

Title Use of a non-volatile 1-MCP formulation, N,N-dipropyl(1-cyclopropenylmethyl)amine, for improvement of postharvest quality of ornamental crops

Author Ludovica Seglie, Edward C. Sisler, Heiko Mibus and Margrethe Serek

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Abstract

Cyclopropene compounds have been shown to counteract ethylene responses in plants in many studies. They are volatile and for that reason are applied in enclosed systems. However, in some cases, use of a non-volatile formulation would be advantageous. This study reports the use of a novel anti-ethylene formulation, a salt N,N-dipropyl(1-cyclopropenylmethyl)amine (DPCA), applied to plant material as a spray. Four ethylene-sensitive plant species with a high ornamental value: *Rosa hybrida* L. 'Lavander', *Dianthus caryophyllus* L. 'Idra di Muraglia', *Pelargonium zonale* 'Katinka', and *Phalaenopsis* 'Lila' were sprayed with different amounts of DPCA: 0, 0.4, 2, 4, 20 or 40 nmol and the effectiveness of DPCA was compared with volatile 1-methylcyclopropene (1-MCP) applied at $0.2 \mu\text{L L}^{-1}$ for 6 h. After chemical treatments the plant material was ventilated with $1 \mu\text{L L}^{-1}$ ethylene or with ethylene-free air. Postproduction quality of flowers and leaves was evaluated and ethylene production in carnation flowers was measured. The optimum concentration of DPCA varied among the tested plant material, but the best concentrations gave protection against ethylene equivalent to the 1-MCP volatile treatment. DPCA amounts of 4 nmol or higher effectively prevented ethylene production in carnation flowers during the postharvest period.