



## **Simulated Rainfall experiments on burned areas**

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Simulated Rainfall experiments were carried out in a Mediterranean area located in Italy, immediately after a forest fire occurrence, to evaluate the effects of forest fire on soil hydraulic properties, runoff and erosion. The selected study area was frequently affected by fire in the last years. Two adjacent 30 m<sup>2</sup> plots were set up with common physiographic features, and the same fire history, except for the last fire, which burned only one of them. Since both plots were previously subject to the passage of fire 6 years before the last one, one compares the hydrologic response and erosion of an area recently burned (B00) with that of an area burnt 6 years before (B06). Several rainfall simulations were carried out considering different pre-event soil moisture conditions where each rainfall simulation consisted of a single 60 minute application of rainfall with constant intensity of about 76 mm/h. The results show runoff ratio, evaluated for different pre-event soil moisture conditions, ranging from 0 to 2% for B06 plot, and from 21 to 41% for B00. Runoff ratio for the recently burned plot was 60 times higher than for the plot burned six years before, under wet conditions, and 20 times higher, under very wet conditions. A large increase in sediment production also was measured in B00 plot, as compared with that in B06 plot. Suspended sediment yield from B00 plot was more than two orders of magnitude higher than that from B06 plot in all the simulated events. The high runoff and soil losses measured immediately after burning indicate that effective post-fire rehabilitation programs must be carried out to reduce flood risk and soil erosion in recently burned areas. However, the results for the plot burned six year prior show that recovery of the hydrological properties of the soil occurs after the transient post fire modification.