

## COMBATING HYDROPHOBICITY IN THE REVEGETATION OF HYDROCARBON-IMPACTED SOILS

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Hydrophobicity is caused by the coating of soil particles with hydrophobic or “water repelling” organic matter such as crude oil hydrocarbons. Studies have shown that the tendency for soils to become hydrophobic from contact with crude oil is dependent on a combination of factors including: 1) the proportion of heavy hydrocarbons; 2) the dryness of the soil at the time of first contact with hydrocarbon; and 3) the amount of exposure to hot dry weather and ultraviolet light. Studies have also shown that hydrophobicity in soils inhibits revegetation because the soil will not hold water. Preferential flow paths are created that allow water to bypass certain zones.

Hydrophobicity can be counteracted by hydrophilic organic matter (hay or composted manure, for example) and hydrogels which increase water-holding capacity and contact between hydrophobic soil particles and water making them more likely to wet. Hydrogels have been used in the nursery and landscaping industries for many years to ensure availability of water to new seedlings and plant stock. Hydrogels have also been recommended by the USDA to help facilitate germination of seeds during revegetation of disturbed sites in semi-arid regions.

We have conducted an investigation of the effect of hydrogels plus stable organic matter on remediation of a spill of 42° API crude oil in a pasture in a randomized block study with various treatments in triplicate in an area with an average 36 inches of rain. Although the hydrogels had little effect on rates of bioremediation, revegetation (as measured by above ground biomass and canopy cover), was markedly improved by hydrogels.

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