

Title Training systems and preharvest ethrel application affect fruit colour development and quality of 'Pink LadyTM' apple at harvest and in controlled atmosphere storage

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Citation Abstracts of 27th International Horticultural Congress & Exhibition (IHC 2006), August 13-19, 2006, COEX (Convention & Exhibition), Seoul, Korea. 494 pages.

Keywords ethrel; training system; CA storage; fruit colour; quality

Abstract

Development of poor red blush on apple (*Malus domestica* Borkh.) fruit surface at commercial harvest under marginal temperate regions limits its export and profit to the growers. Present experiment aimed at investigating the effects of pre-harvest ethrel spray and different training systems on colour development, quality and storage life of apple fruit. Ethrel was sprayed three weeks prior to the anticipated harvest onto 'Pink LadyTM' apple trees grafted on M109 and trained as vase (VS), central leader (CL), spindle bush (SB) or double row (DR) training systems. Data were recorded on fruit blush percentage, total anthocyanin, chromaticity values L*, a*, b*, chroma (C*) and hue angle (H°), percentage of export-grade fruits, total soluble solids (TSS), titratable acidity (TA) and fruit firmness at harvest and after 24 weeks controlled atmosphere (CA) storage. Ethrel application significantly improved red blush, total anthocyanin, H°, and C* of the fruit irrespective of the training systems. SB was more responsive to ethrel application in improving these colour attributes compared to other training systems. The concentration of total anthocyanin in the skin of exposed side of the fruit from ethrel-sprayed SB trees was almost doubled compared to control. Ethrel spray reduced fruit firmness but did not significantly affect TSS or TA of the fruit at harvest irrespective of training systems. Following 24 weeks of CA storage, C* and H° of fruit's exposed side were improved by ethrel treatment in all the training systems without significantly affecting fruit firmness and TA. Generally, ethrel treatment applied to any of the training systems did not adversely affect fruit quality parameters after 24 weeks of CA storage. In conclusion, ethrel treatment and training systems substantially affect colour development and fruit quality in 'Pink LadyTM' apple at harvest as well as in CA storage.