

Title Effect of 1-methylcyclopropene and diphenylamine on storage disorders and water-soluble antioxidants of 'Rocha' pear

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Citation ISHS Acta Horticulturae 800:993-998. 2008.

Keywords ascorbic acid; glutathione; free radical scavenging activity; browning disorder; superficial scald; *Pyrus communis*

Abstract

The effects of 1-methylcyclopropene (1-MCP) and diphenylamine (DPA) on storage disorders and water-soluble antioxidants were examined in 'Rocha' pear stored in controlled atmosphere (CA). 'Rocha' pear (*Pyrus communis* L.) fruits were treated at harvest with 0.5 $\mu\text{L.L}^{-1}$ of 1-MCP or with 0.9 g.L^{-1} DPA and stored at -0.5°C in air or in 2.5 kPa O_2 + 0.7 kPa CO_2 . Free radical scavenging activity (FRSA), ascorbate, and glutathione content were measured throughout storage. CA strongly decreased the incidence and severity of browning disorders and superficial scald. DPA further reduced these physiological disorders and 1-MCP provided the most effective control. However, FRSA, ascorbate, and glutathione levels were not influenced by DPA or 1-MCP. FRSA showed a similar trend in all treatments, and was unaffected by the treatments, with an overall average of $115.6 \pm 3.1 \text{ mg.kg}^{-1}$ (ascorbate equivalents). Concentration of the reduced form of ascorbate at harvest was $35.7 \pm 0.4 \text{ mg.kg}^{-1}$, or 68% of the total ascorbic acid, and decreased by about 40% in all treatments. Reduced glutathione was present at harvest at a concentration of $12.9 \pm 1.6 \text{ mg.kg}^{-1}$, accounting for 98% of the total glutathione content. Both the reduced and oxidized forms of glutathione increased during storage, but were not affected by DPA or 1-MCP. These results suggest that the benefits of 1-MCP on internal breakdown are not directly related with its effects on the antioxidant levels.