



A Brazilian soil hydraulic database and field capacity analysis

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Field Capacity (FC) is a widely-used concept by agricultural engineers, hydrologists and soil physicists to quantify the available soil water during growing seasons and the accessible soil water storage during intensive rainfall periods. In the field FC does depend on various environmental factors, including the soil hydraulic properties, rate of evapotranspiration, root density distribution, and groundwater level. Therefore world-wide different approaches are used to determine field capacity, based on both static and dynamic criteria. Dynamic criteria are usually related to the simulation of the soil internal drainage, until the percolation attains a negligible value. Recently Assouline and Or (2014) proposed a soil intrinsic characteristic length to determine the FC pressure head. This characteristic length is related to the loss of hydraulic continuity and is derived from the soil water retention function.

In Brazil soil hydraulic properties were not yet organized in a database. Therefore we collected existing data of unsaturated soil hydraulic properties across Brazil, using available PhD thesis and scientific publications. This inquiry resulted in a soil sample data set of 106 horizons. We fitted the soil hydraulic parameters (θ_r , θ_s , α , n , $g\lambda$ and K_s) of the Mualem-Van Genuchten (1980) function to all soil samples. Next we derived FC values based on soil internal drainage and using the characteristic length according to Assouline and Or (2014). The internal drainage is analysed with the agrohydrological model SWAP (Kroes and van Dam, 2008). In the poster we will present the Brazilian soil hydraulic database and the derived FC values.