

Title Fluorescence, conjugated trienes, α -farnesene and storage disorders in 'Abbé Fétel' pears cooled with different speeds and treated with 1-MCP

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Abstract

'Abbé Fétel' pears are very prized in Italy, due to their non-melting, juicy texture and excellent flavour when ripe. However, they cannot be stored for long term in normal atmosphere (NA), because after 3-4 months they lose the ripening ability, while in controlled atmosphere (CA) they can be subject to senescent (soft) scald. 'Abbé Fétel' pears picked at two times were cooled to -0.5°C at different speeds (normal: immediately put at -0.5°C ; slow: from 8°C decreasing 1°C d^{-1}), while monitored with fluorescence sensors (HarvestWatchTM). Cooled fruit were treated with 300 ppb 1-MCP and stored in normal air or in controlled atmosphere ($2\% \text{O}_2 + 0.7\% \text{CO}_2$) at -0.5°C . After 4 and 6 months storage, fruit were analyzed immediately after storage and after 9 d of shelf life at 20°C for mass, skin colour and firmness. Fruit skin was extracted with hexane for analysis of α -farnesene and conjugated trienes (CTs) by spectrophotometric method. Cooling speed affected fruit fluorescence ($F\alpha$) and the effect was maintained throughout the storage. $F\alpha$ rapidly increased both due to the fast decrease of temperature and to the decrease of oxygen partial pressure. During storage in CA and NA, $F\alpha$ decreased more and earlier in fruit cooled slowly than in fruit exposed to normal cooling. In NA the decrease was gradual and steady, while in CA a quick decrease of $F\alpha$ occurred after 4 (slow cooling) or 5 months storage (normal cooling). Among storage disorders, superficial scald was remarkably influenced by storage atmosphere, being almost fully controlled in CA. Senescent scald was induced especially in CA, and aggravated by slow cooling. The treatment with 1-MCP reduced both superficial and senescent scald, but was not fully effective due to delayed application. CTs and α -farnesene generally were higher after 4 than 6 months of storage, in NA than in CA, decreased with shelf life and were related to superficial scald.