Chapter 9

Adjustment of the Universal Soil Loss Equation for Cropland Soils Containing Coarse Fragments

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Soils with a significant content of coarse fragments are common in some parts of the United States and at various locations throughout the world. These fragments can greatly affect the erosion of such soils. Generally, the erosion rate is lessened as the surface cover of coarse fragments increases. Surface cover is important in reducing soil erosion by water because it dissipates raindrop impact energy, it reduces the area of erodible surface causing flow energy to be dissipated on nonerodible fragments, and it slows the velocity of runoff flow. However, the inherent erodibility of the soil is associated with the soil particles smaller than about 2 mm (sand, silt, and clay). Normally, a soil increases in erodibility with an increase in silt fraction regardless of whether the corresponding decrease is in the sand or clay fraction (Wischmeier et al., 1971). Organic matter ranks next to particle size distribution as an indicator of erodibility. Also, soil erodibility is a function of complex interactions of a substantial number of its physical properties and may vary within a standard textural class. Data from 17 soils on 50 sites indicated that soil structure and the size of the soil reservoir for storing water also have a significant effect on soil erodibility (Barnett and Rogers, 1966).

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