Plant pest biosecurity sheets

These plant pest biosecurity information sheets were produced as part of the PHC funded project titled **'Improving the accessibility of notifiable plant pest information for Professional Operators'**.

The sheets help professional plants-people (growers, landscapers, retailers, tree specialists, etc.) to create pest risk analyses of their sites and operations. The 'Key measures to protect my site' sections provide information on pest risk management from the requirements of the Plant Health Management Standard.

The pests included are the **22 priority pests** from the UK Statutory Instruments > 2020 NO. 1482 > Schedule 1 and **17 pests with a mitigated risk rating of 60 or above**, UK Plant Health Risk Register (as of Nov 2023)

PHC Project report

Plant Health Centre
Scotland's Centre of Expertise

ROYAL BOTANIC GARDEN EDINBURGH

Plant Healthy

Scottish Government
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Department for Environment Food & Rural Affairs

Plant Health Management Standard

CONTENTS and Key: ● = GB priority pests ○ = Risk Register Mitigated Risk Rating 60 or above (Nov 2023)

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Xylella fastidiosa (Xylella)

Which plant hosts are effected?
More than 600 hosts are known for Xylella. The more high-risk hosts are coffee, *Polygala myrtifolia, Lavandula* (lavender), *Nerium oleander, Rosmarinus officinalis* (rosemary), *Prunus dulcis* (cherry) and *Olea europaea* (olive).

What do I need to look for?

- Symptoms vary depending on the host plant species and its degree of susceptibility, but include:
- Marginal leaf scorch
- Wilting of foliage
- Withering of branches
- Severe infections can result in dieback, stunting and eventual death, especially in a particularly susceptible host species, for example, olive trees or grape vines.
- On plane (*Platanus* spp.), maple (*Acer* spp.), oak (*Quercus* spp.) and elm (*Ulmus* spp.) trees the symptoms include leaf scorch, sometimes also with dieback of twigs and branches. Characteristic leaf symptoms in summer on trees includes browning at the leaf margins (but not along the main veins), and there is often a yellow edge to the browned areas.

What statutory actions are in place?
A regulated quarantine pest. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Insect vectors

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Regularly monitor susceptible host species for symptoms of the presence of plant pests (PHMS 8.1)

Symptoms on *Polygala myrtifolia*. D. Boscia, EPPO.

Symptoms on *Nerium oleander*. D. Boscia, EPPO.

Symptoms on cherry. D. Boscia, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

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Phytophthora ramorum

Which plant hosts are effected?
There are more than 150 known hosts for *P. ramorum* including many commonly traded species such as *Viburnum, Rhododendron, Magnolia* and *Pieris*.

What do I need to look for?

- Black regions on leaf petioles which extend into the leaf along the midrib on species such as Rhododendron and Pieris.
- The regions spread until the entire branch is dead, often forming a 'shepherd's crook'.
- Black, weeping cankers on branches and stems of infected plants.
- The inner bark under the bleeding areas is usually discoloured and dying.
- On mature trees, black bleeding patches on the trunk and dieback of the crown.

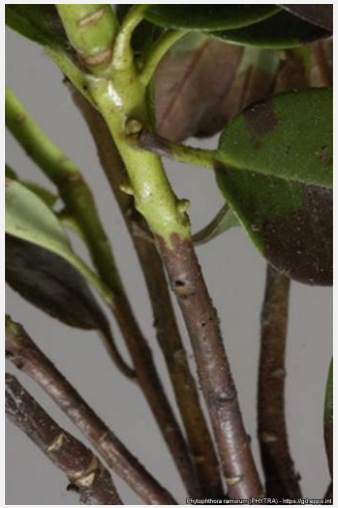
What statutory actions are in place?
A regulated quarantine pest. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Non-squared wood
- Bark
- Soil/growing medium

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Assess soil and growing media for the potential to harbour pests and minimise the risk accordingly (PHMS 6.2)



Rhododendron shoot canker. FERA

Rhododendron leaf necrosis of midrib from petiole. FERA

Viburnum leaf tip necrosis. FERA

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

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Agrilus planipennis (Emerald Ash Borer)

Which plant hosts are effected?

Most *Fraxinus* species (ash) are susceptible as well as *Juglans ailantifolia* var. *ailantifolia*, *Juglans mandshurica*, *Pterocarya rhoifolia* and *Ulmus davidiana*.

What do I need to look for?

- A small (7.5mm - 13.5mm long), slender, metallic green beetle.
- Ash branches dieback from the top of the tree and the foliage yellows.
- Bark fissures between 5 and 10cms long form where the bark is responding to larval feeding beneath.
- Newly emerged adults bore 'D'-shaped exit holes (3-4 mm diameter) on trunks and branches.
- Basal sprouting and the presence of woodpeckers may indicate wood-boring beetle activity.
- After 1 to 2 years of infestation, the bark often falls off in pieces from damaged trees, exposing the insect galleries.

What statutory actions are in place?

A regulated quarantine pest. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Firewood
- Wood and wood products
- Squared wood
- Non-squared wood
- Wood packaging material
- Bark

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Ensure that all relevant Wood Packaging Material meets the ISPM 15 (PHMS 1.7)

A. Planipennis adult. Eduard Jendek, EPPO.

Flat and broad larva. Eduard Jendek, EPPO.

'D' shaped exit hole. Eduard Jendek, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

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Agrilus anxius (Bronze birch borer)

Which plant hosts are effected?

All birch species (*Betula*). Particularly, but not exclusively, from North America (Canada and the U.S.).

What do I need to look for?

- A small, narrow, metallic copper-coloured beetle between 7 and 12mm long.
- Leaf yellowing in summer and branch dieback appear in the upper crown of the tree.
- Rust-coloured sap oozing, and staining, can also appear on the outer bark, along with swellings and bumps where the tree has healed inside.
- Emerging adults bore 3 to 5mm-wide 'D'-shaped exit holes in the bark. Sinuous larval galleries can also be found under the bark.

What statutory actions are in place?

A regulated quarantine pest. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Firewood, wood and wood products, non-squared wood
- Plant parts and plant products

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Risk assess all relevant plant products and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

Callus tissue over a gallery. Steven Katovich, EPPO.

Adult and 'D' shaped exit hole.
Eduard Jendek, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

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Agrilus bilineatus (Two-lined chestnut borer)

Which plant hosts are effected?
Oak species (*Quercus*), including native oaks, and American chestnut (*Castanea dentata*).

What do I need to look for?
- The adults are most likely to be seen in late spring and early summer.
- They are between 6 to 12mm (0.2-0.5 inches) long, slender and black with a light, yellowish stripe on each wing cover.
- The larvae are white, slender, flattened, and about 25mm (1 inch) long, with two spines at the rear end.
- D-shaped 'exit' holes in the bark where the adult beetles emerge after pupation are also a sign of infestation although these can also be made by other Agrilus species.

What statutory actions are in place?
A regulated quarantine pest. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:
- Plants for planting (except seeds bulbs and tubers)
- Non-squared wood
- Wood packaging material

Key measures to protect my site:
- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Ensure that all relevant Wood Packaging Material meets the ISPM 15 (PHMS 1.7)

Adult beetle. D. L. Miller, EPPO.

Larval galleries in *Quercus ellipsoidalis*. S. Katovich, EPPO.

4th instar larva. S. Katovich, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

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Agrilus biguttatus (oak jewel beetle)

Which plant hosts are effected?
Oak (*Quercus*). A native beetle which is protected under the Wildlife & Countryside Act 1981. Therefore, it should not be controlled. May play some role in acute oak decline but yet to be clarified.

What do I need to look for?

- Adults are iridescent green/blue or bronzy/green and 10-13mm (0.4-0.5 inches) long.
- They have two distinctive white spots on the wing-cases.
- Usually found in mature trees which are already declining.
- D-shaped 'exit' holes on the trunks of trees.

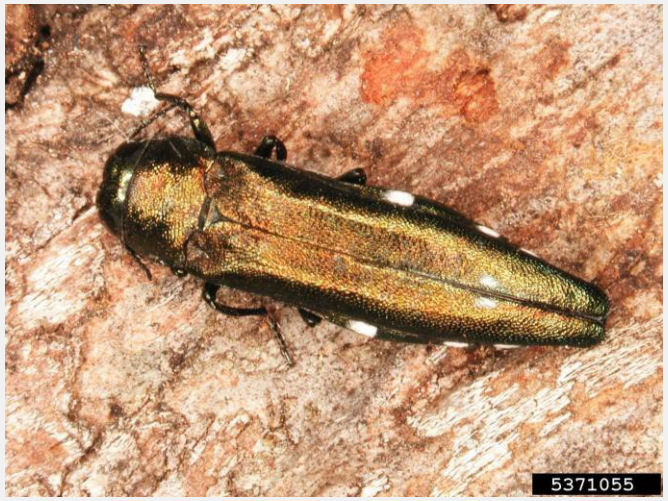
What statutory actions are in place?
Not regulated due to its natural presence.

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Non-squared wood
- Firewood
- Natural spread

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Based on the pest's lifecycle, periodically assess host plant species surrounding the site (PHMS 6.7)



Adult beetle. Forest Research

Adult beetle. Forest Research

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

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Acute oak decline

Which plant hosts are effected?
Quercus species (*Quercus cerris, Quercus ilex, Quercus petraea, Quercus pyrenaica* and *Quercus robur*)

What do I need to look for?
- Thinning tree canopy.
- Dark-coloured, vertical, weeping fissures, which seep black fluid through vertical cracks between bark plates and down the trunk.

What statutory actions are in place?
Not regulated. However, if you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:
- Squared wood
- Non-squared wood

Key measures to protect my site:
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Regularly monitor susceptible host species for symptoms of the presence of plant pests (PHMS 8.1)

Bleeding on oak trunk.
Forest Research

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Thaumetopoea processionea (Oak Processionary Moth, OPM)

Which plant hosts are effected?
Arrived in the UK initially in 2007 but has been intercepted several times since. Exclusive to oak trees (saplings) of any age but larger older specimen trees require particular close examination for eggs on the outer branches.

What do I need to look for?

- The caterpillars of this moth cause allergic reactions in people and animals.
- They live almost exclusively in oak trees.
- They often cluster together.
- They move about in nose-to-tail processions on the trees or on the ground beneath the trees in winter and early spring.
- They form white, silken nests, which the caterpillars build on oak trunks. They soon discolour to brown.
- The eggs are laid in rectangular blocks known as ‘plaques’ on outer branches of oak trees. They can be difficult to spot.

What statutory actions are in place?

A regulated quarantine pest in Great Britain (known to occur in the country) and a regulated protected zone quarantine pest in Northern Ireland. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Roundwood of oak with bark present

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

An OPM nest. Wietse den Hartog, EPPO.


An OPM caterpillar. The Tree Council


An OPM egg plaque. Gyorgy Csoka

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

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Thaumetopoea pityocampa (Pine processionary moth)

Which plant hosts are effected?

Most pine species (*Pinus*), cedars (*Cedrus*), and larch (*Larix decidua*).

What do I need to look for?

- The caterpillars of this moth cause allergic reactions in people and animals.
- They are hairy and coloured orange-brown with blue bands.
- They move about in nose-to-tail processions on the trees or on the ground beneath the trees in winter and early spring.
- They form white, silken nests, which the caterpillars build among the foliage in January. These nests can be as big as a football on larger trees.
- The eggs are in the form of cylindrical masses along the bases of needles.

What statutory actions are in place?

A regulated quarantine pest in Great Britain and a regulated protected zone quarantine pest in Northern Ireland. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

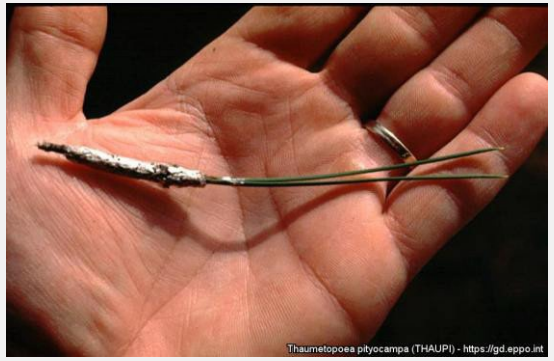
- Plants for planting (except seeds bulbs and tubers)
- Wood and wood products
- Vehicles/containers
- Soil/growing medium
- Natural spread

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Risk assess all vehicles and machinery and ensure they are appropriately cleaned before they arrive on site or move between sites (PHMS 4.1 & 6.5)

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Winter nest. D.D. Cadahía, EPPO.



Egg mass on pine. Boris Hrasovec, EPPO.

Processing caterpillars. Ilya Mityushev, EPPO.

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Anoplophora glabripennis (Asian longhorn beetle)

Which plant hosts are effected?
Many broadleaf tree species including *Acer, Aesculus, Alnus, Betula, Carpinus, Cercidiphyllum, Corylus, Fagus, Fraxinus, Koelreuteria, Malus, Morus, Platanus, Populus, Prunus, Pyrus, Salix, Tilia* and *Ulmus*.

What do I need to look for?

- A very large beetle, about 20 to 40mm long, with black and white markings.
- The antennae, or 'horns', are up to twice the body length and coloured black with white or light blue bands.
- Large, circular 'exit' holes, around 10 mm in diameter, on the main trunk or branches.
- Shredded wood or sawdust associated with the exit holes (this may be piled on branches below or on the ground at the base of the tree).
- Very similar to *Anoplophora chinensis* (the citrus longhorn beetle) – see *A. chinensis* factsheet.

What statutory actions are in place?
A regulated quarantine pest; also regulated by emergency measures. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Wood and wood products
- Wood packaging material

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Ensure that all relevant Wood Packaging Material meets the ISPM 15 (PHMS 1.7)

A. glabripennis Adult. M. Maspero, EPPO.

A. glabripennis larvae. M. Maspero, EPPO.

A. glabripennis exit holes. F. Hérard, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

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Anoplophora chinensis (Citrus Longhorn Beetle)

Which plant hosts are effected?
A very wide host range of frequently traded species including *Acer, Aesculus, Alnus, Betula, Carpinus, Citrus, Cornus, Corylus, Cotoneaster, Crataegus, Cryptomeria, Fagus, Ficus, Hibiscus, Juglans, Lagerstroemia, Malus, Platanus, Populus, Prunus, Pyrus, Rosa, Salix, Ulmus* and *Vaccinium*.

What do I need to look for?

- Adult beetles are large (21mm in length for males to 37mm for females) with black and white markings.
- The antennae, or 'horns', are longer than their bodies (between 1.2 and two times the body length) and are black with white or light blue bands.
- They are very similar in appearance to the related Asian longhorn beetle (*Anoplophora glabripennis*) – see *A. glabripennis* factsheet

What statutory actions are in place?

A regulated quarantine pest and regulated by emergency measures. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Cut flowers or branches

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all branch wood and relevant wood products and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

Adult beetle. EPPO.


Vertical section through a gallery. Dominic Eyre, EPPO.

Exit holes. M. Maspero, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

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Ceratocystis platani (Plane Wilt)

Which plant hosts are effected?
Plane trees (*Platanus*), specifically *Platanus occidentalis, Platanus orientalis* and *Platanus* x *acerifolia*.

What do I need to look for?

- Severe wilting and yellowing (chlorosis) of the leaves, and tree death.
- Sunken lesions on thin-barked trees, with orange/purple streaking around the margin.
- In thicker-barked trees the only external signs of cankering may be vertical cracks.
- When the bark is removed, leopard-like dots (brown to dark violet) appear in the outer wood.
- In cross-section through infected branches bluish-black discoloration in the wood can be visible extending radially into affected branches or stems.

What statutory actions are in place?

A regulated quarantine pest. If you suspect the presence of this disease on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Wood packaging material
- Soil/growing medium
- Water
- Hitchhiking
- Agricultural machinery

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Ensure that all relevant Wood Packaging Material meets the ISPM 15 (PHMS 1.7)
- Risk assess all vehicles and machinery and ensure they are appropriately cleaned before they arrive on site or move between sites (PHMS 4.1 & 6.5)

Infected trees often dieback on one side. M. Guerin, EPPO.

Dark streaks due to *C. platani*. A. Vigouroux, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

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Aromia bungii (Red-necked longhorn beetle)

Which plant hosts are effected?

Prunus are particularly high-risk hosts but there are many others including *Bambusa, Diospyros, Juglans, Olea, Populus, Prunus, Pterocarya, Punica, Pyrus, Quercus, Schima* and *Zanthoxylum*.

What do I need to look for?

- These beetles are 22-38 mm in length and elongate, about 4 times longer than wide.
- They are shiny and blue-black except for the pronotum (section just behind the head), which is usually distinctively bright red.
- The pronotum bears a pair of stout, spine-like lateral tubercles.
- The antennae are as long, or slightly longer than the body and uniformly black.
- As with many other longhorn species the male tends to be smaller, with proportionally longer antennae, than the female.
- An entirely black form of this pest has been reported in Italy.

What statutory actions are in place?

A regulated quarantine pest. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Wood and wood products
- Wood packaging material

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Ensure that all relevant Wood Packaging Material meets the ISPM 15 (PHMS 1.7)

Adult beetle. R. Griffo, EPPO.

Larva of A. bungii. R. Griffo, EPPO.

Larva inside wood. M. Maspero, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

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Fusarium circinatum (Pitch canker of pine)

Which plant hosts are effected?
A serious disease of pine (*Pinus*).

What do I need to look for?
- Causes damping-off in seedlings (although these can also be caused by other agents).
- Needles turn red, brown or chlorotic (pale, yellow, or yellow-white), and die from the base upwards, or the entire seedling dies.

In trees:
- Yellowing of the needles, which turn red in time and finally drop.
- Dieback of the shoots from the tip, occasionally producing 'shepherd's crook' symptoms.
- Repeated infections may result in significant crown dieback.
- Cankers might appear on the shoots, on the main branches and trunk, associated with conspicuous resin exudate (pitch).
- The cankers can cause varying levels of trunk deformation and can eventually girdle branches and trunks.

What statutory actions are in place?
A regulated quarantine pest. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:
- Plants for planting (except seeds bulbs and tubers)
- Cut flowers or branches
- Seeds
- Bark; Non-squared wood; Squared wood; Woodchip

Key measures to protect my site:
- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Risk assess all sources of bark and branch wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

F. circinatum infection. Miloň Dvořák, EPPO.

F. circinatum infection on foliage. Forest Research.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

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Ips typographus (Larger eight-toothed European spruce bark beetle)

Which plant hosts are effected?
A serious pest of coniferous trees, first discovered in Southern England in 2018. Specific species effected include *Abies, Larix, Picea, Pinus* and *Pseudotsuga*.

What do I need to look for?

- Black or brownish-black beetles which are usually 4.0 – 5.5 mm long, cylindrical and robust.
- They are often associated with windblown, damaged and recently-felled spruce trees, where they build up numbers before moving on to attack adjacent live trees.
- Also known as 'engraver' beetles because of the 'engraved' appearance of the galleries.
- Larval galleries radiate outward from linear galleries becoming wider as the larvae grow and burrow along. This gallery pattern is unique to this species.

What statutory actions are in place?
Regulated quarantine pest (Great Britain). Regulated protected zone quarantine pest (Northern Ireland). If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Non-squared wood

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

I. Typographus adult. Gilles San Martin, EPPO.

Adults overwintering under spruce bark. Iris Bernardinelli, EPPO.


Galleries and larvae. EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

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Ips amitinus (small spruce bark beetle)

Which plant hosts are effected?
Coniferous trees commonly used in forestry, including *Abies, Larix, Picea* and *Pinus*.

What do I need to look for?

- Beetles are dark-brown and 3.5 - 5.0 mm long.
- Prefers to breed in smaller-sized material, often in the upper part of weakened trees.
- Can occasionally mass-attack healthy trees, when population densities are high.
- Larval galleries are found beneath the bark in stem sections 2-27 cm in diameter although sections 8-15 cm in diameter are most frequently colonized.
- Sections with 2-3 mm thick bark are preferred.

What statutory actions are in place?
A regulated quarantine pest in Great Britain and a regulated protected zone quarantine pest in Northern Ireland. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Non-squared wood

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

Adult *I. amitinus*. Ivan Andreevich, EPPO

Side view of *I. amitinus*. Ivan Andreevich, EPPO

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Ips duplicatus (double-spined bark beetle)

Which plant hosts are effected?
Coniferous trees commonly used in forestry, including Abies, Larix, Picea and Pinus.

What do I need to look for?

- Adults are small (2.8-4 mm long), cylindrical, dark-brown, shiny and hairy.
- The larvae are 4.5-5.5 mm long, white, cylindrical and legless, with small, brown, chitinous heads and brown mandibles.
- Trees have discoloured crowns.
- The needles are lighter in colour, form mats and often fall to the ground green.
- The frass (light-brown sawdust) can be found on the bark, on the basal part of the stems of standing trees.
- Woodpeckers often break off the bark of attacked stems whilst hunting for larvae.

What statutory actions are in place?
A regulated quarantine pest in Great Britain and a regulated protected zone quarantine pest in Northern Ireland. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Non-squared wood

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

Adult beetle. Bugwood.org

Larval galleries. J. Liska, Bugwood.org

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Xylosandrus germanus (Black timber bark beetle)

Which plant hosts are effected?
A wide range of tree species including *Abies, Acer, Alnus, Betula, Camellia, Carpinus, Carya, Castanea, Cornus, Corylus, Fraxinus, Juglans, Magnolia, Picea, Pinus, Populus, Prunus, Pseudotsuga, Quercus, Salix, Styrax, Ulmus, Vitis* and *Fagus*.

What do I need to look for?

- Small, black beetles, 2.0-2.3 mm long, 2.3 times as long as wide.
- The beetle's galleries are relatively shallow in the wood.
- The inoculated ambrosia fungus associated with the beetle stains the timber around the infestation.
- Symptoms in healthy infested trees include top dieback, profuse basal epicormic sprouting and a reduction in tree growth.

What statutory actions are in place?
No statutory actions currently in place. However, if you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Squared wood
- Non-squared wood
- Wood packaging material
- Bark
- Natural spread

- Cut flowers or branches

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Ensure that all relevant Wood Packaging Material meets the ISPM 15 (PHMS 1.7)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

X. germanus adult. CABI

X. germanus adult. CABI

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Dendroctonus valens (red turpentine beetle)

Which plant hosts are effected?
Many coniferous species which are of importance to forestry including larch (*Larix*), spruce (*Picea*) and pine (*Pinus*).

What do I need to look for?

- Adult beetles are 6 to 10 mm long and about twice as long as wide.
- When adults first emerge from the pupa they are tan, but they soon turn dark reddish-brown.
- On living trees, the beetles are usually only found excavating holes on the lower part of the tree, within a metre or two of the ground.
- Galleries are formed under the bark in the lower part of the trunk and the upper part of the root system.
- The beetles hibernate in the roots in winter.
- In spring, the beetles bore their way out of the trunk and disperse leaving small exit holes in the bark.

What statutory actions are in place?
A regulated quarantine pest. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Squared wood
- Non-squared wood
- Wood packaging material
- Woodchip and Bark
- Cut flowers or branches

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Ensure that all relevant Wood Packaging Material meets the ISPM 15 (PHMS 1.7)

Adult beetle. CABI

Larva. Donald Owen, California Department of Forestry and Fire Protection.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Heterobasidion irregulare

Which plant hosts are effected?
Many coniferous species which are of importance to forestry including larch (*Larix*), spruce (*Picea*) and pine (*Pinus*). Additional hosts include juniper (*Juniperus*) and western red cedar (*Thuja*).

What do I need to look for?

Above-ground symptoms:

- The formation of white mycelia between bark scales followed by fruit bodies that usually form at the base of the tree or stump.
- Reduced height growth.
- Patches of dead and declining trees.
- Wind-thrown trees.
- Reduced shoot and diameter growth.
- Resin-soaking at the root collar.
- The crown may become thin and foliage becomes chlorotic.
- Patches of old dead trees surrounded by progressively newer dead, chlorotic, then healthy trees, usually in a circular area. This is a result of the pathogen moving outward from an initial infection.

Below-ground symptoms include:

- Excessive pitch production
- Stringy, white root decay
- Root lesions.

What statutory actions are in place?
A provisional quarantine pest in Great Britain. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Squared wood
- Non-squared wood
- Wood packaging material

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Ensure that all relevant Wood Packaging Material meets the ISPM 15 (PHMS 1.7)

Fruiting bodies of *H. irregulare*. Angelo Mazzaglia, EPPO

Pine trees killed by *H. irregulare* in Italy. Angelo Mazzaglia, EPPO

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Sirococcus tsugae

Which plant hosts are effected?
Cedars (*Cedrus, Cedrus atlantica, Cedrus deodara*) and hemlocks (*Tsuga, Tsuga canadensis, Tsuga heterophylla, Tsuga mertensiana*).

What do I need to look for?

- Affected trees have dead needles on the shoots, dead shoots, cankers and resin exudation.
- The dead needles are very distinctive as they have a characteristic 'pink' colour, later becoming brown.
- The fruiting bodies may be observed on the dead needles.
- Branches die as they become girdled.
- Brown lesions are evident in the phloem tissue of the bark, these can spread from branches into the main stem, where they can spread longitudinally.

What statutory actions are in place?
An EPPO Alert is in place for this disease. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Seeds
- Cut flowers or branches

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess seed sources and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)
- Risk assess all relevant plant products (e.g. branch wood) and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

Infected *Cedrus atlantica*. Thomas Brand, EPPO.

Infected *Cedrus atlantica*. Thomas Brand, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Lonsdalea populi

Which plant hosts are effected?
Populus species and hybrids such as *Populus* x *canadensis*. *Salix matsudana* is also recorded as a host.

What do I need to look for?
- The bark of symptomatic poplar trees becomes vertically cracked.
- Copious white frothy fluid and creamy slime comes out of the cracks.
- Yellowing foliage.
- Severely affected trees can die after few years.

What statutory actions are in place?
A provisional quarantine pest in Great Britain. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:
- Plants for planting (except seeds bulbs and tubers)
- Non-squared wood

Key measures to protect my site:
- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Corythucha arcuata (oak lace bug)

Which plant hosts are effected?
Species of chestnut (*Castanea*) and oak (*Quercus*).

What do I need to look for?

- Adults are distinctive with their delicate, milk-white, lacy wings with variable brown markings. They can grow to 4mm long and have rectangular wings.
- Small, yellow spots form on the upper surfaces of leaves, often concentrated around the leaf veins.
- The yellow spots coalesce into large yellow and bronze areas on the affected leaves as the population increases.
- Leaves fall prematurely.
- Damage to the leaves is visible during summer and tends to progress from July to September.
- Droplets of liquid frass (droppings) can be seen on the undersides of leaves. These dry out into hard, black spots.

What statutory actions are in place?
There are currently no statutory actions for this pest. However, if you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Regularly monitor susceptible host species for symptoms of the presence of plant pests (PHMS 8.1)

Adult oak lace bug. Gilles San Martin, EPPO.

Empty egg cases. Varga András, EPPO.

Symptoms on oak. Varga András, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Chryseococcus arecae (Golden root mealybug)

Which plant hosts are effected?

This pest can survive outdoors year-round in pots and in the ground in all parts of the UK. It feeds on a very wide range of ornamental and crop plants from at least 54 different genera in 29 families. In the UK it seems to favour *Meconopsis* spp. and *Primula* ssp. but has been found on many common garden plants, weeds (e.g., nettles) and crops.

What do I need to look for?

- Adults are broadly-oval, very small (2-3mm long) with a bright golden wax dusting and black legs.
- Sometimes the bright golden wax dusting can be seen around the base of plants above ground, but pots need to be turned out to fully check for this pest.

What statutory actions are in place?

If you suspect the presence of this pest on your premises you should contact the Plant Health authorities for guidance (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting
- The exchange of plants between private and public collections
- Growing media and soil

Key measures to protect my site:

- Source plants from nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- This includes taking plants out of their pots to inspect the roots for evidence of infestation.
- Any infested plants should be destroyed or returned to the original supplier.

Adult *C. arecae* on the roots of a potted plant. RBGE

Above ground evidence of *C. arecae* infestation (potted plant). RBGE

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Bactericera cockerelli (potato psyllid)

Which plant hosts are effected?

Has been found several times on plants imported from Mexico. Hosts include potato plants (*Solanum tuberosum*), tomato (*S. lycopersicum*), pepper (*Capsicum annum*), aubergine (*S. melongena*) and other solanaceous hosts.

What do I need to look for?

- A small psyllid (about 2.75mm long) which varies in colour from pale green to dark brown.
- An important vector of the bacterium *Candidatus* Liberibacter solanacearum (LSO), which causes 'Zebra Chip' disease. Symptoms in potato and tomato include:
- Delayed growth.
- Erectness of new foliage.
- Chlorosis and purpling of new foliage with leaf basal cupping and upward rolling throughout the plant.
- Shortened and thickened terminal internodes resulting in resetting.
- Enlarged nodes.
- Axillary branches or aerial potato tubers.
- Disruption of fruit set, and production of numerous small fruits of poor quality.
- See *Candidatus* Liberibacter solanacearum factsheet.

What statutory actions are in place?

A regulated quarantine pest. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Fruit or vegetables
- Plants for planting (except seeds bulbs and tubers)

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)

B. Cockerelli nymph. Defra

B. Cockerelli adult. Defra

Infected potatoes. Joseph E. Munyaneza, USDA

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Clavibacter sepedonicus (Bacterial ring rot of potato)

Which plant hosts are effected?
The Solanaceae family are effected, including potato, tomato and aubergine (*Solanum*), peppers (*Capsicum*) and tobacco (*Nicotiana*).

What do I need to look for?

- Infections of ring rot can often be symptomless.
- The disease can cause plants to wilt but symptoms are much more likely to be observed in infected tubers.
- In the early stages the tissues around the vascular ring appear glassy and water soaked when tubers are cut across the heel end.
- As infection progresses the vascular ring becomes discoloured and a soft cheese like rot develops around the vascular ring (hence the name "ring" rot).
- The skin of the potato may appear slightly sunken, dry and cracked, the tubers may also start to mummify.
- Infected tubers can also be invaded by secondary pathogens leading to complete breakdown of the tuber.

What statutory actions are in place?
A regulated quarantine pest. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Bulbs or tubers
- Packing cases

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all packaging cases and minimise risk accordingly and carefully inspect packaging upon its arrival (PHMS 4.1 & 7.1)

Symptoms on a potato plant. J.D. Janse, EPPO

Positive eggplant test. CSL, EPPO

Potato tuber infected by ring rot. CSL, EPPO

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Epitrix cucumeris (Potato flea beetle)

Which plant hosts are effected?

The Solanaceae family are effected, including potato, tomato and aubergine (*Solanum*), peppers (*Capsicum*), tobacco (*Nicotiana*), Petunia hybrids (*Petunia* x *hybrida*), and *Physalis*.

What do I need to look for?

- Potato flea beetles are dark, tiny (1.5-2.0 mm long), oval, convex and hairy.
- It is most likely therefore that they will be discovered by the damage they cause to potato foliage and tubers.
- The adult beetles feed on the foliage producing small, scattered shot-holes, which can occasionally be so severe as to depress yield.
- The larvae feed on the root system and some species also feed on the tubers, which causes the most serious damage.

What statutory actions are in place?

Regulated quarantine pest (Great Britain). Regulated by emergency measures (Northern Ireland). If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Fruit or vegetables
- Soil/growing medium
- Bulbs or tubers

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Assess soil and growing media for the potential to harbour pests and minimise the risk accordingly (PHMS 6.2)
- Source live plant material, bulbs and tubers from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)

Adult beetle. Jean-François Germain, EPPO.

E. cucumeris damage on potato. Jean-François Germain, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Epitrix papa (Potato flea beetle)

Which plant hosts are effected?
The Solanaceae family are effected, including potato, tomato and aubergine (Solanum), peppers (Capsicum) and tobacco (Nicotiana).

What do I need to look for?

- Potato flea beetles are dark, tiny (1.5-2.0 mm long), oval, convex and hairy.
- It is most likely therefore that they will be discovered by the damage they cause to potato foliage and tubers.
- The adult beetles feed on the foliage producing small, scattered shot-holes, which can occasionally be so severe as to depress yield.
- The larvae feed on the root system and some species also feed on the tubers, which causes the most serious damage.

What statutory actions are in place?

Regulated quarantine pest (Great Britain). Regulated by emergency measures (Northern Ireland). If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Fruit or vegetables
- Plants for planting (except seeds bulbs and tubers)
- Bulbs or tubers

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Source live plant material, bulbs and tubers from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)

Adult beetle. Jean-François Germain, EPPO.

Epitrix spp. damage on potato.
Jean-François Germain, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Epitrix subcrinita (Western potato flea beetle)

Which plant hosts are effected?
The Solanaceae family are effected, including potato, tomato and aubergine (*Solanum*), peppers (*Capsicum*) and tobacco (*Nicotiana*). *Physalis alkekengi* var. franchetii is also named as a host.

What do I need to look for?

- Potato flea beetles are dark, tiny (1.5-2.0 mm long), oval, convex and hairy.
- It is most likely therefore that they will be discovered by the damage they cause to potato foliage and tubers.
- The adult beetles feed on the foliage producing small, scattered shot-holes, which can occasionally be so severe as to depress yield.
- The larvae feed on the root system and some species also feed on the tubers, which causes the most serious damage.

What statutory actions are in place?
Regulated quarantine pest (Great Britain). Regulated by emergency measures (Northern Ireland). If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Fruit or vegetables
- Plants for planting (except seeds bulbs and tubers)
- Bulbs or tubers

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Source live plant material, bulbs and tubers from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)

Adult beetle. Jean-François Germain, EPPO.

Epitrix spp. damage on potato.
Jean-François Germain, EPPO.

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Epitrix tuberis (Tuber potato beetle)

Which plant hosts are effected?
The Solanaceae family are effected, including potato, tomato and aubergine (*Solanum*), peppers (*Capsicum*) and tobacco (*Nicotiana*). *Physalis*, *Petunia* and *Lycium* are also named as hosts.

What do I need to look for

- Potato flea beetles are dark, tiny (1.5-2.0 mm long), oval, convex and hairy.
- It is most likely therefore that they will be discovered by the damage they cause to potato foliage and tubers.
- The adult beetles feed on the foliage producing small, scattered shot-holes, which can occasionally be so severe as to depress yield.
- The larvae feed on the root system and some species also feed on the tubers, which causes the most serious damage.

What statutory actions are in place?
Regulated quarantine pest (Great Britain). Regulated by emergency measures (Northern Ireland). If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Fruit or vegetables
- Soil/growing medium
- Bulbs or tubers

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Assess soil and growing media for the potential to harbour pests and minimise the risk accordingly (PHMS 6.2)
- Source live plant material, bulbs and tubers from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)

Adult beetle. Jean-François Germain, EPPO.

Epitrix spp. damage on potato.
Jean-François Germain, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Leptinotarsa decemlineata (Colorado Beetle)

Which plant hosts are effected?
The Solanaceae family, including *Hyoscyamus niger* (henbane), *Solanum rostratum* (buffalo bur), *Solanum elaeagnifolium* (silverleaf nightshade) tomato, aubergine and potato.

What do I need to look for?

- Wing cases (main body)- Yellow/cream with ten straight black longitudinal stripes (5 on each side, the 5th stripe is narrow and runs along the margin).
- Head and area just behind it- Orange marked with irregularly shaped black spots.
- Antennae (feelers)- Not clubbed (they have no increase in width at the tips).
- Overall appearance - Oval shaped and very shiny. Wing cases cover the whole abdomen.

What statutory actions are in place?
A regulated quarantine pest in Great Britain and a regulated protected zone quarantine pest in Northern Ireland. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Fruit or vegetables
- Hitchhiking

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Risk assess all vehicles and machinery and ensure they are appropriately cleaned before they arrive on site or move between sites (PHMS 4.1 & 6.5)

Adult *L. decemlineata.* Ilya Mityushev, EPPO.

L. Decemlineata larva. Ilya Mityushev, EPPO.

Potato leaf damage. A J William Parr, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Candidatus Liberibacter solanacearum (zebra chip)

Which plant hosts are effected?
Apium graveolens, Capsicum annuum, Capsicum frutescens, Daucus carota, Foeniculum vulgare, Solanum lycopersicum, Pastinaca sativa, Petroselinum crispum, Solanum dulcamara and *Solanum tuberosum.*

What do I need to look for?
Symptoms in potato and tomato include:

- Delayed growth.
- Erectness of new foliage.
- Chlorosis and purpling of new foliage with leaf basal cupping and upward rolling throughout the plant.
- Shortened and thickened terminal internodes resulting in resetting.
- Enlarged nodes.
- Axillary branches or aerial potato tubers.
- Disruption of fruit set, and production of numerous small fruits of poor quality.
- Spread via a small psyllid called *Bactericera cockerelli*.
- See *Bactericera cockerelli* factsheet.

What statutory actions are in place?
A regulated non quarantine pest. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Fruits or vegetables
- Seeds
- Bulbs or tubers

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Source live plant material, bulbs and tubers from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all products made of wood and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

An infected potato. J.E. Munyaneza, EPPO

B. cockerelli adults with eggs. J.E. Munyaneza, EPPO

Infected potato plants. J.E. Munyaneza, EPPO

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

Plant Health Centre
Scotland's Centre of Expertise

Phytophthora infestans (potato late blight)

Which plant hosts are effected?
Solanum lycopersicum and *Solanum tuberosum* (tomato and potato).

What do I need to look for?

- Very young lesions on potato or tomato foliage appear as irregularly shaped, small (2-10 mm) lesions with or without a small surrounding area of collapsed but still green tissue.
- Lesions later turn brown.
- Older lesions are larger and circular, unless delimited by the leaflet margin, and are surrounded by a zone of collapsed tissue that is not yet necrotic. The non-necrotic tissue may also appear somewhat chlorotic.
- If there are many lesions on a single leaflet, the entire leaf can turn chlorotic.
- Patches of infected plants have a characteristic odour.
- Infected potato tubers exhibit wet and dry rots.
- On tomato fruits, lesions are firm, large, irregular, brownish-green blotches; the lesion surface has a greasy, rough appearance.

What statutory actions are in place?
There are currently no statutory actions in place for *P. infestans.*

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Soil/growing medium
- Bulbs or tubers

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Source live plant material, bulbs and tubers from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)

Symptoms on tomato fruit. A. Minuto, EPPO.

Symptoms on potato leaf. T. P. Banaras, EPPO.

Leaf symptoms. Dorina Pitorac, EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

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Candidatus Phytoplasma solani

Which plant hosts are effected?

A wide range of crop and ornamental plants are effected including potato, tomato, strawberry, lavender, peony, *Vaccinium* and *Vitis* (grapevine). Vectored by an insect (see *Hyalesthes obsoletus* factsheet).

What do I need to look for?

On potato (known as potato stolbur):

- Upward rolling and purplish or red discoloration of the top leaves.
- Shortened internodes.
- Aerial tubers.
- Early senescence.
- Plant wilting and death.

On tomato (known as tomato stolbur):

- Short internodes near to the plant apex and smaller curled leaves with thicker tissues.
- Yellowing or purpling leaves.
- Adventitious roots sometimes appear on the stem.
- Plants infected early are bushy because of the development of numerous axillary buds.
- The flowers of infected plants are abnormally straight, they are sterile and have altered morphological development.
- Fewer fruits are produced, and they are smaller, lacking colour, and dense.

What statutory actions are in place?

A regulated quarantine pest in Great Britain and a regulated non quarantine pest in Northern Ireland. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Natural spread

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Based on the pest's lifecycle, periodically assess host plant species surrounding the site (PHMS 6.7)

Excessive branching on tomato. EPPO.

Symptoms on a potato. M.A. Kuznetsova, EPPO.

Shrivelled grapes on an infected vine. EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

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Globodera pallida European Strains (cyst nematode)

Which plant hosts are effected?
A wide range of species including *Allium, Asparagus, Beta, Brassica, Capsicum, Dahlia, Fragaria, Gladiolus, Hyacinthus, Iris, Lilium, Solanum, Narcissus* and *Tulipa*.

What do I need to look for?

- *Globodera* species have round cysts, whilst all other groups have lemon-shaped cysts.
- Diagnosis of the exact species in question can only be achieved in a specialised laboratory.
- Damage may appear similar as signs of mineral deficiency or as patches of stunted yellowing plants, or as wilting due to an inefficient root system.
- However, such symptoms usually only appear when infestation levels are already high.
- From July onwards cysts may be seen on roots.
- Fungal diseases such as Rhizoctonia and Verticillium wilt may also be present and contributing to poor growth.

What statutory actions are in place?
A regulated quarantine pest. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Fruits or vegetables
- Soil/growing medium
- Bulbs or tubers

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Assess soil and growing media for the potential to harbour pests and minimise the risk accordingly (PHMS 6.2)
- Source live plant material, bulbs and tubers from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)

Cysts of *G. pallida*.
CSL, EPPO.

Broken cyst with eggs of *G. pallida*. EPPO.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

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Platynota stultana (the omnivorous leafroller)

Which plant hosts are effected?
A wide range of species including *Apium, Capsicum, Chrysanthemum, Cyclamen, Dianthus, Gossypium, Gramineae, Juglans, Solanum, Malus, Ocimum, Pelargonium, Phaseolus, Pinus, Prunus, Punica, Rosa, Rubus, Taxus, Vitis, Zea* and *Citrus.*

What do I need to look for?

- Adult moths are between 7 and 13 mm in length (12–25 mm wingspan).
- They rest with their wings folded over its back in a tented bell shape, with the hindwings completely hidden.
- The wing markings consist of shades of fawn and dark brown but are variable in both colour and strength.
- Newly hatched larvae are cream with a brown head and are less than 2 mm long.
- Larvae reach a maximum of 15–19 mm in length and the colour becomes very variable, but is usually grey-green, greenish or cream, with a brown or black head.
- There are very small whitish spots along the body, and a dark stripe down the centre through which the body contents can be seen moving.

What statutory actions are in place?
A provisional quarantine pest in Great Britain. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Fruit or vegetables
- Plants for planting (except seeds bulbs and tubers)
- Cut flowers or branches

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all relevant plant products (e.g. cut flowers) and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

Adult *P. stultana* captured in a trap. Miguel Ángel, EPPO

P. stultana larva. UK Plant Health Portal, Defra.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

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Rose Rosette virus and *Phyllocoptes fructiphilus*

Which plant hosts are effected?
Roses (*Rosa* species and cultivars). This includes *Rosa canina*, *Rosa rubiginosa* and *Rosa rugosa*. *Phyllocoptes fructiphilus* is a tiny mite which spreads the virus (not yet known to be present in the UK).

What do I need to look for?

- Symptoms are highly variable depending on the rose cultivar in question, its age, and growth stage. Climatic conditions can also influence symptom development.
- Symptoms first appear on leaves, before emerging on stems and branches.
- Leaves redden and become distorted, whilst shoots elongate and redden.
- Witches' brooms and excessive thorniness are characteristic of RRV infection
- During the later stages of infection, reduced flowering and flower malformations are common.
- Diseased plants exhibit a gradual decline and die within 1-5 years, usually as a result of enhanced susceptibility to frosts.
- Rose rosette virus symptom progression is quicker in smaller, younger plants with infected seedlings rarely surviving after one year.

What statutory actions are in place?
A regulated quarantine pest in Great Britain and regulated by emergency measures in Northern Ireland. If you suspect the presence of this pest on your premises you must contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Cut flowers or branches

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all branch wood and relevant wood products and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

Leaf mosaic and mottling caused by RRV.
Patrick Di Bello, EPPO

Reddened shoots on an infected rose.
Patrick Di Bello, EPPO

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

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Thrips palmi (melon thrips; oriental thrips)

Which plant hosts are effected?
Many plants from a wide range of families. Specific examples include *Capsicum, Cucumis, Cyclamen, Chrysanthemum, Ficus, Helianthus, Nicotiana, Phaseolus, Pisum*, Orchidaceae (family), Solanaceae (family).

What do I need to look for?

- Almost entirely yellow in colouration, although a dark longitudinal line is formed by the joining of the wings when they are held at rest.
- Adults and nymphs both feed by sucking the cell contents from leaves, flowers and fruits, thereby causing surface silvery scars, and leaf deformation or chlorosis.

What statutory actions are in place?
A regulated quarantine pest. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Fruits or vegetables
- Plants for planting (except seeds bulbs and tubers)
- Cut flowers or branches

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Risk assess all branch wood and relevant wood products and minimise risk accordingly and carefully inspect material upon its arrival (PHMS 4.1 & 7.1)

Damage on aubergine. J. Guyot, EPPO

An Adult *T. palmi*. J. Guyot, EPPO

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

Plant Healthy

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Prodiplosis longifila

Which plant hosts are effected?
Many frequently traded species including *Allium, Asparagus, Capsicum, Citrus, Cucumis, Solanum, Tagetes, Vitis* and *Gossypium*.

What do I need to look for?

- The adult is small, black-yellowish and about 1.5 mm in length.
- The larva is almost transparent when newly formed and yellowish during the last instar. A full-grown larva is about 1.9 mm in length.
- Flowers have necrosed ovary, stamens, and petals. Where infestations are heavy there may be excessive flower drop.

What statutory actions are in place?
A regulated quarantine pest. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Fruits or vegetables
- Plants for planting (except seeds bulbs and tubers)

Key measures to protect my site:

- Ensure suitable plant hygiene and housekeeping measures are in place (PHMS 6.1)
- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)

Adult of *P. longifila*. Maria Manzano, EPPO

Larvae on tomato. Maria Manzano, EPPO

Tomato fruit damage. Maria Manzano, EPPO

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)

Pest management information

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Hyalesthes obsoletus

Which plant hosts are effected?
Planthopper which can vector the pathogen causing potato stolbur disease (See Candidatus Liberibacter solanacearum factsheet). Hosts include *Convolvulus arvensis, Galium verum, Lavandula angustifolia, Solanum lycopersicum, Olea europaea, Plantago sempervirens, Ranunculus bulbosus, Salvia sclarea, Satureja, Solanum tuberosum, Tanacetum vulgare, Urtica dioica, Vitex agnus-castus* and *Vitis vinifera* ssp. vinifera.

What do I need to look for?

- Adults 4-5 mm in length, body mostly black, wings transparent with dark patches.
- See Candidatus Liberibacter solanacearum factsheet for disease details.

What statutory actions are in place?
A provisional quarantine pest in Great Britain. If you suspect the presence of this pest on your premises you should contact the Plant Health authorities immediately (PHSI, SASA or DAERA).

Pathways of highest risk:

- Plants for planting (except seeds bulbs and tubers)
- Natural spread
- Hitchhiking

Key measures to protect my site:

- Source plants from Pest Free Areas and nurseries with high biosecurity standards and carefully inspect all plants upon arrival (PHMS 5.1 & 7.1)
- Based on the pest's lifecycle, periodically assess host plant species surrounding the site (PHMS 6.7)
- Ensure proportionate measures are in place to minimise the risk of pests spreading on, around or off the site by visitors (PHMS 6.8)

Adult *H. obsoletus*.
Gernot Kunz, FLOW.

Adult *H. obsoletus*.
Konrad Zobel, iNaturalist.

If you have any concerns about this, or any pest, contact the PHSI (England & Wales), SASA (Scotland), DAERA (NI)