

Pests of Coniferous 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: pine, spruce, larch, Douglas fir and true firs

Damage

Aphids suck the sap from small branches and twigs causing minimal damage unless there are repeated severe infestations. Continual infestations cause needle discoloration and eventually, premature needle drop. Aphids excrete a sticky honeydew on which a black sooty mould often grows, making the tree look dirty.

Description

On conifers, aphids usually belong to a specific type that is large and black with long spindly legs. The pests are often found in colonies and are sometimes mistaken for spiders. Adults may be winged or wingless; nymphs are wingless. Ants are often present with aphids because the ants collect the honeydew that aphids excrete.

Life cycle

These aphids overwinter as shiny black, jellybean-shaped eggs. The eggs hatch in the spring and the nymphs begin feeding. The nymphs develop into wingless adults that produce live young without mating. The young nymphs may be winged or wingless. If winged, they fly to new trees to begin producing young and feeding.

In the fall, both males and females are produced, mating occurs and eggs are laid on the needles and branches. Populations of these aphids build in the spring and fall during cool weather. There are several generations a year.

Control

- Hose down infested plants with a strong spray of water from a garden hose to wash off the aphids. Once removed, the wingless aphids are seldom able to return to their host. Repeat the water spray as often as necessary.
- Avoid over-fertilizing plants with nitrogen because succulent growth attracts aphids.
- Effective predators of aphids are ladybird beetles (bugs), lacewings, flower fly larvae and parasitic wasps.
- Hard rains, damp weather and high temperatures also play a role in controlling aphids.
- Use insecticidal soap and pyrethrins as spot sprays.
- Aphids build resistance to insecticides very quickly.
- Residual insecticides used as foliar or broadcast sprays can create a larger aphid problem by removing the natural aphid predators.

Douglas fir pitch moth



Douglas fir pitch moth
Photo credit: Rick and Libby Avis

Hosts: Douglas fir, white spruce and pine

Damage

Larvae tunnel into the bark cambium, which causes sap to ooze out of the wound. The sap usually hardens into lumpy masses, except on spruce where shapeless mounds of sap occur around wounds and at the base of branches. Feeding damage may cause individual branches or the tops of trees to die. Trees are not usually entirely killed.

Description

The adult moth looks similar to a yellow jacket wasp with a narrow black body with orange stripes and a black head. The adult is called a clearwing moth because the wings are transparent. The moths have a wingspan of between 18 mm and 30 mm. Mature larvae are whitish with brown heads and about 25 mm long.

Life cycle

This insect overwinters in the larval stage for two years and then pupates in the spring of the second year. Adult moths appear in June and July and mate, and then the females deposit individual eggs near tree wounds or in bark crevices. After approximately two weeks, the larvae hatch and begin tunnelling into the tree.

Control

- Do not prune branches from conifers unless absolutely necessary because this insect usually lays its eggs near tree wounds.
- Avoid injuring tree trunks with grass cutting equipment.
- Remove pitch masses and insert a flexible wire into the tunnels to destroy the larvae.
- There are no chemical controls for this pest.

Pine needle scale



Pine needle scale

Hosts: spruce, pine and Douglas fir

Damage

Scale insects suck sap from the needles, causing yellowish spots and an unhealthy appearance to the tree. Damage on spruce causes needles to drop over time and can occasionally result in tree death. On pine, scale damage causes the needles to become progressively smaller, and tree growth slows down.

Description

The adult female scale insects are white, oyster-shaped and approximately 8 mm long. Adult males only appear late in the season to mate. They are white, winged and only 1 mm long. The reddish-brown nymphs are so tiny they are difficult to see with the naked eye. Eggs are laid under the female scale, so they are not usually seen.

Life cycle

This insect overwinters as eggs, underneath the female scale. The nymphs hatch in late May or June and then move to another location on the tree and begin feeding. Nymphs may also be blown to other trees by the wind.

As the nymphs develop, they become flattened and secrete a white scale covering. Males emerge in the late summer and mate with the females. The female lays eggs in late summer and fall. There is one generation a year.

Control

- Ladybird beetles and small parasitic wasps may provide some natural control.
- Insecticidal soap and/or pyrethrins are registered products for scale control.
- Several insecticides are registered for the control of scale insects. Be aware that some products will remove the natural predators of scale.
- To be effective, spray just after the nymphs hatch, which is usually in mid-June or soon after new needles appear.
- Re-apply in early August to kill surviving females.

Sawflies



Sawflies larvae



Sawflies damage

Hosts: spruce, larch, cedar and pine

Damage

Several species of sawfly larvae defoliate the new growth of conifers. Repeated infestations over a five- to six-year period may lead to the death of the plant. Sawfly larvae usually feed in groups.

Description

Most larvae are smooth and greenish, often with darker heads. Sawfly larvae have six or more pairs of legs on the abdomen and three pairs on the thorax. The number of legs is important when trying to determine if the insect is a sawfly larvae or a caterpillar. Caterpillars have five or fewer pairs of legs. Adult sawflies are small, usually black, wasp-like insects between 6 mm and 10 mm long.

Life cycle

Most species overwinter as pupae in cocoons in the soil. Adults emerge in the spring or early summer, and females insert eggs in the needles. The larvae may feed for several weeks and when fully grown, they drop to the ground to pupate. There is one generation a year.

Control

- Hand-pick larvae if practical.
- Use a registered chemical spray when the larvae are small to reduce the amount of damage.

Spruce budworm



Spruce budworm

Hosts: spruce and balsam fir

Damage

Spruce budworm larvae begin mining (feeding on) the buds in early to late May and feed on the developing needles. As the new growth emerges, the budworms web the partially eaten needles together to form a shelter. Young needles are usually eaten first before larvae begin feeding on older needles. Partially eaten needles become reddish and dry up. The dead needles may get tangled up in the webbing. Eventually these needles fall off, leaving the ends of the branches bare.

Severe infestations combined with attacks over several years can lead to large portions of branches left bare, reduced plant growth or even tree death.

Description

Young larvae are yellowish with a dark brown head. Mature caterpillars are purplish-brown with small white spots on their back and a black head. They grow between 18 mm to 24 mm long. Adult moths are greyish brown with a wingspan of 20 mm. Eggs are light green and are laid in clusters that overlap like shingles.

Life cycle

Spruce budworms overwinter as young larvae in bark crevices. The larvae emerge in early May and complete feeding in June. They pupate on the tree, and the moths emerge in late June to early July. Females lay their eggs on the needles, and they hatch in about 10 days. The larvae spread out on the tree and find a location to overwinter under the bark. There is one generation a year.

Control

- Hand-pick larvae early in the season if possible.
- Natural predators and parasites may control this pest as well as birds and diseases.
- Use *Bacillus thuringiensis Kurstaki*, insecticidal soap or pyrethrins as a foliar spray when the larvae first appear. Repeat as necessary.

Spruce bud scale



Spruce bud scale

Hosts: Colorado, Norway, white and black spruce

Damage

Nymphs and adults feed on the needles by sucking the sap. Scale insects excrete honeydew that contains a nutrient source for a fungus called black sooty mould. This mould leaves a black powdery residue on the affected branches, which reduces the ornamental value of the plant. Damage to trees is usually minimal; however, heavy feeding can cause needle discoloration and loss, especially on the lower part of the tree.

Description

The adult female scales are round, reddish brown and about 3 mm in diameter. They are usually in clusters of three to eight at the base of twigs. They often go unnoticed because they closely resemble the buds of spruce. The insects are most often found on the lower branches of the tree.

Life cycle

The male scales overwinter on the underside of needles and the females around terminal and lateral buds. In the spring, the females move to the twigs to finish developing. Eggs are laid under the female scale.

Nymphs or crawlers move to the needles, insert their mouthparts and begin sucking sap from the needles. These crawlers actively feed from late June to early August. There is one generation a year.

Control

- Inspect small branches for signs of scale insect.
- Trees can be sprayed with a registered insecticide when the crawlers are active in August.

Spruce gall adelgids



Spruce gall adelgids eggs



Spruce gall adelgids damage

Hosts: spruce, pine, larch, Douglas fir

Damage

Adelgids are close relatives of aphids. Their feeding causes the growth of galls or swellings at the ends of the branches. The galls are green at first, but later turn reddish purple and dry out before opening. The old galls are dry, brown and covered with holes and short needles.

The aphids also feed on the needles in the “white fluff” stage. They cover themselves with a white cottony material at this time. The feeding may cause the needles to turn yellow and appear dirty. The damage is mainly cosmetic, but on spruce, it may kill the ends of the branches. A heavy infestation may create stress on the plant and lead to other problems.

Description

The adults and nymphs are small, black insects. White fluffy spots may also be seen on the needles.

Life cycle

On spruce, the insects overwinter as nymphs at the ends of the branches below the buds. The nymphs develop into adults in early spring. The adult females lay eggs near the buds. After the nymphs hatch, they feed around the new needles. The feeding of the adults stimulates the plant tissue to form galls around the nymphs, which provides food and shelter for them. As the nymphs develop into adults they leave the galls in mid-summer.

Generations continue to cycle as the non-gall forming, “white fluff” stage. The life cycle can be complex depending on the species and if there is an alternate host. Adelgids that alternate between two hosts have a life cycle of two years.

Control

- Pick off new galls if possible.
- During the “white fluff” stage, hose the tree off with a forceful spray of water.
- Insecticidal soap or pyrethrins are recommended products.
- To prevent gall formation, registered insecticides may be sprayed just as the buds begin to open.
- Control the “white fluff” generations on host plants with a registered insecticide sprayed twice, 7 to 10-days apart.

Spruce gall midge



Spruce gall midge damage

Host: spruce

Damage

This insect attacks the newly developing terminal shoots of spruce. Their feeding causes the plant tissue to swell around the larvae to form galls. The galls are cream to tan swellings with a few brown spruce needles sticking out between the swellings. Individual shoots may be killed, and repeated attacks can cause a proliferation of shoots at the ends of the twig and disfigured growth known as “brooming.”

Description

The adult midges are reddish-brown with long legs and are about 2.5 mm long. The larvae are tiny (2 mm) and bright orange.

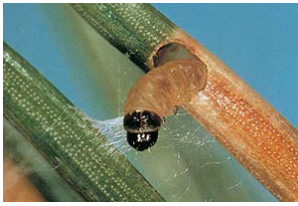
Life cycle

The insect overwinters in the galls. In late May, the adults appear, leaving tiny round holes in each swelling. The adults mate and then lay eggs on the new shoots. The larvae hatch in a few weeks and bore into the shoots, below the needles. Feeding continues throughout the season.

Control

- The damage, although unsightly, is rarely severe and does not affect the long term health of the trees.
- A tiny parasitic wasp commonly controls this insect by attacking pupae in the galls.
- Inspect spruce trees in the early spring for signs of the galls.
- Prune affected shoots back to a side bud or lateral shoot to remove the insects before they can emerge. Burn or discard the shoots.
- Chemical control is rarely necessary due to natural biological controls.

Spruce needle miner



Spruce needle miner larvae



Spruce needle miner damage

Hosts: Colorado, Norway, white and Engelmann spruce

Damage

Damage begins in early July when larvae chew holes at the base of old needles and begin feeding inside the needle towards the tip. Each larva is capable of eating the contents of 10 needles, leaving only the outer layer behind. Once the needle is mined, the larva leaves through the entrance hole and moves to another needle.

To overwinter, larvae build nests of dead needles and droppings. The damage does not kill the tree, but weakens it tree because of needle loss. Also, the nests trap material like dust and seeds, which make the tree unattractive. The nests are usually found at the base of large branches in the heaviest growth or on small trees towards the lowest branches near the trunk.

Description

Fully grown larvae are 8 mm long and green with a brown head. Adults are small, greyish-brown moths.

Life cycle

The insects overwinter as larvae inside the nests where they spin cocoons. They pupate in early May. Adult moths emerge from late May to late June. After mating, the females lay eggs on the undersides of needles. The larvae hatch in about 10 days and begin feeding. Larvae may be active until October when they overwinter. There is one generation a year.

Control

- In the spring, wash nests out of trees with a strong stream of water from a garden hose.
- Gather up the debris and dispose of it in garbage bags.

Spruce spider mite



Spruce spider mite larvae



Spruce spider mite damage

Hosts: spruce, fir, juniper and cedar

Damage

The adults and nymphs pierce the needles and suck the sap, which causes tiny yellow or white speckles. The needles lose colour and begin to turn yellow if the damage continues. Eventually, the needles dry up and drop off. Damage is first noticed on the older needles towards the inside of the plant and then spreads outwards. Spider mites spin webs, which trap needles, dust and seeds, giving the plant a dirty appearance.

Description

Spider mites are related to spiders not insects. Newly hatched larvae are oval and pinkish with three pairs of legs. As these pests feed, they turn green, and then they moult to a nymph with four pairs of legs that looks similar to an adult, but is smaller. They go through another nymphal stage before becoming an adult. Adult mites are oval and dark green to brown. They are less than 0.4 mm long.

Life cycle

Spruce spider mites overwinter as eggs under loose bud scales or at the base of needles. Larvae begin hatching from the eggs in late May or early June, depending on the weather. The first generation may be completed by June, and four to six more generations can follow. These subsequent generations appear about 15 days apart until mid-September when the overwintering eggs are deposited.

Mite populations can increase rapidly because each female can lay 40 to 50 eggs, and the pests have a short life cycle. Warm, dry weather conditions are ideal for a population explosion.

Control

- To check for mite infestations, shake a branch vigorously over a white piece of paper. Then, look at the paper for movement, or press the paper in half and look for red blotches on the paper, indicating the presence of mites.
- Hose down trees and shrubs with a forceful spray of water once a week. This practice washes away many of the mites and removes some of the webbing and debris.
- Natural control is provided by heavy precipitation accompanied by wind and high humidity.
- Predatory mites can provide some control, but they do not build up as fast as spider mite populations.
- A preferred product for spider mite control is insecticidal soap.
- If infestations persist at damaging levels, apply a foliar spray of a registered insecticide. Apply so that the spray penetrates the webbing and the inside of the tree. Spray again two weeks after the first application.

White pine weevil



White pine weevil

Hosts: spruce and occasionally pines

Damage

The damage is first noticed as the new leader, or top of the tree, wilts and the needles turn yellowish. Eventually, the needles turn reddish brown and fall off. Sometimes, the leader may develop a shepherd's crook and curl over. This effect is caused by the larvae feeding under the bark and cutting off the water supply to the top of the tree.

Once the leader dies, there is a loss of terminal dominance, and often, more than one side branch towards the top starts to grow upwards to try and replace it. Sometimes, more than one leader forms, which makes the tree to lose its natural shape. Open-growing trees less than 10 m high with a leader 13 mm or more thick are most likely to be attacked.

Description

The adults are brown weevils that look like a beetle except they have a long snout. They are about 8 mm long. White larvae with brown heads grow 10 mm long and are found under the bark of the dying leader.

Life cycle

Adult weevils overwinter in the ground under infested trees. In the spring, the weevils climb to the tops of trees and chew small holes in the bark. Saps oozes through the holes and hardens. Female weevils deposit eggs in the holes in late May.

Larvae hatch in one to two weeks and move downward as they feed on spruce and upward in pine. In late July, fully grown larvae bore into the wood and form sawdust-lined cocoons to pupate. Adults emerge from late July to early September feed briefly and then overwinter under the tree.

Control

- If possible, prune out and burn or dispose of all infested leaders in early July when they are first noticed.
- When pruning spruce, remove the leader to the second whorl of branches, and with pine, just remove the dead leader.

- Attach a stake to the top of the tree and gently tie a side branch to it so that the branch begins to grow upright and replace the leader. Use soft ties that will not cut into the tree bark.
- Banding tree trunks with insect sticky traps like Tanglefoot in the spring may prevent some of the adults from reaching the leaders. Adults are capable of flying on warm days, so this method alone may not give complete control.
- No chemical controls are effective.

Yellowheaded spruce sawfly



Yellowheaded spruce sawfly

Host: spruce

Damage

The larvae of the yellowheaded spruce sawfly damage trees by eating the needles. The pests begin feeding on the new needles at the ends of the branches and work their way towards the centre of the tree. They may chew only parts of the needles, causing them to look jagged, turn brown and die.

Heavily infested trees have sparse foliage, especially near the top, and turn brown as defoliation increases. Trees may be stripped of almost all of their needles during a severe infestation. Repeated defoliation over a three to four-year period can lead to tree death. Previously infested trees should be monitored because this insect will often be found on the same trees year after year.

Defoliation by the larvae may not be the only factor causing tree death. Additional environmental stresses will make it difficult for trees to recover from insect damage. Monitor trees closely in the spring as the new growth emerges from the bud cap.

Description

When the larvae first hatch, they are yellowish with a brownish-yellow head. Mature silarvae have alternating light and dark green stripes. They have reddish brown heads and grow up to 20 mm long. Their colour makes them difficult to see because they blend in with the needles. The adults are reddish brown sawflies, about 10 mm long.

Life cycle

The yellowheaded spruce sawfly overwinters as larvae in cocoons in the soil. The adult sawflies emerge from the soil from late May to mid-June. Female sawflies lay eggs at the base of newly developing needles. Larvae hatch in about a week and feed on the new needles until mid-July. Then, they drop to the ground where they overwinter.

Control

- Hand-pick larvae if practical.
- Hose down the tree with a forceful spray of water from a garden hose to remove larvae.
- Preferred products for control are insecticidal soap and pyrethrins.
- Spray at the first sign of the insect to help reduce the damage.

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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

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