



Aggregate Stability and Erodibility of Purple Soil on Sloping Farmland as affected by different Soil Thickness

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Abstract [U+FF1A] Soil thickness is basic limiting condition for purple soil, not only due to its effect on crop production, but also its effect on soil structure. Steady-state of soil thickness will be achieved over time, as result the soil aggregate which the key factor of soil erodibility can be enhanced as well. However, the effect of soil thickness on aggregates stability and the characteristics of soil erodibility in sloping land have not yet fully understood. A field survey was conducted in hilly area of Sichuan region located in southeast China to study the relationship between soil aggregate stability and soil erodibility on sloping farmland under different four thickness (100cm, 80cm, 60cm, 30cm) of purple soil. Based on two different sieving methods (Dry and Wet sieving), we analyzed soil aggregate stability and its effect on soil erodibility within depth of 0-30cm soil layers. The results indicated that: Water stable aggregate on sloping farmland was ranged between 37.9% to 58.6%, where it increased with increasing the soil thickness. Moreover, fractal dimension calculated from dry-sieving and wet-sieving was 2.06-2.49 and 2.70-2.85 respectively, where it decreased with decreasing the soil thickness. The overall soil erodibility was 0.05-1.00 and a negative significant correlation was found between soil aggregate stability and erodibility ($P < 0.01$). Moreover, farmland with thick soil profile tended to be high in soil erodibility within the top soil layer (0-30cm). The results reveal that soil thickness can affect soil aggregate stability as well as erodibility. As soil thickness increased, the top soil became more stable and less erodible.

Keywords [U+FF1A] purple soil; soil thickness; soil aggregate [U+FF1B] soil erodibility