

Fire impact on soil hydrology in Mediterranean groves and orchards

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Abstract

Fire has been used in the Mediterranean orchards and groves to remove the pruned branches. The EU policies promote the use of chipped pruned branches to promote the restoration of the soil system. Soils under the use of fire to burn the chipped pruned branches use to be bare and induce high erosion rates and loss of water due to surface wash. On the other hand, the soils covered with chipped pruned branches show higher erosion rates. Moreover, farmers use to light a fire on the leaf cover during winter to maintain “clean” the soil which results in a bare soil surface. This research investigates the impact of chipped pruned leaves and burnt leaves on soil water infiltration in the soils of persimmon plantations in Valencia, Spain. We selected 10 paired plots to compare chipped pruned branches with mulch-covered soils and ask for covered soils. The measurements were done in January and August 2022. We used a single-ring infiltrometer. Ten samples per site were carried out. The results show an increase in infiltration in the areas where chipped pruned branches were used. The use of fire resulted in a reduction in soil infiltration capacity. The use of mulches has been found in Mediterranean orchards as a sustainable practice (Cerdà et al., 2018^a, b; 2021; López-Vicente et al., 2020), and is a positive nature-based solution (Keesstra et al., 2018).

Keywords: Fire, Soil, Infiltration, Orchards, Mediterranean.

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Acknowledgments: This research was funded by REACT4MED: Inclusive Outscaling of Agro-Ecosystem Restoration Actions for the Mediterranean. REACT4MED Project (Grant Agreement No. 2122) financiado por PRIMA, un Programa apoyado por Horizon 2020, European Union's Framework Programme for Research and Innovation info@react4med.eu. SECOMAL AICO/2021/68 Soil Erosion Control in Mediterranean Agriculture Land. Conselleria d'Innovació, Universitats, ciencia i societat digital. Firelinks EU Cost Action 18135.