Package and practices of Apple

Dr Ashwini Kumar Tiwari (SMS- Horticulture)

Apple (*Malus domestica Borkh.*) is a one of the most important table fruit; it is the oldest and commercially the most important temperate fruit and is fourth among the most widely produced fruits in the world after Orange, banana and grapes. **Climate** : Apple has diverse temperature climatic adaptation. It is the most widely planted fruit of the temperate zone. Most of the apple varieties require 1000-1500 hours chilling requirement below 7^{o}c to break the rest periods. These conditions are available at an elevation of 1500-2700 m above sea level in few district of Arunachal Pradesh, where it can be grown extensively Well distributed rainfall of 100-125 cm throughout the growing season is most favorable for its optimal growth and fruitfulness. **Soil**: Apple can be grown on all type of soils. Proper drainage and fertility of soil are important although soil depth, drainage and $_{ph}$ determine the suitability of soil types. Loamy soils, rich in organic matter having a $_{ph}$ 5.5-6.5 with gentle to moderate slope, poor drainage and good aeration are most suitable. **Early season variety:** Michal , Mollies, Delicious, Shlomit, Maayan and Anna.**Mid season variety**: Royal delicious, Red chief, Red spur, Red delicious, Rich-e-Red and Citlodh apple-1**Late season variety**: Lal ambri, sunehari, Top red, Golden delicious , Red gold, **High density planting**: commercial apple orchard with trees planted close together on dwarfing or size controlling rootstocks are referred to as high density planting .High density planting has consistently increased in popularity and acreage particularly with small land holdings in Arunachal Praesh conditions.

Training: The plants are trained according to growth habit and vigor of the rootstock. Training helps to develop a strong framework of scaffold limbs capable of supporting heavy yield with quality fruits, regulate annual succession of crops, expose maximum leaf surface to sun, direct the growth of the trees so that various cultural operations like spraying and harvesting become economical, protect the tree from sun burn and promote early production.Pruning in apple is essential to maintain a proper balance between vegetative growth and spur development.

Orchard cultural practices :Irrigation : Water requirement of an apple orchard varies according to climatic condition. most critical period of water requirement in apple is from April to August.

Orchard management practices.

Clean cultivation: The whole area between trees is cultivated during the first initial years of planting.

Manuring and fertilization: In an orchard of optimal fertility N: P : K may be applied in the ratio of 70:35:70g/year age of the tree. The dose should be stabilized (700:350:700g N:P:K/Tree) after 10 years of age. These applications may be supplemented with farm yard manure @ 10 kg/year age of tree with the form of calcium ammonium nitrate, super-phosphate and muriate of potash respectively. **Weed control:** The use of herbicide to eliminate weeds and grasses enables tree root to exploit the surface soil more effectively than in a grass or cultivated orchard. Apple orchard sprayed with glyphosate@1.7kg/ha or mechanical weed control showed considerably higher yield than trees on unwedded plots. Hexuron 80 WP (Diuron) @ 4kg +glycel 41 sl (Glyphosate) @ 0.8lit/ha. Control the broad spectrum of weeds effectively in apple orchard.**Pre-harvest Fruit drop:** The pre-harvest fruit drop can be checked effectively with the application of 10 PPM NAA (Naphthalene Acetic) before the expected fruit drop or 20-15 days before harvesteld.**Pollination and fruit setting:** For effective pollination, insect activities are important; It is also desirable to place at least 6-8 beehives per hectare of Apple Orchard.

Harvesting and post harvest management: The apple fruit should be harvested at proper picking maturity. Apple being a climacteric fruit, the maturity of fruit does not coincide with ripening. **Precooling:** After picking, the fruit should be placed in a cool and ventilated place to remove field heat before packing. Cold water sprinkling or fruit washing with water also helps quick removal of field heat or another practical way to remove field heat is keep the fruits over-night near the tree basin for cooling down. Fruit surface must be free of moisture before grading, wrapping or packing in cartoons.

Sorting and Grading: After harvesting, unwanted fruits are sorted out. The healthy fruits are cleaned by washing to remove dust and spray residue. Washing can be done with tap water or a dilute solution of 1 percent hydrochloric acid to remove lead carbonate residues. Apple fruits are graded according to size and shape, color and permissible skin blemishes.Large, medium, small and extra small grade fruits are packed in four layers. The fruits of extra large grade are packed in three layers. Pittoo grade fruits are packed with wrappers. However, mechanical grader can be employed for quick and efficient grading of apple fruits:

Packaging : Apple are packed in wooden boxes. Size of wooden boxes used in different apple growing areas of India are different and carry about 10kg or 20 kg fruits in a box.

Storage: Apple have long storage life compared to other fruits. Deterioration of fruits starts after climacteric stage. However, shelf life of apple can be prolonged by providing optimal storage condition. The recommended storage temperature for apple is -1.10c-0^{o}c. The relative humidity of 85-90% should be maintained in cold storage.

`