



INVASIVE FOREST
PESTS
AND DISEASES

A QUICK REFERENCE GUIDE



THIRD EDITION, MARCH 2025

Note: At the time of writing (March, 2025), we are providing you with the most up-to-date information on the status of invasive pests and diseases in Ontario, including biological and regulatory. It is important to understand that scientific names, establishment status, regulatory status, etc. may change over time.



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INTRODUCTION

Invasive species are plants, animals, and micro-organisms that, when introduced outside of their natural environment, out-compete native species (Government of Canada, 2016). Invasive species can have harmful consequences for the natural environment, economy, and society, including human health. However, not all introduced species are invasive. Some, like the introduced Chinook Salmon (*Oncorhynchus tshawytscha*), produce economic incentives for society, while also not posing a significant threat to native fishes and their ecosystems.

Invasive forest pests affect Ontario significantly. Quality of wood can become greatly decreased, impacting the lumber and wood industries. A loss of trees, immature and mature alike, relates directly to a loss of habitat for wildlife, including species at risk. Changes in forest composition change the way we use natural areas as well. For instance, dead-standing trees pose risk of injury and a lack of biodiversity might reduce recreational engagement. Forest pests are generally associated with the import and export of wood packaging materials, shipping containers, and the movement of firewood.

Forest diseases have been on the rise due to the increase of international trade and the exchange of plant material. Forest diseases can be caused by different organisms that affect the whole tree, causing defoliation, root decay, and stem cankers that reduce the distribution of nutrients throughout the tree, eventually leading to tree mortality.

There are federal regulatory measures in place underneath the authority of the Plant Protection Act (CFIA, 2017) to reduce artificial spread of forests pests and diseases. Regulations vary based on species; however, they often prohibit the movement of specific materials from infested areas to areas with no known infestation, or prescribe additional steps such as phytosanitary requirements (CFIA, 2017). For more information please visit: www.inspection.gc.ca

HOW DO INVASIVE FOREST PESTS AND DISEASES ARRIVE AND SPREAD?

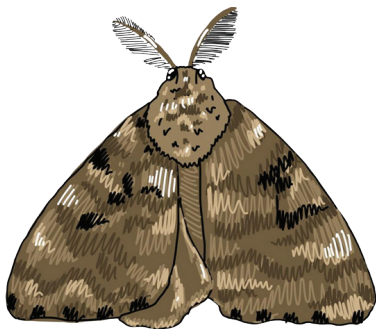
Invasive forest pests and diseases arrive through a number of natural and human-influenced pathways. Natural pathways may include wind and water, or even hitch-hiking on other organisms (e.g., sap-feeding beetles transport the invasive fungus causing oak wilt to new host trees).

Examples of human pathways include international trade (e.g., packaging materials), the movement of firewood and top soil, and the transfer of insects or spores from one area to another when people do not properly clean hiking boots or recreational equipment before moving to a new location.

INVASIVE SPECIES ACT, 2015

The Ontario Invasive Species Act (ISA) came into force on November 3rd, 2016. The goal of the ISA is to support the prevention, early detection, response to, and eradication of invasive species in Ontario. Preventing invasive species from arriving and becoming established in Ontario is critical in the fight against this growing threat. Some key elements of the ISA include:

- » Giving Ontario the tools to regulate invasive species as either prohibited or restricted and banning activities such as buying, selling, possessing, and transporting certain invasive species;
- » Enabling response actions to address urgent threats; and
- » Helping to promote compliance through modernized inspection and enforcement measures.



INVASIVE PEST SPECIES REGULATED AS PROHIBITED UNDER THE INVASIVE SPECIES ACT, 2015 AS OF JANUARY 1ST, 2025

In Ontario, it's **illegal** to import, possess, deposit, release, transport, breed/grow, buy, sell, lease, or trade these species:

Mountain Pine Beetle (*Dendroctonus ponderosae*) Page 38

Please note: Tree of Heaven (*Ailanthus altissima*) is classified as **RESTRICTED** in Ontario and is the preferred host for the invasive spotted lanternfly (*Lycorma delicatula*). If you encounter Tree of Heaven, you should also look for spotted lanternfly and report all sightings.

LIST OF PESTS REGULATED BY CANADA BY THE CANADIAN FOOD INSPECTION AGENCY (CFIA) UNDER THE PLANT PROTECTION ACT:

Long-horned Beetles (*Anoplophora* spp.) Page 14

Emerald Ash Borer (*Agrilus planipennis*) Page 26

Hemlock Woolly Adelgid (*Adelges tsugae*) Page 30

Oak Wilt (*Bretziella fagacearum*) Page 40

Spongy Moth (*Lymantria dispar dispar*) Page 44

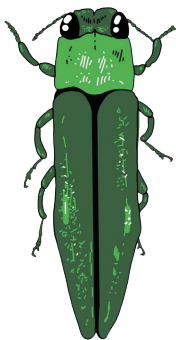
Spotted Lanternfly (*Lycorma delicatula*) Page 48

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To learn more about Ontario's Invasive Species Act, visit ontario.ca/page/managing-invasive-species-ontario

WHAT CAN I DO ABOUT INVASIVE FOREST PESTS AND DISEASES?

- » Learn to identify invasive forest pest and disease species that are a threat to Ontario.
- » Play, Clean, Go: **REMOVE** plants, animals, & mud from boots, gear, pets, and vehicle.
- » **CLEAN** your gear before entering and leaving the recreation site.
- » **STAY** on designated roads and trails.
- » **USE CERTIFIED** or local firewood and hay.
- » If you see an invasive forest pest, disease, or symptoms thereof, please contact the toll-free **Invading Species Hotline** at **1-800-563-7711** or report a sighting online at **EDDMapS.org**



TEMPLATE FOR REPORTING A SIGHTING

When submitting a report through the Invading Species Hotline or online at EDDMapS.org, it is best to have the following information on-hand to submit a complete report:

.....

What?

What species do you suspect you encountered?
Are there native lookalikes that you may not have considered?

Picture?

In order to confirm reports, a picture is required. However, with some high-priority species, it is best to always report!

When and where?

Be sure to note the date and geographical location where you encountered the invasive forest pest or pathogen (latitude and longitude).

Specimen?

Do you have the organism on hand? If so, call **1-800-563-7711** and ISAP staff will direct you on your next steps.

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HOW TO REPORT INVASIVE SPECIES

- » Call: 1-800-563-7711
- » Email: ISAP@ofah.org
- » Create a profile: on EDDMapS.org and submit your reports digitally.



The sapwood of trees attacked by the mountain pine beetle (*Dendroctonus ponderosae*) appears blue in colour.

Species Profiles

ASIAN LONG-HORNED BEETLE

Anoplophora glabripennis



REGULATION

- » The Asian long-horned beetle is regulated under the authority of the Plant Protection Act (CFIA, 2017).

STATUS IN ONTARIO (ERADICATED)

- » The only known populations of the beetle have been eradicated from Mississauga and Toronto, ON. After five years of follow-up surveys with no detections, the regulated area was repealed on June 9, 2020.

ORIGIN

- » The Asian long-horned beetle is native to China and Korea.

DESCRIPTION

- » Larvae are grub-like and cream coloured.
- » The pupa is off-white or ivory-white, measuring ~ 30-37 mm by 10 mm.
- » Adults measure 2-4 cm long, are shiny and black with irregular white, sometimes yellow spots, and bluish-white legs.
- » Mature beetles have long, black and white banded antennae, one to two times its body length.

ASIAN LONG-HORNED BEETLE



SIGNS AND SYMPTOMS

- » Adults leave a round exit hole, ~ 1.5-2 cm in diameter in trees.
- » Other symptoms include oval-shaped egg pits dug on bark, branches, or exposed roots, leaking sap, yellowing leaves, premature leaf drop, and branch dieback.

HOST PREFERENCE

- » Maple is preferred with poplar, birch, and willow considered high risk hosts.

IMPACTS

- » Community quality of life in both urban and rural areas could be significantly reduced since trees provide shade, increase aesthetic beauty, filter air and water pollutants, produce oxygen, and increase property values.
- » Decline in hardwood (broadleaf) trees can have significant impacts on the forest and maple syrup industries.
- » An invasion could change the ecosystem structure, resulting in a loss of biodiversity.

LOOKALIKE SPECIES

- » White-spotted sawyer (*Monochamus scutellatus*), a native species, is commonly mistaken for ALHB. Look for a distinct white spot at the base of the beetle's head where the wing folds meet, if present, it is a white-spotted sawyer beetle.

BEECH BARK DISEASE

Cryptococcus fagisuga/*Neonectria* spp. complex



CHARACTERISTICS

STATUS IN ONTARIO (ESTABLISHED AND WIDESPREAD)

- » Beech bark disease is present throughout all of the Maritime provinces and has moved through the natural beech tree range into Québec and Ontario (Invasive Species Centre).

ORIGIN

- » The scale insect comes from Europe and was first introduced into Nova Scotia in the late 1800s.

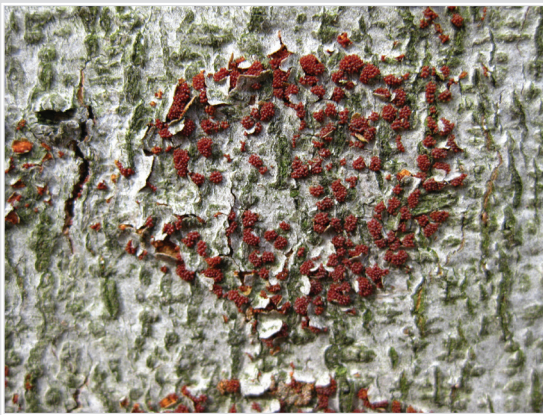
DESCRIPTION

- » Beech bark disease is the outcome of an insect-fungus complex, which results when a non-native beech scale insect (*Cryptococcus fagisuga*) feeds on beech bark, creating cracks through which native canker fungi (*Nectria* spp.) can enter into the tree.
- » 50-85% of infected beech trees will die within 10 years of infestation.
- » The *C. fagisuga* insects are yellow, soft-bodied scale insects about 0.5 to 1 mm long as an adult.
- » The females are legless and wingless.

SIGNS AND SYMPTOMS

- » Symptoms and signs depend on the stage of the disease.
- » *C. fagisuga* nymphs secrete a white and woolly wax to cover their bodies, which can make infested beech trees look like they are covered in wool.

BEECH BARK DISEASE



SIGNS AND SYMPTOMS

- » The fungus then causes small cankers that appear on the bark surface, from which small orange-red fruiting bodies are produced in late-summer to fall.
- » Small cankers and black tarry spots may be visible on the surface of beech trees.
- » Other things to look for include wilting foliage, yellowing leaves, thinning crowns, and a waxy wool-like substance on tree stems and branches.

HOST PREFERENCE

- » American beech (*Fagus grandifolia*) and European beech (*F. sylvatica*).

IMPACTS

- » The disease severely weakens trees, exposing them to other stresses.
- » The marketability of beech wood products is greatly reduced.
- » Beech bark disease also affects more desirable timber species (e.g. sugar maple) as regeneration of these species is inhibited by the heavy beech understory that typically follows mortality.
- » This affects forest biodiversity, as young beech saplings (root suckers) proliferate in the understory. Beech bark disease attacks mature trees over 8 inches (~20 cm) in diameter.
- » The beechnuts from mature trees are an important food source for wildlife, especially black bears.

BUTTERNUT CANKER

Ophiognomonia clavignenti-juglandacearum



REGULATION

- » No regulations in place at this time.
- » If you are planning an activity that may harm or remove a butternut tree, you may need to obtain an Endangered Species Act authorization for your activity. Visit www.ontario.ca for more information.

STATUS IN ONTARIO (ESTABLISHED AND WIDESPREAD)

- » Occurs throughout the natural range of the butternut tree (*Juglans cinerea*) in North America, including within Ontario.

ORIGIN

- » The origin of the fungus (*Ophiognomonia clavigignenti-juglandacearum*) that causes butternut canker disease is not known, though some scientists have traced it back to Asia.

DESCRIPTION

- » Butternut canker occurs when the *O. clavigignenti-juglandacearum* fungus enters the tree (via wind and a variety of insects) and causes cankers that form on the trunk, branches, or exposed roots, girdling the tree and leading to canopy dieback and tree mortality.

SIGNS AND SYMPTOMS

- » Dark, sooty patches and cracks may be present on the bark. Canopy decline may also be visible.
- » Cankers first appear as sooty dark patches on the bark and develop into broad, sunken dead areas, which are dark-brown to black in colour.

BUTTERNUT CANKER



SIGNS AND SYMPTOMS

- » Beneath the bark, *Ophiognomonia Clavigignenti-juglandacearum* produces a thick, black mat of hypha, a branching filamentous structure of fungus. Eventually, the infected bark will crack and fall off.

HOST PREFERENCE

- » The main host tree is butternut (*Juglans cinerea*), although it has the potential to infect other species in the walnut (*Juglandaceae*) family.

IMPACTS

- » The butternut tree is endangered in Ontario and Canada under the Endangered Species Act and the Species at Risk Act, respectively.
- » Butternut canker infects and kills healthy butternut trees, reducing the number and quality of seeds it produces.
- » Economic impacts are seen as the commercial value of butternut decreases due to discoloration of wood.

EMERALD ASH BORER

Agrilus planipennis



REGULATION

- » The emerald ash borer is a regulated pest under the authority of the Plant Protection Act (CFIA, 2017).
- » The regulations include the prohibited movement of specific material, such as ash material and firewood of all species, from specific infested areas of Ontario, Québec, Nova Scotia, New Brunswick, and Manitoba. For more information, please visit: www.inspection.gc.ca

STATUS IN ONTARIO (ESTABLISHED AND WIDESPREAD)

- » Has been found throughout southwestern Ontario; the Niagara region; Hamilton, Halton, and Brant; Huron, Perth, Waterloo, and Wellington; Greater Toronto Area; York, Durham, and headwaters; Bruce, Grey, and Simcoe; Kawarthas and Northumberland; southeastern Ontario; Ottawa region; Haliburton Highlands to the Ottawa Valley; parts of northeastern Ontario just north of Sudbury; and in Thunder Bay in northwest Ontario.

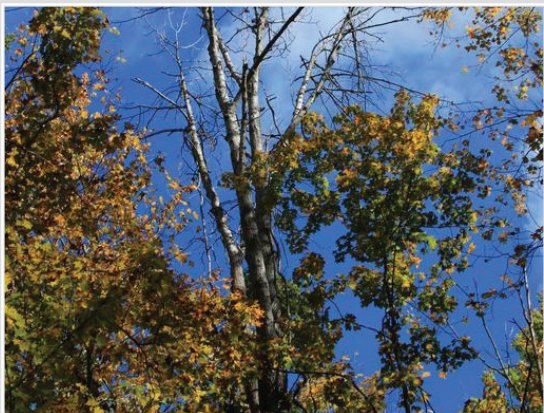
ORIGIN

- » The emerald ash borer is native to Asia.

DESCRIPTION

- » Larvae are 25-32 mm long at maturity, creamy white in colour, with a brown head, and a flat, broad-shaped body.
- » Pupae are 10-15 mm long and creamy white in colour.
- » Adult beetles are a bright metallic green, 8-14 mm long, and 3-3.5 mm wide, with an elongated body and a flat head.
- » The surface of the abdomen beneath the wings is usually a bright red colour.

EMERALD ASH BORER



SIGNS AND SYMPTOMS

- » Crown dieback, bark deformities, and woodpecker feeding holes may be visible.
- » Look for D-shaped exit holes. Epicormic branches (shoots growing out of the lower trunk) may also be found.
- » Yellowing of foliage and vertical cracks in the trunk may be visible as well.
- » Peeling back the bark may reveal larval feeding galleries.

HOST PREFERENCE

- » Attacks and kills all species of North American ash (*Fraxinus* spp.) that it has encountered.
- » A total of 20 species of ash are found in North America, six of which are native to Canada: green ash (*F. pennsylvanica*), white ash (*F. americana*), black ash (*F. nigra*), and much less common blue ash (*F. quadrangulata*), pumpkin ash (*F. profunda*), and Oregon ash (*F. latifolia*) in B.C.

IMPACTS

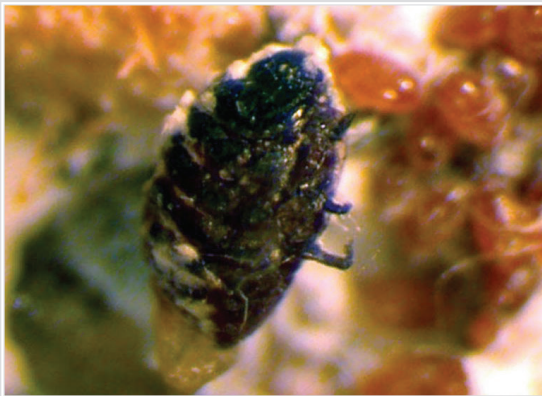
- » The economic and social impacts in Ontario from the emerald ash borer are significant.
- » The costs for removing, treating, and replacing ash trees can be immense for municipalities. The environmental impacts of emerald ash borer relate to losses in biodiversity and abrupt ecological changes.

LOOKALIKE SPECIES

- » Six-spotted tiger beetle (*Cicindela sexguttata*), Japanese beetle (*Popillia japonica*), and Bronze birch borer (*Agilus anxius*).

HEMLOCK WOOLLY ADELGID

Adelges tsugae



REGULATION

- » Import and domestic movement requirements are in place for all hemlock (*Tsuga* spp.), yeddo spruce (*Picea jezoensis*), and tiger-tail spruce (*Picea polita*) trees (and many materials derived from these species) to prevent the introduction and spread of the hemlock woolly adelgid (CFIA, 2025). For more information, please visit: www.inspection.gc.ca

STATUS IN CANADA (DETECTED)

- » In Ontario, hemlock woolly adelgid has been detected in Niagara Falls (2013, 2015, & 2019), Wainfleet (2019), Fort Erie (2021), Pelham (2021), Grafton (2022), Hamilton (2023), Haldimand County (2023), Lincoln (2023), and Port Colborne (2024). It has also been detected in Nova Scotia.

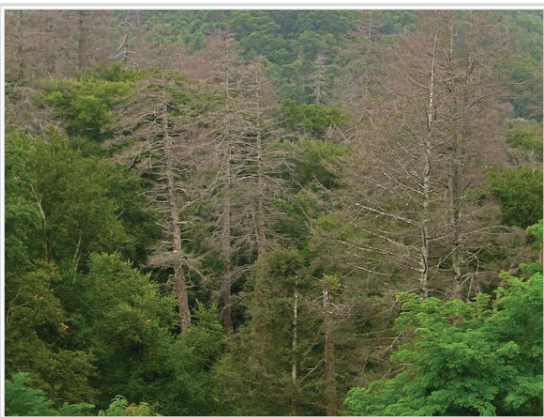
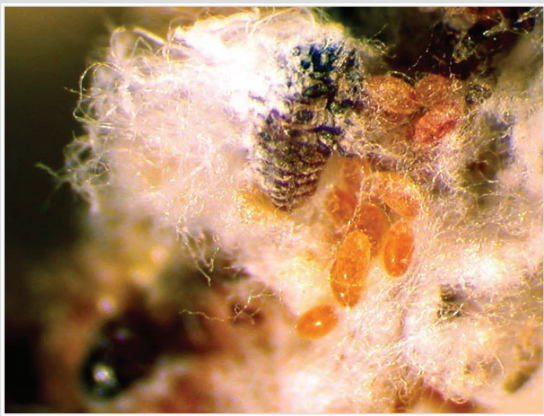
ORIGIN

- » The hemlock woolly adelgid is native to East Asia.

DESCRIPTION

- » Throughout the nymph stage, the insects are brownish-orange and can measure between 0.44 mm long and 0.27 mm wide to 0.74 mm long and 0.47 mm wide.
- » The adult hemlock woolly adelgid is an aphid-like insect.
- » As an egg, they are oblong and amber in colour.
- » Eggs are contained in spherical “woolly” ovisac made of white waxy threads.

HEMLOCK WOOLLY ADELGID



SIGNS AND SYMPTOMS

- » White “woolly” sacs at the base of hemlock needles on most recent twigs. Premature bud and shoot dieback, premature needle loss, thinner, greyish-green crown, and dieback of twigs and branches.
- » Hemlock tree death typically occurs within 4-15 years.

HOST PREFERENCE

- » The only host for the hemlock woolly adelgid in eastern Canada is the eastern hemlock (*Tsuga canadensis*), while other non-native tree species that are grown as ornamentals in the region may also be at risk.

IMPACTS

- » Decline in hemlock would present economic, ecological, and social impacts.
- » Hemlock is processed for use in general construction or as pulp.
- » Hemlock trees play an important role environmentally, contributing to ecological services such as the regulation and maintenance of water temperatures as hemlock tends to establish in riparian areas. Hemlock also provide important over-wintering habitat for wildlife, such as deer.

JUMPING WORMS

(*Amyntas* spp., *Metaphire* spp., *Pheretima* spp.)



STATUS IN ONTARIO (DETECTED)

- » First reported in 2014 in Essex County, Ontario, and have since been reported in Hamilton and Toronto regions.

ORIGIN

- » Native to East-Central Asia and are believed to have been spread through the horticultural trade.
- » First reported in North America in the late 1800s.

DESCRIPTION

- » A worm with smooth, glossy, and rubbery skin that can grow to between 10-13cm in length.
- » The collar-like band around the body (clitellum) is cloudy white to grey in color and sits flush with the rest of the body at 14-16 segments away from the head.
- » When threatened, jumping worms will thrash wildly back and forth in a snake-like motion, and can break off tail segments to escape from predators.

IMPACTS

- » Jumping worms outcompete other worm species for resources, and can alter the soil structure, leading to erosion.
- » They can also alter the nutrient composition of the soil, leading to higher levels of nitrogen, negatively affecting the plant species that are able to grow and survive in those areas.

LOOK-ALIKE SPECIES

- » Common earthworms (*Lumbricus* spp.) have a raised pink clitellum located more centrally along their length body.

MOUNTAIN PINE BEETLE

Dendroctonus ponderosae



REGULATION

- » Regulations are in place in some Canadian provinces (e.g. Alberta, Manitoba, and Saskatchewan).
- » Mountain pine beetle is prohibited under the Invasive Species Act, 2015 in Ontario. For more information, visit www.ontario.ca
- » For more information, please visit: www.nrcan.gc.ca

STATUS IN ONTARIO (UNKNOWN IN ONTARIO)

- » The mountain pine beetle has expanded beyond its historical range and could become an invasive pest if introduced in Ontario.

ORIGIN

- » The mountain pine beetle is native to western Canada.

DESCRIPTION

- » Pupae are white at first, changing to light brown and are about 5 mm long.
- » Larvae are white and grub-like with red-brown heads and are about 5 mm long in the fourth (final) instar.
- » Adults are small (3.7-7.5mm), dull, and cylindrical bark beetles with club-like antenna.
- » Immature adults are light creamy-tan in colour, changing to black as they mature.

MOUNTAIN PINE BEETLE



SIGNS AND SYMPTOMS

- » Look for sawdust on the outer bark around beetle entrance holes.
- » Pitch tubes (small globs of pitch - the tree's defense) may be present on the outer bark of attacked trees within days of attack and remain visible for many years; however, these may not be present on trees with severely compromised defenses.
- » As foliage dries, needles will turn yellow, orange, and finally red, approximately one year after the initial attack.
- » The crowns of some trees may start to fade in the same year as the attack, depending on environmental conditions.
- » These red needles drop off approximately two to four years after the attack and trees appear gray with no needles.

HOST PREFERENCE

- » Primarily lodgepole pine (*Pinus contorta*), although they can attack almost any species of pine, including jack pine (*Pinus banksiana*), which is of particular concern should the mountain pine beetle spread from western Canada and reach the jack pine dominated Canadian Shield of Ontario.

IMPACTS

- » Should the mountain pine beetle reach Ontario, the impacts on jack pine, red pine (*P. resinosa*), and white pine (*P. strobus*) could impact the wood supply for the forestry sector and other related industries in Ontario.
- » The ecological impacts would be severe, as the host species dominate Ontario's swath of boreal forest, on which many species rely.

OAK WILT

Bretziella fagacearum



REGULATION

- » Regulations are in place under the authority of the Plant Protection Act (CFIA, 2017).
- » For more information, please visit: www.inspection.gc.ca

STATUS IN ONTARIO (DETECTED)

- » Oak wilt has been found in the City of Niagara Falls (first confirmed detection in Canada), the Township of Springwater, and the Town of Niagara-on-the-Lake.

ORIGIN

- » The geographic origin of the oak wilt fungus is not known.

DESCRIPTION

- » The fungus develops mats between the sapwood and bark of oak trees.
- » These mats or “pressure pads” found on the trunk or large branches vary in size and are generally produced in late-fall or early-spring, remaining visible for two or more weeks.
- » The mats may appear grey or black depending on progression of the disease.
- » Oak wilt spreads to new hosts via sap-feeding beetles and root grafting with nearby infected oak trees.

OAK WILT



SIGNS AND SYMPTOMS

- » The first symptom in red oaks is often a subtle off-green colour shift in the upper-crown which typically happens late June to early July, but varies depending on occurrence.
- » Next, in “prototypical” leaves, the bronze discoloration will begin at the leaf margins and move inward in an angular pattern, but this pattern can be variable.
- » White, grey, or black fungal mats may be found just under the bark, sometimes emitting a fruity smell.
- » Pressure from the fungal spore mat exerting outward on the bark may reveal vertical bark cracks in the trunk and large branches.
- » Symptoms vary depending on the species of oak.

HOST PREFERENCE

- » All species of oak trees (*Quercus* spp.) have been found to be susceptible to oak wilt, with species of red oak being the most seriously affected, followed by bur oak and white oak.

IMPACTS

- » Landscape degradation, loss of shade and flood water retention, and loss of air and water purification.
- » Loss of oak, including the Shumard oak (*Quercus shumardii*), a species of special concern under Ontario’s Endangered Species Act.

SPONGY MOTH

Lymantria dispar dispar



REGULATION

- » The spongy moth is a regulated pest under the authority of the Plant Protection Act (CFIA, 2017). For more information, please visit: www.inspection.gc.ca
- » Spongy moth is regulated in Ontario everywhere south of, and including, Algoma, Sudbury, and Timiskaming, as well as Manitoulin Island. It is also regulated in Québec, New Brunswick, Nova Scotia, and Prince Edward Island.

STATUS IN ONTARIO (ESTABLISHED AND WIDESPREAD)

- » Found throughout most of southeastern, southwestern, and central Ontario. In northwestern Ontario, it has been detected in Thunder Bay.

ORIGIN

- » The spongy moth is native to Europe and Asia.

DESCRIPTION

- » Has four developmental stages: egg, caterpillar, pupa, and moth.
- » Eggs are tanned yellow, covered with fuzz, and found as egg masses. Its name is derived from its 'spongy' egg masses.
- » Larvae are up to 6 cm in length and covered with hairs. The caterpillar is characterized by five pairs of blue dots and six pairs of red dots that run down its back.
- » In the pupal stage, larval caterpillars transition to become winged moths.
- » Male moths are brown with feathery antennae.
- » Females are beige and cannot fly.

SPONGY MOTH



SIGNS AND SYMPTOMS

- » Egg masses found on tree bark and outdoor objects.
- » Leaves with holes or completely defoliated trees.
- » Defoliation will result in the dieback of twigs and branches.
- » In Ontario, the egg masses hatch between early and late April.

HOST PREFERENCE

- » Oak, birch, poplar, willow, maple, and others; over 300 known host plant species, about 150 of them are considered favoured hosts.

IMPACTS

- » In Ontario, the spread of spongy moth has had economic, environmental, and social impacts.
- » This moth defoliates large amounts of trees, affecting the many benefits provided by trees and the economic impacts affect all forest users.
- » The environmental impacts relate to losses in biodiversity and abrupt ecological changes. Large masses of caterpillars and moths can be aesthetically displeasing, as well.

LOOKALIKE SPECIES

- » Eastern tent caterpillar (*Malacosoma americanum*) and forest tent caterpillar moth (*M. disstria*).

SPOTTED LANTERNFLY

(*Lycorma delicatula*)



REGULATION

- » Added as a regulated species to the Canadian Food Inspection Agency's Regulated Pests list in 2018.
- » For more information, please visit www.inspection.gc.ca

STATUS IN ONTARIO (UNKNOWN IN ONTARIO)

- » No established populations have been confirmed in Ontario, but reports have been received from members of the public.

ORIGIN

- » Planthopper insect native to Southeastern Asia.
- » It was first detected in North America in 2014 in Berks County, Pennsylvania and has since spread to New Jersey, Delaware, Maryland, and other states.

HOST PREFERENCES

- » Adults prefer the invasive tree-of-heaven (*Ailanthus altissima*).
- » Nymphs will target grapevines and fruit trees, as well as pines, oaks and walnuts.

DESCRIPTION

- » Egg masses can be seen in winter and are 2.5 cm (0.98 in) long and covered in a grey waxy coating, which they lose in early spring, revealing brown eggs.
- » Nymphs hatch in the spring and are black with white spots, approximately 0.6 cm long, and become redder as they mature while retaining the white spots.

SPOTTED LANTERNFLY



DESCRIPTION

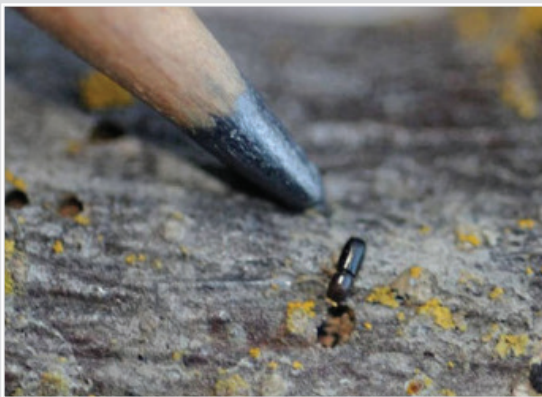
- » As they mature to adults in late summer, they can reach up to 2.5 cm (0.98 in) long with light brown to pink-grey front wings.
- » The rear wings are bright red, and both sets of wings have black spots near the front of the wings.
- » All life stages tend to congregate together in large numbers.

IMPACTS

- » Feeding SLF creates weeping wounds on trees and can cause dieback of host plants.
- » SLF threatens fruit, vine, and forestry industries in Canada by reducing yield and quality of fruit.
- » The sugary waste of SLF called “honeydew” accumulates below host trees which can develop black mold that reduces photosynthesis and growth of understory plants.
- » The honeydew can also attract other insects to feed on the tree.

THOUSAND CANKERS DISEASE

Geosmithia morbida



REGULATION

- » No regulations in place at this time.

STATUS IN ONTARIO (UNKNOWN IN ONTARIO)

- » Thousand cankers disease is not yet present in Canada, but it occurs in U.S. states with close proximity to Canada and the southern extent of Ontario.

ORIGIN

- » Extent of thousand cankers disease is not known as this disease may be confused with other forms of natural mortality.
- » Currently, thousand cankers disease can be found throughout the western United States.
- » The walnut twig beetle, which carries the disease is found throughout southwestern United States and Mexico.

DESCRIPTION

- » Thousand cankers disease is the outcome of an insect-fungus complex, which results when the non-native walnut twig beetle (*Pityophthorus juglandis*) carries spores of a fungus (*G. morbida*) into eastern black walnut trees as it feeds on its bark.
- » The adult walnut twig beetle is dark reddish-brown, about 1.5-2.0 mm long, and has 4-6 concentric rows of dot-like 'bumps' on the prothorax (first segment on body).

THOUSAND CANKERS DISEASE



The entrance and exit holes, created by the walnut twig beetle

SIGNS AND SYMPTOMS

- » Wilting and yellowing of leaves mid-summer and twig and branch dieback leading to a thinning of the canopy. Occurs as a result of the disease disrupting the nutrient-transporting layers beneath the bark.
- » Numerous distinctive circular to oblong cankers will be found growing underneath the bark.
- » The bark surface may have no symptoms. However it could develop a dark-amber to black stain as well as cracked bark directly above the canker.
- » Entrance and exit holes, created by the walnut twig beetles, may also be visible on the dead or dying branches and trunk.

HOST PREFERENCE

- » Thousand cankers disease can affect many species of walnut tree (*Juglans* spp.), but black walnut (*J. nigra*) is the most susceptible to the disease.

IMPACTS

- » The economic impacts of thousand canker disease include loss of black walnut trees, a highly valued timber species in North America where it is used for high-end cabinetry and other products.
- » Ecologically, black walnut trees are a staple for wildlife; nuts produced by the tree serve an important nutritional role for a wide range of wildlife.

GLOSSARY OF TERMS

Dieback

a condition in which a tree or shrub begins to die from the tip of its leaves or roots backward.

Dorsal

the upper surface of an organism.

Epicormic

growth emerging from dormant buds along the trunk and branches of a tree.

Frass

debris or excrement produced by insects.

Girdling

cutting through the bark and cambium around the entire tree or branch circumference.

Leaf margin

is the boundary area extending along the outer edge of the leaf.

Pathogen

a bacterium, virus, or other microorganism that can cause disease.

Root Grafting

the merging of tissues (ie. tree roots) from more than one individual plant.

Riparian

interface between terrestrial and aquatic habitats.

Prototypical

the first, original, or typical form of the leaves.

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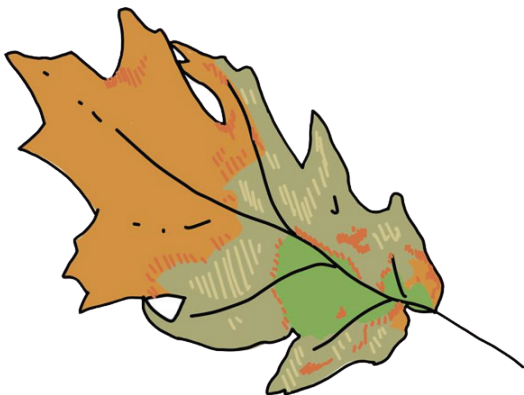


PHOTO CREDITS

Asian Long-Horned Beetle

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Butternut Canker

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Jumping Worms

Mountain Pine Beetle

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Spotted Lanternfly

Andy Wilson. (2023). SLF Nymph. [Photo]. Gettysburg, PA, USA. www.inaturalist.org/observations/170189822; Spotted Lanternfly (*Lycorma delicatula*) observed by Andy Wilson; Spotted Lanternfly from Gettysburg, PA, US on June 29, 2023 at 11:51 AM by Andy Wilson

Thousand Cankers Disease

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