XI Congreso Ibérico de Agroingeniería
XI Congresso Ibérico de Agroengenharia
2021

Type of the Paper ***(Oral or Paper)***

Management of drip irrigated crops using a remote sensing approach at multiple scales. A case study of horticultural systems in Lis Valley, Portugal

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Abstract: Irrigation plays an important role in agriculture, with impact on land productivity and economic prosperity of farmers. Water management is complex but can benefit from remote sensing satellite images, which provide a monitoring of soil, crops and water, in harmony with the requirements of precision agriculture. This communication explores the application of remote sensing (RS) in irrigation management at district scale, aiming to improve water management in the plots, under the responsibility of farmers, and in collective distribution, managed by water users' associations. The study focused on two plots located in the Lis Valley Irrigation District, in Leiria, Portugal, representative of orchards and horticultural crops, both watered with drip irrigation. The methodology considered i) ground observations at plot scale of climate, soil, water and plant parameters, with portable instruments and collection of yield and socio-economic data (2019-2021); ii) assessment of data collected by Unmanned Aerial Vehicles (UAV's) (2021); and iii) analyze of temporal series obtained by satellite imagery, namely with Sentinel 2-A, 2-B and Landsat 8 (2019-2021). The ultimate objective of this work was the development and calibration of models based on RS resources, allowing to support agricultural management and optimize the use of water, energy and economic resources.

Keywords: irrigation; remote sensing; rational management of water; Sentinel 2-A and 2-B; Landsat 8; Lis Valley Irrigation District