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IMPACTS OF LAND USE ON THE CHEMICAL ATTRIBUTES OF THE RIPARIAN SOIL OF A TROPICAL SEMI-ARID REGION

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Abstract

Studies on soil quality and soil potential to be a source of pollutants in aquatic ecosystems are fundamental for monitoring the environmental quality of catchment areas. Here, we studied the impact on soil quality caused by land-use changes in northeastern Brazil's riparian soil. A total of 28 riparian soil composite samples were collected from areas with different land use (native vegetation; agriculture, including family farms, fodder production, and horticulture; and exposed soil with family-owned livestock operations) and evaluated for potential acidity, pH, cation exchangeable capacity, organic matter, and phosphorus available for plants. Family farming and horticulture had less impact on soil quality and, consequently, a low potential to compromise water quality when conducted around aquatic ecosystems. However, forage grass use and extensive livestock production caused changes in soil chemical attributes that could reduce the soil quality and the water quality in nearby aquatic systems. Livestock production has a greater potential to contribute to nutrient diffusion into water bodies. The cultivation of forage grasses can also contribute to the increased alkalinity of soil and water. The minor impacts on soil chemical characteristics by the family farm management led to a statistical grouping of horticulture and family agriculture sites as native vegetation. This result highlights the crucial role of reducing soil mobilization to preserve ecosystem functions in riparian areas.

Keywords: agriculture, alkalization of soil, family farm, livestock, phosphorus

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