



Low frequency – high magnitude simulated rainfall events to determine soil losses under scrubland cover in eastern Spain. 1. Summer dry conditions.

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The use of simulated rainfall can shed light on the erosional processes under low frequency – high magnitude events. Erosion rates measured on scrublands at the Soil Erosion Experimental Station of El Teularet-Sierra de Enguera since 2003 demonstrated that soil erosion on scrubland is low or negligible during dry years. Natural rainfall events did not surpass 100 mm in one day or 40 mm in one hour during the four years of the study. However, historic events of 600 mm in 48 hours (21-22 October 1982) and > 60 mm in one hour were measured during the last 40 years at Sierra de Enguera. Rainfall simulation experiments using a 70 mm h⁻¹ rate for one hour on 1 m² plot at were conducted on 24 plots during the summer 2006 at the Sierra de Enguera sites. The results show an extremely high soil infiltration capacity, as 13 of the 24 plots did not have any runoff and the other 11 had runoff rates < 20 % of the total rainfall, with a mean runoff coefficient of 3 %. Average sediment concentration was 0.89 g l⁻¹ with the highest values reaching 3.44 g l⁻¹, and total soil loss was < 0.02 Mg ha⁻¹. This study simulate an intense thunderstorms on dry summer soil (< 5 % soil moisture at 0-4 cm depth) on dense vegetated (> 90 % plant cover), sandy loam soils with a cover of 3-4 cm of litter, and > 5 % soil organic matter. Our results indicate that surface runoff in these scrublands is negligible at pedon scales, and consequently erosion rates are low. Rainfall simulation experiments should be conducted

during the wet periods in order to determine if runoff and soil loss occurs under wet soil conditions.