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### **Aggregate associated C and their stability under different agricultural land use systems of sub-mountainous districts of Punjab, north-west India**

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The study was conducted on soils from sub-mountainous districts of Punjab, two sites were selected in lower Shiwaliks foothills of Punjab locally known as Kandi area i.e., Takarla from District Shaheed Bhagat Singh Nagar and Mukerian from District Hoshiarpur. The results showed that at Takarla the proportion of macroaggregates in the size class 0.25 to 2 mm was higher in grassland and agro-forestry and proportion of microaggregates in the size class 0.1-0.25 mm was higher in agro-forestry and cropland and in Mukerian, among the different land-uses, the proportion of macro-aggregates in the size class 0.25 to 2 mm was higher in grassland and cropland and the micro-aggregates (WSA <0.25 mm), highest value was in agro-forestry followed by forestry, cropland and grassland. ). At Takarla and Mukerian macro-aggregate associated C ranged from 73.0 to 1378.2 and 106.3 to 8203 mg kg<sup>-1</sup>, respectively and micro-aggregate associated C ranged between 386.9 to 923.6 and 1249.7 to 2565.0 mg kg<sup>-1</sup>, respectively. Highly significant correlation found between aggregate stability and soil organic matter. The highest stability of aggregates under grassland could be due to highest amount of SOC as obtained from the higher root density in the surface soils. In grazed pasture soils, 70-80% of the above ground biomass is grazed and excreta returned as organic inputs. Pasture roots also contribute organic carbon to the soils, whereas in cultivated soils, most of the organic inputs are from crop debris. Macro-aggregates were richer in aggregate associated carbon at both the locations as compared to micro-aggregates. In conclusion, carbon sequestration seems to be more in agro-forestry at Takarla and in grassland at Mukerian. Climatic conditions and temperature also influenced carbon fractions at both sites. At Mukerian, values for carbon fractions were high as compared to Takarla, due to comparatively low temperature which decreases the rate of decomposition of soil organic matter in Mukerian. It is clear that land-use can influence soil health and these indicators are sensitive to cropping practices.

#### **Biography**

Rajwinder Kaur has completed her MSc in Soil Science with thesis entitled as, "Effect of different agricultural land uses on carbon sequestration in soils of sub-mountainous districts of Punjab" from Punjab Agricultural University, Ludhiana, India. Currently, she is working as a Soil Conservation Officer at Faridkot, Punjab, India. She is working on Conservation Techniques for efficient use of water (canal water and ground water) and Sustainable Agriculture. She has presented a poster at an international conference on "Sustainable agriculture for food and livelihood security".

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