Agrochimica, Vol. LVIII - No. 1 January-March 2014

# Land use and canopy positions affect organic carbon pools and fertility of soils in lower Himalayan region, India

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*Received 18 December 2013 – Received in revised form 19 March 2014 – Accepted 24 March 2014*

*Keywords: available nutrients, carbon pools, fertility.*

*Abbreviations: SOC, soil organic carbon; SOM, soil organic matter.*

SUMMARY. – The research aimed to determine the role of land use and canopy position in improving soil organic carbon pools, physico-chemical and biological parameters. The study was conducted in a light-textured hyperthermic Udic Ustochrept soil of lower Shivalik, Himalayan region of India, under different canopy positions of *Terminalia chebula*, *Embilica officinalis*, *Mangifera indica* and *Psidium guvajava*. The highest soil organic carbon content near tree trunk was observed in *Terminalia chebula* (0.71%) and the lowest in *Emblica officinalis* (0.51%). Near tree trunk, very labile C was higher in *Mangifera indica* (0.39%) and lower in *Emblica officinalis* (0.25%). Zinc and iron showed significant variations with respect to land use. Bulk density varied from 1.32 to 1.45 g $cm^{-3}$. Pore space was 44.5% in surface soil of *Mangifera indica*, and 40% at 30-45 cm depth in *Terminalia chebula*.

INTRODUCTION. – Soil organic matter (SOM) depends on the inputs of organic matter to the soil (roots, crop residues, and manures) and the extent to which such organic sources are broken down and mineralized, a process that is mediated by adequate soil moisture and ambient temperatures (PARTON *et al.*, 1987). The soil organic carbon (SOC) pool consists of labile and stable pools with varying residence time. Labile C pool, with rapid turnover rate, is an important energy source for the soil food web and thus influences nutrient cycling for maintaining soil quality and its productivity (CHAN *et al.*, 2001; LAUDICINA *et al.*, 2013). Passive or recalcitrant pool is very slowly altered by microbial activities (SHERROD *et al.*, 2005). Labile C pool is more sensitive to tillage, manuring, fertilisation, crop rotation and other interventions than TOC (HEITKAMP *et al.*, 2009; LAUDICINA *et al.*, 2013). Changes in labile

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