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The influence of rainfall factors on soil resistance to erosion

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For the purposes of researching the influence of rainfall factors on soil shear strength, i.e. soil erosion resistance, research was conducted on plots measuring 1.0x0.3 m at a slope of 15°, with equally prepared soil. It's been carried out 12 rainfall simulations with different values of rainfall factors (rainfall intensity and drops diameter). These simulations were carried out with a modified rain simulator with sprayers by Živanović et. al (2021). The analysis of the uniformity of the prepared soil, as well as the examination of the influence of simulated rainfall factors on soil erosion, was carried out by measuring with a pocket vane tester (Eijkelkamp M1.14.10.E). The measurement was carried out at 30 regularly spaced locations on every plot, immediately after the simulation was completed. Also, the measurement was carried out after 24 hours in three places (upper, middle and lower third of the plot). Spatial distribution of measured values was assessed by Christians' coefficient of uniformity CU. The measured shear strength values of the prepared soil range from 2.1 to 6.9 kN/m^2. The shear strength values immediately after the simulation range from 0.4 to 5.4 kN/m^2, while after 24 hours they range from 2.4 to 8.1 kN/m^2. The CU values of the prepared soil range from 68% to 81% (average 75%). Immediately after the simulation, Cu values range from 73% to 83%, while after 24 hours, from 69% to 91%. In general, there is a clear trend of decreasing values measured with the pocket vane tester from the top to the bottom of the plots. Also, the influence of the change in soil moisture on the values of soil shear strength was observed. The change in rainfall factors affects the change in soil resistance to erosion.