Chafer Beetles

These beetles belong to genera like *Adoretus*, *Anomala*, *Apogonia*, *Holotrichia* etc. They are hard bodied insects with horny front wings having different colours.

BIOLOGY

Adult beetles emerge with onset of rains during May-June. They are active at night and mate. They hide during daytime. About 50 eggs are laid by a single female in the soil at 5-10 cm depth. Eggs hatch in 8-10 days. Full grown larvae are C shaped. The larvae remain in the soil and eat the roots. Pupation takes place in the soil at 20-30 cm depth. Larval and pupal periods are 60-70 and 12-16 days respectively. Life cycle is completed in about 90 days.

Life stages of Chafer beetle

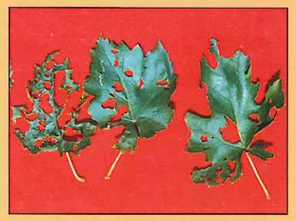
Chafer beetle larvae

Adult

DAMAGE

Both adults and larvae are destructive. Adult beetles start feeding from the periphery of leaves and tender shoots at night. If the population is high, they defoliate the plants. The larvae cut the roots and in certain cases, the damage is serious. The loss ranges from 20-70%.

Damage symptoms of Chafer beetle



Leaf damage

MANAGEMENT

1. Collection and destruction of adult beetles by hand picking in day time and setting up of light traps @2-3/ha in the night time during June -July.
2. Application of chemicals namely fenvalerate 0.005% deltamethrin 0.0028% / carbaryl 0.10%/ endosulfan 0.07% on the very next day of every rain.

NOTE

- All the doses mentioned above are for high volume sprayer, where normal spray volume is 1000 litres/ha.
- Restricted/banned chemicals by importing countries should be avoided in the cropping season on export table grapes. See Annexure 5 of NRCG for details.
- Recommendation of chemicals for the management of flea beetle is of advisory nature for the good viticulture practices and therefore, not covered under any legal scrutiny.

Extension Folder No. 22

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Management of Flea Beetle and Chafer Beetles on Grapes

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Several beetles are known to feed on the leaves leading to defoliation and adverse effect on the growth and production of grapes in the field.

SPECIES

Flea beetle, *Scelodonta strigicollis* and the chafer beetles (*Adoretus, Apogonia, Anomala, Holotrichia*) are the major defoliators reported on grapes.

FLEA BEETLE - *Scelodonta strigicollis*

STATUS

S. strigicollis is a regular and serious pest in the grape growing areas in peninsular India.

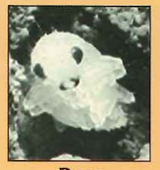
LIFE CYCLE

Adult female beetle lays eggs singly or in groups of 20-40 mainly under loose bark. Each female lays eggs ranging from 250 to 500. Eggs are cylindrical in shape and yellowish white in colour. Egg measures 0.92x0.27 mm. Egg hatches in 4-7 days. Newly hatched larva is pale yellow in colour and the full-grown larva is white, semi transparent and wrinkled having powerful mandibles. Larvae after hatching move to the roots and start feeding on them. There are six larval instars and the total larval period is 30-40 days. They are seen in the soil up to 18 cm. Pupation takes place in the soil up to 6-8 cm deep in earthen cells. Pre-pupal and pupal periods are 2-3 and 7-10 days respectively. Adult beetles mate 25-35 days after emergence.

Life stages of flea beetle

Egg

Larva



Pupa

Adult

Pre-oviposition, oviposition and post-oviposition periods are 30, 75 and 120 days respectively. Adult emergence is closely associated with rains. Newly emerged adult is shining coppery changing to metallic bronze later. Adults are small reddish brown in colour with six visible spots on the elytra. Adult beetles feed on the leaves and live for 8-12 months. Adult measures 4.50 mm in length and 2.0 mm in width. They are nocturnal in habits and many growers fail to detect the presence of the flea beetles on grapevine plants. The life cycle is completed in 50-55 days.

DAMAGE

Adult beetles cause damage to buds, tender shoots, tendrils, leaves and rarely the bunches. They bite the sprouting buds or eat them completely. Damaged buds fail to sprout and dry up. They also scrape the tender shoots and tendrils resulting in white streaks initially and turning into brown patches later. The damaged tender shoots wither and drop down. They mainly feed on the new flush in October and April after pruning. Later, they also feed on mature leaves giving shot hole appearance or create elongated holes on the leaves. In severe cases of infestation, the entire leaf is skeletonised. The damage usually extends from 10 to 30%. The loss goes up to 50% when the sprouting buds are damaged particularly after October pruning. Instances of total failure of crop are also reported in some grape gardens. Sometimes they are seen in the fruiting season, and scrape the unripe berries resulting in scab formation. The larvae feed on roots, devouring the cortical layer and causing the leaves to turn yellow and drop off leading to death of young vines. In general, the larvae do not cause severe damage. Adults are more destructive than the larvae. Adults spread by flying from vine to vine.

Damage symptoms of flea beetle

Shoot scraping

Healthy and damaged bud

Leaf damage

Leaf damage

SEASONAL DEVELOPMENT

Adult female beetle lays eggs from mid March to mid October. Adult beetles are seen throughout the year but degree of activity varies in different months. Adult beetles are also known to hibernate from December to March under the bark of the vine and crevices. They become active in April-May and cause damage. The eggs are found from mid March to mid October and larvae from May to November. Adult populations reach peak numbers in October-November and cause damage to the plants immediately after pruning in October. Among the weather factors, morning relative humidity is positively correlated with the incidence of flea beetle.

MANAGEMENT

Cultural and Mechanical :

1. Raking the soil to expose the larvae and pupae to sunlight.
2. Removal of loose bark after April and October pruning and paste the trunk with a mixture of copper oxychloride 0.20% and carbaryl 0.20% reduce the different stages of the flea beetle.

Chemical : It is easy and practical to control the flea beetles with chemicals. Spray application of dichlorvos 0.20%/ chlorpyriphos 0.05%/ carbaryl 0.20%/ fenvalerate 0.02%/ cypermethrin 0.02% twice at weekly intervals seven days after pruning is recommended.

Biological : Soil drenching of entomopathogenic nematode (EPN) *Heterorhabditis indicus* @ 1-2 lakh infective juveniles (IJS)/vineand irrigation of vines before and after the treatment and also once in a week thereafter results in significant reduction in the larval population and adult emergence.

List of chemicals recommended to control flea beetle

Insecticide	Dose	Pre Harvest Interval
Imidacloprid 200 SL	0.30 mL/L	60
*Carbaryl 50 WP	2.00 g/L	42
Thiamethoxam 25 WG	0.25 g/L	40
Clothianidin 50 WDG	0.12 g/L	40
Lambda-cyhalothrin 05 EC/CS	0.50 mL/L	30

*Not permitted on export table grapes as per EC Regulation Sanco Doc-3010-Directive 91/414/EEC DT. 30-5-2008.