



## **Rainfall simulation experiments: Influence of water temperature, water quality and plot design on soil erosion and runoff**

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Field rainfall simulators are designed to study soil erosion processes and provide urgently needed data for various geomorphological, hydrological and pedological issues. Due to the different conditions and technologies applied, there are several methodological aspects under review of the scientific community, particularly concerning design, procedures and conditions of measurement for infiltration, runoff and soil erosion.

This study aims at contributing fundamental data for understanding rainfall simulations in depth by studying the effect of the following parameters on the measurement results:

1. Plot design - round or rectangular plot: Can we identify differences in amount of runoff and erosion?
2. Water quality: What is the influence of the water's salt load on interrill erosion and infiltration as measured by rainfall experiments?
3. Water temperature: How much are the results conditioned by the temperature of water, which is subject to changes due to environmental conditions during the experiments?

Preliminary results show a moderate increase of soil erosion with the water's salt load while runoff stays almost on the same level. With increasing water temperature, runoff increases continuously. At very high temperatures, soil erosion is clearly increased. A first comparison between round and rectangular plot indicates the rectangular plot to be the most suitable plot shape, but ambiguous results make further research necessary.

The analysis of these three factors concerning their influence on runoff and erosion shows that clear methodological standards are necessary in order to make rainfall simulation experiments comparable.