world congress on integrated crop-livestock-forest systems
3rd International Symposium on Integrated Crop-Livestock Systems
towards sustainable intensification • brasilia • brazil • 2015

Influence of different spatial arrangements of the tree component in ICLF systems on the soil total pore volume

Alexandre R. ARAÚJO[1*], André D. FERREIRA[1], Manuel C. M. MACEDO[1], Roberto G. ALMEIDA[1], Ademir H. ZIMMER[1].
Embrapa Beef Cattle Center, Avenida Radio Maia, 830, CEP 79.106-550, Campo Grande, MS, Brazil.
E-mail address of presenting author*: alexandre.araujo@embrapa.br

Introduction

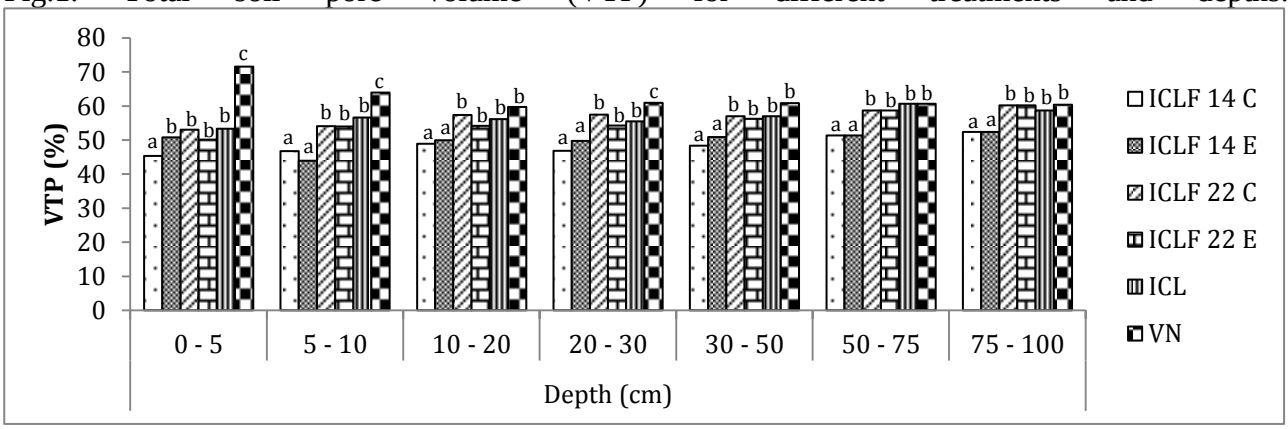
It is estimated that total porosity in soil varies from 0.30 to 0.70 m^3 m^{-3} and this characteristic or attribute is greatly influenced by use and management (FERREIRA, 2010). Study of the porous soil system is important for several features, among them, storage and water movement, root system development and soil resistance. This study aimed to assess the total soil porosity (VTP) at different depths and distances from the eucalyptus plant, established as single rows in ICLF systems in the Cerrado region of Brazil.

Material and Methods

The trial was carried out at Embrapa Beef Cattle Center (20° 26' S, 54° 43'W, 530 m asl), Campo Grande, MS, in a 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. The 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 as before, samples collected at 1m from the eucalyptus plant); ICLF 22 C (spatial arrangement of 227 trees/ha, samples collected in the center between two single rows of eucalyptus); ICLF 22 E (same as before, samples collected at 1 m from the eucalyptus plant); ICL (crop-livestock and no trees) and VN (natural Cerrado vegetation close to experimental area). The tree component was established in January, 2009 and the evaluations of total porosity (VTP) in December, 2014. VTP 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. Total soil pore volume (VTP) for different treatments and depths.



The smaller VTP values were observed in ICLF 14 C and ICLF 14 E treatments, while the highest values in the natural vegetation (VN), especially in the upper layers.

References cited

FERREIRA, M.M. (2010). In: Física do Solo. 298 p., Cap. I, p. 1-29.
EMBRAPA (1997) Manual de métodos de análise de solo.212p.

Acknowledgments

To EMBRAPA, CNPq and FUNDECT for support and funding.