



# Home & Garden Pest Management Guide For British Columbia

2019 Edition

## Chapter 12 Pests of Grapes



# Pests of Grapes

This chapter describes insect and disease problems of grapevines. Management information describes preventative and cultural measures that may control the pest. Try these first. Sometimes the management information also mentions pesticides. When more than one pesticide is mentioned, the least toxic pesticide is listed first. Before using a pesticide read and follow label directions, including the precautions, rates and days-to-harvest. See the "Pesticide Table" in Appendix I for information on available home garden pesticides. Also read Chapter 8 "Using Pesticides to Manage Pests". It contains important safety information.

Proper identification of plant pests and diseases is an important step before attempting to control the pest. Not all plant problems are caused by pests; some are caused by cultural, nutritional or environmental conditions. See Chapter 2 for information on how to get help identifying plant problems.



# Insect Pests of Grapes

## Leafhoppers

(Virginia Creeper Leafhopper, *Erythroneura ziczac*, and Western Grape Leafhopper, *E. elegantula*)



*Virginia creeper leafhopper adult*



*Grape leafhopper damage*

Leafhoppers can cause significant stippling on grape leaves and at higher populations can delay grape maturity, weaken vines, and contaminate fruit. Leafhoppers have 2 generations per year. Populations can be variable throughout a grape planting.

### Management:

Some natural biological control agents are present, and will help keep the populations of leafhoppers in check. Sticky yellow traps can be used to detect presence of adults and relative abundance in the spring. Monitor leaves for nymphs from late June onwards in areas where there have been problems in the past, or where adults were found on sticky traps. If over 20 nymphs per leaf are found, consider a spray with an appropriate insecticide. If insecticidal soap is used, the action threshold should be lower, such as 5-10 nymphs per leaf. If possible spray only the infested vines, in order to preserve reservoirs of beneficial organisms. Effective control of the first generation (July) will often protect the plants for the rest of the growing season.

## Cutworms

Cutworms are fleshy, striped and variably coloured caterpillars that climb up plants to feed at night, and rest in the soil at the base of plants during the day. Some species will feed during the day as long as there is adequate cover from foliage. Caterpillars may change from green to dark as they grow and age. They measure up to 4 cm long as full size larvae and curl up when handled or disturbed. Cutworm larvae can be a significant pest on new buds in the spring. Grassed alley ways or other vegetation near grape plants will help keep cutworms from feeding on grape buds.



*Variegated cutworm.*

*Photo courtesy of Ted Kropiewnicki, Bugguide.net*

### Management:

Remove cutworms from plants by hand after dark or destroy those found in the soil around the base of the plant during the day. Splashing a pail of water containing a ¼ cup of dish washing liquid on the soil around the plants will often bring cutworms to the surface during the day.

Early spring feeding on new buds can be significant, particularly if there are no alternative feeding sites, such as a cover crop or turf. If the population is high enough to warrant a pesticide treatment, apply it to the plants after sunset when the most cutworms will be exposed. One well timed application with an appropriate insecticide may be adequate for control of the population, however, additional applications may be needed. Btk (*Bacillus thuringiensis* var. *kurstaki*) is not effective as a spray on medium to large cutworms. Always check the pesticide label for application directions and appropriate use.

## Thrips

Thrips are tiny insects, less than 2 mm long, usually found in association with flowers. In vineyards, thrips overwinter in the leaf litter as mature females. Early in the spring, thrips develop on weeds and later move up to feed on grape foliage. Thrips feeding on shoots and leaves can result in severe reduction of leaf size and may also reduce internode length. Feeding on very young berries following fruit set causes scars on the skin as the berries increase in size. Odd-shaped or split grapes may result. For table grapes, this type of damage can be significant.



*Western flower thrips adult*

**Management:**

Natural biological control agents are often present, and are important in keeping thrips in check. Avoid mowing nearby plants while in flower, as any thrips on these plants will then potentially move onto the grapes.

Spray vines with water after flowering to remove bud caps under which thrips hide and feed. If thrips have caused fruit damage in past years, and pesticides are required, apply pyrethrins right after blossoming and repeat later in the season if thrips again become numerous. Pyrethrins are very effective for thrips because they drive them out of the plant cracks and crevices (repellent effect). Other pesticides can be used. Thorough coverage is required for adequate thrips control. Note that use of pyrethrins can kill natural biological control agents if contacted directly. Consider treating only infested plants in order to leave reservoirs of beneficial organisms.

**Grape Erineum Mite**

(Grape Leaf Blister Mite, *Colomerus vitis*)

This tiny mite is not considered a significant problem in fruit production; however, its presence causes unsightly galls on the underside of leaves in the spring. Mites are only 0.2 mm long, so are difficult to see.



*Grape erineum mite damage*

**Management:**

Ensure that new plants are free of mites and other pests before planting on your property. Natural biological control agents are important in limiting this mite. Applications of sulphur for powdery mildew management early in the season will protect new growth from gall formation. Leaves with galls can be hand-picked and destroyed.

# Diseases of Grapes

## Bunch Rot

(*Botrytis cinerea*)

Bunch rot is most commonly caused by *Botrytis cinerea*, a fungus which also causes disease on hundreds of other plant species. Bunch rot is more common in high rainfall areas, or in wet years in dry areas.

*Botrytis* survives the winter on bark, in buds and in mummified fruit. Fungal spores spread with wind and rain, and can infect grape shoots, flowers, leaves and fruit. Flowers and ripening fruit are most susceptible to infection. *Botrytis* also readily colonizes dead or dying plant tissues. Typically symptoms of bunch rot do not appear until berries begin to ripen, when they rapidly rot and shrivel. The fungus quickly spreads within ripening bunches entering any wounded or split berries. Fruit can also develop rot in storage. Dried or mummified fruit may remain attached to the vines over winter.



*Botrytis bunch rot sporulating on a cluster of grapes*

### Management:

Prevent bunch rot by following good sanitation to remove sources of the disease and cultural methods that keep plants drier. Remove and dispose of mummified fruit that remains attached to the vines. Train vines for maximum air circulation. Water thoroughly as needed from the base of the plant. Do not overwater or use excessive nitrogen fertilizer as this leads to succulent plant growth and promotes bunch rot. Prune and remove leaves surrounding fruit bunches early in the season so that they dry off quickly. Minimize berry damage from powdery mildew, insects and birds.

Susceptibility varies between varieties. In general, varieties with loose clusters and thicker berry skins are less likely to be damaged by bunch rot.

There are no effective fungicides for use in the home garden. Biofungicides containing *Reynoutria sachalinensis* may provide some suppression of botrytis. Fungicides that control powdery mildew can also reduce botrytis, since mildew infection causes cracks in berries that botrytis can easily enter.

## Powdery Mildew

(*Uncinula necator*)

Powdery mildew is caused by a fungus that attacks all above ground portions of grapevines including the dormant canes, flowers, fruit, shoots and leaves. The fungus overwinters on dormant wood and fallen leaves then infects new foliage and shoots in the spring. Powdery mildew can form on both sides of the leaves as distinct whitish, talc-like patches known as powdery mildew colonies. During the growing season powdery mildew colonies turn from white to grey patches and finally reddish-brown patches on dormant canes. Powdery mildew colonies become peppered with minute black, overwintering fruiting bodies. Infected fruit becomes a brownish colour, russeted, cracked and may drop from the cluster. Powdery mildew affects the flavour of the fruit and may make fruit unsuitable for wine. Powdery mildew is favoured by warm temperatures (optimum 20 - 27 °C) and high humidity.



*Severe fruit damage caused by grape powdery mildew*

### Management:

Powdery mildew is more problematic on wine grapes than on table grapes. Select varieties that are resistant to mildew such as ‘Auxerrois’, ‘Malvoisie’, ‘Melon’, ‘Pinot Gris’ or ‘Semillon’.

Properly space grapevines and trim excess foliage to permit good air circulation and light penetration. Prune off lateral shoots in dense canopies and train vines to spread out over the entire trellis. Prune and remove leaves surrounding fruit bunches early in the season to reduce humidity. Manage water and fertilizer carefully to avoid excessive vigour which encourages powdery mildew.

Apply fungicides that contain sulphur according to label directions. Do not apply sulphur to ‘Concord’, ‘Sheridan’ or ‘Foch’ varieties as it can injure these plants. Sulphur can also cause fruit and leaf “burning” on other varieties if it is applied when temperatures are over 27 °C. Sulphur damage appears as bleached areas between the veins that turns brown and dries out. Use lower rates of sulfur when the temperature is expected to increase and apply during the cooler, early morning hours.

Biofungicides containing citric+ lactic acid or *Reynoutria sachalinensis* may provide some suppression of powdery mildew. Summer oil sprays (Purespray Green) will also help to control powdery mildew, but should not be applied within 14 days of a sulphur application.

## Downy Mildew

*Plasmopara viticola*

Grape downy mildew is caused by a fungus-like microorganism which does not occur in British Columbia or the Pacific Northwest. Cool and wet coastal climates would favour the disease. Monitor grapevines for distinct yellowish, oily leaf spots with fine white growth or 'downy mildew' on the under surface. Downy mildew is a serious disease of grapevines and can cause premature leaf drop and crop failure. Immature berries are highly susceptible to downy mildew. Symptoms of yellow leaf spots could be confused with erineum mite damage. Downy mildew growth could be confused with powdery mildew. A lab diagnosis is needed to confirm the cause of the disease.

### Management:

If you suspect grapevine downy mildew is present on your grapes (within B.C.), send samples to the [Plant Health Laboratory](#) for identification.

Do not move suspect or infected grapevines, nursery stock, plant debris or soil into new areas. Avoid overhead watering or cultural practices that keep leaves wet for long periods.

## Crown Gall

*Agrobacterium spp.*

Galls are usually noticed as swellings near the base of the vine and up the trunk. Young galls are soft, creamy to greenish in colour, with no bark or covering. As they age, the tissue darkens to brown and the galls become hard and rough. The surface tissue of the galls turns black as it dies, but the bacterium remains alive in the vine. Crown gall damage on grape is strongly related to winter injury.



*Crown gall on grapevine stem*

### Management:

Select hardy varieties where possible, and avoid planting in frost-prone areas. Select rootstocks that are resistant to crown gall, if available. Do not propagate wood taken from galled vines. Mulch young vines with 30 cm or more of soil or other material to protect them from cold winter temperatures. Remove this material carefully in spring to avoid mechanical damage.

## 2,4-D Injury (herbicide)

Grapes are extremely sensitive to 2,4-D herbicide spray drift. New growth becomes dwarfed, flattened and crooked. Young leaves have a distinctive saw-toothed edge and resemble a partially closed fan with parallel, straplike veins. Similar symptoms can be caused by some grapevine virus diseases.

### Management:

Avoid using hormone-type lawn weed-killers, such as 2,4-D, mecoprop or dicamba, near grapes or other landscape plants. Injury to sensitive plants can be caused by vapours, spray drift or run-off from treated areas.



*2,4-D injury to grape leaves*

Do not mulch plants with grass clippings that have previously been treated with herbicides.