

How Different Are Effects of Vinass Biochar on Soil Erosion in Loess and Marl Soils?

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Abstract

Nowadays soil erosion control using different amendments has grown up worldwide. However, application of transformed materials like biochar has not been adequately studied. In the same vein, application of biochars produced from waste materials which harm nature, and impose cost to managers and producers is a valuable approach for optimal utilization of the resources. Towards this, the performance of a biochar produced from deleterious raw vinass as the main by-product of sugarcane industries in controlling soil splash and interrill erosions on two marl and loess soils from Iran was investigated. The study was performed in 0.5 m×0.5 m plots in three replicates installed in the field with a slope steepness of 25% subjected to a simulated rainfall with intensity of 50 mm h⁻¹ and 0.5 h duration. Analysis of the results obtained from the splash and interrill erosions during the rainfall-runoff process showed that biochar decreased soil loss compared to the control plot on Marl soil, but to a small extent ($p > 0.05$). However, the plot treated with biochar on the loess soil revealed significant ($p < 0.05$) reduction in soil loss in comparison with that of the control plot. That study clearly demonstrates the addition of biochar may promote stability and limit both runoff and soil erosion. However, such effects strongly depend on the type of soils.

Keyword: Erosion Control, Rainfall Simulation, Field Experiments, Soil Conservation, Soil Stabilizers

Maraveh-Tapeh



Marzan-Abad



Locations of the Marzan-Abad (marl soil) and Maraveh-Tapeh (loess soil) sites in Iran

