

USE OF SATURATED HYDRAULIC CONDUCTIVITY IN EVALUATING SOIL AGGREGATE STABILITY

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Aggregate stability is an excellent accessory property of soil which indicates its susceptibility and resistance to erosion, surface crusting, swelling and shrinking. Kemper and Rosenau (1986) suggested that rather than aggregate size distribution simple procedure involving only one size fraction may be used in stability studies. Therefore, if a suitable aggregate size could be proposed the saturated hydraulic conductivity (K_s) of this particular fraction will be a valuable aggregate stability index.

The objective of this study was to propose the most appropriate aggregate size to evaluate structural stability using K_s for RBE soils (Rhodustalfs) of Sri Lanka. Soil aggregates obtained from Reddish Brown Earth soils (RBE) were separated to six aggregate classes ranging from 3 to 0.106 mm in diameter using dry sieving. These aggregates were filled into soil cores, saturated by capillary action and K_s was determined using a constant head device. During saturation and until steady state flow is achieved the soil aggregates breakdown making K_s an important aggregate stability index. Twenty seven replicates were measured for each aggregate size. The results indicated that the 0.5 to 1.0 mm aggregate size gave the least coefficient of variation of 15%. Therefore, in future aggregate stability studies using the K_s method for HBE soil this aggregate size is suggested.

References:

- Kemper, W.D. and R.C. Rosenau (1986). Aggregate stability and size distribution. In Methods of Soil Analysis Part 1. 2 ed. edited by A. Klute ASA.