Australian Government
Department of Agriculture, Fisheries and Forestry

Pests, diseases and contaminants of horticultural commodities

Purpose of this document

This document has been written for authorised officers (AOs) to assist them in the recognition of pests, diseases and contaminants likely to be encountered within the commodity or associated with the flowpath during the inspection of horticultural commodities.

Where uncertainty exists regarding insect or contaminant identity, professional identification is required. For further information regarding inspections, including action to be taken when pests are identified, please refer to the Guideline: Inspection of horticulture for export.

Contents

This document contains the following topics.

Pests associated with horticultural commodities

Australia is one of the few countries to remain free from the world's most damaging agricultural pests and diseases. Our export industry benefits from our favourable biosecurity status.

Pests, diseases and contaminants associated with horticulture in Australia may be generalists, meaning they are not limited to one particular commodity; or specialist, meaning that they are only associated with a single commodity.

This reference provides information about the pests, diseases and contaminants that may be encountered during the inspection of:

- fresh fruit
- fresh vegetables
- dried fruit
- cut flowers and foliage, dried and fresh
- propagatable, plant and plant products, including
  - nursery stock
  - cuttings
  - tissue cultures
  - bulbs, corms and tubers

Insect pests associated with horticultural products can be classified as quarantine, regulated non-quarantine or non-quarantine pests.

Note: For pests, diseases and contaminants of all other prescribed grain and plant products refer to the Reference: Pests and contaminants of grain and plant products.

Quarantine pests

Quarantine pests are pests of potential economic importance for a country, part of a country or all parts of several countries and not yet present there, or present but not widely distributed and being officially controlled [IPPC 2021].

Common quarantine pests present in Australia and associated with horticulture include, but are not limited to fruit fly, mango seed weevil, light brown apple moth, bacterial black spot and orange fruit borer. These pests and diseases are located within different regions around Australia and AOs need to be aware of the pests and diseases that an importing country considers as quarantine pests.

Quarantine pest lists are published by the National Plant Production Organisation (NPPO) of the importing country and can be found within the Manual of Importing Country Requirements (Micor) plants database, the relevant protocol or work plan.

Regulated non-quarantine pests

Regulated non-quarantine pests (RNQPs) are non-quarantine pests whose presence in plants for planting affects the intended use of those plants with an unacceptable economic impact. Plants for planting include plant material that is to remain planted, to be planted or replanted. Unacceptable economic impact can include yield or quality losses. RNQPs can therefore be regulated by the importing country [IPPC 2021].

Importing countries may include these pests in their regulated pest lists. Phytosanitary actions may be applied to imported plants if RNQPs are present on those plants.

Pathogens (for example, viruses, bacteria and fungi) are common examples of RNQPs that may be present in Australia and associated with plants for planting.

Non-quarantine pests

Non-quarantine pests are pests that are not quarantine pests for a country, part of a country or all parts of several countries [IPPC 2021]. Some countries may have tolerances for non-quarantine pests.

Contaminating pests

Contaminating pests are those that are carried by a commodity, packaging, conveyance or container, or present in a storage place and that, in the case of plants and plant products, do not infest them [IPPC 2021].

Common regulated non-quarantine pests present in Australia and associated with horticulture include snails, ants and red back spiders.

Contaminants

A contaminant is any foreign matter (whether organic or inorganic, but not including a pest) that:

- is in, on or with the plants or plant products
- could come into contact with the plants or plant products while operations (such as preparing, storing, loading or transporting goods) are being carried out.

Some examples of contaminants are animal carcases (including the carcase of vermin), animal waste, and residues (including soil, leaves and stems) of plants or plant products.

Where sand, soil or any other contaminants are detected during inspection, the type of contaminant should be recorded on the inspection record.

Inert material

Inert material for phytosanitary certification purposes is restricted to only sand and soil. An importing country authority may require a consignment to be free from inert material. AOs should interpret this as the consignment is to be practically free from sand and soil. AOs should avoid the term ‘inert material’ to reject a consignment where possible.

Extraneous matter

Extraneous matter for export certification purposes is considered to be sand, soil and foreign plant debris. Extraneous matter does not include plant matter that would be expected to be present on the export commodity, such as stalks on cherry fruit. Extraneous matter that should not be present in a consignment may include leaf material in a fruit consignment. If you are unsure about what constitutes extraneous matter in a consignment, further information may be found in the relevant protocols or import permits. For further information contact Horticulture Exports Program.

Weed seeds

Importing country authorities may specify that consignments be certified as free of specific weed seeds or require complete freedom from any weed seed contamination. The requirement for additional declarations declaring freedom from weed seeds will be stated either on the import permit or in the Micor plants database.

Wood packaging

A large proportion of commodities that are traded among countries are accompanied by wood packaging. Approximately 70% of all cargo transported internationally by plane, ship, rail and road are supported in transit by wooden structures.

Pests may be present in or on host material at the time of harvest, or they may colonise after harvest. Many species of bark beetles and wood borers are particularly attracted to recently cut wood.

In recognition of the plant health risk associated with wood packaging material made from unprocessed raw wood, the International Plant Protection Convention (IPPC), as part of the United Nations Food and Agricultural Organisation's global program of policy and technical assistance in plant quarantine, published the International Standards for Phytosanitary Measures Publication No. 15: Guidelines for Regulating Wood Packaging Material in International Trade (ISPM 15), in March 2002.

Quality

The department provides certification for phytosanitary requirements and does not certify quality parameters. Phytosanitary certificates should only include statements that relate to plant health and mitigate against valid phytosanitary risks.

The department cannot include additional declarations on phytosanitary certificates for freedom from extraneous matter to meet quality requirements. Demonstrating freedom from extraneous matter to meet a quality requirement is the responsibility of the exporter. Freedom certification documents can be obtained from commercial organisations.

Identifying common pests

A range of references may be used to support AOs to identify common pests and diseases. Some useful references include:

- Pests and Diseases Image Library (PaDil)
- CABI Crop Protection Compendium
- Invasive Species Compendium
- Atlas of Living Australia
- A-Z list of horticultural insect pests
- Pest Information Document Database (PIDD)
- National Priority Plant Pests.

Important: Where uncertainty exists regarding insect or contaminant identity, professional identification is required. AOs are not expected to be able to identify pests, diseases or contaminants.

Sample Collection

Where formal identification is required a sample of the pest or contaminant is obtained and taken to a suitable laboratory.

Refer to the Reference: Plant exports guide – Specimen collection for guidance on how to collect specimens.

Pests and diseases on fresh fruit and vegetable

The following table illustrates and describes important pests and diseases of fresh fruits and vegetables.

Name	Images	Main hosts	Description
Codling moth *Cydia pomonella* (Linnaeus 1758)	Adult moth  Cranshaw, W, Colorado State University, (Bugwood.org) Larva  Cranshaw, W, Colorado State University, (Bugwood.org)	Apple, pear and other pome fruits, and walnuts (Caprile 2011).	Codling moth larvae are internal feeders of fruit. The female moth lays eggs singly on leaves and fruits. The eggs are flat, oval, 1 mm long. Fully matured larvae are creamy pink with a dark brown head and about 15–19 mm long (Caprile 2011). Once they emerge, larvae chew through the fruit skin and excavate a cavity just below the skin where they bore their way to the core and feed on the seeds in some hosts. The fruit pulp around these tunnels is often attacked by bacteria, causing extensive internal injury. Presence of one or more holes with reddish brown larval excreta is a characteristic sign of attack by codling moth (Caprile 2011). A syrupy substance may also exude from the holes as the fruit matures (Caprile 2011).

Name	Images	Main hosts	Description
Fall armyworm *Spodoptera frugiperda*	Adult fall armyworm moth  PaDiL (www.PaDil.gov.au) Fall armyworm larvea with key identifying features highlighted  D Visser, ARC-VOP Roodeplaat Fall armyworm eggs  Diedrich Visser, ARC-VOP Roodeplaat	Maize, rice, sorghum, sugarcane, vegetables and fruits.	The fall armyworm is a destructive horticulture pest, with larvae that feed on more than 350 plant species. Key hosts include grasses and maize (corn) crops, but the pest can also affect other crops such as rice, sorghum, sugarcane, cotton, and vegetables. Identifying fall armyworm typically involves observing certain physical characteristics and behaviours. Fall armyworm go through several stages of development, but in their larval stage (caterpillar), they are the most damaging to crops. Eggs are usually laid under the surface of leaves in clustered masses of 100-200. Upon hatching, the larvae vary in colour from light green to brown or black, with longitudinal stripes running along the length of the body. The stripes are usually lighter in colour, often yellowish or white. As the larvae mature, they become darker, with larger caterpillars having a pale inverted Y shape between the eyes, dark spines occurring on the body and 4 black spots arranged in a square near the rear. Damage by larvae in many crops produces similar symptoms on foliage to that caused by other caterpillars and chewing insects. Typical signs include windowing of leaf surfaces, and in maize and sorghum the feeding on leaf whorls producing ‘shot holes’ upon unfurling. If you find crop damage symptoms, carefully examine the plants for larvae to identify which species are present.

Name	Images	Main hosts	Description
Fruit flies Queensland fruit fly *Bactrocera tryoni* (Froggatt) Mediterranean fruit fly *Certitis capitata* (Wiedemann)	Queensland fruit fly  www.agric.wa.gov.au Mediterranean fruit fly  Daniel Feliciano -CC BY-SA 3.0 Fruit fly larvae  www.agric.wa.gov.au	Fresh fruits and vegetables, including, citrus species, pome fruits, stone fruits and berries. For example, *Mallus dometica* (apple), *Mangifera indica* (mango), *Vistis vinifera* (grape), *Psidium guajava* (guava), *Carica papaya* (papaya), *Passiflora edulis* (passionfruit), *Prunus persica* (peach), *Pyrus communis* (pear), *Prunus domestica* (plum), *Diospyros kaki* (persimmon), *Punica granatum* (pomegranate), *Lycopersicon esculentum* (tomato), *Capsicum annum* (capsicum).	Fruit flies are a serious horticultural pest and damage over 300 species of fruiting vegetables and cultivated fruits. Two of the most significant fruit fly pests in Australia are the Mediterranean fruit fly (Medfly) in Western Australia and Queensland fruit fly (Qfly) in tropical and subtropical regions of Australia. The adult fruit fly is about 8 mm long, red brown with yellow marks on the thorax between the wings. Female fruit flies sting fruit and fruiting vegetables to lay eggs beneath the skin of host. Direct damage occurs as the larvae develop and feed within the fruit and induce decay and premature fruit drop (Allwood and Leblanc, 1997). Piercing the fruit to lay eggs also introduces bacteria into the fruit, which starts to rot. Affected fruit may show skin discolouration around the sting marks, rapid fruit decomposition and decay as well as early fruit drop. Fruit fly larvae can be easily seen in the flesh of ripe infested host fruit. Larvae are white with a flat pointed head. Puncture marks and associated necrosis on the fruit should be inspected. Cutting the fruit or vegetable to investigate whether eggs or larvae are inside, is a common method for identifying if the product has been infested.

Name	Images	Main hosts	Description
Fuller's rose weevil *Naupactus cervinus* Boheman, 1840	Adult weevil  PaDil (www.PaDil.gov.au) Weevil eggs  South Australian Research & Development Institute (PIRSA)	All *Citrus* species and their hybrids (Martin et al 2012).	Fuller's rose weevil are brown, flightless beetles that are about 8 mm long. Female beetles lay eggs in yellowish, papery masses of about 20–30. When they hatch, the larvae drop to the ground where they live and feed on citrus roots (Martin et al 2012). Adults also chew leaf margins, leaving serrated edges, further damaging the plants. Foliage near the trunk or touching the ground is most likely to be damaged by this pest. Obvious signs of damage can be detected by the presence of eggs under or near the fruit calyx, in cracks and crevices of bark and leaves (Martin et al 2012).

Name	Images	Main hosts	Description
Grapevine dieback *Eutypa lata* (Pers.) Tul. & C.Tul.	 dieback disease on grapevine wineaustralia.com	Grape and other commercial horticultural crop such as stone fruits, pomes, citrus, figs and olives (Nicholas et al 1994).	Grapevine dieback is caused by a fungus and is one of the major trunk diseases of grapevines. Under wet conditions, plants can become infected through fresh cuts, such as those made during pruning, and is spread by airborne spores that are released from infected dead wood during rainfall. Spores infect exposed wounds, with vines being most susceptible to infection in the first two weeks after pruning. The earliest symptoms of the disease are cankers formed around pruning wounds (Nicholas et al 1994). The fungus grows slowly, and symptoms are apparent after the canker becomes well established in about 2 - 4 years, causing stunted shoots and progressively killing spurs, cordons and trunks and eventually the entire affected vine. Infected leaves are small and yellow, often becoming cupped and tattered around the edges. Grape bunches on infected shoots ripen unevenly, are small and in severe cases shrivel and die (Nicholas et al 1994).
Light brown apple moth *Epiphyas postvittana* (Walker)	Adult apple moth  PaDil (www.PaDil.gov.au)	Pome and stone fruit, avocados, kiwifruit, strawberries and nursery stock.	Adults of light brown apple moth are small and bell-shaped, showing variable wing patterns and colours and range from 6 to 13 mm in length. Apple moth larvae feed on the skin, fruit stalk or occasionally burrow into the fruit and cause damage to young plants, adversely affecting plant structure and discolouring fruit. Larvae can be found clumped or webbing on leaves within webbed tissue or attached to the fruit (CABI 2020). On fruits, the damaged skin has a cork-like appearance. Apple moth eggs and larvae are difficult to detect as they are cryptic on foliage. Characteristic signs for detecting the apple moth larvae include lesions or pitting on fruits or webbing on leaves (CABI 2020). The best method for

Name	Images	Main hosts	Description
	Apple moth larva  Clark JK, Univ. Calif IPM Program		assessing the presence and abundance of apple moths is to deploy pheromone traps, with a lure placed within delta traps with a sticky base (Bellas et al 1983).
Mango seed weevil *Sternochetus mangiferae* (Fabricius, 1775)	Adult  PaDil (www.PaDil.gov.au) Larval damage of seed weevil  Peter A. Follett (CABI 2020)	*Mangifera indica* (mango) and wild *Mangifera* spp. (CABI 2020).	Mango seed weevil is a monophagous pest of mango (CABI 2020). The adult weevil is 7.5–10 mm long, dark brown to black in colour with grey markings. It is oval shaped with an elongated head that forms a snout. The larvae develop within the seed and feed on the fruits seed where they complete their development and emerge from the fruit as adults (CABI 2020). Infected fruits can be easily distinguished by the presence of hardened amber coloured secretions and brown marks at the oviposition site (CABI 2020). The infected fruits rot from the outer surface, the seeds show holes, and the cotyledons turn black and become a rotten mass. AOs will observe the fruit being cut and inspect the seed for the presence of mango seed weevil larvae or an adult.

Name	Images	Main hosts	Description
Potato cyst nematode *Globodera rostochiensis*, Wollenweber, 1923) Skarbilovich, 1959	Nematode cysts on roots  www.agric.wa.gov.au	Plants of Solanaceae family including potato, tomato and eggplant. A number of weeds in the Solanaceae family are also hosts (CABI 2020).	Potato cyst nematodes are microscopic roundworms that live on the roots of plants. They affect the pre-emergence, seedling stage and vegetative growing stage of affected plants and cause direct damage mainly to roots and yield of tubers (CABI 2020). The nematodes are very small, less than 1mm in size. AOs would not have the equipment to identify nematodes but the cysts they form on roots can be visible. These are the size of a pinhead and contain hundreds of eggs.
Red banded mango caterpillar *Deanolis sublimbalis* Snellen	Adult moth and larva   www.ces.csiro.au	*Mangifera indica* (Mango)	Red banded mango caterpillar is a major pest of mango. The larvae grow up to 2 cm long are brown or black headed, with alternating red and white bands. The larvae are internal feeders and attack all stages of fruit development. They tunnel through the skin and flesh and mainly feed on the seed, causing fruit to spoil and fall before ripening (Royer 2008). Damaged fruit may also be attacked by fruit flies or various decaying bacterial and fungal organisms. The larvae usually enter the fruit through one borehole, typically made in the lower half of the fruit (Krull 2004). These caterpillars leave external sap stains at their entry hole. The sap can be identified as a dark black streak on the fruit skin (Royer 2008). Cutting the fruit open will expose the damage, inside of the tunnel and the likely presence of the larva in the flesh and the seed can be confirmed.

Name	Images	Main hosts	Description
	Sap stains on mango fruits  Larval damage inside mango seed  Pestnet.org		
Septoria spot *Septoria citri* Pass. 1877	Septoria spot on fruit  NSW Dept of Primary Industries Septoria spot on leaf  Zitter, TA, Cornell Uni, Ithaca, NY	*Citrus* species including *Citrus limon* (lemon), *Citrus paradisi* (grapefruit) and *Citrus sinensis* (navel orange).	Septoria spot is a fungus that affects many citrus species. Fruit symptoms include small, round, light tan-coloured lesions (pits) on the outer rind (Cooke et al 2009). They are 1–2 mm in diameter with a narrow green margin. As the fruit matures, they become reddish to pale brown and contain small black spots. These black spots are barely visible to the naked eye. Fruit lesions affect their quality, grade, and marketability, which is a concern for growers aiming for high value fresh markets (Cooke et al 2009). Leaf spots also occur on the lower surface of leaves. They appear as small, blister-like brown-to-black spots, surrounded with a yellow halo.

Name	Images	Main hosts	Description
Western flower thrips *Frankliniella occidentalis* (Pergnade, 1895)	Adult thrips  PaDil (www.PaDil.gov.au)  www.agric.wa.gov.au	Capsicums, lettuce and chrysanthemums.	Western flower thrips are small 1–2mm flying insects, which are yellow to brown in colour. Adults have tiny, narrow wings carried over their back. Nymphs are similar in shape, pale yellow-orange, wingless and smaller than adults. Nymphs and adults feed in flowers and on growing tips (CABI 2020). The thrips can feed on more than 400 plant species including many vegetables, flower crops and weed species As these insects are so small and cryptic, detection usually occurs when present in very large numbers, through trapping the insects or detecting plant symptoms, rather than direct observation of the insects. Feeding damage can be readily visible as white streaking. Severe damage leads to leaf discolouration, deformed new growth and buds, and spotted foliage with silvery appearance due to necrosis (CABI 2020). These pests can also transmit a range of tospoviruses, including Tomato spotted wilt virus, which reduces the quality and yield of tomato, capsicum, and eggplant. Viruses also produce distinct symptoms in some hosts, such as ringspots, patterns, distortion of fruit and some leaf spots.

Pests and disease symptoms found on Nursery Stock

The following table illustrates and describes common pests and disease symptoms associated with nursery stocks.

Name	Images	Main hosts	Description
Aphids	Adult  USDA-ARS/Scott Bauer (Bugwood.org) Nymphs (Green peach aphid)  USDA-ARS/Scott Bauer (Bugwood.org) Woolly aphid  Clark JK, Univ. Calif IPM Program	Aphids' hosts include plants from over 40 different families including Brassicaceae, Solanaceae, Poaceae, Leguminosae, Cyperaceae, Convolvulaceae, Chenopodiaceae, Compositae, Cucurbitaceae and Umbelliferae (Flint 2013).	Aphids are one of the most destructive sucking insect pests and can be found on number of different nursery stock plants. They are soft bodied, pear-shaped insects, about 1–2mm long and their colours range from light green, grey-green, dark green to pink or red (Flint 2013). Most species are females and do not need to mate and rarely lay eggs. But some species such as green peach aphid produce males just before winter in cooler climates. Adult aphids are mostly wingless, but some species also occur in winged forms. Most aphid species are host specific, having hosts from one or a small number of closely related genera, but a small number of aphid species are highly polyphagous (Manners 2018). Aphids generally feed on the underside of the leaves, stems, and on the new growth and growing tips, causing them to become chlorotic and deformed with stunted growth (Flint 2013). Some aphid species such as woolly apple aphid attack apple roots, often near pruning wounds, and can cause tree decline if roots remain infested for many years (Flint 2013). Aphids are also common vectors of plant viruses such as Potyviruses in certain vegetables and ornamentals including pumpkin, melon, bean, potato, lettuce, and cucumber (Flint 2013). Aphids also produce sugary honeydew that promotes fungal growth and attracts ants due to their symbiotic relationship. Ants being present on the shoots and leaves are often associated with aphid infestations.

Name	Images	Main hosts	Description
Mealy bugs	Long tail mealy bug  www.dpi.nsw.gov.au Mealy bug infestation leaves and stems  Clark JK, Univ. Calif IPM Program	Citrus, stone fruits and pome fruits, nursery stock, woody ornamentals and herbaceous perennials including cactus, coral bells, figs, fuchsia, gargenia, hibiscus, jasmine, dracaena, ferns, orchids, palms, poinsettia and mimosa (Flint 2016).	Mealy bugs are 3-7mm long, soft bodied sucking insects that feed on plant sap from a variety of different plant species. Their appearance is distinctive with a white powdery view from above and a pink view from beneath (Flint 2016). Mealy bugs feeding on leaves, stems, fruits, growing tips, and buds affect plant growth and vigour and cause premature leaf or fruit drop and twig dieback (Flint 2016). Their presence can be easily detected by white waxy coverings on the underside of leaf and twigs. Like aphids, ants often feed on the honeydew produced by these insects and hence ant activity also indicates mealy bugs infestations (Flint 2016). Mealy bugs are also a known vector, carrying several different diseases affecting plants.

Name	Images	Main hosts	Description
Powdery Mildew	fungal growth on leaves  www.agric.wa.gov.au	Horticultural crops, trees, shrubs and woody ornamentals. A wide variety of vegetable crops are affected by powdery mildews, including artichoke, beans, beets, carrot, cucumber, eggplant, lettuce, melons, parsnips, peas, peppers, pumpkins, radicchio, radishes, squash, tomatillo, tomatoes, and turnips (Davis et al 2008).	Powdery Mildew is a fungal disease that affects a wide variety of plants. The symptoms first appear as white powdery spots that can be observed on the leaves, flowers, fruits, and fruit stalks, and on the stems of the plants (Davis et al 2008). These spots grow bigger to cover large areas of the leaves and stems. Affected leaves gradually turn yellow to brown and die (Davis et al 2008). In some hosts, powdery mildew causes the leaves to curl or twist (Davis et al 2008). The fungi produce masses of spores which can visually be seen as a white powdery growth on the leaf surfaces and other affected areas.
Rust	Yellow fungal lesions  www.dpi.nsw.gov.au  Scharpf, RF USDA Forest Services, (Bugwood.org)	Pear, rhododendron, chrysanthemum, geraniums, birch, cottonwood, pine and plants from Rosaceae and Myrtaceae families.	Rust is a fungal disease that affects a variety of different plants. Symptoms vary from lesions on the leaves, yellow, orange, or red spots on leaf surfaces and buckling of the leaves. Plants infected severely may appear stunted, discoloured, and wilted. Rust spore masses and fruiting bodies can be easily identified by the presence of pustules containing powdery spores on the lower surface of leaves and other plant parts including stems, petioles, and the flower calyxes.

Common pests and diseases on other plant and plant products

The following table illustrates and describes common pests and diseases associated with other horticultural plants and plant products.

Name	Images	Main hosts	Description
Ants	Ants  Clark JK, Univ. Calif IPM Program Ant colony  Choe DH, Univ. Calif IPM Program		Ants are commonly found on advanced nursery stock and in pots that still contain soil and other media. Ants usually nest in soil, but some species construct nests under buildings, stones, boards, tree stumps or near their food sources, such as trees or plants that harbor honeydew-producing insects such as aphids and mealy bugs (Rust and Choe 2012). The AO will need to thoroughly inspect the plant and any packaging. Ants could also be in the shipping containers used for the transportation of plants and plant products.

Name	Images	Main hosts	Description
Sooty mould	Sooty mould growth  Clark JK, Univ. Calif IPM Program		Sooty mould is a black sticky fungus that grows on plants and other surfaces covered by honeydew, a sugary substance produced by sucking insects such as aphids and mealy bugs. The fungi do not infect plants, but it causes indirect damage by blocking the sunlight that reduces the rate of photosynthesis and results in stunted plant growth. Leaves covered with sooty mould may die prematurely. However, fruits or vegetables covered with sooty mould are still edible following a wash with mild soap or warm water (Windbiel-Rojas and Messenger-Sikes 2020).
Springtails	 North Carolina State University http://www.cals.ncsu.edu/course/ent525/soil/soilpix/index.html Nymphs  Clark JK, Univ. Calif IPM Program	Leafy vegetables such as cabbages, lettuce and celery.	Springtails are common agricultural pests found around the world. They are small, wingless, soft bodied insects varying in colour from white to yellow, light purple to grey or brown to black. They range in length from 0.25 mm to 6 mm but normally grow up to 1 mm long. Springtails are generally considered as harmless insects and do not transmit diseases (Koehler et al 1994). Though, some species of springtail can cause minor damage to plants by chewing on the leaves, stems and roots of young seedlings (Koehler et al 1994). They are considered pests due to their large numbers. As decomposers, they feed mainly on decaying organic matter and are known to play a positive role in some agricultural sectors by controlling plant fungal diseases. At the inspection bench, springtails will more than likely be found on leafy vegetables.

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Related material

The following related material is available on the department's website:

- Manual of Importing Country Requirements (Micor – Plants)
- Plant Exports Operations Manual (PEOM)
  - Guideline: *Inspection of horticulture for export*
  - Work instruction: *Inspecting horticulture for export using end-point sampling*
  - Work instruction: *Inspecting horticulture for export using in-line sampling*
  - Reference: *Plant exports guide—equipment*
  - Exports Reference: *Plant exports guide—horticulture inspection techniques*
  - Reference: *Plant exports guide—specimen collection*
  - Reference: *Pests and contaminants of grain and plant products*.

Contact information

- Authorised Officer Hotline: 1800 851 305
- Authorised Officer Program: PlantExportTraining@aff.gov.au
- Horticulture Export Program: Horticultureexports@aff.gov.au
- Assessment Services Exports: PlantExportsNDH@aff.gov.au
- Micor administrator: micorplants@aff.gov.au
- See. Secure. Report hotline: 1800 798 636.

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1	18/01/2024	18/01/2024	New document	First publication of this reference.
2	5/04/2024	5/04/2024	Major Change	• Update to include information about Fall armyworm • Update to new exports template