

MODELING FOR MAXIMIZING LOW QUALITY WATER USE MANAGEMENT UNDER EGYPTIAN CONDITIONS

By

AMR KHAIRY MAHMOUD ABD EL-WAHAB

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

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

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Under the supervision of:

Dr. Abdel-Ghany Mohamed El-Gindy

Prof. Emeritus of Agricultural Engineering, Department of Agricultural
Engineering, Faculty of Agriculture, Ain Shams University
(Principal Supervisor)

Dr. Ahmed Mohamed El-Araby

Prof. Emeritus of Soil Science, Department of Soil,
Faculty of Agriculture, Ain Shams University

Dr. Mostafa Hassan El-Dosouky

Research Prof. Emeritus of Water Requirements and Meteorology,
Department of Chemical and Soil Physics, Desert Research Center

Approval Sheet

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This thesis for Ph.D. degree has been approved by:

Dr. Diao El-Din Ahmed El-Quosy

Research Prof. Emeritus of Irrigation Engineering, National Water
Research Center

Dr. Mahmoud Mohamed Hegazy

Prof. Emeritus of Agricultural Engineering, Faculty of Agriculture,
Ain Shams University

Dr. Ahmed Mohamed El-Araby

Prof. Emeritus of Soil Science, Faculty of Agriculture,
Ain Shams University

Dr. Abdel-Ghany Mohamed El-Gindy

Prof. Emeritus of Agricultural Engineering, Faculty of Agriculture,
Ain Shams University

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نمذجة الادارة لتعظيم استخدامات مياه الري منخفضة الجودة تحت الظروف المصرية

عمرو خيرى محمود عبد الوهاب

بكالوريوس علوم زراعية (ميكنة زراعية) ، جامعة عين شمس ، 1997

ماجستير علوم زراعية (ميكنة زراعية) ، جامعة عين شمس ، 2003

لوم الزراعية
(ميكنة زراعية)

قسم الهندسة الزراعية

كلية الزراعة

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عمرو خيرى محمود عبد الوهاب

بكالوريوس علوم زراعية (ميكنة زراعية) ، جامعة عين شمس ، 1997

ماجستير علوم زراعية (ميكنة زراعية) ، جامعة عين شمس ، 2003

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وقد تمت مناقشة الرسالة والموافقة عليها

اللجنة:

د. ضياء الدين

هندسة الري المتفرغ ، المركز القومي للبحوث المائية

أستاذ الهندسة الزراعية المتفرغ ، كلية الزراعة ، جامعة عين شمس

، كلية الزراعة ، جامعة عين شمس

أستاذ الهندسة الزراعية المتفرغ ، كلية الزراعة ، جامعة عين شمس

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جامعة عين شمس
كلية الزراعة

رسالة دكتوراه

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لجنة الإشراف:

د. عبد الغنى محمد الجندى

أستاذ الهندسة الزراعية المتفرغ ، قسم الهندسة الزراعية ، كلية الزراعة ، جامعة عين شمس
(المشرف الرئيسى)

د. أحمد محمد العربى

أستاذ الأراضى المتفرغ ، قسم الأراضى ، كلية الزراعة ، جامعة عين شمس

د. مصطفى حسن الدسوقي

أستاذ باحث الإحتياجات المائية والارصاد المتفرغ ، قسم الكيمياء وطبيعة الأراضى ، مركز
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ABSTRACT

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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 *Achillea* 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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