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Interrill erosion processes along a hillslope

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Soil erosion by water reduces soil's productivity and causes sedimentation in streams and reservoirs. Interrill erosion is a major source of soil loss for many cropping systems although awareness of this process is smaller than of rill erosion. Aim of the study was to analyze the effects of runoff on interrill erosion from a silt loam under controlled lab conditions. Two initial conditions (dry and wet soil surface), two rainfall intensities (40 and 60 mm h-1) and two slopes (2 and 7.5%) were investigated. To simulate the conditions of different sections along a hillslope two experiments were carried out: 1) simulations without additional runoff to reproduce conditions at the beginning of the slope (NR), and 2) simulations with additional runoff to reproduce conditions at lower parts of the slope (AR). The additional runoff corresponded to the fivefold amount of applied precipitation. Runoff, soil loss, splash water and splash sediment were measured throughout the 60-min duration of the experiments in 5-min intervals. The results showed that surface runoff under NR was more affected by rainfall intensity and under AR more by slope steepness. No difference in splash erosion were observed between both treatments. The amount of soil loss was generally greater under AR than under NR, but sediment concentration was lower. This affected also the particle size distribution of the sediment. When additional runoff was applied the percentage of finer particles decreased while the amount of coarser particles increased approaching the particle size distribution of the initial soil. This will mainly influence the transport of substances (like nutrients or pollutants) attached to soil particles.