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Soil density of a clayey Oxisol under different ICLF systems in the Cerrado region of Brazil

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Introduction
It is consensus that soil physical conditions may be restrictive for plants development, reducing production of crops and pastures, and their sustainability over time. Identify soil constraints are a main objective in soil physics studies in order to provide better plant growth. The goal of this trial was to evaluate soil density at different depths and distances from tress of *Eucalyptus urophylla* x *Eucalyptus grandis* (clone H13), planted in single line rows, as ICLF (integrated crop-livestock-forest) systems, in the Cerrado region of Brazil.

Material and Methods
The experiment was carried out at Embrapa Beef Cattle Research Center (20° 26' S, 54° 43'W, 530 m asl), in a complete randomized block design, with four replications. Soil samples were collected at depths: 0-5, 5-10, 10-20, 20-30, 30-50, 50-75 and 75-100 cm. Treatments were: ICLF 14 C (spatial arrangement with 357 trees/ha, spaced 14 x 2, soil samples collected in the center between two single rows of eucalyptus); ICLF 14 E (same spacing as before, samples collected at 1m from the eucalyptus plant); ICLF 22 C (spatial arrangement of 227 trees/ha, samples collected at same position as ICLF 14C); ICLF 22 E (samples collected at 1 m from the eucalyptus plant); ICL (crop-pasture, no trees) and VN (natural vegetation close to the experimental area). The tree component of the ICLPF was planted in January, 2009 and soil sampling in December, 2014. Soil density was calculated in accord to the Manual of Soil Analysis Methods (EMBRAPA, 1997). Forage grass, established between trees and under grazing, was *Brachiaria brizantha* cv. BRS Piatã.

Results and Conclusions
Fig. 1. Values of soil bulk densities (g cm^{-3}) for different treatments and depths.
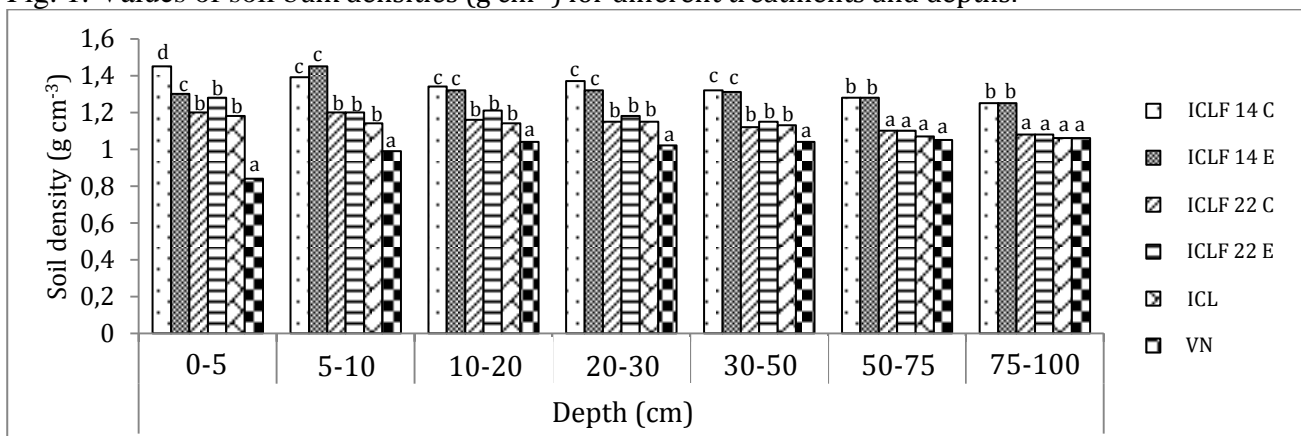
The largest values of soil densities, regardless of soil depth, were observed in ICLF 14 treatments: in the center between two single rows of eucalyptus (C) or close to eucalyptus plant (E).

References cited
EMBRAPA (1997) Manual de métodos de análise de solo.212p.
Acknowledgments