

Use of Plant Growth Regulators for Increasing Quality Kinnow Production

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Abstract—Now a days among citrus, 'Kinnow' has gained special importance and has monopolized the citrus industry in semi-arid region of North India includes Punjab, Haryana and Rajasthan. It is commercially cultivated because of its better adaptation to varied soil and environmental conditions and it has not only excelled in area, production and quality relative to other mandarin cultivars but has also surpassed other citrus species. The average yield of citrus in India is low (9.076 t/ha), as compared to other citrus producing countries like USA (25.98 t/ha), Turkey (26.73 t/ha) and Brazil (21.64 t/ha).

Low fruit setting and excessive fruit drop are serious problems in kinnow orchards which are the main causes of low yield. Fruit drop in kinnow caused due to various factors like, climatic conditions, nutrient imbalance, hormonal imbalance and pest and disease incidence. PGRs play a paramount role in citrus biology and can affect several processes connected with flowering, fruit setting and fruit development. PGRs are versatile compounds. Endogenous hormones and play important role in the transfer of sink to the developing organs. The drop of flowers and fruit occurs when the concentration of auxin decreases and the concentration of abscissic acid (ABA) increases. Exogenous application of PGRs significantly increased 'Kinnow' mandarin fruit set percentage and yield/plant. Synthetic auxins (2, 4-D) generally used to reduce drop of mature fruit. The use of gibberellic acid (GA3) increases fruit set and reduces fruit drop. PGRs also improved the Fruit quality (juice percentage, TSS, acidity and fruit size) by the application at lower concentrations.

A widespread agriculture practice for the production of parthenocarpic fruit consists in treating flowers with phytohormones before pollination. PGRs are also effective in inducing seedlessness. The low seeded strains require GA for seedless

fruit set. The fruit set can be enhanced and fruit abscission can be minimized by more GA sprays in self-pollinations. Natural and artificial auxins supplied exogenously to unpollinated flowers induce fruit growth suggesting that these hormones can replace the signals provided by pollination and fertilization and increased auxin levels in flower organs after fertilization of the ovules. The growth of ovary is blocked before pollination and that auxin is involved in derepression of ovary growth after fertilization and induce seedlessness.

Thus there is an urgent need to test the effects of PGRs to increase fruit set, reduce the number of seeds/fruit, reduce fruit drop and improve yield of fruit quality under different kinnow growing regions.

Keywords: *Kinnow, PGRs, Parthenocarpic, Seedlessness, etc.*