Effect of Soil Aggregate Size Distribution on Water Retention. (S01-pachepsky152944-Oral)

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Abstract:

Soil aggregate distribution is an important characteristic of soil structure and, as such, has been expected to affect water retention. Our objective was to see whether and how aggregate size distributions affect water retention from saturation to the wilting point. Cumulative particle size and aggregate size distributions of Podzoluvisols, Planosols, Chernozems, Fluvisols, Calcisols, and Gleysols were used in regression trees to see which size boundaries can be used to break the data set into the least heterogeneous subsets as judged from values of water retention at matric potentials of -10, -33, and -1500 kPa as well as from van Genuchten's water retention parameters, all on gravimetric basis. Contents of either small aggregates (<0.25 mm, <0.5 mm, <1 mm) or large aggregates (>7 mm, >10mm) were the grouping variables in most cases for van Genuchten equation parameters. No aggregate size distribution parameters entered the regression tree for the -10 kPa water content. Contents of medium size aggregates affected -33 and -1500 kPa water contents. Aggregate size distributions, if available in soil databases or feasible to measure, can be useful in estimating soil water retention.

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