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Editorial

Postharvest: biology, physiology, and technology

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Postharvest is directly related to the quality maintenance of cut flower, foliage, or in the post-production of potted plants; postharvest terminology embarks all these cases. Several factors can influence it, e.g. the pre-harvest step has a key role in establishing the initial quality of the product, as per the recommended production practices were followed. Novel technologies, such as neural networks, control the environment of the greenhouse and commence being implemented to determine the optimal harvest timing with indirect measures (Dias, 2017). Moreover, the use of nanotechnology and even genetic engineering through gene silencing controlled by viral vectors are a reality (El-Serafy, 2019). Moreover, there were reports applying inducible/specific promoters that act on a given stage or are tissue specific and extended vase life, such as *floral binding protein – 1* (*fbp-1*). It is imperative that either cut flowers or potted plants receive the proper postharvest treatment and are kept in adequate environment to sustain their initial quality for as long as possible (Darras, 2020).

Initial quality and ideal harvest stage, both related to the above mentioned pre-harvest factors, are species specific and directly influenced by the consumers' market; *Anthurium* is an example that, when locally commercialized in Brazil and Hawaii, are harvested with 2/3 of the inflorescences open, whereas when exported, this parameter is aimed at 1/3 (Dias-Tagliacozzo, 2004). Postharvest quality is also associated in maintaining the ornamental plants' metabolism functioning while retarding senescence. Consequently, physiological and biochemical aspects must be investigated; the use of postharvest treatments are often helpful in preventing these issues; usual treatments are vase solutions containing sugars, plant growth regulators, and sanitizers.

The use of non-toxic treatments promotes sustainable practices while attending the future consumers' need. Storage and transport are also pivotal aspects to be considered as tropical species should not be stored/transported in temperatures below 13ºC, seen that low temperatures are likely to induce chilling injuries. Conversely, ornamental plants from temperate regions can handle temperatures below 3ºC during these steps. Therefore, proper refrigeration is fundamental in keeping postharvest quality. Worldwide, it has been observed a trend in combining both refrigeration and modified atmosphere. Both these techniques can be installed in a cold chamber, in a container-truck (largely utilized in Europe) and in ship containers, the latter emerge as an alternative to aerial transportation with a much lower carbon footprint, thus emitting less greenhouse gases (GHG) (Dias et al., 2017).

Another postharvest challenge is diseases and pests that cause visible damages, just like fungi or herbivory marks, etc., reducing or even eliminating the ornamental potential of several species. Therefore, integrated pest and disease management are the basis to guarantee disease and pest-free floriculture products. It should cover the whole production chain, since the purchase of clean stocks with targeted diseases resistance until monitoring and the use of biological and chemical control during production and postharvest steps (Daughtrey and Benson, 2005). A recurrent example is *Botrytis*, which in susceptible species, normally does not exhibit symptoms during the production. This fungi quiescence is broken during postharvest, in which conditions are favorable to its development (high humidity and mild temperatures) (Bika et al., 2020). In this direction, an innovative model-based decision analysis is the ultimate tool for ornamental production. The ex-ante approach is promising, thus highlighting the potential benefit or risk of given interventions (Ruett et al., 2020).

We now kindly invite you to read about novel postharvest of ornamental plants aspects in this Ornamental Horticulture special edition of "Postharvest - biology, physiology, and technology".

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