Practical - 7

PERFORMING INTERCULTURAL OPERATIONS IN ORCHARDS

Exercise

Performing intercultural operations in orchards.

Objectives

- To know about different cultural operations in fruit orchards

Delivery schedule: 01 period

Student expectations/learning objectives

- To know about necessity of intercultural operation in orchards.
- To acquire skill of performing intercultural operation in fruit orchards.

Handouts/material/equipment's & tools required: Practical note book, pen, and pencil to note down the important points on intercultural operations etc.

Pre-learning required: Pre-requisite knowledge about cultivation of fruit trees and management in fruit orchards.

Introduction

Intercultural operation are those activities which are performed in the fruit orchards for improving sanitary conditions, controlling weeds, providing nutrition to the trees, growing intercrops, irrigation, green manuring, mulching pruning and training, fruit thining and management of insect pest and diseases. Factors responsible for the decline of fruit yield and proper fruiting pattern mostly pertains to poor management practices. It is therefore imperative to pay attention for timely execution of intercultural operation in order to keep fruit trees in the orchard in healthy condition. Practical knowledge of several intercultural operations in fruit orchards is a requisite for successful growing of fruit trees. Important intercultural operations generally followed in some commercial fruit crops are given hereunder.

For teachers…

- Ask students to practically observe and make a schedule of different intercultural operation in fruit orchards in the locality.
- Ask students to make schedule of intercultural operation in other fruit crops as per their cultural requirements.

Intercultural operation in apple orchards

Weed control: The young apple tree are vulnerable to competition for nutrient from the weeds. Weeding should be done at regular intervals during the initial years. Apart from hand weeding use of herbicides to eliminate weeds both in the nursery as well as in the field is practical. In the apple orchards

Weeds in apple orchard

pre- and post-emergence application of Atrazine (2-6 kg/ha) controls the weed population. Mulching followed by herbicide application is the most effective method of controlling weed. The best time of application of these herbicides is early in the spring.

Mulching: Mulching with straw, hay, sawdust, oak leaves or other organic matter increases the humus content of the soil and its moisture holding capacity. Various plastic and polythene mulches are used. Black polythene mulch in cooler climatic conditions is very effective. It also helps in reducing fruit drop and improve fruit size, colour and quality.

Pruning: Pruning is done with a view to divert the sap flow towards the fruiting branches and to force the plants to bear more fruits or to induce vigorous vegetative growth. During pruning, weak-growing and diseased branches are removed from the tree. Usually the trees are pruned every year in the month of December-January. The systems of pruning adopted in apple cultivation are different for different purposes. For established spur system, the objective of pruning is to develop permanent fruit spurs for production of fruits. To ensure formation of spurs on the laterals the central leader is cut back every year along with the strong erect laterals near the central leader. This leads to wide angled laterals for formation of spurs. Similarly in case of regulated system, pruning is practiced on apple cultivars growing on semi-dwarfing and vigorous rootstocks. Before planting, the central leader of the tree is cut back at 75 cm on which three well placed primary branches are allowed to grow. In bearing trees, the growth of leader and strong laterals are encouraged by pruning weak and crowded branches. For renewal system in vigorous cultivars instead of developing permanent spurs, the objective is to encourage continuous growth of new healthy shoots, spurs and branches every year. A part of the tree is pruned every year to produce fruits in the following year on the new shoot growth, while the unpruned parts produces fruit buds.

Pruning in apple

Thinning of fruits: Thinning is one of the major techniques to improve fruit quality. In apples, heavy bearing not only results in small-sized poor quality fruits but also sets in alternate bearing cycle. Judicious thinning done at the proper stage of fruit development can regulate cropping and improve fruit size and quality. Since manual thinning is cumbersome and expensive, chemical thinning is advised.

Fruitlets in apple

Chemical	Dose (ppm)	Stage of appliction
NAA	10-15	Full bloom to 4 weeks after petal fall
2,4-D	2-10	Full bloom to petal fall
2, 4, 5-T	2-2.5	Full bloom to petal fall
Carbaryl (Sevin)	1000-2000	Petal fall and 4 week after petal fall

Intercultural operations in mango orchards

Weed control: Immediately after planting the mango, the excessive population of weed should not exist. Hoenig should be done depending on weed growth in the basin. The area between the basins should be ploughed at least three times a year, i.e., pre-monsoon, post-monsoon and in the last week of November.

Intercropping: During intial years of planting, crops like green gram, black gram, vegetable crops such as cabbage, cauliflower, potato, brinjal, cucumber, pumpkin, tinda etc. and spices like chilies can successfully be grown as inter crops. The partial shade loving crops like pineapple, ginger, turmeric, etc. can be grown in fully grown orchards. In addition to field crops, some short duration, less exhaustive and dwarf type inter fillers like papaya, guava, peach etc. can also be grown with the main mango crop.

Pruning: Normally, mango trees do not require frequent pruning. However, the training of the plants in the initial stages is very essential to give them adequate shape. Training becomes very important especially when the branches are placed at a low level. Therefore at least 75 cm of the main stem should be kept free from branches and the first leader/main branch is allowed to grow. The main branches should be spaced in such a way that they grow in different directions and are at least 20-25 cm apart. The branches, which exhibit tendency of crossing and rubbing each other, should be removed in the pencil thickness stage. Subsequently pruning is done only to remove the diseased and dead branches.

Students Activities

1. Visit local fruit orchards and make a schedule of intercultural operations practiced there.
2. On the basis of cultural requirement of other fruit crops available in the locality prepare schedule of different month wise cultural operations.

Study Material

- Bose, T. K., Mitra, S. K. and Sanyal, D. (2001). Fruits: Tropical and Subtropical (Vol. 1). Noya Udyog, Kolkatta-6.
- Bal, J. S. (2007). Fruit growing. Kalyani Publishers, Ludhiana, India.
- Chattopadhyay, T. K. (2008). A textbook on Pomology, Vol. 4 (Sub-tropical fruits), Kalyani publishers, Ludhiana, India.
- Chadha, K. L. (2001). Handbook of Horticulture. ICAR, New Delhi.
- Sharma, R. R. (2006). Fruit Production: Problems and Solutions. Ineternational Book Distributing Company, ISBN 81-8189-102-3