THE EFFECT OF HYDROPHOBIC SOILS ON INFILTRATION, RUNOFF, AND EROSION IN WILDLAND SOILS

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Hydrophobic substances alter the infiltration responses of many wildland soils, particularly following fire. Curves describing infiltration, runoff, and sediment loss for typical wettable soils are of limited usefulness when describing these hydrologic processes in soils containing a hydrophobic layer. Although the distribution and severity of water-repellent soil layers varies widely among different soils, some generalizations have emerged from a wide range of studies on hydrophobic soils. This paper synthesizes published information into some generalizations about the effects of water-repellent layers on infiltration and runoff and presents runoff hydrographs and sedigraphs for specific forest soils subjected to simulated rainfall. Runoff and sediment delivery was measured during a sequence of dry, wet, and very wet simulated rainfall trials on three California forest soils. Two hydrophobic sandy loam soils generated the greatest amounts of runoff and soil loss.