General information :- In India, there is a vast scope for growing fruit and vegetable throughout the year in one or other part of the country because the climatic conditions are highly suitable for growing various types of fruits and vegetables.

- Fruit and vegetable are most important commodity for human diet due to their high nutritional value but are highly perishable. They are the cheapest and other source of protective food supplied in fresh or processed or preserved form throughout the year for human consumption. Hence the national picture will improve significantly.

- Fruit and vegetable are available in surplus only in certain seasons and availability in different regions.

- In peak season due to improper handling practices, marketing, storage problems around 20-25% fruit and vegetable are spoilt in various stages.

- Fruit and vegetable are living commodities as they respire. Hence, proper post harvest management handling and processing is required in horticulture crops.

I. MATURITY

It is the stage of fully development of tissue of fruit and vegetables only after which it will ripen normally. During the process of maturation the fruit receives a regular supply of food material from the plant. When mature, the abscission or corky layer which forms at the stern end stops this inflow. Afterwards, the fruit depend on its own reserves, carbohydrates are dehydrated and sugars accumulate until the sugar acid ratio form. In addition to this, typical flavour and characteristic colour also develop. it has been determined that the stage of maturity at the time of picking influence the storage life and quality of fruit, when picked immature like mango develop white patches or air pockets during ripening and lacking in normal brix acid ratio or sugar acid ratio, taste and flavour on the other hand if the fruits are harvested over mature or full ripe they are easy susceptible to microbial and physiological spoilage and their storage life is considerably reduce. Such fruits persist numerous problems during handling, storage and transportation.

Therefore, it is necessary or essential to pick up the fruits or vegetables at correct stage of maturity to facilitate proper ripening, distant transportation and maximum storage life.

OR

Maturity is the process for the determination of the perfect moment or stage to pick up the crop.

It refers to the attainment of final stage of biological function by a plant part or plant as a whole. It is the particular stage in life of plant or fruit at which they attain maximum growth and size.

The stage at which the crops should be harvested has an important bearing on quality. Good quality is obtained when harvesting is done at the proper stage of maturity. Fruits harvested before optimum maturity may not ripen adequately and may not develop good flavor, while crops harvested late (over mature) will have a shorter post-harvest life and deteriorate easily.

Types of Maturity:-

Horticultural maturity

It is a developmental stage of the fruit on the tree, which will result in a satisfactory product after harvest.

Horticultural maturity refers to any stage of development when the commodity has reached a level of development sufficient for its intended use.

Physiological maturity

It refers to the stage in the development of the fruits and vegetables when maximum growth and maturation has occurred. It is usually associated with full ripening in the fruits. The Physiological mature stage is followed by senescence.

OR

Physiological maturity: Attainment of full development of stage just prior to ripening or ripening in non climacteric fruits.

Commercial maturity

It is the state of plant organ required by a market. It commonly bears little relation to Physiological maturity and may occur at any stage during development stage.

Harvest Maturity

It may be defined in terms of Physiological maturity and horticultural maturity, it is a stage, which will allow fruits / vegetables at its peak condition when it reaches to the customer develop acceptable flavour or appearance and having adequate shelf life.

In other words, harvest maturity is the perfect moment or stage to pick up the crop which will allow fruits / vegetables to develop acceptable flavour or appearance and having adequate shelf life when it reaches to the customer.

: Criteria of maturity for harvesting fruits and vegetables

Fruit	Physical	Chemical
Mango	Olive green colour with clear lenticels, shoulder development size sp. gravity, days from fruit set.	Starch content, flesh colour
Banana	Skin colour, drying of leaves of the plant, brittleness of floral ends, angularity of the fruit, and days from emergence of inflorescence.	Pulp/peel ratio, starch content
Citrus	Colour break of the skin from green to orange, size	Sugar/acid ratio, TSS
Grapes	Peel colour, easy separation of berries, characteristic aroma	TSS 18-12 Thompson seedless, 12-14 for Bangalore Blue,14-16 for Anab-e-shahi
Apple	Colour, size	Firmness as measured by pressure tester
Papaya	Yellow patch or streaks.	Jelliness of the seed, seed colour

Vegetables are harvested at harvest maturity stage, which will allow it to be at its peak condition when it reaches the consumer, it should be at a maturity that allows the produce to develop an acceptable flavour or appearance, it should be at a size required by the market, and should have an adequate shelf life. Time taken from pollination to horticultural maturity under warm condition, skin colour, shape, size and flavour and abscission and firmness are used to assess the maturity of the produce.

Table:-Time taken from pollination to horticultural maturity

S. No	Vegetables	Time to harvest Maturity (days)
1	Ridge gourd	5-6 days
2	Squash	7-8 days

3	Brinjal	25-40 days
4	Okra	4-6 days
5	Pepper (green stage)	45-55 days
6	Pepper (red stage)	60-70 days
7	Pumpkin (mature)	65-70 days
8	Tomato (mature green)	35-45 days
9	Tomato (red ripe stage)	45-60 days
10	Peas	30-35 days

Skin colour

Loss of green colour in citrus and red colour in tomato.

Shape, size and flavour

Sweet corn is harvested at immature stage, smaller cobs marketed as baby corn. Okra and cow pea are harvested at mature stage (pre fiber stage). In chilli, bottle gourd, bitter gourd, cluster beans maturity is related to their size. Cabbage head and cauliflower curd are harvested before un pleasant flavour.

Abscission and firmness

Musk melon should be harvested at the formation of abscission layer. In cabbage and lettuce should be harvested at firmness stage.

Factors affecting maturity

1. Temperature: Higher temperature gives early maturity. e.g. Gulabi (Pink) grapes mature in 100 days in Western India but only 82 days are enough in the warmer Northern India.

Lemon and guava takes less time to mature in summer than in winter. Sun-scorched portions of fruits are characterized by chlorophyll loss, yellowing, disappearance of starch and other alcohol insoluble material, increase in TSS content, decrease in acidity and softening.

2. Soil: Soil on which the fruit tree is grown affects the time of maturity. e.g. Grapes are harvested earlier on light sandy soils than on heavy clays.

3. Size of planting material: This factor in propagated fruits affects fruit maturity. e.g. In pineapple, the number of days taken from flowering to fruit maturity was more by planting large suckers and slips than by smaller ones.

4. Closer spacing: Close spacing of hill bananas hastened maturity.

5. Pruning intensity: It enhanced the maturity of Flordasun and sharbati Peaches.

6. Girdling: Process of constricting the periphery of a stem which blocks the downward translocation of CHO, hormones, etc. Beyond the constriction which rather accumulates above it. In Grape vines it hastens maturity, reduces the green berries in unevenly maturity cultivar and lowers the number of short berries. It is ineffective when done close to harvest. 4-CPA compound has an additive effect with girdling.