

PRODUCTION OF SOME FRUIT ROOTSTOCKS THROUGH TISSUE CULTURE TECHNIQUE

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By

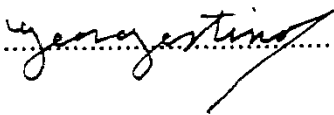
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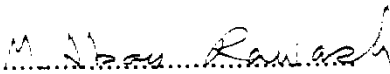
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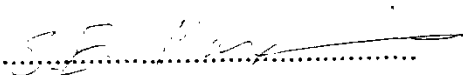
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ABSTRACT

This research work was undertaken during the years 1985 to 1987 to investigate the best procedure of tissue culture technique that can be adopted for producing some new promising citrus rootstocks namely: Volkamer lemon, Carrizo citrange, Swingle citrumelo and Cleopatra mandarin that resist tristeza virus disease. Some peach rootstocks namely: Okinawa, Nemaguard and *P. davidiana* that resist nematodes, were also investigated. The obtained results revealed varietal variations in response to different treatments due to the different genotype make up between cvs.

Preferable disinfection procedures for obtaining alive aseptic cultures were reached. In addition, utmost multiplication rates per explant were obtained by applying the cytokinin BA alone (at 1.0-2.0 mg/l) or combined with the auxin IBA (at 0.02-0.2 mg/l) or coumarin (at 10 mg/l) or adenine sulfate (at 40 mg/l) added to Murashige &

Skoog (MS) medium for citrus and peach cultures.

The best rooting values were obtained when NAA (at 0.1 - 1.0 mg/l) was applied to citrus and peach rooting media. Plantlets with the highest root number survived best. Average root length was also a limiting factor. The difficulty in rooting was associated with the presence of resins or sclereids in the plant's cortex cells that hindered the emergence of adventitious roots.

—oOo—

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To the Horticultural Research Institute, especially Citrus Research Department, I dedicate my heartfelt thanks for support and help.

—oOo—

DEDICATION

I would like to dedicate this thesis to my Brother, my Wife and my Children who insistly have encouraged me to get this work done.

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INTRODUCTION

One of the keys to the profitable production of horticultural crops is an efficient propagation system. Many recent developments have taken place by adopting the most advanced techniques. One of these techniques to be used is plant tissue culture.

The term "tissue culture" encompasses a wide range of techniques and culture systems including in vitro culture of protoplasts, cells, tissues, organs (meristems, shoot tips, root tips, anthers, etc.), ovules and embryos. These techniques are of use to nurserymen and plant propagators to achieve one or more of the following objectives:

1. Rapid clonal multiplication of valuable specimens for testing and eventual commercial production.
2. Vegetative propagation of difficult-to-propagate species.
3. Elimination of viruses from infected stocks.
4. Detection of early incompatibilities through in vitro micrografting which only appear in the orchard after several years.

Total area planted with citrus in Egypt is about 276,000 feddans in 1988 that represents about 42.8 % of the total area of fruit trees, budded on sour orange the most common rootstock. The spread of tristeza (quick decline disease) lately in the Mediterranean region was the impetus for replacement new rootstocks for the standard sour orange which is susceptible to the disease. In addition, the advantages of such rootstocks extend to involve control of fruit quality, tolerance to unfavourable soil factors such as salinity, Phytophthora