Ripening Agents Used for Fruits

Source: TH

Ripening of fruits is associated with the **process of senescence or aging in plants**. It involves changes in colour, texture, flavour, sugar content, and acidity, and is **influenced by the ripening hormone ethylene.**

Artificial Fruit Ripening Agents:

- **Calcium Carbide:** It releases **toxic acetylene gas** and may contain **phosphorus**, and **arsenic (a carcinogenic substance)**causing severe health issues.
  - Its usage has been **banned by FSSAI** under Food Safety and Standards Regulations, 2011.
- **Permitted Substances:**
  - **Ethylene Gas**: Approved by FSSAI up to **100 ppm (parts per million)**; triggers natural ripening. It must be applied in **controlled ripening chambers** and **not in direct contact** with fruits.
  - **Ethephon**: Releases **ethylene on breakdown** and used for artificial ripening under regulated conditions.
  - **Ethereal**: It is an **ethylene-releasing compound** used in **controlled settings**.

PLANT HORMONES

HORMONE	FUNCTION	LOCATION
 Gibberellins	Increase the speed of seed germination; promote stem elongation; induce early blooming of flowers; increase fruit size	Shoot and root apical meristems; seeds
 Auxins	Stimulate stem elongation; control seedling orientation; stimulate root branching; promote fruit development	Apical meristems; immature plant tissue
 Ethylene	Increases the speed at which fruit ripens; stimulates leaf dropping and the death of flowers	All parts of the plant including the fruits
 Abscisic acid	Inhibits growth and reproduction; inhibits seed germination; stimulates closure of stomata	Leaves; fruits; root tips; seeds
 Cytokinins	Cause rapid cell division, in conjunction with auxin; induce seed germination; initiate new branches from lateral buds	Roots and fruits, primarily