

Evaluation of 1-methylcyclopropene (1-MCP) and low temperature conditioning (LTC) to control brown of Huangguan pears

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Abstract

Harvested 'Huangguan' pears are popular with consumers, but a series of physiological diseases are likely to occur in Huangguan pears during storage, especially brown. The objective of the study was to evaluate the effectiveness of 1-methylcyclopropene (1-MCP) and low temperature conditioning (LTC) on the control of brown in Huangguan pears. Physiological indexes and enzyme activity including browning index, total phenol content, malondialdehyde (MDA) content, electrolyte leakage, hydrogen peroxide (H_2O_2) content, superoxide radical (O_2^-) production rate, flavonoid content, soluble solid content (SSC), l-ascorbate peroxidase (APX), phenylalanine ammonia lyase (PAL) and polyphenol oxidase (PPO) were measured. Results showed that 1-MCP or LTC treatment suppressed browning index, MDA content, electrolyte leakage, H_2O_2 content, O_2^- production rate, PPO activity and improved total phenol content, flavonoid content, SSC, APX and PAL activity in comparison with the control. Furthermore, the combination of 1-MCP and LTC contributed the maximum efficacy compared to the individual treatment. In conclusion, our results indicated the combined treatment may be an efficient way to control brown in Huangguan pears.