

Title *Leucadendron* 'Safari Sunset': postharvest treatments to improve quality of cut foliage during prolonged sea shipment

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Abstract

Leucadendron 'Safari Sunset' is considered one of the most important cut foliage crops cultivated in Israel for export to Europe and the USA, with annual exports totalling more than 24 million stems. Profitable marketing of these stems requires the use of more cost efficient sea transport, currently an eight-day journey from Israel to Europe and between 21 to 28 days to the USA. Some of the major problems which limit the quality of *L.* 'Safari Sunset' cut stems are leaf blackening, foliage desiccation and pathogen development during storage. Carbohydrate depletion in leaves, occurring post-harvest and associated with the assimilate demand of the developing inflorescence, was suggested to initiate leaf blackening in proteas. Our results show that *L.* 'Safari Sunset' stems pulsed with either 5% sucrose or glucose before storage, followed by the inclusion of 2% sucrose or glucose in the vase solution, displayed a reduced incidence of leaf blackening and desiccation, which then resulted in a significantly longer vase life. Analysis of endogenous carbohydrates in various stem tissues showed that sucrose pulsing before sea transport is necessary to improve the carbohydrate balance in the cut stems, possibly through a manipulation of the sink-source relationships between the red inflorescence bracts and the green foliage leaves. Additional treatments in combination with sucrose pulsing included: dipping of stems in fungicides and bactericides, pulsing stems in a commercial preservative TOG-3 as well as the application of controlled atmosphere (CA) composing of 15% O₂ and 5% CO₂ during the sea transport to USA. All these treatments when used in combination significantly improved the quality of *L.* 'Safari Sunset' stems and enabled the prolonged sea shipment of this product from Israel to Europe or the USA.