Water Saving Strategies in Mediterranean Areas

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Abstract

Mediterranean climate is associated with summer water scarcity and, consequently, with a general susceptibility to erosion, degradation, and desertification. Thin soils, with low water storage capacity, develop in slopes where all main factors for erosion can at its worst. The need for wise irrigation is crucial for human activities. Plant adaptation includes stomatal closure as a strategy to reduce water use improving plant survival, while reducing photosynthesis and control of leaf temperature. Other strategies at leaf level include reducing radiation interception and increasing sensible heat diffusion, for instance by developing small leaf size, high leaf reflectance and adapted positions towards sunlight. Another order of survival strategies to cope with summer water scarcity concerns the increase of water uptake at root level and hydraulic lift or water redistribution. Finally, irrigation efficiency and evapotranspiration efficiency also should be optimised. Several experiments were performed on olive orchards under the harsh summer conditions of South East Portugal. The results were consistent in several aspects related to water uptake: colonization of the inter-row space, qualitative and quantitative importance of hydraulic redistribution and water balance estimates from soil water content versus plant water use measured by a micrometeorological technique. In orchards under deficit irrigation, analysed in same study, water use was also quantified and parameters of stress coefficients functions were critically analysed.

Keywords: Water Strategies , Mediterranean Areas , evapotranspiration , water use