

## MANAGEMENT OF FRUITS AND NURSERY PLANTS DURING WINTER SEASON

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Temperature plays an important role in the life of a fruit plant sapling. The ultimate size which a plant would attain and also the annual growth to a large extent, depend upon the favourable temperature during the growing season. The Jammu and Kashmir state has a Sub-tropical, tropical and temperate climate where the temperature falls nearby 0°C on many occasions. A very low temperature in the month of December and January causes cold and frost injury to the fruit plant saplings as well as younger plants also. The advent of early winter cold may result in killing terminals of immature. Some times, the temperature even falls below zero and causes a great loss to the fruit plant sapling such as Mango, Litchi, Papaya Custard apple and Citrus, through the destruction of their foliage and tender twigs. Early blossoms are also sometimes destroyed by the late frosts. However, deciduous fruit trees such as pear, grape, peach, plum etc. shed their leaves during winter and are not normally damaged by frost.

Other than young fruit plant are also affected by frost. The frost affected fruits, become dry and lose their characteristics quality. The extent of frost damage is more in case of weak or diseased tree or those suffering from mineral deficiencies. The unirrigated or rainfed orchards and fruit trees on unsuitable or frost susceptible rootstocks are the worst suffers.

**Choice of fruits plants:** The fruit growers should select fruit plants for their localities according to the prevailing temperature during winter. Frost susceptible plants such as mango, litchi, papaya and citrus should be planted only in frost free locations. When these plants are grown at frost-prone areas they are bound to suffer from frost damage. Hence, all such frost susceptible fruit trees need protection from low temperature during winter.

The fruit trees grown in northern India can be broadly classified as follows, irrespective of their cold tolerance.

Among fruits also, frost-tolerant varieties should be

Highly susceptible	Slightly tolerant	Tolerant
Mango	Citrus	Pear
Papaya	Loquat	Peach
Litchi	guava	Plum
Banana	Ber	Almond
Custard apple	Pomegranate	Grape
Tamarind	Aonla	Phalsa, Karonda

given preference over those which are frost susceptible. In Langra, Bombay Green, Safeda, Fazali and Malta should be given preference in frost-prone localities. Among citrus fruits, the cold tolerance is in the following descending order; mandarins, sweet lime and kagzi lime. Thus kagzi lime is much more susceptible to frost and needs greater protection than others.

Generally speaking, the cold hardiness increases with the age of the plants. As the plants grow older, their resistance to cold injury also increases. The young plants of most citrus varieties are susceptible to frost and must be protected during the first two winters. Similarly, the young plants of mango, litchi, Aonla and custard apple up to an age of 3-5 years should be provided protection against frost.

**Frost –protection measures:** The fruit growers should adopt the following measures to protect their nursery area and small fruit plants orchards from frost during the winter season:

- The young plants both in the nursery and in the field should be covered with thatches or kullies made of sarkanda, Lucena and farm waste material like sugarcane trash, Bajra straw, rice straw (parali), etc. Keep the south –east side open to let the sun in during winter.

Thatches should be completed from First week of December and the free from thatches for nursery fruit sapling on 15 February.

- Planting of windbreaks around the orchard is very essential to protect the fruit plants from both cold and hot winds. The windbreak trees should be planted, 2-3- years earlier than the planting of the fruit plants in the orchard. While windbreaks on the west and north side of the orchard protect the fruit plants against hot and desiccating winds during summer, they also afford protection from the cold waves during the winter.

- The fruit plants which have suspended growth in winter can withstand low temperature better than the actively growing plants and it can be done by fertilizer and water applications at proper time. In case of grapes, the fertilizers are applied in February and then in April which are utilized for fruit-set and development. The irrigation which makes the vines to suspend growth in October and harden enough to withstand low temperatures

in winter,

– Application of irrigation for the Nursery area during winter it is possible to raise the temperature by 1-2°C. The temperature of water does not fall so easily and rapidly as that of the earth and moreover moist soil does not loose heat so quickly as dry soil. It is, further opinion to the farmer during winter season irrigation of the fruit plant sapling (nursery area) regularly during frost periods.

– Dry leaves, grass or trash should be collected at many places in the nursery side and near about burnt as smoke raises the atmospheric temperature. This raises the temperature in the nursery area by a few degrees and saves the fruit plant saplings from cold injury. Care should be taken that only smoke is produced.

– Healthy plants are more tolerant to frost injury. The trees getting adequate fertilizer and water during their growing season build up high levels of reserve carbohydrates to tide over the cold weather. Therefore adequate and timely manuring, irrigation, plant protection measures, etc. should be followed to maintain the fruit plants in proper health.

– The dwarf plants withstand the cold better than tall ones. It is, therefore, necessary that the fruit plants should be trained in such a way that they remain low – head.

**Training and pruning:** Training of deciduous fruit trees during the early years is highly desirable to build up a proper and strong framework of the trees. In later year, pruning is done to maintain its vigour, spread the fruiting area uniformly on the tree, secure fruit of good size and quality and to encourage regular bearing. Deciduous fruit trees such as pear, peach, plum, grapes, etc. become dormant by shedding their leaves during the winter season. Generally speaking, deciduous trees may be trained and pruned any time between leaf fall and a little before the buds start swelling at the beginning of spring season. However, the best time for pruning pear, peach and plum is January. In grapes, pruning is done from mid-January to the first week of February when the vines are in dormant conditions.

There are three systems of training fruit trees but the modified leader system is preferred for pear, peach and plum. In many states, grapevine varieties are trained on different systems. However, most of the plantations have

been put on Bower and Kniffin systems. In order to know the correct technique of training as well as on pruning a particular kind of fruit plant, the local horticultural extension staff should be consulted.

**Manuring and fertilization:** Manuring and fertilization of fruit trees at appropriate time and in a suitable manner is of utmost importance to keep the trees in vigorous and healthy condition for getting optimum fruits of good size and quality. The fertilizer dose should be applied taking into consideration the variety, age the past cropping history, potential yield of a tree and soil type. Well-rotten farmyard manure along with P should be applied in the end of December. The nutrients contained in farmyard manure become available to trees a few weeks after it is applied to soil. The organic nitrogen becomes immediately available to the trees and its fertilizer dose should be divided into equal parts. Half of the nitrogen containing fertilizer should be applied a week or 10 days before the growth starts in February and the other half in April after fruit set. Many fruit growers make the mistake of applying fertilizers quite close to the tree trunks. This may cause sudden injuries, manifested by drying and burning of leaves and should, therefore, be avoided. When the trees are round, the manures and fertilizers should be spread evenly in the basins made for irrigation. When the trees are full-grown, their root-systems extend all over the orchard soil and at this stage these should be spread evenly all over the orchard soil and mixed well with it. Care should be taken to minimize root injury while incorporating them into soil with spade or khurpa. After incorporating them into soil, alight irrigation must be applied immediately.

**Irrigation:** It is very essential to provide adequate and timely irrigation to fruit trees and plant sapling to keep them healthy. During December-January, the irrigation requirement of fruit trees is considerably reduced. The evergreen trees may be given irrigation at 3 to 4 weeks intervals. Care must be taken to apply adequate and timely irrigation to ber during winter season when fruit is developing. The deciduous fruit trees do not need any irrigation, if there are rains during the winter seasons, otherwise, only one irrigation is sufficient. However, the deciduous as well as ever green trees must be irrigated before the start of new growth in February

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