

# REJUVENATION OF OLD AND SENILE FRUIT ORCHARDS

## Exercise

Orchard rejuvenation: making rings, application of fertilizers and root pruning

## Objectives

- To know about rejuvenation procedures in old and senile fruit orchards.
- To know about top working of old and unproductive fruit trees with superior scion varieties.

**Delivery schedule:** 02 periods

**Student expectations/learning objectives:**

- To know about rejuvenation practices in different fruit crops.
- To know about cultural practices in rejuvenated fruit orchards.
- To know about top working of old and unproductive fruit trees.

**Handouts/material/equipment's & tools required:** Paper sheet and pen to note down the different important points pertaining to rejuvenation in fruit orchards.

**Pre-learning required:** Pre-requisite knowledge of fruit species and their cultivation practices.

## Introduction

The term 'Rejuvenation' means renewal or making new or young again. As applied to the fruit trees it would mean restoring the productive capacity of the fruit trees which have attained a stage where they are no more profitable. Students might have observed that in poorly managed old and senile fruit orchards having intermingling and over-crowding of shoots with poor photosynthetic efficiency, severe infestation of insect pests and diseases. Senile orchards with poor efficiency are now a common phenomenon in temperate, sub-tropical and tropical fruits. Since most of the fruit crops have long juvenile phase, instead of planting new plantations, it is advisable to rejuvenate them to have new vigour which will ultimately leads to better and quality production.

## Month wise rejuvenation activities

### December - January

- Mark trees and undesired branches for severe pruning.
- Prune marked branches of fruit trees preferably in December.
- Pruning should be done in alternate rows.
- Avoid cracking and splitting by cutting the branches first from lower side and then from upper side.

- Apply copper oxychloride paste or biodynamic tree paste on all cut surfaces.
- Deep ploughing of the orchards in January.
- Prepare irrigation channels and tree basin in the orchard.

### February - March

- Apply recommended full dose of phosphorus and half dose of nitrogen in the fruit tree basins in the second fortnight of February.

- If infestation of stem borer and other insect pest on pruned fruit trees is seen. Treat trees with monocrotophos or chlorpyrifos (0.05 per cent ) or dichlorvos or kerosene oil upon identification of infestation.
- In March irrigate pruned trees as per their requirement.

### April-May

- Irrigation as per requirement of fruit trees.
- Apply mulch material in the fruit tree basin.
- Perform hoeing and weeding in tree basins.
- Protect new emerging shoots from the pruned trees.
- Observation for incidence of stem-borer and its management as given above.

### June- July

- Thin out undesired shoots and retain 6-10 healthy shoots with outwardly growth per pruned branch during June
- Spray of copper oxychloride (3 g / liter) on trees.
- Irrigate fruit trees at an interval of 10-15 days.
- Application of remaining half dose of nitrogen during June.
- Apply farm yard manure (75-100 kg per tree) in tree basins during July month.
- Careful watch the infestation of stem borer and manage as given above.
- Spray of copper oxychloride (3 g/litre water) twice at an interval of 15 days, if symptoms of diseases like anthracnose and leaf spot appear on new growth.

### For teachers..

- Practically show the old, crowded, unproductive fruit orchards to the students.
- Demonstrate before students marking and pruning of undesirable branches.
- Try to make the students to understand seedling origin fruit trees and superior scion

- Spray carbarly (2 g per litre water) at an interval of 10-15 days if incidence of leaf cutting weevil is observed.

### August - September

- Thin out other undesired shoots.
- Observation of incidence of stem-borer insect pest and anthracnose and other leaf spot diseases and their management.

### October-November

- Cultural operations such as ploughing, hoeing, weeding should be done.
- Remove dried and diseased twigs on the fruit trees.
- Control insect pests and disease on the fruit trees.
- Spray urea (2 per cent) in October for healthy vegetative growth.
- Marking of remaining trees for pruning in the December month.

### Rejuvenation in mango



Emergence of new shoot from the pruned branches



Rejuvenated mango trees



Fruiting in rejuvenated mango trees

In mango, 40 to 60 years old plantation can be further given a productive life of 20 to 25 years by adopting rejuvenation practices. Rejuvenation consists of heading back and removal of selected branches three to four meters above ground during winter month. Proper orchard management which includes immediate pasting by copper oxychloride or bordeaux paste or cow dung paste, thinning of unwanted shoots, nutrient and water management need to be scientifically practiced. In case original varieties are of poor quality, or there is no provision of pollinizers, top working of elite clone(s) need to be adopted. These rejuvenated trees start bearing from third year onwards. Branches emerging from the main trunk have been considered to be the first order and subsequent branches have been assigned higher orders respectively. There is good income realization from the sale of pruned wood and cultivation of appropriate intercrops. Thus, it is clear that the open space could be profitably utilized for inter-cultivation of vegetables, medicinal and aromatic crops, and even short duration horticultural crops like papaya and drumstick, etc. particularly in early years of rejuvenation. The rejuvenation technology in mango involves various steps depends on condition of orchard and age of the fruit plants.

### **Canopy management**

- Older plantations of seedling origin can be adopted for top working by grafting with superior varieties.
- Over lapping of canopy may be observed between 10 and 12 years of age. Maintained the canopy by thinning and trimming.

### **Irrigation, manuring and fertilization**

- For mango, Urea (2.5 kg), Single Super Phosphate (3 kg) and Potassium sulphate (1.5 kg) and 75 kg farm yard manure is suggested.
- Full dose of farm yard manure (120 kg/tree) should be applied in the first week of July.
- In the last week of February, apply half dose of urea with full dose of Single Super Phosphate and Potassium Sulphate.
- The remaining half dose of urea is applied during June.
- Adequate watering is essential for the development of shoots on rejuvenated trees. Pruned trees need to be irrigated at 10-15 days interval from March to June.

### **Mulching**

- Mulching under pruned trees by black alkathane sheet or organic material, such as, dried grass, banana leaves etc..
- Optimum soil moisture should be ensured after new shoots emergence on pruned trees.

### **Thinning of shoots**

- Selective and regular thinning of shoots is essential for the development of open canopy of healthy shoots.
- Outwardly growing 8-10 healthy shoots are retained per branch and the rest are removed.

- Spray copper oxychloride (3 g / litre water) after thinning operations.

### **Insect pest and disease management**

- Infestation of stem-borer can be easily identified by wooden frass fallen on ground from the affected branches. Holes and oozing of gum in affected branches are the other indicators of borer infestation.
- Larvae can be killed or pulled out from the hole by using thin wire.
- Larvae hidden inside the branch and trunk can be effectively controlled by placing cotton wick soaked in insecticide inside the hole and sealing it with mud.
- Leaf cutting weevil damages new growth. It can be managed by spraying carbaryl (0.2 per cent) at 10-15 days interval.
- The anthracnose disease on leaves can be controlled by spraying Copper oxychloride (0.3 per cent) at 15 days interval.

### **Students Activities**

1. The students should perform marking and pruning operations on old and unproductive fruit trees available in the locality.
2. Students should be asked to manage the pruned trees and to make a schedule of operation required in different months.
3. Students should be asked to top work seedling type unproductive fruit trees with the superior varieties.
4. Students should be asked to prepare solution/paste of different plant protection chemical required during rejuvenation of fruit trees.

### **Study Material**

- Baba Jahangeer A., Akbar P. Ishfaq, Kumar Vijai(2011). Rejuvenation of old and senile orchards: a review, *Annals of Horticulture*, **4**(1): 37-44
- Lal, B., Rajput, M. S., Rajan, S. and Rathore, D. S. (2000). Effect of pruning o rejuvenation of old mango orchards, *Indian Journal of Horticulture*, **57**(3): 240-242
- Management and rejuvenation of senile orchards. [www.nhm.nic.in/Management Rehabilitation Senile Orchards..pdf](http://www.nhm.nic.in/Management%20Rehabilitation%20Senile%20Orchards..pdf)
- Srivastav, Manish, Dubey, A. K. and Singh, A. K. (2008). Rejuvenation of fruit orchards. In: Fruit Production Manual Published by Division of Fruits and Horticultural Technology, IARI, New Delhi, p, 86.



# POMOLOGY-II

## Practical Manual



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