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INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

[PARAGRAPH 1]

DESIGN AND OPERATION OF POST-ENTRY QUARANTINE STATIONS FOR PLANTS

[Work programme topic: Post-entry quarantine facilities]
[Specification No. 24]

Secretariat of the International Plant Protection Convention
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[2] **CONTENTS**

[3] INTRODUCTION

[4] SCOPE

[5] This standard describes general guidelines for the design and operation of post-entry quarantine (PEQ) stations for holding in quarantine consignments of plants that may be infested with quarantine pests.

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

[7] REFERENCES

Framework for pest risk analysis, 2007. ISPM No. 2, FAO, Rome.
Glossary of phytosanitary terms, 2009. ISPM No. 5, FAO, Rome.
Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms, 2004. ISPM No. 11, FAO, Rome.
Phytosanitary principles for the protection of plants and the application of phytosanitary measures in international trade, 2006. ISPM No. 1, FAO, Rome.

[8] DEFINITIONS

[9] Definitions of phytosanitary terms used in the present standard can be found in ISPM No. 5 (*Glossary of phytosanitary terms*).

[10] OUTLINE OF REQUIREMENTS

[11] Pest risk analysis (PRA) is required to determine the quarantine requirements for a specified consignment of plants. For certain consignments of plants, the National Plant Protection Organization (NPPO) may decide that post-entry quarantine is required to manage pest risks identified by PRA.

[12] For a PEQ station to function successfully, the design and management of the station should ensure that any quarantine pests associated with consignments of plants are suitably confined and do not enter and/or establish in the area. The PEQ station should also ensure that consignments of plants are held in a manner that best facilitates the observation or further inspection, testing and/or treatment of the plants.

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

[14] Operational requirements to meet specified quarantine conditions include appropriate policies and procedures relating to staff requirements, technical and operational procedures, and documentation. PEQ stations should have systems to detect and identify quarantine pests and treat, remove or destroy infested plant material. The NPPO or NPPO-approved body should audit the PEQ station on a regular basis.

[15] The plants may be released from quarantine at the conclusion of the PEQ period if they are found to be free of quarantine pests and meet all other regulatory requirements of the importing country.

[16] **BACKGROUND**

[17] Imported consignments of plants have the potential to introduce quarantine pests. When considering phytosanitary measures for such consignments, National Plant Protection Organizations (NPPOs) should apply measures based on the principle of managed risk (ISPM No. 1: *Phytosanitary principles for the protection of plants and the application of phytosanitary measures in international trade*). In order to assess the pest risks and identify appropriate measures for particular pathways, pest risk analysis (PRA) is carried out. For many commodities that are traded internationally, importing NPPOs identify risk management measures that mitigate pest risk without the need to apply quarantine after entry. For some commodities, NPPOs may decide that a quarantine period is part of the import requirements or is necessary for certain consignments after entry into the country because of uncertainty about the presence of pests in that consignment. This allows for testing for the presence of pests, time for the expression of signs or symptoms, and appropriate treatment if necessary.

[18] The purpose of PEQ station is to contain both the plants and any quarantine pest potentially associated with them so that neither can escape from the station before the required inspection, testing, treatment and verification activities have been completed, and the consignment is released or destroyed, as appropriate.

[19] **REQUIREMENTS**

[20] **2. General Requirements for PEQ**

[21] PRA is required to determine the quarantine requirements for a specified consignment of plants as described in ISPM No. 2 (*Framework for pest risk analysis*) and ISPM No. 11 (*Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms*). The PRA determines the pest risk associated with the plants and identifies measures, which may include PEQ, to manage the risk. The physical and operational characteristics of a PEQ station determine the level of confinement provided by the station.

[22] The specifications of PEQ stations for consignments of plants should reflect both the biology of the plants and the biology of the quarantine pests that may potentially be associated with the plants. The potential impacts of such pests should also be taken into account. Successful quarantine of consignments of plants requires measures to prevent any associated quarantine pests from escaping, and where appropriate, to prevent organisms in the area outside the PEQ station from entering the station and transferring or vectoring quarantine pests.

[23] Once the quarantine requirements have been determined by the NPPO in the importing country, the NPPO then needs to determine whether these requirements can be provided by any of the following:

- an existing PEQ station
- a modification of structural or operating conditions of an existing station
- quarantine in a different area
- a new station designed and constructed to meet the requirements.

[24] **2. Specific Requirements**

[25] **2.1 PEQ stations**

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

[27] NPPOs should consider the location, physical and operational requirements of the PEQ station as well as systems for diagnosis and treatment of quarantine pests and auditing of the station. Annex 1 provides specifications for PEQ stations based on the biology of different types of quarantine pests.

[28] **2.2 Location**

[29] In determining the location of the PEQ stations the risks of accidental escape of quarantine pests should be addressed. PEQ stations should provide adequate isolation and stability (e.g. with minimal exposure to severe climatic events, not in earthquake-prone areas), and some separation from related plant species (e.g. location away from agricultural or horticultural production, forests or areas of high biodiversity) and suitable separation from susceptible plants.

[30] **2.3 Physical requirements**

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

[32] Physical requirements to consider include:

- delimitation of the station
- external structural materials (for walls, floors, roof and windows)
- size of the station (to ensure effective operation of the PEQ station and associated procedures)
- access to the station (to avoid areas where plants 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 safety cabinets, backup generators, autoclaves)
- access to water supply
- signage.

[33] **2.4 Operational requirements**

[34] PEQ stations should either be operated by or be authorized by the NPPO.

[35] Operational requirements to meet specified quarantine conditions involve appropriate policies and procedures relating to management review, training of personnel, general operation of the PEQ station, record keeping and traceability of plants, contingency planning, health and safety, and documentation.

[36] Specific procedures are 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, should show how the station meets the quarantine requirements.

[37] **2.4.1 Staff requirements**

[38] Staff requirements may include as appropriate:

- a qualified manager who has overall responsibility for maintaining PEQ and for all PEQ activities
- key responsibilities concerning the maintenance of the PEQ stations and activities described and attributed to staff members
- a means to control and register entry of authorized staff
- all access to the station restricted to authorized persons
- a procedure to ensure that all staff are adequately qualified, including training where appropriate.

[39] **2.4.2 Technical and operational procedures**

[40] Technical and operational requirements may include as appropriate:

- provision for the number of plants in a PEQ station not to exceed the capacity of the station in a way that could impede inspection or compromise quarantine
- provision of disinfestations of the station before introduction of material for screening or in the event of pest occurrence
- adequate spatial separation of different consignments or lots within the station as appropriate
- a procedure to enable full traceability of the consignments through the PEQ station (the traceability system should use a unique identifier throughout the process of plant arrival, handling, treatment and testing to release)
- use of specific containment equipment (e.g. biological cabinets)
- appropriate handling and sanitation procedures to prevent the spread of organisms on hands, cutting tools, footwear and clothing, as well as procedures for disinfections of surfaces
- provision for monitoring for pest occurrence in station using traps etc.
- appropriate inspection and/or testing to detect quarantine pests that may be associated with the plants
- a procedure that describes how plants are sampled and transported to diagnostic laboratories for the testing of quarantine pests

- criteria for what constitutes a breach of quarantine confinement, and a reporting system to ensure that any breaches are reported without any delays to the NPPO or authorized body
- provision for assessment and control (e.g. maintenance and calibration) of critical equipment (e.g. autoclaves and safety cabinets)
- effective contingency plans for disruptions to or failures of quarantine (e.g. through fires, accidental release of plants or pests from the station, electrical outages or other emergencies)
- a schedule for internal audits to check that the station meets the PEQ requirements (e.g. structural integrity and hygiene requirements)
- a procedure for dealing with non-compliances including the appropriate treatment or destruction of plant material infested with quarantine pests
- a procedure to control risks related to visitors (e. g. records of visitors)
- provision for disposal of infested consignments
- procedures for decontamination of waste
- procedures that describe how quarantine documents are reviewed, amended and controlled.

[41] **2.4.3 Documentation**

[42] The following documents may be required:

- a list of staff authorized to enter the station
- 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 register of visitors
- a record of all PEQ activities conducted in the station (e.g. staff activities, treatments and disposal of consignments in quarantine)
- a register of all consignments of plants in the station
- records of training and skills of staff
- records of inspections and testing.

[43] **2.5 Diagnosis and removal of infestations of quarantine pests or vectors**

[44] PEQ stations should have systems in place to detect and identify quarantine pests or potential vectors of quarantine pests. It is essential that diagnostic expertise be held by staff within or associated with the PEQ station.

[45] 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.

[46] **2.6 Audit of PEQ stations**

[47] The NPPO or an NPPO-approved body should audit the PEQ station on a regular basis to ensure that the station meets the physical and operational requirements.

[48] **3. Conclusion of PEQ**

[49] If plants are found to be free of quarantine pests, and meet the other regulatory requirements of the importing country, they can be released from quarantine.

[50] If plants are found to be infested with quarantine pests they should either be treated to remove infection or be destroyed. In special circumstances infested or potentially infested plants may be shipped to another area for release or to another PEQ station for further inspection, testing or treatment.

ANNEX 1

[51] SPECIFICATIONS FOR PEQ STATIONS

[52] One or more of the following requirements may be considered by NPPOs when determining the requirements for consignments of plants. The specifications are based on the biology of quarantine pests potentially associated with the plants.

[53]

General specifications for PEQ stations	
[54] • Physical separation of plants from other areas, including offices used by personnel • Adequate security to ensure plants are not removed from the PEQ station without appropriate authorization • Appropriate signage • Restricted access to the site • Growth of plants in pest-free growing medium (e.g. sterilized potting mix or soil-less growing medium) • Labelling or otherwise suitable identification of consignments • Provision of good 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 • Regular pest and pest vector monitoring at specified intervals by use of appropriate methods (e.g. sticky insect traps) • Control of local pests (e.g. rodents, white flies) and exclusion from the PEQ station by sealing all the points of penetration, including electrical and plumbing conduits (except for open ground facilities) • Regular maintenance and calibration of equipment used in the PEQ station (e.g. autoclaves and biological safety cabinets) • Sterilization or decontamination of waste and equipment (e.g. cutting implements) before removal from the station • For glass houses and screen houses: accessible surfaces constructed of smooth and impervious material for cleaning and effective decontamination • A means and system for destruction of waste including infested plants	•
[55] **Biological characteristic (of quarantine pests)**	**PEQ station specifications** [56]
[57] Pests that are exclusively graft-transmitted e.g. some viruses or phytoplasmas	[58] • Type of station: field site, screen house or glasshouse • PEQ area clearly delineated • Appropriate separation from potential hosts • Host material restricted to PEQ site only, and no grafting performed unless part of testing procedures
[59] Pests spread by soil or water only, or in vectors that themselves are spread by soil or water only e.g. cyst nematodes	[60] • Type of station: screen house or glasshouse constructed of regular glass or twin-skin plastic • Entry through two doors separated by a vestibule or anteroom • Windows and doors locked shut when not in use • Appropriate treatment of water (entering and leaving station) to eliminate quarantine pests • Prevention of drainage water reaching water sources used to irrigate host plants • Protective clothing (e.g. a laboratory coat and dedicated footwear or shoe covers) to be worn by all staff and visitors
[61] Pests or pest vectors that are airborne or mobile and are greater than 0.2 mm in size e.g. aphids, mealybugs	[62] • Type of station: screen house or glasshouse constructed of regular glass or twin-skin plastic • Self-closing and tight-fitting doors, with appropriate seals and sweeps • Entry through two doors separated by a vestibule or anteroom • Anteroom with insecticidal spray

		• 0.2 mm mesh over vents to prevent pest or vector entry or escape • Alternative host material for the quarantine pest not within the expected pest or vector dispersal distance from the PEQ station (in any direction) • A heating, ventilation and air-conditioning system capable of preventing the movement into or out of the station of small (but greater than 0.2 mm) aerially dispersed organisms or organism life stages • Installation of insect monitoring devices such as sticky traps or light traps • Protective clothing (e.g. a laboratory coat and dedicated footwear or shoe covers) to be worn by all staff and visitors
[63]	Pest or pest vectors that are airborne or mobile and less than 0.2 mm in size e.g. some mite or thrips species	• Type of station: screen house or glasshouse constructed of regular glass or twin-skin plastic • 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 • High-efficiency particulate air (HEPA) filtration (to remove particles greater than 0.3 microns with 99.97% efficiency) • Negative air pressure • Protective clothing (e.g. a laboratory coat and dedicated footwear or shoe covers) to be worn by all staff and visitors • Sterilization or decontamination of waste and equipment (e.g. cutting implements) before removal from the station • A shower (may be required for staff members on leaving the station)
[65]	Pests that are highly mobile or easily dispersed e.g. rust fungi, airborne bacteria	• Type of station: screen house or glasshouse constructed of breakage-resistant glass or twin-walled polycarbonate • No direct access to the station from the outside of the building • Entry through two doors separated by a vestibule or anteroom • Interlocked vestibule doors so that only one door at a time can be open • HEPA filtration (to remove particles greater than 0.3 microns with 99.97% efficiency) • Negative air pressure • Protective clothing (e.g. a laboratory coat and dedicated footwear or shoe covers) to be worn by all staff and visitors • Sterilization or decontamination of waste and equipment (e.g. cutting implements) before removal from the station • Where stations have supply air systems, interlocking of the supply air and exhaust air systems to ensure inward flow at all times • All waste air, including from fume hoods that discharge to the outside atmosphere, filtered through HEPA filters • 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 • A backup electricity supply system for air systems to maintain negative air pressure gradients and for other critical equipment

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