

**Title** Relationship between free radical scavenging activity and superficial scald in 'Rocha' pear  
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#### Abstract

The effect of 1-methylcyclopropene (1-MCP) and diphenylamine (DPA) on the free radical scavenging activity (FRSA) and superficial scald was studied in 'Rocha' pear (*Pyrus communis* L.) fruit stored in air or in controlled atmosphere (CA). Fruit were treated after harvest with 0.1, 0.5 and 1.0  $\mu\text{L.L}^{-1}$  of 1-MCP or with 636  $\text{mg.L}^{-1}$  DPA, and stored for 200 days at 0°C and 90–95% relative humidity in air or in 2.5 kPa  $\text{O}_2$  + 0.7 kPa  $\text{CO}_2$  (balance  $\text{N}_2$ ). FRSA in the fruit peel was higher when fruit were stored in CA than when stored in air. 1-MCP increased the average FRSA in relation to untreated controls, but no significant effect of 1-MCP concentration was observed. 1-MCP- and DPA-treated fruit consistently showed higher FRSA than untreated controls. After 6 months in storage, 82% or 38% of fruits were affected by superficial scald in air or CA, respectively. DPA or 0.1  $\mu\text{L.L}^{-1}$  of 1-MCP reduced scald by about 50% and higher concentrations of 1-MCP (0.5 or 1.0  $\mu\text{L.L}^{-1}$ ) reduced scald by about 95%. There was a significant negative correlation between FRSA and scald ( $r=-0.914$ ;  $P=0.028$ ). A close, although not significant, correlation was also observed between the levels of conjugated trienols and scald ( $r=-0.822$ ;  $P=0.088$ ). The results suggest that peel antioxidants may have a protective role against superficial scald. However, the use of FRSA measurements to predict scald susceptibility is hindered by its fluctuations during storage.