

## Quadrant II – Notes

**Programme:** B. Sc. (Hons.) Agri.

**Subject:** Horticulture

**Course Code:** HORT- 366

**Course Title:** Post Harvest Management and value addition of Fruits and Vegetables

**Module Name:** Storage (ZECC, Cold storage, CA, MA, and Hypobaric)

**Module No:** 8

**Name of the Presenter:** Gourish Karanjalker

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**Notes :**

### **Storage (ZECC, Cold storage, CA, MA, and Hypobaric)**

- Fruits and vegetables are perishable in nature
- Need to improve shelf life of Fruits and Vegetables
- Methods of storage depending on commodity, need and budget
- Different methods of storage are proposed

### **Methods of Storage**

- A. Ambient temperature
- B. Cold storage
- C. Controlled Atmospheric storage
- D. Modified Atmospheric storage
- E. Hypobaric storage
- F. Cool chamber storage: ZECC
- G. Irradiation

**A. Ambient temperature:** at room temperature

**B. Cold storage:** lower than room temperature, depends on produce, if temperature goes below it causes chilling or freezing injury, causes market loss

**Cold storage conditions for some fruits and vegetables**

<b>Crop</b>	<b>Storage temperature (oC)</b>	<b>Relative Humidity</b>	<b>Shelf life (weeks)</b>
Cashew apple	0-1.5	85-90	4-6
Mango	7-9	85-90	4-7
Orange	4-7	85-90	4
Pomegranate	0-1.5	85-90	4-6
Sapota	1.5-3	85-90	6-8

**C. Controlled Atmospheric storage:** increasing CO<sub>2</sub> and decreasing O<sub>2</sub>. It control respiration, ripening. Example apple can be stored upto 6-8 months. However improper CA can detiriate the frutis, spread certsain diseases and disorders.

**D. Modified Atmospheric storage:** Similar to CA but the gas concentrations is less precise and CO<sub>2</sub> derived from dry ice CO<sub>2</sub> allowed to accumulate and allowed to decrease.

**E. Hypobaric storage:** produce is placed in vacuum tight chamber (removing air). Shelf life increased by lowering respiration, ethylene and ripening.

**F. Cool chamber storage:** ZECC Simple structure made out f bricks and sand. Principle based on direct evaporative cooling.

ZECC was developed by Roy and Khurdiya at IARI, New Delhi. It is constructed using simple materials like brick, sand, bamboo, straw, gunny bag, etc. Chamber should have floor of 165 cm x 115 cm and layout with Double

wall erection of brick at the height of 67.5 cm leaving gap of 7.5 cm in between two walls for filling of river sand. The sand is wetted to reduce the temperature and maintain humidity. ZEC lowers temperature by 10- 15°C and maintains 95% relative humidity.

### **G. Irradiation**

- Gamma rays (CO-60) prevents sprouting in onion, ginger, garlic.
- BARC: mango-(0.25 Kgy) extends shelf life by 5-7 days, banana (0.25-0.35 Kgy) by 10 days.
- Rays affect the nucleic acid (RNA interference) results in inhibition of sprouts.
- Interference with basic metabolites results in delayed ripening and senescence.
- Destruction of spoilage and fruit fly infestation.

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