EVALUATING OF SOME ENVIRONMENTALLY SAFE CON TROL METHODS TO MANAGE SOME APHID SPECIES INFESTING SOME MEDICINAL AND AROMATIC PLANTS IN EGYPT

Submitted By

Essam Refaat Mahmoud Abdallah

B.Sc. of Agricultural Sciences, Faculty of Agriculture, Ain Shams University, 1994

Diploma in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 1999

M. Sc. in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 2007

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Sciences

Department of Environmental Agricultural Sciences
Institute of Environmental Studies and Research
Ain Shams University

2019

APPROVAL SHEET

EVALUATING OF SOME ENVIRONMENTALLY SAFE CONTROL METHODS TO MANAGE SOME APHID SPECIES INFESTING SOME MEDICINAL AND AROMATIC PLANTS IN EGYPT

Submitted By

Essam Refaat Mohmoud Abdallah

B.Sc. of Agricultural Sciences, Faculty of Agriculture, Ain Shams University, 1994

Diploma in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 1999

M. Sc. in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 2007

A Thesis Submitted in Partial Fulfillment

Of

The Requirement for the Doctor of Philosophy Degree

In

Environmental Sciences

Department of Environmental Agricultural Sciences

This Thesis Towards a Doctor of Philosophy Degree in Environmental Sciences has been Approved by:

Name Signature

1-Prof. Dr. Ramadan Mostafa Abdo El-Kholy

Prof. of Pesticides – Plant Protection Department

Faculty of Agriculture

Al-Azhar University

2-Prof. Dr. Youssef Ezz-eldin Youssef Abdallah

Prof. of Economic Entomology- Plant Protection Department

Faculty of Agriculture

Ain Shams University

3-Prof. Dr. Asharf Helmi Fathi

Prof. of Economic Entomology – Plant Protection Department

Faculty of Agriculture

Ain Shams University

4-Prof. Dr. Sayed Mohamed Abdel Latif Dahroug

Emeritus Prof. of Pesticides – Plant Protection Department

Faculty of Agriculture

Ain Shams University

EVALUATING OF SOME ENVIRONMENTALLY SAFE CONTROL METHODS TO MANAGE SOME APHID SPECIES INFESTING SOME MEDICINAL AND AROMATIC PLANTS IN EGYPT

Submitted By

Essam Refaat Mohmoud Abdallah

B.Sc. of Agricultural Sciences, Faculty of Agriculture, Ain Shams University, 1994

Diploma in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 1999

M. Sc. in Environmental Sciences, Institute of Environmental Studies & Research, Ain Shams University, 2007

A Thesis Submitted in Partial Fulfillment

Of

The Requirement for the Doctor of Philosophy Degree

In

Environmental Sciences

Department of Environmental Agricultural Sciences

Under The Supervision of:

1-Prof. Dr. Sayed Mohamed Abdel Latif Dahroug

Emeritus Prof. of Pesticides – Plant Protection Department

Faculty of Agriculture

Ain Shams University

2-Prof. Dr. Asharf Helmi Fathi

Prof. of Economic Entomology – Plant Protection Department

Faculty of Agriculture

Ain Shams University

3-Dr. Mohamed Hawedy Mahmoud Ramadan

Lecturer of Medicinal and Aromatic Plants – Horticulture Department

Faculty of Agriculture

Ain Shams University

4-Prof. Dr. Mona Abdel-Hamid Mohamed Ahmed

Prof. of Vegetables & Medicinal Aromatic Plants

Plant Protection Research Institute

Agricultural Research Center

2019

ABSTRACT

Esam Refat Mahmoud: Evaluating of some environmentally safe control methods to manage some aphid species infesting some medicinal and aromatic plants in Egypt.
Unpublished M. Sc. Thesis, Department of Plant Protection, Faculty of Agriculture, Ain Shams University, 2013.

Medicinal and aromatic plants are considered very economic plants and play a very important role in some drug manufacturing. These plants infested with several insect pests especially sap-sucking insects such as aphids. This study aims at surveying, identifying aphids' infest medicinal and aromatic plants in Egypt as well as determing some ecological aspects and evaluating of some control methods against certein aphids species. Nine aphid species were surveyed and identified on 56 medicinal and aromatic plants in Egypt throughout three successive years, 2013 to 2015.

A bracket key based on morphological diagnostic characters of alate viviparous aphid females was designed to facilitate identification. Population dynamics of the most abundant aphid species; *Aphis gosspyii* on roselle, *Brevicoryne brassicae* on fennel and *Myzus persicae* on both marigold and chamomile plant as well as associated predators were studied; also parasitism and predation percentages were calculated in Qalyubiya and Fayoum governorates during two successive seasons; 2013-2014 and 2014-2015. Effects of three main weather factors; minimum and maximum temperatures as well as relative humidity percentage on changes of population density of certain aphids on roselle, marigold, chamomile and fennel were detected in Fayoum and Qalyubiya governorates. Throughout two successive seasons, 2013-2014 and 2014-2015. Two environmentally safe control methods against the three aphids/were evaluated. The first method was direct treatments by using Biomectin, Bref-AM, A chock, Nimeex and Neem-force against

A.gossypii, *Myzus persicae* and *Brevicoryne brassicae* on the four plants (Roselle, Marigold, Chamomile and Fennel).

Results indicated that Bref-AM was the most efficiency against *A.gossypii* on Roselle, *M.persicae* on Marigold and Chamomile. While Neem-force was the most effective in reducing *B.brassicae* on fennel plants. Also, the second method was undirected by using traps to reduce aphids on medicinal and aromatic plants, two traps. Colored were used; water trap and yellow sticky trap.

Key words: Aphids, Identification, Population dynamics, Weather factors, Pesticides, Yellow sticky trap, Colored water trap.

ACKNOWLEDGEMENT

Firstly an ultimate thanks to Allah

I would like to express my deepest immeasurable thanks and profound gratitude to **Prof. Dr. Sayed Abdel-Latif Dahroug**, Professor Pesticides, Plant Protection Department, Faculty of Agriculture, Ain Shams University, for his keen supervision, valuable guidance, continuous kind encouragement, and constructive criticism and careful revision of the manuscript.

Great appreciation and sincere thanks to **Prof. Dr. Ashraf Helmi Fathi** Professor of Economic Entomology and Insect Ecology, Plant Protection Department, Faculty of Agriculture, Ain Shams University, for his valuable help during the course of this work and for reviewing the manuscript and preparing it in the final form.

I'm grateful to **Dr. Mohammed Hewidy Mahmoud Ramadan** Lecturer of I would also like to thank him for his kind support and revision of the manuscript of this thesis.

Also, I want to thank all of my colleagues in the Plant Protection Research Institute for their help, encouragement and sincere prayers, especially **Dr. Mona Abdel Hamied Ahamd** Head Researcher, Plant Protection Institute, Agricultural Research Center.

Thanks are also extended to all staff in all laboratories of Plant protection Department in Faculty of Agriculture, Ain Shams University and Plant Protection Research Institute, Agricultural Research Center for helping and real cooperation.

Firstly and finally I wish to thank my family and my friends for moral support and making the life possible.

LIST OF TABLES

LIST OF FIGURES