



Evaluation of different aggregate stability methodologies for clay soils of semi arid landuses

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There are many methods of measuring the soil aggregate stability to establish relationships between stability and easily measurable physical and chemical soil properties. This study aimed to evaluate different aggregate stability methodologies for clay soils of semi arid landuses. Wet sieve methods using one sieve (FW: fast wetting, SW: slow wetting and MB: mechanical breakdown) were compared with a new wet sieve approach using multiple sieves (MSP: multiple separation process). The soil samples were taken from the surface layer (0- 15 cm) of three major landuses, which were forest, grassland and agriculture located on the landscape positions of the eroded summit and shoulder, back-slope, and toe-slope, respectively, and the Mean Weight Diameter (MWD, mm) was used to express aggregate stability. The results showed that the ability of methods in differentiating the soil aggregation among landuses were different. The MWD values of all landuses differed from each other statistically at the level of $P < 0.05$ when MSP was used for comparison. However, the methods of FW, SW and MB found no significant differences in the MWD values between landuses of grassland and agriculture. Additionally, for all research methods, the analysis of the Pearson correlation coefficients indicated that soil organic carbon and hydraulic conductivity were highly correlated with MWD values although clay contents of soils appeared insignificant. The latter was ascribed to the fact that the landuses under investigation had the comparable clay contents.

Key words: Aggregate stability, mean weight diameter, semi arid land uses, wet sieving

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