

Packaging of Horticultural Crops

An important consideration in reducing post-harvest losses of fresh fruits and vegetables



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Packaging.....

What is common to industrial motors, personal computers and tomatoes?

The answer: All the three have protective packaging referring to the act of enclosing any product that needs to be boxed, bottled or bagged before it reaches the consumer.

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- Packaging also encompasses an additional layer of application that facilitates shipping and distribution, such as wrapping, cartoning, case packaging and pelletizing.
- Packaging applications can be found chiefly in consumer goods, food and beverage, pharmaceutical and small mechanical industries, among others.

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Types of packaging

- **Paper and Cardboard**
 - This is most popular, being cheap, light weight and easy to use and store. Cardboard is automatically linked to box. Plastic and aluminium are combined with paper to minimise the use of resources and weight of the final packed product.



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Types of packaging

● Glass

- This is easily manufactured from sand and water. It is transparent and impermeable. Pharma tablets are ideally exported in glass bottles.



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Types of packaging

● Metal

- Aesthetic types of packaging are also available. The invention of the metal canister and drink cans attract lighter weight.



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Types of packaging



● Plastic

- Plastic offers huge potential as a modern packaging material, especially for exports as a cost saving device.
- Modern hi-tech state-of-art packaging for agri / horti products exports is also a cost saving and pilfer proof packing.
- Different types of polymers like LDPE (Low density polyethylene) HDPE (High density polyethylene), HMHDPE (High molecule high density polyethylene), LDPE (Linear low density polyethylene), PP (polypropylene) are used

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Types of packaging



● Wood

- Wooden crates or boxes are still used even though their use has come down considerably due to availability of alternate options mentioned above and also due to environmental awareness and economic reasons.
- Even though wood packages are biodegradable they are not considered to be eco-friendly since deforestation causes harm to ecology.

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Functions of packaging

to contain, to protect, to communicate and to market

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● *To contain produce*

- As an efficient handling unit, easy to be handled by one person.
- As a marketable unit.

● *To protect produce against*

- Rough handling during loading, unloading and transport – e.g, rigid crate
- Pressure during stacking
- Moisture or water loss with consequent weight and appearance loss

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● *To communicate*

- Identification of the product with a label describing place of origin, volume, type or variety of product, etc.
- Marketing, advertising: recognizable trade name and trademark

● *To market the product*

- Proper packaging reduces injuries and improves appearance
- Standard units (weight, count) will increase speed and efficiency of marketing.
- A more efficient use of space by palletizing.
- Labels facilitate inspection.

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Types of packaging

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Types.....

- ◉ **No packaging:**
 - > Hand carried.
 - > Bruising and neck damage to the banana fingers
- ◉ **Second hand containers**
 - > Must be clean
 - > More chances of contamination
- ◉ **Bags and sacks**
 - > Made from a variety of materials such as paper, polyethylene film, hessian



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Types.....

- ◉ **Woven baskets**
 - made from split *bamboo*, *rattan* or *palm leaves*
 - variety of *designs*.
 - Construction is normally *by hand*
 - *Good ventilation* for crops
 - Damage the crop by *abrasion*
 - *Cushioning material* such as paper or leaves reduces abrasion, but this also reduces ventilation.



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Types...

◉ Wooden field boxes

- good *stacking* properties
- *expensive* and *heavy*, which affects their use in crop handling
- Many wooden boxes are *made by hand*, which result in variations in size and shape that creating problem in *stacking*
- can take up moisture and, if not properly cured, can lose moisture and become distorted.



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Types.....

◉ Plastic crates

- strong and durable
- Reusable and recyclable
- Good stackability
- Biodegradable plastic material (polyhydroxybutyrate) is also available

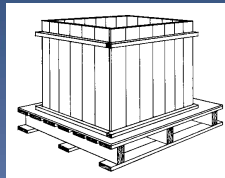


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Types.....

● Pallet boxes

- made from wood or plastic and are used for a whole range of crops
- Size can vary
- Standard size of a European pallet of 1.0 x 1.2 m and usually about 0.5 m high.



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Types....

● Fibre-board boxes

- made from either laminated fibreboard or, more commonly, corrugated fibreboard
- reduce injury to the produce
- Low cost
- Solid fibreboard is not commonly used for fresh produce
- easily takes up moisture affecting strength of the box



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Special packaging

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Shrink packaging

- Shrink wrap -- plastic film that shrinks tightly over the produce under heat
- Checks spoilage and bruising
- Retains moisture
- Moulded trays, wrapped with film liners (Tray packaging), combine four to six units (citrus, apple, etc.) to one larger unit. The tray will give the produce protection from the bottom and some protection on the sides.



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Retail packaging or Prepackaging

- Deterioration or decay is slowed down
- The reduction of spoilage caused by consumers selecting out of a bulk of produce
- Time needed for weighing and checking after selecting by the consumer will be reduced
- Advertisement by abundant supply
- More protection to the produce



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Modified atmosphere packaging

- MAP defined as an alteration in the composition of gases in and around fresh produce by respiration and transpiration when such commodities are sealed in plastic films
- Higher CO₂ and lower oxygen
- For fresh fruits and vegetables this is commonly achieved by packing them in plastic films.



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Thank you