STUDIES ON THE VEGETATIVE PROPAGATION

OF GUAVA TREES

Ву

take property of the state of t

Ahmed Abd El-Hamed Ahmed Awad

Thesis Submitted in Partial Fulfillment

of

The Requirement For The Degree of

Master of Science

in

Agricultural Science

(Pomology)

[Chail En

48705

134.421 A.A

Department of Horticulture

Faculty of Agriculture

Ain Shams University

1993



STUDIES ON THE VEGETATIVE PROPAGATION

OF GUAVA TREES

Ву

المرابعة المساوعة الم

Ahmed Abd El-Hamed Ahmed Awad

Thesis Submitted in Partial Fulfillment

of

The Requirement For The Degree of

Master of Science

in

Agricultural Science (Pomology)

(mail Const

48705

434.421 A.A

Department of Horticulture

Faculty of Agriculture

Ain Shams University

1993





APPROVAL SHEET

STUDIES ON THE VEGETATIVE PROPAGATION OF GUAVA TREES

Ву

Ahmed Abd El-Hamed Ahmed Awad

B.Sc. Agric. (Horticulture) Ain Shams Univ. 1988
This thesis for M.Sc. Degree has been
approved by:

Prof. of Pomology, Fac. Agric., Ain Shams Univ.

Date of examination: / / 1993.

STUDIES ON THE VEGETATIVE PROPAGATION OF GUAVA TREES

Ву

Ahmed Abd El-Hamed Ahmed Awad

B.Sc. Agric. (Horticulture), Ain Shams Univ., 1988

Under the supervision of:

- Prof. Dr. Abd El-Azim Mohamed El-Hammady

 Prof. of pomology, Horticulture Dept., Fac.

 Agric., Ain Shams Univ.
- Prof. Dr. Mohamed Abou-Rawash Aly

 Prof. of pomology, Horticulture Dept., Fac.

 Agric., Ain Shams Univ.

ABSTRACT

Leafy soft-wood cuttings of Montakhab El-Sabahia and Banaty guava cvs. could initiate roots and survive successfully when collected from June to August and treated with 2500 p.p.m. IBA and grown under mist system or polyethelene cover in a greenhouse for eight weeks.

Nodal segments were the best explants for guava micropropagation. Maximum proliferation was achieved on MS medium supplemented with 1 mg/L $^{-1}$ BAP. About 80% of shoots rooted well on a medium supplemented with 0.5 mg/L $^{-1}$ IBA, 7 g/L $^{-1}$ agar and 1 g/L $^{-1}$ activated charcoal. Plantlets were successfully established in soil.

ACKNOWLEDGEMENT

I'm deeply indebted to Dr. Abd El-Azim El-Hammady Prof. of Pomology, Department of Horticulture, Fac. Agric., Ain Shams Univ. for his supervision and valuable suggestions. His ideas in the field of this study are reflected in the different parts of this thesis.

My sincere gratitude to Dr. Mohamed Abou-Rawash Prof. of Pomology, in the same Department for his supervision and valuable guidance and advice.

I would like to express my great thanks to Dr. Wafaa Wanas Associate prof. of pomology, in the same Department for her supervision and valuable guidance and advice.

I'm also greatly indebted to Dr. Hussein El-Hennawy Associate Prof. of Pomology and Dr. Hassan El-Wakeel Lecture of Pomology, Dept. of Hort., Fac. Agric., Ain Shams Univ. for their sincere help and advice during this work.

CONTENTS

	Page
INTRODUCTION	1
REVIEW OF LITERATURE	3
MATERIALS AND METHODS	22
RESULTS AND DISCUSSION	32
Part I: Leafy soft-wood cuttings experiments	32
1- Mist propagation experiments	32
2- Greenhouse experiments	51
Part II: In vitro propagation experiments	72
1- Initiation and establishment of guava shoot-tip	
and nodal cultures	72
2- Proliferation stage	77
3- Rooting stage	82
4- Hardening and establishment of rooted guava	
plantlet in soil	88
SUMMARY AND CONCLUSIONS	90
REFERANCES	9 4
ARABIC SUMMARY	

LIST OF TABLES

No.	þ	age
1-	Effect of collection time and IBA treatments on	
	rooting percentage and roots number/cutting of	
	terminal cuttings of Montakhab El-Sabahia guava	
	cv. (1990 season)	33
2-	Effect of collection time and IBA treatments on	
	average root length and survival percentage of	
	terminal cuttings of Montakhab El-Sabahia guava	
	cv. (1990 season)	34
3-	Effect of collection time and IBA treatments on	
	rooting percentage and roots number/cutting of	
	sub-terminal cuttings of Montakhab El-Sabahia	
	guava cv. (1990 season)	37
4 –	Effect of collection time and IBA treatments on	
	average root length and survival percentage of	
	sub-terminal cuttings of Montakhab El-Sabahia	
	guava cv. (1990 season)	38
5-	Effect of collection time and IBA treatments on	
	rooting percentage and roots number/cutting of	
	sub-terminal cuttings of Montakhab El-Sabahia	
	guava cv. (1991 season)	42
6-	Effect of collection time and IBA treatments on	
	average root length and survival percentage of	
	sub-terminal cuttings of Montakhab El-Sabahia	
	guava cv. (1991 season)	43

No.	P	age
7-	.Effect of collection time and IBA treatments on	
	rooting percentage and roots number/cutting of	
	sub-terminal cuttings of Banaty guava cv.(1991	
	season)	46
8-	Effect of collection time and IBA treatments on	
	average root length and survival percentage of	
	sub-terminal cuttings of Banaty guava cv. (1991	
	season)	47
9-	Effect of collection time and IBA treatments on	
	rooting percentage and roots number/cutting of	
	terminal cuttings of Montakhab El-Sabahia guava	
	cv. (1991-1992 season)	52
10-	Effect of collection time and IBA treatments on	
	average root length and survival percentage of	
	terminal cuttings of Montakhab El-Sabahia guava	
	cv. (1991-1992 season)	53
11-	Effect of collection time and IBA treatments on	
	rooting percentage and roots number/cutting of	
	sub-terminal cuttings of Montakhab El-Sabahia	
	guava cv. (1991-1992 season)	56
12-	Effect of collection time and IBA treatments on	
	average root length and survival percentage of	
	sub-terminal cuttings of Montakhab El-Sabahia	
	guava cv. (1991-1992 season)	57

No.	Page
13-	Effect of collection time and IBA treatments on
	rooting percentage and roots number/cutting of
	terminal cuttings of Banaty guava cv. (1991-
	1992 season) 61
14-	Effect of collection time and IBA treatments on
	average root length and survival percentage of
	terminal cuttings of Banaty guava cv.(1991-1992
	season) 62
1,5-	Effect of collection time and IBA treatments on
	rooting percentage and roots number/cutting of
	sub-terminal cuttings of Banaty guava cv.(1991-
	1992 season) 66
16-	Effect of collection time and IBA treatments on
	average root length and survival of sub-terminal
	cuttings of Banaty guava cv. (1991-1992 season) 67
17-	Effect of surface sterilization agents on the
	contamination percentage and survival of guava
	shoot-tip explants 73
18-	Effect of surface sterilization agents on the
	contamination percentage and survival of guava
	nodal explants 75
19-	Effect of BAP and IBA concentrations on proliferation
	rate of guava nodal explants (number and length of
	proliferated shoots) 80

No.		Page
20-	Effect of IBA and NAA concentrations in solidified	
	agar medium on the <u>in vitro</u> rooting percentage,	
	and both number & length of roots proliferated on	
	guava shoots	. 83
21-	Effect of IBA and NAA concentrations in liquid	
	medium on the <u>in vitro</u> rooting percentage and	
	both number & length of roots proliferated on	
	guava shoots	. 86

LIST OF FIGURES

No.	P:	ige
1-	Effect of collection time and IBA treatments on	
	rooting percentage of terminal cuttings of Mon-	
	takhab El-Sabahia guava cv. (1990 season)	35
2-	Effect of collection time and IBA treatments on	
	survival percentage of terminal cuttings of Mon-	
	takhab El-Sabahia guava cv. (1990 season)	35
3 –	Effect of collection time and IBA treatments on	
	rooting percentage of sub-terminal cuttings of	
	Montakhab El-Sabahia guava cv. (1990 season)	39
4 –	Effect of collection time and IBA treatments on	
	survival percentage of sub-terminal cuttings of	
	Montakhab El-Sabahia guava cv. (1990 season)	39
5-	Effect of collection time and IBA treatments on	
	rooting percentage of sub-terminal cuttings of	
	Montakhab El-Sabahia guava cv. (1991 season)	44
6-	Effect of collection time and IBA treatments on	
	survival percentage of sub-terminal cuttings of	
	Montakhab El-Sabahia guava cv. (1991 season)	4.4
7-	Effect of collection time and IBA treatments on	
	rooting percentage of sub-terminal cuttings of	
	Banaty guava cv. (1991 season)	48
8-	Effect of collection time and IBA treatments on	
	survival percentage of sub-terminal cuttings of	
	Banaty guava cv. (1991 season)	48

No.	P	age
9-	Effect of collection time and IBA treatments on	
	rooting percentage of terminal cuttings of Mon-	
	takhab El-Sabahia guava cv. (1991-1992 season)	54
10-	Effect of collection time and IBA treatments on	
	survival percentage of terminal cuttings of Mon-	
	takhab El-Sabahia guava cv. (1991-1992 season)	54
11-	Effect of collection time and IBA treatments on	
	rooting percentage of sub-terminal cuttings of	
	Montakhab El-Sabahia guava cv. (1991-1992	
	season)	58
12-	Effect of collection time and IBA treatments on	
	survival percentage of sub-terminal cuttings of	
	Montakhab El-Sabahia guava cv. (1991-1992	
	season)	58
13-	Effect of collection time and IBA treatments on	
	rooting percentage of terminal cuttings of	
	Banaty guava cv. (1991-1992 season)	63
14-	Effect of collection time and IBA treatments on	
	survival percentage of terminal cuttings of	
	Banaty guava cv. (1991-1992 season)	63
15-	Effect of collection time and IBA treatments on	
	rooting percentage of sub-terminal cuttings of	
	Banaty guava cv. (1991-1992 season)	68
16-	Effect of collection time and IBA treatments on	
	survival percentage of sub-terminal cuttings of	
	Ranaty guaya cv. (1991-1992 season)	68

LIST OF PLATES

	p	age
1(a)	Effect of IBA treatments on rooting of sub-	
	terminal leafy soft-wood cuttings of Montakhab	
	El-Sabahia guava cv. collected in June 1990	40
1(b)	Effect of 2500 p.p.m IBA on rooting of subterminal	
	leafy soft-wood cuttings of Banaty guava cv. coll-	
	ected in August 1991	49
1(c)	Effect of IBA treatments on rooting of sub-	
	terminal leafy soft-wood cuttings of Mon-	
	takhab El-Sabahia guava cv. collected in	
	July 1992	60
1(d)	Effect of IBA treatments on rooting of terminal	
	leafy soft-wood cuttings of Banaty guava cv.	
	collected in July 1992	70
1(e)	Effect of IBA treatments on rooting of sub-	
	terminal leafy soft-wood cuttings of Banaty	
	guava cv. collected in July 1992	70
2(a)	The abnormal appearance of guava leaves floded	
	around the mid-rib during establishement stage	
	of shoot tip explants	78
2(b)	Guava proliferated shoots derived from the nodal	
	explant in multiplication stage	78
2(c)	Effect of IBA and NAA concentrations in solidified	
	agar medium on in vitro rooting of guava shoots	85



	Page
2(d)	Effect of IBA and NAA concentrations in liquid
	medium on in vitro rooting of guava shoots 85
2(e)	Hardening and outestablishment of rooted guava
	plantlets 89
	AIN SHAMS UNIVERSITY