ties. Experience has shown significant inconsistencies among soil scientists in different parts of the country in making such interpretations.

Since surface texture and structure are major factors governing normal infiltration of water in bare soils, the U.S. system of soil taxonomy is poorly suited to provide criteria for predicting these properties in the higher taxa of the system. This is especially true of an extensive group of soils in California that are covered by a dense cover of xerophytic shrubs, known as chaparral, where the normal relationship between surface texture and infiltration does not apply. These soils become highly repellant to water when this vegetation is burned at a high temperature. Site-specific data are essential to predict their hydrologic behavior under these circumstances.

DeBano (1979) has shown that such repellancy is caused by the precipitation of hydrophobic organic substances on mineral soil particles within the upper soil horizons. It is inversely proportional to the surface area of the topsoil. Thus, coarse-textured soils tend to become more repellant than those of finer texture when this vegetation is burned. This diminished permeability is a major factor in causing severe runoff, erosion, and sediment production on many California watersheds.

Wieslander and Gleason (1954) and Wieslander and Jensen (1946) have identified 8.5 million acres of chaparral and 2.0 million acres of similar coastal sagebrush vegetation in California. These occur mostly on steeply sloping Alfisols, but include Entisols, Inceptisols, and Ultisols in the foothills of the Sierra Nevada and coastal mountains. These are probably comparable areas of dense xerophytic shrub vegetation throughout the world that modify hydrologic soil properties in a similar manner when burned.

References

Becoming a Pedologist

Richard W. Arnold

Let me talk a little bit about being a soil scientist. No, that’s not correct—I mean a pedologist. Pedology is the heart, soul, and artistry of soil science.

Heart because it is the pump, the vital organ that gives life. It integrates all the components of soils in their landscapes and nourishes them to grow and change with a majesty seldom appreciated by most of mankind.