

Shear Strength and Compaction Characteristics of Termite Mound Soil (TMS)

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Abstract

Termite mounds are common features of agricultural landscape of the tropical regions of the world, however, published scientific research on TMS in relation to surrounding soil and possible potential of TMS in agricultural production are scarce. The purpose of this study was to investigate effect of moisture content on compaction and shear strength of TMS with a view to comparing it with the surrounding. Standard laboratory methods were used to evaluate physical, chemical and strength properties of sampled termite mound soils and their surrounding soils. Results showed that the texture of a TMS varied from top to bottom of the mound and from that of the surrounding soil (R). There was less organic matter, organic carbon, and nitrogen in the TMS than in the R, however, there was higher phosphorus, calcium, potassium, magnesium and sodium. Similarly, consistency (Atterberg) limits of TMS were significantly higher than those of surrounding soils at 5% level of significance. Mean shear strength (cohesion) of TMS was higher than that of the R. The shear strength ranged between 63.11 and 120.11 kPa for experimental TMS while for the R it was between 40.52 and 72.46 kPa. The maximum shear strength of compacted (15 blows) TMS was 195 kPa at 12% (db) moisture content. The results of this study will be useful in characterizing TMS in relation to surrounding soil and also for assessing potential uses of TMS in agricultural production.

Keywords: Shear, Strength