

**MUTUAL EFFECTS OF SOME NEWLY  
INTRODUCED CITRUS CULTIVARS  
BUDED ON SOUR ORANGE  
AND VOLKAMER LEMON  
ROOTSTOCKS**

By

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B.Sc. Agric. Sc. (Horticulture), Ain Shams University, 2005

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## ABSTRACT

**Mohamed Abd El-Hamed Nasser: Mutual Effects of Some Newly Introduced Citrus Cultivars Budded on Sour Orange and Volkamer Lemon Rootstocks. Unpublished M.Sc. Thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2010.**

The present study was carried out on newly introduced citrus cultivars i.e. Navelina and New Hall Navel orange, Olinda Valencia orange and Fermont mandarin budded on Volkamer lemon (*Citrus volkameriana* Ten. and Pasq.) and Sour orange (*Citrus aurantium* L.) rootstocks. The transplants were planted on May 2005, at 4 x 6 meters, in sandy loam soil under drip irrigation system in a private orchard at Wady El-mollak, Ismailia Governorate, Egypt during 2006 and 2007 seasons.

The evaluation program considered the major characteristics of vegetative growth, root growth and leaf content of N, P and K%.

The obtained data showed that Volkamer lemon rootstock induced higher values of vegetative growth than Sour orange rootstock represented in (Scion height, Canopy diameter, Tree canopy volume, Shoot and leaf number, Shoot length and Leaf area). While, the compatibility percentage did not affected significantly by the tested rootstocks through the two studied seasons.

At all studied combination, root system measurements showed that, Volkamer lemon rootstock induced higher values of fresh and dry weight of root and average root length than the Sour orange rootstock. While, when New Hall and Navelina were budded on both rootstocks there were no significant effect on either root fresh and dry weight or average root length.

Volkamer lemon rootstock showed significantly high length values of white roots, yellowish roots and brownish roots, in comparison to Sour orange rootstock. The highest significant length of white roots occurred during May and August. While, the smallest length of white

roots were noticed in November and January. In addition, the white roots disappeared in December. The highest significant length of yellowish roots occurred in June, July, August and September. While the smallest yellowish roots were noticed during the period from December to February. The highest significant length of brownish roots occurred during August and October. While, the smallest brownish roots were noticed in April.

The obtained data showed that Volkamer lemon rootstock induced high values of N, P and K% of New Hall, Navelina, Olinda and Fermont leaf during 2007, in compared to Sour orange rootstock

**Key Words:**

Citrus rootstocks (Sour orange and Volkamer lemon) , Citrus cultivars (New Hall, Navelina, Olinda and Fermont), Vegetative growth, Root system growth

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## CONTENTS

	page
<b>LIST OF TABLES</b>	<b>Iii</b>
<b>LIST OF FIGURES</b>	<b>Vii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>Viii</b>
<b>1. INTRODUCTION</b>	<b>1</b>
<b>2. REVIEW OF LITERATURE</b>	<b>3</b>
2.1. Root system measurements	3
2.2. Effect of rootstocks on leaf mineral percentage of scion leaves	4
2.3. Effect of rootstock on some scion characteristics	5
2.3.1. transplant vigor	5
2.3.2. Shoot number	8
2.3.3. Shoot length	9
2.3.4. Leaf number	9
2.3.5. Leaf area	10
2.3.6. Compatibility Percentage	11
<b>3. MATERIALS AND METHODS</b>	<b>12</b>
3.1. Root system measurements	13
3.1.1. Root fresh and dry weight	13
3.1.2. Average root growth	13
3.2. Chemical analysis	16
3.2.1. Determination of total nitrogen	16
3.2.2. Determination of total phosphorus	16
3.2.3. Determination of total potassium	16
3.3. Scion characteristics	16
3.3.1. Vigor measurements	16
3.3.2. Number of Shoots	17
3.3.3. Shoot length	17
3.3.4. Number of leaves per tree	17
3.3.5. Leaf area (cm <sup>2</sup> )	17
3.3.6. Compatibility Percentage	17

3.3.7. Statistical analysis	17
<b>4. RESULTS AND DISCUSSION</b>	18
4.1. Effect of scion on root growth	18
4.1.1. Root system measurements	18
4.1.1.1. Root fresh weight	19
4.1.1.2. Root dry weight	19
4.1.2. Average length of roots	22
4.1.2.1. Average length of white roots	22
4.1.2.2. Average length of yellowish roots	26
4.1.2.3. Average length of brownish roots	31
4.2. Effect of rootstock on some leaf mineral percentage of scion	37
4.2.1. Nitrogen Percentage	37
4.2.2. Phosphorus Percentage	37
4.2.3. Potassium Percentage	38
4.3. Effect of rootstock on some scion characteristics	42
4.3.1. tree vigor	42
4.3.1.1. Scion height	42
4.3.1.2. Canopy diameter	43
4.3.1.3. Canopy volume	44
4.3.2. Number of shoots	49
4.3.3. Shoot length	50
4.3.4. Number of leaves per tree	54
4.3.5. Leaf area	55
4.3.6. Trunk circumference	59
4.3.7. Compatibility Percentage	60
<b>5. SUMMARY</b>	64
<b>6. REFERENCES</b>	66
<b>ARABIC SUMMARY</b>	

## LIST OF TABLES

No.		Page
1.	Some physical properties of the experimental soil.	12
2.	Chemical properties of the experimental soil.	13
3.	Variations in root fresh and dry weight of Sour orange and Volckamer lemon budded with New Hall and Navelina Navel orange cultivars during 2006 and 2007 seasons.	20
4.	Variations in root fresh and dry weight of Sour orange and Volckamer lemon budded with Olinda Valencia orange cultivar during 2006 and 2007 seasons.	21
5.	Variations in root fresh and dry weight of Sour orange and Volckamer lemon budded with Fermont mandarin cultivar during 2006 and 2007 seasons.	21
6.	Average growth rates of white roots for Volkamer lemon and Sour orange rootstock budded with New Hall and Navelina Navel orange during the first season (2006-2007).	23
7.	Average growth rates of white roots for Volkamer lemon and Sour orange rootstocks budded with New Hall and Navelina Navel orange during the second season (2007-2008).	24
8.	Average growth rates of yellowish roots for Volkamer lemon and Sour orange rootstocks budded with New Hall and Navelina Navel orange during the first season (2006-2007).	28
9.	Average growth rates of yellowish roots for Volkamer lemon and Sour orange rootstocks budded with New Hall and Navelina Navel orange during the second season (2007-2008).	29
10.	Average growth rates of brownish roots for	

- Volkamer lemon and Sour orange rootstocks budded with New Hall and Navelina Navel orange during the first season (2006-2007). 33
- 11.** Average growth rates of brownish roots for Volkamer lemon and Sour orange rootstocks budded with New Hall and Navelina Navel orange during the second season (2007-2008). 34
- 12.** Leaf N, P and K% of New Hall and Navelina Navel orange scions budded on Sour orange and Volkamer lemon rootstocks during 2007 season. 40
- 13.** Leaf N, P and K% of Olinda Valencia orange scions budded on Sour orange and Volkamer lemon rootstocks during 2007 season. 41
- 14.** Leaf N, P and K% of Fermont mandarin scions budded on Sour orange and Volkamer lemon rootstocks during 2007 season. 41
- 15.** Effect of Sour orange and Volkamer Lemon Rootstocks on scion height (cm), canopy diameter (cm) and canopy volume (m<sup>3</sup>) of New Hall and Navelina Navel orange scions during 2006 and 2007 seasons. 47
- 16.** Effect of Sour orange and Volkamer Lemon Rootstocks on scion height (cm), canopy diameter (cm) and canopy volume (m<sup>3</sup>) of Olinda Valencia orange scions during 2006 and 2007 seasons. 48
- 17.** Effect of Sour orange and Volkamer Lemon Rootstocks on scion height (cm), canopy diameter (cm) and canopy volume (m<sup>3</sup>) of Fermont mandarin scions during 2006 and 2007 seasons. 48

18. Effect of Sour orange and Volkamer Lemon Rootstocks on Shoot number and shoot length (cm) of New Hall and Navelina Navel orange cultivars during 2006 and 2007 seasons. 52
19. Effect of Sour orange and Volkamer Lemon Rootstocks on Shoot number and shoot length (cm) of Olinda Valencia orange cultivar during 2006 and 2007 seasons. 53
20. Effect of Sour orange and Volkamer Lemon Rootstocks on Shoot number and shoot length (cm) of Fermont mandarin cultivar during 2006 and 2007 seasons. 53
21. Effect of Sour orange and Volkamer Lemon Rootstocks on leaf number and leaf area (cm<sup>2</sup>) of New Hall and Navelina Navel orange cultivars during 2006 and 2007 seasons. 57
22. Effect of Sour orange and Volkamer Lemon Rootstocks on leaf number and leaf area (cm<sup>2</sup>) of Olinda Valencia orange cultivar during 2006 and 2007 seasons. 58
23. Effect of Sour orange and Volkamer Lemon Rootstocks on leaf number and leaf area (cm<sup>2</sup>) of Fermont mandarin cultivar during 2006 and 2007 seasons. 58
24. Effect of Sour orange and Volkamer Lemon Rootstocks on Trunk circumference at 5 cm above and below bud union (cm) and Compatibility% of New Hall and Navelina Navel orange cultivars during 2006 and 2007 seasons. 62

25. Effect of Sour orange and Volkamer Lemon Rootstocks on Trunk circumference at 5 cm above and below bud union (cm) and Compatibility% of Olinda Valencia orange cultivar during 2006 and 2007 seasons. 63
26. Effect of Sour orange and Volkamer Lemon Rootstocks on Trunk circumference at 5 cm above and below bud union (cm) and Compatibility% of Fermont mandarin scion during 2006 and 2007 seasons. 63

## LIST OF FIGURES

No.		page
1.	Pyrex Tube was installed in the soil at angle of 45°.	14
2.	(a) The periscope (b) The upper part of periscope. (c) The lower part of periscope.	15
3.	A12V automobile-battery was used as a power source.	15
4.	The effect of the interaction between the two tested rootstocks, scions and months on average growth rates of white roots (2006-2007).	25
5.	The effect of the interaction between the two tested rootstocks, scions and months on average growth rates of white roots (2007-2008).	25
6.	Fig. (7): The effect of the interaction between the two tested rootstocks, scions and months on average growth rates of yellowish roots (2006-2007).	30
7.	The effect of the interaction between the two tested rootstocks, scions and months on average growth rates of yellowish roots (2007-2008).	30
8.	The effect of the interaction between the two tested rootstocks, scions and months on average growth rates of brownish roots (2006-2007).	35
9.	The effect of the interaction between the two tested rootstocks, scions and months on average growth rates of brownish roots (2007-2008).	35

**LIST OF ABBREVIATIONS**

<b>AOAC</b>	Association of Official Analytical Chemists
<b>i.e.</b>	That is
<b>S.o</b>	Sour orange
<b>TCSA</b>	Trunk cross sectional area
<b>V.1</b>	Volkamer lemon

## INTRODUCTION

World citrus production and consumption has witnessed a period of strong growth since 1980 (FAO, 2001).

Citrus is the most important tree fruit crops in Egypt with annual production of approximately 3,233,458 tons. Oranges and Mandarin are the most extensively produced citrus fruit about 2,138,425 tons represented about 66.13% and 758,105 tons represented about 23.44%, respectively, according to (Agricultural Statistics Institute, 2008)

Rootstocks have a vital importance in the quality of production and survival of citrus species. Many citrus varieties are used successfully as rootstocks under different environmental conditions of the Mediterranean and temperate regions, as well as their tolerance to diseases and certain soil conditions such as high salinity, alkaline and water logging (Castle, 1987 and Montevde *et al.*, 1988).

Sour orange is an excellent rootstock for most orange and mandarine varieties, due to its moderate, deep root system, resistance to gummosis disease, and to the high fruit quality, smooth, thin-skinned, and juicy fruit produced by cultivars budded on it. However, its lack tolerance to (quick decline), due to a virus disease that is transmitted by an insect vector or from infected budwood "Tristeza", this virus deteriorate the phloem tissues in the union area between Orange scion and Sour orange rootstock (Hudson *et al.*, 1990).

Volkamer lemon (*Citrus volkameriana*) is a lemon hybrid, it is produce the most tree vigorous growth for the scions and tolerant to Tristeza, Xyloporosis and Exocortis, but it is susceptible to Phytophthora, citrus nematode and burrowing nematode (Davies and Albrigo, 1994).

New Hall cultivar was created as bud mutation from Washington Navel orange, its fruits similar to Washington Navel orange with