aluminium saturation of the soil compared with control. Results showed that the crop-livestock integration system has shown a great potential to increase TOC (0-10cm). It is interesting to highlight that the grasses used during the remain period in the pasture can influence the soil accumulation rates of C and N. In our study, higher accumulation rates were found with Marandu and B. *ruziziensis* grasses.

Keywords: *Brachiaria*, gypsum, liming.

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