

## Abstract

The efficacy of 1-methylcyclopropene (1-MCP) gas to prevent the adverse effects of ethylene is limited by its short-term residual activity in some plants. Development of a simple 1-MCP sustained release device that prolongs 1-MCP exposure is reported herein. Sustained release devices comprised of polyvinylchloride tubes containing 0.1 g SmartFresh™ powder (a.i. 3.3% 1-MCP) and 1.25 ml deionised water were used to release 1-MCP into fibreboard cartons containing cut Geraldton waxflower (*Chamelaucium uncinatum* Schauer) cv. CWA Pink bunches during export shipment by air (107 h) from Australia to the UK. The devices protected flowers against abscission induced by subsequent test exposures to ethylene ( $10 \mu\text{l l}^{-1}$ , 12 h, 20 °C) for 3–5 days after arrival. In contrast, pre-shipment treatments with either a single application of  $790 \text{ nl l}^{-1}$  1-MCP for 14 h at 2 °C or a 0.2 mM  $\text{Ag}^+$  (as silver thiosulphate; STS) pulse for 14 h at 2 °C protected flowers against exogenous ethylene for only 1–2 days of post-export life. However, pre-shipment 1-MCP fumigation was up to about three-fold more effective than either sustained 1-MCP release or pre-shipment STS treatments in reducing floral organ and leaf abscission from bunches during export. Thus, it is suggested that a combination of pre-shipment 1-MCP fumigation before export with sustained 1-MCP release during shipment should maximise efficacy against ethylene-induced waxflower flower abscission.