

Title Gas exchanges in 1-methylcyclopropene treated 'Abbé Fétel' pears during storage in different atmospheres

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Abstract

Gas exchange rates were studied in 'Abbé Fétel' pears in relation to 1-MCP treatment (300 ppb) and storage atmosphere at -0.5°C (normal atmosphere, NA; controlled atmosphere, CA: 2 kPa O_2 + 0.7 kPa CO_2 ; dynamic low- O_2 controlled atmosphere, DLOCA: 0.7 kPa O_2 + 0.3 kPa CO_2). O_2 , CO_2 , ethylene and ethane were measured in different concentrations of O_2 (0, 0.1, 0.5, 2 and 21 kPa) and CO_2 (0 and 5 kPa) at -0.5°C , after 4 months storage. 1-MCP treated pears from all storage environments and control fruit stored in DLOCA showed aerobic respiration at $p\text{O}_2$ as low as 0.5 kPa, where control fruit stored in NA and CA showed anaerobic respiration. 1-MCP greatly reduced ethylene production rate (EP). In control fruit, maximum EP was achieved in conditions similar to those of the storage atmospheres, while in the lower O_2 (for NA stored fruit) or higher CO_2 (for CA and DLOCA stored fruit) EP was impaired. With 5 kPa CO_2 , ethane production rate (EthaP) was high in all fruit whatever the storage condition, 1-MCP treatment and $p\text{O}_2$. With 0 kPa CO_2 , EthaP was lower with a maximum at 0.1 kPa O_2 ; in control fruit EthaP was absent at $\text{O}_2 \geq 2$ kPa, while in 1-MCP treated pears low levels of ethane were produced even in 21 kPa O_2 .