Land capability and classification of some shale-derived soils in the New Valley, Egypt.


Abstract:

Twelve soil profiles representing four locations (El-Kharga oasis, EL-Dakhla oasis, El-Zaiyat plain and Gharb El-Mawhub) in the New Valley governorate, were selected to give some information about morphological, physical and chemical properties of some shale-derived soils and to identify the soil taxonomic units of these soils with a special reference to their suitability for agricultural use. The texture class of the studied samples differs from sandy loam, silty loam, clay loam and loam to clay with a finer texture in El-Kharga, Gharb El-Mawhub and El-Dakhla and a coarser one in El-Zaiyat. Most of these samples are moderate to extremely strong saline with moderate calcium carbonate and low organic matter in most locations. Gypsum content is low to moderate and tends to be lower in El-Kharga and El-Zaiyat. The cation exchange capacity (CEC) values of different soils are positively correlated to the fine particles content. Soil reaction (pH) tends to be slightly to moderately alkaline in most locations. Most soil samples have exchangeable sodium percentage (ESP) values less than 15%, except few soil samples at El-Kharga and EL-Dakhla. Free iron oxide content ranged between 0.46 and 11.07 % and did not show any consistent distribution pattern in the studied locations. Based on the morphological and analytical soil properties, the studied soil profiles were classified according to Soil Taxonomy as: a) Typic Torriorthents, b) Vertic Torriorthents, c) Typic Haplosalids, d) Gypsic Haplosalids, e) Sodic Haplotorrerts and f) Typic Salitorrerts. According to land capability classification, most of the soils under consideration are placed in classes (II and III). Most of these soils are affected by high limitation of salinity and sodicity levels.

Keywords:

Soil Properties, Soil Classification and Land Capability

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