

Sandy Soil Properties under Different Plant Cover Types in Drylands, Sudan

Authors : Rayan Elsiddig Eltaib, Yamanaka Norikazu, Mubarak Abdelrahman Abdalla

Abstract : This study investigated the effects of *Acacia Senegal*, *Calotropis procera*, *Leptadenia pyrotechnica*, *Ziziphus spina Christi*, *Balanites aegyptiaca*, *Indigofera oblongigolia*, *Arachis hypogea* and *Sesimum indicum* grown in the western region of White Nile State on soil properties of the 0-10, 10-30, 30-60 and 60-90 cm depths. Soil properties were: pH(paste), electrical conductivity of the saturation extract (ECe), total N (TN), organic carbon (OC), soluble K, available P, aggregate stability and water holding capacity. Triplicate Soil samples were collected after the end of the rainy season using 5 cm diameter auger. Results indicated that pH, ECe and TN were not significantly different among plant cover types. In the top 10-30 cm depth, OC under all types was significantly higher than the control (4.1 to 7.7 fold). The highest (0.085%) OC was found under the *Z. spina Christi* and *A. Senegal* whereas the lowest (0.045%) was reported under the *A. hypogea*. In the 10-30 cm depth, with the exception of *A. hypogea*, *Z. spina christi* and *S. indicum*, P content was almost similar but significantly higher than the control by 72 to 129%. In the 10-30 cm depth, K content under the *S. indicum* (0.46 meq/L) was exceptionally high followed by *Z. spina christi* (0.102 meq/L) as compared to the control (0.029 meq/L). Water holding capacity and aggregate stability of the top 0-10 cm depth were not significantly different among plant cover types. Based on the fact that accumulation of organic matter in the soil profile of any ecosystem is an important indicator of soil quality, results of this study may conclude that (1) cultivation of *A.senegal*, *B.aegyptiaca* and *Z. spina Christi* improved soil quality whereas (2) cultivation of *A. hypogea* or soil that is solely invaded with *C. procera* and *L.pyrotechnica* may induce soil degradation.

Keywords : canopy, crops, shrubs, soil properties, trees

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