

Pests of Small Fruits



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.

Pests of Small Fruit

Aphids



Aphid - bug

Hosts: Saskatoon, raspberry, strawberry and many other fruit bearing crops

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. An unattractive, black, sooty mould may grow on the honeydew, but does not harm the plants. Large numbers of aphids often attracts ants that 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 (cluster) 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, sticking out their back ends, which is an identifying feature of the insect.

Life cycle

Most species overwinter as eggs on the stems of perennial plants. The eggs hatch in the spring, and after one or two wingless generations, winged forms are produced and fly to other plants. Females produce live young continuously throughout the summer without mating, so population growth is usually rapid. Male and female winged aphids develop in the fall and mate; then, the females 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 lush growth attracts aphids.
- Effective aphid predators are lady beetles (bugs), lacewings and flower fly larvae. Also, aphids may be parasitized by tiny wasps.
- Recommended products for aphid control are insecticidal soap and pyrethrins. Use these non-residual products as spot sprays.
- Aphids build resistance to insecticides very quickly so use an integrated method of control (more than one method of control).

Apple Curculio



Apple curculio

Hosts: Saskatoon, apple and crabapple

Damage

Adults feed on the immature fruit, buds and shoot tips. Feeding damage early in the season causes raised rough patches on the apples. Damage to fruit late in the season looks like small holes or dark spots surrounded by round, sunken areas. Fruit remains on the shrub and is misshapen and hard. On Saskatoons, the feeding on the outside by the adults and on the inside by the larvae makes the fruit unsuitable for eating (causes Saskatoon berries to mummify).

Description

The adult weevil is 5 mm long and reddish brown with a long curved snout. The body is triangular-shaped with four humps on its back. The larvae are white with brown heads and 5 mm long.

Life cycle

The insects overwinter as adults on the ground under leaves and debris. The adults appear about the time Saskatoons are flowering. The female deposits one egg per fruit about 28 to 32 days after the peak flowering time. The egg laying punctures are close to the fruit's stem. The larvae feed on the developing seeds in the fruit.

There is one larva per seed. It feeds on one seed and then moves to another. Most of the seeds are usually eaten. Feeding and development of the larvae takes about four weeks. They pupate within the fruit for about one week, and then, the new adults emerge from the fruit from mid-July to mid-August and move to the ground.

Control

- Monitor with a net for adult weevils shortly before and during fruit set.
- No chemical controls are registered for this insect.

Apple maggot



Apple maggot

Photo credit: Central Science Laboratory, Harpenden Archive, British Crown, Bugwood.org

Hosts: apple, crabapple, cherry, pear and hawthorn

Damage

Apple maggot larvae tunnel into the flesh of the apple fruit, which causes significant damage. Small spots or pitted areas may be seen on the skin of the apple, caused when the flies lay eggs. The damage to the fruit may also lead to infection by disease organisms. Fruit affected by this insect may still be used, but the damaged portions should be removed.

Description

The adult is a fly that is smaller than a housefly, with black bands on its wings. The small larvae are whitish and legless. They are difficult to see because their colour blends in with the apple flesh.

Life cycle

The insect overwinters as pupae in the soil. The adult flies appear from late June throughout the summer and lay eggs under the skin of the fruit. The eggs are laid individually, but numerous eggs may be laid in the fruit. After hatching, the larvae begin feeding.

Fruit with minor damage usually stays on the tree until harvest. However, heavily damaged fruit will drop off the tree prematurely. Once the fruit drops off, the larvae exit, move into the soil and pupate. There is only one generation a year.

Control

- Clean up fruit that has fallen on the ground and dispose of it in garbage bags.
- Do not compost fruit that is infested with the apple maggot.
- Apple maggot traps may be used as a control measure for a small number of trees. The traps are round, red balls coated with a sticky, apple-scented substance that attracts adult flies. When a fly lands on the ball, it will be trapped and unable to lay eggs in the fruit.

Caterpillars



Caterpillars

Hosts: various plants

Damage

Several species of caterpillars attack plants, chewing holes in the leaves. Unless defoliation is severe, overall plant 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 plant health.

Chokecherry midge



Chokecherry midge

Host: chokecherry

Damage

Chokecherry midge larvae feed inside the immature fruit, causing it to expand in size and become a more oval shape than unaffected fruit. There are no seeds inside the damaged fruit. Affected fruit will often fall off the tree prematurely.

Description

The adult is a tiny, slender fly called a midge. The small larvae are yellowish orange.

Life cycle

The larvae pupate in the spring, and then adults appear and lay eggs in the flowers. The larvae feed inside the immature fruit where they usually remain until the fruit falls off the tree. The insect moves into the soil to overwinter.

Control

- If possible, remove and destroy the infested fruit.
- No chemical controls are registered for this insect.

Currant aphid



Currant aphid

Hosts: currant (red, black and albol) and gooseberries

Damage

The aphids feed by sucking the sap on the undersides of leaves and on tender shoots. This feeding causes the leaves to pucker and curl under. It also produces raised red and yellow blotches on the upper leaf surface. When damage is severe, plant growth may be reduced and the leaves may drop off the plant.

Aphids excrete a shiny, sticky substance called honeydew that may be seen on the leaves and fruit. A black sooty mould may grow on the honeydew.

Description

The aphids are small and approximately 2 mm long. The eggs are small and black.

Life cycle

The insects overwinter as eggs on currant and gooseberry plants. The eggs hatch when the new leaves develop, and the nymphs begin feeding on the leaves.

Control

- A recommended product for control is dormant oil, which is used before the plant begins to leaf out.
- Other registered insecticides may be applied if this insect was a problem the previous year. Apply before flowering for the best control.

Currant fruit fly



Currant fruit fly - damage



Currant fruit fly - damaged berries

Hosts: currant (red and white) and gooseberry

Damage

The adult lays eggs in the young fruit, leaving reddish spots on the skin. The larvae then feed inside the developing fruit. Damage by the larvae often causes the fruit to drop off the plant. Affected berries are unsuitable for eating.

Description

The adult is a small, yellowish fly. The white larvae grow up to 7 mm long.

Life cycle

The insects overwinter in the soil as pupae. The flies appear in the spring when the plants are flowering and lay eggs in the fruit. After the fruit drops to the ground the mature larvae emerge and move into the soil, where they overwinter. There is only one generation a year.

Control

- Remove damaged berries.
- Rake up infested berries that drop off the plants.
- Place plastic or tarps under the plants to catch the falling berries. This approach will prevent the larvae from entering the soil to pupate. Collect and destroy the fallen fruit daily.
- Cultivate the soil 5 to 7 cm deep to help prevent the insects from overwintering. Be careful not to damage the roots of the plants.
- No products are registered for the control of this insect.

Currant sawfly/imported currantworm



Currant sawfly-imported currantworm - immature



Currant sawfly-imported currantworm - adult

Hosts: currant and gooseberry

Damage

The larvae feed on the leaves of currants and gooseberry, except black currants. The larvae begin feeding by chewing holes in the leaves. They begin feeding on the leaves in the centre of the plant and work their way towards the ends of the branches.

Larvae can completely strip the leaves off the plant. Defoliation reduces plant vigour and fruit production. The insects are difficult to see and may not be noticed until damage is severe.

Description

The adult is a black sawfly approximately 8 mm long. Immature larvae have light greenish grey bodies with black spots and black heads. Mature larvae have green bodies with yellowish heads. They grow up to 20 mm long. When disturbed, the larvae lift their front and back ends. The eggs are oval, white and shiny.

Life cycle

The insects overwinter in the soil or just below the soil surface. They spend the winter in cocoons as larvae or pupae. The adults appear in late spring and lay eggs on the undersides of leaves.

After hatching, the larvae feed for two to three weeks. Then, they pupate, and a second generation of adults appears in late June or July, and the cycle continues with the larvae from this generation overwintering. There are two generations each year.

Control

- If possible, hand-pick the larvae.
- A recommended product for control is insecticidal soap and should be applied when the larvae are first seen.

Forest tent caterpillar



Forest tent caterpillar



Forest tent caterpillar - eggs

Hosts: Nanking cherry, apple, chokecherry, plum and other trees and shrubs

Damage

Caterpillars chew holes in the leaves and may completely defoliate trees and shrubs. The first noticeable sign of an infestation is a lack of foliage. Several years of heavy defoliation will reduce the vigour of the trees and shrubs and weaken them. Plant 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 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.

Leaf rollers



Leaf rollers

Hosts: apple, strawberry and chokecherry

Damage

Initially, the young larvae feed on the leaves; then, they roll up individual leaves. Two leaves may be folded in half and webbed together, which causes the leaves to turn brown and die. The fruit is rarely affected except when populations are high. Damage is usually minimal.

Description

Adult leaf rollers are a diverse group of moths. The caterpillars are slender, green to brown and 12 mm long with a dark brown or black head. The larvae change from pale green to greyish brown as they mature. They are very active, moving backwards and dropping from the plant by a silken thread when disturbed.

Life cycle

The eggs are laid on the leaves. After feeding, the larvae pupate in the webbed leaves. There may be two generations a year.

Control

- Hand-pick infested leaves or prune infested branches and destroy them.
- Several natural predators and parasites help control leaf rollers.
- A recommended product for control is dormant oil, which is used before the buds open in the spring.
- Chemical control is not usually necessary because there is minimal damage. Also, once the insect is inside the leaves, insecticides cannot reach them.

Pear slug sawfly



Pear slug sawfly - damage

Hosts: fruit trees

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

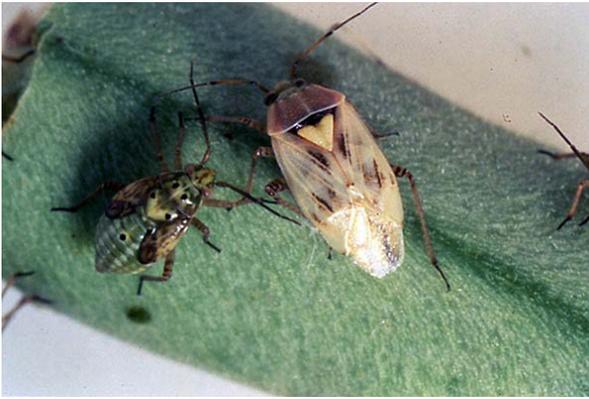
Pear slugs overwinter as larvae in cocoons just below the soil surface. They pupate in the spring, and the sawflies appear from mid-June to mid-July. They lay eggs on the underside of leaves, and the larvae hatch in about two weeks. Larvae feed for two or three weeks, and then drop to the ground to pupate.

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.

Plant bug/Lygus bug/tarnished plant bug



Plant bug-lygus bug-tarnished plant bug - bugs

Hosts: strawberries, Saskatoons, raspberries

Damage

Adults and nymphs suck the sap from the leaves of various fruit crops causing yellowing, brown spots and distorted growth. They also feed on stems, buds, blossoms and fruit.

Seeds of strawberries are punctured, usually on one side of the berry. Those seeds will abort, causing the tissue around that area to stop growing, which produces cat-facing, button berries or seediness at the tip of the fruit. Hollow seeds (brown seeds) distinguish plant bug damage from poor pollination. Damage is more severe when feeding occurs earlier in the season.

Description

There are many plant bug species, but the tarnished plant bug is the most common. The adults are 5 to 6 mm long, 2.5 mm wide and flattened. They are pale green to reddish brown with a distinct triangle shape on their back. This appearance is characteristic of all plant bugs. Young nymphs are a dull bluish green and difficult to see because they move quickly or fly away.

Life cycle

The insects overwinter as adults under plants or debris. In the spring, they feed on young plants, mate and lay eggs. The eggs hatch into nymphs, usually when the plants are flowering. The nymphs develop into adults in 12 to 34 days depending on the temperatures. They develop more quickly during hot weather.

Control

- Destroy weeds in and around the garden.
- Continue mowing grass in the fall to reduce overwintering sites.
- Practice fall cultivation and clean up garden refuse.
- The preferred product for control is insecticidal soap.

Raspberry cane maggot



Raspberry cane maggot
Photo credit: Saskatchewan Ministry of Agriculture



Raspberry cane maggot - damage
Photo credit: Saskatchewan Ministry of Agriculture

Host: raspberry

Damage

Damage is caused by the larvae feeding inside the raspberry canes. The larvae tunnel downwards into the canes, then stop and feed around the inside of the cane, which causes girdling of the tissue.

The wilted canes usually turn purple where the insect has entered. This damage causes the ends of the canes to wilt or break off. When they break, it is a clean cut. This insect is often mistaken for the raspberry crown borer. The damage is usually minor and only affects a few canes.

Description

The adult is a grey fly that is smaller than a housefly. The whitish larvae grow up to 8 mm long.

Life cycle

The insect overwinters as pupae in the raspberry stems. The adults emerge in the spring after the new growth appears and lay eggs at the end of the shoots. The larvae begin feeding inside the canes. They overwinter just below the point where they entered the cane.

Control

- Prune wilted canes below the point where they were girdled. Destroy infested canes.
- Cut damaged canes back to the ground in the fall.

Raspberry crown borer



Raspberry crown borer damage

Host: raspberry

Damage

Larvae begin feeding in the crown or base of the plant. They may also feed at the base of the canes and in the roots. Feeding damage causes the water supply to the canes to be cut off. This damage results in poor growth, wilting and even death of the canes. Feeding at the base of new canes may cause galls to form, which makes the canes weak and easily broken.

Description

The adult is a large clear-winged moth that is black with yellow stripes. The adults look similar to wasps. The larvae are white with brown heads and grow up to 25 mm long.

Life cycle

The life cycle takes two years to complete. The moths appear in late summer or early fall and lay eggs on the undersides of leaves. After the eggs hatch, the larvae move to the base of the plant and overwinter under the bark just below the soil surface. The following spring and summer, the larvae tunnel into the crown and begin feeding on the canes. In the fall, mature larvae overwinter in the crowns.

The following summer, the larvae continue feeding on the crowns, and by the middle of the summer, they move up towards the canes. In the fall, the pupae push through the bark of the canes to overwinter. The moths appear the following summer or fall.

Control

- Cut back wilted canes and look for holes in the crown. Insert a wire into the hole to attempt to kill the larvae.
- Dig out affected crowns and dispose of them.

Raspberry fruitworm



Raspberry fruitworm - larvae
Photo credit: John Gavloski, Manitoba Agriculture, Food and Rural Development



Raspberry fruitworm beetle
Photo credit: Manitoba Agriculture, Food and Rural Development

Host: raspberry

Damage

The beetles feed on the new leaves, making long, narrow holes, which gives the leaves a ragged appearance. The pests also feed and lay their eggs in the flower buds. Feeding damage by the adults is usually minimal. The larvae do more damage because they feed on the flowers, then on the developing fruit.

Damage to the fruit often causes it to fall off prematurely or rot before it ripens. Larvae may stay in the fruit making it inedible.

Description

The adult is a small, brown beetle approximately 4 mm long. The larvae are yellowish and grow to 7 mm in length.

Life cycle

The insects overwinter as pupae in the soil. The beetles emerge in the spring at about the time the raspberry leaves begin to open. The pests begin feeding, and the adults lay eggs in the flower buds. The larvae feed on the flowers and berries and then drop to the ground to pupate. There is one generation a year.

Control

- If possible, hand-pick beetles.
- Work the soil around the canes gently in the spring and fall to bring the pupae to the surface. Be careful to avoid damaging the plant roots.
- The preferred product for control is insecticidal soap.

Raspberry sawfly



Raspberry sawfly damage

Host: raspberry

Damage

Damage is caused mainly by the larvae feeding on the leaves. The damage is usually minor with the holes being small. In severe infestations, the holes become larger as the pests devour almost the entire leaf. Eventually, the leaves are almost entirely eaten except for the veins and mid-rib.

Heavy defoliation can reduce fruit production. In addition to the leaves, the larvae may also feed on flower buds, developing fruit and the bark of young shoots.

Description

The adult is a black sawfly with yellowish-red markings. The larvae are light green with white spines and grow up to 12 mm long. They blend in with the leaves, making them difficult to see.

Life cycle

The adult sawfly first appears when the raspberries are flowering and lays eggs in the leaves. After hatching, the larvae feed during summer. When finished, they fall to the ground and spin a cocoon to overwinter. They pupate the following spring.

Control

- Check the leaves for holes in July. Hand-pick larvae if possible.
- Keep the plants healthy to withstand feeding damage.
- Spraying is not usually necessary, but for heavy infestations, the preferred product is insecticidal soap.

Saskatoon bud moth



Saskatoon bud moth

Photo credit: Saskatchewan Ministry of Agriculture

Host: Saskatoon

Damage

Damage is caused by the larvae feeding on the flower buds. Small drops of ooze appear from the feeding holes. Affected buds fall off later in the season, which reduces fruit production. In severe infestations, all the buds may be destroyed.

Description

The adult is a small, greyish-black moth with brown markings. The larvae are yellowish to light green with a dark head.

Life cycle

The adult moth emerges in April and lays eggs at the base of flowers and in bark crevices. The larvae hatch around the time the flower buds begin to open. They tunnel into the base of the buds and begin feeding inside them. The larvae finish developing by the time the flower petals fall. Mature larvae move to the leaves, web them together for protection and continue feeding.

Control

- No chemical controls are registered for this pest.

Saskatoon sawfly



Sawfly - adult
Photo credit: Canadian Forest Service



Saskatoon fruit infested with sawfly larvae
Photo credit: Manitoba Agriculture, Food and Rural Development

Host: Saskatoon and chokecherry

Damage

The fruit is damaged by the larvae of the sawfly. They feed inside developing fruit, which causes the fruit to fall off the plant prematurely. Fruit attacked later in the season usually hangs onto the plant but is black and hollow.

Description

The adult is a sawfly 6 mm long and yellow with brown markings. Mature larvae are white to brownish and grow up to 7 mm long.

Life cycle

The adults usually appear in May when the plants are flowering. They lay one egg in each flower. The eggs hatch after the petals drop, and the larvae feed on the developing fruit. Mature larvae fall to the ground at the end of June and overwinter in the soil. They pupate in the spring.

Control

- No chemicals are registered to control this pest.

Slugs



Slug
Photo credit: Saskatchewan Ministry of Agriculture

Host: strawberries

Damage

Slugs feed on all plant parts including leaves, flowers, seeds and fruit. They scrape the surface of the leaves, making irregularly shaped holes. Slugs feed mostly at night from two hours after sunset to two hours before sunrise. Slugs usually feed in a relatively small area, returning to the same spot to hide during the day, unless the spot dries out.

Description

Slugs are soft-bodied and depending on the species, are grey to greyish-brown to almost black. They are covered in a clear slime that protects their bodies from drying out. Slugs leave shiny slime trails as they move from one area to another. They grow up to 30 mm in length. Damp, shady locations provide the ideal condition for slugs.

Life Cycle

Slugs overwinter as clear round eggs under boards, debris or in the soil. A jelly-like substance protects the eggs from drying out. The eggs are very tolerant of severe winter temperatures and will lie dormant until there is sufficient moisture for hatching. Eggs hatch in late spring, and young slugs are usually observed in midsummer. Occasionally, they will overwinter as adults.

Control

- Attract natural predators like ground beetles, garter snakes and frogs by planting permanent walkways of clover, sod or mulch between the rows to provide refuge.
- Dispose of all residues where slugs can hide and lay eggs.
- Maintain a border of bare soil around the garden.
- Do not overwater the garden.
- Hand-pick slugs in the evening or early morning.
- Look for slugs on the plants or under vegetation near damaged plants.
- Place a floating row cover or fine screen to protect small plants and new shoots. Make sure no slugs are trapped under the cover.
- A barrier of crushed eggshells or diatomaceous earth around plants damages the body of slugs, leading to dehydration and death. Replace the diatomaceous earth regularly.
- Keep generous spacing between plants in the garden to allow good air circulation and reduce hiding spots for the slugs.
- Avoid mulching the soil with grass clippings or any damp material that the slugs could use as a hiding spot.
- Lay boards, grapefruit or melon rinds, cabbage leaves or cut raw potatoes on the soil. These objects will give the slugs a hiding place, so the pests can then be gathered every few days and killed.
- Shallow containers of beer or any yeasty-smelling fermented product can be dug into the soil, so the container edge is even with the soil surface. These products will attract slugs, which will fall into the containers and drown.
- Copper stripping or flashing can be used as a barrier that slugs will not cross.
- Spade the garden in the fall either to bury the eggs or to bring them to the surface over the winter.
- Apply slug baits or pellets according to label directions. Do not allow the product to come into contact with plants. Protect baits from pets and wildlife.
- Putting the bait under boards will keep the bait dry, and the slugs will be drawn to the area naturally. Replenish the bait once it has dissolved. Start control early in the season, although warm nights are best for baiting.

Spider mites



Spider mites - bugs



Spider mites - damaged leaf, bleached

Hosts: tree fruits, raspberries and various other small fruits

Damage

The first sign of spider mite damage is a white speckling on the upper leaf surface. Spider mites feed by sucking the contents of the cell out. As feeding progresses, leaves appear bleached or brown or yellow, depending on the plant's reaction to the feeding.

Webbing in combination with the leaf colour change is a definite indicator of high spider mite populations. Plants and fruits are stunted.

Description

Spider mites are small, less than 1 mm long. They are oval, yellowish or green except for two dark spots. Adults have eight legs, while the nymphs have six.

Life cycle

Females overwinter under leaf litter, tree bark or in other protected areas. They emerge in late spring and begin laying eggs. The optimum temperature for mite development is 30°C; at this temperature, a new generation of mites will be produced every 8 days. At 12°C, it can take 6 weeks for new generations to be produced. Generally, hot, dry weather increases populations.

Control

- Natural control is provided by heavy precipitation, accompanied by high winds and high humidity.
- Predatory mites can also offer some form of control. Predatory mite populations do not build as fast as spider mite populations.
- Monitor plants regularly for the presence of mites.
- Spray down garden plants with a forceful spray of water from the garden hose once a week or more often if conditions are favourable for mite population explosions.
- Preferred products for chemical control: insecticidal soap and pyrethrin.
- If infestations persist at damaging levels, apply a foliar spray of insecticide. Insecticides must be applied in such a way that the spray penetrates the webbing. A follow-up spray can be necessary two weeks after the first spray.

Spittle bug



Spittle bug - frothy substance



Spittle bug - nymph

Host: strawberry

Damage

The nymphs and adults feed by sucking sap from the strawberry plants. Feeding damage causes distorted leaves, stunted growth and small berries. Damage is not usually severe, and once the insect moves, the plant recovers. In addition, the foamy spittle is unappealing when harvesting the fruit.

Description

Spittle bugs cover their bodies with a white, frothy substance, which is a combination of waste products and air. The insect looks similar to a large aphid. Nymphs are white, yellow or yellowish green. The adults are greyish brown and grow up to 6 mm long. They move by hopping or flying.

Life cycle

Spittle bugs overwinter as eggs on plants. They hatch in May, and the nymphs take five to eight weeks to mature. The adults lay eggs in September and October. There is one generation a year.

Control

- Control weeds in the garden and surrounding area to help reduce the insects.
- Spray the plants with a strong jet of water from the garden hose to remove the spittle covering, which causes the insects to dry out.
- Hand-pick and destroy insects if the numbers are small.
- If control is necessary, a preferred product is insecticidal soap. The spittle provides a protective covering, making it difficult to contact the insect with the spray.

Strawberry root weevil



Strawberry root weevil

Host: strawberry

Damage

The adult weevil feeds on the strawberry plant leaves and makes notches on them, which does not harm the plant. The larvae feed on the rootlets and can burrow into the main root, which weakens the plant.

This damage may make the plants susceptible to disease and winter injury and cause them to wilt and die during dry summer periods. The adults are often a nuisance in the fall when they move into homes looking for a place to overwinter.

Description

The adult is a weevil that is 5 to 8 mm long. They are brown or black with a typical long snout. The larvae are 6 mm long and pinkish-white with a brown head.

Life cycle

The strawberry root weevils overwinter as either adults or larvae around the base of the strawberry plants under debris. They emerge in late spring or early summer and begin laying eggs. Each adult female can lay 200 to 300 small white eggs in the soil. In two to three weeks, the eggs hatch, and the larvae burrow into the ground and begin feeding on plant roots. The adults move around in the fall looking for places to overwinter.

Control

Eliminate piles of garden debris near strawberry beds since these can serve as overwintering sites for the adults.

Rotate the crops planted in the beds.

In the evening, knock the adults off the plants onto a tarp or sheet and dispose of them.

Woolly elm aphid



Woolly elm aphid damage

Hosts: Saskatoons and elm

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 Small Fruit

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. Peh

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 978-0-7732-6107-5

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