

**EFFECT OF INTERSTOCK ON GROWTH AND
LEAF MINERAL CONTENT OF VALENCIA
AND NAVEL ORANGE TRANSPLANTS**

By

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ABSTRACT

Marwa Yahia Mohammed : Effect of Interstock on Growth and Leaf Mineral Content of Valencia and Navel Orange Transplant. Unpublished M.Sc. Thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2019.

This study was carried out in controlled greenhouse of Desert Research Center, Cairo, Egypt. Two famous citrus rootstocks sour orange (*C. aurantium.*) and volkamer lemon (*C. volkamariana.*) were tested as interstocks at the stage of transplant production to investigate their mutual effects on the scion growth characteristics, mineral content, carbohydrates, total indols and phenols from side; and rootstock growth traits. nitrogen content, carbohydrates, indols and phenols from the other side. In the first experiment the results indicated that Valencia orange scion budded on *C. volkamariana* interstock grafted on *C. aurantium* rootstock gave the highest significantly zinc in leaf content, total carbohydrates in scion stem and C/N ratio in scion stem, and Valencia orange budded on *C. volkamariana* grafted on *C. volkamariana* revealed significantly the highest leaf area, N, P, K, Mn content in leaf, total N in stem, total N in root, total indols in vegetative growth and indols / phenols ratio in root system. Whereas, in the second experiment the results indicated that, Navel orange scion budded on *C. volkamariana* interstock grafted on *C. aurantium* rootstock gave the highest significantly vegetative growth dry weight percentage, root dry weight percentage, Ca, Fe, Zinc in leaf content, C/N ratio in scion stem and root, and Navel orange budded on *C. volkamariana* grafted on *C. volkamariana* achieved significantly the highest scion height, root length and leaf number. Whereas, the highest content of N, P, K, Mg, Fe, Zn, Mn and total phenols in scion stem. Moreover, the mentioned treatment gained the highest significant carbohydrates in roots.

Key words: Interstock, Rootstock, Valencia orange, Navel orange, Citrus transplant, Sour orange, Volkamer lemon.

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LIST OF ABBREVIATIONS

V.O	Valencia Orange
N.O	Navel Orange
V.L	Volkamer Lemon
S.O	Sour Orange
V.g.f.w	Vegetative growth fresh weigh
V.g.d.w %	Vegetative growth dry weigh percentage
R.f.w	Root fresh weight
R.d.w	Root dry weight percentage

INTRODUCTION

Citrus is one of the most important fruit crops, which occupies the first rank in the production of fruit in Egypt. Citrus fruits represent 30% of the production in Egypt with a capacity of 6.5 million tons and export 1.5 million tons according to **The Agricultural Crops Export Council of Egypt (2017)**. Orange is the most productive member of citrus species.

The common way of propagation in citrus is grafting, which takes place in the spring, the selection of the rootstock has important effect on the behavior of scion including the vegetative characters, yield and fruit quality (**Sharma *et al.*, 2016 and Abo-Eid, Manal *et al.*, 2017**).

Sour orange rootstock is the predominant in the clay heavy soil, semi dwarf, resistant to *Phytophthora* infection, the scions grafted on it produce high quality, juicy, smooth and thin skinned fruits also have deep root system (**Abo- Eid, Manal *et al.*, 2010**). It has few compatibility with some citrus varieties (**Castle 2010**).

Volkamer lemon rootstock has a strong growth and grow well in sandy soil and yields high yield. Tolerant to Tristesza, Exocortis and *Xyloporosis*, (**Shafieizargar *et al.*, 2012**). Tolerant to flooding (**Protopapadakis *et al.*, 1998**) it produced the most vigorous tree growth for citrus cultivars (**Khankahdani *et al.*, 2006 and Bassal, 2008**).

Valencia orange scion is present the world taste. On the other hand, gave large size fruit, content on 2-4 seeds. Staying on trees until June and July, used juice extraction and popular variety after Navel orange are out of season (**Yildiz *et al.*, 2013**). Average middle sugar.

Navel orange is the most important cultivar because it has economic importance at the local market and export. Also, it is the most popular cultivar in Egypt, the best taste, medium to medium large size fruit, seedless, gave high juicy, low thickness peel, smooth, sweet flavor and harvest on November to march (**Ferguson *et al.*, 2014**).

INTRODUCTION

Interstock originally used to overcome the problem of local incompatibility in grafting in several cases of fruit species (**Hudson *et al.*, 2014**), In different cases, interstock may be used for its mutual effects on both scion and rootstock that could be useful in citrus species (**Gimeno *et al.* 2012 and Kamilogu and Yesiloglu 2014**).

In this study, sour orange and volkamer lemon genotypes at the transplant production stage were used as interstocks and rootstocks, alternatively, to take advantage of the distinctive qualities of both rootstocks and their effect on scion. Also, we aimed to appoint the effect of interstock (sour orange and volkamer lemon) on vegetative growth, leaf mineral content, C/N ratio, total indols and total phenols of Valencia and Navel orange scions. Study of the mutual between scion and rootstock in the presence of interstock during the production of citrus transplants of the varieties and rootstocks under study. Trying to obtained the best combination which gave highest quality of some citrus transplants.