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Soil and Water Research

Temporal variations of runoff and sediment in different soil clay contents using simulated conditions

Bashari M., Moradi H.R., Kheirkhah M.M., Jafari-Khaledi M.:

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[fulltext]

Soil clay content (SCC) plays an essential role in the processes of infiltration, seal and crust formation, runoff, and soil erosion. The role played by SCC in water erosion has received much attention in recent years. Hence, in order to investigate these effects on a small scale, a simulation experiment was conducted. Soil lacking clay content was combined with 0, 10, 20, 30, 40, and 50% of clay soil, respectively. The experimental setup consisted of rectangular metal plots (1.5 × 1 m) comprising soil with selected combinations of clay content, placed at a 9% slope. Six treatments, three replicates each (totally 18 plots), were exposed to simulated rainfall at an intensity of 70 mm/h for 30 min. The results were compared by means of statistical tests. General trends in runoff volume were similar for different SCCs and decreasing and increasing trends were achieved for sediment and runoff, respectively. The results showed significant differences in the hydrological and erosional responses of these soils based on their clay contents. The soils with intermediate clay content were more resistant to erosion

and had lower values of the runoff. Finally, time had significant ($P < 0.00$) effects on both runoff and sediment production during the rainfall.

Keywords:

clay; erosion plot; rainfall simulator

[fulltext]