

RECENT POSTHARVEST SOLUTIONS FOR SUSTAINABLE FRUIT PRODUCTION IN VIETNAM

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The fruit industry is a key cornerstone of Vietnam's agriculture and economy, with notable success in both domestic consumption and exports. However, it faces major challenges, particularly in postharvest losses, quality degradation, and sustainability. These losses not only reduce market supply, leading to higher prices, but also have significant social and environmental impacts, as resources like labor, water, land, and energy are used to produce, process, and transport fruits that are never consumed. To address these challenges and promote sustainable fruit production in Vietnam, our study developed and implemented innovative postharvest solutions. A major focus was on improving postharvest treatments and controlled atmosphere storage to extend the shelf life and preserve the quality of dragon fruit, which is extensively grown in Vietnam and is increasingly in demand internationally due to its appealing appearance, high nutritional value, and health benefits. Under optimal storage conditions (2 kPa O₂ + 5 kPa CO₂ at 6°C), dragon fruit's shelf life can be extended up to 50 days, opening new opportunities for exporters to access more distant markets.

Beyond postharvest improvements, we developed advanced processing technologies to create high-value products with longer shelf life and superior nutritional quality. These include nutritious juices, wine, detox teas, and dried dragon fruit. For example, dragon fruit jam was incorporated into soy milk and soy yogurt to enhance both the taste and nutritional content, addressing the growing demand for high-quality, safe, and sustainably produced tropical fruits.

Additionally, we focused on waste management strategies by transforming by-products like dragon fruit peel and seeds into valuable products such as dried candy, pectin, and essential oils. These efforts not only maximize the use of natural resources but also boost the efficiency and sustainability of the fruit industry, enhancing its environmental footprint.

Keywords: Dragon fruit; Postharvest technology; Controlled atmosphere; Fruit processing; Waste treatment