Book of Abstracts

Wageningen Soil Conference 2015

'Soil Science in a Changing World'

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CHANGES IN SOIL INFILTRATION RATES AFTER WILDFIRES INTHE SERRA DE GROSSA AND THE MASSÍS DEL CAROIG, EASTERN SPAIN

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Wildfires are recurrent under Mediterranean climatic conditions due to summer droughts, vegetation characteristics and human activities. Fire disturbs soil properties and removes vegetation and covers the soil with an ash bed for some weeks.
Water infiltration is the key hydrological process to understand the impact of wildfires on the hydrological cycle, as infiltration is the process that partitions rainfall into surface and subsurface flow. Fire affects the soil water relationships and contributes to the changes in soil infiltration rates. Although this process is already well-know, there is a lack of long-term measurements, which is the objective of this research.
In order to determine how fire and post-fire changes control the soil properties we selected 10 research sites in the study area of La Costera inthe Serra Grossa and the Massis del Caroig in Eastern Spain, that all suffered from recurrent wildfires for decades. The parent material is Limestone and the mean annual rainfall ranges from 480 to 550 mm. Vegetation is characterised by dense scrubland (maquia, Quercus coccifera, Pistacia lentiscus, Juniperus oxycedrus, etc.), and Pinus halepensis (Aleppo pine). The study sites were selected in the middle parts of the slopes (straight tram) and rainfall simulation experiments (55 mm h-1 during one hour) and cylinder infiltration measurements were carried out. At each research site 10 measurements were carried out. Each site was selected upon the last registered fire: 0, 1, 5, 9, 16, 24, 33, 44, 51, and 63 years ago. The measurements were carried out in August 2014 under very dry conditions. The results show that immediately after the wildfires the infiltration rates were higher due to the ash cover (45.6mm h.1 as Steady-State Infiltration rate (fc in the Horton Equation), but that after one year the infiltration rates were reduced to very low values (22.45 mm). After this low infiltration rates recovered due to vegetation recovery which contributes to an increase in the infiltration rate which showed to be stable after 16 years.
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