

## **Quadrant II – Notes**

**Programme:** BSc. (Hons.) Agri.

**Subject:** Horticulture

**Course Code:** HORT-111

**Course Title:** Fundamentals of Horticulture

**Module Name:** Unfruitfulness

**Module No:** 7

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**Notes :**

### **Unfruitfulness**

#### **Introduction**

- Unfruitfulness is Major problem in orchard
- ☐ Commercial cultivation is affected because of the unfruitfulness
- ☐ Bearing is mandatory in the orchard or else the economical loss occurs
- ☐ Many factors affect the regular flowering, fruiting and yield

#### **Terminologies**

1. Bearing: connotation of flowering and fruiting
2. Unfruitfulness: failure of tree to bear fruits towards expectation
3. Infertility: inability of a plant to not to set viable seeds
4. Self fruitfulness: Ability of a plant to produce fruits after pollination
5. Self fertility: ability of a plant to produce viable seeds after self pollination

#### **Factors affecting unfruitfulness**

- ❖ Phylogenical
- ❖ Physiological
- ❖ Managemental
- ❖ Paratistical and
- ❖ Climatological factors

### Phylogenical factors

- ☐ Sex forms fails to form zygote
- ☐ Evolutionary tendencies: imperfect flowers or varied developmental periods
- ☐ **Monoecious**: the male and female flowers are different on same eg. coconut
- ☐ **Dioecious**: the male and female flowers are different on different plant Dioecious: eg. Papaya, Date palm and Strawberry
- ☐ **Heterostyly**: difference in styles of the flowers Heterostyly: difference in styles of the flowers
- ☐ **Dichogamy**: non synchronous nature of stigma and pollen viability
- ☐ Abortive Flowers
- ☐ Impotence of pollen

### Physiological factors

- ❖ **Slow pollen tube growth**
- ❖ **Premature or delayed pollination**
- ❖ **Self sterility**: example: hybrids between *Vitis rotundifolia* and *Euvitis* are completely sterile
- ❖ **Incompatibility**: due to incompatibility between the pollen and ovules of the same plant
- ❖ **Nutritional conditions that affect**: pollination, fertilisation, over bearing, drought or poor soil that results in production of defective pistils, flower set, fruit drop, etc.

### Managemental factors

- **Nutrient supply:** High fertility level is generally associated with good pistil development and low level with poor pistils and good stamens
- **Pruning and Training:** Pruning tends to produce more true hermaphrodite condition
- **Locality:** Jonathan apple which is sterile in one location is reported to be self fertile in another location
- **Season:** grape Hybrid 'Ideal' is self impotent in early season
- **Clonal rootstocks:** produces regular bearing
- **Bee activity:** affects the pollination

#### **Parasitical factors**

- Pests and diseases affects the fruiting and flowerings
- Mango hopper, powdery mildew, etc.

#### **Climatological factors**

- ❖ Temperature, humidity, rainfall, hail, frost, clouds affect state of fruitfulness
- ❖ Temperature: High temperature at flowering dries up stigma, affect bee activity 15-40°C is ideal
- ❖ Rains, Humidity and frost damage blossoms
- ❖ Light: Exposure of strawberry plants to long photoperiod results in development of stamens and pistils in strawberry flowers.

#### **Measures to overcome unfruitfulness**

- Choice of the crop and variety
- Provision of windbreak to avoid heavy wind damage
- Good management of orchard by maintaining organic matter, pH amendments and nutrients
- Planting pollinisers to avoid problems of pollination due to heterostyly, dichogamy incompatibility, sterility, etc.
- Maintenance of honey bee colonies

- Use of PGRs against slow growth of pollen tube, premature and delayed pollination
- Replanting or rejuvenation of old trees
- Thinning, pruning and training
- Irrigation management to avoid drought and waterlogged conditions
- Management of pests and diseases

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