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Stock of total organic carbon and total nitrogen in irrigated mango cultivation in the Brazilian semi-arid

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Abstract

The production systems of mango trees in irrigated areas of the Brazilian semi-arid lead to the loss of total organic carbon and, consequently, total nitrogen in the soil and may contribute to the liberation of greenhouse gases to the atmosphere. An experiment with mango trees (*Mangifera indica* L.) cv Kent was implemented testing intercropping with green manure and two soil management systems, leaving the biomass area on the surface or incorporated into the soil. After three years of cropping, the density and total organic carbon values and total nitrogen values in the soil layers were evaluated at 0-5, 5-10, 10-20 and 20-40 cm between or in between the mango tree rows. The stock of total organic carbon and total nitrogen were calculated with a conventional mango orchard as reference and a native forest (Caatinga). In all the layers of the soil, the cultivation of green manure had a positive effect on the carbon stock and nitrogen in relation to the conventional cultivation of mangoes and a negative influence in relation to Caatinga. After examing the layer of 40 cm, it was found that the cultivated mango trees with green manure stocked 24,08 Mg C ha^{-1} and 4,63 Mg N ha^{-1} in the soil, while the conventional mango cultivation stocked 12,65 Mg C ha^{-1} and 2,62 Mg N ha^{-1} and the Caatinga 35,06 Mg C ha^{-1} and 4,83 C ha^{-1}. Green manure can be a technological strategy to promote the increase of carbon and nitrogen stock in irrigated areas cultivated with mango trees in the Brazilian semi-arid, mitigating the emissions of CO_2.

Keywords: *Mangifera indica*, green manure, native forest