Geophysical Research Abstracts
Vol. 12, EGU2010-334, 2010
EGU General Assembly 2010

Formation of post-fire water-repellent layers in Monterrey pine (Pinus radiata) plantations in south-central Chile.

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A wildfire burned around 15,000 ha of Monterrey Pine (Pinus radiata) plantations near Yungay, Chile, in January of 2007. Post-fire water repellency (hydrophobicity) was measured using the water-drop-penetration-time (WDPT) method at depths of 0, 5, and 10 mm from the soil surface. These measurements were collected on burned sites of both young (4-years old) and old (11-years old) plantations sampling both sand- and clay-rich soils. Water repellency was also measured one year after the wildfire on four unburned sites representing the same soil types and plantation ages as those occurring on the burned sites. These measurements were taken for comparison purposes. While water-repellent layers were documented on the burned sites, these layers were not found on the unburned sites. Significant differences in thickness and deepness of post-fire water repellent layers were found across most treatments. Several important management implications can be discerned from the results of this study, since a significant portion of Chile is compound by fire-adapted exotic species.