

Post Harvest Management of Agricultural Produce

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Abstract: *The minimization of wastage of agricultural produce is the ultimate goal of post-harvest management. The post-harvest management has increasing population and shrinking agricultural land and other resources. Present situation is the main global challenge to ensure food security in a sustainable manner safe to mankind and environment. The production of agricultural crops have increased during the recent years, but the development and adoption of post harvest technology is lacking and resulting in huge post harvest losses. The factors which affect on post harvest during harvesting, storing, transporting, and marketing is microbial activity. The highly perishable crop like horticultural produce need much more attention and to ensure promotion of processing and value addition. The value chain for processing has become a important to improve the food safety and strengthen national food security. The value chain in post-harvest management of horticultural crops mainly comprise of pre-harvest factors, harvesting, market preparation (common storage, sorting, grading, packaging and on-farm storage), transportation, storage by-product waste management.*

Keywords: Harvest, Quality, Post-Harvest Techniques in Vegetables. Post-Harvest Management, Processing of Vegetables

I. INTRODUCTION

Today, one of the main global challenges is how to ensure food security for a world growing population whilst ensuring long-term sustainable development so it's a core part of the concept of sustainable development. Agro-ecosystem functions solving the persistent hunger problem is not simply a matter of developing new agricultural technologies and practices. Most poor producers cannot afford expensive technologies. They will have to find new types of solutions based on locally-available and cheap technologies combined with making the best of natural and human resources. the use of the best available technologies and inputs such as best genotypes, best agronomic management practices and best postharvest technologies to maximize yields, while at the same time minimizing or eliminating harm to the environment.

Postharvest losses are caused by external such as mechanical injury (bruising, cutting, breaking, impact wounding), Parasitic Diseases (fungi, bacteria, other organisms) and internal factors such as physiological deterioration, mineral deficiency, low or high temperature injury, or undesirable environmental conditions. Postharvest losses which average between 24 and 40% in developing countries, and between 2 and 20% in developed countries are major source of waste. High levels of waste result in higher prices for fresh produce, and the farmer increasingly facing poverty. Therefore, this review will be focused on the postharvest physiology and management including harvesting, handling, packing, storage, transportation and hygiene of fruits and vegetables to enhance using of new postharvest biotechnology. India is the second largest producer of fruits

II. METHODOLOGY

Minimization of Post-Harvest Losses

By various technological adoptions there are two approaches for reducing postharvest losses of vegetables. The first approach for loss reduction is to follow scientific postharvest management of vegetables. Another approach for loss reduction in processing into value added products. Postharvest technology of vegetable crops envisages development of appropriate techniques to reduce postharvest losses to prevent spoilage and help to utilize maximum crops in a nutritious and safe manner.

Post-harvest management practices Post-harvest losses can be reduced by adopting breeding technologies for longer shelf life, improvement of pre-harvest factors and harvesting techniques, proper methods of handling, marketing, packaging, transportation and storage, development of appropriate processing technology

1. Selection of varieties
2. Harvesting
3. Sorting/Grading
4. Washing
5. Trimming
6. Curing
7. Waxing
8. Precooling
9. Post- Harvest Disease Control
10. Sprout inhibition
11. Packaging
12. Transport
13. Waxing
14. Marketing System
15. Storage

III. REVIEW OF LITERATURE

Post-harvest technologies constitute an inter-disciplinary science and technique applied to agricultural commodities after harvest for the purpose of prevention, conservation, quality, packing, storage, distribution, marketing and utilization to meet the food and nutritional requirements of consumer in relation to their need

IV. RESULT AND DISCUSSION

Post-harvest losses in vegetable in (Murud 2021-2022):

Name of vegetable	Post-harvest losses as percentage of production
Bean and pea	7-12
Brinjal	10-13
cabbage	7-15
Cauliflower	10-15
Garlic	1-3
Onion	15-13
Potato	15-20
Tomato	10-20

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1. Selection of varieties: Varieties with better keeping and processing quality and lesser handling susceptibility should be bred and selected for different vegetables. A few examples of varieties with long shelf life are Arka Vishal, Pusa Gaurav (Tomato).
2. Harvesting: Harvesting should be done at proper stage where there is minimum damage and loss, as rapidly as possible and at minimum cost. Harvesting should be done at early morning or late evening hours. A temperature of above 27 °C during harvesting should be avoided. The products that are to be send to distant markets are harvested in the evening and transported in the cool hours of night where as commodities for local markets are harvested early morning. Harvesting should not be done immediately after rain or irrigation. Harvesting at optimum stage of maturity ensures maximum quality and yield. Care must be taken to avoid mechanical injury to product.

3. **Sorting/Grading:** Sorting of harvested vegetable produce is done to remove diseased, damaged, misshapen, over mature, insect attacked and rotten vegetable.
4. **Washing:** The Produce is cleaned/washed to remove adhering dirt, dust, insects, mould and spray residues and to improve appearance. Onion, garlic, okra and mushrooms are not washed after harvest
5. **Trimming:** Trimming is done in crops like cabbage and lettuce etc. To remove unwanted, discolored, rotten and damaged parts.
6. **Curing:** Curing is a process of strengthening and wound periderm (skin) of root and tuber crops for a specified period under well-defined conditions of temperature and relative humidity which enhances shelf life of these crops by forming corky layer which protects against water loss and infections by decaying organisms.
7. **Waxing:** Waxing is done mainly to minimize water loss and reduce shrivelling and wilting to enhance therefore storage life. Wax seals off the stem near the petiole and the pores on the surface of fruits which are the main routes of transpiration. Waxing on the surface of fruit or vegetable product which are the main routes of transpiration.
8. **Precooling:** Pre-cooling is the process of removing field heat from the harvested commodity, particularly when harvested during hot weather. Pre-cooling helps in decreasing rate of transpiration and respiration delayed ripening and easing the load on the cooling system of transport or storage chambers.
 - a. Room cooling
 - b. Hydro-cooling
 - c. Contact icing
 - d. Vacuum cooling
9. **Post- Harvest Disease Control:** Vegetables suffer significantly due to invasion of fungi and bacteria causing disease and resulting in huge postharvest losses.
10. **Sprout inhibition:** Tuber and bulb crops (onion & potato) enter a dormant stage at maturity, sprouting starts at the end of dormancy or rest period. Sprouting is a growth resumption process.
11. **Packaging:** Packaging is a fundamental and necessary for management of highly perishable products. The main role of packaging is to assemble the produce into convenient units for handling and safeguard the produce during distribution, storage and marketing. Packaging materials are selected according to plant characteristics. It improves storage life of produce.
12. **Transport:** Transport is an important linkage in postharvest handling, storage and distribution. Transport of horticultural produce from field to the distribution markets is done by rail, truck, airplane and ship. Serious losses take place due to improper handling, careless loading and unloading and use of improper containers.
13. **Waxing:** Vegetables such as tomato, brinjal, sweet pepper, cucumber, muskmelon, carrot etc. are often waxed with a water emulsion by dipping or spraying to retard the moisture loss from the product
14. **Marketing System:** Vegetable market is often suffering from several constraints due to their high perishable nature, season market and bulky nature. Assembling and subsequent marketing of the produce is further blocked due to lack of proper storage facilities and quick transport systems.
15. **Storage:** Storage of vegetable produce an important for improving shelf life avoiding market glut and to ensure supply through the year and increase profit to the producers.

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VI. CONCLUSION

A study was conducted on the effects of postharvest handling and storage temperature on the quality and shelf of produce during 2021-2022. Which revealed that rough handling of produce can result in the destruction of the fruit cell wall leading to softening and reduced marketability of the produce. Also, high storage temperature can result in increased respiration (3.8 mlCO₂/kg-h) and ethylene production (7.85 µl/kg/h) significantly as well as accelerate ripening (16.80)

and weight loss (97.08 %). Therefore these conditions (rough handling and high temperature) accelerate the metabolic rate of produce and thereby reduce the shelf life of the produce. This research is based on the study on shelf life and quality of produce by using post-harvest technique like produce packed in perforated (0.25%) polyethylene bag and kept at ambient temperature (20-25 °C) & relative humidity 70-90%) condition resulted in substantial reduction in decay and weight losses.

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