BEHAVIOUR AND LOSS OF SOIL NITROGEN IN RELATION TO THE ENVIRONMENT

BY

MAHMOUD MOHAMMED AHMED EL-BORDINI

B.SC. in Soil Sci., Fac. of Agric.,Ain Shams Univ., 1990

A thesis submitted in partial fulfillment

of

the requirements for the degree of

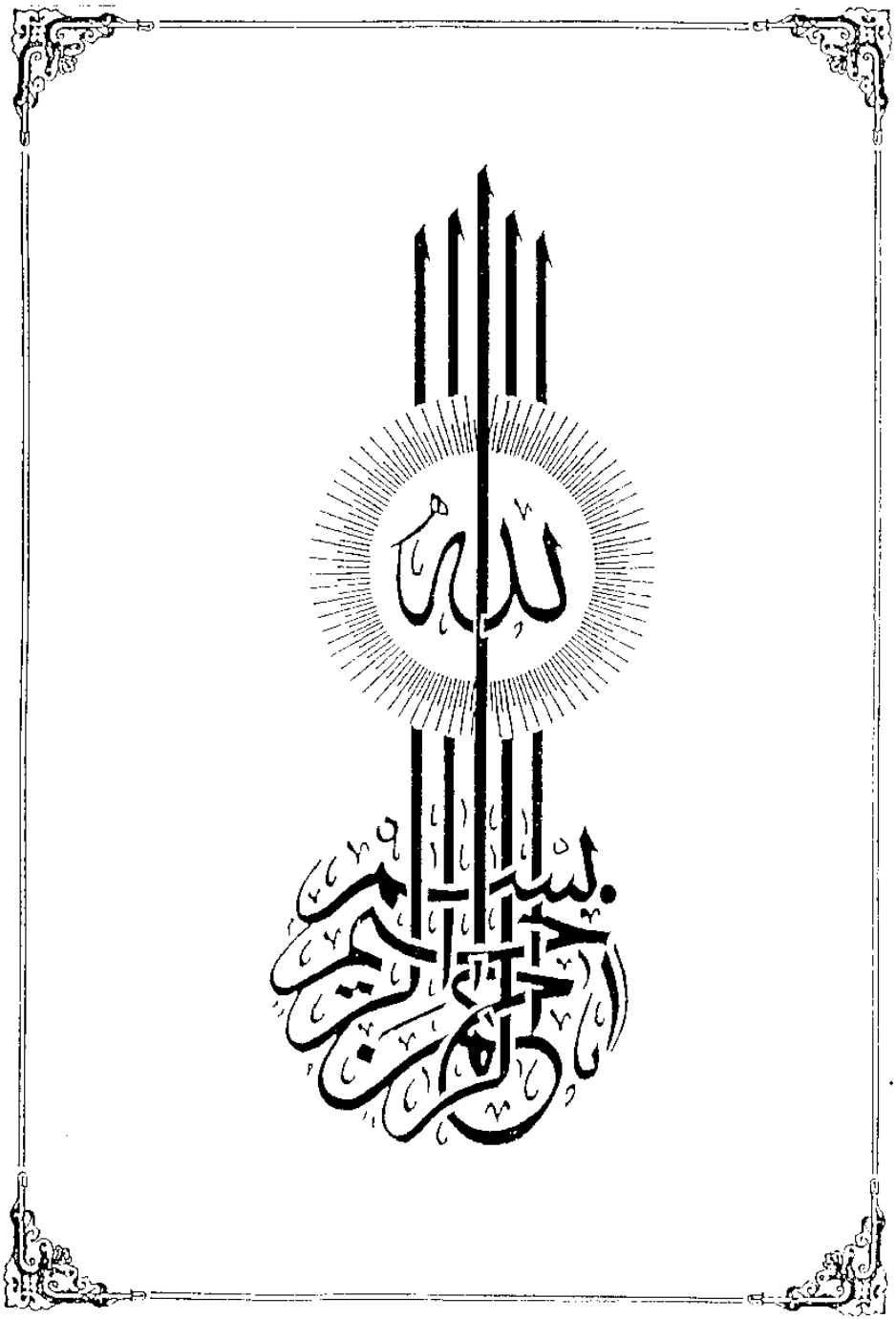
MASTER OF SCIENCE

in

Agriculture
(Soil Science)

Department of Soil Science
Faculty of Agriculture
Ain Shams University

1996



APPROVAL SHEET

Name : Mahmoud Mohammed Ahmed El-Bordini

Title : Behaviour and loss of soil nitrogen in relation to the environment

This Thesis for M.Sc. degree has been approved by

Prof.Dr. Mohamed Fathy Ghoneim .....
Prof. and Head of Soil Science Dept., Fac. of Agric. Assuit Univ.

Prof.Dr. Mohamed Ahmed Mostafa .....
Prof. of Soil Science Dept., Fac. of Agric. Ain Shams Univ.

Dr. Abdel-Latif Saleh El- sebaay.....
Assist. Prof. of Soil Science, Fac. of Agric. Ain Shams Univ.(Supervisor)

Date of Examination : 17 / 7 /1996

BEHAVIOUR AND LOSS OF SOIL NITROGEN IN RELATION TO THE ENVIRONMENT

BY

MAHMOUD MOHAMMED AHMED EL-BORDINI

B.SC. in Soil Sci., Fac. of Agric., Ain Shams Univ., 1990

Under the Supervision of:

Prof. Dr. Abd EL- Moneim Mohamed Elgala
(Head of Soils Dept.,Faculty of Agric.,Ain Shams Univ.)

Dr. Abdel-latif Saleh El-Sebaay
(Assist. Prof. of soil Science, Fac., of Agric., Ain Shams Univ.)

Dr. Mohamed Aly Ossman El-Sharawy
(Assist. Prof. of soil Science, Fac., of Agric., Ain Shams Univ.)

ABSTRACT

Mahmoud Mohammed Ahmed EL- Bordini. Bahaviour and loss of soil nitrogen in relation to the environment unpublished Master of Science, University of Ain Shams, Faculty of Agriculture, Department of Soils Science, 1996.

The behaviour and loss of nitrogen in an alluvial soil cultivated with wheat or corn in column under greenhouse or in the field were examined under different treatments including firtilization with urea or ammonium nitrate (46.5 KgN/feddan) added in two or three splitted portions and presence or absence of organic manure (12 m^3/feddan) .

The results showed that under both greenhouse and field conditions, urea was superior to ammonium nitrate in increasing the available N in soil, N-content in the plant and grain yield of wheat and corn. It was also better in decreasing N loss from soil especially when accompanied with organic manure. In general, two splitted N doses gave higher vegetative growth and grain yield than three doses especially with wheat compared to corn.

The nitrogen contents and NO_3-N in the polluted soil, water and grasses along Bahr El-Bakar drain were examined. It was found that each of the drain`s soil, water and grasses have tremendous amounts of nitrate-nitrogen in the toxic levels. The obtained values were much greater than premisible levels in water and plants which may be used by animals living around

the studied sites.

Key words:
Nitrogen in alluvial soil — Fertilizer nitrogen — Nitrogen distribution in soil column — Soil nitrogen — Nitrogen in soil lechate — Nitrate in Bahr EL- Bakar drain — Corn yield — Wheat yield — Urea — Ammonium nitrate .

ACKNOWLEDGEMENT

The author wishes to express his deepest gratitude and appreciation to Prof. Dr. A.M.Elgala, Head of Soil Science Department, Faculty of Agriculture, Ain Shams University, for suggesting the problem, supervision and for constructive ideas during the study and preparation of this thesis.

I would like also to thank Dr. A.S.El-Sebaay and Dr. M. A. El-Sharawy, Assistant Profs. in the same Department for their advices and sincer guidance throughout the course of study, beside introducing all facilities needed throughout the hole investigation and during writing the manuscript.

Finally, I would like to thank all the staff members of the soil science Dept., fac. of Agric., Ain Shams Univ., for their cooperation, help and supplying all facilities to accomplish this thesis.

CONTENTS

LIST OF TABLES

LIST OF FIGURES