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Soil water repellency in Portuguese eucalypt stands during the first two years following wildfire

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The present study wants to contribute to the knowledge of the spatio-temporal variations of topsoil water repellency following wildfire in eucalypt forest, in particular the commercial plantations that now constitute one of Portugal's predominant forest types.

Topsoil water repellency was monitored on about thirty occasions over a 2-year period, starting in September 2005, six weeks after a moderately severe wildfire. This was done, on mostly alternating dates, in two neighbouring commercial eucalypt plantations, one with an undisturbed and one with a ploughed soil profile, in the foothills of the Gralheira Massif in north-central Portugal. Water repellency severity was measured *in situ* at soil depths of 2-3 and 7-8 cm using the ´Molarity of an Ethanol Droplet' (MED) test, and accompanied by soil moisture measurements using a ThetaProbe™ or, at a few occasions, sample analysis in the laboratory for gravimetric content.

Whereas the results from the second year after the wildfire are still being analysed, those from the first year show a broadly seasonal pattern of overall very high water repellency in dry periods and reduced or no repellency following prolonged rainfall. This was more pronounced at the undisturbed compared to the ploughed site, as the latter exhibited strong to extreme water repellency at almost all sampling dates. Significant changes in repellency severity, including major increases, occurred within periods as short as 6-7 days, suggesting that the sampling intervals used here may have not captured the full dynamics of topsoil repellency. Repellency severity was con-

sistently lower at greater soil depth, in particular when considering the whole study period. Soil moisture was found to relate to the temporal variations in repellency. As found in previous studies, however, soil moisture alone was not sufficient to predict the temporal variations in water repellency.