USDA NRCS Natural Resources Conservation Service FACT SHEET

WHAT ARE HYDROPHOBIC SOILS?

DEFINITION: Wildfires burn dead and living vegetation that accumulates on the surface of the soil. This burning produces volatile hydrophobic substances which can penetrate the soil up to a depth of six inches. When these substances penetrate the cool soil, they condense and coat the soil particles making the soil hydrophobic (water repellent).

PROBLEM: Soils that water repellent exhibit a decreased water infiltration rate and an increased water runoff rate, creating extreme soil erosion potentials. Initially, rain and irrigation water will run off hydrophobic soils instead of infiltrating and promoting germination of seed and growth of roots. This makes it difficult to establish a stand of vegetation on a hydrophobic soil for erosion control purposes.

Water repellency will be the worst where the fuel and burn temperatures were extreme, especially around buildings which burned to the ground.

TEST: Field checking for water repellent soil conditions can be done by digging a shallow trench with a vertical wall and applying water droplets from the surface down in centimeter increments. If water sits as a ball on the soil for 10 to 40 seconds, it is moderately hydrophobic. If more than 40 seconds, it is strongly hydrophobic.

TREATMENT: On gentle slopes, home owners may hoe the soil a few inches deep to break up the hydrophobic layer. This will allow rain or light irrigation waters to penetrate the soil surface for seed germination and root growth.

On steeper slopes, lightly spray the soil surface with a soil wetting product (surfactant.) This will break up the hydrophobic substances coating soil particles the way dishwashing detergent breaks up grease. Then rain and irrigation water can penetrate the soil readily. Soil wetting products can be purchased at a lawn and garden store or a golf course supply store.