

## Research Article

# Integrated Management of Pre-Harvest Fruit Drop in Kinnow Mandarin (*Citrus nobilis* Lour x *Citrus deliciosa* Tenore)

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### Abstract

Citrus is commercial crop of Haryana, but its cultivation is let down by pre harvest fruit drop. Therefore, in the present investigation attempts were made to manage the pre harvest fruit drop. Foliar spray with 2, 4-D @10 ppm and propiconazole @ 0.1 per cent reduced the fruit drop upto 48.60 per cent with the mean yield of 126.24 Kg plant<sup>-1</sup> followed by application of 2, 4-D @10 ppm and ziram @ 0.25 per cent recorded reduction in 45.96 per cent fruit drop and yielded 127.76 kg plant<sup>-1</sup>. Conversely; maximum fruit weight (171.26g) was observed in 2, 4-D @ 10ppm and mancozeb @ 0.2 spray. Maximum net profit was also obtained on application of 2, 4-D @10ppm and ziram @ 0.25.

**Key words:** Chemicals, kinnow mandarin, pre-harvest fruit drop, and yield

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Citrus is an economically important crop of India, for its nutritive and commercial value. Among Citrus crop, Kinnow mandarin cultivation in Haryana state is gaining popularity due to its wide adaptability, high yield and more economic return. It ranks 1<sup>st</sup> in area (18780 ha) and production (250545 MT) among different fruit crops in Haryana (www.nhb.nic.in, 2013). Among the major constraints, fruit drop is a main bottleneck as the fruit continue to drop at various stages of the fruit growth and development. It resulted in 30 to 76 per cent loss to the farmers (Thind and Kumar 2008). It bears large number of flowers but they drop at early stage of development. Post bloom and pre harvest fruit drop is a common phenomenon which can be attributed mainly due to physiological, *Colletotrichum gloeosporioides* and *Diplodia natalensis* (Thind and Kumar 2008). Sudden change in temperature or humidity, poor nutrition management, hormonal imbalance, improper soil moisture etc are the physiological causes and the fungal infection lead to pathological fruit drop (Racsko et al 2007). Application of plant growth regulators can control the hormonal balance at the abscission layer and reduce the early fruit fall and harvest losses (Modise et al 2009). Nutritional factors are limiting factors, whereas hormonal

compounds are factors of the regulation of the abscission process (Gomez et al 2000). Many remedial measures have been adopted to reduce fruit drop in citrus right from cultural to nutritional and growth regulator treatment. The application of plant growth regulators, fungicides and nutrition can be helpful in reducing the pre harvest fruit drop and the losses at harvest (Arora et al 2008 and Ibrahim et al 2011). So, the present investigation was chalked out to cope with management strategy of pre harvest fruit drop through integrated management approaches.

### Materials and Methods

Uniform and healthy Kinnow (*Citrus nobilis* Lour x *Citrus deliciosa* Tenore) trees of 15 year age were selected at the experimental orchard of the Department of Horticulture, CCS HAU Hisar for evaluating the efficacy of different fungicides, 2,4-D and urea on pre harvest fruit drop. Pathogenicity was also proved for pre harvest fruit drop incited by *Colletotrichum gloeosporioides* and *Diplodia natalensis* as nutritional, hormonal balance and fruit fly are also equally responsible for causing pre harvest fruit drop (personal communication). There were eight treatments given as foliar sprays