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Stock and carbon levels in the soil in the tree lines or pasture lane in integrated production system (iCLF) in the western Brazilian Amazon

Rogerio PERIN[1]; Felipe TONATO[1], Jasiel N. SOUSA[1], Gilvan C. MARTINS[1]
[1] Embrapa Amazônia Ocidental, Rodovia AM-010, Km 29, CEP: 69010-970, Manaus, AM
E-mail address of presenting author: rogerio.perin@embrapa.br

Introduction:
Animal production systems in Brazil are constantly singled out as largely responsible for the emission of greenhouse gases (GHGs), mainly due to changes in land use, generated by the farming expansion, felling native vegetation and implementation of new pastures.
Integrated systems are shown as an alternative to increase the soil organic carbon accumulation, mitigating part of the carbon emitted once the presence of greater root diversity and greater biomass production from the annual crop, pasture, and forest species has led to increases in carbon stock in iCLF systems.
Despite there being the increase in the C stock, the place where this increase occurs is still controversial. Therefore, the objective of this study was to evaluate the stock (STC) and the C content (Ccont) in the soil in the tree lines or pasture lane of an integrated system iCLF with Mahogany (*Swietenia macrophylla*) and *Brachiaria brizantha* cv. Xaraés sown after corn cultivation in western Brazilian Amazon.

Materials and methods:
The work was conducted at the Experimental Station of Embrapa Western Amazon, located at km 54 of BR 174 highway. The object of the study was an agrosylvopastoral system implemented in 1991, made up of six paddocks 3000 m^2 each, with pasture associated with Mahogany, arranged in two central lines. This system pasture was reformed through the cultivation of corn associated with Xaraés and then grazed by sheeps for two years in a rotational arrangement of 7 days of grazing and resting period of 35 days. The soil is a Xanthic Ferralsol (FAO, 1990) [dystrophic Yellow Latosol –Brazilian classification (EMBRAPA, 1999)] with clayey texture and kaoliniticmineralogy.
Two years after the pasture reform, six soil samples were collected at a depth of 0 to 20cm in pasture range and at the tree lines of each of the six paddock to analyze the organic carbon content. Next to each of these samples, soil were collected with cylinders at the depth of 7cm to determine soil bulk density (BS). The STC was estimated by the formula of Veldkamp (1994). Analysis of variance was performed using the design of randomized blocks, with six replications and the means compared by F test.

Results:
The Ccont were highest on the tree lines with 19.3 g/kg of the pasture lane with 17.9 g/kg ($P < 0.0994$), however, due to the smaller bulk density (BS) in the line of trees than in the observed in the pasture lane, 0.92 g/cm^3 and 1.02 g/cm^3 respectively ($P < 0.0210$), the STC was the same in both conditions, with 36.2 Mg/ha. Although higher the BS values are in the range of normal pasture to Yellow Latosol of clay or clayey that present in the original vegetation soil density of about 1 g/cm^3.

Conclusions:
The smaller BS soil in the tree lines offsets the higher Ccont of the tree line, making the STC indistinguishable between the range of grassland and the tree line when considering the horizon of 0 - 20cm.