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REFERENCE TO AGRICULTURE**

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First page of paper “Impact of different land use on bulk density and other physical properties of soil

Impact of different land use on bulk density and other physical properties of soil

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ABSTRACT

An understanding of the effects of land-use and land-use changes on soil properties is a pre-requisite for ensuring the sustainability of the environment and for better soil quality management. A study was conducted in Fruit Research Farm, Punjab Agricultural University, Ludhiana to evaluate the influence of land-use on soil organic carbon and physical characteristics. Four adjacent land uses namely: Bare, Paddy-wheat, Grassland and Pear were selected to evaluate their effects on different soil properties viz. Soil organic carbon (SOC), bulk density (Db), aggregate stability (MWD), infiltration, saturated hydraulic conductivity (K_{sat}), and soil moisture retention parameter (S). The SOC content in the surface layer was maximum in pear soils and minimum in bare soils but in sub-surface layer, it was maximum in grassland and minimum in paddy-wheat soils. The wet stability of aggregates (MWD) was maximum in grassland soils for both surface (0.51 mm) and sub-surface (0.45 mm) soils. In the surface soils, pear and grassland soils have similar and minimum bulk density whereas the paddy-wheat soils have maximum bulk density. In the sub-surface layer, grassland soils have minimum bulk density whereas it was maximum for paddy-wheat soils. Grassland soils had higher infiltration rate and K_{sat} over the other land uses. In the surface soils, the soil moisture retention parameter (S) was maximum for the pear soils (20.8 %) but for subsurface soils, it was maximum for grassland soils (18.9%). The maximum value of positive correlation was obtained between infiltration rate (IR) versus MWD ($R^2=0.97$) and IR versus K_s ($R^2=0.97$) whereas the maximum value of negative correlation was obtained between K_s versus Db. Of the evaluated land uses, pear and grassland soils were more sustainable over the other land uses.

Keywords: Aggregate stability; Bulk density; Infiltration; Saturated hydraulic conductivity; Soil characteristics; Sustainability.