

**EFFECT OF FARM WASTES AND TOWN REFUSE
COMPOSTS WITH BORON APPLICATION ON SUGAR
BEET PRODUCTION UNDER ENVIRONMENTAL
CONDITIONS OF SOIL AND SALINE WATER AT RAS
SUDR, SOUTH SINAI**

Submitted BY

Asha El- Sayed Abd El-Nabi

B. Sc. of (Plant production), Faculty of Agriculture, Menoufiya University, 1988
Diploma of Environmental Sciences, Institute of Environmental Studies & Research
Ain Shams University, 2002

M. Sc. of Environmental Sciences, Institute of Environmental Studies & Research
Ain Shams University, 2009

A Thesis Submitted in Partial Fulfillment

Of

The requirement for the Doctor of Philosophy Degree

In

Environmental Science

Department of Environmental Agriculture Sciences
Institute of Environmental Studies and Research
Ain Shams University

2015

APPROVAL SHEET

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Ain Shams University, 2002

M. sc. of Environmental Sciences, Institute of Environmental Studies & Research

Ain Shams University, 2009

This thesis Towards a Doctor of Philosophy Degree in
Environmental Sciences Has been Approved by:

Name

Signature

1- Prof. Dr. Ezzat Mohamed Soliman

Pro. of Soil & Water in Department of Environmental
Agricultural Science, Institute of Environmental Studies & Research
Ain Shams University.

2- Prof. Dr. Mohamed AL-Asmar EL-Hawary

Prof. of crop production & physiology, Fac. of Agric., Al-Azhar
Univ., Cairo.

3- Prof. Dr. Hamed Mabrouk El-Kouny

Head of research, in Institute of Soil, Water and Environment,
Agricultural Researches Center

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Under The Supervision of:

1- Prof. Dr. Ezzat Mohamed Soliman

Pro. of Soil & Water, in Department of Environmental

Agricultural Science, Institute of Environmental Studies & Research

Ain Shams University.

2- Dr. Mona Metwaly Abaas Hammada

Lecturer of Environmental Pollution Unit, Plant Ecology

and Ranges Department, Desert Research Center

2015



ACKNOWLEDGEMENT

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to the members of supervising committee, **Prof, Dr. Ezzat Mohammad Soliman** professor of Soil Science, Department of Environmental Agricultural Science, Institute of Environmental Studies and Research, Ain Shams University, for supervision, valuable advice, encouragement and support during experimental work and writing the thesis.

My thanks are also due to **Dr. Mona Metwaly Hamada**, Lecturer of Environmental Pollution Unit, Plant Ecology and Ranges Department, Desert Research Center for supervision, suggesting the problem, comment and suggestion on manuscripts, patient guidance and constructive criticisms that have been extremely valuable in this research.

Wishes to express my sincere thanks, deepest gratitude and appreciation to **Dr. Waleed Mohamed Fares**, Senior Researcher – Central Laboratory for Design and Statistical analysis Research.

Sincere thanks are extended to a late **Prof, Dr. Hamed sayed mohammed El-Tokhy** professor of Environmental Pollution Unit, Plant Ecology and Ranges Department, Desert Research Center, for this valuable help in this work.

The author is also indebted to the staff members of Agricultural Science Department, Environmental Studies and Research Institute, Ain Shams University. Also, thanks are due to all member of the staff of the Plant Physiology, Desert Research Center and my family for providing all facilities throughout the work and their assistance and help.

My deep thanks also extended to my family, especially my husband and my sons who offer love and encouragement.

ABSTRACT

Two field experiments were done in the two successive winter seasons of 2011/2012 and 2012/2013 in the experimental farm of the Desert Research Center at Ras Sudr, South Sinai Governorate, to study the effect of nine compost production from {animal waste (10, 20 and 30 m³/fed.), town refuse (10, 20 and 30 m³/fed.) and plant waste (10, 20 and 30 m³/fed.)} and three rates foliar application of boron (control, 0.4 and 0.6 g/L.) and their interaction on growth, yield and chemical composition of sugar beet. The experiments were laid out in a split plot design with four replications.

The main results obtained were as follow:

1- There were a significant differences in growth characters i.e. leaf area, root length, root diameter and total soluble solids percentage (T.S.5%), root fresh and dry weight / plant, top fresh and dry weight / plant and fresh and dry yield of roots and tops of sugar beet between the tested sources of different compost types during both seasons. The highest values of growth characters and yield were recorded in plants treated with 30 m³ / fed. animal waste in the first and second seasons. The lowest value was obtained from 10 m³ / fed. town refuse in two growing seasons. There were significant differences in sucrose % , juice purity %, crude protein %, boron mg / kg, zinc mg / kg, copper mg / kg, cadmium mg/ kg and lead mg / kg in roots of sugar beet among the tested sources of different compost types during first and second seasons. In this regard, the highest values of crude protein percentage were recorded in plants treated with 30 m³/fed. animal waste and the lowest value was attained by using 10 m³/fed. town refuse in the two seasons. While, the highest value of juice purity % was obtained by using 30 m³ / fed. animal waste and 10 m³ / fed. town refuse at the first and second seasons, respectively. The highest values of sucrose percentage and juice purity % were obtained by plants treated with 10 m³/fed. Town refuse and the lowest value was attained by using 30 m³/fed. Animal waste in the two seasons. Applying 30 m³ town refuse / fed. gave the highest value of

boron in the first and second seasons. Application of 30 m³ / fed. town refuse gave the highest value of zinc, cadmium and lead in both seasons, while 30 m³ / fed from animal waste in the first season and with 30 m³ / fed from town refuse in the second season gave the highest value of copper.

2- Boron foliar application showed significantly responses in two seasons in respect to leaf area, root length, root diameter, total soluble solids (T.S.5%), root fresh and dry weight / plant, top fresh and dry weight / plant and fresh and dry yield of roots and tops of sugar beet. Increasing boron foliar application from 0 to 0.4 g/L. increased growth characters and yield of sugar beet at the first and second seasons. On the contrary, control treatment (nil boron treatment) gave the lowest value of all growth characters and yield in the first and second seasons. Application of boron fertilizer exerted a significant decrease in sucrose % and juice purity %, but a significant increase in crude protein %, boron mg / kg, zinc mg / kg, copper mg / kg, cadmium mg/ kg and lead mg / kg in two seasons. Increasing boron spraying from 0 to 0.6 g/L. increased all chemical composition in the first and second seasons, except crude protein % (0.4 g/ L. gave the highest value of protein). Also, increasing boron spraying from 0 to 0.6 g/L decreased sucrose and juice purity % in both seasons

3- The interaction between compost types and boron foliar had not significant effect on root length, root diameter, root fresh and dry weight plant, top fresh weight / plant and fresh and dry yield of roots and tops of sugar beet in the two growing seasons. In this respect, the combination of 30 m³ / fed. animal waste and boron spraying at 0.4 g / L. recorded the maximum values of all growth characters and yields of sugar beet plant in two seasons. The interaction between different compost types and boron foliar had a significant effect on in sucrose %, crude protein %, boron mg / kg, zinc mg / kg, copper mg / kg, cadmium mg/ kg and lead mg / kg in roots of sugar beet plants. This effect was observed in the two growing seasons.



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