



# Home & Garden Pest Management Guide For British Columbia

2019 Edition

## Chapter 14 Pests of Nut Trees



# Pests of Nut Trees

This chapter describes insect and disease problems of nut trees. 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 Hazelnut (Filberts)

## Aphids

Aphids can be found on the underside of hazelnut leaves. There are two main aphid species of concern in hazelnuts: the filbert aphid, *Myzocallis coryli*, and the hazelnut aphid, *Corylobium avellanae*. Aphids suck fluids from plant cells, causing yellowing, wilting, and distortion of leaves. Honeydew is produced as excrement, which causes the growth of black sooty mould on the surface of leaves. The filbert aphid overwinters as eggs in crevices on bark and around bud scales. Eggs hatch in the spring, and the young aphids feed on the underside of expanding leaves. Aphids mature rapidly and give birth to live offspring allowing for large population increases in summer. Colonies form on the undersides of leaves, with all growth stages present. There are several generations each summer. In late summer and fall, aphids mate and lay overwintering eggs.



*Aphids on the underside of a hazelnut leaf.*  
Photo courtesy of Ontario Ministry of Agriculture, Food & Rural Affairs, © Queen's Printer for Ontario

### Management:

Excess nitrogen can encourage aphid activity; ensure fertilizer applications are suitable. Many species of predators and parasites of aphids are present in B.C. and help to keep these pests under control, particularly in mid and late summer. Insecticides are available for aphids, but are not normally needed for management on hazelnut in B.C.

Some ants 'farm' aphids for their sweet honeydew secretions and protect them from predatory insects. Applying a sticky band around the trunk or lower limbs will keep ants out of the tree and help the predators to do their job.

## Brown Marmorated Stink Bug

(*Halyomorpha halys*)



*Adult brown marmorated stink bug*



*Brown marmorated stink bug nymphs*

Brown marmorated stink bug was first detected in British Columbia in 2015. It is a serious pest and feeds on more than 100 different plant species including tree fruits, nuts, berries, grapes, vegetables, and ornamental plants. Both adults and nymphs feed on nuts, causing blank nuts and corking. They can be a nuisance to homeowners when the adults aggregate on and in buildings in the fall to seek warm overwintering sites.

The adult is shield-shaped, about the size of a dime, brown marbled appearance with alternating brown and white markings on the outer edge of the abdomen. It can be distinguished from other stink bugs by the presence of distinctive white bands on the antennae. Immature stages range in colour from bright orange, black or brown and later stages are pear-shaped with white markings on legs and antennae.

### **Management:**

A tiny parasitic wasp *Trissolcus japonicus* that attacks the eggs of brown marmorated stink bugs in Asia has been found in the United States and British Columbia. Other predators such as spiders, ladybugs and lacewings will feed on brown marmorated stink bug eggs.

There are no insecticides currently available for use by home gardeners for this pest.



## Leafrollers and other Leaf-eating Caterpillars

These pests attack a wide range of fruit and ornamental trees and shrubs. Some feed from within rolled leaves; others skeletonize leaf surfaces. Damage may occur throughout the growing season. Bud damage can occur in early spring, as well as leaf damage in spring and summer. Severe infestations may nearly defoliate small trees. Some common species include Bruce spanworm, winter moth and European/filbert leafroller.



*Bruce Spanworm: early spring bud feeder*



*Leafroller: spring and summer bud and leaf feeder*

The life cycles vary between species, but most species overwinter as larvae or eggs, hatching and/or becoming active and feeding in the spring, when green tissue first appears. The larvae feed on leaves and buds. Leaf-rolling caterpillars will roll leaves up as they expand, using silken webbing, where they hide during the day. Bruce spanworm and winter moth larvae feed on buds from March-May, and have one generation per year. European or filbert leafroller has one generation per year, with larvae present in mid summer. Oblique banded leafroller has two generations per year, so can cause damage to foliage and buds in both spring and mid summer.

Visually examine buds and leaves for presence of larvae and feeding damage. Some species, including the European/filbert leafroller and oblique banded leafroller, can be monitored for moth flight using pheromone baited traps in summer, to estimate population and timing of flight.

### **Management:**

Normally in B.C. foliage feeding caterpillars do not reach high enough levels to warrant spraying in established large trees. However, it may be necessary in smaller trees that are not yet fully established. Naturally occurring predators and parasites of leafrollers and other caterpillars are widely present in B.C. and will help manage these pests. For small infestations, remove caterpillars by hand.

Insecticides are registered for use in tree nuts for caterpillar control. A microbial insecticide containing *Bacillus thuringiensis kurstaki* (Btk) that kills only caterpillars and is harmless to other insects and wildlife is available to help control foliage feeding caterpillars.

## Filbertworm

*(Cydia latiferreana)*

The filbertworm is a caterpillar that feeds in nuts of hazelnuts and oaks. Though a major pest in some growing regions, it has only limited impact in B.C. Adult moths are gray to reddish with golden bands across each forewing. After mating in the spring, female moths lay single eggs near developing nuts from June through until fall. After 8-10 days, eggs hatch and larvae enter a nut to feed, where they remain for up to 4 weeks until they are about 1 cm long. Larvae are whitish with a brown head. Exit holes in nuts bored by the larvae are evident in harvested nuts, as well as frass and webbing. Larvae overwinter on the orchard floor under leaves and other debris, about 2-5 cm deep, in a cocoon. In the spring, the larvae pupate and the moths emerge. There is one generation per year.

There are no insecticides available for this pest for use in the home garden.



*Filbertworm larva*

*Photo courtesy of Ken Gray Insect Image Collection, Oregon State University, CC BY 4.0*



*Adult filbertworm moth*

*Photo courtesy of Ken Gray Insect Image Collection, Oregon State University, CC BY 4.0*

## Scale Insects

Various species of scale insects are present in B.C. Scale insects have piercing-sucking mouthparts, used to suck plant fluids, which can cause unthriftiness and even death of small branches if populations are high enough. Scales produce large amounts of honeydew as excrement, which hosts the growth of black sooty mould.

Scale nymphs ('crawlers') can be small, flat, oval and mobile when they are young, and walk readily on the plant surface. They can disperse to new plants via wind, rain, irrigation, or by the movement of people and machinery. As crawlers age, they settle on the plant surface, and suck plant fluids. Adults form into the characteristic 'scale' and eggs are produced under it, resulting in a new crop of crawlers.



*Lecanium scale*



*European fruit scale*

**Management:** Scale can be rubbed off plants by hand with a glove or toothbrush. Major infestations can be pruned off. As with aphids, avoid excessive nitrogen fertilizer or water applications, as this may encourage population growth. Late winter applications of dormant oil will help to suppress overwintering scales. Applications of summer oil at the crawler stage will help control populations. There are many parasitoids and predators of scale insects in B.C., and these generally keep scale populations in check.

## Bud Mites

Bud mites feed within flower and leaf buds, causing buds to swell into oversized ‘big buds’, or blasted buds. Two species are responsible for this damage: *Phytoptus* or *Phytocoptella avellanae* (the filbert bud mite), and *Cecidophyopsis vermiformis*. These damaged buds dry up and fall off, and mites move to new buds. Buds may open or partially open, but will be distorted, rigid, and brittle and catkins produce little or no pollen. Hazelnut varieties differ in susceptibility to bud mite infestation. These tiny sausage shaped mites overwinter within the buds. In summer they move from old buds to newly formed buds and cause them to expand from late summer through winter. Mites are protected within buds most of the time. They cannot be seen with the naked eye but can be detected by the damage they cause.

When big buds and damage is present, begin management which includes pruning and destroying infested buds where possible. At least two applications of sulphur or lime sulphur sprays in late winter and spring will kill exposed mites as they move from old buds to new buds. Predatory mites may help control these pest mites.

## True Bug

(*Phylus coryli*)

This true bug is omnivorous. It does feed on hazelnut leaves and this damage can be seen readily on the leaves throughout the season. *Phylus coryli* is also a predator of aphids, and is native to Europe but is now common in south west B.C. It has at least two generations per year, and either the black adults with yellow legs or the yellow nymphs can be seen throughout the season.

No management is expected to be needed for this insect.



*Feeding damage to hazelnut leaf from Phylus coryli*

## Leafhoppers

Leafhoppers are widely present in BC, and several species feed on many species of plants and crops, causing characteristic speckling on leaves from adult and nymphs feeding. Leafhoppers feed by piercing plant cells and sucking the fluids out.

Depending on the species, leafhoppers may overwinter as adults or eggs. Populations increase through summer, and may have 2 or more generations per year. Adults are winged, nymphs are highly mobile. Both are easily disturbed and fly or disperse readily, making it difficult to visually identify the insects in the field, or catch for further examination. Management may be justified in small trees if nymph populations are high and extensive speckling is evident on hazelnut leaves. Some natural biocontrol may occur, but does not always provide adequate control.



# Hazelnut (Filbert) Diseases

## Bacterial Blight

*(Xanthomonas arboricola pv. corylina)*

Brown leaf spots and reddish-brown sunken cankers on young twigs are common. Buds may also be brown and shriveled. Clusters of dead leaves remain attached to dead branches in fall.

### Management:

Prune out and remove twigs or branches that have died from this disease. Make pruning cuts well below the infected area. Apply a copper spray before nut drop in late August to early September. Repeat in early spring prior to bud break. In Oregon, 'Barcelona' and 'Du Chilly' are rated susceptible.

## Eastern Filbert Blight

*(Anisogramma anomala)*



*Dark-brown to black stroma, bearing spores, are produced on infected branches in a uniform manner*

This disease is widespread in the Lower Mainland area of B.C., but has not yet been detected in the B.C. Interior. Sunken cankers develop in branches. The cankers continue to expand each year and may girdle and kill the branches and trees. Black, raised, fungal fruiting bodies are produced in cankers in relatively straight rows, lengthwise along the branches.

### Management:

Pruning and burning (where permitted) diseased wood prior to bud break is recommended. It is also recommended that susceptible varieties such as 'Ennis' and 'Daviana' should be sprayed 3-4 times at 2-3 week intervals starting at bud swell with a copper spray. Resistant varieties of hazelnut are available but currently in limited supply.

# Insect Pests of Walnut

## Walnut Husk Fly

*(Rhagoletis completa)*

Walnut husk fly is now established throughout the Okanagan Valley and Lower Fraser Valley. It is similar to the western cherry fruit fly in appearance and life history. It overwinters as a pupa under host trees. Adult flies begin to emerge about mid-July for 4 to 6 weeks. Emergence can be monitored using yellow sticky traps baited with ammonium carbonate and suspended inside the canopy clear of leaves.

Eggs are laid in the developing husk and the white legless maggots feed only on the husk tissue, turning it black and spongy. The husk does not drop off when the fruit is ripe, making the nuts black and messy to pick. Mature larvae drop to the ground and burrow into the soil to pupate. Husk fly injury can be confused with that of walnut blight because of the blackened appearance of the husk.



*Walnut husk fly damage*

### Management:

Because the fruit inside the nut is not damaged, control is really not required. Removal and destruction of infested nuts and fallen husks will aid in reducing fly numbers. Make sure to remove the damaged husk in order that the fruit will dry properly and not go moldy. Use ground barriers like landscape fabric, tarp and other dense mulches under the tree to prevent maggots from emerging and also pupating in the soil. There is no registered home garden insecticide for this pest at present. GF-120 is a fruit fly control product that is approved for use in organic orchards and commercial orchards. It contains a bait that attracts adult husk flies and an insecticide, spinosad, which kills the flies. Although not currently available to home gardeners, this product and other insecticides may be available through commercial spray services.

## Fall Webworm

*(Hyphantria cunea)*

Tent-forming caterpillars appear in late summer to early fall on a wide range of trees. The nests are unsightly but the damage to trees is less than that caused by earlier emerging caterpillars, such as forest and western tent caterpillar, because the trees have had time to store reserves for the winter.



*Fall webworm tents*



*Fall webworm*

### Management:

Prune out and destroy nests when they appear or spray with Btk or pyrethrins at label rates. Prune host tree to lower canopy to make it easier to reach the nests. There are several natural enemies that feed on fall webworm larvae.

## Walnut Blister Mite

*Aceria erineus*

Feeding by tiny eriophyid mites causes blister-like swellings on the upper leaf surface. The lower leaf surface develops orange to brown felt-like masses in depressions. The mites overwinter beneath bud scales. Several generations occur during the summer.

### Management:

No control is necessary. Damage is cosmetic with no significant harm to the tree.



*Galls on walnut leaf caused by blister mites*

# Walnut Diseases

## Bacterial Blight

*(Xanthomonas campestris pv. juglandis)*

Brownish spots develop on new spring leaves, causing them to scorch, wither and drop. Black slimy spots appear on nuts, penetrating both the husk and shell. It is especially common in coastal areas.

### Management:

Spray with a fungicide containing copper using the higher rate in the fall after leaves have dropped. Apply the lower rate in the spring when new leaves are first visible and again 2 weeks later. Spring applications must be made during fast-drying weather conditions to avoid plant injury.