



The Effects of Applying Treated Wastewater on the Physical and Mechanical Behavior of Soil-Root Interactions

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Wastewater reclamation and reuse has become an important element in

water resources planning, particularly in arid and semi-arid regions. Application of treated wastewater in slope stability or for protection against landslide, erosion and desertification, is an ecologically satisfactory solution under certain conditions.

This study consisted of three treatments of water as tap water, mixed tap water and wastewater (50%+50%), wastewater (100%), two plant species of Crassula (Crassula arborescens) and Haloxylon (Haloxylon ammodendron), a clay sandy loam soil, three normal pressure forces, in order to determine the soil shear resistance with eight replications. The results showed as the amount of wastewater in applied water increased, the number of root, mean root diameter, root surface area, its volume and total length significantly increased too. The results reveal some correlations between shear strength and plant physiological characteristics. The enhancement of shear strength for Haloxylon may arise mainly from the effect of root physiological characteristics; however, the woody structure of Crassula roots were more effective than the herbaceous structure of Haloxylon roots in stabilizing soil against slips and slides. This study shows that the application of treated wastewater affected the root characteristics and significantly contributes to the increase in soil shear strength.