



Management of Leafhopper on Grapes



National Research Centre for Grapes

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Chemical Control : Effective management of hoppers on grapes relies primarily on the use of insecticides. The chemicals should be applied at critical growth stages like new flush and flowering and berry developing stages. Indiscriminate use of chemicals leads to pesticide residue problem on the fruit bunches. Pre harvest interval (PHI) is to be strictly followed to avoid the residue problem.

List of insecticides recommended to control hoppers

Insecticide	Dose	Pre Harvest Interval (days)
Thiamethoxam 25 WG (Actara)	0.25g/L	40
Dimethoate 30 EC (Rogor)	1 ml/L	100
Lambda-cyhalothrin 5EC/CS (Karate EC & Karate Zeon CS)	0.5 ml/L	30
Imidacloprid 200 SL (Confidor)	0.3 ml/L	60
Clothianidin 50% WDG (Dantop)	0.12 g/L	40

Note :

- All the doses mentioned above are for high volume sprayers, where normal spray volume is 1000 L/ha. Spray volume can however be changed as per the efficiency of sprayers used. However, the amount of each pesticide (active ingredient) recommended for 1 ha on the basis of 1000 L spraysolution should be strictly maintained to minimize pesticide residues.
- Recommended PHI will be valid only if maximum Two sprays are applied per fruiting season at 7-15 days interval at recommended doses.
- Recommendation of pesticides for the management of various insect pests and diseases along with their dose, PHI and MRL values are of advisory nature for the good viticulture practices and therefore, not covered under any legal scrutiny.

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Leafhoppers pose an increasing threat to grape cultivation in some grape growing areas in India causing heavy loss in the field.

Hopper Species : *Arboridia viniferata*, *Typhalo* sp., *Empoasca minor*, *Chlorota lybica*, *Amrasca biguttula biguttata* are found causing damage to grapevine.

Identification : Adults are small measuring 3mm in length and wedge-shaped insects. They are yellowish green in colour with black and red markings. The newly emerged adults are pale yellow in colour.

Status : Leaf hoppers are destructive pests in north India and also certain pockets in South India.

Life cycle : Adult leafhopper lays about 15 eggs in the midrib of the leaves. They are elongated yellow-white. They become grayish yellow before hatching and they are measuring 0.8mm long. Hatching takes place in 7-10 days. The nymphs can be easily identified because they tend to move side ways when they are disturbed. Nymphs are pale greenish in colour. There are five nymphal instars lasting for 15-20 days. Adults are green in colour and they have a tiny black spot on each forewing. Adults measure 3.5 to 5 mm and fly readily. The life cycle is completed in 30- 35 days.

Life stages of leafhopper



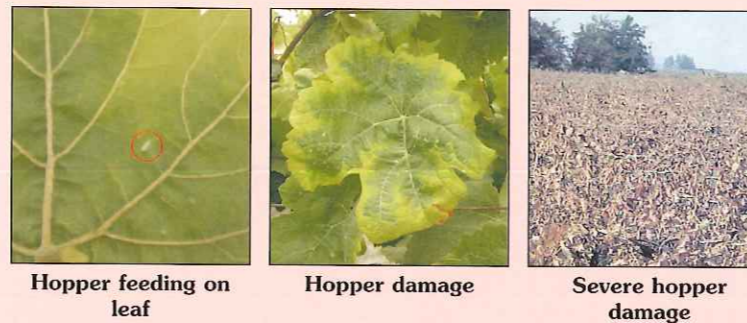
The pest is active from June-October and February-April. They lives in colonies and reproduce parthenogenetically. Both nymph and adults suck sap from the tender leaves, twigs and buds and weaken the plants. The leaves curl up. Each aphid make several punctures and excretes honeydew which encourages development of sooty mold on the twigs and leaves and this leaves a blackened look of the plants.

NATURE OF DAMAGE

Damage : Nymphs and adults feed on the under surface of the leaves. They suck the sap from the leaves. The damage first

appears as a scattering of small white spots. The damaged leaves curled downwards at the edges. With severe infestation and continuous feeding, the entire leaf turns yellow to brown, dries up and drops off. Vigour of the plant is reduced due to severe attack by leaf hoppers.

Symptoms of leafhopper damage



Seasonal Development : Leafhopper population was observed upto two months after pruning. They cause the damage to the new leaves in November and December months .

Crop Scouting and Trapping : Regular scouting is necessary to detect early infestations and also monitor the efficacy of control measures. A crop scouting program includes visual inspection. Scouting should be done once a week. A hand lens is a useful tool to detect hoppers on leaves. Light tapping of the leaves aids in visual inspection.

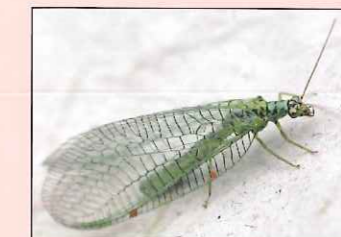
Yellow sticky trap : Yellow sticky traps can be placed 1 to 2 inches above the crop canopy so that the bottoms of the traps are just above the crop, at the rate of one or two per 1,000 square feet.



Yellow sticky trap

MANAGEMENT

Biological Control : Many natural enemies help to provide control of leafhopper. Egg parasites, including *Anagrus* spp., are commonly found in vineyards during part of the season . *Anagrus* spp. can parasitize these eggs and survive the winter. After a leafhopper egg is parasitized it becomes visibly red. Unfortunately, many of the insecticides and sulfur sprays applied for fungal control are very toxic to *Anagrus* spp.



Chrysoperla carnea adult



Chrysoperla carnea larva



Anagrus Spp.

General predators of grape leafhoppers include spiders, green lacewings (*Chrysopa* spp.), minute pirate bugs (*Orius* spp.), and predaceous mites. It is not practically as well as economically feasible to multiply and release these predators. Hence, conservation of natural enemies is important by regulating pesticide sprays.

Botanical Pesticides : Different neem formulations (EC based) depending upon the strength of botanical viz., 0.3% @ 7.5 ml, 1% @ 5 ml and 5% @2 ml/l can be sprayed like insecticide @ 400 l spray solution per acre.

Other Safe chemicals : Farmers are following several alternate methods to manage leaf hoppers. Among those extractions made out of ten different herbs (*Dashaparni*), extractions from chilli and garlic etc. However, results may vary depending on the preparations. Petroleum based Mineral oil (Agro Spray Oil) was tested and found effective @ 0.5%.