MODELING FOR MAXIMIZING LOW QUALITY WATER USE MANAGEMENT UNDER EGYPTIAN CONDITIONS

By

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B. Sc. Agric.Sc. (Agric. Mech.), Ain Shams University, 1997

M. Sc. Agric.Sc. (Agric. Mech.), Ain Shams University, 2003

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نمذجة الادارة لتعظيم استخدامات مياه الري منخفضة الجودة تحت الظروف المصرية

رسالة مقدمة من

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ABSTRACT

Amr Khairy Mahmoud Abd El-Wahab: Modeling for Maximizing Low Quality Water Use Management under Egyptian Conditions. Unpublished Ph.D. Thesis, Department of Agricultural Engineering, Faculty of Agriculture, Ain Shams University, 2010.

The shortage of good quality water resources is becoming an important issue in the arid and semi-arid zones. For this reason, the availability of water resources of marginal quality such as saline groundwater has become an important consideration. Nevertheless, the use of this water to irrigate lands has different effects on irrigation systems efficiency. Thus, the work aimed to test the influence of using three levels of saline water under two irrigation systems (trickle and mini-sprinkler) using three amounts of water on localized irrigation efficiency [ratio of clogging, absolute emission Uniformity and the irrigation water use efficiency]. *Calendula officinalis* L. and *Achillea millefolium* L. were used as test crops; also, invent a regression models to connect all parameters. Results indicated that values of Clogging Ratio under trickle irrigation system using high saline water are higher compared to the mini-sprinkler's values by 4.8, 5.7 and 2% respectively with water quantities. Moreover, the value for the Absolute Emission Uniformity under mini-sprinkler system is higher than the trickle irrigation's value by 3% using high saline water under low quantity of water; but with others quantities there are not any significant change at values. The mean average yield under trickle irrigation was higher than the mini-sprinkler irrigation by 31.15% for Calendula and 57.5% for Achillea. Eventually, the irrigation water use efficiency under drip irrigation using high saline water was lower than low saline water by 23.5% for Calendula and by 25% for Achille when using the third amount of water. In addition, soil salinity increased when using mini-sprinkler more than trickle irrigation system

Key Words:

Low quality water, Modeling, Efficiency, Saline soil and yield productivity.

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