

## Precision irrigation of five years date palm trees (Majdool variety) by applying Hydrus-2D software: Jericho area/West Bank (occupied Palestinian territories)

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Received 11 April 2022; Accepted 1 September 2022

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### ABSTRACT

In the West Bank, the agricultural sector accounts for the majority of water demand in the region. Where irrigated agriculture covers only 12% of the cultivated area of the West Bank it consumes around 65% of the total water resources. Most of the irrigated area of the Jordan Valley is under Majdool date palm trees, with a total number of about 250,000 trees, half of whom are younger than 5 y. Despite using drip irrigation, which is considered efficient and reduces water loss, improvement of the irrigation schedule can still be realized by a tailored management of the water demand of plants. In the Jordan Valley, the most important irrigated agricultural area in the West Bank, over-irrigation of the crops and trees is a common practice that causes the degradation of the groundwater aquifer systems. This study aims to use precise irrigation management to balance water demand with irrigation volumes to avoid water spillage. The Hydrus-2D package was used to develop an irrigation schedule for a 5 y date palm old. Model simulations show that farmers can schedule irrigation with less than the recommended volume of 20 m<sup>3</sup>/tree·y. By applying around 46% of the currently recommended volume, similar production levels could be obtained in terms of yield and biomass. We conclude that using precision irrigation scheduling, the water demand per tree reduces to a recommended rate of about 12.5 m<sup>3</sup>/tree·y increasing crop water productivity up to 2.63 kg/m<sup>3</sup> as opposed to 1.66 kg/m<sup>3</sup> with the traditional irrigation schedule. Additionally, less water drains beneath the root zone.

*Keywords:* Young date palm; Irrigation scheduling; Hydrus-2D; Jordan Valley

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Presented at the 1st Palestinian-Dutch Conference on Water, Sanitation and Hygiene (WASH), and Climate Smart Agriculture (CSA), 5–6 September 2022, Nablus, Palestinian Authority

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