EFFECT OF BIOLOGICAL FERTILIZERS COMPARED WITH MINERAL FERTILIZERS ON HINDI BESINARA MANGO TREES

By

RANIA ABD ELFATTAH ELSAYED
B.Sc. Agric. Sci. (Pomology), Fac. Agric., Cairo Univ., Egypt, 2002

THESIS
Submitted in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE

In

Agricultural Sciences
(Pomology)

Department of Pomology
Faculty of Agriculture
Cairo University
Egypt

2009

APPORVAL SHEET

EFFECT OF BIOLOGICAL FERTILIZERS COMPARED WITH MINERAL FERTILIZERS ON HINDI BESINARA MANGO TREES

M.Sc. THESIS
In
Agric. Sci. (Pomology)

By

RANIA ABD ELFATTAH ELSAYED
B.Sc. Agric. Sci. (Pomology), Fac. Agric., Cairo Univ., Egypt, 2002

APPROVAL COMMITTEE

Dr. Samir Zaki EL-Agami.....
Professor of Pomology, Fac. Agric., Assuit University

Dr. Mohamed Ahmed Fayek.....
Professor of Pomology, Fac. Agric., Cairo University

Dr. Ibrahim EL-Shenawy Ghoniem.....
Associate Professor of Pomology, Fac. Agric., Cairo University

Dr. Ramzy George Stino.....
Professor of Pomology, Fac. Agric., Cairo University

Date: 9 / 7 /2009

SUPERVISION SHEET

EFFECT OF BIOLOGICAL FERTILIZERS COMPARED WITH MINERAL FERTILIZERS ON HINDI BESINARA MANGO TREES

M.Sc. THESIS
In
Agric. Sci. (Pomology)

By

RANIA ABD ELFATTAH ELSAYED
B.Sc. Agric. Sci (Pomology), Fac. Agric., Cairo Univ., Egypt, 2002

SUPERVISION COMMITTEE

Dr. RAMZY GEORGE STINO
Professor of Pomology, Fac. Agric., Cairo University

Dr. IBRAHIM EL-SHENAWY GHONIEM
Associate Professor of Pomology, Fac. Agric., Cairo University

Dr. HASSAN ALI ABD ELKAREEM
Researcher of Pomology, Hort. Res. Inst., Agri. Res. Center, Giza

ACKNOWLEDGEMENT

I wish to express my thanks; deepest gratitude and appreciation to ***Dr. RAMZY GEORGE STINO professor*** *of pomology, Faculty of Agriculture, Cairo University. And* ***Dr. IBRAHIM El-SHENAWY GHONIEM*** *Associate professor of pomology, Faculty of Agriculture, Cairo University for suggesting the problems, supervision, continued assistance and his guidance through the course of study and revision the manuscript of this thesis. Sincere thanks to* ***Dr. HASSAN ALI ABD-ELKAREEM*** *Associate professor of pomology, Horticulture Researches Institute for sharing in supervision.*

I would like to thank staff members of the Central Laboratory, Horticulture Research Institute, Agriculture Research Center, for encouraging, advising and help during the whole period of study.

Grateful appreciation is also extended to all staff members of Pomology Department, Faculty of Agriculture, Cairo University.

Special deep appreciation is given to my late father, my mother, my sisters and my brothers and my friends.

Name of Candidate: Rania Abd ElFattah Elsayed **Degree:** M.Sc.
Title of Thesis: Effect of biological fertilizers compared with mineral fertilizers on Hindi Besinara mango trees
Supervisors: Dr. Ramzy George Stino
Dr. Ibrahim El-Shenawy Ghoniem
Dr. Hassan Ali Abd Elkareem
Department: Pomology **Approval:** 9 / 7 / 2009

ABSTRACT

This study was carried out throughout three seasons in 2006, 2007 and 2008.And the experiment was conducted at a private orchard located at El-Mansouria, Giza Governorate, Egypt on 40–years mango trees "Hindi Besinara" cultivar.

This experiment was carried out to evaluate of the organic and bio-fertilizers on "Hindi Besinara" mango trees in comparison with mineral fertilizers. Eight sources of organic and natural fertilizers, compost "El-Neel" at36.5kg / tree , compost with bio fertilizers (Nitrobien 10g / tree + phosphoriene10g / tree) , compost with natural rocks (Feldspar 6.25 kg./ tree) ,compost + NR + BF , cattle manure 7.50 kg./tree cattle manure + BF , chicken Manure 25.33 kg./tree , chicken manure + BF .These treatments were added to the soil (compared to the mineral fertilization) . Compost + NR with BF application increased vegetative growth, yield fruit weight, fruit height and diameter as well as fruit T.S.S, total sugars and carotinoids , specially during the3rd season compared to other organic and natural fertilizers with or without bio- fertilizers application. Mineral fertilizer was more effective in this concern than different organic and natural sources. However, the results indicated that organic and bio fertilizer applications had a long term effect successive seasons and could be used instead of mineral fertilization, besides they are human safe. The conclusion of this study was that the best treatment is compost + NR +BF .which increased yield, and had effective prosperous on fruits characters.

The recommendation of this study is condensation using organic fertilization at long term treatments that could be equal to mineral fertilization even more effectiveness .on the other hand it is obvious that organic fertilization is cheap, available and safe.

Key Words: Compost - Cattle- Manure - Natural rocks – Nitrobiene- Phosphoriene- Mango

CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Mango (*Mangifera indica L.*) is an important tropical fruit with a high demand in world markets. It is consumed both fresh and in processed form.

However, mango is also cultivated in more than 100 countries at both tropical and sub tropical latitudes Galan (1996).

The largest producing country in the world is India, with over10 million metric tons, followed by China and Mexico at roughly 1 million metric tons each .Mexico, Egypt still ranks on the world production scale as the 16th largest producers of mangos.(Agriculture Technology Utilization and Transfer report "ATUT " 1997).

In Egypt , mango growing areas increased rapidly from year to year to reach 184.204 feddans in 2005 , also the productive area reached 115.529 feddans which produced 532.422 tons / year with an average of 4.61 tons / feddan (Table1).

It is well known that mangos needs large amounts of fertilizers especially nitrogen so, the major problems facing mango growers are the high cost of excessive manufactured fertilizers needed for mango trees. Besides, these chemical fertilizers are considered as air, soil and water polluting agents during their production and utilization. Consequently, it has drowned the attention of researchers to use the organic fertilizers which are safe for human, animal and environment. Thus, it is preferred to use these natural fertilizers to avoid pollution and to reduce the costs of chemical fertilizers. Organic agriculture has a solid 2% market share and continues to grow at a rate of 20% per year.