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Minimizing the pest risk associated with the sea-container pathway

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2017-04 CPM-12 agreed with the reformatting and incorporating of ink amendments.

2022-04 CPM-16 requested revision of CPM recommendation on *Sea containers* (R-06).

2022 CPM Focus Group on Sea Containers revised.

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2024-07 IPPC Secretariat adjusted the page numbers in the footer.

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PURPOSE AND SCOPE

In 2016, the Eleventh Session of the Commission on Phytosanitary Measures (CPM-11) recognized the risk of plant pests being moved through the international sea-container pathway.

The purpose of this CPM recommendation is to raise awareness of the pest risk associated with the sea-container pathway, and to recommend practices for implementation by national plant protection organizations (NPPOs), and other relevant parties, that will contribute to a reduction in the pest risk associated with this pathway.

The scope of this CPM recommendation encompasses internal and external pest contamination¹ in both packed and empty sea containers transported by sea, road and rail.

Although the scope of the International Plant Protection Convention (IPPC) is restricted to plant pests (hereafter referred to as “pests”), the CPM recognizes that actions that are effective against these pests may also help reduce the risk of organisms and other contaminants that are not of phytosanitary concern.

Further contextual information is provided in Annex 1.

Specifically, this CPM recommendation is provided in order to:

- communicate and raise awareness of the pest risk associated with the sea-container pathway;
- provide guidance on approaches to reducing the pest risk associated with the sea-container pathway while minimizing impacts on supply chains;
- encourage visual examination of sea containers and their cargoes and other measures to reduce pest contamination;
- provide guidance on common methods for the removal of pest contamination;
- encourage the production and widespread use of sea containers that are less likely to harbour pests (particularly containers that have floors without gaps), while also enhancing detectability and ease of removal of pest contamination; and
- seek input from IPPC contracting parties and other relevant parties on effective measures to reduce the risk of pest contamination of sea containers and their cargoes, and related information.

ADDRESSED TO

Contracting parties, NPPOs, regional plant protection organizations, and other relevant parties involved in international trade, including exporters, importers, shippers, packers, other logistics operators and sea-container manufacturers.

RECOMMENDATIONS

1. Aim of activities to address pest risk

The CPM *encourages* contracting parties and stakeholders to support implementation of globally consistent science- and risk-based measures that aim to significantly reduce the pest risk associated with the sea-container pathway.

2. Raising awareness

The CPM *encourages* NPPOs to inform relevant parties of any phytosanitary requirements that may apply to the sea-container pathway.

¹ The term “contamination” in this CPM recommendation differs from that in International Standard for Phytosanitary Measures (ISPM) No. 5 (*Glossary of phytosanitary terms*): see Annex 1.

National plant protection organizations are *encouraged* to:

- communicate information about the risk of pest movement via the sea-container pathway to all parties involved in the operation of sea-container logistics;
- promote practices that prevent or reduce the risk of pest contamination of sea containers and their cargoes; and
- promote and support the application of appropriate procedures for cleaning the interior and exterior of sea containers and their cargoes by incorporating the IPPC guidelines on sea-container cleanliness (IPPC Secretariat, 2020a) into relevant guidelines for industry.

3. Reducing the risk of pest contamination in the sea-container pathway

The CPM *encourages* all parties involved in sea-container logistics to ensure that they execute their custodial responsibility to verify that sea containers and their cargoes are free from visible pest contamination before they are transferred into the custody of the next responsible party in the chain. The receiving party is *encouraged* to hold the previous party responsible if visible pest contamination is detected.

Parties with custodial responsibilities include but are not limited to container depots, consignors, shippers, packers, vessel operators, container operators, all carriers in all terrestrial modes (i.e. rail, truck), consignees and terminals.

All parties involved in sea-container logistics are *encouraged* to take appropriate steps to prevent visible pest contamination of sea containers and their cargoes. This may involve actions such as handling, locating and storing containers and cargoes in accordance with available best practices, such as the *Code of practice for packing of cargo transport units* (CTU Code: IMO, ILO & UNECE, 2014) and IPPC guidelines (as summarized in Appendix 1), to avoid contamination with pests. Best practices may include:

- storage in areas free from the risk of pest contamination via vegetation, soil and free-standing water (e.g. the use of fully paved or sealed storage and handling areas);
- storage in areas apart from contaminated containers and cargoes; and
- consignees completely unpacking and cleaning containers before their next use or before vessel loading.

Other measures may be applied in specific situations to reduce the attraction of pests (such as when using artificial lights), as well as during seasonal periods of high pest prevalence or in cases of ongoing pest outbreaks.

4. Visual examination for pest contamination of sea containers and their cargoes

The CPM *encourages* NPPOs and all relevant parties to visually examine, when accessible and safe to do so and in accordance with their custodial responsibilities, all interior and exterior surfaces of sea containers (e.g. the ceiling and roof, floor and undercarriage, side walls, end walls, doors) and their cargoes for potential pest contamination. The CPM *recommends* that such examinations are conducted not only in compliance with health and safety regulations but also in compliance with company-specific visual examination policies and procedures. Similarly, it is *recommended* that the exterior and interior of empty containers are also examined for pest contamination before dispatch, before packing and after unpacking, when accessible. In addition, it is *recommended* that the ventilation-inlet grilles and floor-drain holes of refrigerated containers are visually examined.

More detailed information on the places where pest contamination is most often found, and guidance on how to undertake visual examination of sea containers (including examination of the undercarriage and roof) in a safe manner, is provided in the IPPC guidelines for sea-container surveys (IPPC Secretariat, 2020b).

5. Methods to remove and manage pest contamination

If pest contamination is found, methods for removal or management may include any or all of the following:

- sweeping or vacuum-cleaning the interior of the sea container;
- washing, scraping or using other physical means to clean the interior or exterior of the sea container; or
- using high-pressure washers.

Storage of containers in places where the containers are less likely to become contaminated (on hard surfaces such as concrete, gravel, or other surfaces that are free of plants and animals) is *encouraged*.

All relevant parties are *encouraged* to safely and securely dispose of contaminants to prevent spread, for example by collecting all sweepings and materials from vacuum cleaners for disposal.

Methods for safe storage, treatment or disposal of contaminants may include one or more of the following:

- physical containment, such as bagging or placing in an airtight receptacle;
- safe and appropriate chemical treatment;
- temperature (heat or freezing) treatments;
- incineration; or
- deep burial.

If treatment should be necessary to neutralize pest contamination that cannot be safely removed from the sea container, NPPOs or other authorities may have requirements and guidance in place on the use of treatments.

The CPM *recommends* that recipients of sea containers that have moved internationally seek guidance on appropriate risk-management actions and disposal of pest contamination, including wash water, from their respective NPPO or other authorities if visible pest contamination is detected on or in containers and their cargoes. For that purpose, NPPOs are *encouraged* to provide such guidance.

6. Sea-container structure

The CPM *acknowledges* that introducing modifications to the existing container design across the global container fleet will take significant time. However, evidence shows that eliminating the use of floors with cracks, crevices, and gaps between the flooring panels and container walls reduces the risk of pest contamination. The CPM therefore *encourages* the container industry, in cooperation with container manufacturers, to consider ways to facilitate the production and widespread use of containers with floor types that have no gaps, are less prone to developing cracks and crevices, and that are easier to clean. The CPM also *encourages* container manufacturers to apply light-coloured coatings to container undercarriages to improve the detectability of pest contamination. The CPM *recommends* that these modifications are introduced as part of the normal container life cycle and time frame for replacement.

Other modifications to existing container design (e.g. to the undercarriage and vents) can contribute further to risk reduction. The CPM *recommends* that more research is conducted into these possibilities and *encourages* NPPOs and other relevant parties to make information available regarding the places on or in containers where pest contamination is most commonly found.

Currently, existing container coatings cannot be easily modified to reduce pest contamination. The CPM therefore *recommends* that more research is conducted into such modifications and *encourages* relevant parties to consider replacing current, bitumastic, undercarriage coatings to reduce their “stickiness” and thus the adhesion of pests and other contaminants.

7. Input for effective measures and best practices

Proposals for industry- or government-led solutions that would contribute to a reduction in pest risk, and suggestions for practicable measures and activities that may be effective if widely adopted, are *welcomed* by the IPPC Secretariat. In addition, information on emerging technologies that may contribute to a reduction in pest risk would be of value for the IPPC Secretariat's considerations.

The CPM *encourages* NPPOs to continue working with relevant parties to gather information on pest presence and the risk of pest movement via the sea-container pathway and to provide this information to the IPPC Secretariat. An important tool for such data collection is the template in the IPPC guidelines for sea-container surveys (IPPC Secretariat, 2020b).

The CPM *requests* that information on these points be submitted to the IPPC Secretariat (email ippc@fao.org).

8. Establishing appropriate regulatory tools

The CPM *encourages* contracting parties to establish appropriate regulatory tools to enable NPPOs to manage the pest risk associated with the sea-container pathway.

9. Collaboration with other multilateral bodies

Recognizing that contamination of sea containers may pose a risk to both plant and animal health, and in the interest of avoiding the development of duplicating or conflicting measures, the CPM *encourages* the IPPC Secretariat to seek collaboration with other relevant multilateral bodies (e.g. Secretariat of the Convention on Biological Diversity, International Maritime Organization, World Customs Organization, World Organisation for Animal Health).

Implementation of this CPM recommendation by relevant container-logistics parties may be facilitated by relevant multilateral bodies using a consistent approach in relation to sea-container cleanliness.

REFERENCES

- IMO, ILO & UNECE (International Maritime Organization, International Labour Organization & United Nations Economic Commission for Europe). 2014. *Code of practice for packing of cargo transport units (CTU Code)*. 149 pp. <https://wwwcdn.imo.org/localresources/en/OurWork/Safety/Documents/1497.pdf>
- IPPC Secretariat. 2020a. *Sea container supply chains and cleanliness – An IPPC best practice guide on measures to minimize pest contamination*. IPPC Secretariat. Rome, FAO. vi + 6 pp. <https://www.fao.org/documents/card/en/c/ca7963en>
- IPPC Secretariat. 2020b. *Sea containers surveys – Guidelines for national plant protection organizations (NPPOs)*. IPPC Secretariat. Rome, FAO. 17 pp. <https://www.fao.org/3/ca7740en/CA7740EN.pdf>
- ISPM 5. *Glossary of phytosanitary terms*. IPPC Secretariat. Rome, FAO. <https://www.ippc.int/en/publications/622/>

RECOMMENDATION(S) SUPERSEDED BY THE ABOVE

CPM Recommendation R-06. 2017. *Sea containers*. IPPC Secretariat. Rome, FAO. Adopted 2015.

This annex is part of the formal recommendations presented in this document.

ANNEX 1: Pest risk and implications for sea containers as a pathway

This annex provides contextual information regarding the characteristics of the international sea-container² pathway, the identification of shared responsibilities for relevant parties, and the pest risk associated with the sea-container pathway.

The management of the pest risk associated with the sea-container pathway currently represents a challenge for contracting parties to the IPPC. At the same time, the performance of the global economy and all national economies, the maintenance of food security, and the need to avoid unnecessary costs for global trade depend on the efficient movement of sea containers to ensure the predictable and effective functioning of supply chains. In addition, the number and diversity of parties involved is high, while the pathway itself is mostly a non-plant pathway, thus involving responsible authorities in addition to NPPOs.

Container-logistics operations are complex and are sensitive to impediments both to the movement of containers and their positioning. Even small delays in their movement can result in broader ramifications for international supply chains and global trade. There is, therefore, a delicate balance between the necessity for phytosanitary actions and the need to minimize the impact on supply chains.

It is also the case that complete elimination of the pest risk associated with the sea-container pathway is not feasible. Therefore, the most that can be achieved is to implement science- and risk-based measures aimed at reducing such risk significantly.

Shared responsibilities

National plant protection organizations, other government organizations, and industry parties can play a role in reducing the risk of pest contamination of sea containers and their cargoes. However, the legal basis for managing the pest risk associated with the sea-container pathway varies by country.

All parties involved in international sea-container logistics are encouraged to use practices such as visual examination that minimize the risk of pest contamination while the containers are in their control. The party receiving the container is encouraged to hold the previous party responsible if visible contamination is detected in or on the container and its cargoes. This CPM recommendation provides a set of practices, that, when implemented, may reduce pest contamination of containers and their cargoes. The CPM recognizes that any such practices will be conducted in accordance with the parties' roles and responsibilities in sea-container logistics and need to take into consideration all relevant safety and operational constraints.

Risks associated with empty sea containers

Empty sea containers can also be contaminated by pests. A main contributor to such pest contamination is incomplete unpacking and cleaning. This CPM recommendation therefore includes recommendations regarding visual examination and cleaning of empty containers as well as visual examination of packed containers. Consignees and container depots can play an important role in the cleanliness of empty

² The term “sea container” refers to multimodal, steel freight containers as defined in the *Code of practice for packing of cargo transport units* (CTU Code: IMO, ILO & UNECE, 2014), which in turn aligns with the definition in the International Maritime Dangerous Goods Code:

“An article of transport equipment that is of a permanent character and accordingly strong enough to be suitable for repeated use; specially designed to facilitate the transport of goods, by one or other modes of transport, without intermediate reloading; designed to be secured and/or readily handled, having fittings for these purposes, and approved in accordance with the International Convention for Safe Containers (CSC), 1972, as amended.”

The term “sea container” does not include the carrying vehicles, carrying conveyances or packaging. It does, however, include all containers transported internationally by sea, road and rail. The term includes empty and packed containers.

containers, with container depots often acting as the start and end points for empty containers. Visual examination and, when necessary, cleaning of an empty container done at a container depot may cause the least interruption of sea-container logistics.

Pest risk influenced by cargo type, handling and storage

The nature of the cargo transported in sea containers can affect the pest risk. Pests associated with cargo and packaging can persist in sea containers for many months to years. In addition, the handling and storage of commodities before and during the packing of containers can result in pest contamination of the cargoes and sea containers. Packing is a stage when there is a high risk that internal pest contamination of sea containers may occur. This CPM recommendation therefore applies to the consideration of pest risk up to and including the packing stage. This includes the time spent by the cargo in the place where packing occurs. All types of cargo, irrespective of whether they are plant or non-plant products (e.g. car parts, pipes, tyres, electronics), or their method of handling and storage, may be a source of pest contamination of containers (e.g. with weed seeds, plant parts, soil, insects, standing water).

Terminology specific to this CPM recommendation

Contamination. This CPM recommendation uses the definition of “contamination” from the CTU Code, which applies to both the sea container and its cargo if applicable.

The definition of “contamination” in the CTU Code (IMO, ILO & UNECE, 2014) is as follows:

Visible forms of animals, insects or other invertebrates (alive or dead, in any lifecycle stage, including egg casings or rafts), or any organic material of animal origin (including blood, bones, hair, flesh, secretions, excretions); viable or non-viable plants or plant products (including fruit, seeds, leaves, twigs, roots, bark); or other organic material, including fungi; or soil, or water; where such products are not the manifested cargo within the CTU.

CTU. A “cargo transport unit” (CTU) is defined in the CTU Code as being “a freight container, swap body, vehicle, railway wagon or any other similar unit in particular when used in intermodal transport.”

For the purposes of this CPM recommendation, a clean sea container (commonly referred to simply as a “CTU”) is one that is free from the following (as modified from the CTU Code):

- any previous cargo residues;
- any securing materials used from previous consignments;
- any marks, placards or signs associated with previous consignments;
- any detritus (waste) that may have accumulated in the CTU; and
- any visible contamination (including any part, seeds, eggs or propagules of such species that may survive and subsequently reproduce; soil; and organic matter).

This appendix is for reference purposes only and is not part of the formal recommendations presented in this document.

APPENDIX 1: Summarized IPPC guidance on reducing the risk of sea-container contamination

(See next page.)



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Look out for contaminating pests and contaminants in sea containers and their cargoes

Contaminating pests and contaminants* can travel on or in sea containers. The goods in the container can also contain such pests, regardless of the type of the goods being carried. They can cause serious damage to agricultural industries, the environment and economy.

* Plant and animal material, weeds, seeds, snails, insects and soil. Soil can carry serious diseases such as foot-and-mouth disease.

Before using a sea container, make sure it is clean and free of pests and contaminants.

Areas contaminating pests are commonly found:



- bottom rails;
- forklift pockets and twist lock fittings; and
- tops and cross members.



Inspections should only be conducted where it is safe to do so. See this link for guidance: [fao.org/3/ca7740en/CA7740EN.pdf](https://www.fao.org/3/ca7740en/CA7740EN.pdf)



Shared responsibility

Everyone along the supply chain has a responsibility to keep containers and their cargoes clean. For guidance on best practices to keep containers and cargoes clean, in accordance with roles and responsibilities of parties in the supply chain, please refer to: <https://www.fao.org/documents/card/en/c/ca7963en>

Detections

If pests or contaminants are detected:

- Before vessel loading: take the appropriate action to remove them and ensure container is clean.
- After vessel discharge: seek guidance from your national plant protection organization (NPPO).

Methods to remove contamination

Minor contamination can be removed using sweeping or vacuum cleaning, high pressure water wash or scraping. Under certain circumstances, treatments may be necessary to manage contamination.

Guidance on appropriate treatment options can be obtained from your NPPO or a local professional pest controller.







Disposal

Pests and contaminants must be disposed of safely to prevent their spread. The most common method is bagging: contaminants, as well as the bodies of pests or animals, are placed in bags, sealed, and then placed in a sealable containment bin for collection. Other disposal options may include incineration and deep burial.

Prevention

When containers and cargoes are moved to storage areas, packing areas, ports of loading, or are transiting through another country, preventative measures should be taken to avoid contamination. This includes preventing contamination of containers and cargoes that have already been inspected and cleaned. For guidance on establishing and maintaining pest free areas, please see this link: <https://www.fao.org/documents/card/en/c/ca5844en>

Examples of pests and contaminants and where they are commonly found

<p>Internal pests (such as khapra beetle)</p> <p>Look for insects, larvae or larval skins in goods, in the joints between floors and walls of sea containers, and where possible, in the joints between floor panels and under floors of sea containers.</p>	 <p>khapra beetle skins in cross rail</p>	<p>Nesting pests (such as ants and bees)</p> <p>Look for groups or nests in joins, gaps and spaces at ground level both in and on sea containers and their cargoes.</p>	 <p>African big headed ant</p>
<p>Sheltering pests (such as snails)</p> <p>Look for snails in a variety of colours, sizes and forms attached to sea containers.</p>	 <p>snail in forklift tyre pocket</p>	<p>Overwintering pests (such as stink bugs)</p> <p>Look for pests sheltering in containers, and goods that have been stored outdoors.</p>	 <p>stink bugs on container wall</p>
<p>Egg-laying pests (such as spongy moth)</p> <p>Look for egg masses and pests on external sea-container surfaces.</p>	 <p>egg mass on external surfaces</p>	<p>Contaminants such as soil, seeds, plant and animal material</p> <p>Look for contaminants on the base (including twist locks, side rails and forklift pockets), inside, and where possible, on the underside of containers.</p>	 <p>soil under container</p>

For factsheets on other invasive pests, please visit: <https://www.cabidigitallibrary.org/product/qi>

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IPPC

The International Plant Protection Convention (IPPC) is an international plant-health agreement that aims to protect global plant resources and facilitate safe trade. The IPPC vision is that all countries have the capacity to implement harmonized measures to prevent pest introductions and spread, and minimize the impacts of pests on food security, trade, economic growth, and the environment.

Organization

- » There are over 180 IPPC contracting parties.
- » Each contracting party has a national plant protection organization (NPPO) and an official IPPC contact point.
- » Ten regional plant protection organizations (RPPOs) have been established to coordinate NPPOs in various regions of the world.
- » The IPPC Secretariat liaises with relevant international organizations to help build regional and national capacities.
- » The secretariat is provided by the Food and Agriculture Organization of the United Nations (FAO).

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