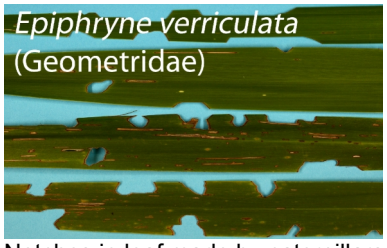
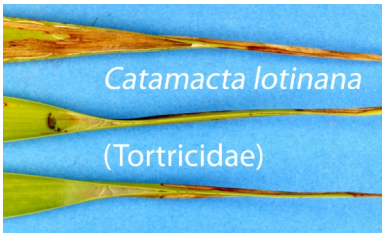
Ti kouka / Cabbage Tree – *Cordyline australis*

Leaf



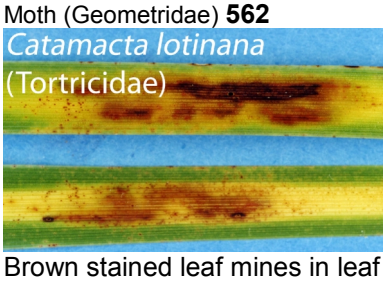
Notches in leaf made by caterpillars of the cabbage tree moth living between young leaves.
Moth (Geometridae) **562**

Long channels made in young leaves by caterpillars of the cabbage tree moth.
Moth (Geometridae) **562**



Edges of leaf tip webbed together by caterpillar of cabbage tree bell moth.
Moth (Tortricidae) **569**

Edges of leaf tip webbed together by caterpillar of cabbage tree bell moth.
Moth (Tortricidae) **569**

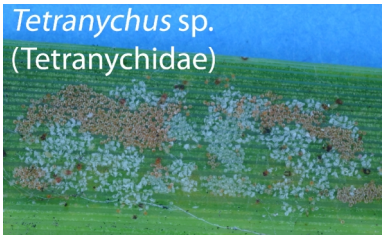


Brown stained leaf mines in leaf base made by caterpillar of cabbage tree bell moth.
Moth (Tortricidae) **569**

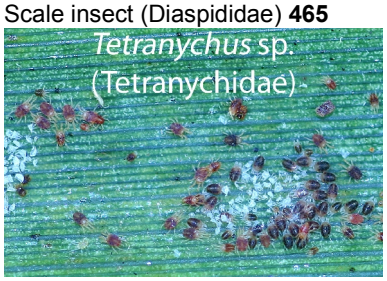
Brown stained leaf mines in leaf base made by caterpillar of cabbage tree bell moth.
Moth (Tortricidae) **569**

Colonies of flocculent white scale insects on undersides of leaves. Yellow areas on upper side of leaf.
Scale insect (Diaspididae) **465**

Brown eggs of cabbage tree mites on underside of leaf.
Mite (Tetranychidae) **2413**



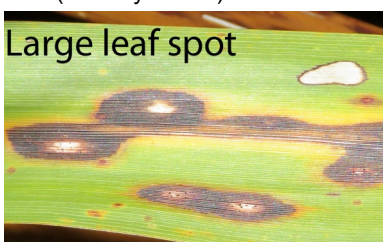
White eggshells of cabbage tree mites on underside of leaf.
Mite (Tetranychidae) **2413**



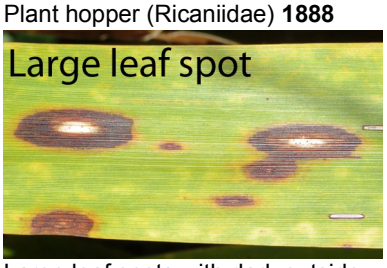
Red web-spinning mites and white moulted skins on underside of leaf.
Mite (Tetranychidae) **2413**

* Passion vine hopper nymphs with fluffy white wax tails that stick up. Present in summer.
Plant hopper (Ricaniidae) **1888**

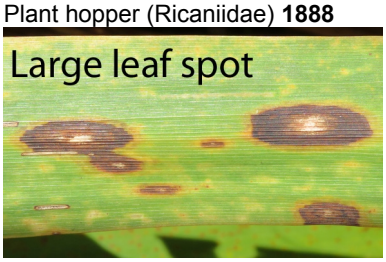
* Passion vine hopper adults with black and clear wings. Present in summer.
Plant hopper (Ricaniidae) **1888**



Large leaf spots with dark outside and pale centre, on both sides of live and dead leaves.
Cause unknown. **131 F**



Large leaf spots with dark outside and pale centre, on both sides of live and dead leaves.
Cause unknown. **131 F**



Large leaf spots with dark outside and pale centre, on both sides of live and dead leaves.
Cause unknown. **131 F**

More on next page

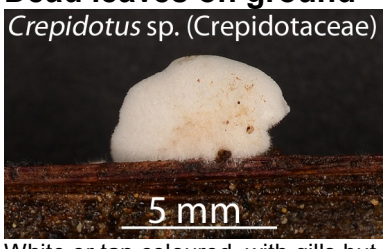
Flower and fruit spikes

* Dark green aphids on young leaves.
Aphids (Aphididae) **4835**

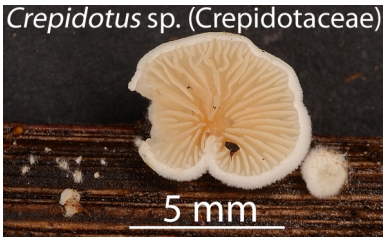
* Dark green aphids amongst flowers, flower buds and young fruit.
Aphids (Aphididae) **4835**

*Dark green aphids amongst flowers, flower buds and young fruit.
Aphids (Aphididae) **4835**

Dead leaves on ground



White or tan coloured, with gills but no stalk, lives on dead stems and leaves often with little space underneath. Present in winter.
Fungus (Basidiomycota) **59 F**



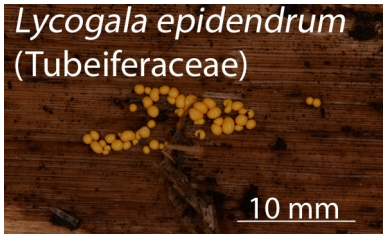
White or tan coloured, with gills but no stalk, lives on dead stems and leaves often with little space underneath. Present in winter.
Fungus (Basidiomycota) **59 F**

White or tan coloured, with gills but no stalk, lives on dead stems and leaves often with little space underneath. Present in winter.
Fungus (Basidiomycota) **59 F**

White cap with white gills, on short stout stalk, usually in groups. Present in winter.
Fungus (Basidiomycota) **53 F**

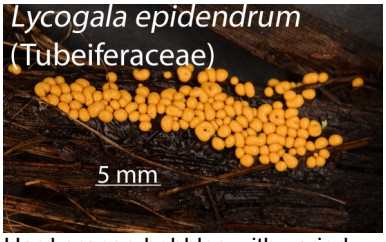
White cap with white gills, on short stout stalk, usually in groups. Present in winter.
Fungus (Basidiomycota) **53 F**

White cap with white gills, on short stout stalk, usually in groups. Present in winter.
Fungus (Basidiomycota) **53 F**



Hard orange bobbles with varied rounded shapes and powdery interior; immature bobbles white. Present in winter.
Slime mould. **88 F**

Hard orange bobbles with varied rounded shapes and powdery interior; immature bobbles white. Present in winter.
Slime mould. **88 F**



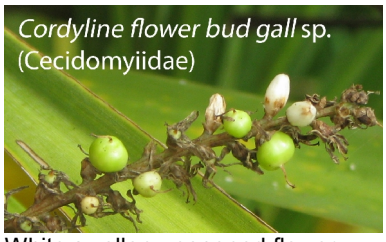
Hard orange bobbles with varied rounded shapes and powdery interior; immature bobbles white. Present in winter.
Slime mould. **88 F**

More on next page

Other plant damage symptoms, invertebrates and fungi that may be seen

Flower and fruit spikes

White swollen unopened flower buds, fly maggot may be inside, present during and just after flowering.
Gall fly (Cecidomyiidae) **3874**

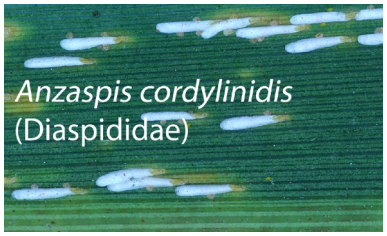


White swollen unopened flower buds, fly maggot may be inside, present during and just after flowering.
Gall fly (Cecidomyiidae) **3874**

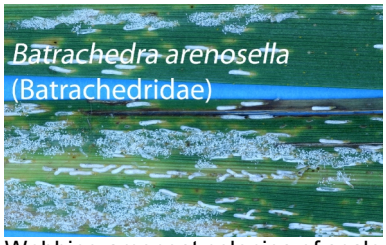
Green and black shield bug nymph feeding on green fruit. Larger nymphs may be blacker or greener.
Shield bug (Pentatomidae) **1966**

Adult Australasian shield bug.
Shield bug (Pentatomidae) **1966**

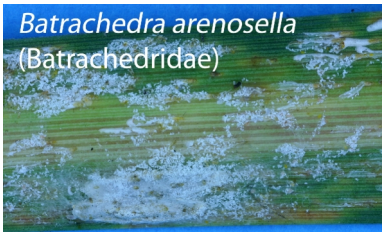
Leaf



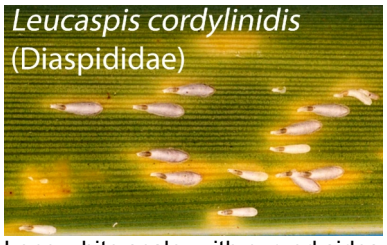
Narrow white scale insect with grey or dark cap. On top or underside of leaves.
Scale insect (Diaspididae) **403**



Webbing amongst colonies of scale insects made by a scale-eating caterpillar.
Moth (Batrachedridae) **79 PR**



Webbing amongst colonies of scale insects made by a scale-eating caterpillar. Moth cocoons present.
Moth (Batrachedridae) **79 PR**

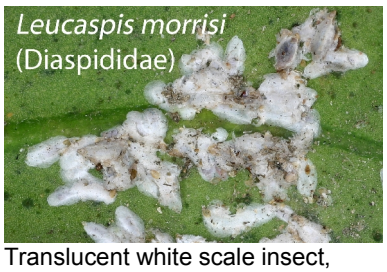


Long white scale, with curved sides, chlorotic (yellow) areas on leaves, present all year.
Scale insect (Diaspididae) **1977**

Long white scale, with curved sides, chlorotic (yellow) areas on leaves, present all year.
Scale insect (Diaspididae) **1977**

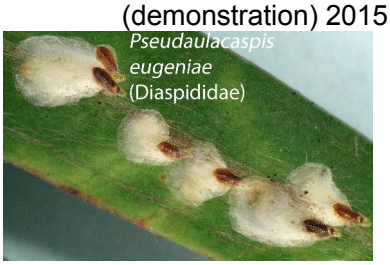
Translucent white scale insect, oyster-shell shaped with brown cap, dark body visible, on leaves, male scale narrower, present all year.
Scale insect (Diaspididae) **1032**

More on next page

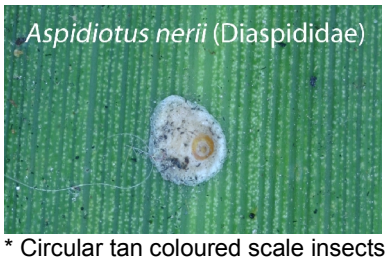


Translucent white scale insect, oyster-shell shaped with brown cap, dark body visible, on leaves, male scale narrower, present all year.
Scale insect (Diaspididae) **1032**

Scale insect on underside of leaves, white female oyster-shell shaped, light brown terminal cap, present all year.
Scale insect (Diaspididae) **1041**



White scale insect, oystershell-shaped, brown cap, on underside of leaves, pale (chlorotic) areas on leaves, present all year.
Scale insect (Diaspididae) **2541**

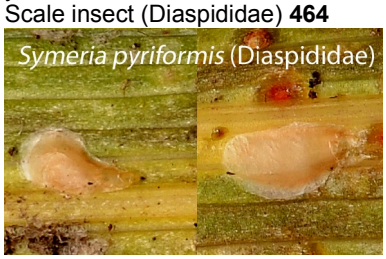


* Circular tan coloured scale insects with darker central cap. On underside of leaves.
Scale insect (Diaspididae) **1047**

Adult female scales are transparent gold; male scales have two straight lines under scale cover; present all year.
Scale insect (Diaspididae) **464**

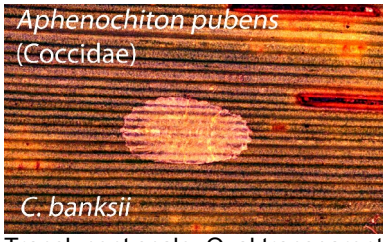
Adult female scales are transparent gold; male scales have two straight lines under scale cover; present all year.
Scale insect (Diaspididae) **464**

* Scale insect, sub-circular, pale beige or tan with light brown cap, on leaves, present all year.
Scale insect (Diaspididae) **2147**



Brown scale adult female scales are pear-shaped and light to dark brown; present all year.
Scale insect (Diaspididae) **388**

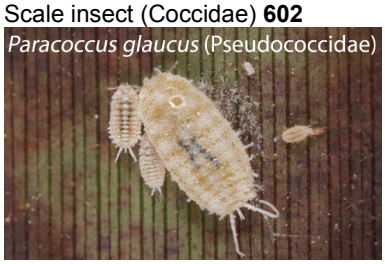
* Oval brown scale, convex, rounded, light brown. Young scale with H-pattern.
Scale insect (Coccidae) **1048**



Translucent scale, Oval transparent scale insect with wax plates, on underside of leaves.
Scale insect (Coccidae) **602**

Tawny felted scales on leaves; present all year.
Felted scale (Eriococcidae) **3536**

Tawny felted scales on leaves; present all year.
Felted scale (Eriococcidae) **3536**

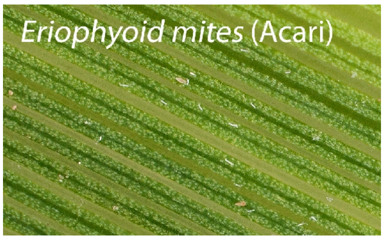


Mealybug body oval, pale green or orange, under powdery white wax, short wax lateral filaments, longer posterior filaments; on underside of leaves.
Mealybug (Pseudococcidae) **701**

Mealybug body oval, pale green or orange, under powdery white wax, short wax lateral filaments, longer posterior filaments; on underside of leaves.
Mealybug (Pseudococcidae) **701**

* Long-tailed mealybugs have a fringe of long lateral wax filaments and body length wax tail are distinctive, on leaves, present all year.
Mealybug (Pseudococcidae) **719**

More on next page



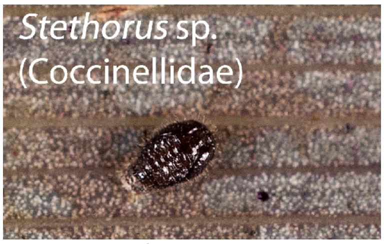
Tiny white moulted skins and cream coloured mites on underside of leaves. Present in winter, spring and summer.
Gall mite (Eriophyoidea) **2128**

* Adult and juvenile greenhouse thrips on underside of leaves. Present in summer and autumn.
Thrips (Thripidae) **997**

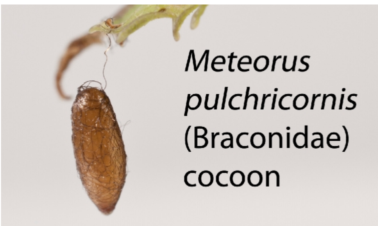
* Tiny wasp parasitoid. Naked black pupae in thrips colonies on underside of leaves. Present in summer and autumn.
Wasp (Eulophidae) **609 PA**

Small black adult ladybird in web-spinning mite colonies. Present all year.
Ladybird (Coccinellidae) **163 PR**

Small dark or white ladybird larvae in web-spinning mite colonies. Present all year.
Ladybird (Coccinellidae) **163 PR**



Black pupa of ladybird in web-spinning mite colonies. Present all year.
Ladybird (Coccinellidae) **163 PR**



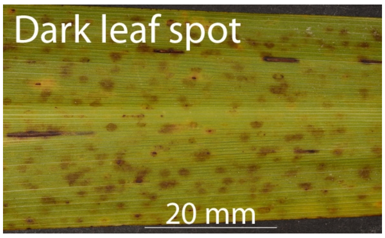
* Distinctive oval cocoon is covered in netting and hangs on a thread. Present all year, except mid winter.
Wasp (Braconidae) **103 PA**

Scars made by female cicadas when inserting eggs into leaves. Present all year.
Cicada (Cicadidae) **4133 H**

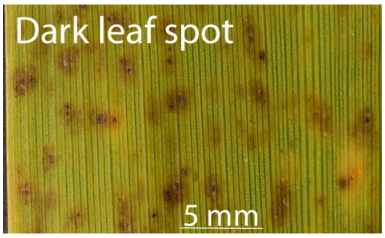
Irregular rounded brown or black spots on upper side of leaves, variable in size, some spots with yellow areas underneath.
Cause unknown.**14 F**

Irregular rounded brown or black spots on upper side of leaves, variable in size, some spots with yellow areas underneath.
Cause unknown.**14 F**

Irregular rounded brown or black spots on upper side of leaves, variable in size, some spots with yellow areas underneath.
Cause unknown.**14 F**



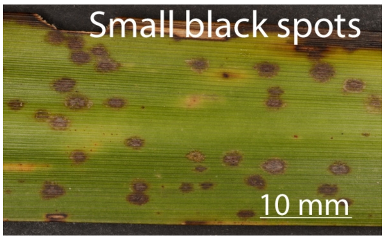
Irregular rounded brown or black spots on upper side of leaves, variable in size, some spots with yellow areas underneath.
Cause unknown.**14 F**



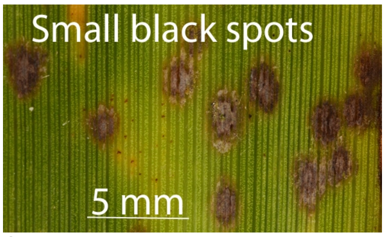
Irregular rounded brown or black spots on upper side of leaves, variable in size, some spots with yellow areas underneath.
Cause unknown.**14 F**

Irregular rounded brown or black spots on upper side of leaves, variable in size, some spots with yellow areas underneath.
Cause unknown.**14 F**

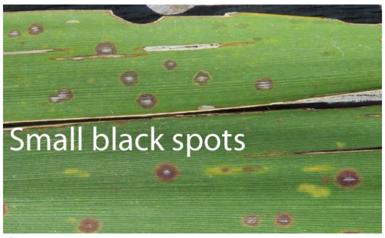
More on next page



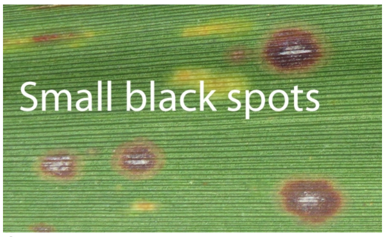
Small black spots with sharp outline on upper side of leaves, may have pale centre. Cause unknown. **132 F**



Small black spots with sharp outline on upper side of leaves, may have pale centre. Cause unknown. **132 F**



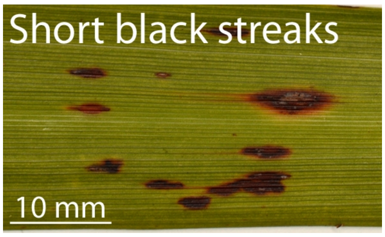
Small black spots with sharp outline on upper side of leaves, may have pale centre. Cause unknown. **132 F**



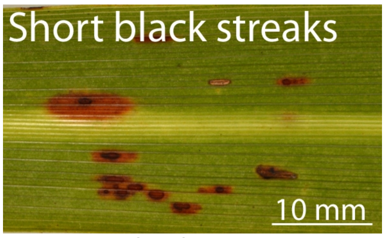
Small black spots with sharp outline on upper side of leaves, may have pale centre. Cause unknown. **132 F**

Small black spots with sharp outline on upper side of leaves, may have pale centre. Cause unknown. **132 F**

Short black streaks on both sides of leaf. Upper side of leaves. Cause unknown. **126 F**



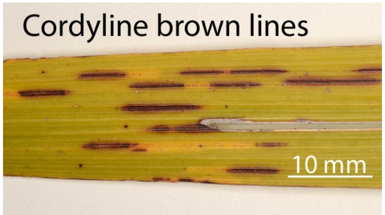
Short black streaks on both sides of leaf. Upper side of leaf. Cause unknown. **126 F**



Underside of leaf with short black streaks on both sides of leaf. Cause unknown. **126 F**

Short narrow brown streaks on both sides of leaves, one to several veins wide. Upper side of leaf. Cause unknown. **127 F**

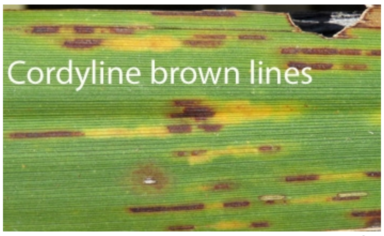
Short narrow brown streaks on both sides of leaves, one to several veins wide. Underside of leaf. Cause unknown. **127 F**



Thick brown lines on both sides of leaves, usually associated with elongated orange/yellow areas. Causal organism unknown. **85 F**

Thick brown lines on both sides of leaves, usually associated with elongated orange/yellow areas. Causal organism unknown. **85 F**

Thick brown lines on both sides of leaves, usually associated with elongated orange/yellow areas. Causal organism unknown. **85 F**



Thick brown lines on both sides of leaves, usually associated with elongated orange/yellow areas. Causal organism unknown. **85 F**

More on next page

Leaf base

Mealybugs orange-pink, covered with powder wax, at base of young leaves, present all year.
Mealybug (Pseudococcidae) **649**

Mealybugs orange-pink, covered with powder wax, at base of young leaves, present all year.
Mealybug (Pseudococcidae) **649**

Mealybugs orange-pink, covered with powder wax, at base of young leaves, present all year.
Mealybug (Pseudococcidae) **649**

Mealybugs orange-pink, covered with powder wax, at base of young leaves, present all year.
Mealybug (Pseudococcidae) **649**

Raised callous with central depression for gall fly larvae, mainly at base of leaf, present all year.
Gall fly (Cecidomyiidae) **1700**

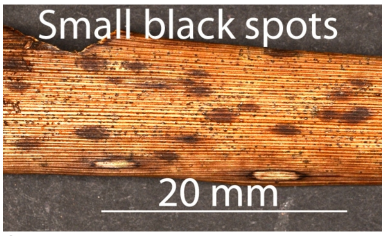
Raised callous with central depression for gall fly larvae, mainly at base of leaf, present all year.
Gall fly (Cecidomyiidae) **1700**

Raised callous with central depression for gall fly larvae, mainly at base of leaf, present all year.
Gall fly (Cecidomyiidae) **1700**

Dead suspended leaves

Thick brown lines on both sides of leaves, usually associated with elongated orange/yellow areas.
Causal organism unknown. **85 F**

Thick brown lines on both sides of leaves, usually associated with elongated orange/yellow areas.
Causal organism unknown. **85 F**



Small black spots with sharp outline on upper side of leaves, may have pale centre. Cause unknown. **132 F**

Small black spots with sharp outline on upper side of leaves, may have pale centre. Cause unknown. **132 F**

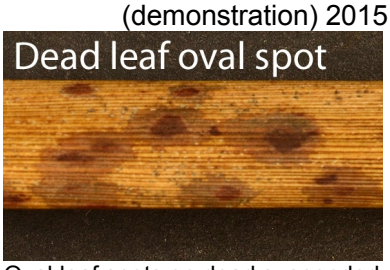
Small black spots with sharp outline on upper side of leaves, may have pale centre. Cause unknown. **132 F**

Small black spots with sharp outline on upper side of leaves, may have pale centre. Cause unknown. **132 F**

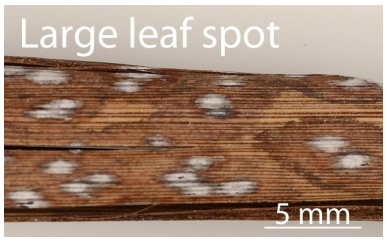
More on next page

Oval leaf spots on dead suspended leaves. Spot have a dark centre. Causal organism unknown. **50 F**

Oval leaf spots on dead suspended leaves. Spot have a dark centre. Causal organism unknown. **50 F**



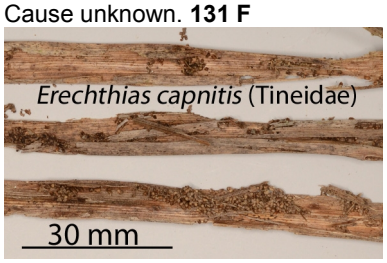
Oval leaf spots on dead suspended leaves. Spot have a dark centre. Causal organism unknown. **50 F**



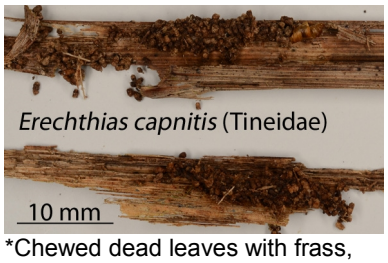
Large leaf spots with dark outside and pale centre, on both sides of live and dead leaves. Cause unknown. **131 F**

Large leaf spots with dark outside and pale centre, on both sides of live and dead leaves. Cause unknown. **131 F**

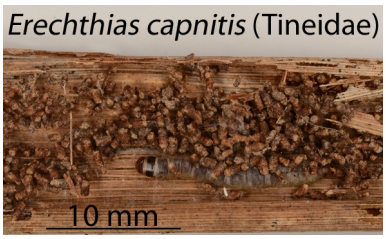
Large leaf spots with dark outside and pale centre, on both sides of live and dead leaves. Cause unknown. **131 F**



*Chewed dead leaves with frass, webbing and grey caterpillars. Moth (Tineidae) **4942**



*Chewed dead leaves with frass, webbing and grey caterpillars. Moth (Tineidae) **4942**



*Chewed dead leaves with frass, webbing and grey caterpillars. Moth (Tineidae) **4942**

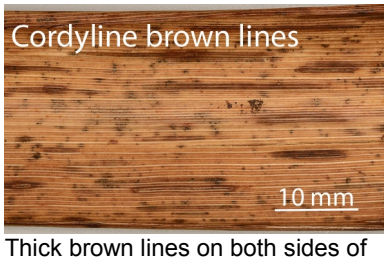
Dead leaves on the ground

Large leaf spots with dark outside and pale centre, on both sides of live and dead leaves. Cause unknown. **131 F**

Oval leaf spots on dead suspended leaves. Spot have a dark centre. Causal organism unknown. **50 F**

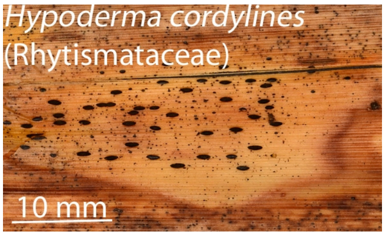
Oval leaf spots on dead suspended leaves. Spot have a dark centre. Causal organism unknown. **50 F**

Thick brown lines on both sides of leaves, usually associated with elongated orange/yellow areas. Causal organism unknown. **85 F**



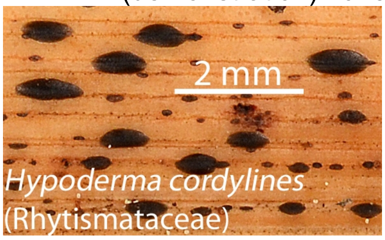
Thick brown lines on both sides of leaves, usually associated with elongated orange/yellow areas. Causal organism unknown. **85 F**

More on next page

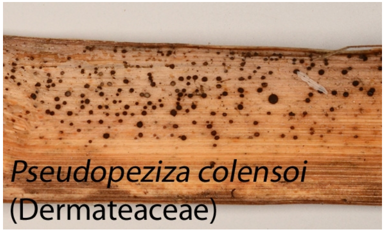


Black ellipses with long split, on fallen dead leaves. Present in winter.
Fungus (Ascomycota) **114 F**

Black ellipses with long split, on fallen dead leaves. Present in winter.
Fungus (Ascomycota) **114 F**



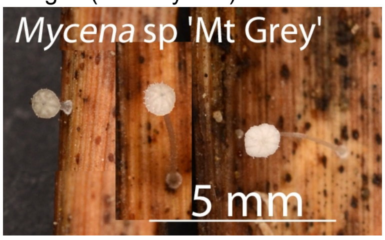
Black ellipses with long split, on fallen dead leaves. Present in winter.
Fungus (Ascomycota) **114 F**



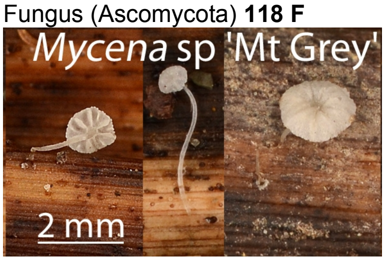
Tiny grey caps from black pustules on recently dropped dead leaves. Present in winter.
Fungus (Ascomycota) **118 F**

Tiny grey caps from black pustules on recently dropped dead leaves. Present in winter.
Fungus (Ascomycota) **118 F**

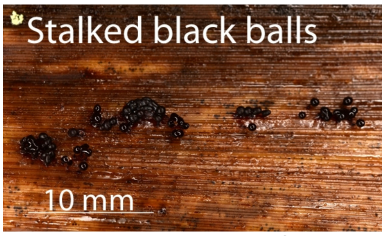
Tiny grey caps from black pustules on recently dropped dead leaves. Present in winter.
Fungus (Ascomycota) **118 F**



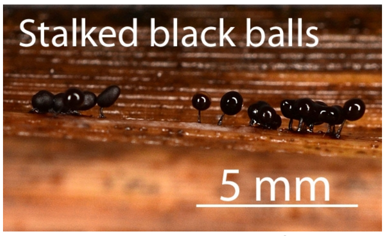
Small white cap with tiny spines, gills and long thin stalk; present on dead leaves on the ground. Present in winter.
Fungus (Basidiomycota). **84 F**



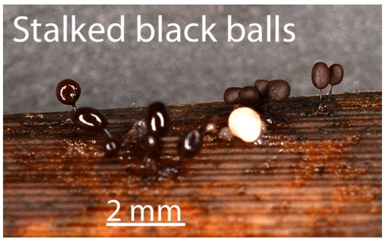
Small white cap with tiny spines, gills and long thin stalk; present on dead leaves on the ground. Present in winter.
Fungus (Basidiomycota). **84 F**



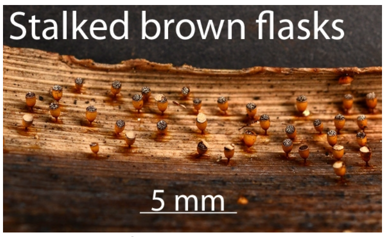
Tiny black oval bodies on fine stalks. Present in winter.
Slime mould. **69 F**



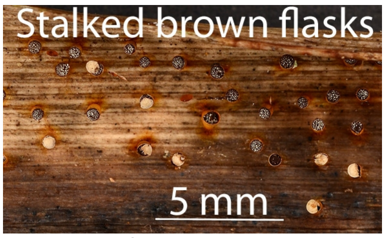
Tiny black oval bodies on fine stalks. Present in winter.
Slime mould. **69 F**



Tiny black oval bodies on fine stalks. Present in winter.
Slime mould. **69 F**



Tiny brown flask-shaped bodies on fine stalks, lid may be on or off. Present in winter.
Slime mould. **90 F**



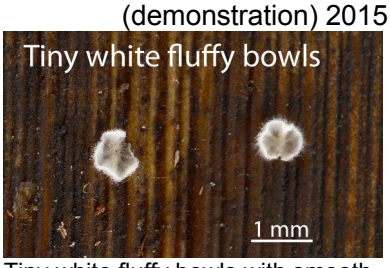
Tiny brown flask-shaped bodies on fine stalks, lid may be on or off. Present in winter.
Slime mould. **90 F**

Tiny brown flask-shaped bodies on fine stalks, lid may be on or off. Present in winter.
Slime mould. **90 F**

More on next page

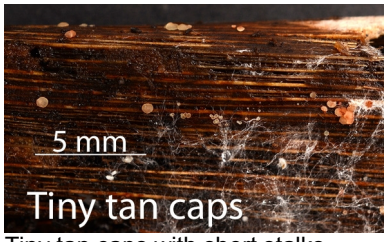
Tiny white fluffy bowls with smooth interior. Present in winter.
Fungus not identified. **70 F**

Tiny white fluffy bowls with smooth interior. Present in winter.
Fungus not identified. **70 F**

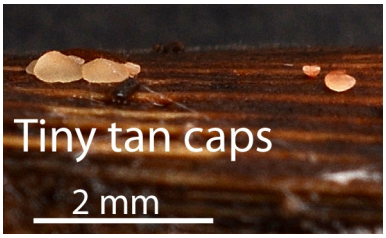


Tiny white fluffy bowls with smooth interior. Present in winter.
Fungus not identified. **70 F**

Tiny tan caps with short stalks.
Present in winter.
Fungus not identified. **67 F**



Tiny tan caps with short stalks.
Present in winter.
Fungus not identified. **67 F**



Tiny tan caps with short stalks.
Present in winter.
Fungus not identified. **67 F**

Trunk

Phloeococcus cordylinidis. Scale insect living in bark crevices on trunk, female without sac, but with a little white wax, present all year.
Felted scale (Eriococcidae) **809**

* = adventive species (herbivores from other countries)

Other host associations are in the Plant-SyNZ database (August 2014)
All plant-herbivore host associations are recorded in the database plant-synz.landcareresearch.co.nz/SearchForm.aspx

How Plant-SyNZ™ demonstration identification charts can be used
Cabbage trees are present in native habitats, parks, gardens and school grounds. The identification charts can be used to compare the fauna and fungi on plants in different habitats (e.g. school grounds and native plant reserve) different parts of the same place (e.g. school grounds) or different native plant reserves. They can also be used to compare what is found on the plants at different times of year. If there are extensive areas of the plants to be surveyed, it is a good idea examine several areas separately and intensively rather than trying to examine all the plants in one go.

For students, teachers may wish to print just the first page of the chart for the plant being surveyed and have a copy of the full chart so that they can answer any questions about other organisms that might be found.

The identification chart comes with a matching recording sheet. These can be printed and given to students. A separate recording sheet should be used for each habitat. Each organism is only recorded once per sheet. This results in a species list for each habitat.

If a measure of the relative abundance of organism is wanted, divide the area into several plots and record the presence of organism in each plot. Then count the number of plots in which each organism is found.

Older and more experienced students could use the 'Standard Level' identification charts.

New associations
The host associations illustrated and listed here are those known when this identification guide was compiled. New host associations are likely to be discovered. If invertebrates and/or plant damage are found that may be a new association, send specimens of the insects and plants to

Dr Nicholas Martin, Landcare Research,
By post to: Private Bag 92170, Auckland 1142, or
Courier to: Landcare Research, 231 Morrin Road, St Johns, Auckland 1072
If possible contact (0-9-574 4105, email: martinn@landcareresearch.co.nz) before sending.

Level of expertise
This version is suitable for students. A 10x hand lens is useful but not essential to confirm the presence of some invertebrates. Versions of this identification guide that are suitable for experts (botanists and entomologists) and non-experts are available. The identification guide and the accompanying recording sheets can be obtained from Dr Martin (see above) or from the Plant-SyNZ web site, http://plant-synz.landcareresearch.co.nz/index.asp.

Identification of *Cordyline australis* (G.Forst.) Endl. (Asparagaceae)
This information is provided on the assumption that the plant species in the habitat are known and that the species of interest can be distinguished from closely related species in the habitat being surveyed. The most reliable way to distinguish *Cordyline australis* from other cabbage tree species is the form of the trunk and leaves. *Cordyline australis* leaves are 0.5-1m long and 4-6 cm wide and have a short petiole (leaf stalk). Plants may have one stem when young and a thicker multiple branching trunk when older. Plants do no not usually flower until one or more metres tall.


Cabbage tree showing a typical thick trunk.


Low growing leafy shoots of cabbage trees.

Information about herbivores associated with *Cordyline australis*
Separate internet factsheets have been produced about some of the invertebrate herbivores associated with each plant species. These will have pictures of the different life stages, more pictures of the damage to plants, and information about their life cycle and distribution in New Zealand. Information about natural enemies (parasites, pathogens and predators) will be included if known.
The factsheet series, Interesting Insects and other Invertebrates, is available at nzacfactsheets.landcareresearch.co.nz/Index.html.

Acknowledgement
RC Henderson for photograph of *Hemiberlesia lataniae, Pseudaulacaspis brimblecombei* and *Pseudaulacaspis eugeniae.*

Please send feedback to:
Nicholas Martin:
Email: martinn@landcareresearch.co.nz
Post: Landcare Research, Private Bag 92170,Auckland 1142

Please send us your feedback with comments on what you like and ideas for improvements. Comments are particularly welcome on the layout and arrangement of the photographs, the selection of photographs for the level of expertise you have used, and the text under each photograph.

Questions.

1. Is the selection of organisms suitable for this level of expertise?
    a. Should any be listed as 'May be found'?
    b. Should any be moved to the first section, expected to be found?
2. Are the photographs suitable?
    a. Should any photographs be changed for better ones?
    b. Should any photographs be deleted?
3. Is the arrangement and order of the photographs suitable?
    a. Should any photograph be moved to be nearer another, if so which one and where?
4. Are the captions for each photographs adequate?
    a. Please suggest any that need improvement.
5. Is the use of numbers for each organism a suitable link between the pictorial identification guide and the recording sheet?