

A photograph of a tray filled with approximately 15 apples. Each apple is individually wrapped in a pink, mesh-like protective sleeve. The apples have a mix of red and yellow-orange hues. The tray is dark-colored, possibly black or dark purple. The background is a plain, light-colored surface. The text 'WEL COME' is superimposed in the center of the image in a large, white, bold, sans-serif font.

WEL COME

NAME :- GODKAR PRASAD YASHAWANT

**COLLEGE NAME :- GOVINDRAOJI NIKAM COLLEGE OF
AGRICULTURE MANDAKI-PALVAN**

REG NO :- AMPU-131020

MODULE NAME :- VEGETABLE PRODUCTION

**SUBJECT :- PACKAGING OF FRUITS &
VEGETABLES**



Contents

- INTRODUCTION
- **Packaging defined**
- **Packaging materials**
- **Function of Packaging**
- **PACKAGING POINTS**
- **Packaging industry extruded nets & Rachel bags**
- **Types of Packaging Materials**
- **Reference**

INTRODUCTION

- ❑ Packaging fresh fruits and vegetables is one of the more important steps in the long and complicated journey from grower to consumer.
- ❑ Bags, crates, hampers, baskets, cartons, bulk bins, and palletized containers are convenient containers for handling, transporting, and marketing fresh produce.
- ❑ More than 1,500 different types of packages are used for produce and the number continues to increase as the industry introduces new packaging materials and concepts.
- ❑ Packing and packaging materials contribute a significant cost to the produce industry; therefore it is important that packers, shippers, buyers, and consumers have a clear understanding of the wide range of packaging options available.

- **Packaging** -is defined as a mean or system by which a fresh produce or processed product will reach from the production centre to ultimate consumer in safe & sound condition at an affordable price.



Packaging materials

- ❑ The following are among the more important general requirements and functions of food packaging materials/ containers :-
 - they must be non-toxic and compatible with the specific foods.
 - sanitary protection.
 - moisture and fat protection.
 - gas and odor protection.
 - light protection.
 - resistance to impact.
 - Transparency.
 - Tamper proofness.
 - easy of opening.

- pouring features.
- reseal features.
- ease of disposal.
- size, shape, weight limitations.
- appearance, printability.
- low cost.
- Special features.



The Function of Packaging

- To assemble the produce into convenient units for handling.
- A properly designed produce container should contain, protect, and identify the produce, satisfying everyone from grower to consumer.

PACKAGING POINTS

- Recyclability/Biodegradability.
- Variety.
- Sales Appeal.
- Shelf Life.

- **Packaging industry extruded nets & Rachel bags**



- Nets will be used to pack
 - – Onions
 - – Potatoes
 - – Garlic & Ginger
 - – Hard fruits like Ber
- Rachel Bags will help Retail Businesses to pack 25- 50 Kg produce at farms.

❑ Primary and secondary containers

- Some materials are provided with efficient primary containers by nature, such as **nuts, oranges, eggs** and the like. In packaging these, we generally need only a secondary **outer box, wrap, or drum** to hold units together and give gross protection.

❑ Hermetic closure

- Two conditions of the greatest significance in packaging are **hermetic** and **non-hermetic** closure.
- The term hermetic means a container which is absolutely impermeable to gases and vapors throughout its entirety, including its seams.
- On the other hand, a container which prevents entry of micro-organisms, in many instances will be non-hermetic.
- The most common hermetic containers are **rigid metal cans** and **glass bottles**, although faulty closures can make them non-hermetic.

Types of Packaging Materials

□ Moisture Resistant materials :-

- a) Polythene films
- b) Polyester films
- c) Polyvinyl films
- d) Aluminium foils
- e) Laminations
- f) Cellulose film (coated)
- g) Rubber hydrochloride
- h) Cellulose acetate
- i) Glass containers

□ Wood

Pallets :- literally form the base on which most fresh produce is delivered to the consumer. Pallets were first used during World War II as an efficient way to move goods.

- Depending on the size of produce package, a single pallet may carry from 20 to over 100 individual packages.

Pallet Bins :- Substantial wooden pallet bins of milled lumber or plywood are primarily used to move produce from the field or orchard to the packing house. Depending on the application, capacities may range from 12 to more than 50 bushels.



Wooden Pallets

Pallet Bins



- **Wire-Bound Crates.** Although alternatives are available, wooden wire-bound crates are used extensively for **snap beans, sweet corn** and several other commodities that require hydro cooling. Wire-bound crates are **sturdy, rigid** and have very high stacking strength that is essentially unaffected by water.
- **Wooden Crates and Lugs.** Wooden crates, once extensively used for **apples, stone fruit, and potatoes** have been almost totally replaced by other types of containers. The 15-, 20-, and 25-pound wooden lugs still used for **bunch grapes** and some specialty crops are being gradually replaced with less costly alternatives.



Wire-Bound Crates

Wooden Crates and Lugs



- **Wooden Baskets and Hampers.** Wire-reinforced wood veneer baskets and hampers of different sizes were once used for a wide variety of crops from **strawberries to sweet potatoes**. They are durable and may be nested for efficient transport when empty.
- **Pulp Containers.** Containers made from recycled paper pulp and a starch binder are mainly used for small consumer packages of fresh produce. Pulp containers are available in a large variety of shapes and sizes and are relatively inexpensive in standard sizes.
- **Paper and Mesh Bags.** Consumer packs of **potatoes and onions** are about the only produce items now packed in paper bags. In addition to potatoes and onions, **cabbage, turnips, citrus**, and some specialty items are packed in mesh bags. **Sweet corn** may still be packaged in mesh bags in some markets. In addition to its low cost, mesh has the advantage of uninhibited air flow. **Good ventilation** is particularly beneficial to onions.



Wooden Baskets and Hampers

Pulp Containers



Paper and Mesh Bags.

MODIFIED ATMOSPHERE PACKAGING

- The shelf-life of perishable foods as meat, poultry, fish, fruits and vegetables and bakery products is limited in the presence of normal air by two principal factors-the chemical effect of atmospheric oxygen and the growth of aerobic spoilage micro organisms
- These factors either individually or in association with one another bring about changes in odour, flavour, colour and texture leading to an overall deterioration in quality.

- MAP is the replacement of air in a pack with a single gas or mixture of gases; the proportion of each component is fixed when the mixture is introduced.
- The normal composition of air is 21% oxygen, 78% nitrogen and less than 0.1% carbondioxide.
- Modification of the atmosphere within the package by reducing the oxygen content while increasing the levels of carbon dioxide and/or nitrogen has been shown to significantly extend the shelf-life of perishable foods at chill temperatures.

Advantages and disadvantages of MAP

- Advantages of MAP
- a) Increased shelf-life allowing less frequent loading of retail display shelves;
- b) Reduction in retail waste;
- c) Improved presentation-clear view of product and all round visibility;
- d) Hygienic stackable pack, sealed and free from product drip and odour;
- e) Easy separation of sliced products;
- f) Little or no need for chemical preservatives;
- g) Increased distribution area and reduced transport costs due to less frequent deliveries;

- Disadvantages of MAP
- a) Capital cost of gas packaging machinery;
- b) Cost of gases and packaging materials;
- c) Cost of analytical equipment to ensure that correct gas mixtures are being used;
- d) Cost of quality assurance systems to prevent the distribution of leakers, etc.
- e) increased pack volume which will adversely affect transport costs and retail display
- space;
- f) potential growth of food-borne pathogens due to temperature abuse by retailers and
- consumers;
- g) benefits of MAP are lost once the pack is opened or leaks.

Reference

- www.instructables.com
- www.google.com
- Wikipedia.com
- Wikihow.com

THANK YOU

