**Title** Physico-chemical, respiratory and fungicide residue changes in wax coated mandarin fruit stored at chilling temperature with intermittent warming

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**Abstract**

Influence of chilling temperature, intermittent warming (IW) and fungicidal wax coating was evaluated during storage of 'Nagpur' mandarins (*Citrus reticulata* Blanco). Fruits were light green coloured with slight colour-break at the start of storage. Waxed and non-waxed fruits were stored at 3.5 °C (constant), 2 weeks at 3.5 °C followed by IW for 1 week at 19.5 °C (cycle) and at 6.5 °C (constant), and were evaluated immediately after 30, 45, 60, 75 days and also after 1 week holding at ambient condition (24 ± 2 °C, 60–70% RH). There was no chilling injury to fruit under IW treatment irrespective of coating. At 3.5 °C (constant) chilling injury appeared after 45 days during 1 week holding and thereafter increased at each storage interval. Wax coated fruit had lower chilling injury. Fruit under IW treatment and at 6.5 °C (constant) developed yellow-orange colour while at 3.5 °C (constant) fruit remained green during storage. Juice content, titratable acidity and ascorbic acid contents were not affected by temperature regimes and waxing while total soluble solids content was higher with IW treatment. Reducing and total sugars were higher in fruits stored at IW treatment and at 6.5 °C (constant) than at 3.5 °C (constant). Total peel phenols content were not significantly affected by waxing and temperature regimes. However, loss of phenols content was higher at 3.5 °C (constant). Phenol content decreased during storage. At 3.5 °C (constant), chlorophyll ('a', 'b' and total) content in peel was maximum while total carotenoids were minimum with little colour development. Rapid colour development was recorded under IW and also at 1 week holding. Wax coating delayed colour development at 3.5 °C (constant). Initially carbendazim residues were higher in peel (4.0 ppm) and pulp (3.2 ppm) of waxed fruit than in non-waxed (3.2 ppm in peel and 3.1 ppm in pulp) fruit. Overall drop in residues till storage up to 75 days+ 1 week over the initial values was 80.2–85.6% in peel and 56.2–75.8% in pulp of waxed and non-waxed fruit, respectively. Respiration was lower in waxed fruit. Respiratory rate was lowest at 3.5 °C (constant) and it changed with IW. At 3.5 °C and 6.5 °C (constant), range of respiration was 4–6 mg$CO_2$/kg/h and 7–9 mg$CO_2$/kg/h, respectively in waxed and non-waxed fruit. Respiratory rate increased as the fruit was removed to warmer temperature. Chilling injury caused

considerable rise in respiration rate of fruit. Present findings indicated that storage life of 'Nagpur' mandarin can be extended up to 75 days at 3.5 °C with IW.

http://www.springerlink.com/content/a4n28766j5752032/fulltext.pdf