

**EFFECT OF IRRIGATION WITH TREATED
WASTEWATER AND SOME AGENTS FOR
REMEDIATION OF INJURIOUS IONS
ON THE PERFORMANCE OF
SOME PLANTS.**

BY

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B.Sc. Agric. Sc., (Horticulture), Ain Shams University, 2001.

**A thesis submitted in partial fulfillment
of
the requirements for the degree of**

MASTER OF SCIENCE

in

Agricultural Science

(Plant Physiology)

Department of Agricultural Botany

Faculty of Agriculture

Ain Shams University

2007

Approval Sheet

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ABSTRACT

Bahaa Badry Mosa Salim. Effect of irrigation with treated wastewater and some agents for remediation of injurious ions on the performance of some plants. Unpublished, Master of Agric. Science, University of Ain-Shams, Fac. of Agric., Dept. of Agric. Botany, 2007

Two field experiments in 15th September 2003 and 2004 were conducted on carrot (root crop) and lettuce (leafy crop) plants in a sandy soil in the experimental farm of El-Gabal El-Asfer at Kalubya Governorate. A number of different soil treatments include *Bacillus subtilis*, calcium super phosphate , SPC at two rates 250 and 500 Kg/fed and soil conditioner (polyacrylamide hydrogel, PAMG) to reduce the hazard effect of some injurious ions. Samples were taken for growth parameters studies and some chemical determination in both plants and seasons.

The results could be summarized in the following:

1. A significant increase in plant and storage root fresh weights of carrot for the inoculation with *Bacillus subtilis* were observed as compared to the control. The low rate of SPC (250 Kg/fed) resulted in the highest significantly values of plant fresh weight. A significant increase and decrease was achieved for plant fresh weight and storage root fresh weight respectively as a result of applying the PAMG.
2. *Bacillus subtilis* treatment produced a significant increase plant, stem and root fresh weights. Variable trends of growth parameters was found in lettuce plants as a result of SPC treatments. PAMG treatment led to a significant increase of plant length.
3. The obtained results indicated that inoculation with *Bacillus subtilis* gave a significant decrease in Ni, Pb and Cd contents in both plants. A significant decrease in Fe content was observed in both plants as a result of the applied SPC₁ and SPC₂ (250 and 500 Kg/fed) while there are variable trend in the other heavy metals contents with the same

treatments. SPC₁ treatment caused a significant decrease in Fe, Cu, Ni and Pb contents. PAMG treatment led to a significant decrease in Mn content and increase in Ni content in both plants. The content of Zn, Ni and Pb in carrot roots were significantly increased while all heavy metals except Ni in lettuce leaves were significantly decrease.

4. The highest and lowest significant values of NO₃⁻ and NO₂⁻ concentrations were given by the PAMG and *Bacillus subtilis* treatments, respectively. Total chlorophylls were increased by all soil treatments and the highest content found by SPC₂.

Key words: Carrot, *Daucus carota*, Lettuce, *Lactuca sativa*, *Bacillus subtilis*, super phosphate, polyacrylamide, wastewater, Heavy metals.

ACKNOWLEDGMENT

I wish to express my gratitude to **Dr. Mohamed Abd El-Rasoul Mohamed** Prof. of Plant Physiology, Dept. of Agric. Botany, Fac. of Agric., Ain Shams Univ. for his supervision, useful suggestions, continuous guidance through the course of investigation and precious advice during the progress of this work.

Sincere thanks and gratefulness are extended to **Dr. Ibrahim Seif El-Din Ibrahim Aly** Associate Professor of Plant Physiology, Dept. of Agric. Botany, Fac. of Agric, and Ain Shams University for his supervision, valuable suggestions and sincere encouragement via the first two years of supervision. Also, efforts made during the preparation of the manuscript are greatly appreciated.

Deep thanks are offered to **Dr. Sayed Said Shaban Eisa** Associate Professor of Plant Physiology, Dept. of Agric. Botany, Fac. of Agric. Ain Shams University, for his supervision and kind remarks following up the stages of laboratory work and efforts in writing.

Sincere appreciation is due to **Dr. Ahmed Abou El-Yazid Abd El-Hafez** Associate Professor of Vegetables, Dept. of Horticulture, Fac. of Agric., and Ain Shams University.

Many thanks are offered to the **Engineer/ Mohamed Ahmed Abd El rahman** a Head of the General State of Wastewater and all members in Cairo and El gabal El Asfer Farm.

Thanks are also extended to all members of Agric. Botany Dept. at Fac. of Agric., Ain Shams Univ. for their kindness, cooperation and help that made such work possible.

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