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BOOK OF ABSTRACTS

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DEFICIT IRRIGATION STRATEGIES IN OLIVE ORCHARDS: INFLUENCE ON FRUIT QUALITY

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Abstract

In order to overcome constrains that affect olive groves and its socioeconomic value, new cropping practices focusing on water use efficiency were investigated. The study was conducted in Northeast Portugal and different deficit irrigation strategies (DIS) were investigated: regulated (RDI, 10% ET_c during pit hardening and 80% ET_c in the remaining stages), sustained (SDI, 27.5% ET_c), sustained usually applied by farmer (SDIAF, 21.2% ET_c) and fully irrigated (FI, 100% ET_c), as control treatment. The fruit metabolites fluctuations and quality parameters were evaluated. Using FI as reference, DIS treatments led to changes in the secondary metabolism in fruits with increased total phenolic compounds (+11% in SDIAF), ortho-diphenols (+25 in SDI and +44% in SDIAF), and flavonoids (+29% in RDI, +26% in SDI, +91% in SDIAF) concentrations, and higher total antioxidant capacity (+41% in SDI). DIS treatments influenced the profile of olive fruit phenolics with changes in oleuropein (-55% in SDIAF), chlorogenic acid and quercetin-3,4'-di-O-glucoside (non-detected in FI), eriodictyol-7-O-glucoside (+64% in RDI and +95% in SDI), and procyanidin A2 (+59% in RDI and -59% in SDIAF). Olive fruits from DIS treatments also showed higher fat content (22, 29 and 24 % in RDI, SDI and SDIAF, respectively). Fruits from RDI and SDI presented lower palmitoleic and linolenic acids, while no significant differences were observed in the concentrations of saturated, monounsaturated and polyunsaturated fatty acids. When subject to a puncture test in a texture analyser, all DIS fruits presented higher peel break force than FI control. This work show that DIS are essential for sustainable olive growing, as they do not compromise the competitiveness of the sector in terms of olive production and associated quality parameters.

Keywords: Antioxidant activity, climate change, *Olea europaea*, sustainability, water management.

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