



improvement of the efficiency of the olive tree water use in arid environment

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Drought, salinity, unfavourable temperature, and irradiance are some of the environmental constraints that make the Mediterranean environment vulnerable in terms of sustainability for agricultural systems. The olive tree (*Olea europaea* L.) is an evergreen tree and is one of the most important tree crops in Mediterranean agro ecosystems. Although, olive plant is well adapted to the Mediterranean environment several stress factors restrict its growth. Therefore, olive productivity at the end of the growing season expresses only a fraction of the plant's genetic potential. In Tunisia, this specie is present in the whole territory. However more of the two third of the olive tree area is localized in semi arid and arid zones. In these zones the olive tree prosperous in very variable microclimates where the yearly mean rainfall varies between 12 and 300 mm. To this weak rainfall level is added the seasonal precipitation irregularity as well as the frequency of the drought periods. The success of this plantation rests on the appropriated water management practices where the processes and techniques permit to exploit to the maximum the rain water and to reduce at the most his loss. In this paper, we will present the traditional system of water management practices in semi arid and arid Tunisian regions. Otherwise, the frequency of the drought periods to what is added the deterioration of the traditional grove maintenance practices, make that the recourse to the irrigation to be sometimes indispensable. In this setting, it is crucial to optimize the use of water supply by avoiding his loss and improving methods that allow reductions in water volumes supply by adopting different irrigation strategies. In this study we will describe results of some water supply methods inspired of the tradition used to improve the olive tree water state in arid conditions.