MUTUAL EFFECTS OF SOME NEWLY INTRODUCED CITRUS CULTIVARS BUDDED 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 Unpublished M.Sc.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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LIST OF ABBREVIATIONS

AOAC	Association of Official Analytical Chemists
i.e.	That is
S.o	Sour orange
TCSA	Trunk cross sectional area
V.l	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 Statisics 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, 1987and 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