

Relationship of soil dispersibility to infiltration and erosion of southeastern soils

ABSTRACT

Fifteen agricultural topsoils from Georgia were subjected to simulated rainfall at high intensity in runoff pan studies. Infiltration over time and total soil loss were not related to soil texture, but were correlated with each other. Both infiltration and soil loss were highly correlated with several measures of soil dispersibility. Dispersible clay measured after 36 h of shaking at an 8:1 water:soil ratio and a dispersible clay index weighting clay dispersion by time were significantly related to both soil loss ($r = 0.88$ to 0.89) and infiltration ($r = -0.5$ to -0.6). Dispersion expressions derived from plots of log (undispersed clay) versus time had lower correlation coefficients, as did dispersion variables that included both silt and clay. The high percentage of clay that is dispersible in these soils appears to seal water transmission pores and reduce infiltration, as observed in sodic soils. Therefore, dispersion may be a fundamental soil property to be considered in erosion prediction and control.

Keyword: Soil dispersibility; Soil property; Erosion; Infiltration