Fruit quality and sensory characteristics of 1-MCP treated 'Abbé Fétel' pears after storage under dynamic controlled atmosphere at different temperatures

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Abstract

‘Abbé Fétel’ is the most important pear cultivar in Italy but is susceptible to superficial scald and soft scald during storage. Superficial scald is controlled by ethoxyquin but recently it has been excluded from the list of the active ingredients of chemicals used in food production. The combination of 1-MCP and dynamic controlled atmosphere (DCA) storage can be considered as an alternative to ethoxyquin because 1-MCP and DCA are effective in preventing superficial scald. However, 1-MCP at -0.5°C prevents pear ripening and DCA can favor the appearance of soft scald, especially after long storage. The aim of this work was to study the quality of ‘Abbé Fétel’ pears after 4 months of storage at -0.5 and 1°C in normal air (NA) and in DCA (0.8 kPa O_2 + 0.4 kPa CO_2). 1-MCP treated (300 µl/L) and control fruit were stored at -0.5 and 1°C in NA and DCA After 4 months, fruit were put at 20°C up to 7 days and evaluated for skin color, flesh firmness, ethylene production (EP), sensory characteristics and storage disorders. Fruit softening and EP were strongly reduced by 1-MCP at -0.5°C; some EP was found after 7 days at 20°C in 1°C stored pears, which showed also firmness values lower than 40 N in 40% of NA fruits and in 15% of DCA fruit. Skin yellowing was slowed down by 1-MCP, especially in DCA fruit which kept the greenest color throughout the shelf life period whatever the storage temperatures; NA treated fruit turned yellow during shelf life, showing the highest *H°* at -0.5°C. Control fruit stored in DCA showed a similar skin color to treated DCA pears at the beginning of shelf life which quickly yellowed up to the end of shelf life. Control fruit stored in NA at 1°C showed the lowest *H°*. 1-MCP treated pears were perceived firmer, and less juicy, sweet and aromatic than control ones regardless of the storage condition. Control pears in NA at 1°C showed the lowest scores for juiciness and aroma and the highest for graininess while control pears stored in NA at -0.5°C and in DCA at both

temperatures were judged soft, juicy, sweet and aromatic and slightly grainy, especially after 4 and 7 days at 20°C. 1-MCP prevented soft scald, superficial scald and internal breakdown, but was ineffective on internal browning. Control pears stored in NA showed a very high incidence of superficial scald at both temperatures; control pears stored in DCA at -0.5°C developed only some internal breakdown while those stored at 1°C showed also soft scald and internal browning.