# EFFECT OF SOME INDUSTRIAL WASTES OF 10th OF RAMADAN CITY ON SOIL AND PLANT

By
**Walid fouad Ibrahim Ramadan**
B.Sc. Agric., (Soils) Cairo Univ., 1989

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## APPROVAL SHEET

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By

**Walid fouad Ibrahim Ramadan**

B.Sc. Agric., (Soils) Cairo Univ., 1989

This thesis for M.Sc. Degree has been approved by

**Prof. Dr. : I.H. Elsokkary**

Prof. of Soil Science, Faculty of Agriculture, Alexandria University

**Prof. Dr. : M. El-El Nennah**

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

**Prof. Dr. A.M. Elgala** **(Supervisor)**

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

Date of examination : / / 2000

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**Walid fouad Ibrahim Ramadan**

B.Sc. Agric., (Soils) Cairo Univ., 1989

**Under the supervision of :**

**Prof. Dr. : A.M. Elgala**

Prof. Soils , Faculty of Agriculture
Ain Shams University

**Prof. Dr. : F.A. Hassan**

Prof. Soils , Desert Research Center

**Assis. Prof. Dr. : M.A.M. Eid**

Assistant Prof. Soils , Faculty of Agriculture
Ain Shams University

**Page**

**Page**

# LIST OF TABLES

# LIST OF FIGURE

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The author wishes to express his deep thanks and gratitude to **Prof. Dr. A.M. Elgala** Professor of Soil Science, Faculty of Agriculture, Ain Shams University, **Prof. Dr. F.A. Hassan** Professor of Soil Science, Desert Research Center and **Dr. Mohamed Abdel Fattah** Ass. Professor of Soil Science, Faculty of Agriculture, Ain Shams University, for suggesting the problem, supervision, advice, sincere help, guidance and constructive criticism throughout the course of the study.

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# ABSTRACT

Walid Fouad Ibrahim Ramadan. Effect of some industrial wastes of 10th of Ramadan City on soil and plant. Unpublished Master of Science, Ain-Shams University, Faculty of Agriculture. Department of Soil Science, 2000.

The objective of this work was to study the effect of using solid and liquid industrial wastes on soil and plant composition under greenhouse experiments. In two experiments faba bean or corn grown on 10th of Ramadan and Ras Sudr soils were treated with soil and liquid dying, ceramic, paper and starch industrial effluent wastes. Also their dilution or mixture were studied.

Results showed that the irrigation with industrial waste increased soil EC, pH and O.M. The highest increases of pH and EC were found with applying liquid ceramic waste and the lowest values were with starch effluent waste, while the highest increase of soil O.M. was found with starch waste.

Soil total and available macro-micro and heavy-elements and their contents in p0latns increased differently with industrial wastes application. The highest increases of N, P, K, Ca and Mg were found with starch effluent irrigation. Paper effluent waste irrigation treatments resulted in remarkable increases of Fe, Mn, Zn, Cu, Pb, Cd, Co and Ni in soils and plants. Particularly chemically available Cd and Co in the soil increased about 50 folds and their concentrations in plant increased about 4 folds.

Only starch effluent wastes irrigation treatment and solid dying waste up to 2% with tap water irrigation increased faba bean and corn dry weight.

Results indicated that the effluent of paper, ceramic dying industrial wastes could not be used directly without sample adjustments as a source of irrigation while starch effluent can be used safely for crop production.

**Key words:** Industrial wastes –10$^{th}$ of Ramadan area - dying wastes- ceramic wastes – paper wastes – starch industrial waste- macronutrients – micronutrietns biotoxic matals.

# *1. INTRODUCTION*

Many cities around the world are faced with the problem of industrial wastes disposal. The need to conserve and reuse waste water, particularly in arid and semiarid region wherever the shortage of irrigation water represents a tremendous problem. These waste waters may be reused on potential cropland.

Industrial development in Egypt has been grown significantly during the last two decads. The discharge of these factories into the environment can give rise to pollution problem, in air, water and soil. The wastes of these factories are mainly loaded with heavy metals such as Fe, Mn, Zn, Cu, Pb, Cd and Co, which dumped either into the River Nile irrigation canals or directly into the surrounding soils. A possible problem may be raised as salinity or toxicity in the soils as a result of long term irrigation with these wastes. It is possible that their levels will be reached at high concentrations, where to be hazard to plants and consequently affect human food chain.

Industrial solid and liquid wastes of $10^{th}$ of Ramadan city were collected from four different sectors of industries, namely: liquid wastes of dying, ceramic, paper and starch industries. The quantity of the effluent, as thousands of $m^3$/month of these industries are about 50, 11, 20 and 60 $m^3$/month respectively.

The main objectives of this work were to assess and evaluate the effect of the reuse of industrial wastewater of ceramic, paper, starch industries on some chemical properties of sandy and calcareous soils as well as the growth and mineral composition of faba bean and corn plants grown in these two different soils.

The effect of solid and liquid wastes of dying industry on soil properties and growth of plans will also be studied.