

Title Ethylene resistance of Regal Pelargonium is complemented but not replaced by 1-MCP
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Abstract

Ethylene-induced petal abscission is a significant problem in Regal Pelargonium (*Pelargonium × domesticum* L.H. Bailey) during commercial shipping and handling. We previously demonstrated that the Penn State genotypes 'Elegance Silver', and its two progeny, 00-43-1 and 00-43-2, have greater floret longevity and exhibit less sensitivity to ethylene than a range of commercial genotypes. These experiments were conducted to compare the postproduction quality of Penn State genotypes with commercial cultivars following pretreatment with the ethylene action inhibitor, 1-methylcyclopropene (1-MCP). Pretreatment with 1-MCP protected florets from petal abscission in response to ethylene treatment (4 h, $0.3 \mu\text{L L}^{-1}$) and during simulated transport (3 days, 5°C and 95% RH, $0.067 \pm 0.004 \mu\text{L L}^{-1}$ ethylene) in all cultivars, but its effectiveness varied with genotype. In all genotypes, ethylene-induced petal abscission increased with floret age. Consequently, 1-MCP had a significant inhibitory effect on petal abscission of older florets, less effect on freshly opened florets, and no effect on the florets that opened after simulated transport. Whole plant longevity in a simulated consumer environment was significantly higher for Penn State genotypes, which retained and maintained twice as many flowers as commercial genotypes. 1-MCP treatment had no effect on plant performance after simulated transport in any of the cultivars. These results indicate that 1-MCP pretreatment prevents petal abscission of florets during shipping but that only reduced ethylene sensitivity achieved through breeding improves quality during the entire postproduction period.