CAZRI soil moisture calculator

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Soil moisture content mainly depends on sand and clay content of soil and also on organic carbon content. This relation between soil moisture and particle size distribution is strong in arid soils. The main purpose of the developed calculator is to estimate soil water content at two critical points: i) at 0.3 bar (field capacity) and ii) at 15 bar (permanent wilting point), which guides the amount of water to be irrigated. The difference in soil moisture content between these two critical points is the plant available water or available water capacity (AWC). More is the value of AWC signifies less is frequency of irrigation. Use of this calculator will lead to optimum use of water for irrigation in drylands.

The calculator was developed based on pedotransfer functions (PTFs), which estimate soil water content at FC and PWP from basic soil properties (Fig. 1). Arid region specific PTFs were generated at CAZRI based on the soil series database of Rajasthan and Gujarata.

Important features of the calculator

i) It estimates soil water content at 0.3 bar (FC) and 15 bar (PWP) from the data on sand content, clay content, organic carbon content and geometric mean diameter of soil particles (Dg).

ii) The calculator estimate soil water content on both point data and batch data and there is provision to save the results as a text file.

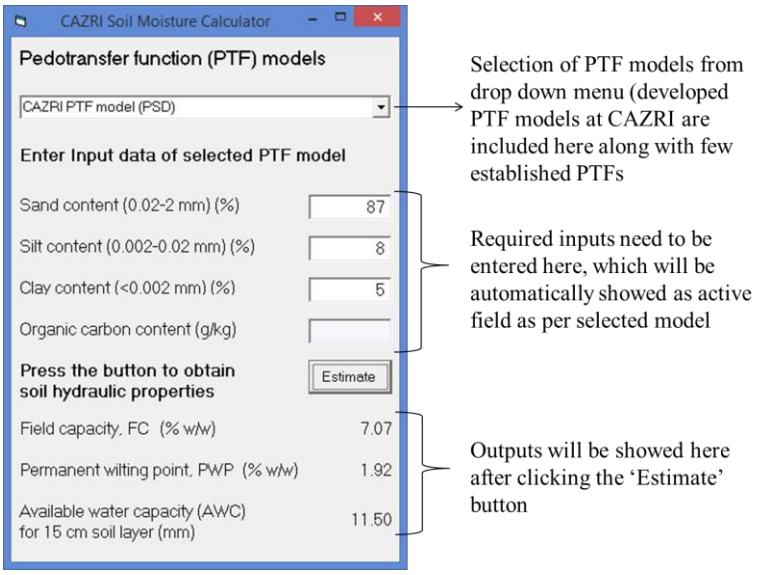

Fig. 1: Features of CAZRI soil moisture calculator

iii) It can also access the PTFs available in India as well as outside India for arid soils. If the user select for a particular PTF, estimation of FC and PWP will be based on those PTFs.

iv) It can also calculates the amount of water to be irrigated based on the desired level of soil moisture depletion

v) It can also access the database of arid western India to estimate soil water retention for a particular region.