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# بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني



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# جامعة عين شمس

التوثيق الإلكتروني والميكرو فيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغييرات



**SIMULATION MODEL FOR INTEGRATED  
SURFACE IRRIGATED PALM TREES  
MANAGEMENT IN NEW VALLEY  
GOVERNORATE**

By

**SHEREEN MAMDOUH ABDALLA RABOUH**

B.Sc. Agric. Sc. (Agricultural Engineering), Fac. Agric., Ain Shams Univ., 2009  
M.Sc. Agric. Sc. (On-Farm Irrigation and Drainage Engineering), Fac. Agric., Ain Shams Univ., 2017

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## ABSTRACT

**Shereen Mamdouh Abdallah Rabouh. Simulation Model for Integrated Surface Irrigated Palm Trees Management in New Valley Governorate. Unpublished Ph.D. Dissertation, Department of Agricultural Engineering, Faculty of Agriculture, Ain Shams University, 2022.**

Egypt has the majority of productivity of date palm fruit worldwide due to its nutritional, economic, and social importance to the Egyptians. Therefore, this study aimed to apply new technique such as simulation models for improving the distribution uniformity and the water application efficiency under different surface irrigation system techniques in order to select the proper decisions of integrated water management. Field experiments were carried out in two successive growing seasons of 2018-2019 and 2019-2020 on date palm (*Phoenix dactylifera*) at the Experimental Farm in El-Dakhla district, New Valley Governorate, Egypt. Modified surface irrigation with gated pips was used with three irrigation water distribution techniques :( Two-side furrows, basin and one side furrow with loop). The results revealed that the statistical indicators of  $R^2$  ( $> 0.9$ ), RMSE (nearest to 0) and E ( $> 0.9$ ) between measured and simulated advance time and recession time. However, data analysis indicated high satisfaction to use the software under the Egyptian conditions for furrow irrigation. In addition, data revealed that the highest values of yield, water use efficiency and distribution uniformity were (12.288 Mg/fed, 2.1 kg/m<sup>3</sup> and 90%) for one side furrow with loop technique comparing with two side furrows and basin (5.440 Mg/fed, 1.6 kg/m<sup>3</sup> and 87%) and (5.760 Mg/fed, 0.8 kg/m<sup>3</sup> and 68%) respectively.

**Keywords:** Application efficiency, distribution uniformity, gated pips, advance time, and recession time.



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