



شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم



شبكة المعلومات الجامعية
@ ASUNET



شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

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 الأصلية تالفة

بالرسالة صفحات لم ترد بالاصل

PHYSIOLOGICAL STUDIES TO CONTROL POMEGRANATE FRUIT DISORDERS

CEV

By

SALAH EL-DIN MOHAMED ALY EL-MASRY

B.Sc. Agriculture Pomology

Assiut University, 1989

THESIS

Submitted in partial fulfilment
of the requirement for the degree of

MASTER OF SCIENCE

IN

HORTICULTURE (POMOLOGY)

Department of Horticulture
Faculty of Agriculture
Assiut University

1995

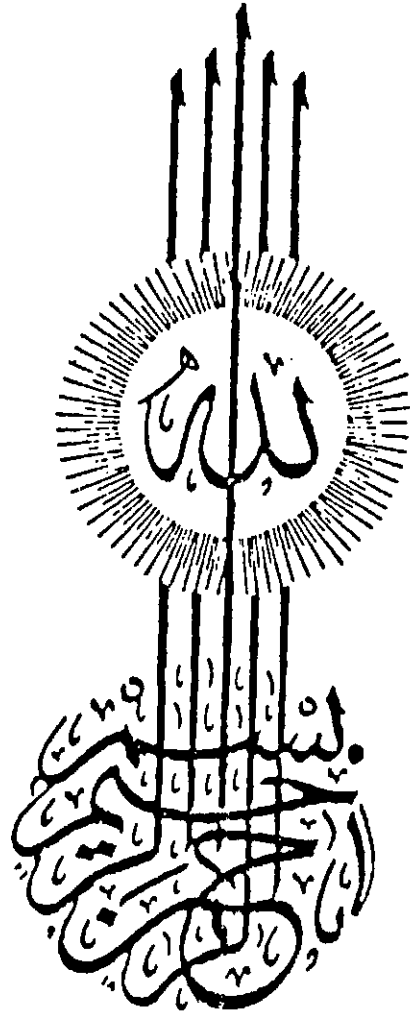
Supervised by:

Prof. Dr. Shehata E. El-Kassas
Prof. Dr. Hassanein G. hassanein
Dr. Ashraf Y. Abdalla

Assiut University

Examined by:

Prof. Dr. Abdel-Hamid M. Wasel
Minia University
Prof. Dr. Samir Z. El-Agamy
Prof. Dr. Shehata E. El-Kassas
Assiut Universty



« قالوا سبحانك لا علم لنا إلا ما علمتنا
إنك أنت العليم الحكيم »

صدق الله العظيم
(سورة البقرة ، ٣٢ ، الجزء الاول)

APPROVAL SHEET

PHYSIOLOGICAL STUDIES TO CONTROL
POMEGRANATE FRUIT DISORDERS

By

Salah El-Din Mohamed Aly El-Masry

This thesis has been approved by:

--- A. H. Wassef ---

--- EL-Kassa ---

--- Sameh El-Agamy ---

(Committee in charge)

Date: / /1995

Acknowledgment

ACKNOWLEDGEMENT

The author wishes to express his sincere gratitude and appreciation to his supervisor **Prof. Dr. Shehata El-Azab El-Kassas**, Professor of Pomology, Horticulture Department, Assiut University for his assistance, guidance and suggestion in carrying out this research and in preparation of this manuscript during the whole period of study.

Deep thanks are also expressed to **Prof. Dr. H.G. Hassanein**, Department of Soils and Water, College of Agriculture, University of Assiut, for his continuous encouragement and technical advice.

The author wishes to express his appreciation and gratefulness to **Dr. Ashraf Y. Abdalla**, Lecturer of Pomology Horticulture Department, Assiut University for his supervision, valuable advice and kind help during writing this thesis.

Many great thanks are also expressed to the Staff Members of Horticulture Department (Pomology), Assiut University for their valuable advice and generous help during the whole period of the study.

Also, I would like to express my deep gratitude to my colleagues of Horticulture Department, Assiut University for their sincere cooperation.

I am indebted to my family for giving me love, moral support, encouragement and standing by me all the time.

Contents

CONTENTS

	Page
List of Tables -----	iv
Introduction -----	1
Review of Literature -----	4
1- Cracking -----	4
1-1- Causes of cracking -----	4
1-1-a- Varietal susceptibility -----	5
1-1-b- Climatic conditions -----	6
1-1-c- Soil fertility and fertilization -----	10
1-1-d- Changes of peel properties and fruit volume -----	13
1-1-e- Physiological characteristics of the fruit -----	16
II- Reduction of fruit cracking -----	16
II-1- Horticultural practices -----	17
II-2- Alleviation of unsuitable environmental conditions -----	19
II-3- Chemical used to reduce fruit cracking -----	20
III- Sunburn -----	24
IV - Discoloration or pale color of the fruit skin. -----	28
Materials and Methods -----	33
Results and Discussion -----	39
The first experiment -----	39
I- Fruit density and tree aspect -----	39
II- Fruit cracking -----	42
II-1- The effect of tree aspect on the percentage of fruit cracking relative to total cracked fruits/tree -----	42
II-2- The effect of tree aspect and soil application of $ZnSO_4$ on the percentage of fruit cracking relative to total number of fruits/tree. -----	45

II-3- The effect of soil application of ZnSO_4 on progressive succession of fruit cracking of Manfalouty pomegranate from the time of fruit maturity till harvesting. -----	51
III- Fruit yield (in kg/tree). -----	54
IV- Fruit quality -----	57
IV-1- Fresh weight per fruit -----	57
IV-2- Peel thickness -----	59
IV-3- Total soluble solids (TSS) -----	61
IV-4- Reducing sugars -----	63
IV-5- Total acidity -----	63
IV-6- Total soluble solids/acid ratio -----	66
The second experiment -----	68
I- Fruit density and tree aspect -----	68
II- Fruit cracking -----	68
II-1- The distribution of cracked fruits on the four aspects of Manfalouty pomegranate tree -----	68
II-2- The effect of tree aspect and foliar vis fruit sprays with GA_3 and certain concentrations of some micronutrients on the percentage of fruit cracking relative to total number of fruits/tree -----	72
II-3- The progressive succession of fruit splitting after maturity (as percent from total number of fruits/tree) in respnse to foliar sprays with GA_3 and certain concentrations of some micronutrients. -----	78
III- Fruit yield in kg/tree -----	82

IV- Fruit quality -----	84
IV-1- Fresh weight per fruit -----	84
IV-2- Peel thickness -----	87
IV-3- Total soluble solids & reducing sugars -----	89
IV-4- Total acidity -----	92
IV-5- Total soluble solids/acids ratio -----	94
The third experiment -----	97
I- Sunburn -----	97
II- Pale color of fruit skin or discoloration -----	104
III- Fruit yield in kg/tree -----	112
IV- Fruit quality -----	115
IV-1- Fresh weight per fruit -----	115
IV-2- Peel thickness -----	117
IV-3- Total soluble solids & reducing sugars -----	119
IV-4- Juice acidity -----	123
IV-5- TSS/acids ratio -----	125
Summary and Conclusion -----	127
Literature cited -----	136
Arabic summary -----	-

LIST OF TABLES

Table No		Page
1	Area and production of pomegranate in 1993	2
2	Effect of tree aspect on the percentage of fruit density relative to total number of fruits/tree during 1991, 1992 and 1993 seasons	41
3	Effect of tree aspect on the percentage of fruit cracking (as percent of total cracked fruits) during 1991, 1992 and 1993 Seasons	44
4A	Effect of soil application of zinc sulfate, tree aspect and combination of both on the percentage of fruit splitting (based on total number of fruits/tree) during 1991, 1992 and 1993 seasons at Assiut orchard.	46
4B	Effect of soil application of zinc sulfate, tree aspect and combination of both and the percentage of fruit splitting (based on total number of fruits/tree) during 1992 and 1993 seasons at El-Ghorieb orchard (sandy calcareous soil).	50
5A	Effect of soil application of zinc sulfate and delaying harvesting on the percentage of fruit splitting in manfalouty pomegranate during 1992 and 1993 seasons on clay soil at Assiut orchard (values based on total number of fruits/tree)	52
5B	Effect of soil application of zinc sulfate and delaying harvesting on the percentage of fruit splitting of Manfalouty pomegranate during 1992 and 1993 seasons on sandy calcareous at El-Ghorieb orchard (values based on total number of fruits/tree).	53
6	Effect of soil application of zinc sulfate on the expected yield (in kg/tree) of Manfalouty pomegranate during 1991, 1992 and 1993 seasons	56