



Sap flow and hydraulic conductance of Olive trees

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Photosynthetic assimilation is controlled by the water flow dynamic and hydraulic conductance in the soil-plant-atmosphere continuum. An experimental investigation was carried out to study sap flow and the dynamic of hydraulic conductance changes during water stress of the two Olive tree cultivars Meski and Picholine grown in Tunisia. Olive tree cultivars were tested in a factorial combination of two irrigation regimes by dropper system, a well watered (T1) and stressed (T2), daily irrigated with a restitution of 100% and 50% of crop evapotranspiration (ET_c). Analytical and comparative study of the hydraulic conductance by sap flow and leaf water potential methods under various water conditions showed that:

- Under well watered regime, transpiration and hydraulic conductance were highest for the Meski cultivar, which resulted in largest water irrigation consumption. The mean sap flow reported during this experiment was for Meski and Picholine cultivars 40 and 30 L.j⁻¹ respectively. - In water stress (T2), hydraulic conductance levels were decreased for the Picholine and Meski cultivars by 40 and 80 % respectively. But, for the Picholine, sap flow and hydraulic conductance was very highest and most stable during the day compared to the Meski, and reflects the capacities of this Picholine cultivar to adapt to limiting irrigation water conditions. - Highly positive correlation between the sap flow, leaf water potential and evapotranspiration. Keywords: olive trees; sap flow ; hydraulic conductance; water potential