



ISPM 34

**INTERNATIONAL STANDARDS FOR
PHYTOSANITARY MEASURES**

ISPM 34

**DESIGN AND OPERATION OF POST-ENTRY
QUARANTINE STATIONS FOR PLANTS**

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Adoption

This standard was adopted by the Fifth Session of the Commission on Phytosanitary Measures in March 2010.

INTRODUCTION

Scope

This standard describes general guidelines for the design and operation of post-entry quarantine (PEQ) stations for holding imported consignments of plants, mainly plants for planting, in confinement in order to verify whether or not they are infested with quarantine pests.

References

- ISPM 1.** 2006. *Phytosanitary principles for the protection of plants and the application of phytosanitary measures in international trade*. Rome, IPPC, FAO.
- ISPM 2.** 2007. *Framework for pest risk analysis*. Rome, IPPC, FAO.
- ISPM 5.** *Glossary of phytosanitary terms*. Rome, IPPC, FAO.
- ISPM 11.** 2004. *Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms*. Rome, IPPC, FAO.

Definitions

Definitions of phytosanitary terms used in the present standard can be found in ISPM 5 (*Glossary of phytosanitary terms*).

Outline of Requirements

Pest risk analysis (PRA) should be carried out to determine the phytosanitary measures for specified plants commodities. For certain such commodities, the national plant protection organization (NPPO) of the importing country may decide that post-entry quarantine is required to manage pest risks identified by PRA. Confinement of a consignment of plants in a PEQ station may be an appropriate phytosanitary measure in cases where a quarantine pest is difficult to detect, where it takes time for sign or symptom expression, or where testing or treatment is required.

For a PEQ station to function successfully, its design and management should ensure that any quarantine pests that may be associated with consignments of plants are suitably confined, and do not move or escape from the station. The PEQ station should also ensure that consignments of plants are held in a manner that best facilitates observation, research, further inspection, testing or treatment of the plants.

PEQ stations may consist of a field site, screen house, glasshouse and/or laboratory, amongst others. The type of facility to be used should be determined by the type of imported plants and the quarantine pests that may be associated with them.

PEQ stations should be appropriately located and comply with physical and operational requirements based on the biology of both plants and quarantine pests that may potentially be associated with the plants. The impact of such pests should also be considered.

Operational requirements for PEQ stations include policies and procedures relating to staff requirements, technical and operational procedures, and record keeping. PEQ stations should have systems in place to detect and identify quarantine pests and to treat, remove or destroy infested plant

material and other materials that may harbour these pests. The NPPO should ensure that the PEQ station is audited on a regular basis.

The plants may be released from the PEQ station at the completion of the PEQ period if they are found to be free from quarantine pests.

BACKGROUND

Imported plants have the potential to introduce quarantine pests. When considering phytosanitary measures for such commodities, NPPOs should apply measures based on the principle of managed risk (ISPM 1:2006). In order to assess the pest risks and identify appropriate phytosanitary measures for particular pathways, PRA should be carried out. For many commodities that are traded internationally, NPPOs of importing countries identify risk management measures that mitigate pest risk without the need to apply quarantine after entry. However, for some commodities, especially plants for planting, NPPOs may identify that a quarantine period is required.

In some cases, NPPOs may decide that a period of quarantine is necessary for a specific consignment because of the impossibility of verifying the presence of quarantine pests in that consignment at entry. This allows for testing for the presence of pests, time for the expression of signs or symptoms, and appropriate treatment if necessary.

The purpose of confinement in a PEQ station is to prevent the escape of pests associated with plants. When the required inspection, testing, treatment and verification activities have been completed, the consignment can be released, destroyed or kept as reference material, as appropriate.

The guidelines described in this standard may also be relevant for holding other organisms in quarantine (e.g. quarantine pests, beneficial organisms, biological control agents) for which other specific requirements may also be needed.

Determining the need for post-entry quarantine as a phytosanitary measure

PRA should be carried out to determine the phytosanitary measures for specified commodities of plants for planting or other plants according to ISPM 2:2007 and ISPM 11:2004. The PRA determines the pest risk associated with the plants and identifies phytosanitary measures, which may include post-entry quarantine for a specified period, to manage the risk. The physical and operational characteristics of a PEQ station determine the level of confinement provided by the station and its ability to confine adequately various quarantine pests.

Once the post-entry quarantine measure has been determined by the NPPO of the importing country, the NPPO should determine whether this measure can be met by any of the following:

- an existing PEQ station (this may include isolated field sites) without modification
- a modification of structural or operating conditions of an existing PEQ station
- a new PEQ station designed and constructed
- quarantine in a different area or country.

REQUIREMENTS

1. General Requirements for PEQ Stations

The requirements of PEQ stations for consignments of plants should consider the biology of the plants, the biology of the quarantine pests and the biology of any vectors that may potentially be associated with them, particularly their mode of dispersal and spread. Successful detention of consignments of plants in quarantine requires prevention of any associated quarantine pests from escaping and prevention of organisms in the area outside the PEQ station from entering the station and transferring or vectoring quarantine pests out of the station.

2. Specific Requirements for PEQ Stations

PEQ stations may consist of one or more of the following: a field site, screen house, glasshouse, laboratory, amongst others. The facilities of a PEQ station to be used should be determined by the type of imported plants and the quarantine pests that may be associated with them.

NPPOs should consider all appropriate issues when determining the requirements for the PEQ station (e.g. the location, physical and operational requirements, waste processing facilities, and the availability of adequate systems for detection, diagnosis and treatment of quarantine pests). NPPOs should ensure that the appropriate level of confinement is maintained by inspections and audits. Appendix 1 provides guidance on requirements for PEQ stations based on the biology of different types of quarantine pests.

2.1 Location

In determining the location of a PEQ station the following should be addressed:

- risks of accidental escape of quarantine pests
- the possibility of early detection of the escape
- the possibility of effective management measures in case of escape.

PEQ stations should provide adequate isolation and stability (e.g. with minimal exposure to severe climatic or geological events). Suitable separation from susceptible plants and related plant species should also be considered (e.g. location away from agricultural or horticultural production, forests or areas of high biodiversity).

2.2 Physical requirements

The physical design of a PEQ station should take into consideration the growth requirements of the plants, the biology of any quarantine pests potentially associated with the consignment, the work flow in the station and specific emergency requirements (e.g. in the event of loss of electricity, water supply). Office facilities and supporting service infrastructure should be available as required and have suitable separation from plants in the PEQ station.

Physical requirements to be considered include:

- delimitation of the station
- isolation of field sites
- differentiation of internal access zones with different levels of confinement
- structural materials (for walls, floors, roof, doors, meshes and windows)
- size of the station (to ensure effective operation of the PEQ station and associated procedures)
- compartments for internal separation of consignments
- access into and within the station (to avoid traffic in areas where plants in quarantine are being grown)
- design of openings (for doors, windows, air vents, drains and other conduits)
- treatment systems (for air, water, solid and liquid waste)
- equipment (e.g. specialized biological safety cabinets, autoclaves)
- access to water and electricity supplies, including backup generators
- footbath at the entrance
- decontamination room for workers and clothing
- use of signs
- security measures
- access to waste disposal facilities.

2.3 Operational requirements

PEQ stations should either be operated or be authorized and audited by the NPPO of the importing country.

Specific procedures will be required in the operation of the station to manage the identified risks associated with the consignments of plants in the PEQ station. A procedural manual, approved by the NPPO where appropriate, should detail the procedures by which the station meets its objectives.

Operational requirements involve appropriate policies and procedures relating to management review, regular auditing, training of personnel, general operation of the PEQ station, record keeping and traceability of plants, contingency planning, health and safety, and documentation.

2.3.1 Staff requirements

Requirements may include:

- a suitable qualified supervisor who has overall responsibility for maintaining the PEQ station and for all PEQ activities
- qualified staff with responsibilities assigned for the maintenance of the PEQ station and associated activities
- appropriately qualified scientific support staff or ready access to them.

2.3.2 Technical and operational procedures

Technical and operational requirements should be documented in a procedural manual and may include:

- a limit on the number of plants held at any one time in the PEQ station so as not to exceed the capacity of the station in a way that could impede inspection or compromise quarantine
- ensuring adequate spatial separation of different consignments or lots within the station
- provision for disinfestations of the station before transfer of plants or in the event of pest occurrence
- handling and sanitation procedures that prevent the spread of pests on hands, cutting tools, footwear and clothing, as well as procedures for disinfestation of surfaces in the PEQ station
- description of how plants are to be handled, sampled and transported to diagnostic laboratories for the testing of quarantine pests
- use of specific confinement equipment (e.g. biological safety cabinets, cages) if needed
- provision for assessment and control (e.g. maintenance and calibration) of equipment (e.g. autoclaves and biological safety cabinets)
- use of dedicated or disposable personal protective equipment
- provision for monitoring pest occurrence in the PEQ station and its vicinity (e.g. using traps)
- appropriate inspection and/or testing to detect quarantine pests
- effective contingency plans for disruptions to or failures of quarantine (e.g. fires, accidental release of plants or pests from the station, electrical outages or other emergencies)
- a procedure for dealing with non-compliances including the appropriate treatment or destruction of plant material infested with quarantine pests, and the preservation of specimens if required
- a system to enable full traceability of the consignments through the PEQ station (the traceability system should use a unique identifier from plant consignment arrival through handling, treatment and testing, until release or destruction of the infested consignment)
- criteria for determining what constitutes a breach of quarantine and a reporting system to ensure that any breaches and adopted measures are reported without delay to the NPPO
- procedures that describe how documents are reviewed, amended and controlled

- a schedule for internal and external audits to check that the station meets the requirements (e.g. structural integrity and hygiene requirements)
- provision for disposal and inactivation of infested consignments
- procedures for decontamination and disposal of waste, including packaging and growing media
- restricting staff contact with plants that may be at risk outside the PEQ station
- a means to control the entry of authorized staff and visitors (e.g. escorting visitors, visitor access restrictions, recording system for visitors)
- a procedure to ensure that all staff are adequately qualified, including training and competency testing where appropriate.

2.3.3 Record-keeping

The following records may be required:

- a site plan of the PEQ station showing the location of the PEQ station on the site and all station entrances and access points
- a record of all PEQ activities conducted in the station (e.g. staff activities, inspections, pest detections, pest identifications, testing, treatments, disposal and release of consignments of plants in quarantine)
- a record of all consignments of plants in the PEQ station and their place of origin
- a record of equipment
- a list of PEQ station staff and other persons authorized to enter the station (or specific parts thereof)
- records of training and skills of staff
- a record of visitors.

2.4 Diagnosis and removal of quarantine pests or vectors

PEQ stations should have systems in place for monitoring for pest occurrence in the PEQ station and its vicinity as well as for detecting and identifying quarantine pests or potential vectors of quarantine pests. It is essential that the PEQ station has access to diagnostic expertise either from the staff within the station or other means. In any case the final diagnostic decision rests with the NPPO.

PEQ stations should have access to expertise and facilities or equipment to treat, remove or destroy as quickly as possible any infested plant material detected in the PEQ station.

2.5 Audit of PEQ stations

The NPPO should ensure that the PEQ station is officially audited on a regular basis to ensure that the station meets the physical and operational requirements.

3. Completion of PEQ Process

Consignments of plants should be released from the PEQ station only if they are found to be free from quarantine pests.

Plants found to be infested with quarantine pests should either be treated to remove infestation or be destroyed. Destruction should be in a manner that removes any possibility of escape of the pest from the PEQ station (e.g. chemical destruction, incineration, autoclaving).

In special circumstances infested or potentially infested plants may be

- shipped to another PEQ station for further inspection, testing or treatment

- returned to the country of origin or shipped to another country under restricted/safe conditions if complying with the recipient country's phytosanitary import requirements or with the agreement of the corresponding NPPO
- kept as reference material for technical or scientific work under quarantine.

In such circumstances any pest risks associated with the movement of plants should be fully addressed.

The completion of the post-entry quarantine process should be documented by the NPPO.

The appendix is for reference purposes only and is not a prescriptive part of the standard.

APPENDIX 1: Requirements for PEQ stations

The following may be considered by NPPOs for PEQ stations for consignments of plants. The requirements are based on the biology of quarantine pests potentially associated with the plants. Other requirements may be necessary to address the risks from specific pests.

General requirements for PEQ stations	
<ul style="list-style-type: none"> Physical separation of plants from other areas, including offices used by personnel Adequate safeguards to ensure plants cannot be accessed or removed from the PEQ station without appropriate authorization Growth of plants in pest-free growing medium (e.g. sterilized potting mix or soil-less growing medium) Growth of plants on raised benches Provision of suitable growing conditions for the imported plants (e.g. temperature, light and humidity) Provision of conditions conducive for the development of signs and symptoms of pests to be expressed Control of local pests (e.g. rodents, whiteflies, ants) and exclusion from the PEQ station by sealing all the points of penetration, including electrical and plumbing conduits (except for open ground facilities) A system and means for sterilization, decontamination or destruction of waste (including infested plants) and equipment (e.g. cutting implements) before removal from the station Appropriate irrigation system to prevent transmission of pests For glasshouses and screen houses: accessible surfaces constructed of smooth and impervious material for cleaning and effective decontamination For glasshouses and screen houses: ceilings and walls to be constructed of material resistant to deterioration and to attack by insects and other arthropods Protective clothing (e.g. a dedicated laboratory coat and footwear or shoe covers, disposable gloves) to be worn by all staff and visitors and removed on exit from the PEQ station Decontamination of personnel upon exit of PEQ station areas containing risk material 	
Biological characteristic (of quarantine pests)	PEQ station requirements
Pests that are exclusively graft-transmitted (e.g. some viruses or phytoplasmas, where vectors are known to be absent)	<ul style="list-style-type: none"> Facilities of the station may include field site, screen house, glasshouse or laboratory PEQ station clearly delimited Appropriate separation from potential hosts Host material restricted to PEQ station only
Pests spread by soil or water only, or in vectors that themselves are spread by soil or water only (e.g. cyst nematodes, nepoviruses)	<ul style="list-style-type: none"> Facilities of the station may include screen house, tunnel or glasshouse Windows and doors locked shut when not in use, and when open, windows should be fitted with screens Footbath Impermeable flooring Appropriate treatment of waste and water (entering and leaving PEQ station) to eliminate quarantine pests Appropriate treatment of soil to eliminate soil-borne vectors Appropriate separation of plants from soil Prevention of drainage water reaching water sources used to irrigate host plants Soil traps installed in drains

Biological characteristic (of quarantine pests)	PEQ station requirements
Pests or pest vectors that are airborne or mobile and are greater than 0.2 mm in size (e.g. aphids)	<ul style="list-style-type: none"> • Facilities of the station may include screen house, glasshouse or laboratory • Self-closing and tight-fitting doors, with appropriate seals and sweeps • Entry through two doors separated by a vestibule or anteroom • A sink with hands-free operation in the anteroom • Anteroom with insecticidal spray • Mesh less than 0.2 mm (70 mesh) (e.g. for screen houses and over vents) to prevent pest or vector entry or escape • Alternative host material for the quarantine pest should not be within the expected pest or vector dispersal distance from the PEQ station (in any direction) • Pest monitoring programme that includes the use of sticky traps, light traps or other insect monitoring devices • Inward directional air flow to be provided within the heating, ventilation and air-conditioning system • Backup electricity supply system for air flow systems and to maintain other equipment • Sterilization or decontamination of waste and equipment (e.g. cutting implements) before removal from the PEQ station
Pests or pest vectors that are airborne or mobile and less than 0.2 mm in size (e.g. some mite or thrips species)	<ul style="list-style-type: none"> • Facilities of the station may include glasshouse constructed of regular glass, impact-resistant polycarbonate or twin-skin plastic, or a laboratory • Self-closing and tight-fitting doors, with appropriate seals and sweeps • Entry through two doors separated by a vestibule or anteroom • A sink with hands-free operation in the anteroom • Anteroom with insecticidal spray • Alternative host material for the quarantine pest should not be within the expected pest or vector dispersal distance from the PEQ station (in any direction) • Pest monitoring programme that includes the use of sticky traps, light traps or other insect monitoring devices • Inward directional air flow to be provided within the heating, ventilation and air-conditioning system • High-efficiency particulate air (HEPA) filtration or its equivalent (HEPA filters to trap 99.97% of particles of 0.3 microns in diameter) • Sterilization or decontamination of waste and equipment (e.g. cutting implements) before removal from the PEQ station • A backup electricity supply system for air systems to maintain negative air pressure gradients and for other equipment • Interlocking of the supply air and exhaust air systems to ensure inward flow at all times

Biological characteristic (of quarantine pests)	PEQ station requirements
Pests that are highly mobile or easily dispersed (e.g. rust fungi, airborne bacteria)	<ul style="list-style-type: none"> • Facilities of the station may include glasshouse constructed of breakage-resistant glass or twin-walled polycarbonate, or a laboratory • Footbath • Self-closing and tight-fitting doors, with appropriate seals and sweeps • Entry through two doors separated by a vestibule or anteroom • A sink with hands-free operation in the anteroom • Alternative host material for the quarantine pest should not be within the expected pest or vector dispersal distance from the PEQ station (in any direction) • Inward directional air flow to be provided within the heating, ventilation and air-conditioning system • A backup electricity supply system for air systems to maintain negative air pressure gradients and for other equipment • No direct access to the station from the outside of the building • Interlocked vestibule doors so that only one door at a time can be opened • HEPA filtration or its equivalent (HEPA filters to trap 99.97% of particles of 0.3 microns in diameter) • All waste air filtered through HEPA filters • Sterilization or decontamination of solid and liquid waste and equipment (e.g. cutting implements) before removal from the PEQ station • Interlocking of the supply air and exhaust air systems to ensure inward flow at all times • Installation of a security alarm • A shower (may be required for staff members on leaving the station) • Monitoring systems for operational processes such as pressure differentials and wastewater treatment to prevent failure of essential systems