شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائق الاصلية تالفة

بالرسالة صفحات لم ترد بالاصل

SWEET BASIL HERB AND OIL PRODUCTION AS AFFECTED BY CHEMICAL AND ORGANIC FERTILIZATION

By

MAIE MOHAMED AHMED MOHSEN

THESIS

Submitted in Partial Fulfillment of the Requirements
for the Degree of

MASTER OF SCIENCE

IN
MEDICINAL AND AROMATIC PLANTS

ORNAMENTAL HORTICULTURE DEPARTMENT
FACULTY OF AGRICULTURE
CAIRO UNIVERSITY

2002

Approval Sheet

SWEET BASIL HERB AND OIL PRODUCTION AS AFFECTED BY CHEMICAL AND ORGANIC FERTILIZATION

By

MAIE MOHAMED AHMED MOHSEN

This Thesis for the M.Sc. Degree
Has Been Approved by:

A. A. El-Sayed

A. Z. Sarhan

Hayam A. Mansour

El Sayed El gamal

Committee in Charge

Date : 6 / 7 / **2002**

Name of Candidate Maie Mohamed Ahmed Mohsen **Degree** Master

Title of Thesis Sweet basil Herb and oil production as affected by chemical and organic fertilization

Supervisors Dr. Abdel - Ghafour A. EL-Sayed, Dr. Hazem A. Mansour and Dr. Mahassen M.A. Sidky

Branch Ornamentel **Approval** 6/7/2002

ABSTRACT

This study was conducted during the two successive seasons of 1998 and 1999 to investigate the effect of some organic manures (poultry, cattle and horse manures) and inorganic (NPK) fertilization on the growth, oil yield and chemical composition of sweet basil (Ocimum basilicum L.) cv. "Grand Vert" plants. Sweet basil plants were grown in 30 cm (diameter) clay pots filled with a sandy soil, and were supplied with chemical NPK or organic fertilization treatments. The chemical NPK fertilizer (with a formula of 25:10:10) was applied at rates equivalent to 600, 800, 1000 or 1200 kg/fed./season, while the organic fertilization treatments included the addition of poultry manure (at rates of 12, 18, 24, or 30 m^3/fed./season), cattle manure or horse manure (each at rates of 24, 36, 48 or 60 m^3/fed./season). Unfertilized plants were used as the control. Plant fertilized by PM (at 24 m^3 /fed.) gave the highest values for plant height, fresh and dry weights of leaves/plant and fresh and dry weights of herb per plant and per feddan. While the highest values for number of branches/plant were obtained from plant fertilized with CM (at 60 m /fed.). On the other hand, the highest percentage and oil yield per plant and per feddan of the essential oil were obtained from plants fertilized with PM (at 24 m^3 /fed.). While the highest values of the main component of the essential oil (Linalool) were obtained from plants fertilized with NPK (at 800 kg/fed.).

A.A. El-Sayed

Name of Candidate Maie Mohamed Ahmed Mohsen **Degree** Master

Title of Thesis Sweet basil Herb and oil production as affected by chemical and organic fertilization

Supervisors Dr. Abdel - Ghafour A. EL-Sayed, Dr. Hazem A. Mansour and Dr. Mahassen M.A. Sidky

Branch Ornamentel **Approval** 6/7/2002

ABSTRACT

Prolonging the fertilized with CM (at 60 m^3/fed.) increased the chlorophyll "a" and carotenoids. While the highest values for total carbohydrates in dry leaves were obtained from plants fertilized with HM (at 60 m^3/fed.).

A. A. El-Sayed

ACKNOWLDGEMENT

THANKS ARE PRIMARILY TO ALLAH

I wish to express my appreciation and sincere gratitude to Prof. Dr. Abdel-Ghafour A. El-Sayed, Professor of Floriculture, Department of Ornamental Horticulture, Faculty of Agriculture, Cairo University for his supervision, indispensable advice, valuable comments, constructive criticism, encouragement, and continuous help during the course of this investigation.

My deepest thanks are also offered to Dr. Hazem A. Mansour, Associate Professor of Floriculture, Department of Ornamental Horticulture, Faculty of Agriculture, Cairo University, and to Dr. Mahassen M. A. Sidky, Associate Professor at the Medicinal and Aromatic Plants Department, Horticultural Research Institute, Agricultural Research Center, Ministry of Agriculture, for their supervision, continuous encouragement and guidance throughout the study and during the preparation of this thesis.

Finally, I would like to thank my parents, my husband, and all my friends for their love, and for their continuous support and encouragement throughout the course of this study and during the preparation of the thesis.

CONTENTS

INTRODUCTION

INTRODUCTION

Egypt has an important position among middle-eastern countries in the production and trade of aromatic and medicinal plant species.

In Pharaohonic Egypt, the clergymen used medicinal and aromatic plant in folk medicine. Many countries (including Egypt) are now returning to the use of folk medicine instead of chemical medicinal preparations.

A large number of medicinal and aromatic plants such as mint, roselle, dill, and many other plants, are consumed either fresh or dried, or are used for preparation of hot or cold beverages. In addition, many aromatic and medicinal plants are used in several important industries, including the manufacture of pharmaceutical preparations, perfumes, dental creams, toothpaste and dried spices.

Aromatic and medicinal plants are an important source of national income and foreign currency. They are among the most important agricultural export commodities that are in demand in European and other international markets.

The Labiatae (Lamiaceae) is one of the largest and most highly envolved plant families. With a world-wide distribution of about 200 genera and between 2000 and 5000 species of aromatic herbs, it is an extremely diverse family.

The Labiatae family includes a large number of economically important plants such as mint, thyme, sweet basil, salvia, rosemary, marjoram and lavender. Most of these plants grow well in Egypt and have a

high economic value and a high essential oil content. During the last few years, medicinal and aromatic plants have been cultivated in newly reclaimed desert areas. Under such conditions, the nutrition of lamiaceae plants depends on the supply of macro-nutrients (including N, P and K), as well as micro-nutrients (including Fe, Zn and Mg) by the addition of organic and chemical fertilizers.

The importance of fertilization to aromatic plants was emphasized by Moa and Craker (1991), who stated that an adequate supply of nutrients, particularly N, is one of several factors responsible for increasing the oil yield.

Organic fertilization is a very important method of providing the plants with their nutritional requirements. Organic fertilization has been used basically as a means of alleviation of the problem of chemical residues in the export market. Organic fertilization is also one of the methods used to reclaim sandy desert land and to improve the chemical and physical characteristics of the soil.

These days, the use of organic agriculture is spreading all over the world. For this reason, this investigation was conducted to determine the effect of different organic fertilizers (viz. poultry, cattle and horse manures) on the growth, oil yield and chemical composition of an important Lamiaceae plant (*Ocimun basilicum* cv. "Grand Vert"), and to compare this effect with that of conventional NPK fertilization. The results of this study may help in optimizing the herb and essential oil yields as well as the oil quality and the chemical composition of that plant.