# Long term impact of poplar and eucalyptus based agroforestry systems on physico-chemical properties and nutrient status of soil in north-western India

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**Abstract**

The present study was conducted to compare the depth-wise (0-15, 15-30, 30-45 and 45-60 cm) distribution of physico-chemical properties and nutrient status of soil under seven land use systems *viz.*, poplar (*Populus deltoides* Bartr.) + fodder wheat rotation (T1), eucalyptus (*Eucalyptus tereticornis* Smith) + fodder wheat rotation (T2), sole fodder-wheat rotation (T3), poplar + citrus (kinnow) (T4), eucalyptus + citrus (T5), sole citrus (T6) and fallow land (T7) in district Hoshiarpur, Punjab, India. Tree based agroforestry systems had significantly lower pH and higher EC as compared to T7. The cation exchange capacity ranged from 10.91-18.55 cmol kg$^{-1}$ in 0-15 cm soil depth and was highest in T1. Bulk density was higher in subsurface layers than the surface layer. Water holding capacity was the highest in T1 and lowest in T7. In fodder-wheat systems, T1 had highest available N (69.2 - 115 kg ha$^{-1}$) in all the soil depths. The available P and K were 74.3 and 73.6%, respectively higher in T1 as compared to T7 in surface depth. Similarly, DTPA-extractable Fe, Mn, Zn and Cu were highest in T1 and lowest in T7 in various soil depths and decreased with increase in depth.

**Keywords:** Agroforestry systems, Cation exchange capacity, Macronutrients, Micronutrients, Water holding capacity