

Performance of post-harvest treatments with CCC, GA₃ and CaCl₂ on the fruit quality changes of “Red Delicious” apple during cold Storage

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SUMMARY

The fruits of Red Delicious apple were treated with CCC (2500 and 3500ppm), GA₃ (120 and 240 ppm), CaCl₂ (4 and 6%) and control (treated with distilled water). All the fruits were stored at 1-4°C temperature and 90-95% relative humidity. The results indicated that lowest total soluble solids were recorded in the fruits treated with GA₃ (240ppm). The treatment of the fruits with CCC (3500ppm) was found effective in reducing the total sugars. Treatment of the fruits with GA₃ (120ppm) was found effective in checking reducing sugars, and the highest calcium content was recorded in the fruits treated with CCC (2500ppm).

Key words: CCC, GA₃, CaCl₂, Apple, storage.

The pome fruits are most important in the temperate regions of the world and apple is choicest of all. It is the premier table fruit of the world. Apple (*Malus domestica* Borkh) belongs to the family Rosaceae; subfamily Pomoidae with 17 basic chromosome number. Of all the apple varieties grown in the world, the Red Delicious is most popular and widely planted. ‘An apple a day keeps the doctor away’—this old adage focuses man’s attention on the importance of apple in the daily diet. Eating apples is believed to reduce incidence of dental caries, control obesity and supply extra energy for heavy exercise. The post harvest losses in case of fruits are very high which stands in the way of establishing fruit industry on commercial basis. In order to give impetus to fruit production the storage aspects need special attention. Storage of fruits aims at to protect the perishables for longer period. Improper storage causes physiological losses including change in respiration, transpiration, pigments and flavour. These losses can be minimized by proper storage and by post-harvest treatment with some chemicals. The post-harvest application of 2 and 4 per cent CaCl₂ and 50ppm GA₃ on the fruits of apple cultivars Anna and Dorset Golden. GA₃ yielded the lowest values of TSS% followed by Calcium Chloride at 4 and 2% Hussein M. A. *et al.*, (2001). The post-harvest application of CaCl₂ (0.5%) + S (0.5%) showed the highest sugar content after 90 days of storage Bhartiya S. P. *et al.*, (1998). Post harvest treatment of the fruits of five apple cultivars with calcium chloride solution increased the fruit Ca content compared to controls. Anit Obahar A. *et al.*, (1994). Therefore the present study was conducted to find out the effect of CCC, GA₃ and CaCl₂ on the chemical characteristics of Red Delicious apple.

MATERIALS AND METHODS

The present investigation was conducted in the

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Department of Horticulture C.C.R. (P.G.) College, Muzaffarnagar (U.P.) during the year 2004-2005. The fruits for the studies were procured from Kashmir valley. The fruits were randomly picked from all sides including peripheral areas of the tree by hand.

The treatments, namely Cycocel (ccc) (2500 and 3500ppm), Gibberellic Acid (GA₃) (120 and 240ppm), Calcium Chloride (CaCl₂) (4 and 6%) and control (treated with distilled water) were applied (the dip for 10 minutes) to the fruits before packing in cardboard boxes. The fruits were placed in shade for air-drying the excess water from their surface and were then packed in cardboard boxes. Five fruits were packed in each box. Each treatment comprising of three boxes having 15 fruits. The boxes were placed in cold storage having 1-4°C temperature and 90-95% relative humidity. The observations were recorded at 30 days interval.

The total soluble solids (TSS) were determined with the help of a hand refractometer. The readings were corrected at 20°C. The sugars were estimated by following the standard procedures of the A.O.A.C. (1970). For the estimation of calcium, 100 gram of fruit pulp along with skin was dried at 70°C in a hot air oven, and passed through 80-mesh sieve. Then ash was dissolved in 2.5 ml of acid buffer and sparked in emission spectrophotometer.

RESULTS AND DISCUSSION

Total Soluble Solids :

The data in Table-1 shows that the fruits treated with GA₃ (240ppm) recorded the lowest reading of total soluble solids (14.02%), (14.11%) and (14.40%) at 30, 60 and 90 days of cold storage respectively. Whereas the highest total soluble solids (15.00%), (15.31%) and (15.75%) were recorded in the control at 30, 60 and 90 days after cold storage respectively. All the other treatments were found