



Insect Pests of *Phalsa* (*Grewia asiatica* Linn) and Their Management Options

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Phalsa is one of important minor fruit crops cultivated in the arid and semi-arid regions of India. The crop thrives well in dry areas and gives good return. The fruits are eaten as fresh and famous for its cooling effect as well as medicinal values. The crop is cultivated successfully under various abiotic stress conditions. However, it needs proper plant protection measure to attain good yield. In India, so far twelve insect pests have been reported and scarce information is available about their damage loss, symptom of damage and management options. In this article, the brief details of damage symptom, extent of damage and available management strategies has been compiled, discussed and given in a concise manner so that it can be highly useful for identification of pest damage and successful management of these insect pests at farmer level.

Introduction

Phalsa (*Grewia asiatica* Linn) is an important underutilized fruit crop widely grown under arid and semi-arid region of the India. The Rajasthan, Punjab, Haryana, Uttar Pradesh, Gujarat, Bihar and some part of West Bengal, Maharashtra, Karnataka and Andhra Pradesh are important *phalsa* growing states in India. The fruits are rich source of vitamin A, C and minerals like phosphates and Iron and also famous for its medicinal properties in ayurvedic medicine. It is one of the hardiest fruit plant can withstand diversity of soil and climatic condition. There are various constrains which limits *phalsa* fruit production. Of these, insect pests are one of the important constrains causing a heavy yield loss to the crop. Although the crop is hardiest in nature, about dozen of insect pests and its damage has been reported from various parts of India. The pests are, chafer beetle, brown beetle, bark eating caterpillar, oriental fruit fly, peach fruit fly, citrus leaf minor, citrus psylla, aphid, pink mealy bug, hairy caterpillar and ants. In brief, a detail of these pests damage and control option has been discussed here.

Important pests and its damage symptom

Sl. No.	Name of the pest	Damage symptom
1	Chafer beetle, <i>Holotrichia consanguinea</i> Blanch (Coleoptera: Melolonthidae)	During onset of monsoon, the newly emerging beetles cause heavy damage to new sprouts as well as mature leaves. Grubs also found to damage the roots. The severe defoliation reduces the crop canopy and results in less fruit yield
2	Brown beetle, <i>Anomala</i> sp (Coleoptera: Scarabidae)	
3	Bark eating caterpillar, <i>Indarbela</i> sp (Cossidae: Lepidoptera)	The caterpillar makes tunnels in main branches and trunk, severe cases affected parts dies off
4	Oriental fruit fly, <i>Bactrocera dorsalis</i> (Hendel) (Diptera: Tephritidae)	Maggots feeds on berries internally and infested fruits are drop off. Fruit damage has been reported up to 63% at Punjab. Prominently, the damaged fruits found to had single fly pupa.
5	Peach fruit fly, <i>Bactrocera zonata</i> (Saunders) (Diptera: Tephritidae)	
6	Citrus leaf minor, <i>Phyllocnistis citrella</i> Stainton (Lepidoptera: Gracillariidae)	Caterpillar mines superficially on the epidermis of young leaves, tender shoots and gives serpentine look, leaves become silvery and withered off.
7	Citrus psylla, <i>Diaphorina citri</i> Kuwayama (Hemiptera: Psyllidae)	Psylla cause damage to young foliage as well as new shoots. Infestation results into deformation of vegetative as well as flower parts and growth become arrested.
8	Aphid, <i>Aphis craccivora</i> Koch (Homoptera: Aphididae)	The aphid incidence occurs on the sprouts after pruning, nymphs suck the leaf sap and affect the plant vigour .
9	Pink mealy bug, <i>Maconellicoccus hirsutus</i> (Green) (Hemiptera: Pseudococcidae)	It occurs on the leaves, flowers and fruits, suck the sap. Attack would retard the plant vigour completely in severe case
10	Hairy caterpillar, <i>Euproctis fraterna</i> (Moore) (Lepidoptera: Noctuidae)	Caterpillar feeds on the leaves and cause the defoliation. At banging the affected leaves gives sieve appearance
11	Carpenter ant, <i>Camponotus compressus</i> (Fabricius) (Hymenoptera: Formicidae)	Ant found to cause the damage to <i>phalsa</i> fruits and damaged fruits remain with cracks and gives bad look to the mature fruits. The activity ants species would be more during fruit maturity stage.
12	Fire ant, <i>Solenopsis geminata</i> (Fabricius) (Hymenoptera: Formicidae)	

Management Strategies

Cultural control: Integrated strategy is essential to curtail the pest attack from nursery to field level. Proper pruning of shrubs during month of December to February and racking of soil around the plant will reduce the residual pest population especially chafer beetles and fruit fly pupa. The removal of bark eating caterpillar frass webs at the time of pruning would help to reduce the pest infestation. The leaf minor affected leaf should be pruned in nursery as well as

main field. Collection and destruction of hairy caterpillar larvae also would be effective in controlling this pest.

Mechanical control: Installation of fruit fly trap catches using methyl eugenol + malathion for male annihilation. Light trap can be used to catch the adult chafer beetle during night and to monitor the moths activity.

Botanical pesticides: Application of neem seed kernel extracts 4% (NSKE) will effectively reduce the pest infestation and also help to conserve the existing natural enemies.

Biological control: Natural predation of coccinellid predator, *Coccinella sexmaculata* and *Scymnus sp* has been reported on aphid. Predator coccinellid, *Cryptolaemus mountrouzieri* and lycanid predator, *Spalgis epius* found to occur on pink mealy bug (Mani and Krishnamoorthy, 1996).

Chemical control: Foliar spray of dimethoate (0.03%) during sprout emergence and imidacloprid 0.008% or thiomethoxam 0.008% reported had significantly high nymphal reduction of psylla and leaf minor. Application of carbaryl 2.5g/lit of water would be effective against leaf feeders. Application of petrol or kerosene or dichlorvos on hole and plugging with cotton or mud immediate after pruning for bark eating caterpillar will reduce the damage. Bait spray consist of malathion and jaggery will effectively reduce the fruit fly infestation.

Conclusion

Selection of healthy and leaf minor free seedlings for planting, periodical cleaning of orchards, racking of soil around the shrub and timely pruning is necessary to reduce the pest attack. Manual removal of leaf minor infested leaves, webs of bark eating caterpillar and caterpillar larvae would encourage the pest free condition. Installation of light trap and fruit fly traps for chafer and fruit fly, prophylactic spray of neem based formulation and selective insecticide application will improve the natural control also conserve the natural enemies.

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