IMPROVING FLOWERING, PRODUCTIVITY AND FRUIT QUALITY OF PICUAL OLIVES USING SOME GROWTH PROMOTERS AND NATURAL EXTRACTS

By

AHMED MOHAMED HASSAN MAHMOUD

B.Sc. Agric. Sc. (Horticulture), Ain Shams University, 2010
M.Sc. Agric. Sc (Pomology), Ain Shams University, 2015

A Thesis Submitted in Partial Fulfillment
Of
the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

in

Agricultural Science

(Pomology)

Department of Horticulture
Faculty of Agriculture
Ain Shams University

2019

Approval Sheet

IMPROVING FLOWERING, PRODUCTIVITY AND FRUIT QUALITY OF PICUAL OLIVES USING SOME GROWTH PROMOTERS AND NATURAL EXTRACTS

By

AHMED MOHAMED HASSAN MAHMOUD

B.Sc. Agric. Sc. (Horticulture), Ain Shams University, 2010
M.Sc. Agric. Sc (Pomology), Ain Shams University, 2015

This thesis for Ph.D. degree has been Approved by:

Dr. Ayman El-Sayed Ahmed Shaban ……
Prof. of Pomology, Faculty of Agricultural, Cairo University.

Dr. Mohamed Abou Rawash Ali Badr …….
Prof. Emeritus of Pomology, Faculty of Agriculture, Ain Shams University.

Dr. Rawhya Bedeir Mohamed …….
Associate Prof. Emeritus of Pomology, Faculty of Agriculture, Ain Shams University.

Dr. Nazmy Abd El-Hamed Abd El-Ghany ……
Prof. of Pomology, Faculty of Agriculture, Ain Shams University.

Date of Examination: 15 / 6 / 2019

IMPROVING FLOWERING, PRODUCTIVITY AND FRUIT QUALITY OF PICUAL OLIVES USING SOME GROWTH PROMOTERS AND NATURAL EXTRACTS

By

AHMED MOHAMED HASSAN MAHMOUD

B.Sc. Agric. Sc (Horticulture), Ain Shams University, 2010
M.Sc. Agric. Sc (Pomology), Ain Shams University, 2015

Under the supervision of:

Dr. Nazmy Abd El-Hamed Abd El-Ghany
Prof. of Pomology, Dept. of Horticulture, Faculty of Agriculture, Ain Shams University (principal supervisor).

Dr. Rawhya Bedeir Mohamed
Associate Prof. Emeritus of Pomology, Dept. of Horticulture, Faculty of Agriculture, Ain Shams University

Dr. Hassan Said Ahmed
Researcher Prof. of Pomology, Dept. of Pomology, National Research Center.

ABSTRACT

Ahmed Mohamed Hassan Mahmoud: Improving flowering, productivity and fruit quality of Picual olives using some growth promoters and natural extracts. Unpublished Ph.D. Thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2019.

This study was carried out during 2017 and 2018 seasons on adult olive trees cv. Picual (8 years old) in a private orchard located at Cairo Ismailia Desert Road, (about 80 Km from Cairo), Ismailia Governorate, Egypt. Trees were grown in sandy soil, under drip irrigation system, uniform in shape and received the common horticultural practices. The Study involved three individual experiments, first experiment was designed to study the effect of spraying olive trees with algae and moringa leaves extarcts at different concentrations and dates (i.e. mid of November or mid of December) where each date had a separate group of trees. Second experiment was designed to study the effect of spraying olive trees with putrescine (PUT), salicylic acid (SAL) and ascorbic acid (ASC) at different concentrations and dates (i.e. mid of November and mid of December) and each date had a separate group of trees. The third experiment was designed to study the effect of spraying olive trees with nano-boron and nano-zinc at different concentrations on vegetative growth, leaf pigments and mineral content, flowering, fruit set, yield and fruit physical and chemical properties of Picual olive trees. However, in the first experiment, results indicated that all different spraying treatments of algae and moringa extract at different spraying dates had a positive effect on vegetative growth, leaf mineral contents, fruit set, yield and fruit chemical properties in comparison with the control. As for the second experiment, results revealed that all different spraying treatments of some growth active substances at different spraying dates had a positive effect on most of parameters in comparison with the control. Concerning the third experiment, results illustrated that all different spraying treatments of nano-boron and nano-zinc had a positive effect on the same parameters

as compared with the control. Treatment of nano-boron at 20 ppm + nano-zinc at 200 ppm at three times (i.e. the first one at mid of December, the second before the flowering and the third one during full bloom) was the most effective treatments to enhance vegetative growth, leaf minerals content, flowering, fruit set, yield, fruit quality, and oil content and quality.

Key words: Olive (*Olea europaea*) – Picual – Algae extract – Moringa leaves extract – Putrescine – Salicylic acid – Ascorbic acid - Nanoboron - Nanozinc – Vegetative growth – Flowering – Leaf mineral content - Fruit set – Yield – Fruit quality – Oil properties.

ACKNOWLEDGEMENTS

First of all, full praise and gratitude is to **Allah** for his blessings

Words cannot express my gratitude and I am honored to convey my deepest thanks to my principal supervisor **Prof. Dr. Nazmy Abd Elhamid Abd El-Ghany** Professor of Pomology, Vice President of Ain Shams University for Community Service and Environmental Development, for his support, advices, guidance and suggestions that benefited her much in the success of this study.

I would also like to thank my supervision **Dr. Rawhya Bedeir Mohamed** Associate Professor Emeritus of Pomology, Faculty of Agriculture, Ain Shams University, for advices, guidance and valuable comments to me during this work.

I would like to thank my supervision **Prof. Dr. Hassan Sayed Ahmed** Professor of Pomology, Department of Pomology, National Research Center, for his supervision, helping, guidance and gracious support throughout of my work.

My deepest gratitude to **Prof. Dr. Laila Foaud Haggag** Professor Emeritus of Pomology, Department of Pomology, National Research Center, who guided and still guiding me and for her supervision, support and encouragement.

In addition, I would like to thank **Dr. Ismael Abd Ellah Gnidy**, Associate Professor of Pomology, Dept. of Pomology, National Research Center, for his supervision, helping, support me during this work.

Special thanks for all staff members in pomology Dept. National Research Center for their valuable help during carring out the experiments of this work.

I am particularly grateful to my family, specially my father and my mother for their understanding, patience and loving encouragement.

CONTENTS

LIST OF TABLES