

Effects of Adding Gypsum in Agricultural Land on Mitigating Splash Erosion on Sandy Loam and Loam Soil Textures, Afghanistan

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Abstract : Splash erosion in field has affected by factors; slope, rain intensity, soil properties, and plant cover. And also, soil erosion affects not only farmland productivity but also water quality downstream. There are a number of potential soil conservation practices, but many of these are complicated and relatively expensive, such as buffer strips, agro-forestry, counter banking, catchment canal, terracing, surface mulching, reduced tillage, etc. However, mitigation soil and water loss in agricultural land, particularly in arid and semi-arid climatic conditions, is indispensable for environmental protection and agricultural production. The objective of this study is to evaluate the effects of adding gypsum mineral on mitigating splash erosion caused by rain drop. The research was conducted in soil laboratory Badam Bagh Agricultural Researching Farm, Kabul, Afghanistan. The stainless steel cores were used, and constant water pressure was controlled by a Mariotte's bottle with kinetic energy of raindrops $2.36 \times 10^{-5} \text{J}$. Gypsum mineral was applied at a rate of 5 and 10 t ha^{-1} and using a sandy loam and loam soil textures. The result was showed an average soil loss from sandy loam soil texture; control was 8.22%, 4.31% and 4.06% similar from loam soil texture, control was 7.26%, 2.89%, and 2.72% respectively. The application of gypsum mineral significantly ($P < 0.05$) reduced dispersion of soil particles caused by the impact of raindrops compared to control. Therefore, it was concluded that the addition of gypsum was effective as a measure for mitigating splash erosion.

Keywords : gypsum, soil loss, splash erosion, Afghanistan

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