



Characterizing aggregate stability and processes related thereto by the High-Energy-Moisture-Characteristics Method

Amrakh I. Mamedov (1) and Guy Levy (2)

(1) Selcuk University, Turkey and USDA-ARS, United States (amrakh03@yahoo.com), (2) ARO, Israel (vwguy@volcani.agri.gov.il)

Aggregate stability tests are commonly used to evaluate degradation in a range of soil functions and quality. Among the methods used to assess soil structure and aggregate stability is the high energy moisture characteristic (HEMC) method in which energy of hydration and entrapped air are the main forces responsible for breaking down of aggregates. Structure and aggregate stability is inferred, in quantitative terms, from changes in the pore size distribution (PSD) computed from water retention curves that are obtained at low suction (<50 cm H₂O tension). The observed changes in PSD can be associated with changes in apparent aggregates' size. Differences between water retention curves can, therefore, be used to identify which apparent aggregates' size, had been affected. Two case studies that evaluate the effects of (i) tillage history and (ii) use of a stabilizing agent (polyacrylamide) on aggregate stability of soils varying in texture (from loam to clay) are presented. The results highlight the potential of the HEMC method to shed light on the mechanisms responsible for the observed changes in aggregate stability resulting from the tested management practice.