Soil Organic Carbon Storage in Relation to Site Variables under Different Land Uses. (S05-tan102323-Oral)

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Abstract:

An understanding of site variable effects on the soil organic carbon storage (SOCS) is important to planning future land use for C sequestration and sustaining agriculture. This study was to clarify relations between the SOCS in the upper 30cm mineral soils and site variables under cropland, grassland, and forestland in Ohio. The data of the SOCS and site variables of 2137 pedons were derived from the Ohio Soil Survey Database and analyzed using SAS. The SOCS varied markedly with soil order: Mollisols were 9.4 (kg/m2), followed by Inceptisols 7.2, Entisols 5.6, Alfisols 5.4, and Ultisols 4.6. It was highly correlated with all site variables (p < 0.0001) and the strongest correlation presented in cropland and the weakest one in forestland. Poor drainage and heavy texture favored C sequestration in all land uses. The contribution of all site variables to the variation of SOCS was 55% in cropland, 51% in grassland, and 30% in forestland. The significance of each site variable was: soil order > drainage > texture > slope > elevation, of which elevation was proven ignorable under cultivation but significant under forests. The weaker correlations and less explainable variance observed in forestland suggest that actual controlling factors over SOCS differ from those in cultivated lands.

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