Major Pests of Deciduous Fruit Crops and Their Management

Randhawa H S, R K Sandhu*, B S Dhillon and N Pandey
Pau Regional Station Gurdaspur
*Department of Fruit Science PAU Ludhiana
Corresponding Author: harpals_randhawa@pau.edu

India ranks second largest producer of fruits globally, accounting for 10% of the total fruit production of the World. The cultivation of fruit crops spans an area exceeding 6.97 million hectares, yielding an annual production of 3.25 million tons (Anonymous, 2024). However, this total production remains insufficient to satisfy the recommended daily dietary intake of 90 grams of fruit per capita (Anonymous, 2024a).

There are several factors contribute to the low productivity and poor quality of fruit, including inadequate sources of nursery fruit plants, improper variety selection, excessive fertilizer application, micronutrient deficiencies, drought conditions or excessive irrigation and significant infestations of insect-pests and diseases. Among these factors, insect pests are particularly detrimental, adversely affecting yield, marketable fruit quality and juice content. Consequently, an integrated approach to pest management is essential for achieving long-term and sustainable horticultural practices. The primary deciduous fruit crops, such as pear, peach, and plum, are cultivated commercially in the mid-hills of Himachal Pradesh, Jammu and Kashmir, and Uttarakhand, albeit on a limited scale in Punjab. A comprehensive overview of the life cycle and effective management strategies for the major insect pests affecting deciduous fruit crops is provided below (Atwal and Dhaliwal 2015; Anonymous 2022).

Peach leaf curl aphid: Aphids range in color from dark green to chocolate brown and are active between February and May. They are considered polyphagous pests. Both the nymphs and adults feed on the cell sap of tender leaves, branches, flower pedicels, and calyxes. This feeding often causes the leaves to curl and turn yellow, while flowers and young fruits may drop off. Additionally, black sooty mold can grow on their excrement, which interferes with photosynthesis. Affected leaves will curl, yellow, and eventually fall, and blossoms and young fruits may also drop prematurely. To control aphids, remove and destroy the damaged plant parts along with the nymphs and adults, and promote the presence of natural predators like ladybird beetles.

Peach black aphid: This pest is commonly found in many stone fruit regions of Punjab. It is larger than the green aphid and is black in colour. It gathers on the stems, shoots, or trunks just beneath the scaffold branches. From March to June, it feeds on the cell sap from the bark of the limbs. The ongoing extraction of cell sap weakens the trees, impacting their ability to set fruit and the size of the fruit. Some distortion of the fruit may happen, and the honeydew produced by large groups of these pests can lead to leaf spotting and sooty mold on the fruit. Preserving natural predators will aid in management efforts.

Chaffer and other defoliating beetles: The mature beetles are light yellow and emerge with the onset of the monsoon. They feed on leaves at night and conceal themselves during the day. If there is a significant infestation, they may also damage fruits near the top. Female beetles deposit their eggs in the soil, and the larvae consume roots and other organic material, which can occasionally lead to the death of the tree due to root damage.

Hairy caterpillars: These pests appear sporadically. The young caterpillars are covered in whitish hairs, while the mature ones have a red head and a dark brown body adorned with white hairs on the head and a tuft of long hair at the rear. The adult moths are yellow with light transverse lines on their forewings. Female moths lay their eggs in clusters on the underside of leaves, which are covered in yellow hairs. Once they hatch, the young caterpillars feed in groups on the leaf surface, completely skeletonizing it. They consume all the mesophyll, leaving only the mid-rib intact. In cases of severe infestation, an entire tree can lose its leaves. The caterpillars are also capable of feeding on the fruit's outer layer.

Fruit flies: Fruit flies' impact over 42 different species of fruit crops, including citrus, guava, mango, papaya, peach, pear, and plum. They pose a significant threat to fruit production and sales in regions where they are present, mainly due to their wide range of host plants. These pests begin causing damage as the fruit nears maturity and continue until the harvest is complete. Infested fruit may become inedible because maggots

burrow into the flesh while feeding. This allows decay-causing organisms to invade, resulting in the fruit's interior becoming a rotting mass. When infested fruits are pressed, a dirty brown liquid seep from the puncture made by the eggs. Severely affected fruits may also fall from the tree. Orchards that are isolated tend to experience lower levels of fruit fly infestation

Flat headed borer: The flat-headed borer is a significant pest affecting deciduous fruit trees. Adult beetles emerge in mid-March and begin to feed on the foliage. The female beetle deposits her eggs individually, dispersing them across the tree trunk and primary branches. Upon hatching, the larvae feed beneath the bark, creating small, irregular galleries. This feeding activity causes the bark to loosen and split. As the larvae mature, they burrow into the wood. Externally, gum globules may exude from the entrance holes in the bark. Consequently, the leaves may exhibit a pale coloration, and the overall growth of the tree may be stunted. In cases of severe infestation, the tree may ultimately succumb to the damage. Flat-headed borers are particularly drawn to limbs that are diseased or injured, including those affected by sunburn, scale insects, bacterial canker, and significant pruning cuts.

Plum Caseworm: The name shows the pest has a covering of conical shape. This pest often goes undetected due to the protective cap that envelops its body. Its diet primarily consists of leaves, as well as the bark of young twigs and branches. It engages in feeding behaviour that involves nibbling on the lamina, resulting in the formation of holes. Additionally, it is capable of feeding on the epicarp of fruits.

Spider mites: These mites target fruit crops from April to June during dry spells. At first, yellowish-white spots show up on the leaves, which then leads to leaf scorching and early leaf drop. Affected leaves accumulate dust. To manage this issue, provide regular irrigation during April to June. Additionally, eliminate Castor and Bhang weeds, as they serve as alternative hosts for the mites.

Bark eating caterpillar: The adult moth is a robust yellowish-brown color, featuring distinctive brown wavy markings on its forewings. Young trees are particularly vulnerable to this pest's attacks. It inflicts damage by boring into the stems and branches, feeding on the bark while concealed beneath its droppings. The caterpillars tend to stay hidden in their tunnels during the day and emerge at night to feed on the bark. Signs of this pest's presence can be identified by the silk and frass galleries they create. This pest is most commonly found in neglected orchards.

Fig. 1. Major Insect-pests and their damaging symptoms

Integrated pest management (Anonymous 2022)

1. Plant early maturing cultivars of peach i.e. Prabhat, Partap, Florda Prince, Earli Grande, Flordasun and Shan-e-Punjab.
2. Do frequent irrigation of orchard for management of peach chaffer beetle.
3. Plough the surrounding area of fruit trees in winter months that can help to kill the grubs and adults chaffer beetle. The predatory insects and bird can also eat them.
4. Be cautious for cleanliness of orchards.
5. Fix Anisol chaffer beetle PAU trap @ 12 per acre in orchard in last week of April.
6. For management of bark eating caterpillar apply kerosene oil in the holes after removing the web in month of September-October and again in month of January
7. For fruit fly pest harvest the ripening fruits and do not allow the ripe fruits on the tree.
8. Regular removal of fallen fruits from the ground and bury the infested fruits at least 60 cm depth.
9. Shallow ploughing with cultivator immediately after harvest is effective in exposing and killing the pupating maggots/pupae, which are mostly present at 4-6 cm depth.
10. Fix PAU fruit fly traps @16 traps/acre in the 2nd week of April, 1st week of May, 1st week of June while in plum, peach and pear, respectively. Recharge the traps after 30 days, if needed.
11. Remove and destroy dead and severely affected branches of the tree.

12. Remove alternate hosts.
13. Remove webbing and apply kerosene oil into the holes during September-October and again in January-February. Treat all the alternate host plants in the vicinity. Young trees may succumb to the attack.

References

Anonymous (2022) Package of practices for cultivation of fruits. Punjab Agricultural University Ludhiana.

Anonymous (2024) The New Indian Express https://www.newindianexpress.com

Anonymous (2024a) Dietary Guidelines for Indians. Indian Council of Medical Research. https://main.icmr.nic.in.

Atwal A S and Dhaliwal G S (2015) Agricultural Pests of South Asia and Their Management (8th Edition) Kalyani Publishers, New Delhi: 179-190.

* * * * * * * * *