Title Novel red-flowered Gentiana: an emerging export cut flower crop from New Zealand

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Abstract

We are developing high performance Gentiana cultivars for the export cut flower industry. New Zealand producers are located a great distance from markets and cut stems must withstand the rigors of harvest, storage and transport, then surpass consumer expectations for display and vase life. The research challenges for growing the New Zealand Gentiana Gentiana triflora 'Showtime Starlet' is a novel red-flowering cultivar that has been developed at Crop & Food Research (New Zealand). The plants are infertile and propagated in tissue culture. Plants may produce flowering stems (>50 cm) suitable for cut flower production, and are also suited to pot-plant production if cultivated at lower temperatures to produce plants with abundant short branched stems. The natural infertility of 'Showtime Starlet' makes it an ideal model to investigate pollination-induced senescence in Gentiana. Cross-pollination of 'Showtime Starlet' flowers results in premature petal senescence, thereby reducing the display life of cut flowers and the potted plants. We have established a detached flower model for testing treatments that may prevent or delay pollination-induced senescence. Inhibiting ethylene production and perception in floral tissues by treating detached flowers with AOA and 1-MCP slowed natural petal senescence and prevented pollination-induced senescence. We found that 'Showtime Starlet' flowers were not sensitive to exogenous ethylene (5 ppm, 1 h), and we were unable to detect ethylene production from detached flowers. This suggests that ethylene production and perception by 'Showtime Starlet' flowers is very specific and enables tight regulation of pollination-induced senescence in this relatively ethylene-insensitive cut flower species.