



## Important of Postharvest of Horticultural Products: An Over View

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### Abstract

Horticulture products (Vegetables, fruits and flowers) considered the backbone of the Egyptian agricultural sector, horticulture products get good in export incomes for the national economy. Unfortunately, more than 25-30% of horticulture produce gets wasted due to lack of post-harvest management of vegetables, a complex disturbed of metabolic adjustments occur in horticultural commodities after harvest which is influenced by dislocation of various factors like a supply of nutrients, water and growth regulators from the parent plant to the harvested produce. The overall process leads to a postharvest decline of the produce; however, the losses can be decreased with the adoption of postharvest management and use of processing technology of horticulture produce.

**Keywords:** Post-harvest management, Horticulture produce, Vegetables, Flowers and fruit losses.

### Background

This work provides updated comprehensive information on the emerging technologies in postharvest and processing of horticultural produce (fruits, Vegetables, and flowers), as well as postharvest treatments to implement shelf life. Also, the proper harvesting time involves in this work, ripening physiology, chilling injury, fresh cut and minimal processing, non-destructive quality evaluation, and health effects. All horticultural crops are stored under different conditions; postharvest technologies have allowed horticultural industries to meet the worldwide demands of local and large-scale production and global marketing of fresh products that have high nutritional and sensory quality [1].

Due to metabolically active, undergoing ripening and senescence processes harvested products require proper controlled increasing respective produce shelf life, inadequate management of these processes resulted in great losses in nutritional and quality aspects [2]. The main target for postharvest processing is looking to decrease physiological progressions of maturation and decay; inhibit physiological injuries and reduce the injuries of microbial growth and contamination. With the growing demand for fresh produce, the field of postharvest science is continuously developing. Activities are being complete by scientists involved in postharvest research to implement the quality and safety of fresh horticultural produce to improve shelf life and to increase the availability of the products in both time and places.

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### Preharvest Aspects

In last decades the consumers are more interested with products quality rather than quantity, it is important to link preharvest factors with postharvest quality management in the horticulture products supply chain; postharvest quality parameters and storage life of various fresh products are affected by different preharvest aspects as follow:

- a. Canopy management
- b. The position of fruit on plant
- c. Rootstock
- d. Foliar application of growth substances
- e. Fruit harvesting stage

### Major Factors affected Shelf- Life

- a. Physical injuries
- b. Pathogens
- c. Contamination [3]
- d. Improper Relative Humidity
- e. High Temperature

### Handling Postharvest Steps

- a. Harvest early in the morning (to avoid direct sun temperature).
- b. Directly pre-cooling [1].
- c. Providing enough shade during transporting fresh produce.
- d. Preserve a full cold supply chain whenever possible.
- e. Providing proper marketing tool.

### How can we increase shelf-life?

Horticultural products are subject to different postharvest defects i.e. mechanical, physical, bruised, diseased, or chemical damage due to mishandling which had caused the observed damage which defects and cause the fastest decline [4].

Prolonged the shelf life of fresh produce with original quality of freshly harvested products depending on two main steps:

- i. Pre-cooling
- ii. Proper time for harvesting

### The benefit of pre-cooling

- a. Reduced production losses
- b. Increase the economics of harvest Processes
- c. Reduced losses during marketing.
- d. Improve utilization by consumer
- e. Extended market opportunities

### Pre-cooling methods (Figure 1)

- a. Room Cooling
- b. Forced-air cooling
- c. Hydro-cooling
- d. Top icing or liquid method
- e. Vacuum cooling

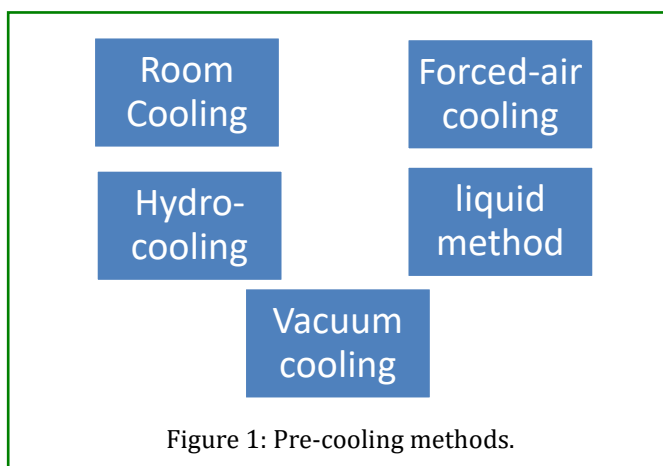


Figure 1: Pre-cooling methods.

### Why is Postharvest Handling Important?

Annually there are a massive quantity of fruits, vegetables and flowers produced worldwide, these products are living organisms which continue their respiration, transpiration after picking, generating heat and giving off moisture and gases, therefore, it's important to keep it under proper condition by cooling them over all the steps of marketing chain. In natural conditions the products are left in the field and harvesting is delayed, while in cold storage favorable conditions are provided to preserve product freshness and nutritional quality for a longer time. However, the main problems associated with export are extended storage life of the fresh produce, and reducing weight loss, shrinkage, chilling injury, also, maintains fruit quality during transport and storage.

The basic of storage is to prolong the shelf life of horticultural products through storing them in proper conditions to keeping their availability for fresh consumption and processing industries in their usable form [5]. Therefore, the activity in research on horticultural commodities postharvest has been

addressed to the search of physical treatment to prolong the storage life of different fresh products, maintain the quality of the freshly harvested products, also, modify the environmental storage conditions of products and cold storage might be a perfect storage facility for preserving the quality of domestic and export market acceptability of fresh products [6].

## Main Roles of Postharvest in the Horticultural Sector

- i. Premium Price.
- ii. Protect Food Safety.
- iii. Decrease Losses.
- iv. Extended shelf life and marketing opportunities.

## Packing

Packaging fresh products is one of the greatest essential steps in the long journey from farm to end user because it supports in food distribution, giving consumers more choice in the availability of products and support to decrease malnutrition, also reduces post-harvest losses. Therefore, appropriate packaging in developing countries has deep effects on both of food consumption and the quantity of food used up [7]. Therefore, understanding the biology of fresh produce consider the chief key to explaining the respiration rate and different metabolic processes problems during packaging and storage to grow a proper package for fresh produce, however developing a packaging system, following product characteristics must be considered [8].

## Types of packaging materials

There are two main types of the packaging materials for fresh fruits and vegetables:

**Shipping packs:** This kind contains and protects the horticultural products during transport and distribution without marketing role, like sacks, cartons, shrink-wrapped or stretch-wrapped containers.

**Selling packs:** These packages are small, it's kept the produce for retail sale and home storage, there are several forms and materials are used as consumer packs depends on marketing.

The most regularly used packages are as follow:

- a. Flexible Plastic Films.
- b. Trays with Overwrap.
- c. Plastic Pun nets.
- d. Plastic Net bags (Extruded & Woven).
- e. Foam Sleeve.

- f. Light Weight Plastic Crates.
- g. Shrink Wrap.
- h. Corrugated Boxes/Cartons.

## Packaging requirements

Horticultural produce requires a various kind of packages due to their physical, physiology nature and vulnerability to microbial decline; also, there is an imperative role for relative humidity, temperature, and ventilation in extended the post-harvest life of the fresh produce [9].

The indispensable properties for packaging of fresh produce:

- i. Protect from moisture/weight loss.
- ii. Afford ventilation for gases exchange and respiration.
- iii. Control ethylene concentrations in the package.
- iv. Decrease respiration rate and slowly ripening.
- v. Safe against bruising and physical damage.
- vi. Protection against microbial contamination and decline.

## Packaging plays an important role in protecting horticultural products as follow

- a. It provides protection from dust.
- b. Decrease microbial contamination from the surrounding environment and from consumer contact.
- c. Preserve the freshness of produce.
- d. Prolong the shelf life of commodities.
- e. Increasing the marketing of fresh produce.

There is several factors effect on fresh produce quality like:

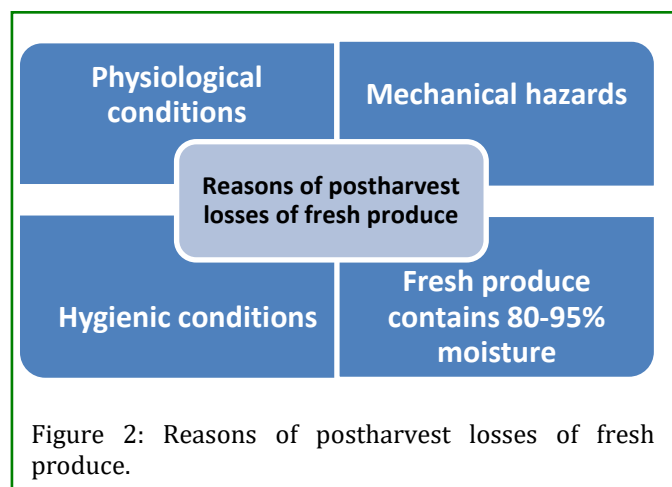
- a. The period from harvest till end user.
- b. Initial quality of the harvest.
- c. Fresh ring the produce care and handling process.
- d. Storage conditions.

## Post-Harvest Losses

Postharvest fresh produce loss is any negative change in volume or quality, like weight losses, loss edibility, reduce nutritional quality, decrease consumer acceptability, that occurs in the time from harvesting time till the end user consumed. Several strategies are used to decrease losses of the post-harvest process, also, different materials are used to limit or prevent various disorder like fungi diseases and internal browning through maintain fresh products by using certain methods to stop or limit deterioration organism's development [10].

There is different factors influence the post-harvest losses in fresh produce (Figure 2):

- a. Physiological conditions.
- b. Mechanical hazards.
- c. Hygienic conditions.
- d. Fresh produce contains 80-95% moisture.



Also, there are other reasons such as pathogen and pests, environmental factors like temperature, relative humidity, and gasses balance are also critically responsible.

## Conclusion

Horticulture produce are metabolically active, undergoing ripening and senescence processes that must be controlled to prolong postharvest quality. Insufficient management of these procedures can result in major losses in nutritional and quality attributes. Ideal postharvest treatments for fresh produce aimed to inhibit physiological processes of maturation and senescence, decrease development of physiological disorders and diminish the hazard of microbial growth and contamination, proper packaging plays an important role in maintain horticultural products, there are several strategies used to reduce losses of the post-harvest process, also, different materials are used for packaging and prevent fresh produce from various biotic and biotic disorder.

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