

**Title** Effects of active modified atmosphere packaging (MAP) on carbohydrates contents and quality in potted carnations (*Dianthus caryophyllus*)

**Author** K. Yamane, C. Burana, W. Ohira and Y. Yamaki

**Citation** Book of Abstracts. International Conference on Quality Management in Supply Chains of Ornamentals. 21-24 February, 2012. Golden Tulip Sovereign Hotel, Bangkok, Thailand.

**Keywords** carbohydrates; *Dianthus caryophyllus*; MAP; 1-MCP; potted plant

### Abstract

Quality of potted carnation is often lowered by unfavorable environmental conditions during transportation and under consumer's residents. Modified atmosphere packaging (MAP) during simulated shipment for 48 h slightly increased number of open florets in potted carnation. However, it took more than 24 h to attain optimum concentration of CO<sub>2</sub> and O<sub>2</sub>. In this study, we applied active MAP to potted carnation 'Scarlet' plants. Plants were placed in polyethylene bags of 0.05 mm thickness and held at 20 °C for 48 h under dark condition (i.e., passive MAP). O<sub>2</sub> concentration was lowered to 10 % and CO<sub>2</sub> increased to 2.8% by using 5.16% CO<sub>2</sub> in N<sub>2</sub> gas at the start of MAP (i.e., active MAP). During the MAP, 0 or 0.1 μL L<sup>-1</sup> of 1-methylcyclopropene (1-MCP) was treated. Then the quality of potted plants was evaluated under continuous light of PPFD 15 μmol m<sup>-2</sup> s<sup>-1</sup>. After 48 h of passive and active MAP, O<sub>2</sub> concentration dropped to 17 and 7 %; CO<sub>2</sub> concentration rised to 3 % and 3.7%, respectively. Ethylene concentration was higher in the 1-MCP treated bags. Active MAP treatment slightly delayed opening of florets and tended to increase the number of open florets 4 days after treatment (DAT). Active MAP tended to increase dry weight and soluble carbohydrates, especially pinitol, in the leaves. 1-MCP delayed the peaks of floret wilting from 6 to 10 DAT. Combined treatment of active MAP and 1-MCP significantly increased the number of open florets. These results suggested that active MAP plus 1-MCP treatment alleviated loss of carbohydrates and suppressed ethylene action, and thus improved quality of potted carnations.