



A multi-purpose rainfall and runoff simulator for soil erosion and hydrological studies

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Rainfall and runoff simulation is frequently employed in soil erosion, hydrology and related processes studies. A rainfall and runoff simulator was constructed in Soil Conservation and Watershed Management Research Institute (SCWMRI), which is superior to other existing simulators in Iran. This simulator consists of some parts such as; water supply, rainfall boom, tilting flume, inflow generator, runoff collection and storage system, control keyboard and laboratory. Rainfall boom has 6 nozzles type BEX-S30W, which introduce a distribution of drop sizes. Rain Intensity can be controlled by water pressure, number of active nozzles, their distance and pattern, so different intensities ranges 35 to 125 mm/h are simulated with coefficient of uniformity more than 90%. Depending on rain intensity, mean drops diameter varies from 1.64 to 2.15 mm and terminal velocity ranges 5.70 to 6.78 m/s. Besides, the kinetic energy of falling drops varies from 16.24 to 22.97 J m⁻² s⁻¹. Tilting flume consists of inflow generator section, drainage part, slope control facility adjusting to 60%, and runoff collection system. Different stream powers can be generated by controlling the slope and inflow rate. This facility can simulate rainfall and or runoff separately or simultaneously. So, it is possible to study rain-driven and or flow- driven processes under laboratory conditions.

Keywords: Rainfall- runoff simulation, Pressurized nozzle, Tilting flume, Water erosion.