

Title Integrated application of 1-methylcyclopropene and modified atmosphere packaging to improve quality retention of litchi cultivars during storage

Author Karen De Reuck, Dharini Sivakumar and Lise Korsten

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Abstract

The effect of 1-MCP application on overall quality retention of 'Mauritius' and 'McLean's Red' litchi under modified atmosphere packaging (MAP) was investigated. Fruit was packed in biorientated polypropylene bags and exposed to different concentrations of 1-MCP (300, 500 and 1000 nL L⁻¹) within the packaging, heat sealed and stored at 2 °C for 14 and 21 d. Of the three concentrations, 300 nL L⁻¹ was most effective in preventing browning and retention of colour in both cultivars after 14 and 21 d cold storage. The effect of 1-MCP (300 nL L⁻¹) was more promising on 'McLean's Red' than 'Mauritius'. 1-MCP (300 nL L⁻¹) significantly reduced the polyphenol oxidase (PPO) and peroxidase (POD) activity, retained membrane integrity, anthocyanin content and prevented the decline of pericarp colour values, L*, a* and b* during storage. At higher concentrations, 1-MCP showed negative effects on membrane integrity, pericarp browning, PPO and POD activity in both cultivars. 1-MCP (1000 nL L⁻¹) significantly suppressed fruit respiration and retained the SSC/TA and firmness. Thus, application of 1-MCP in combination with the use of MAP can extend the storage life of 'McLean's Red' up to 21 d.