



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



Alexandria University  
Faculty of Agric. (Saba Basha)  
Plant Protection Dept.,

# **INTEGRATED MANAGEMENT OF INSECT-PESTS INFESTING TOMATO IN ALEXANDRIA GOVERNORATE**

A THESIS

Presented to the Graduate School  
Faculty of Agriculture (Saba Basha)  
Alexandria University

In Partial Fulfillment of the Requirements  
for the degree of

**MASTER OF AGRICULTURAL SCIENCES  
(PESTICIDES)**

**Department of Plant Protection**

**BY**

**Abeer Ahmed Mohamed Menesy**

**2002**

B-7194



ALEXANDRIA UNIVERSITY

Faculty of Agriculture

(Saba Basha)

**INTEGRATED MANAGEMENT OF INSECT-  
PESTS INFESTING TOMATO  
IN ALEXANDRIA GOVERNORATE**

Presented by

**ABEER AHMED MOHAMED MENESY**

For the Degree of

**MASTER OF AGRICULTURAL SCIENCES**

( PESTICIDES )

DEPARTMENT OF PLANT PROTECTION

Examiner's Committee :

**Prof. Dr. Abdel-Fattah Sayed A. Saad**

Professor of Pesticides Chemistry and Toxicology,  
Plant Protection Department,  
Faculty of Agriculture (Saba Basha),  
Alexandria University.

Approved

...A.....Saad J

**Prof. Dr. Hassan Aly Abdel-Hamid Mesbah**

Professor of Entomology,  
and Head of Plant Protection Department,  
Faculty of Agriculture,  
Alexandria University.

H.A. Mesbah

**Prof. Dr. Ahmed El-Sayed Omar**

Professor of Pesticides Chemistry and Toxicology,  
Faculty of Agriculture, Zagazig University.

A.E. Omar

**Prof. Dr. El-Sayed Hassan Mohamed Tayeb**

Professor of Pesticides Chemistry and Toxicology,  
Plant Protection Department,  
Faculty of Agriculture (Saba Basha),  
Alexandria University.

El-Sayed Tayeb

## **SUPERVISION 'S COMMITTEE**

**Prof. Dr. Abdel-Fattah Sayed Abdel-Karim Saad**

Prof. of Pesticides Chemistry & Toxicology,  
Plant Protection Dept.,  
Fac. of Agric. (Saba Bahsa) , Alex. University

**Prof. Dr. El- Sayed Hassan Mohamed Tayeb**

Prof. of Pesticides Chemistry & Toxicology,  
Plant Protection Dept.,  
Fac. of Agric. (Saba Bahsa) , Alex. University

**Dr. Magdy Abdel- Zaher Massoud**

Associate Prof. of Pesticides Chemistry & Toxicology,  
Plant Protection Dept.,  
Fac. of Agric. (Saba Bahsa) , Alex. University



# CONTENTS

	Page
<b>I- INTRODUCTION .....</b>	<b>1</b>
<b>II- REVIEW OF LITERATURE .....</b>	<b>4</b>
II.1 Insects related to tomato plants .....	4
II.2 Evaluation of chemicals used to control	
tomato pests .....	18
II.3 The effect of foliar application of various formulation	
contain nutritive elements on plants .....	38
II.4 IPM Programmes for tomato .....	44
II.4.1 IPM Definitions .....	44
II.4.2 Resources used in integrated pest management	
Programmes .....	45
II.4.3 Integrated pest management programmes for	
tomato .....	47
<b>III- MATERIALS AND METHODS .....</b>	<b>59</b>
III.1 Plants Cultivation .....	59
III.2 Treatments .....	59
III.3 Insects Inspection .....	60
III.4 Infestation Reduction .....	63
III.5 The effect on yield .....	63
<b>IV- RESULTS AND DISCUSSION .....</b>	<b>64</b>
IV.1 Evaluation of certain compounds against the abundant	
Insects to be involved in an IPMprogram .....	64
IV.1.1 The growing season of 2000.....	64
IV.1.1.1 The evaluation against the whitefly...	65
IV.1.1.1.a Insecticides.....	65
IV.1.1.1.b Nutritive and bio-stimulant	
compounds.....	71
IV.1.1.2 The evaluation against the leafminer.....	74

IV.1.1.2.a Insecticides.....	47
IV.1.1.2.b Nutritive and bio-stimulant	
Compounds .....	82
IV.1.1.3 The evaluation against the cabbage	
looper .....	88
IV.1.1.3.a Insecticides.....	88
IV.1.1.3.b Nutritive and bio-stimulant	
compounds.....	94
IV.1.2 The growing season of 2001.....	99
IV.1.2.1 The evaluation against the cabbage	
Looper .....	99
IV.1.2.1.a Insecticides.....	99
IV.1.2.1.b The bio-stimulant.....	105
IV.1.2.2 The evaluation against the cotton aphid.....	105
IV.1.2.2.a Insecticides.....	105
IV.1.2.2.b The bio-stimulant.....	115
V - SUMMARY .....	124
VI - REFERENCE .....	134
VII ARABIC SUMMARY	

# INTRODUCTION

## I- INTRODUCTION

Tomato belongs to the genus *Lycopersicon* especially *L. esculentum* that is grown for its edible fruit. Tomato is considered among the most important vegetables, where it is the second most commonly grown vegetable crop in the world while potato being the first.

Also, tomato is considered to be an important vegetable in Egypt, where the cultivated area occupies about 280,456 Feddans according to Agricultural Extension and Statistics (Agricultural Economic, Ministry of Agriculture and land Reclamation in 2000). Alexandria Governorate is considered to be the first governorate of Egypt for its area which is cultivated with tomato, where this area occupies about 36,037 Feddan and produced about 522,552 Tons.

Tomato is exposed to a great number of pests, diseases, insects, weeds and nematodes. Therefore, it is important to find out the main methods to control these pests especially the insect-pests.

Insects attacking tomato plant are becoming increasingly difficult to control, particularly in the field. The major insect of concern being the whitefly *Bemisia tabaci*. Genn, (Homoptera: Aleyrodidae) (Schuster, 1997). In addition, insects can carry and transmit diseases such as various geminiviruses, which are now well identified (Polston and Anderson, 1997).

Control means and methods are important and they have been improved and applied to reduce the tomato insect-pests. The chemical control is one of them and the great one. Most diseases, nematodes and

weeds can be also controlled chemically, although the use of chemicals for control can render fruit less desirable in marketplace. Chemicals that are used for controlling insect-pests vary widely in their effectiveness. **Papadopoulos *et al.* (1997), Snyder (1997), and Gill and Sanderson (1998)** discussed insects as well as diseases control measures which can be easily applicable to greenhouse tomato production.

A new line of pesticides (biopesticides) is being developed and some of them containing naturally occurring fungus organisms that can invade the insect's body. These products can be used to control whiteflies, thrips and aphids. Also, these products would be safe for workers and the environment without causing any side effect upon the beneficial insects (**Stephens, 1997**).

The nutrition of tomato plants determines to a large extent its susceptibility to pest infestation, so that it was important to study the effect of the foliar spray on tomato plants and to show whether they increase or reduce the pest infestation.

So that, the aim of the present research work is directed to investigate the effect of two chemical insecticides, a bio-insecticide, a nutritive compound and two natural compounds (neem oil and a biostimulant compound) on those insects attacking tomato throughout the growing season. These compounds would be evaluated to be involved in IPM program for tomato.

In addition to throw a light on the effectiveness of those suggested compounds on insect-pests infestation and on yield. Therefore a schematic

diagram of an integrated management program for insect-pests attacking tomato in Alexandria area would be remarkable. Moreover this program would be useful and could be applicable ones by those farmers who grow tomato in Alexandria governorate.

# REVIEW OF LITERATURE