

Effect of different pre - treatments of plant growth regulators to shoot tips on *in vitro* shoot tip grafting in Nagpur seedless(*Citrus reticulata*, Blanco.)

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Accepted : April, 2008

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ABSTRACT

Dipping of shoot tips in different concentration of plant growth regulators for 10 min significantly improved the *in vitro* shoot tip grafting success of Nagpur seedless. Pre-treatment of shoot tips with BAP 0.5 mg/l for 10 min before grafting significantly increased the grafting success of micrografted plant followed by 2, 4-D 10 mg./l.

Key words : Growth regulators, *In vitro*, Shoot tip, Grafting, Nagpur seedless.

The need for pathogen free propagative budwood for the production of healthy certified trees is recognized as basic to the establishment and future of a viable citrus industry. Viruses, virus-like pathogens, viroids or mycoplasma-like organisms in propagative budwood can be deleterious to tree survival and fruit production. They are known to reduce life expectancy or even kill trees, reduce fruit size, quality and yield, induce nutritional and bud union problems. Viral infections have been reported to be the major cause of citrus decline at various locations in India. Navarro *et. al* (1975) described three *in vitro* techniques for recovering virus- free citrus plants. Thermotherapy can eliminate many viruses but is ineffective in eliminations of some severe viral diseases like exocortis and xyloporosis. Nucellar seedlings, whether produced *in vivo* or *in vitro*, exhibit juvenility and delayed sexual maturity. *In vitro* micrografting, popularly known as shoot tip grafting is very useful for elimination of viruses and is being used in several countries to obtain virus-free budwood for commercial propagation. Success of grafting largely depends upon the condition of apical meristem. Most of the apical meristems die during grafting due to desiccation and quick oxidation (Mishra and Yadav, 1999). Although the effect of certain plant growth regulators on the success of grafting in Nagpur mandarin scion has been studied earlier, there is a need to test the efficacy of these growth regulators on the success of micro grafting in Nagpur Seedless which is a seedless cultivar of

mandarin orange with high yield potential of good quality fruits, recommended for fruit processing. Hence, the present study was undertaken to test the effect of pre-treatments to shoot tips with different plant growth regulators.

MATERIALS AND METHODS

Experiment was carried out at Tissue Culture Laboratory, Biotechnology Centre, Dr. PDKV, Akola during 2003-05. Rootstocks of Rough lemon were obtained by germination of seeds *in vitro*. Seeds were surface sterilized by immersion for 10 minutes in 0.5% sodium hypochlorite solution containing 1-2 drops of labolene (disinfectant) and rinsed three times with sterile distilled water. Seeds were individually planted in 25 x 150 mm culture tubes containing 25-30 ml MS basal salt media solidified with 0.8% agar. Culture tubes were incubated at $27 \pm 1^\circ\text{C}$ in darkness for two weeks. Shoot tips of Nagpur Seedless were isolated from actively growing branches of field grown trees. New flushes of about 3 cm length were collected. Large leaves were stripped off and cut into 1 cm long shoot tips. They were surface sterilized by 0.25% sodium hypochlorite solution containing 1-2 drops of labolene for 10 minutes which was followed by washing with sterile distilled water. After sterilization, shoot tips were pre-treated with different concentrations of growth regulator solution prior to excision of apical dome with 2-3 primordial leaves. Growth regulators tried for pre- treatments were BAP (0.5 and 1.0 mg/l), Kin. (1.0 and 2.0 mg/l) and 2,4-D (5 and 10 mg/l) with control.

In vitro raised rootstock seedlings were removed