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Abstract : The Mitidja plain in Algeria is one of the most important areas ensuring food security for the Algiers region and large parts of the country. To ensure a quality yield, large volumes of water are used for irrigation. Surface irrigation remains the predominant irrigation technique despite the development of modern methods. Assessment of the hydrodynamic properties of different soil types is essential to introduce modern irrigation techniques to avoid water losses. In this work, a field study was carried out to describe the water retention capacity of soils of the plain. The study was carried out on selected representative samples from 65 sites. The soil moisture and pressure matrix data were fitted to two classical and robust water retention models in order to describe the water retention curves. The results showed that the van Genuchten model was better suited than the Brooks and Corey model. A map showing the spatial distribution of available water in the soil was developed using a Geographic Information System (GIS). The eastern part of the Mitidja plain retains a low percentage of water compared to the western part of the plain. In the center part of the plain, soil water retention is highest. These results are useful to help farmers to establish rational irrigation scheduling methods. This work serves to improve irrigation management and water governance in the region to save and protect water resources while ensuring food security for the population.

KEYWORDS : Algeria ; Brooks and Corey model ; Irrigation ; Mitidja Plain ; Soil ; VanGenuchten ; ;Water retention curve.

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