



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





شبكة المعلومات الجامعية



شبكة المعلومات الجامعية

التوثيق الالكتروني والميكرو فيلم

جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت 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

STUDIES ON MANGO NUTRITION

By

SAFAA KAMAL ABO EL-AZM EL-NAGAR

**B.Sc. In Agricultural Co-operation Sciences
High Institute of Agricultural Co-operation, 1988**

**Complementary of B.Sc. Degree in Agriculture Science,
Horticulture-Department, Faculty of Agric.,
Moshtohor, Zagazig University - 1994**

THESIS

Submitted in Partial Fulfilment of the Requirements for the Degree of

MASTER OF SCIENCE

IN

HORTICULTURE

DEPARTMENT OF HORTICULTURE

FACULTY OF AGRICULTURE, MOSHTOHOR

ZAGAZIG UNIVERSITY

1999

B1.752

APPROVAL SHEET

TITLE OF THESIS

STUDIES ON MANGO NUTRITION

By

SAFAA KAMAL ABO EL-AZM EL-NAGAR

*This Thesis For The Master Of Science Degree
Has Been Approved By*

Prof. Dr. A. M. Hegazy

Prof. Dr. G. A. Baghdady

Prof. Dr. Farid A. Mohamed

Prof. Dr. M. A. Khen

(Committee In Charge)

Date : 1/12/1999

ACKNOWLEDGEMENT

The author wishes to express her deepest gratitude to **Prof. Dr. Mohamed M. Sharaf**, and **Prof. Dr. Mohamed A. Khamis** Professors of Pomology, Hort. Dept., Faculty of Agric., Moshtohor, Zagazig Univ., for their supervision, valuable guidance, providing facilities, kind help in the course of presentation of the results, writing the manuscript and over coming difficulties throughout the whole period of investigation.

Sincere thank and gratitude to **Prof. Dr. Farid A. Mohamed**, Professor of Plant Nutrition, Plant Res. Dept., Atomic Energy Authority, for his supervision, planning this work, direction, criticism and continuous guidance throughout the course of this work and writing the manuscript.

I am most tremendously indebted to **Dr. Alaa N.M. Sharaf**, Lecture of Pomology, Plant Res. Dept., Atomic Energy Authority, for his sincere help and valuable assistance during green house & laboratory work and writing the manuscript.

Appreciation is also expressed to **Dr. Saleh M. Awad**, Associate Prof. of Pomology, Plant Res. Dept., Atomic Energy Authority for his help and advice through this work.

I am most grateful to my colleagues, all members and assistant technicians in Plant Res. Dept., N.R.C., Atomic Energy Authority for being always ready to help when needed.

CONTENTS

	Page
LIST OF TABLES	1
I. INTRODUCTION	1
II. REVIEW OF LITERATURE	3
III. MATERIALS AND METHODS	22
IV. RESULTS AND DISCUSSION	34
IV. I. EXPERIMENT, 1:	
IV. I. I. Vegetative growth measurements.....	23
IV. I. II. Mineral composition/nutritional status.....	49
IV. II. EXPERIMENT, 2 :	
IV. II. I. Vegetative growth measurements.....	63
IV. II.II. Mineral composition/nutritional status.....	82
IV. III. EXPERIMENT, 3 :	
IV. III. 1. Retained Zn-65 in treated leaves.....	98
IV. III. 2. Translocation of Zn-65 in mango seedlings.....	98
IV. III. 3. Total absorption of Zn-65 by mango leaves.....	103
IV. III. 4. Distribution pattern of translocated Zn-65 within mango plants.....	106
IV. III. 5. Percentage use of Zn-65 by mango plants.....	107
V. SUMMARY AND CONCLUSIONS	112
VI. LITERATURE CITED	125
VII. ARABIC SUMMARY.	

LIST OF TABLES

No. of Table	Page
Table (1): Preparation of N,P,K and Zn treatments applied for 1 st experiment.....	26
Table (2): Number of leaves, plant height and stem thickness of mango seedlings as influenced by soil application rates of both phosphorus & zinc and their combinations during 1997 & 1998 seasons.....	40
Table (3): Leaves, stems and roots dry weight (gm/plant) of mango seedlings as influenced by soil application rates of both phosphorus & zinc and their combinations during 1997 & 1998 seasons.....	45
Table (4): Total plant dry weight and top/root ratio of mango seedlings as influenced by soil application rate of both phosphorus & zinc and their combinations during 1997 & 1998 seasons.....	48
Table (5): Nitrogen content (%) in various plant organs of mango seedlings in relation to soil applied rates of both phosphorus & zinc and their combinations during 1997 & 1998 seasons.....	52
Table (6): Phosphorus content (%) in various plant organs of mango seedlings in relation to soil applied rates of both phosphorus & zinc and their combinations during 1997 & 1998 seasons.....	55
Table (7): Potassium content (%) in various plant organs of mango seedlings in relation to soil applied rate of both phosphorus & zinc and their combinations during 1997 & 1998 seasons.....	58
Table (8): Zinc content (ppm) in various plant organs of mango seedlings in relation to soil applied rate of both phosphorus & zinc and their combinations during 1997 & 1998 seasons.....	62
Table (9): Number of leaves, plant height and stem thickness of mango seedlings as influenced by rates of both (phosphorus soil & zinc foliar applied) and their combinations during 1997 & 1998 seasons.....	70
Table (10): Leaves, stems and roots dry weight (gm./plant) of mango seedlings as influenced by rates of both (phosphorus soil and zinc foliar applied) and their combinations during 1997 & 1998 seasons.....	76
Table (11): Total plant dry weight and top/root ratio of mango seedlings as influenced by rates of both (phosphorus soil & zinc foliar applied) and their combinations during 1997 & 1998 seasons.....	81

No. of Table	Page
Table (12): Nitrogen content (%) in various plant organs of mango seedlings in relation to rates of both (phosphorus soil & zinc foliar applied) and their combinations during 1997 & 1998 seasons.....	84
Table (13): Phosphorus content (%) in various plant organs of mango seedlings in relation to rates of both (phosphorus soil & zinc foliar applied) and their combinations during 1997 & 1998 seasons.....	88
Table (14): Potassium content (%) in various plant organs of mango seedlings in relation to rates of both (phosphorus soil & zinc foliar applied) and their combinations during 1997 & 1998 seasons.....	93
Table (15): Zinc content (ppm) in various plant organs of mango seedlings in relation to rates of both (phosphorus soil & zinc foliar applied) and their combinations during 1997 & 1998 seasons.....	96
Table (16): Retained Zn-65 in the treated leaves of mango transplants as influenced by the level of both Zn foliar and P soil applications during 1999 year.....	99
Table (17): Upward translocation of Zn-65 in mango plant, leaves (A) and stem (B) as affected by level of both Zn foliar and P soil applications during 1999 year.....	101
Table (18): Downward translocation of Zn-65 in mango plants, leaves (A), stems (B) and roots (C) in response to level of both Zn foliar and P soil applications during 1999 year.....	102
Table (19): Total absorption of Zn-65 by mango leaves as influenced by the level of both Zn foliar and P soil applications during 1999 year.....	105
Table (20): Distribution of translocated Zn-65 in various mango plants organs, leaves (A), stems (B) and roots (C) in response to level of both Zn foliar and P soil applications during 1999 year.....	108
Table (21): Percentage use of Zn-65 by mango transplants as influenced by the level of both Zn foliar and P soil applications during 1999 year.....	109

INTRODUCTION

INTRODUCTION

The mango (*Mangifera indica*, L.) is one of the oldest widely cultivated fruits in the subtropical and semitropical regions. It is also one of the popular tropical fruits cultivated in both the world and Arab Republic of Egypt.

Mango is botanically belonging to family Anacardiaceae. Its trees are evergreen and growing well with good production under the native tropical territories, whereas soils are well drained.

Mango is regard in Egypt as one of the major local fruit crops and approximately could be considered the third fruit crop after citrus and grapes. It is worthy to be mentioned that mango introduced to Egypt in 1825 year but since this date it spread steadily. The acreage planted area with mango reached about 65417 Feddans (according to the census of the Ministry of Agriculture in 1997). However, because mango fruits are considered as one of the most popular fruits for the Egyptian consumer due to its good flavour, delicious taste, nutritive value and other fruit attractive features. It is in need to be of wide spreading in ARE particularly in the new reclaimed areas. Successful plantation is an equation of technical know how, favourable environmental, soil and water requirements.

It is well known that mineral fertilization is very essential especially after the construction of the High Dam in 1964, the total suspended matter of the River Nile was decreased by 98% which consisted of the most essential nutrient elements (Helal and Rasheed, 1976). This sharp decrease deprived the soil of Egypt from about 91% of the annual supply

of nature source of most mineral elements, (Faizy, 1980). Accordingly, application of fertilizers is essential to replenish such soil with the sufficient amounts of plant nutrients. In addition, micro-nutrients such as Zn are perform essential function in vital processes. A lack of micro-nutrient is responsible for some plant diseases and often causes crops to perish. Application of appropriate micro-nutrients not only prevents these disease, but also ensures higher yields of better quality crops.

Therefore, the present study was carried out to investigate the effect of rate and application method for two important elements i.e., phosphorus and zinc regarding the response of both vegetative and nutritional status of 6 month old mango seedlings. Moreover, absorption, translocation and utilization of zinc through foliar application of the isotop Zn-65 were also included.

With the main purpose of enhancing and improving their growth to attain the suitable size for carrying out grafting from one hand and to shorten the time required for producing a standard transplants for selling from the other which will be reflected beneficially on mango merserymen and increasing their income.

REVIEW OF LITERATURE