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The Effects of Some Organic Amendments on Sediment Yield, Splash Loss, and Runoff of Soils of Selected Parent Materials in Southeastern Nigeria

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Abstract : Soil erosion has been linked to stream sedimentation, ecosystem degradation, and loss of soil nutrients. A study was conducted to evaluate the effect of some organic amendment on sediment yield, splash loss, and runoff of soils of selected parent materials in southeastern Nigeria. A total of 20 locations, five from each of four parent materials namely: Asu River Group (ARG), Bende Ameki Group (BAG), Coastal Plain Sand (CPS) and Falsebedded Sandstone (FBS) were used for the study. Collected soil samples were analyzed with standard methods for the initial soil properties. Rainfall simulation at an intensity of 190 mm hr-1was conducted for 30 minutes on the soil samples at both the initial stage and after amendment to obtain erosion parameters. The influence of parent material on sediment yield, splash loss and runoff based on rainfall simulation was tested for using one way analyses of variance, while the influence of organic material and their combinations were a factorially fitted in a randomized complete block design. The organic amendments include; goat dropping (GD), poultry dropping (PD), municipal solid waste (MSW) and their combinations (COA) applied at four rates of 0, 10, 20 and 30 t ha-1 respectively. Data were analyzed using analyses of variance suitable for a factorial experiment. Significant means were separated using LSD at 5 % probability levels. Result showed significant ($p \leq 0.05$) lower values of sediment yield, splash loss and runoff following amendment. For instance, organic amendment reduced sediment yield under wet and dry runs by 12.91 % and 26.16% in Ishiagu, 40.76% and 45.67%, in Bende, 16.17% and 50% in Obinze and 22.80% and 42.35% in Umulolo respectively. Goat dropping and combination of amendment gave the best results in reducing sediment yield.

Keywords : organic amendment, parent material, rainfall simulation, soil erosion
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