Common insect pests and diseases on New Zealand native plants

Te Rātā Whakamaru

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ROTOITI 15
Ngā Rawa E Tupu

Introduction

Our native species have a range of insect pests and diseases associated with them, many of which are native, very common and not known to cause significant damage.

This booklet has been developed to help kura, whānau and environmental groups identify what insect pests and diseases they may have on native plants in their whenua. The identified hosts are non exhaustive.

A glossary of terms and a list of Māori and Latin names of insect pests, diseases, and hosts is also included.

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Contents

Algal spots

Algal leaf spot on māhoe.

Host/s:

Wide range of hosts.

What to look for:

Slightly raised, greenish white to yellow circular spots on the topside of leaves. Coinciding brown spots may be present on the underside of leaves.

What it does:

Causes leaf spots on green leaves. Not known to cause significant long-term damage to its host.

Where it is:

A native algal pathogen which is found commonly throughout New Zealand.

Coral spot of tōtara

Landcare Research, CC BY 4.0

Yellow spots on needles and black coral like fungal structures.

Host/s:

Tōtara and other *Podocarpus* species.

What to look for:

Yellow or pink oval spots on both sides of needles. Distinct hard, black coral like fungal structures develop on the spots.

What it does:

Causes needle spots. Not known to cause significant long-term damage to its host.

Where it is:

A native fungal pathogen which is found commonly throughout New Zealand.

Harakeke leaf spot

Irregular, reddish purple spots which turn brown over time.

Host/s:

Harakeke and other *Phormium* species.

What to look for:

Irregular, reddish purple spots on leaves which turn brown over time. Blackish brown fungal structures may form on the lower surface of the leaf and can be seen with a hand lens.

What it does:

Causes leaf spots but is not known to cause significant long-term damage to its host.

Where it is:

A native fungal pathogen which is commonly found on harakeke throughout New Zealand.

Harore

(Honey fungus)

Harore.

White sheets of fungal tissue.

Black bootlace type structures.

Host/s:

Wide range of native and exotic hosts.

What to look for:

This fungus feeds on wood and is found at the base of dead or unhealthy trees and on stumps or fallen wood. Mushrooms appear through autumn into early winter. It also produces white sheets of fungal tissue under the bark of host trees along with black bootlace type structures which also grow through the soil. If the tree is alive sap or resin bleeding may also be present.

What it does:

This fungus attacks many trees and shrubs causing disease and sometimes death to its host. It is also able to feed on dead wood which it decomposes, releasing nutrients, which become available to other plants.

Where it is:

A common native fungal pathogen and mushroom that is found throughout New Zealand.

Karamū leaf spot

Brown spots on leaves of karamū.

Host/s:

Karamū and other *Coprosma* species.

What to look for:

Irregular shaped grey/brown spots on both sides of leaves. Fungal structures that look like tiny black pin heads, or grey hairs may be present on the under surface of the leaf and can be seen with a hand lens.

What it does:

Causes leaf spots on green leaves. Not known to cause significant long-term damage to its host.

Where it is:

A native fungal pathogen commonly found throughout New Zealand.

Kawakawa looper

Dougal Townsend. CC BY-NC

Possums' End. CC BY

Top: *Female kawakawa looper.*
Bottom: *Male kawakawa looper.*

Jemmarosie. CC BY-NC

Kawakawa Looper caterpillar and damage on kawakawa.

Host/s:

Kawakawa and a very wide range of other native hosts such as akeake and horopito.

What to look for:

Moths are light to dark brown sometimes with yellow spots with a wing span of 40 to 50 mm. The caterpillars are light green at first and turn light brown as they age. The caterpillars feed at night.

What it does:

Caterpillars feed on leaves and make distinctive holes in kawakawa leaves, the larger caterpillars leave notches on the edges of the leaves. It is not known to cause significant long-term damage to its host.

Where it is:

A native insect found throughout New Zealand.

Māhoe stripper

Phil Bendle. CC BY-NC

Māhoe stripper moth.

strewick, iNaturalist NZ. CC BY

Māhoe stripper caterpillar.

Host/s:

Māhoe.

What to look for:

Moths are usually flying from September to January. During the day they rest and can be found on lichen covered tree trunks. Their wing pattern and the colour is a moss-like green, this camouflages them during the day. They fly at night visiting flowers and are attracted to light. The caterpillars grow to about 25 mm long and are bright green with spots of white, black and pale yellow/orange. As they grow bigger they become a darker green or brown.

What it does:

The caterpillar feeds on the leaves of māhoe which they can totally strip from the tree. It is not known to cause significant long-term damage to its host.

Where it is:

A native insect found throughout New Zealand.

Makomako leaf spot

Brown leaf spots with a dark brown margin.

Host/s:

Makomako/mako.

What to look for:

Brown spots with a darker brown margin found on both sides of leaves. Fungal structures that look like grey hairs may be present on the under surface of the leaf and can be seen with a hand lens.

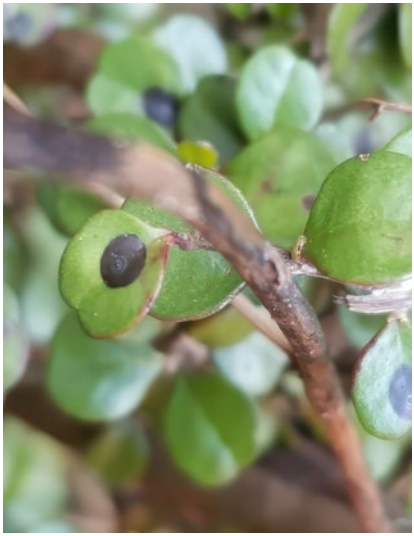
What it does:

Causes leaf spots. Not known to cause significant long-term damage to its host.

Where it is:

A native fungal pathogen found commonly throughout New Zealand.

Ross' black scale



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Ross' black scale on rōhutu leaves.

Jon Sullivan, CC BY-NC 2.0

Closeup of Ross' black scale on kāpuka/pāpāuma leaf.

Host/s:

Rōhutu and ramarama, a range of native and exotic hosts.

What to look for:

Very distinctive black circular scales. 2-2.5mm in diameter. Found on leaves and occasionally twigs.

What it does:

Has not been associated with significant long-term damage to its host.

Where it is:

Throughout the North Island and occurs north of Christchurch in the South Island.

Notes:

An exotic scale insect which was introduced from Australia.

Rust of houhere and mānatu

J. Kruse, CC BY 4.0

Brown rust structures on the underside of a houhere leaf.

Landcare Research, CC BY 4.0

Brown rust structures on surface of a mānatu *leaf.*

Host/s:

Houhere, mānatu, and other *Hoheria* and *Plagianthus* species.

What to look for:

On houhere, pale yellow, grey, or brown, irregular spots, up to 4cm long, on both surfaces of green leaves or on distorted segments of stem. Dark brown rust structures can be seen mostly on the lower surface of the leaf spots and yellow fungal structures can be seen on both surfaces of the leaves. On mānatu, light yellow leaf spots with brown rust structures breaking through the leaf surface. Rust structures can be seen with the naked eye or a hand lens.

What it does:

Causes leaf spots on houhere and mānatu. Not known to cause significant long-term damage to its host.

Where it is:

A native rust found throughout New Zealand.

Rust of karamū

Yellow spots on upper surface of a karamū leaf which turn brown with age.

Rust structures on under surface of a karamū leaf.

Host/s:

Karamū and other *Coprosma* species.

What to look for:

Pale yellow circular or irregular spots on under surface of leaves and yellow on upper surface. Spots turn brown over time. Brown/black rust structures develop on the lower surface of the leaf spot and can be seen with the naked eye or a hand lens.

What it does:

Causes leaf spots but is not known to cause significant long-term damage to its host.

Where it is:

A native rust which is found throughout New Zealand.

Rust of kōtukutuku and tānekaha

J. Kruse, CC BY 4.0

Yellow/brown spots with yellow rust structures on the lower surface of kōtukutuku leaves.

Landcare Research, CC BY 4.0

Yellow spots and yellow rust structures on tānekaha.

Host/s:

Kōtukutuku, tānekaha, and other *Fuchsia* and *Phyllocladus* species.

What to look for:

On kōtukutuku, yellow spots on lower surface of leaves, that progress to upper surface and eventually become brown. Yellow to orange rust structures develop on both surfaces of the leaf spot. On tānekaha, yellow spots on the under surface of the leaf which eventually also show on the upper surface of the leaves. Green stem infections can also occur. Bright yellow rust structures develop on the upper surface of the leaf spots and on the stem infections. Rust structures can be seen with the naked eye or a hand lens.

What it does:

Causes leaf spots on kōtukutuku and leaf spots and stem lesions on green stems of tānekaha. Not known to cause significant long-term damage to its host.

Where it is:

A native rust found throughout New Zealand.

Rust of ngaio

Landcare Research, CC BY 4.0

Swellings on stems and yellow rust structures.

Host/s:

Ngaio and other *Myoporum* species.

What to look for:

Distorted shapes such as swelling and cankers up to 15cm long on shoots, leaves, flower stalks and twigs. Small yellow rust structures may be present on infected areas.

What it does:

Distorts infected parts of host plant. Not known to cause significant long-term damage to its host.

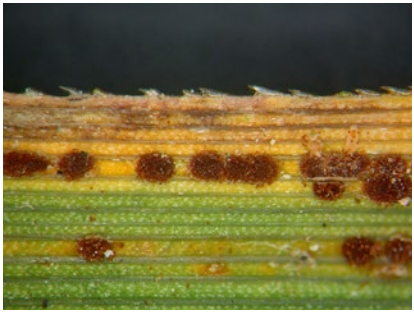
Where it is:

A native rust found in Auckland, Waikato, Hawkes Bay, Gisborne, Wellington, and Marlborough.

Rust of ongaonga and native grasses

Landcare Research, CC BY 4.0

Top: *White rust structure on distorted stem of ongaonga.*
Bottom: *Yellow rust structures on under surface of ongaonga leaf.*



Landcare Research, CC BY 4.0

Leaf spots with brown rust structures on Carex.

Host/s:

Ongaonga and *Carex* species.

What to look for:

Severe galling and deformation of stems and leaves occurs on ongaonga. White or yellow cup-like rust structures can usually be seen on the infected tissues. Leaf spots with dark brown rust structures develop on *Carex* species. Rust structures can be seen with the naked eye.

What it does:

Infected areas will eventually wither and die; however, it is not known to cause significant long-term damage to its host.

Where it is:

It is thought to be a native rust and is found throughout New Zealand where the hosts occur.

Notes:

Ongaonga is a stinging nettle, ensure you use hand protection if handling.

Rust of puawānanga and pōhuehue

Landcare Research, CC BY 4.0

Rust structures on distorted puawānanga *stem.*

J. Kruse, CC BY 4.0

Red and green spots on the under surface of pōhuehue leaves.

Host/s:

Puawānanga, pōhuehue, and other *Clematis* and *Muehlenbeckia* species.

What to look for:

On puawānanga distorted and inflated swellings on leaves, stems and flowers. Rust structures form on the distortions and are circular, orange with a white frill. On scrub pōhuehue dark green or red spots on both leaf surfaces with brown rust structures on the underside of the leaf. Rust structures can be seen with the naked eye or with a hand lens.

What it does:

Causes stem and leaf distortion on puawānanga and leaf spots on pōhuehue. Not known to cause significant long-term damage to its host.

Where it is:

A native rust found throughout New Zealand.

Sixpenny scales

(Toronia, turtleshell, sixpenny, and spotted sixpenny scales)

sourced from Landcare Research

Scale associated depressions showing from underside and surface of the leaf.

sourced from Landcare Research

Clockwise from top left: *Toronia, turtleshell, sixpenny, and spotted six penny scale.*

Host/s:

Toronia scale: Toru.
Turtleshell scale: Wide range of native hosts.
Sixpenny scale: Horoeka, houpara, puka, and karamū species.
Spotted sixpenny scale: Wide range of native hosts.

What to look for:

Soft scales on the underside of leaves.

What it does:

Causes bumps on the topside of leaves, and leaf curling. Not known to cause significant long-term damage to its host.

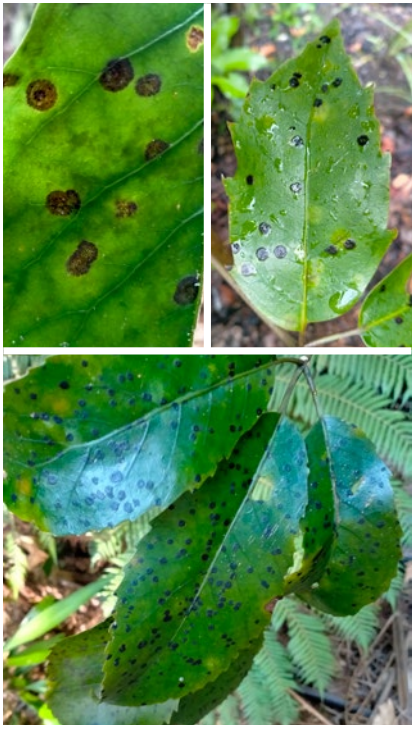
Where it is:

The sixpenny scale and spotted sixpenny scale are native scale insects which are commonly found throughout the country. The toronia scale and turtleshell scale are also native but relatively rare.

Notes:

They overwinter on old leaves. In spring the females move onto new growth to speed up their development.

Tar spot



Black raised circular spots on puahou.

Host/s:
Puahou/whauwhaupaku.

What to look for:
Slightly raised, black circular spots on the topside of leaves.

What it does:
Causes leaf spots on green foliage. Not known to cause significant long-term damage to its host.

Where it is:
A native fungal pathogen found commonly throughout New Zealand.

Thrips

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Typical damage caused by thrips on under surface of ramarama leaf.

https://alchetron.com/Thrips

Thrips on leaf surface of unknown host.

Host/s:

Wide host range.

What to look for:

Small, 1mm or less, slender insects. Plant leaves may turn pale, splotchy, and silvery. Damage is often seen on the underside of leaves. Often debris is left on leaves in the form of thrips shells, brown frass, and dead leaf tissue.

What it does:

Thrips damage plants by sucking their juices and scraping at fruits, flowers, and leaves. Plant leaves may die.

Where it is:

Both exotic and native species of thrips are found throughout New Zealand.

Notes:

Insect will run off leaves when disturbed.

Tōtara blight

Khaki and blackened shoots and needles.

Brown needles retained in lower crown.

Host/s:

Tōtara.

What to look for:

Needles turn khaki colour, and often blacken. Shoot infection also occurs, resulting in brown, dead shoots and needles.

What it does:

Causes needles and shoots to die. Dead needles are either cast, or retained resulting in lower parts of the canopy turning brown.

Where it is:

Throughout the North Island. It is currently not known if this disease is native or exotic.

Notes:

Tōtara blight is caused by a fungus-like organism.

Myrtle rust

Pōhutukawa flower and leaves with yellow myrtle rust structures and typical leaf spotting.

Host/s:

Wide range of native and exotic hosts in the Myrtaceae family. Highly susceptible native hosts include maire tawake/waiwaka, pōhutukawa, ramarama and rōhutu.

What to look for:

Bright yellow rust structures form on newly forming leaves, shoots and flower buds, flowers and on fruit in late spring through to early autumn (the disease may occur all year round in warm areas). The disease can look different on different hosts, but infected areas often have a yellow or red halo.

What it does:

Severe infection will cause new growth to die, over time dying twigs may be seen on severely affected trees. Death of the plant/tree may occur after multiple attacks for highly susceptible hosts.

Ramarama and rōhutu leaves, shoots, and flower bud with yellow myrtle rust structures.

Where it is:

Myrtle rust is an exotic disease first found in New Zealand in 2017. Since then, it has spread throughout the North Island and upper South Island. It has been found as far south as Christchurch.

If you find myrtle rust you can contribute to tracking the disease in New Zealand by taking a picture that clearly shows the yellow rust structures and upload this to iNaturalist NZ. Take care not to disturb the fungal structures.

Notes:

Myrtle rust is having a devastating impact on some of our highly susceptible hosts. The disease is spread by wind, but it can also be moved into new areas on clothing, hands and hair. If you have been in an area with myrtle rust it is very important to wash clothes etc. before you go into other areas. Never take plant material with myrtle rust on it out of an area.

inaturalist.nz/taxa/549208-Austropuccinia-psidii

Glossary

Algal - relating to a simple, non-flowering plant, such as seaweed.

Canopy - the branches and leaves of a tree.

Decompose - to break down, decay or rot.

Disease - a condition that harmfully affects the structure or function of all or part of a plant.

Exotic - a plant or fungus introduced from another country.

Frass - waste matter of insects, poo.

Fungus - an organism that reproduces by spores, and lives and feeds on live, dead or decaying organic matter.

Host - an organism that a parasite or pathogen lives on or in (e.g. a plant)

Insect - a very small animal with six legs, a body divided into three parts and usually two pairs of wings as an adult.

Insect pest - a destructive insect.

Mushroom - a fungal structure that typically forms above ground, often taking the form of a rounded cap on a stalk.

Myrtaceae - the myrtle family, a family of flowering plants, such as pōhutukawa and eucalyptus.

Native - a plant or fungus that originated in a particular place.

Needle - a narrow and stiff leaf.

Organism - any living thing that functions as an individual.

Resin - the thick sticky fluid which circulates in certain plants.

Rust - a specialised group of fungi that cause disease on the above ground parts of a plant.

Rust structures - Spores (infection propagules) and spore producing parts of a rust.

Sap - the watery sugary fluid which circulates in certain plants.

Scale - a small insect with a shieldlike protection.

Shoot - a young branch produced from a plant.

Species - a category of living things that is made up of related individuals.

Latin names – insect pests

Kawakawa looper - *Cleora scriptaria.*

Māhoe stripper - *Feredayia graminosa.*

Ross' black scale - *Lindingaspis rossi.*

Sixpenny scales - *Ctenochiton viridis, Ctenochiton toru, Ctenochiton chelyon.*

Thrips - Various thrips species.

Latin names – diseases

Algal spots - *Cephaleuros lagerheimii, C. minimus, C. parasiticus, C. virescens.*

Coral spot of tōtara - *Corynelia tropica.*

Harakeke leaf spot - *Zasmidium phormii.*

Harore (honey fungus) - *Armillaria aotearoa, A. hinnulea, A. limonea, A. novae-zelandiae.*

Karamū leaf spot - *Mycosphaerella coacervata, Pseudocercospora coprosmae.*

Makomako leaf spot - *Pseudocercospora aristoteliae.*

Rust of houhere and mānatu - *Puccinia plagianthi.*

Rust of karamū - *Puccinia coprosmae.*

Rust of kōtukutuku and tānekaha - *Mikronegeria fuchsiae.*

Rust of ngaio - *Aecidium myopori.*

Rust of ongaonga and native grass - *Puccinia urticata.*

Rust of puawānanga and pōhuehue - *Puccinia otagensis.*

Tar spot - *Placosoma nothopanacis.*

Tōtara blight - *Phytophthora podocarpi.*

Myrtle rust - *Austropuccinia psidii.*

Latin names – native hosts

Akeake - *Dodonaea viscosa*.

Harakeke - *Phormium tenax*.

Horoeka - *Pseudopanax crassifolius*.

Horopito - *Pseudowintera* species.

Houhere - *Hoheria populnea*.

Houpara - *Pseudopanax lessonii*.

Kāpuka - *Griselinia littoralis*.

Karamū - *Coprosma lucida, Coprosma robusta*.

Kawakawa - *Piper excelsum*.

Kōtukutuku - *Fuchsia excorticata*.

Māhoe - *Melicytus ramiflorus*.

Maire tawake - *Syzygium maire*.

Makomako/mako - *Aristotelia serrata*.

Mānatu - *Plagianthus regius*.

Ngaio - *Myoporum laetum*.

Ongaonga - *Urtica ferox, Urtica gracilis*.

Pāpāuma - *Griselinia littoralis*.

Pōhuehue - *Muehlenbeckia* species.

Pōhutukawa - *Metrosideros excelsa*.

Puahou - *Pseudopanax arboreus*.

Puawānanga - *Clematis paniculata*.

Puka - *Meryta sinclairii*.

Ramarama - *Lophomyrtus bullata*.

Rōhutu - *Lophomyrtus obcordata*.

Tānekaha - *Phyllocladus trichomanoides*.

Toru - *Toronia toru*.

Tōtara - *Podocarpus totara, Podocarpus laetus*.

Whauwhaupaku - *Pseudopanax arboreus*.

Waiwaka - *Syzygium maire*.