

### Abstract:

We studied application of 1-methylcyclopropene (1-MCP) in various ornamentals, with the aim of finding optimum application temperature, dose, and duration. We also studied its competition with ethylene, and its synergistic effect with silver thiosulfate (STS). Ethylene ( $5 \mu\text{l l}^{-1}$ ) was simultaneously applied with 1-MCP ( $15$  or  $150 \text{ nl l}^{-1}$ ) at  $4$ ,  $12$  or  $20^\circ\text{C}$  to carnation (*Dianthus caryophyllus* cv. 'Yellow Candy'). At these application temperatures ethylene negatively affected flower quality. 1-MCP applied at  $15 \text{ nl l}^{-1}$  neutralized the adverse ethylene effects when applied at  $4^\circ\text{C}$ , but not at  $12$  or  $20^\circ\text{C}$ . However, when applied at  $150 \text{ nl l}^{-1}$  1-MCP successfully eliminated ethylene effects at all temperatures. It seems, therefore, that 1-MCP is a better competitor with ethylene at low temperatures.

1-MCP pre-treatment ( $0.2$ - $1 \mu\text{l l}^{-1}/2$ - $20 \text{ h}$ ), followed by a subsequent exposure to ethylene ( $1$ - $5 \mu\text{l l}^{-1}/24 \text{ h}/20^\circ\text{C}$  or  $0.5 \mu\text{l l}^{-1}/12 \text{ days}/12^\circ\text{C}$ ), significantly improved the quality of cut flowers (carnations cv. 'Yellow Goldy', *Cymbidium* orchids) and potted plants (*Ficus* 'Green island'), respectively. In *Limonium* hybrid 'Beltlaard' cut flowers the combined use of 1-MCP and STS resulted in highest quality. This combined treatment also enabled storage under sea transport conditions (8 days at  $2^\circ\text{C}$ ). When applied alone, 1-MCP ( $0.4 \mu\text{l l}^{-1}/4 \text{ h}$ ) was also very effective in improving flower opening and the length of vase life in several rose cultivars.

The results suggest that 1-MCP may be very useful in preserving quality of various ornamentals and that it protects against ethylene effects.