



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





شبكة المعلومات الجامعية



شبكة المعلومات الجامعية

التوثيق الالكتروني والميكرو فيلم

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأفلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %



شبكة المعلومات الجامعية



بعض الوثائق الأصلية تالفة



شبكة المعلومات الجامعية



بالرسالة صفحات

لم ترد بالأصل

B9E.V.

**IRRIGATION WITH DIFFERENT SEWAGE WATER
AND ITS EFFECT ON PRODUCTIVITY AND
QUALITY OF EGYPTIAN MANDARIN (*CITRUS
RETICULATA*) UNDER NEWLY RECLAIMED AREAS**

BY

OMIMA MOSTAFA EL-SAID

B.Sc. Agric. (Horticulture), Ain Shams Univ., 1979

M.Sc. in Environmental Sci., Ain Shams Univ., 1994

**A Thesis Submitted for
Doctor of Philosophy
In
Environmental Science**

**Department of Agricultural Science
Institute of Environmental Studies & Research
Ain Shams University**

1999

APPROVAL SHEET

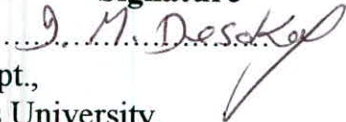
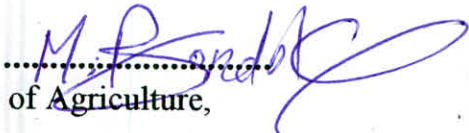
IRRIGATION WITH DIFFERENT SEWAGE WATER AND ITS EFFECT ON PRODUCTIVITY AND QUALITY OF EGYPTIAN MANDARIN *CITRUS* *RETICULATA* UNDER NEWLY RECLAIMED AREAS

BY

OMIMA MOSTAFA EL-SAID

B.Sc. Agric. (Horticulture), Ain Shams Univ., 1979
M.Sc. in Environmental Sci., Ain Shams Univ., 1994

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

Name	Signature
Prof. Dr. Ibrahim M. Desoky Prof. and Head of Horticulture Dept., Faculty of Agriculture, Ain Shams University.	
Prof. Dr. Saad El-Demerdashe Prof. Soils and Chairman of Socio-economic Div., Desert Research Center.	
Prof. Dr. Mohsen A. Bondok Prof. of plant physiology, Faculty of Agriculture, Ain Shams Univ.	
Prof. Dr. Abd El Azim M. El-Hammady Prof. of Pomology, Dean's Institute of Environmental Studies and Research, Ain Shams Univ.	

Date of Examination

Date / /

**IRRIGATION WITH DIFFERENT SEWAGE WATER
AND ITS EFFECT ON PRODUCTIVITY AND
QUALITY OF EGYPTIAN MANDARIN (*CITRUS
RETICULATA*) UNDER NEWLY RECLAIMED AREAS**

BY

OMIMA MOSTAFA EL-SAID

B.Sc. Agric. (Horticulture), Ain Shams Univ., 1979
M.Sc. in Environmental Sci., Ain Shams Univ., 1994

**A Thesis Submitted for
Doctor of Philosophy
In
Environmental Science**

Under The Supervision of :

1. Prof. Dr. A.M. El-Hammady

Prof. of Pomology,
Dean's Institute of Environmental Studies
and Research, Ain Shams Univ.

2. Prof. Dr. F.G. Moawad

Prof. of Agricultural Bio-Chemistry, Faculty of
Agriculture, Ain Shams Univ.

3. Prof. Dr. M. A. Bondok

Prof. of plant physiology, Faculty of Agriculture,
Ain Shams Univ.

4. Prof. Dr. A.A. M. Hussein

Prof. of Pomology, Desert Research Center.

ABSTRACT

Field experiments were carried out on the representative areas at El-Salhiya which irrigated with Nile water (control), El-Gabal El-Asfar area, irrigated with sewage water of Cairo city and Bahr El-Bakar area, irrigated with combined drainage water, planted with unique species varieties (Egyptian mandarin) in three seasons during 1995-1997. In an attempt to study the effect of irrigations with different water resources on growth and productivity of Egyptian mandarin trees.

The effects of prolonged irrigation by waste water (sewage and combined drainage waters) on heavy metals accumulation in soil and plant (Egyptian mandarin) were studied in Egypt. The results indicated that the concentration of Fe, Mn, Zn, Cu, Cd, Ni, Co and Pb in irrigation water samples were below than the maximum permissible limits.

The highest values of Pb, Co, Ni, Cd, Zn, Mn, Cu and Fe were produced in leaves, shoots, fruits and peel of trees irrigated with sewage and combined drainage waters. However the levels of heavy metals in tested parts of Egyptian mandarin are considered to be within the permissible limits and rather below their side toxic effects on plant.

The concentration of total amino acids in leaves and fruits of mandarin trees irrigated with the waste water was significantly higher than those irrigated with Nile water.

Peroxidase activity increased in leaves and fruits produce of trees irrigated with combined drainage and sewage waters as compared to value the amount of peroxidase activity in those irrigated with Nile water.

The protein patterns (SDS) of Egyptian mandarin leaves and fruits changes according to irrigation water resources, since water pollution alternate the number and the area of protein fraction.

ACKNOWLEDGEMENT

This work has been carried out under the supervision of ***Prof. Dr. A.M. El-Hammady*** Professor of Pomology and dean's Institute of Environmental Studies and Research, Ain Shams University, ***Prof. Dr. F.G. Moawad***, Professor of Agricultural Biochemistry, Faculty of Agriculture, Ain Shams University, ***Prof. Dr. M.A. Bondok***, Professor of Plant Physiology, Faculty of Agriculture, Ain Shams University and Prof. Dr. ***A.A. M. Hussein***, Professor of Pomology, Desert Research Center.

The author wishes to express her deepest gratitude and indebtedness for their supervision, progressive criticism, unfailing guidance and continuous help, generously offered during the course of the work.

The author is also grateful to Dr. ***H.I. El-Kassas***, Assoc. Professor of Agricultural Science. Institute of Environmental Studies and Research, Ain Shams University.

The author is indebted to all members of Plant Production Department, especially those of fruit crops unit, Desert Research Center for their willing help and fruitful cooperation.

