

Pests of Deciduous Trees and Shrubs



Introduction

Managing common insects, weeds, plant diseases and certain animal pests found in the backyard can be a challenge. However, there are a number of ways to approach the problem. Information in this publication will help identify and manage pest problems.

Pest management methods will vary among individuals according to their tolerance of the pest, the damage and a basic philosophy about handling pest problems.

It may not be necessary to control pests if numbers are low and damage is not significant. At other times, simply spraying a tree with water, pruning a branch or digging up a weed will reduce or eliminate the problem. Natural predators may also control the pest problem.

Backyard Pest Management is designed to help focus on the key areas of pest management. The first section provides basic approaches to pest management and looks at ways to prevent problems and handle them as they arise. Further sections focus on the insects and the types of plants they damage.

There are many ways to deal with backyard pest problems. When using pesticides to control a problem, there is the potential for damage and the possibility of legal issues. Use pesticides with caution and always according to label directions.

Approaches to Pest Management

Integrated Pest Management (IPM) is an environmentally responsible approach to pest management. IPM focuses on prevention, and if problems occur, the method provides a variety of control strategies.

Prevention

Prevention is the foundation of an IPM program, and one way to do prevent problems is to choose the right plant for a specific location and provide the best growing conditions.

- Use a variety of plant material in a landscape to avoid a monoculture (growing only one type of plant), which can create potential problems with one species of insect.
- Select plant species that are less prone to pest problems. Some plants are consistently plagued by certain insect pests and diseases.
- Evaluate the planting site for exposure to light, low spots, wind speed and direction. Choosing plants suited to their growing conditions reduces plant stress, which helps prevent insect and disease problems.
- Be aware of soil conditions including pH, drainage, fertility and organic matter. If possible, improve the soil or choose a plant adapted to the conditions.
- Provide the best start for the plants, using good planting techniques. This approach includes proper planting, pruning, staking and mowing practices.
- Provide proper maintenance practices for plants including watering, fertilizing, pruning and weed control. Good maintenance practices will ensure healthy plants that are less likely to be affected by pests and diseases.

Identifying the problem

The first step in controlling a problem, whether it is an insect, disease or weed, is to identify it correctly. When dealing with insect and disease problems, learning about preferred hosts, the type of damage that occurs and life cycle are important when choosing the best control method. For weeds, having information about their life cycle is important because weeds are usually easier to control at some stages than others.

Monitoring

Monitoring involves checking plants in a yard regularly for the presence of pests. Frequent monitoring of pests is important so that proper treatment can be started when the outbreak first begins. Monitoring should occur throughout the entire growing season.

Action decisions

Proper pest control action involves two steps:

- first, identifying the injury threshold
- second, determining the action threshold

The **injury threshold** is the level at which a pest population causes an unacceptable degree of damage so that treatment is necessary. Knowledge of the pest and the plant it is affecting will help when deciding the treatment. For example, most deciduous trees and shrubs can withstand substantial defoliation by insects, especially later in the growing season. However, coniferous trees cannot tolerate defoliation because the needles are not replaced. Having this knowledge about the types of plants, as well as information about the pest, helps in making a decision about treatment when a problem arises.

The **action threshold** is the time to treat the problem to avoid an unacceptable amount of damage or *injury threshold*. It is important to know the life cycle of the pest and have an understanding of the time it takes for a control measure to be effective. For example, the biological control agent *Bacillus thuringiensis Kurstaki* will take longer to control caterpillars than a contact insecticide because the agent must be ingested by the caterpillars to be effective.

Treatment

Five general types of treatments can be used to control pests.

Types of treatment

Cultural

Provide proper maintenance practices such as regular watering, fertilizing, pruning and sanitation. Good maintenance practices keep plants healthy, so they are less likely to be affected by pest problems.

Physical

One method of physically controlling pests is to remove and destroy the insects, the infested leaves or the part of the plant that is severely affected. Pests such as caterpillars, beetles, slugs and other large pests can be easily removed by hand when infestations are low. Also, removing forest tent caterpillar egg bands on trees in the fall or early spring will reduce the problem the following year.

Another effective way to control insects is with a strong jet of water from a garden hose. Spraying trees and shrubs thoroughly and regularly with water will dislodge and kill small caterpillars, aphids, spider mites, pear slugs and other pests.

Physical barriers may also be used to prevent insects from attacking plants, especially in the vegetable garden. Floating row covers may be used to prevent some insects from attacking plants. Tarpaper discs may also be used around the base of cole crops to discourage root maggot flies from laying eggs in the soil. Cutworms can be prevented from attacking the roots of transplants by sinking large tin cans, with both ends removed, into the soil around plants to act as cutworm barriers.

For diseases, physical control may involve removing plant parts by pruning. For example, the only way to control black knot on mayday is to prune out the affected branches or portions of the branches with the fungus. Also, if an individual plant is affected by a disease, it may need to be removed completely to prevent the spread of the disease to other plants.

Physical control for weeds involves simply hoeing or hand digging the weeds.

Mechanical

Insect vacuums, heat applicators for weed control and motion-triggered water applicators for wildlife may all be used for mechanical pest control.

Biological

Biological controls are natural enemies of pests such as predatory and parasitic insects as well as birds. These natural enemies will often come to the garden on their own if there are high populations of a pest insect. For example, an outbreak of aphids will attract the natural predator lady beetles (lady bugs). Beneficial insects can be attracted to a yard by growing plants that are sources of nectar and pollen such as aster, marigold, salvia and monarda. Shallow dishes or bird baths act as a water source for both insects and birds, encouraging them to visit the yard. Also, a bird feeder will help supplement the diets of birds like chickadees and other insect eaters.

Protect birds and beneficial insects by avoiding the use of pesticides. If pesticides are used to control the pest, the pesticide is likely to kill the beneficial insects as well. If pesticides have to be used, choose the product with the lowest toxicity and shortest residual period. Spot or target spray to minimize the area covered.

Beneficial insects are often sold to control backyard insect pests. The most common beneficial insects are ladybeetles and praying mantids. These insects usually have little benefit, as they frequently leave the yard, especially if their food supply is poor. It is preferable to let the native species of beneficial insects control the outbreak.

A bacterium called *Bacillus thuringiensis Kurstaki* is another type of biological control. It can be purchased to control leaf feeding caterpillars including forest tent caterpillars and the larvae of cabbage butterflies. It only affects the larvae of moths and butterflies and does not control any other insects.

Chemical

When purchasing pesticides, choose the product with the lowest toxicity. There are synthetically produced pesticides as well as naturally derived products. When using any product on food crops, follow the label directions for safety precautions and wait periods between spraying and harvest.

Many municipalities are moving to minimum or zero-pesticide tolerance and may have a municipality-wide bio-control program. Be aware of these issues in the community, so an informed decision can be made about pest control.

Evaluation

The last step in any pest management program is evaluation. Monitoring and record keeping are key factors in determining if the control measure was successful. This information may help in choosing a method in the future.

Many commonly used products for pest control in the home garden are being removed from the market. Many municipalities are creating by-laws to reduce or eliminate the use of pesticides. The principals and practices of integrated pest management will become more important in the future.

Integrated pest management takes time, planning and patience for it to be a successful.

Aphids



Aphids

Hosts: many deciduous trees and shrubs

Damage

Aphids feed by sucking the sap from leaves, causing them to turn yellow, curl or become deformed and eventually fall off. The pests may also feed on flower buds, stems and even roots. Plant growth may be reduced. Aphids may also transmit viral diseases when feeding.

Aphids excrete a shiny, sticky substance called honeydew that can be found on the leaves or on anything under the tree. A black sooty mould that is unattractive may grow on the honeydew, but does not harm the plants. Large numbers of aphids often attract ants, which feed on the honeydew. The ants become a nuisance and will often protect the aphids from predators.

Description

Aphids are small (2 mm or less), soft-bodied, pear-shaped insects with sucking mouthparts. They are often found in colonies and may be light green, yellow, brown, black or pink. The adults may or may not have wings; the nymphs are wingless. They also have two cornicles that look like tailpipes emerging from their back end, which is an identifying feature of the insect.

Life cycle

Most species overwinter as eggs on the stems or trunks of plants. The eggs hatch in the spring, and after one or two wingless generations, winged forms are produced and fly to other plants. Adults produce live young continuously during the summer without mating, so population growth is usually rapid. Winged aphids develop in the fall, mate and fly to other plants to lay eggs.

Control

- Hose down infested plants with a strong spray of water from a garden hose. The spray washes off the wingless aphids, which are seldom able to return to their host, but rarely hurts aphid predators. Repeat the water spray as often as necessary.
- Avoid over-fertilizing plants with nitrogen because succulent growth attracts aphids.
- Effective predators of aphids are lady beetles (bugs), lacewings and flower fly larvae. Also, aphids may be parasitized by tiny wasps.
- Hard rains, damp weather and high temperatures help control aphids.
- Preferred products for aphid control include insecticidal soap, horticultural oil, dormant oil and pyrethrins.
- Aphids build resistance to insecticides very quickly so use an integrated method of control (more than one method of control).

Ash flower gall mite



Ash flower gall mite

Host: ash

Damage

Tiny mites attack the male flowers of ash, causing them to fuse together and form galls. The galls are initially green and then turn brown and dry out. Over time, the galls turn into rough, lumpy masses. The galls reduce the ornamental value of the plants because they remain on the tree for some time. The galls become much more noticeable when the tree drops its leaves.

Description

The ash flower-gall mite is very tiny (0.2 mm) and difficult to see even with magnification. Mites are carrot shaped and light coloured with two pairs of legs.

Life cycle

Adult females overwinter on the tree under the bark or in cracks on the tree. They migrate to the developing flower buds in the spring where they lay their eggs. Several generations are produced in the summer.

Control

- Remove galls when pruning in the spring.
- Plant only female ash trees because the mites only attack male flowers.
- Control measures are generally not necessary, as the mite does not usually harm the tree.
- Dormant oil may be sprayed in the spring to reduce severe infestations.

Ash leaf cone roller



Ash leaf cone roller

Hosts: ash (green, black, Manchurian)

Damage

Young larvae enter the leaves and begin to mine them by feeding between the upper and lower surfaces of the leaves. At first, the mines are narrow, but then spread into blotches. Mature larvae move to new leaves and roll them up in a cone shape.

There is very little damage, but the leaf rolling reduces the ornamental value of the tree. Also, the larvae hang down on long threads and are a nuisance to anyone walking beneath the trees.

Description

The larvae are whitish caterpillars, about 7 mm long. The adult is a small, grey moth with a wingspan of 12 mm.

Life cycle

Eggs are laid along the mid-rib of new leaves. Newly hatched larvae enter the leaves and begin mining. From early to mid-June, mature larvae crawl out of the leaves and hang by strings while searching for new leaves. Mature caterpillars spin thin white cocoons inside the rolled up leaves and pupate. After a few weeks, the adults emerge from the base of the leaves.

Control

- Natural predators and parasites help reduce the population of this insect.
- Contact insecticides are not effective because the insect does not feed openly. Also, pesticides will likely kill natural predators and parasites.

Ash plant bug



Ash plant bug

Host: ash



Ash plant bug damage

Damage

The nymphs and adult plant bugs pierce the leaves and suck the sap, causing yellow spots. Over time, the leaves look speckled and may become deformed and drop off. Plant bugs also suck sap from flowers, buds and seeds. Spots of black excrement may be seen on the leaves.

Description

The nymphs appear greenish to tan. The adults are beige with pink markings and are approximately 8 mm long. As with all plant bugs, they have a triangular patch a third of the way down their back.

Life cycle

The insects overwinter as eggs laid in the tree bark. The nymphs emerge in the spring and begin feeding on the underside of the leaves. Adults will be seen by mid-summer and will lay eggs on the leaves. A second generation of nymphs emerge in late summer. The adults continue to feed until the fall. There are usually two generations a year.

Control

- Spray the tree with a strong jet of water from a hose to help remove nymphs and adults.
- Insecticidal soap may be used if damage is serious.
- Chemical control is not required unless damage is severe.

Birch leaf miner



Birch leaf miner damage

Host: birch

Damage

Damage is caused by the larvae that feed on the leaf tissue between the upper and lower leaf surfaces. The feeding produces pale green spots that expand into brown, blister-like blotches. The affected areas peel apart similar to the way a two-ply tissue splits apart. When the leaves are separated, larvae may or may not be present; however, insect droppings will be left behind.

Affected leaves look brownish and dry from a distance, which reduces the ornamental value of the tree. This insect rarely causes tree death, although repeated severe infestations can reduce the growth and vigour of the trees.

Description

The adults are small, black sawflies about 3 mm long. The larvae are flattened, whitish and up to 7 mm long when fully grown. Three species of sawfly larvae cause damage to birch trees.

Life cycle

Larvae overwinter in earthen cells in the soil. Adults appear in mid-May and lay single eggs in slits on the upper leaf surface. Eggs usually hatch in early June, and the larvae begin feeding within the leaves. In late June to early July, mature larvae exit from the leaves and drop to the ground to pupate. Adults emerge about two weeks later, and the cycle is repeated. There are two and sometimes three generations a year, depending on the species.

Control

- Proper tree maintenance, especially regular watering, will help the tree withstand insect attacks.
- In Edmonton, populations of a tiny parasitic wasp (*Lathrolestes luteolator*) attack the most damaging birch leaf miner species and have drastically reduced the problem.
- Chemical control is not recommended.

Box elder bug



Box elder bug



Box elder bug

Hosts: box elder (Manitoba maple), maples, ash, apples

Damage

Both nymphs and adults suck the sap from the leaves, tender twigs and seeds of Manitoba maple trees. This activity can cause leaf mottling and premature leaf drop, but the damage is usually minor. Also, they may feed on the flowers and fruit of apples. Box elder bugs are more of a nuisance when they migrate in the fall because they often enter houses to find a sheltered location.

Description

Nymphs are bright red with a black head when young. Adults are 11 to 14 mm long, winged and grey-brown to black. They have red eyes and a few bright red lines on their body. They are true bugs with piercing, sucking mouthparts.

Life cycle

Box elder bugs overwinter as adults. When the females emerge in the spring, they lay red eggs, primarily in bark crevices. Nymphs and late-season adults feed on young leaves and twigs. In the fall, they move to sunny areas before finding a location to hibernate.

Control

- Hose the insects off the walls of buildings with a strong spray of water.
- Remove female Manitoba maple trees.
- To prevent the bugs from entering buildings, seal cracks and crevices with weather stripping or caulking.
- Chemical control is rarely necessary.

Bronze birch borer



Bronze birch borer

Photo credit: Pennsylvania Department of Conservation and Natural Resources - Forestry Archive, Bugwood.org

Host: birch

Damage

Damage to birch trees is caused by the larvae, which make tunnels while feeding under the bark. The bark of infested branches may appear bumpy because of the tunnels. Small limbs, less than 25 mm, are attacked first; then, the insect moves to larger branches and the trunk.

Branches towards the top of the tree are usually killed first and in severe infestations, the entire tree may be killed. Trees that are old and under stress are the most susceptible to attack, but newly transplanted trees are also at risk for infestation.

Description

The adult beetle is bullet-shaped and green with a bronze sheen. They grow up to 11 mm long. The distinctly segmented larvae are creamy-white and legless with a flat, brown head. Mature larvae grow to 35 mm in length.

Life cycle

Adults emerge between late June and August by chewing semi-circular holes in the bark. They lay their eggs in bark cracks or under the loose bark of weak or dying trees. The adults may also choose to lay eggs on damaged areas of bark. After hatching, the larvae burrow into the bark, where they feed for up to two years. Pupation occurs in the sapwood in the spring.

Control

- Maintain tree health with proper watering and pruning practices.
- Remove dead wood in the spring after the tree leafs out.

Caterpillars



Caterpillar - spiny elm

Hosts: various trees and shrubs

Damage

Several species of caterpillars attack trees and shrubs, chewing holes in the leaves. Unless defoliation is severe, overall tree health will not be affected.

Description

Common caterpillars are linden loopers, cankerworms, spiny elm, woolly bears and the larvae of rusty tussock moth and swallowtail butterfly.

Spiny elm caterpillars are purplish-black with red spots down their back and long black bristles covering the body. When mature, the larvae are about 60 mm long. The adult is the mourningcloak butterfly, which has dark brown wings with blue dots above whitish coloured edges. It is a large butterfly with a wingspan up to 80 mm. It can be seen flitting around when the air temperature is above 10°C, so it may be seen early in the spring.

Linden loopers are bright yellow caterpillars with 10 wavy black lines on their back. When mature, they can be up to 35 mm long. Larvae move like inchworms and when disturbed, they fall from the trees on silken threads. Larvae feed alone, but can consume entire leaves with only the petiole (leaf stem) left behind. They feed from the time the buds open for about one month. Adults are light brown moths with dark bands on their wings. Linden loopers feed on elm, Manitoba maple, lindens and poplars.

Swallowtail butterfly larvae are green, segmented caterpillars with a large eyespot marking on each side and about 45 mm long. A gold band separates the thorax and abdomen. The adults are the beautiful black and yellow butterflies with a wingspan up to 80 mm. They can be seen around mud puddles and lilac flowers from late May to early July. Larvae can be found on birch, aspen, willow and other hardwoods. This insect seldom does any significant damage to trees and should not be harmed.

Life cycle

The life cycle varies depending on the species. Most overwinter as pupae. Moths or butterflies emerge in the spring to lay eggs on leaves. Caterpillars grow and usually feed for two to four weeks, but this may vary depending on the species. Most caterpillars in Alberta have only one generation a year.

Control

- Hand-pick and destroy caterpillars only if damage is severe enough to warrant.
- Some caterpillars develop into beautiful butterflies or moths and should not be destroyed.
- Preferred products for control include *Bacillus thuringiensis Kurstaki*, insecticidal soap and pyrethrins.
- Before spraying, consider the decision carefully as caterpillar feeding seldom affects tree health.

Cottony psyllids



Cottony psyllid larva
Photo credit: City of Red Deer

Hosts: Manchurian and black ash

Damage

The nymphs feed on the undersides of the leaflets by sucking the sap. As they feed, they inject a toxin that causes shrivelled, curled and discoloured leaflets. The psyllids become enclosed within the curled leaves. Severe infestations have caused tree death in as little as two years.

Description

The adults are pale yellow with black markings and clear wings. They are only 3 mm long. The adults also have strong hind legs, which allow them to jump. The nymphs resemble the adults, but are wingless. They produce a white, cottony substance as the name suggests.

Life cycle

The insects overwinter as eggs attached to the branches of the ash tree. In the spring, the eggs hatch and the young nymphs begin feeding. Adults appear in midsummer and lay eggs on the mid-rib of the leaves. The second generation of nymphs feed within the curled leaves. The nymphs moult to adults in early August and then lay eggs.

Control

- Maintain tree health because drought-stressed trees are more susceptible to insect attack.
- A preferred product for control is a combination of insecticidal soap and pyrethrin, applied when the nymphs first hatch and before the leaves begin to roll.

Elm leaf miner



Elm leaf miner

Photo credit: Joseph O'Brien, USDA Forest Service, Bugwood.org

Hosts: occasional pest - American and Siberian elm

Damage

The larvae mine the leaves by feeding between the upper and lower surface of the leaves. They mine the leaves between the veins, making small, whitish spots at first. The damaged areas eventually turn brown. If numerous larvae are feeding on one leaf, the mines blend into large blotches. The leaves remain on the tree for the growing season.

Description

The adult is a black sawfly 3 mm long. Mature larvae are approximately 6 mm long and white with a brown head.

Life cycle

Females deposit their eggs under the upper surface of the leaf. Eggs hatch soon after, and the larvae mine the leaves. Larvae pupate in the soil in a papery cocoon, emerging as an adult in the spring. There is only one generation a year.

Control

- Rarely does leaf destruction cause tree death, although repeated severe infestations can reduce tree growth and vigour.
- Proper tree maintenance will help the tree withstand insect attacks.
- Rake leaves in the fall to reduce overwintering populations.

European fruit lecanium scale



European fruit lecanium scale

Photo credit: Raymond Gill, California Department of Food and Agriculture, Bugwood.org

Hosts: occasional pest - elm, ash, Manitoba maple, plum, poplar, willow and other hardwoods

Damage

Nymphs and adults feed on twigs and branches by sucking the sap. Large populations of the insect may weaken the tree and possibly cause the death of small branches and twigs. Honeydew is also produced, which causes a shiny covering on the leaves and anything below the tree.

Description

The adult scale insect is raised, oval and brown. The pests grow to 6 mm in length. The yellowish-brown crawlers are difficult to see because they are so small.

Life cycle

Nymphs begin to move from their overwintering sites in late March to early May. They settle on the ends of branches and on twigs. They secrete a protective scale covering over themselves and mate in late May. In June, the eggs are laid under the scale covering.

The crawlers hatch from mid-June to late July and move to the leaves. Over the summer, they feed on undersides of the leaves along the veins. Between late August and the end of September, the nymphs make their way back to the branches to overwinter in cracks in the bark. There is one generation per year.

Control

- Remove the insects by hand if practical.
- Prune severely infested branches.
- Dormant oil spray may be applied just before bud break in the spring or summer.
- Horticultural oil may be sprayed on tolerant plants.
- Insecticidal soap and/or pyrethrins may also be used to kill the nymphs.
- Other insecticides registered for the control of scale insects may be used.
- Proper timing of any spray is important. The spraying should be done when the nymphs are moving, which is usually around early July.

Forest tent caterpillar



Forest tent caterpillar



Forest tent caterpillar - eggs

Hosts: poplar, birch, Manitoba maple, other trees and shrubs

Damage

Caterpillars chew holes in the leaves and may completely defoliate trees. The first noticeable sign of an infestation on trees is a lack of foliage. Several years of heavy defoliation will reduce the vigour of the trees and weaken them. Tree death is rare, but may occur when combined with other stress factors like drought. Outbreaks occur approximately every 10 years and can last for 3 to 6 years until a natural crash.

Description

The caterpillars are bluish-black with a row of keyhole-shaped white spots along their back. They have wide bands of blue on either side of their body as well as thin yellow and brown lines. The caterpillars are covered with fine hairs. Mature caterpillars grow up to 50 mm in length. They prefer to stay in groups, especially at night.

The larvae pupate in a cocoon that they spin between leaves or on buildings. The adults are large, tan to brownish-coloured moths. The moths lay eggs in bands that wrap around small branches. They are covered with a frothy, dark brown substance to protect them over the winter. Although called tent caterpillars, they do not build tents, but they deposit silk strands used for traveling back and forth from feeding locations.

Life cycle

Forest tent caterpillars overwinter as tiny larvae in the egg bands. The larvae emerge when the trembling aspen (poplar) leaves begin to unfold, which is usually around mid-May. Larvae complete their growth in five to eight weeks. When mature, they spin yellowish cocoons and pupate on leaves and buildings. The moths emerge about 10 days later, and the females lay the egg bands on tree branches.

Control

- Remove egg bands and destroy them in the fall or before the larvae emerge in the spring.
- If possible, remove the insects by hand.
- Several natural predators and parasites help control the caterpillars.

- Cold, wet weather reduces the insect's survival.
- Spray with *Bacillus thuringiensis Kurstaki* or a combination of insecticidal soap and pyrethrin.
- Other registered insecticides may be applied and are most effective when the larvae are small.

Gall insects and mites



Gall insects and mites



Gall insects and mites damage

Hosts: poplar, elm, linden, other trees and shrubs

Damage

Galls usually look like bumps, finger-like extensions or fuzzy growth on leaf surfaces and sometimes on petioles or stems. This abnormal growth is the response by the plant to the feeding of the insect or mite. The damage caused by these pests does not kill the plant, but reduces the ornamental value.

Description

Gall mites are almost invisible to the naked eye, whereas insects such as gall aphids and gall midges are quite visible when galls are opened.

Life cycle

The life histories are very complicated and for some species, not well known. Most mites overwinter under bud scales, bark and other protected places and move onto new growth in the spring. Gall-forming aphids often have an alternate summer host. In response to feeding by the pest, the plant forms galls, and the development of the insect proceeds within the gall. Adults may emerge in spring or fall, depending on the species.

Control

- If possible, remove galls as they form.
- Chemical control is generally not recommended.

Honeysuckle aphid



Honeysuckle aphid damage



Honeysuckle aphid severe damage

Host: honeysuckle

Damage

Aphids feed on the new growth by sucking sap from leaves and new shoots. The feeding causes leaves to fold up and produces clusters of shoots at the ends of the branches called witch's broom. This growth dies over the winter, and severe infestations can kill whole shrubs or branches. The pest severely reduces the ornamental value of the shrub.

Description

Aphids are soft-bodied, pale green to cream and 2 mm long. They produce a white powdery wax on their bodies.

Life cycle

The honeysuckle aphids overwinter as eggs in the bark of shoots and twigs. The eggs hatch when the leaves begin to open in the spring. Only wingless, female aphids develop, and they give birth to live young without mating.

These nymphs develop into winged or wingless females that continue giving birth to live young. Winged aphids fly to new locations on the same shrub or to other shrubs and continue reproducing. Both male and female aphids appear in the fall, mate and the females lay eggs.

Control

- Plant honeysuckle species that are resistant to the honeysuckle aphid. Recommended cultivars of honeysuckle are Clavey's Dwarf, Dropmore Scarlet and Emerald Mound.
- Remove and destroy the witch's brooms as they form.
- Insecticides should be applied early in the spring before any leaf folding takes place.

Large aspen tortrix



Large aspen tortrix

Photo credit: Steven Katovich, USDA Forest Service, Bugwood.org

Hosts: poplar, birch, willow and alder

Damage

The caterpillars chew into developing buds in early spring, causing damage to the buds and making holes in the new leaves. Older larvae tie the leaves together with webbing and continue to feed inside the leaves. When disturbed, mature larvae drop from the leaves on silken threads. The larvae may move, searching for other food sources. At this time, they leave behind large quantities of white webbing, which can be very annoying for people living or using these areas.

The large aspen tortrix can strip the trees of leaves during severe outbreaks, although the trees can usually leaf out again later in the season. Repeated outbreaks, especially combined with other stresses, can reduce the vigour of trees and cause the death of branches or portions of the tree. Tree death does not usually occur. Outbreaks may last 2 to 3 years and can occur about every 10 years.

Description

Young caterpillars are yellowish or pale green with a black head. They go through several moults as they get larger. Mature larvae are dark green to black and have a dark head. They grow up to 20 mm long. The adult moths are greyish brown. Small, white eggs are laid in clusters on top of the leaves.

Life cycle

This insect overwinters as small larvae in cracks in the tree bark toward the bottom of the trees. In early May, they move up the tree and begin to mine the leaf buds. Older larvae feed on the leaves that they web together until early to mid-June. They pupate within the tent, and the moths appear in mid-June to mid-July.

The adults mate and lay egg clusters on the upper leaf surfaces. These hatch after two weeks, and the young larvae web leaves together and feed. The larvae move to the base of the trees to overwinter in bark cracks. There is only one generation a year.

Control

- Prune out webbed leaf clusters if possible.
- Use Tanglefoot around the base of trees in early spring and late summer to catch the larvae as they move up or down the tree.

- Weather conditions like late spring frosts, high winds and rain help reduce insect populations.
- Numerous natural predators, parasites and birds provide control.
- Spray with *Bacillus thuringiensis Kurstaki* because it only controls caterpillars. It must be applied while the caterpillars are feeding openly.
- Other insecticides must be applied early in the spring when the larvae are feeding openly and before they make their tents.

Leaf and flea beetles



Leaf and flea beetles - leaf beetle



Leaf and flea beetles damage

Hosts: poplar, willow and elm

Damage

Adult beetles and larvae chew holes or skeletonize the leaves. Damaged leaves may look scorched. These insects do not cause serious damage, but reduce the ornamental value of the infested plants.

Description

Adult leaf beetles are black, brown, red or whitish with dark-coloured spots or stripes. They vary in size depending on the species, but are usually between 5 mm and 9 mm long. Flea beetles are small, shiny black beetles ranging in size from 4 to 6 mm, with strong hind legs used for jumping.

The larvae of both insects are slender and segmented. Some species have black bodies, while others are whitish or yellowish with dark stripes or spots. They are usually found in clusters on the undersides of the leaves.

Life cycle

Adult flea and leaf beetles overwinter on the ground under dead vegetation. The beetles emerge in late May and lay eggs on the leaves. Larvae feed on the leaves until they mature and then pupate. Most species have more than one generation a year, so all stages may be found on the plant by late summer. Infestations tend to be sporadic.

Control

- Damage is usually minimal, so spraying is not recommended in most cases.

Lilac leaf miner



Lilac leaf miner damage (leaf roll)



Lilac leaf miner damage

Host: lilac

Damage

Larvae begin feeding within the leaves, producing small, transparent yellowish spots on the underside of the leaf tips. The spots become larger, turn brown and dry up. After three weeks, the larvae exit the mines (feeding areas) and roll the leaves downwards from the tips. They continue feeding on the upper leaf surface inside the rolled leaves.

Common lilac is the species of lilac most often affected. The insect does not cause serious damage, but it reduces the ornamental value of the plant.

Description

The larvae are slender, yellowish caterpillars up to 8 mm long. The adults are small, greyish brown moths with yellow patches.

Life cycle

The insect pupates in the soil over the winter in cocoons. The moths emerge in late spring, and the females lay eggs on the undersides of the leaves along the veins. The eggs hatch in early July, and the larvae feed until mid-July. They drop to the ground and pupate. In early August, a second generation of moths appears, and the larvae feed into September before pupating.

Control

- If possible, remove infested leaves and destroy them.
- Chemical control is usually not necessary.

Native Elm Bark Beetle/Smaller European Elm Bark Beetle



Native elm bark beetle - bug



Native elm bark beetle - beetle

Host: elm

Damage

Damage is caused by the beetles and larvae of both species mining (feeding) under the bark of branches. Adults may carry the Dutch elm disease fungus on their bodies, which is a serious threat because trees infected with Dutch elm disease will die. Before Dutch elm disease came to Canada, this beetle was of little consequence to elm trees.

Description

Native elm bark beetles are dark brown to black and only 2 mm to 3.5 mm long. Smaller European elm bark beetles are less than 3 mm long and black or reddish brown. When mature, the white legless larvae are 3 mm to 5 mm long with yellowish brown heads. The larvae of the native elm bark beetle look the same, but may be a little smaller.

Life cycle

The native elm bark beetles overwinter mainly as adults, but some larvae may overwinter. The beetles overwinter under the bark at the base of elm trees. In the spring, they emerge and feed for a short time on the bark of healthy elms before flying to dying or dead trees to lay eggs. The beetles tunnel into the bark to make egg galleries. The female deposits her eggs along the sides of the galleries.

Once hatched, the larvae make tunnels that run perpendicular to the egg galleries. They pupate at the ends of the feeding tunnels. Larvae that overwinter pupate in the spring, and the adults appear in late June or early July. There is usually only one generation of beetle each year.

Smaller European bark beetles overwinter as larvae in the bark. In the spring, the insects pupate and begin appearing through holes in the bark by the time the first leaves have opened. The adults feed briefly on young twigs before excavating through the bark of the weak or stressed trees.

The females make egg galleries in the inner bark and lay eggs along the gallery sides. Once hatched, the larvae feed in the inner bark and on the wood surface. The larval galleries are 8 cm to 20 cm long and are at right angles to the egg galleries. Pupation occurs in the bark, and the adults emerge through individual holes in the bark. Beetles may also feed and lay eggs on newly cut elm logs.

Control

- Maintain tree health by watering and fertilizing.
- Avoid bringing firewood into the province from other areas.

Oystershell scale



Oystershell scale

Hosts: occasional pest - cotoneaster, ash, lilac, dogwood and a wide range of broad-leaved trees and shrubs

Damage

The scales are often so numerous, they form a crust on the branches, causing a loss of vigour and branch dieback. With cotoneaster, what is often diagnosed as winterkill is often preceded by an infestation of this scale.

Description

The female scale insect looks like an oystershell and is about 3 mm long. When numerous, they are found clustered together. Male scale insects are rarely seen.

Life cycle

The insects overwinter as eggs under the protective scale covering. Eggs hatch in late June, and the crawlers move out until they find a feeding site on the twigs and branches. They insert their mouthparts and begin feeding; they then lose their legs and increase the size of their scale covering. The female lays eggs in the fall and then dies.

Control

- Prune to remove severely infested branches.
- Spray dormant oil just before bud break in the spring or use a horticultural oil treatment on tolerant plants.
- A combination of insecticidal soap and pyrethrins may be used to kill nymphs.
- Insecticides registered for the control of scale insects may also be used to kill nymphs.
- Proper timing of any insecticide is critical. Use these products when the nymphs are moving from under the scale.
- Scales do not fall off the branches when dead, so be sure to remove a few shells from the branch with a thumbnail to check the effectiveness of the spray application.

Pear slug



Pear slug sawfly - slug



Pear slug sawfly - damaged leaves

Hosts: fruit trees, cotoneaster, mountain ash and hawthorn

Damage

The larvae feed on the upper surface of the leaves, causing brown spots. If the damage is severe, the leaves may appear scorched and fall off. The second generation often causes more damage than the first because the insects are more numerous. This pest reduces the ornamental value of plants but does not seriously harm them.

Description

When young, the larvae are dark, slimy and slug-like with the head end larger than the rest of the body. When mature, the larvae are yellowish green and approximately 11 mm long. The adult is a small, black sawfly.

Life cycle

Pear slugs overwinter as larvae in cocoons just below the soil surface. They pupate in the spring, and the sawflies appear from mid-June to mid-July. They lay eggs on the underside of leaves, and the larvae hatch in about two weeks. Larvae feed for two or three weeks, then drop to the ground to pupate.

A second generation of adults may appear in late July or early August depending on the weather. After the second generation of larvae are mature, they drop to the ground to overwinter.

Control

- Hose trees off with a forceful spray of water from a garden hose to remove larvae.
- Shallow cultivation (5 cm maximum) in the spring around susceptible plants helps to reduce the first generation. Fall cultivation reduces the overwintering population.
- Insecticidal soap and/or pyrethrins are recommended and should be sprayed when the insect is first noticed.
- Registered insecticides for control of pear slug may be used if there is a serious infestation.

Poplar bud gall mite



Poplar budgall mite

Hosts: poplar

Damage

The feeding by poplar bud gall mites causes round galls with a rough surface to form in place of leaf clusters. New galls are soft and green, but become hard and reddish by the end of the summer. Over time, they turn greyish and hard. The galls are most common on the lower part of the tree and cause the branches to become stunted and crooked. Heavily infested branches may die.

This insect does not cause serious damage, but the galls reduce the ornamental value of the trees. Also, it may weaken the tree and make it more susceptible to damage by other insects and diseases. It is a common pest in southern Alberta on Northwest poplars.

Description

The adult poplar bud gall mite is invisible to the naked eye (0.2 mm) and spindle-shaped with two pairs of legs. The mites vary in colour from greenish white to dark reddish orange. The nymphs look identical to the adults but are smaller.

Life cycle

All stages of the mites overwinter inside the galls. In the spring, the adults mate and begin reproducing. They feed inside the gall or migrate to new buds and begin feeding to form new galls. A new generation is produced every two to three weeks until the fall. There can be as many as eight generations in one summer.

Most galls contain mites for one to four years, but it may be much longer. Mites may be carried by the wind to other trees where they start new infestations.

Control

- Prune and destroy all galls on dormant trees in the fall or spring. Remove new galls as they form.
- Avoid planting Northwest poplar in southern Alberta as the variety is very susceptible to bud gall mite.
- Plant resistant hybrids such as Walker, Assiniboine and Manitou and native trees.
- No chemical control is recommended.

Sawflies



Sawflies larvae



Sawflies damage

Hosts: willow, birch, poplar, dogwood and other trees and shrubs

Damage

Sawfly larvae are vigorous defoliators. They often feed in groups on the leaves, starting at the edges and eating inwards. Also, they may skeletonize the leaves, which means they eat everything but the veins. Over time, the leaves may be completely stripped from the plants. The damage reduces the ornamental value of the plants. Rarely do infestations cause major harm to the trees unless it occurs over several years or the trees are under stress from other causes.

Description

Sawfly larvae resemble caterpillars, but they have at least six pairs of legs on the abdomen in addition to the three pairs on the thorax. The larvae of most species have brown or black heads and bodies that are green or yellowish. They usually have markings such as spots or stripes that are black or yellow. Some species are covered with a white powdery substance that acts as camouflage.

The larvae vary in size depending on the species, but usually grow from 15 mm to 25 mm long. When touched, a larva will lift its back end into the air. The adults are sawflies that resemble small wasps and usually grow 6 to 9 mm in length. They are rarely seen and difficult to identify.

Life cycle

Most species overwinter as larvae in cocoons in the soil. They pupate in the spring, and adult sawflies emerge in May or June. The sawflies lay eggs on or in the leaf tissue, and they hatch into larvae about three weeks later. The larvae feed for three or more weeks before dropping to the ground to spin their cocoons. There are usually one or two generations a year, depending on the species.

Control

- Hand-pick the larvae if possible.
- Apply insecticidal soap and/or pyrethrins if damage is severe.
- Registered insecticides may be used if necessary.

Scurfy scale



Scurfy scale

Photo credit: Whitney Cranshaw, Colorado State University, Bugwood.org

Hosts: cotoneaster, apple, mountain ash, hawthorn, pear

Damage

The adults and nymphs feed by sucking the sap from the branches, causing a loss of vigour over time. They are a major pest problem on cotoneaster hedges and can cause severe damage. When insect populations are high, the leaves often turn red prematurely in the summer. Severely infested branches die over time.

Description

The female scale insects are white, tapered at one end and rounded at the other. They are approximately 2 to 3 mm long. The male scales are smaller with a narrow, rectangular shape. When numerous, the insects give the branches a white, scaly appearance.

Life cycle

There is little information about the life cycle of scurfy scale. There is probably one generation a year.

Control

- Remove infested branches. In severe cases on cotoneaster, the branches may need to be removed to the ground and allowed to regrow.
- One of the most effective insecticides is dormant oil. Follow label directions carefully and apply before bud break. Cotoneaster hedges leaf out very early, so care must be taken when applying this product.
- Several insecticides are registered for the control of scale insects. Using these products will upset the natural biological controls of scale and should be avoided if at all possible.
- If spraying, do so at one-week intervals starting June 1.

Smokywinged poplar/willow aphid



Aphids

Hosts: occasional pest - poplar and willow

Damage

Insect damage results in poplar and willow branch death.

Description

A dark purple, almost black aphid with orange legs.

Life cycle

This aphid overwinters on the host plant as eggs. The eggs hatch in the spring, and the stem mother begins giving birth to live young. Winged forms are produced when the population gets too large and there is too much competition for food. In the fall, winged males and females develop and mate; then, the females deposit overwintering eggs on the host plant.

Control (refer back to aphids)

- Hose down the infested plant with a strong spray of water from a garden hose. This spray will wash off the wingless aphids that are seldom able to return to their host, but it rarely hurts the aphid predators. Repeat the water spray as often as necessary.
- Avoid over-fertilizing plants with nitrogen; succulent growth attracts aphids.
- Effective predators of aphids are lady beetles (bugs), lacewings and flower fly larvae. Also, the pests may be parasitized by tiny wasps.
- Hard rains, damp weather and high temperatures also help control aphids.
- Preferred products for aphid control include insecticidal soap, horticultural oil, dormant oil and pyrethrins.
- Aphids build resistance to insecticides very quickly, so use an integrated method of control.

Spider mites



Spider mites - leaf damage

Hosts: elder, mountain ash, rose, other trees and shrubs

Damage

Adults and nymphs feed by piercing the undersides of leaves, producing tiny yellow or white speckles. Over time, the leaves look pale yellow or bleached, and eventually, they dry up and fall off. As well, mites produce a fine webbing on the undersides of leaves and stems of heavily infested plants. This webbing traps dust and dirt, taking away from the plant's ornamental value.

Description

Spider mites are not insects, but are related to spiders. They have four pairs of legs and a single oval body. They are difficult to see with the naked eye because adult mites are less than 0.4 mm long. They vary in colour from the light salmon or pale red of newly hatched nymphs to dark green or red, depending on the time of year and the host.

Life cycle

Mites overwinter either as eggs, nymphs or adults under bark or debris for protection. Mites become active when the new foliage begins to develop. The females lay eggs after mating, and they hatch into six-legged nymphs. After a few days, they moult into eight-legged nymphs. There are several generations a year, and different stages of the life cycle will be present at the same time.

Control

- Natural control is provided by heavy precipitation accompanied by high winds and high humidity.
- Predatory mites may control spider mites although their populations do not build up as fast as the spider mites.
- Hose down trees and shrubs with a forceful spray of water once a week. This spray washes away many of the mites and removes some of the webbing and debris.

- Dormant oil may be used in early spring to control overwintering mites. Horticultural oil may be applied to trees that can tolerate the product.
- Apply insecticidal soap and/or pyrethrins if populations of spider mites are high.
- If infestations persist at damaging levels, apply a foliar spray of a registered insecticide. Apply insecticides in such a way that the spray penetrates the webbing. Also, sprays should be applied towards the underside of the leaves.
- A follow-up spray should be applied two weeks after the first spray.

Western ash bark beetle



Western ash bark beetle

Hosts: green, black and Manchurian ash

Damage

Adult beetles and larvae attack pencil-sized or larger branches by tunnelling under the bark. This activity causes the supply of water to be cut off above that area. The leaves of affected branches turn bright yellow and wilt by July or August. Small holes may be seen on the bark, often encircling the branch and leaving a reddish colour.

As damage continues, the insect may attack larger branches and the trunk of the tree. The beetle generally attacks stressed or weakened trees.

Description

The adults are oval beetles, 2 mm to 3 mm long that are light reddish brown to dark brown. The larvae are white with a brown head, legless and 2 mm to 4 mm long.

Life cycle

Adults overwinter in hibernation chambers and emerge in late May or early June. They make their way to the upper branches of the tree where they begin making egg galleries under the bark. As they feed, they chew small ventilation holes in the bark. They lay their eggs in this tunnel.

The eggs hatch into larvae that chew deep tunnels parallel to the grain of the wood. They feed until early August, pupate and become adult beetles. They emerge in late summer and feed in the axils of new branches. In September or October, the adults move down to the base of the trunk where they construct hibernation chambers. There is only one generation a year.

Control

- Remove branches with wilted foliage below the egg gallery by late June or early July.
- Prune out any dead branches. Burn or dispose of branches in garbage bags.
- Maintain tree health by proper watering, fertilizing and pruning.
- If damage is severe, trees may need to be removed.
- Apply Tanglefoot to tree trunks in the spring or fall to trap the beetles as they make their way up or down the tree.
- No chemicals are registered for control of this insect.

Willow redgall sawfly



Willow redgall sawfly

Photo credit: Milan Zubrik, Forest Research Institute - Slovakia, Bugwood.org

Host: willow

Damage

The damage occurs when the adult sawfly lays eggs in the leaves. The eggs are either individually inserted in the leaf or in rows on either side of the mid-vein of the leaves. Galls are red on top and green or yellow on the underside. Mature galls are the size of cherry pits. The galls do not affect the health of the tree, but reduce the ornamental value.

Description

The adult sawfly is a black wasp-like insect less than 5 mm long. Fully grown larvae are light green with a shiny black head and are approximately 7 mm in length.

Life cycle

Larvae overwinter in cocoons in the soil. Adult sawflies emerge in the spring, and the females lay eggs in the leaf. Each gall contains a single larva. Larvae feed for about five weeks within the galls, and by the middle of the summer, they drop to the ground to pupate. About two weeks later, the second generation of adults appears and lays eggs in the leaves. By mid-September, the second generation of larvae are fully grown and drop to the ground to overwinter.

Control

- Remove affected leaves if numbers are small.
- Rake up leaves in the fall and dispose of them.
- No chemical control is necessary.

Wood borers



Wood borers - bug



Wood borers - damage

Hosts: poplar, willow, birch, ash, elm and others

Damage

Larvae of many species of wood borers damage trees by tunnelling into the trunks and large branches. Holes are seen on the trunk, and large amounts of sap may ooze from these holes and stain the tree bark. Sometimes, insect droppings or sawdust may be seen around the holes, on the bark or at the base of the tree.

Wood borers do not usually kill the trees although the damage may allow disease organisms to enter. The foliage on small branches may wilt, and the branches may die. Repeated attacks may cause the tree to become unstable and make it susceptible to breaking during storms. Woodpeckers feed on the larvae, causing more damage.

Description

Most of the common species are beetles in the adult stage, except carpenter worms, which develop into large grey moths. The larvae are predominately segmented and are usually cream coloured or white with darker heads. Larvae are between 40 mm and 75 mm long.

Life cycle

The life cycle varies depending on the species of insect. Adults appear in the spring, mate and lay eggs in the bark. The larvae begin tunnelling into the tree. They usually tunnel from two to four years before pupating in the tunnels.

Control

- Wrap the affected areas of the trunk with burlap from May to August to prevent the adults from emerging and laying eggs.
- Push a flexible wire into the holes to try and kill the larvae. Some species of wood borers clog the holes with sap and sawdust, so inserting a wire may not be possible.
- Heavily infested trees may need to be removed.
- Infested branches should be removed and destroyed.
- No chemical controls are available.

Woolly elm aphid



Woolly elm aphid - bugs



Woolly elm aphid - damage (leaf roll)

Hosts: elm and Saskatoon

Damage

A fluid injected into the elm leaves when the aphids are feeding causes the leaves of the elm to curl and become distorted. When the leaves are unrolled, there is a mass of aphids, which secrete a white, powdery material and honeydew. Honeydew produced by the aphids will drip onto objects underneath the tree. The aphid damage to elm trees reduces the ornamental value, but does not cause serious damage.

Damage to Saskatoon plants is different because the aphids attack the roots. Saskatoon shrubs that were moderately infested the previous year may leaf out in the spring, but they may be small and yellowish. The trees often die because of root damage once the weather becomes warmer. Saskatoon shrubs that were heavily infested the previous year may fail to leaf out in the spring. Saskatoon seedlings and plants less than five-years-old are most susceptible to infestations.

Description

The aphids are soft-bodied, bluish-white and waxy looking. The nymphs that hatch on the Saskatoon leaves are yellowish, but turn greyish to blue when they become established on the roots. Saskatoon roots affected by aphids look almost like they are affected by a fungus because of the aphids' whitish blue colour.

Life cycle

The woolly elm aphids overwinter as eggs in the cracks of the bark on elm trees. The eggs hatch about the time the leaves appear, and the aphids begin to feed on the leaves. The aphids mature and give birth to live young without mating. They feed within the curled leaves, and in June, they develop wings and search out Saskatoon plants, which are their secondary host.

About the time the wild roses and lilacs bloom, the aphids fly to the undersides of the Saskatoon leaves and give birth to around 15 live young. These aphids move to the roots where they continue to feed and multiply. In late summer and fall, winged forms of the aphid fly back to elm trees. They give birth to male and female aphids. They find protected areas in cracks of the bark, mate and each female lays a single egg.

Control

- No chemicals are registered for controlling this insect on Saskatoon plants.
- Products registered for control of aphids on elms may be used when the aphids appear but before the leaves roll up.

Backyard Pest Management: Pests of Deciduous Trees and Shrubs

Published by

Alberta Agriculture and Rural Development
Information Management Division
7000 – 113 Street
Edmonton, Alberta
Canada T6H 5T6

Authors: Pam North and Shelley Barkley

Editor: Chris Kaulbars

Graphic Designer: Lee Harper

Electronic Page Production: J.A. Serafinchon

Image Acknowledgements

R. Howard

S. Barkley

B. Casement

J. Jones

M. Dolinski

T. Pheh

V. Sowiak

H. Philip

J. Emond

J. Feddes-Calpas

L. Hausher

A. Tellier

G. Rankin

D. Johnson

University of Alberta

Canadian Forest Service

Rick and Libby Avis

Bugwood.org

City of Red Deer

Manitoba Agriculture, Food and Rural Development

Saskatchewan Ministry of Agriculture

Alberta Agriculture and Rural Development

Copyright © 2014. Her Majesty the Queen in right of Alberta (Alberta Agriculture and Rural Development). All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without written permission from the Information Management Division, Alberta Agriculture and Rural Development.

No Endorsement Given: This publication should not be taken as an endorsement by Her Majesty the Queen in right of Alberta of the products or services mentioned herein.

Disclaimer: Responsibility for interpretation or application of the content contained in this publication rests with the user. Information in this publication is provided solely for the user's information and while thought to be accurate, is provided strictly "as is" and without warranty of any kind, either express or implied. Her Majesty, the publishers and contributors to this publication, and their agents, employees or contractors will not be liable to you for any damages, direct or indirect, or lost profits arising out of your use of this publication.

ISBN 978-0-7732-6105-1

See the website: www.agriculture.alberta.ca/publications for information about other publications, CD-ROMs and DVDs.