

Therefore, comparing the crop area with the natural area, there where no loss of soil physical quality, even though that values where considered critical by the literature. The higher SD values in the CLI and LFI was a signal to the importance of implementing a physical soil quality monitoring program in the property, besides the control in the activities of machines and animals in those systems.

Keywords: Soil Compaction; Soil Management; Pastagem; Roraima;

Financial support: Embrapa RR; CNPq, CAPES

(5623 - 266) Soil quality indicators of a Planosol under integrated Crop/livestock/Forest system at Agreste Mesoregion of Paraíba State, Brazil

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Crop, livestock, and forestry integrated systems (CLFIS) are strategies that promote soil quality. This work aimed to determine some soil quality indicators attributes, after short time use of CLFI systems at Agreste of Paraíba State, Brazil. The soil is an Eutric Planosol, moderate A horizon, sandy loam texture, light towaved slope, sub-deciduous forest of semi-arid climate. Intercropping was implemented at June 2015: a) *Brachiaria decumbens* sole pasture (Livestock system); b) *B. decumbens* + *Gliricidia* (*Gliricidia sepium* (Jacq.) Steud.) (Livestock/*Gliricidia* Forest integration system LGFIS); c) *B. decumbens* + Sabiá (*Mimosa caesalpinifolia*) (Livestock/Sabia Forest integration system LSFIS); d) *B. decumbens*+ Yellow Ipê (*Tabebuia alba* (chamiso) sandwith) (Livestock Ipê Forest integration system LIFIS); e) *B. decumbens*+ maize (*Zea mays* L.) (Crop/Livestock integration system CLIS) at last crop in april 2016, in no-tillage. The trial was carried out in a randomized block experimental design, with four replicates. Forest species were planted in triple rows, at regular spacing 3 m x 2 m, with 20 m between triple rows. Plots (rectangular format) have 20 m x 38 m. In April 2016, 15 days after maize seeding, soil samples (5 subsamples) was collected, inside the plots (triple rows) at center plots, at 0-0.10m; 0.10-0.20 m and 0.20-0.40 m depths. Physical attributes of: gravimetric soil moisture (Ug), soil bulk density (Ds) and index cone by electronic device (RP) and chemical attributes of: soil reaction (pH-H₂O); potassium (K⁺), phosphorus (P) and organic matter (OM) were evaluated. In general, no significant difference was found in both physical (without indicating additional soil compaction) and chemical attributes. Probably the short time of systems was the reason. The pH-H₂O mean values ranged from 4.7 to 5.2 (p>0.05). From the results it was concluded that it is necessary to raise pH-H₂O to increase availability of the replacement of nutrients, mainly Ca²⁺, Mg²⁺ and P and K⁺. OM levels increased at 0-0.10 m depth this shown important role of CLFI systems for the recovering of degraded pastures by higher soil cover, increasing nutrient cycling, promoting income diversification and increasing productivity in farmlands at the local of this study.

Keywords: soil management; soil attributes; sustainable production systems.

Financial support: EMBRAPA Project number: 0413110010604, Brazilian development network ICLF

(8315 - 2270) Soil temperature measurements by newly developed soil probes in Hungary

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According to the state of science today, we have different ways

available to measure soil paramteres, including in situ and remote sensing methods. In agricultural production the effect of soil temperature on germination is well known. Besides that soil temperature has impact on other biology, chemical and physical processes. This research was carried out on measuring soil temperature by newly developed soil probes in Hungary. The soil puffer capacity and its temperature dynamics does not belong to the main research themes. We have selected a few arable land throughout Hungary which have characterized by different soil type. The common point is the cultivated plant grown on them. By the examination we get answer about puffer capacity, resistance of each soil types again athomospere effects. Each type of soil has different characters, whereupon each soil type has different response againts external influences. We would like to use the results to help developing landscape management.

Keywords: soil temperature, temperature dynamics, soil probe

Financial support:

(5563 - 2978) Soil water dynamics in a Cerrado fragment and clonal *Eucalyptus* plantation fertilized with K sources

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Among the Brazilian tropical soils most used for *Eucalyptus* plantation are oxisols (48%) and ultisols (26%). Often these soils present low natural chemical fertility and, those with lower clay content, low water retention capacity. Considering that potassium (K) presents physiological functions related to plant water regulation and frequently provides positive responses in tree growth, the objective of this research was to evaluate the potassium fertilization effect in a clonal *Eucalyptus* plantation in a Red Yellow Oxisol with low clay content (185 g kg⁻¹; 0-60 cm soil layer) and exchangeable K (0.3 mmol_c dm⁻³), and compare the soil water content dynamics under *Eucalyptus* plantation, using a Cerrado fragment as reference, original phytophysognomy of the study area. The experiment was carried out in the municipality of Luiz Antônio, SP, Brazil, between April 2014 and December 2016. Three treatments were evaluated: (CER) Cerrado fragment; (POT) *Eucalyptus* plantation fertilized with 180 kg ha⁻¹ K₂O, using KCl; and (FO) *Eucalyptus* plantation fertilized with 180 kg ha⁻¹ K₂O, using phonolite rock powder. Soil water content was measured monthly at 1.6 m depth with a capacitive probe (Diviner model) between the 16th and 41st months after *Eucalyptus* planting. The measurements were performed in a 120 m² plot using three probe access tubes, which were considered repetitions. To assess tree growth, the circumference at the breast height (CBH; 1.3 m above ground level) of the trees of the two treatments with *Eucalyptus* at the 13th and 42nd months after planting were measured. CBH averages were generated from the measurement of four plots with 16 trees/treatment. During the 16 months of evaluation, the CER treatment presented the highest soil water content (154 mm), followed by FO treatment (131 mm) and POT treatment (111 mm). The growth in CBH of the FO treatment was 5 and 0.7% higher than POT at the 13th and 42nd months after planting, respectively. The substitution of KCl fertilizer by phonolite rock powder decrease soil water consumption, maintaining the same CBH growth in eucalyptus trees.

Keywords: KCl; Phonolite; Rock powder; Soil water content; Forestry

Financial support: National Council for Scientific and Technological



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