



Australian Government
**Department of Agriculture,
Fisheries and Forestry**

Imported goods

Biosecurity risk treatment guide

Biosecurity Operations Division

Version 7.0



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1 Introduction

One of the Department of Agriculture, Fisheries and Forestry's (department) primary roles is to address biosecurity threats to Australia's primary production sectors, the environment and human health, while also supporting tourism and trade.

To do this, the department provides import and export inspection and certification to help retain Australia's highly favourable animal, plant and human health status and wide access to overseas export markets.

The department also manages biosecurity controls at our borders to minimise the risk of exotic pests and diseases entering the country.

Imported goods may be subject to targeted or random inspection by biosecurity officers who are trained to look for biosecurity risks on imported goods. In most cases, import conditions relating to imported goods that pose a specific and identifiable biosecurity risk are stipulated in the department's [Biosecurity Import Conditions system](#) (BICON).

It is important that the reader notes that this guide does not apply to situations where a BICON case is available for the imported goods. This is because known biosecurity risks, and the treatments available to address those risks, are usually documented in the relevant BICON case.

There may be instances where biosecurity risks are detected on imported goods, but there is no BICON case available that documents suitable treatment options. In these cases, this guide provides information on the department approved treatment options available to address a specific biosecurity risk.

The application of more than one treatment type may be necessary to mitigate multiple biosecurity risks. All expenses for any treatment, supervision of treatment and/or reinspection (if required) are borne by the importer.

2 What is included in this guide?

The tables within this guide provide department approved treatment information for:

- Importers, brokers, import agents and external stakeholders involved in the importing industry.
- Biosecurity officers, supervisors and managers to assist in determining appropriate treatments.

These treatments apply only to biosecurity risks detected at the initial inspection as biosecurity risks that may occur:

- on the surfaces of imported goods
- as non-commodity based risks associated with imported goods
- in packaging not associated with the imported goods but used to facilitate safe transport.

This document does not contain treatment options for:

- 1) Biosecurity risks with the goods itself – treatment information for specific goods that pose a biosecurity risk can be found in their BICON case located on the department’s website.
- 2) Post border treatments.
- 3) Disinfection treatments approved for use at specific classes of Biosecurity Approved Premises (AA sites) – a list of broad spectrum disinfectants can be found on the department’s website. Please note some of these options are not available at initial inspections.
- 4) Biosecurity waste treatments – whilst some biosecurity risks detected on goods are usually treated as biosecurity waste, there are aspects of the treatment of biosecurity waste from, for example vessels or AA sites, not covered in this document.

3 Biosecurity risks

Table 1 describes examples of biosecurity risks that may be detected on imported goods, non-commodity items and packaging.

Table 1 Examples of biosecurity risks on imported goods

Item	Examples
Live animals – vertebrates	frogs, geckos, birds, rodents, reptiles
Animal material	hair, fur, skin, faeces, shell, blood, and fluids, feathers, honey, flesh, bone, horn
Animal material – evidence	feathers, fur, faeces
Plants – live	plants, weeds, sprouted seeds, propagatable material
Plant material – reproductive	pollen, spores, flowers, fruit, vegetables
Plant material – seeds	seeds, pods
Plant material – fresh	fresh leaves, gum, stems, pods, roots, flowers
Plant material – dry	dried leaves, branches, roots, straw, wood
Plant material – bark	bark
Invertebrates – timber pests	borers, wasps, termites, ants, larvae, eggs, beetles
Invertebrates – flying pests	flies, moths, bees, wasps
Invertebrates – fresh produce pests	beetles, thrips, larvae, mites, flies, caterpillars
Invertebrates – stored product pests	beetles, larvae, eggs, casings
Other invertebrates of concern – terrestrial	flatworms, nematodes, earthworms
Other invertebrates of concern – aquatic	sponges, jellyfish, starfish, barnacles, algae
Invertebrates seeking refuge – hitch-hikers	ants, bees, wasps, moths, spiders, grasshoppers, butterflies
Invertebrates – evidence	wasps nests, mud nests, wings, shells, casing, frass
Snails and slugs	snails, slugs
Snails and slugs – evidence	shells, eggs, trail marks
Plant pathogens	fungi, lichen, bacteria, viruses, moulds, protozoa, phytoplasmas
Soil	dirt, mud, clay, sand
Water	pools of water, water in receptacles, articles used with water
Water – evidence	water marks

4 Treatment

4.1 Treatment of goods

Where a biosecurity officer suspects, on reasonable grounds, that the level of biosecurity risk associated with the goods that are subject to biosecurity control is of an unacceptable level, the officer may require biosecurity measures to be taken in relation to the goods. These biosecurity measures allow a biosecurity officer to manage biosecurity risks to an acceptable level.

Biosecurity officers have the power to require that goods be treated in a specific manner.

4.2 Treatment that may damage goods

The *Biosecurity Act 2015* outlines the requirements for notifying the person in charge of goods where a biosecurity officer suspects on reasonable grounds that the treatment required is likely to damage the goods.

Note: If the biosecurity officer suspects on reasonable grounds that the goods pose a high level of biosecurity risk and need to be treated as soon as practicable, the officer will be able to carry out the specified treatment without having to notify the person in charge.

4.3 Request for agreement to treat goods (where the treatment may damage goods)

Before any treatment is carried out on the goods, a biosecurity officer must, by notice in writing or orally, inform a person in charge of the goods that the goods are required to be treated in a specified manner which is likely to result in damage to the goods and request the person to agree to the treatment of the goods.

If a notice is given to the person in charge of the goods requesting their agreement to treatment, and the person does not respond or does not agree to the treatment within 30 days, a biosecurity officer may in writing request that the person arrange for the goods to be dealt with or destroyed within a specified period. If the person in charge of the goods does not comply with this request the biosecurity officer may take possession of the goods and cause them to be exported out of Australian territory, destroyed or otherwise disposed of.

A biosecurity industry participant is excluded from the definition of 'person in charge' of goods if the biosecurity industry participant is only in possession or control of goods because of a direction given to the participant by a biosecurity officer. This reflects that it would not be appropriate for the biosecurity industry participant to agree to treatment that may damage goods, where they do not have a relationship to the owner of the goods and the goods are only in their possession because of the actions of the biosecurity officer. In this case, the person in charge who is receiving the request to treat goods must have a relationship to the owner of the goods.

4.4 Treatment of high value goods

If the goods are high-value goods—that is the value of the goods is greater than the amount prescribed in the regulations—the goods must not be treated in a way that the biosecurity officer suspects is likely to damage the goods without the written approval of the Director of

Biosecurity. This extra step reflects the impact ordering such a treatment might have on the owner of the goods and the potential loss of value caused by the treatment.

Regardless of the value of the goods, if the treatment is likely to damage the goods, a person in charge must be asked to agree to the treatment (see [Treatment that may damage goods](#)).

5 Approved treatments

Department approved treatments that address known biosecurity risks are categorised as:

- Treatment types – approved types of treatments that are commonly used in biosecurity practices
- Cleaning treatments – approved treatments that clean biosecurity risks from a surface
- Disinfection treatments – approved treatments that disinfect a surface
- Physical removal – total removal of the contaminant
- Destruction – approved methods to destroy biosecurity risks.

5.1 Size limits

Size limitations will apply in most circumstances. Factors to consider are the size of the treatment chamber (autoclave, fumigation and incineration), size of the combined load, or size of the actual material requiring treatment. In some circumstances, information in this document may not be appropriate for the situation.

5.2 Timeframes

All timeframes must be applied within given timeframes as directed.

5.3 Availability

Availability of treatments is dependent on treatment provider availability. Not all treatments listed are available in all Australian states and territories.

6 Treatment types

Table 2 lists and describes the main department approved treatment types and any restrictions, limitations or damage that may occur.

Table 2 Department approved treatment categories

Treatment	Definition	Restrictions, limitations and damage
Autoclaving treatment	Sterilisation using steam under high pressure to control biosecurity risks.	Size and goods limitations apply.
Cleaning treatment	The use of water or air that cleans biosecurity risks from a surface. The air or water may or may not be under pressure.	n/a
Cold treatment	The use of cold air in the control of biosecurity risks.	Size limitations apply. May cause fibreglass to become brittle. This treatment is not suitable for cold climate timber pests.
Devitalisation treatment	Rendering the goods incapable of germination, growth of further reproduction.	Other limitations can be due to the type of chemical, dosage applied, duration of treatment and method and application of dipping the plant material.
Disinfection treatment	The application of a department approved chemical to the surfaces of non-living and non-porous objects to control biosecurity risks.	May cause damage to leather and some metals such as aluminium, zinc, chrome, and similar alloys. May cause plastic to melt. May cause lacquer to blister or run. May also cause possible damage to surfaces or electrical components.
Ethylene oxide fumigation treatment	Sterilisation using ethylene oxide gas under pressure in the control of biosecurity risks on instruments, equipment and other goods.	Phytotoxic to many plants, fresh fruits and vegetables. Not for use on food or products that will contact skin – refer to the Australian Pesticides and Veterinary Medicines Authority website .
Freezing treatment	The use of cold air in the control of biosecurity risks.	Size limitations apply.
Gamma irradiation treatment	Exposure of goods to gamma rays in the control of biosecurity risks.	Size and goods limitations apply. May cause animal hides or pelts to lose hair or become brittle. May discolour or damage silica products (for example mirrors, pearls, fibreglass, some glass, white porcelain, sands and plastics, such as polyurethane packaging). Will damage commodities that have built-in integrated circuits. Prohibited for use on food for human consumption unless specific permission is given by FSANZ.
Hot air treatment - dry	The use of hot, dry air in the control of biosecurity risks.	Products may become brittle or fragile, or smoulder or ignite with this treatment. Will dry out products containing any liquid or moisture. May damage plastic or goods containing glue. For goods limitations and further information, refer to the department's Heat Treatment Standard .
Hot air treatment - moist	The use of hot, humid air in the control of biosecurity risks.	Size limitations apply.

Treatment	Definition	Restrictions, limitations and damage
Methyl bromide fumigation treatment	Fumigation using methyl bromide gas in the control of biosecurity risks.	FSANZ enforces Maximum Residue Limits (MRL) for certain foodstuffs for human consumption. May affect seed viability. May affect plant growth in soil that has been fumigated. For goods limitations and further information, refer to the department's Methyl Bromide Treatment Standard .
Phosphine fumigation treatment	Fumigation using phosphine or phostoxin in the control of biosecurity risks.	FSANZ enforces Maximum Residue Limits (MRL) for certain foodstuffs. Reacts with some metals (for example copper, brass, gold and silver) so may damage electronic and electrical equipment such as computers, motors, switches and fire alarms; and photographic film or copy paper.
Physical removal	Physical removal is the physical separation of a contaminant from its original location or position. Removal is usually followed immediately by destruction of the contaminant by a department approved method.	n/a
Sodium hypochlorite (NaClO) treatment	The use of sodium hypochlorite in the control of biosecurity risks.	FSANZ limits use as a processing aid. May corrode metals.

7 Destruction

7.1 Destruction of goods

If goods have been directed for treatment, and the person in charge does not agree with the treatment, they may request permission to dispose of goods.

If the biosecurity officer suspects on reasonable grounds that the goods cannot be effectively treated to reduce the biosecurity risk to an acceptable level, the biosecurity officer may, subject to the notification and approval requirements, require the goods to be destroyed.

7.2 Destruction of high-value goods

If the goods are high-value goods—that is the value of the goods is greater than the amount prescribed in the regulation—the goods must not be destroyed without written approval of the Director of Biosecurity.

The decision to require high-value goods be destroyed is a reviewable decision. If a review is being undertaken, the goods can only be destroyed if the biosecurity officer is satisfied that the goods pose a high level of biosecurity risk and the risks cannot be managed for long enough to allow a review to be finally determined.

The requirement that the Director approve the destruction of high-value goods along with the review function reflect the monetary outlay that an owner may have invested in the good and ensures that an owner or person in charge is able to access review mechanisms to protect his or her goods.

A biosecurity officer must not cause high-value goods to be destroyed until the end of the review period, for any review of the decision to destroy the good to be completed or until an application for review (including an appeal) has been determined.

7.3 High risk goods

If the goods have been destroyed, because the biosecurity risks cannot be managed for the duration of any review or appeal, no application for review can be made and any review or related proceedings are taken to be discontinued.

7.4 Destruction methods

Destruction methods are usually administered using a third party provider at an Approved Arrangement (AA) site either under the supervision of biosecurity officers or under an AA. If an AA is not in place, department supervision is required. Destruction must take place within given timeframes.

Table 3 lists and describes the department approved methods of destruction.

Table 3 Department approved destruction methods

Treatment	Definition	Comment
Autoclaving	High-pressure sterilisation of biosecurity risks by steam.	Widely used to mitigate any biosecurity risks with the material prior to further disposal such as disposal via domestic waste systems.
Deep burial	Burial of biosecurity waste at a department approved location at a depth of greater than 2 metres.	Insects, animal and plant material may need to be treated by an approved means prior to deep burial to ensure each risk is mitigated.
Incineration	The combustion of organic substances contained in waste materials at a department approved location. Incineration of waste materials converts the waste into ash, flue gas, and heat.	Ash is mostly formed by the inorganic constituents of the waste, and may take the form of solid lumps or particulates carried by the flue gas.

8 Export

Goods with biosecurity risks that cannot be treated or destroyed by an approved method must be exported from Australia.

Goods destined for export must be separated and contained prior to export.

Export from Australia must take place within stated timeframes.

9 Live animals (vertebrates)

9.1 Definition

This includes any animal with a back bone that is alive, and unintentionally enters Australia as a hitch-hiker on imported goods or packaging arriving by sea or air.

Common live animals detected on imported goods or in containers include, but are not limited to, mammals (for example rats and mice), amphibians (for example toads and frogs), reptiles, birds and other vertebrates (for example cats and bats).

9.2 Biosecurity risks

Live animals pose a biosecurity risk to Australia because they can:

- Introduce exotic pests and/or diseases.
- Be a pest in their own right.
- Be infested with disease carrying internal parasites (such as worms, flukes).
- Be infested with disease carrying external parasites (such as ticks, mites, lice and fleas).

9.3 Evidence

Evidence indicating the presence of a live animal includes feathers, nesting material, fur or faeces.

9.4 Treatments

Table 4 lists and describes the department approved treatments for live animals.

Table 4 Department approved treatments for live animals

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
n/a	n/a	n/a	n/a	n/a	n/a	Refer to a biosecurity veterinarian or the Live Animal Imports section for humane euthanasia and disposal using a department approved method.	Refer to a biosecurity veterinarian or the Live Animal Imports section.

10 Animal material

10.1 Definition

Animal material is considered to be any dead animal and any material that originates from, or is produced by an animal. Examples of animal material commonly detected on imported goods include, hair, fur, skin, faeces, shell, blood and fluids, feathers, honey, flesh and bone.

10.2 Biosecurity risks

Animal material poses a biosecurity risk to Australia because:

- All animal parts/products can introduce pathogens that can affect animals and humans.
- Many viruses and bacteria are able to survive for long periods in animal tissue, blood and mucous.
- Some species and spores can be comparatively resistant to a variety of treatments.

10.3 Evidence

Evidence indicating the presence of animal material includes feathers, fur, faeces.

10.4 Physical removal

The contaminant must be removed and treated as biosecurity waste unless it has been treated by one of the methods in Table 5.

10.5 Treatments

Table 5 lists and describes the department approved treatments for animal material.

Table 5 Department approved treatments for animal material

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction
Applies to biosecurity risk only 121°C, 105kPa (15psi) for 15 mins; OR 134°C, 205kPa (30psi) for 4 mins.	n/a	For invertebrates and eggs that may be on animal hair when it is a contaminant 32g/m ³ for 2 hrs at 21°C.	50 kGray (5 Mrad).	n/a	n/a	If appropriate for the type of biosecurity risk and goods.

10.6 Cleaning treatments

All surfaces must be cleaned of visible biosecurity risks.

If import conditions state disinfection is required, all surfaces must be cleaned of visible biosecurity risks prior to application of a department approved disinfection treatment.

Any waste water generated from these treatments must be treated as biosecurity waste.

Table 6 lists and describes the department approved cleaning treatments for organic matter.

Table 6 Department approved cleaning treatments for organic matter

Cleaning under pressure	Vacuuming	Steam cleaning
Water/air under pressure.	Vacuum with a minimum capacity of 1400 watts. Contents of vacuum bag must be destroyed under biosecurity officer supervision.	Hot water under pressure.

10.7 Disinfection treatments

All surfaces must be cleaned of visible biosecurity risks prior to a disinfection treatment being applied.

Table 7 lists and describes the department approved disinfection treatments for pathogens on non-porous surfaces.

Table 7 Department approved disinfection treatments for pathogens on non-porous surfaces

Virkon
Virkon disinfectant (<i>active ingredient Potassium peroxymonosulphate</i>) Applied as per manufacturer's instructions on animal, plant and microbial goods. Sold as 1% Virkon S (Antec International) or 1% Viricidal X (Johnson Diversy)

11 Invertebrates

11.1 Definition

Invertebrates include many parasites and important vectors of disease. Invertebrates commonly detected on imported goods or containers include arthropods such as insects (for example bees, wasps, ants, termites, mosquitoes, beetles, moths, bugs and flies), crustaceans, snails, mites, spiders, millipedes and scorpions.

11.2 Biosecurity risks

Invertebrates pose a biosecurity risk to Australia because:

- The introduction of some exotic pests would have a serious adverse impact on Australia's economy and environment.
- Some exotic pests can carry and transmit disease to humans, animals and plants.
- All life stages (such as eggs and larvae) of invertebrates can also represent a biosecurity risk to plant, animals and humans.

Note: Identification by a regional biosecurity entomologist may be required to determine suitable treatment.

11.3 Evidence

Evidence indicating the presence of invertebrates includes nests, mud casings (wasps) and tunnelling (termites), wings, frass, shells or casings. In some cases, the extent or type of evidence may require the area to be treated, even in the absence of the invertebrate itself.

11.4 Categories

The categories of invertebrate pests commonly encountered include:

- [Timber pests](#)
- [Stored product pests](#)
- [Flying pests](#)
- [Spiders](#)
- [Ants](#)
- [Other](#)
- [Fresh produce pests](#)
- [Hitch-hikers](#)
- [Aquatic pests](#)
- [Non-actionable pests](#)

12 Invertebrates – timber pests

12.1 Definition

Timber pests include those invertebrates who, at some time in their life cycle, use timber as a food source. This group mainly includes termites, timber boring beetles, longicorns, borers, weevils, bark beetles, some moths, and timber boring ants and wasps.

12.2 Biosecurity risks

Timber pests pose a biosecurity risk to Australia because:

- The introduction of some exotic timber pests could cause serious structural damage to buildings and other structures using timber as a component.
- These pests can equally cause serious damage to softwood and hardwood plantation timbers in the timber industry.
- They can also impact on forest, horticultural and urban trees.

Note: Identification by a regional biosecurity entomologist may be required to determine suitable treatment.

12.3 Evidence

Evidence indicating the presence of timber pests includes mud tunnels, nests, wings, casings, holes, eggs and frass as granular pellets or powder.

12.4 Treatments – timber pests

Table 8 lists and describes the department approved treatments for timber pests.

Table 8 Department approved treatments for timber pests

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
n/a	Under vacuum of 50kPa at 1200g/m ³ for 5 hrs at 50°C; OR 1500g/m ³ for 24 hrs at 21°C.	48g/m ³ for 24 hrs at ≥21°C at NAP; OR 64g/m ³ for 4 hrs at ≥21°C under 660mm vacuum; OR 64g/m ³ for 5 hrs at 4-20°C under 660mm vacuum.	10kGray (1.0Mrad)	Refer to Timber and timber mouldings BICON case; OR 56°C ≥30 mins at the core.	Refer to OSS for advice on treatment options.	Usually allowed for hitch-hikers only when conditions allow.	Refer to OSS for advice on treatment options.

13 Invertebrates – stored product pests

13.1 Definition

Stored product pests are those pests found in animal or plant based stored products. This group mainly includes weevils, moths, beetles, grain borers, and meal worms.

13.2 Evidence

Evidence indicating the presence of stored product pests includes webbing, nests, wings, casings, holes, eggs and frass as granular pellets or powder.

13.3 Treatments – stored product pests

Table 9 lists and describes the department approved treatments for stored product pests.

Table 9 Department approved treatments for stored product pests

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
n/a	n/a	Khapra beetle 80g/m ³ for 48 hrs at ≥21°C at NAP with an end point concentration of 20g/m ³ .	n/a	n/a	n/a	n/a	Refer to OSS for advice on treatment options.
n/a	n/a	Other stored product pests 32g/m ³ for 24 hrs at ≥21°C at NAP; OR 40g/m ³ for 2 hrs at ≥21°C under 660mm vacuum. Refer to OSS for treatment options to treat insects in seeds for sowing.	n/a	n/a	-18 °C for min 7 days.	n/a	Phosphine fumigation treatment 1.0-1.5g/m ³ for 10 days at 15°C-25°C; OR 1.0-1.5g/m ³ for 7 days at ≥25°C.

14 Invertebrates – other

Imported goods infested with actionable live insects will require immediate action/ treatment (in most cases, fumigation), in consultation with the regional biosecurity entomologist.

Importers may be provided with the option for identification of the insect(s) prior to treatment, while the container remains on hold.

If the insects are highly mobile, (for example bees and ants) contact the regional biosecurity entomologist for advice whether a more urgent treatment or special containment measures are required.

If the goods are refrigerated, hazardous or the goods have other factors that may affect fumigation contact the regional biosecurity entomologist for treatment options.

If the insects are determined to be of no biosecurity risk, the goods or container may be released from biosecurity control or proceed on to the next AIMS direction.

14.1 Invertebrates – flying pests

Flying pests usually include bees and/or wasps swarming around a nest attached to a container or goods. Evidence indicating the presence of flying pests usually includes the nest itself, insects flying around the nest, dead insects under the nest, honey or other product under the nest. Refer to your regional office for advice on treatment options.

14.2 Invertebrates – spiders

Spiders on imported goods usually include non-ground dwelling actionable pests like black widow spiders, or non-actionable pests like daddy-long-legs. Evidence indicating the presence of spiders includes webbing, nests and silk strands. Refer to your regional office for advice on treatment options.

14.3 Invertebrates – ants

Ants detected on imported goods usually include those in a nest, those feeding on a food source, or those found as hitch-hiker pests. Evidence indicating the presence of ants includes frass or dirt around the site of a nest. Refer to your regional office for advice on treatment options.

14.4 Invertebrates – fresh produce pests

Refer to your regional office for advice on treatment options.

14.5 Invertebrates – hitch-hikers

Refer to your regional office for advice on treatment options.

14.6 Invertebrates – aquatic

Refer to your regional office for advice on treatment options.

14.7 Invertebrates – non-actionable

Non-actionable pests are those species who do not pose a biosecurity risk.

Usually no action is required; however, if these pests occur in high numbers, their presence may mask the presence of exotic pests and/or be indicative of poor sanitary or biosecurity measures. In these cases, refer to your regional office for advice on treatment options.

15 Snails and slugs

15.1 Definition

There are many species of snails and slugs exotic to Australia, the most significant being the giant African snail (GAS).

15.2 Biosecurity risks

Snails and slugs pose a biosecurity risk to Australia because:

- Snails and slugs are destructive invertebrates that eat various plant materials and can also carry parasites and pathogens.
- GAS is considered to be the most damaging land snail because it can consume over 500 varieties of plants.
- GAS can also carry human diseases, and has the ability to reproduce in large numbers very quickly.
- Snails can aestivate (become dormant) and emerge when weather conditions are more favourable.
- Snails can carry the rat lungworm parasite *Angiostrongylus cantonensis*, which can infect humans and cause meningitis.

15.3 Evidence

Evidence indicating the presence of snails and slugs includes shells, eggs and trail marks.

15.4 Treatments

Table 10 lists and describes the department approved treatments for slugs and snails. Note: Follow up inspection is required post-treatment.

Table 10 Department approved treatments for slugs and snails

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
n/a	n/a	<p>GAS 128g/m³ for 24 hrs at ≥21°C at NAP; OR Refer to OSS for advice on treatment options.</p> <p>Non-GAS snails/slugs Refer to OSS for advice on treatment options.</p> <p>Snails/slugs on nursery stock or cut flowers Refer to OSS for advice on treatment options.</p>	n/a	n/a	n/a	<p>If appropriate for the type of biosecurity risk and goods. Only allowed in this case if officers are wearing gloves.</p>	<p>Washing of containers is an option under certain conditions. For any other situations, refer to OSS for advice on treatment options.</p>

16 Plant pathogens

16.1 Definition

Plant pathogens include fungi, bacteria, viruses and various other micro-organisms that can infect plant parts from the roots to the leaves, fruit, seeds and even pollen. Timber can also be infected by fungal pathogens such as wood rotting and sap staining fungi.

16.2 Biosecurity risks

Plant pathogens pose a biosecurity risk to Australia because:

- Australia is relatively free from most of the world’s serious pathogens.
- Exotic fungi, bacteria and viruses entering and establishing in Australia could severely affect Australia’s environment, horticultural, agricultural and forest industries and urban landscapes.
- Many pathogens cause severe crop losses and reduce or prevent fruit and vegetable production.

16.3 Evidence

While the pathogen itself may not always be visible, signs of infection include spots/lesions, colour mottling, distorted growth, stunted plants etc.

16.4 Treatments

Table 11 lists and describes the department approved treatments for plant pathogens. Note: Verification by a biosecurity plant pathologist is required to determine suitable treatment.

Table 11 Department approved treatments for plant pathogens

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal
121°C 105kPa (15psi) for 15 min; OR 134°C 205kPa (31psi) for 4 min.	Under vacuum of 50kPa at 1200g/m ³ for 5 hrs at 50°C; OR 1500g/m ³ for 24 hrs at 21°C.	n/a	For items of plant origin 25kGray (2.5Mrad).	Core temperature 85°C ≥8 hrs.	n/a	n/a

17 Plant material (excl. seed and bark) – live, reproductive, fresh, dry

17.1 Definition

Plant material includes material that originates from, or is produced by a plant, such as pollen, spores, flowers, pods, gum, leaves, branches, roots, stems, wood chips, straw, wood, fruit and fruit pulp.

17.2 Biosecurity risks

Plant material poses a biosecurity risk to Australia because:

- Fresh material could introduce exotic plant diseases, insects and snails.
- Dried plant material may be infested with insects and plant diseases.
- Soil may adhere to plant parts which can also harbour exotic pests (both plant and animal).

17.3 Physical removal

The contaminant must be removed, and must be treated as biosecurity waste unless it has been treated by one of the methods in Table 12.

17.4 Treatments

Table 12 lists and describes the department approved treatments for plant material.

Table 12 Department approved treatments for plant material

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction
121°C 105kPa (15psi) for 15 min; OR 134°C 205kPa (31psi) for 4 min.	Under vacuum of 50kPa at 1200g/m ³ for 5 hrs at 50°C; OR 1500g/m ³ for 24 hrs at 21°C.	n/a	25kGray (2.5Mrad)	Core temperature 85°C ≥8 hrs	n/a	If appropriate for the type of biosecurity risk and goods.

17.5 Cleaning treatments

All surfaces must be cleaned of visible biosecurity risks.

Any waste water generated from these treatments must be treated as biosecurity waste.

If detected in a container, reinspect the container after cleaning to confirm it is free from biosecurity risk.

Table 13 describes the department approved cleaning treatments to remove organic matter.

Table 13 Department approved cleaning treatments for organic matter

Cleaning under pressure	Vacuuming	Steam cleaning
Water/air under pressure.	Vacuum with a minimum capacity of 1400 watts. Contents of vacuum bag must be destroyed under biosecurity officer supervision.	Hot water under pressure.

17.6 Disinfection treatments

All surfaces must be cleaned of visible biosecurity risks.

If import conditions state disinfection is required, all surfaces must be cleaned of visible biosecurity risks prior to application of a department approved disinfection treatment.

Table 14 lists and describes the department approved disinfection methods for pathogens on non-porous surfaces.

Table 14 Department approved disinfection methods for pathogens on non-porous surfaces

Virkon
Virkon disinfectant (<i>active ingredient Potassium peroxymonosulphate</i>) Applied as per manufacturer's instructions on animal, plant and microbial goods. Sold as 1% Virkon S (Antec International) or 1% Viricidal X (Johnson Diversy)

18 Bark

18.1 Definition

Bark is the natural outer protective layer of stems and roots of woody plants. Plants with bark include trees, woody vines and shrubs. Bark refers to all the tissues outside the vascular cambium. This material is distinct and separable from processed timber.

18.2 Biosecurity risks

Bark poses a biosecurity risk to Australia because it can harbour:

- Invertebrates such as bark beetles that feed just under the bark of trees.
- Plant pathogens including fruiting structures of fungal pathogens. For example bracket fungi fruit through bark and *Ophiostoma* sp. fruit under bark.
- Biosecurity risks from the environment in its structure, for example resistant spores like rusts and smuts, or seeds may be present in the cracks and crevices of bark.

18.3 Tolerances

The department requires all solid timber packaging and dunnage to meet the bark requirements as defined in the [International Standard for Phytosanitary Measures No. 15 \(ISPM15\)](#) – Regulation of Wood Packaging Material in International Trade.

This standard requires solid timber packaging and dunnage material to be free of bark, however does allow for a tolerance for small pieces of bark that have not been completely removed during milling.

Please note that the department maintains its bark freedom requirement for timber imported as goods. Only ingrown bark around knots and bark pockets between rings of annual growth are acceptable for goods timber.

18.4 Treatments

Table 15 lists and describes the department approved treatments for bark in excess of stated tolerances.

Table 15 Department approved treatments for bark in excess of stated tolerances

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
n/a	Under vacuum of 50kPa at 1200g/m ³ for 5 hrs at 50°C; OR Under vacuum of 50kPa at 1500g/m ³ for 24 hrs at 21°C.	n/a	25kGray (2.5Mrad).	Core temperature 85°C ≥8 hrs.	n/a	If appropriate for the type of biosecurity risk and goods. Immediate removal is usually followed by destruction of the bark using a department approved method.	Refer to OSS for advice on treatment options.

19 Seeds

19.1 Definition

A seed is a propagating organ formed in the sexual reproductive cycle of plants, consisting of a protective coat enclosing an embryo and food reserves.

19.2 Biosecurity risks

Seeds pose a biosecurity risk to Australia because they have the potential to harbour risk material such as:

- Other viable seeds that may be prohibited or restricted entry into Australia.
- Insect infestations.
- Soil, which also may harbour plant and animal pathogens, nematodes and/or invertebrates.
- Plant pathogens (fungi, bacteria, viruses, nematodes) both externally or internally and, in some cases, the infection may not be evident until the plant matures.

19.3 Treatments for biosecurity risks found in seeds

Table 16 lists and describes the department approved treatments for seeds as per the following key:

- 1) Treatments for seed contaminated with soil are marked '1' in the table header below.
- 2) Treatments for seed with insect infestation/s are marked '2' in the table header below.
- 3) Treatments for seed contaminated with plant pathogens are marked '3' in the table header below.
- 4) Treatments for seed contaminated with other viable seeds are marked '4' in the table header below.

Note: Some treatments for the contaminant, may affect the viability of the seed.

Table 16 Department approved treatments for seeds

^{1,3} Autoclave	² Ethylene oxide fumigation	Methyl bromide fumigation	^{1,2,3} Gamma irradiation	^{1,3} Heat	Cold	⁴ Physical removal and destruction
121°C 105kPa (15psi) for 15 min; OR 134°C 205kPa (31psi) for 4 min.	Under vacuum of 50kPa at 1200g/m ³ for 5 hrs at 50°C OR 1500g/m ³ for 24 hrs at 21°C.	n/a	25kGray (2.5Mrad)	Core temperature 85°C ≥48 hrs (50% relative humidity); OR Core temperature 95°C ≥24hrs (50% relative humidity).	n/a	If appropriate for the type of biosecurity risk and goods. Immediate removal is usually followed by destruction using a department approved method.

19.4 Treatments for seeds as a contaminant

If seeds are present on goods such as ornaments, the goods may be treated using one of the methods in Table 16 Department approved treatments for seeds although consideration needs to be given to possible damage to the product. Refer to plant biosecurity for assessment on a case by case basis.

19.5 Cleaning treatments

If cleaning is an option, all surfaces must be cleaned of visible biosecurity risks as per below. If import conditions state disinfection is required, all surfaces must be cleaned of visible biosecurity risks prior to application of a department approved disinfection treatment.

Any waste water generated from these treatments must be treated as biosecurity waste.

Table 17 lists and describes the department approved cleaning treatments to remove organic matter.

Table 17 Department approved cleaning treatments for organic matter

Cleaning under pressure	Vacuuming	Steam cleaning
Water/air under pressure	Vacuum with a minimum capacity of 1400 watts. Contents of vacuum bag must be destroyed under biosecurity officer supervision.	Hot water under pressure.

20 Soil

20.1 Definition

Soil is a natural unconsolidated or loose covering of fine rock particles that covers the surface of the earth.

20.2 Biosecurity risks

Soil and related material pose a biosecurity risk to Australia because they have the potential to harbour risk material such as:

- Plant material for example weed seeds.
- Animal waste for example faeces and fluids.
- Animal diseases for example anthrax and foot and mouth disease.
- Plant pathogens for example fungi, bacteria, viruses and nematodes.
- Plant pests for example insects, mites and snails.

20.3 Treatments

Table 18 lists and describes the department approved treatments for organic matter.

Table 18 Department approved treatments for organic matter

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
Biosecurity risk only 121°C, 105kPa (15psi) for 15 mins; OR 134°C, 205kPa (30psi) for 4 mins.	n/a	n/a	50kGray (5 Mrad)	n/a	n/a	If appropriate for the type of biosecurity risk and goods. Immediate removal is usually followed by destruction using a department approved method.	Refer to OSS and assess on a case by case basis.

20.4 Physical removal

The contaminant must be removed, and must be treated as biosecurity waste unless it has been treated by one of the methods in Table 18.

All surfaces must be cleaned of visible biosecurity risks as per the cleaning treatments in Table 19.

20.5 Cleaning treatments

If cleaning is an option, all surfaces must be cleaned of visible biosecurity risks as per below. If import conditions state disinfection is required, all surfaces must be cleaned of visible biosecurity risks prior to application of a department approved disinfection treatment.

Any waste water generated from these treatments must be treated as biosecurity waste.

Table 19 lists and describes the department approved cleaning treatments to remove organic matter.

Table 19 Department approved cleaning treatments to remove organic matter

Cleaning under pressure	Vacuuming	Steam cleaning
Water/air under pressure	Vacuum with a minimum capacity of 1400 watts. Contents of vacuum bag must be destroyed under biosecurity officer supervision.	Hot water under pressure.

21 Water

21.1 Definition

Water is a transparent, odourless, tasteless liquid. It is a compound of hydrogen and oxygen that in a more or less impure state constitutes rain, oceans, lakes and rivers.

21.2 Biosecurity risks

Water poses a biosecurity risk to Australia because it has the potential to harbour risks such as:

- Seeds.
- Plant, human and animal pathogens.
- Many micro-organisms including those that cause water borne diseases.
- Providing a pathway for vectors to introduce disease especially mosquito life stages. For example the Asian tiger mosquito, *Aedes albopictus*, can carry several exotic infectious viruses that affect both animals and humans.

21.3 Evidence

Water marks are evidence that water has been present.

21.4 Treatments – water only

Table 20 lists and describes the department approved treatments for water.

Table 20 Department approved treatments for water

Autoclave	Ethylene oxide fumigation	Methyl bromide fumigation	Gamma irradiation	Heat	Cold	Physical removal and destruction	Other
121°C, 105kPa (15psi) for 15 mins; OR 134°C, 205kPa (31psi) for 4 mins.	n/a	n/a	50kGray (5 Mrad)	Boiling at 100°C for 30 minutes	n/a	n/a	Chlorine treatment 3300 ppm = 10 teaspoons (50g) chlorine (650g/kg calcium hypochlorite) per 10 litres water. Ensure nil organic material present; OR Refer to OSS for advice on treatment options.

22 Further information

For further information about treatment options please contact Imports:

- Phone: 1800 900 090
- Email: [Imports](#)

23 Related material

- [Biosecurity Act 2015 and subordinate legislation](#)
- [Biosecurity Import Conditions \(BICON\) system](#)
- [Plant Pest and Diseases \(incl. Forestry and Timber\)](#)
- [Plant Health Australia – Exotic Plant Pest Hotline](#)
- [National Pests and Disease Outbreaks](#)
- [Northern Australia Quarantine Strategy](#)
- [Forests and Timber: A Field Guide to Exotic Pests and Diseases](#)
- [Wood Packaging Material \(Technical Justification Report\)](#)
- [World Organisation for Animal Health - OIE](#)

24 Version history

Version	Date published	Reason for issue or amendment	Section
1.0	September 2009	Available treatment options for staff and importers when risk material is detected in a consignment.	Plant Biosecurity Operations
2.0	September 2011	Update to plant pathogen treatment.	Air and Sea Cargo Program
3.0	June 2013	Updates to content and formatting following review.	Air and Sea Cargo Program
4.0	September 2015	Update to rebrand and include information from the 'Detection of QRM' work instruction.	Cargo and Mail Section
5.0	June 2016	Update to reflect biosecurity legislation changes.	Cargo and Mail Section
6.0	April 2017	Formatting update	Cargo and Mail Section
7.0	September 2022	Update to rebrand and treatment guide	Sea Cargo Section