



## INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

# DRAFT STANDARD

## INTEGRATED MEASURES APPROACH FOR PLANTS FOR PLANTING IN INTERNATIONAL TRADE

(201-)

DRAFT  
DOCUMENT

<b>Date of this document</b>	29 April 2010
<b>Document category</b>	Draft ISPM
<b>Current document stage</b>	Draft for member consultation 2010
<b>Origin</b>	Work programme topic: Plants for planting (including movement, post-entry quarantine and certification programmes)
<b>Major stages</b>	Specification No. 34, May 2006. Revised after review by SC-7, May 2008. Draft sent for member consultation by April 2010 SC.
<b>Notes</b>	File template: IPPCStyles, April 2010. Numbered ¶.

**CONTENTS**

INTRODUCTION.....	4
Scope .....	4
References .....	4
Definitions .....	4
Outline of requirements .....	4
BACKGROUND.....	5
REQUIREMENTS .....	5
1. Factors that Affect the Pest Risk of Plants for Planting .....	5
1.1 Pest factors that affect risk .....	5
1.2 Plant-related factors that affect risk .....	6
1.3 Production factors that affect risk .....	6
1.4 Intended uses that affect risk.....	7
2. Application of Risk Mitigation Measures.....	7
3. Integrated Measures Approach .....	7
3.1 General integrated measures .....	7
3.1.1 Authorization of places of production.....	7
3.1.2 Requirements for the place of production .....	8
3.2 Integrated measures in high-risk situations .....	8
3.2.1 Requirements for the place of production in high-risk situations .....	8
3.2.1.1 Place of production manual.....	9
3.2.1.2 Pest management plan.....	9
3.2.1.3 Crop protection specialist.....	10
3.2.1.4 Training of employees.....	10
3.2.1.5 Examination of plant material.....	10
3.2.1.6 Packing and transportation .....	11
3.2.1.7 Internal audits.....	11
3.2.1.8 Records.....	11
3.2.2 Non-compliance with requirements for the place of production.....	12
3.2.2.1 Critical non-compliance .....	12
3.2.2.2 Non-critical non-compliance.....	12
4. Responsibilities of the NPPO of the Exporting Country .....	12
4.1 Establishing integrated measures approaches .....	13
4.2 Authorization of places of production.....	13
4.3 Oversight of authorized places of production .....	13
4.4 Export inspections and issuance of phytosanitary certificates .....	13
4.5 Providing adequate information .....	14
5. Responsibilities of the NPPO of the Importing Country .....	14
5.1 Traceability procedures.....	14
5.2 Auditing by the importing NPPO.....	14

APPENDIX 1: Examples of pest management measures to reduce the phytosanitary risk of plants  
for planting .....15

APPENDIX 2: Examples of non-compliance .....18

## [1] INTRODUCTION

### [2] Scope

[3] This standard provides guidelines for the development and implementation of integrated measures to manage the pest risks associated with the production and international movement of plants for planting (excluding seeds). It outlines factors relevant for the determination of the risk level associated with particular plants for planting and places of production, as well as risk-based application of measures and the responsibilities of the national plant protection organizations (NPPOs) of the importing and exporting countries.

### [4] References

- [5] **ISPM 2.** 2007. *Framework for pest risk analysis*. Rome, IPPC, FAO.
- [6] **ISPM 5.** 2009. *Glossary of phytosanitary terms*. Rome, IPPC, FAO.
- [7] **ISPM 11.** 2004. *Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms*. Rome, IPPC, FAO.
- [8] **ISPM 12.** 2001. *Guidelines for phytosanitary certificates*. Rome, IPPC, FAO.
- [9] **ISPM 13.** 2001. *Guidelines for the notification of non-compliance and emergency action*. Rome, IPPC, FAO.
- [10] **ISPM 14.** 2002. *The use of integrated measures in a systems approach for pest risk management*. Rome, IPPC, FAO.
- [11] **ISPM 20.** 2004. *Guidelines for a phytosanitary import regulatory system*. Rome, IPPC, FAO.
- [12] **ISPM 21.** 2004. *Pest risk analysis for regulated non-quarantine pests*. Rome, IPPC, FAO.
- [13] **ISPM 32.** 2009. *Categorization of commodities according to their pest risk*. Rome, IPPC, FAO.

### [14] Definitions

[15] Definitions of phytosanitary terms used in the present standard can be found in ISPM 5:2009.

### [16] Outline of requirements

[17] This standard provides guidance for the use of integrated measures to manage the pest risks that plants for planting (excluding seeds) pose as a pathway for regulated pests and to meet the phytosanitary requirements of the importing NPPO. The use of integrated measures approaches requires the involvement of the NPPOs of both the importing and exporting countries, as well as producers, and relies on pest risk management measures applied throughout the production and distribution processes.

[18] The standard provides guidance on two types of integrated measures approaches: general integrated measures and integrated measures for high-risk situations. Requirements for establishing the integrated measures and for authorizing places of production are also provided. Specific guidance is included on non-compliances in high-risk situations.

[19] The standard also provides general guidance for identifying and categorizing the risks that may be associated with particular types of plants for planting. These risks should be taken into account when determining the strength of measures applied in a particular situation.

## [20] BACKGROUND

[21] Several ISPMs on pest risk analysis (PRA) provide general guidance on pest risk management (for example, ISPM 2:2007, ISPM 11:2004, ISPM 14:2002, ISPM 21:2004, ISPM 32:2009). Although these standards provide general guidance for PRA for plants for planting, such plants are generally considered to pose a higher pest risk than other plant products and therefore additional specific guidance is needed. In any case, the conclusions from pest risk analysis should be used to decide the appropriate measures to reduce the risk to an acceptable level for the importing country.

[22] Export inspections of consignments of plants for planting has limitations:

- Some pests may be difficult to detect visually, particularly at low pest population densities.
- Disease symptoms may be latent or masked at the time of inspection (e.g. as a result of pesticide use, dormancy of plants at time of shipping or removal of symptomatic leaves).
- The type of packaging and physical state of the consignment can influence the rigour of inspection.
- Alternative or supplementary non-visual detection methods for many plant pests, particularly pathogens, are not available.

[23] An integrated measures approach for pest risk management may provide an alternative or supplement to single measures (particularly point of entry inspections) to meet the phytosanitary import requirements of the importing country. The use of integrated measures for pest risk management requires not only the participation of the NPPO of the exporting country but also the participation of the producer throughout all the production stages of the plants for planting.

[24] An integrated measures approach also has the advantage of better managing the risk not only of known pests that are difficult to detect based on export or import inspections but also of organisms that are unknown to science, contaminating pests and organisms that are not quarantine pests in the country of origin.

[25] The application of an integrated measures approach may also provide an alternative to post-entry quarantine or prohibition.

## [26] REQUIREMENTS

### [27] 1. Factors that Affect the Pest Risk of Plants for Planting

[28] The factors described in sections 1.1 to 1.4 should be considered by the importing NPPO when conducting a PRA to identify the appropriate combination of measures to meet its phytosanitary requirements.

[29] These factors should also be considered by the exporting NPPO when establishing measures to be taken at places of production participating in an integrated measures approach to ensure plants for planting meet the importing country's phytosanitary requirements.

#### [30] 1.1 Pest factors that affect risk

[31] Pest factors that should be taken into consideration include:

- whether the pest occurs in the country/area of origin
- type of pest (arthropod, fungus, virus, bacteria etc.)
- establishment and spread potential
- reproduction rate and numbers of generation per year
- transmission (e.g. vector, graft transmission, mechanical transmission)

- ability to detect the pest, even at low population levels
- availability of control measures
- host range of the pest
- presence of host plants in the country of import
- latency of infection.

[32] Table 1 in Appendix 1 provides options for measures related to pest characteristics that are applicable for most types of plants for planting. Depending on their efficacy, a single such measure may be sufficient to mitigate the risk or a combination of these measures may be incorporated in an integrated measures approach.

### [33] 1.2 Plant-related factors that affect risk

[34] As part of the risk categorization, the initial plant risk factors to be considered are species and area of origin. Within any given species, there is a range of risk associated with the type of plant material moved, as broadly ranked below from lowest to highest risk:

- meristem tissue culture
- *in vitro* culture
- budwood/graftwood
- unrooted cuttings
- rooted cuttings
- plants rooted in sterilized and/or soil-less growing media
- bulbs
- bare root plants (soil free)
- plants rooted in soil.

[35] In addition, risk increases with age, as older plants have had longer exposure to potential pests. Risk also increases with size because larger plants have a larger surface area exposed to pests and may also be more difficult to inspect and treat. However, age and size are not always related (e.g. artificial dwarfing).

[36] Appendix 1, Table 2 provides examples of possible measures that NPPOs may require for different types of plants for planting and different types or groups of pests associated with them. The examples describe frequently used measures for important pest types of the relevant type of plants for planting.

### [37] 1.3 Production factors that affect risk

[38] How plants for planting are produced can influence the level of risk. Some factors include:

- growing media
- irrigation
- other growing conditions.

[39] In general, use of soil as a growing medium is likely to pose a greater risk than a soil-free medium because soil may carry soil-borne pathogens, insects or nematodes. Sterilization or pasteurization of the growing medium prior to planting may mitigate some risk.

[40] The source and quality of irrigation water can affect pest risk. For certain pests spread by water, surface water may pose a greater risk than treated or deep well water. Likewise the method of irrigation may produce microclimates or conditions favourable for pest growth and spread (e.g. overhead (rather than drip) irrigation).

[41] Other growing conditions that may affect risk are listed below, broadly ranked below from lowest to highest risk:

- growth chamber
- glasshouse
- screen house
- field grown in containers (pots, tubs etc.)
- field grown
- plants collected from the wild.

[42] Enclosures such as growth chambers, glasshouses and screen houses usually provide better control over plant material and better opportunity for pest exclusion than field-grown plants. Field-grown crops are generally subject to cultural and chemical pest control, and containers with sterilized growing medium and grown on a membrane may afford some protection from soil-borne pests. Wild collected plants do not have any form of pest control and may therefore be unprotected from pests.

#### [43] **1.4 Intended uses that affect risk**

[44] Plants for planting are classified in ISPM 32:2009, as a high-risk commodity category. Nevertheless, plants for planting are used for various purposes that affect the risk. Examples of intended uses are listed below, broadly ranked from lowest to highest risk:

- plants not intended for continuous growing
- plants for continuous growing
- plants for propagation.

### [45] **2. Application of Risk Mitigation Measures**

[46] The strength of risk mitigation measures applied at the place of production should be consistent with the identified pest risk. The range of possible management options constitutes a continuum starting from a single measure (e.g. treatment or inspection) to a comprehensive integrated measures approach with numerous elements.

### [47] **3. Integrated Measures Approach**

[48] Where individual measures alone are not sufficient to mitigate the pest risk, an integrated measures approach may be implemented. Based on the risk identified this may involve a range of options, from an integrated measures approach whose elements are widely applicable to all plants for planting (see “General integrated measures”, section 3.1) to one with additional elements designed to mitigate situations where the pest risk is high (see “Integrated measures in high-risk situations”, section 3.2). NPPOs may consider these options in addition to pre-export inspection in order to mitigate plant pest risks.

#### [49] **3.1 General integrated measures**

[50] Where individual measures alone are not sufficient to mitigate the pest risk, the NPPO of the exporting country may authorize a place of production that complies with general integrated measures that are applicable to all types of plants for planting.

##### [51] **3.1.1 Authorization of places of production**

[52] The following conditions should form part of the authorization process for places of production seeking to participate in the general integrated measures approach:

- maintaining an updated plan of the place of production describing when, where and how plants for planting were produced, stored or prepared for movement from the place of production

(including information on plant species and type of plant material such as cuttings, *in vitro* cultures, bare root plants)

- keeping, for at least three years, records that verify where and how plants for planting were purchased, stored, produced and distributed
- designating a person with a well-established working knowledge of pest identification and control as a contact person for the NPPO of the exporting country
- notifying their NPPO if any relevant pests are observed.

Any failure of products or procedures to adhere to the requirements for authorization (non-compliance) should result in the suspension of authorization of the place of production until corrective actions have been successfully completed.

### [53] 3.1.2 Requirements for the place of production

The following measures may be sufficient to meet the phytosanitary requirements of the importing country when the PRA indicates that they are consistent with the risk (e.g. plants of a well-documented plant species with known risks originating from a country or area with a documented history of safe exports):

- conducting visual examinations of plants and places of production by designated staff as necessary, at appropriate times and according to protocols provided by the NPPO of the exporting country (Records of all examinations, including a description of pests found and corrective actions taken, should be made.)
- establishing a system of sanitation and hygiene
- taking measures, where necessary, to keep the plants free from relevant pests
- complying with any phytosanitary measures required by the exporting NPPO.

Additional requirements may be necessary in order to mitigate specific pest risks at the place of production. Appendix 1 provides examples of different pest management measures that NPPOs may require for different types of plants for planting and different types or categories of pests associated with them. Requirements will depend on the plants concerned, the circumstances in the exporting country and the conclusions of relevant PRAs. In all situations, the strength of the measures at the place of production should be consistent with the risk.

## [54] 3.2 Integrated measures in high-risk situations

[55] Where the general integrated measures of section 3.1 are not sufficient to meet the phytosanitary requirements of the importing NPPO, the situation may require further risk management measures, as described in this section.

### [56] 3.2.1 Requirements for the place of production in high-risk situations

[57] A place of production applying for authorization to participate in an integrated measures approach for high-risk situations should develop a manual that includes a pest management plan and relevant information on production practices. Once this document has been developed, implemented and audited to verify compliance and the NPPO of the exporting country has determined that the measures meet the import requirements of the importing country, the place of production may be authorized by the NPPO of the exporting country to export plants to a particular destination.

[58] The following sections provide the elements to be documented, implemented and audited by the exporting NPPO. A documented quality management system, where available, may also be presented to the NPPO for consideration.



### [59] 3.2.1.1 Place of production manual

[60] The manual should describe all of the requirements, elements and processes that make up the integrated measures for risk management of the plants for planting. The manual should be developed, implemented and maintained by the place of production and approved by the exporting NPPO. For exports of additional plants or exports to additional countries, the manual should be amended, and the affected sections reviewed and approved by the exporting NPPO as appropriate; an audit of the entire programme may not be required.

[61] The manual may include the following elements:

- a description of the organizational structure and of the roles and responsibilities of the relevant personnel, including names of the person designated as responsible for the technical performance of the place of production and/or the crop protection specialist (see section 3.2.1.3) (Either of these personnel may serve as the contact point between the NPPO and place of production.)
- a plan of the place of production, which is kept up to date (This should describe when, where and how plants for planting are produced, stored or prepared for movement from the place of production (including information on plant species and type of plant material such as cuttings, *in vitro* cultures, bare root plants).)
- a pest management plan (see section 3.2.1.2) that includes a description of the phytosanitary requirements of the target importing countries for each plant species and type of plant material
- a brief description of production, shipping and receiving locations
- handling procedures for incoming plant material, including procedures to ensure segregation of plant material
- a description of subcontracted activities
- a description of documentation procedures to maintain evidence of the source and origin of propagation material
- copies of the forms used for internal audit reports and checklists
- a description of how internal audits will be conducted, including the frequency and who is responsible
- copies of employee training records and plans
- record-keeping necessary to maintain forward and backward traceability of plants for planting from the place of production.

### [62] 3.2.1.2 Pest management plan

[63] The pest management plan, included in the manual, should describe procedures or processes approved by the NPPO of the exporting country and designed to prevent infestations, eradicate or control pests, or suppress pest populations to the accepted level.

[64] The pest management plan should include the following elements:

- sanitation and hygiene – preventing the introduction of pests to the place of production and minimizing spread within a place of production, for example:
  - . regular removal of plant debris
  - . disinfection of tools and equipment
  - . removal of weeds and non-crop plant material
  - . water treatment
  - . personal hygiene (e.g. hand washing, foot baths, coveralls or aprons)
- pest control – products, procedures and measures (see Appendix 1) to prevent and/or treat pests, such as:
  - . physical barriers (e.g. screens, double doors)

- . disinfection of growing media
- . crop protection product applications (e.g. chemical, biological)
- . disposal of infested plants
- . mass trapping
- . climate control
- . hot water or heat treatment
- handling of incoming plant material – methods and documentation for managing pest risks associated with incoming plant material, with descriptions of:
  - . measures to ensure that all plants for planting entering the place of production are free of regulated plant pests and practically free of non-regulated plant pests, and that the risk of introducing and transmitting plant pests is mitigated
  - . procedures to be followed if pests are detected
  - . records to be kept, including the date, the name of the person carrying out the examination, any pests, damage and/or symptoms found, and any corrective actions taken
- examination of plant material and production sites – methods, frequency and intensity used to examine all plant material in the place of production (e.g. visual examination, sampling, testing (indexing, serology etc.) and trapping), including any laboratories used to identify any pests found
- examination of plants for planting prior to export – methods, frequency and intensity used to examine plants where and when exports are being prepared
- identification and management of infested product, with descriptions of:
  - . how infested product is identified and treated
  - . measures to ensure that non-compliant plant material is not shipped
  - . disposal of culled plant material in a manner that prevents buildup and spread of pests
  - . keeping accurate records of the application of crop protection products and other pest management measures.

### **[65] 3.2.1.3 Crop protection specialist**

[66] Places of production implementing comprehensive integrated measures for pest risk management should employ a specialist with a well-established working knowledge of pest identification and control. The specialist should ensure that sanitation, pest monitoring and pest control measures are implemented as described in the phytosanitary manual and pest management plan and that the NPPO of the exporting country is notified upon detection of relevant pests. This person should also serve as the contact person with diagnosticians who may be needed for pest identification.

### **[67] 3.2.1.4 Training of employees**

[68] Employees should be trained to detect pests regulated by the importing country and communicate information on pest findings to the crop protection specialist.

### **[69] 3.2.1.5 Examination of plant material**

[70] All plant material in a place of production (including plants destined for domestic markets and all production sites) should be examined on a regular schedule by designated staff according to established methods and intensity.

### **[71] 3.2.1.6 Packing and transportation**

[72] The following considerations apply to packing and transport operations:

- Plant material should be packed in a manner to prevent infestation or reinfestation by regulated pests.
- Packing material should meet the requirements of the importing country.
- Each unit of a consignment should be identified in a way that links it to the consignment and to the phytosanitary certificate.
- Packing material and boxes should be clean, unused, disinfested or decontaminated.
- Conveyances at the place of production should be examined and cleaned as necessary prior to loading.

### **[73] 3.2.1.7 Internal audits**

[74] Internal audits should be conducted to ensure that the place of production is in compliance with its phytosanitary manual. Internal audits should focus on whether the documentation and its implementation meet the requirements of the exporting NPPO. For example, the internal audit may evaluate the competency of place of production staff in identifying and controlling pests, carrying out duties and responsibilities and whether the record-keeping of the place of production is sufficient to keep track of the country of origin of plant material, labels etc.

[75] Internal audits should be carried out by employees who are independent of the people directly responsible for the audited activity. The results of the audits and any non-compliances (see section 3.2.2 and Appendix 2) should be recorded and presented to the place of production management for review. The employees responsible for the audited activity should promptly take corrective action regarding any non-compliances discovered during an audit and ensure that corrective actions are implemented effectively and are documented.

[76] If a place of production identifies any critical non-compliances, it should immediately notify its NPPO in writing and ensure that non-compliant plants for planting are not exported. Immediate corrective actions should be taken in cooperation with the NPPO.

### **[77] 3.2.1.8 Records**

[78] Accurate and up-to-date records should be kept and should be able to be retrieved when required by the NPPO. Records that verify compliance with the phytosanitary manual and the requirements of the NPPO should be maintained for at least three years. Records should include date, name and signature of the person who carried out the task and/or prepared the document. Examples of records that may be required include:

- invoices, phytosanitary certificates and other information that substantiate the origin and the phytosanitary status of all incoming plant material
- results of the inspection of incoming plant material
- results of internal audits and external audits
- records of examination during production including any pests, damage or symptoms detected and corrective actions taken
- records of examination of outgoing plant material, including type and quantity of material exported
- copies of phytosanitary certificates for plant material exported by the place of production
- records of pest management measures taken to prevent or control pests (including method of application, product applied, dosage and date of application and results of their application)
- records of non-compliances identified and the corrective or preventative actions taken
- records of training of staff and their qualifications.

### [79] **3.2.2 Non-compliance with requirements for the place of production**

[80] A non-compliance is any failure of products or procedures to adhere to the phytosanitary requirements of the importing country or the integrated risk management measures established by the exporting NPPO. Non-compliances can be detected during internal audits, audits conducted or administered by the NPPO, or as a result of examinations of plant material.

[81] If the NPPO finds a critical non-compliance, or repeatedly identifies non-critical non-compliances, identifies multiple non-critical non-compliances, or if the place of production fails to carry out the required corrective actions within the specified time period, the place of production should be suspended promptly from participation in the integrated measures approach.

[82] Reinstatement should occur only once corrective action has been put into place and an audit by the NPPO has confirmed that the non-compliances have been corrected.

[83] A list of examples of critical and non-critical non-compliances can be found in Appendix 2.

#### [84] **3.2.2.1 Critical non-compliance**

[85] Critical non-compliances are incidents that compromise the integrated measures approach at the place of production or increase the risk of infestation of the plants for planting. On discovering these critical non-compliances, the NPPO should immediately suspend the authorization for the place of production to export. Reinstatement should occur only once corrective action has been put into place and an audit by the NPPO of the exporting country has confirmed that the critical non-compliances have been corrected.

#### [86] **3.2.2.2 Non-critical non-compliance**

[87] Non-critical non-compliances are incidents of non-compliance that do not immediately compromise the integrated measures approach at the place of production. Corrective actions should be carried out to the satisfaction of the NPPO, within a specified period of time. The corrective actions may require a change to the integrated measures and should include measures to prevent a recurrence.

[88] The exporting NPPO should suspend the place of production or relevant parts thereof from participating in the integrated measures approach if several non-critical non-compliances are identified during an audit, if the same non-compliance is identified repeatedly, or if the place of production fails to carry out the required corrective actions within the specified time period. Exports should be suspended until such time as corrective action is successfully implemented and an audit by the NPPO of the exporting country has confirmed the non-critical non-compliances have been corrected.

### [89] **4. Responsibilities of the NPPO of the Exporting Country**

[90] The NPPO of the exporting country is responsible for:

- establishing the implementation of the integrated measures approaches authorizing places of production seeking participation in an integrated measures approach
- overseeing authorized places of production
- ensuring that all plants for planting exported by authorized places of production meet the phytosanitary requirements of the importing country
- carrying out or authorizing export inspections and issuing phytosanitary certificates for consignments from authorized places of production
- providing adequate information to the NPPOs of importing countries upon request.

#### [91] **4.1 Establishing integrated measures approaches**

[92] In establishing its integrated measures approaches, the NPPO should specify its requirements to be met by places of production based on the risk factors described in section 1 and the import requirements for the plants for planting. Furthermore, the documentation and communication requirements for the place of production should be specified.

#### [93] **4.2 Authorization of places of production**

[94] The general requirements for the authorization of places of production that require only the general integrated measures approach are described in section 3.1.

[95] The authorization of places of production seeking to participate in the integrated measures approach for high-risk situations described in section 3.2 should be based upon:

- a review of the phytosanitary manual and an initial documentation audit at the place of production to verify that it is complying with the requirements established according to the risk factors of its production
- an implementation audit whose objectives are to verify that:
  - . the place of production complies with the protocols, procedures and standards specified in its phytosanitary manual
  - . required supporting documentation is sufficient, current and readily available to staff
  - . adequate records and documents are maintained
  - . internal audits are performed and corrective actions completed
  - . procedures in place are adequate to ensure that any pest problems are quickly identified and appropriate actions are taken to ensure that plants for planting that do not meet the requirements of the importing country are not exported
  - . either plant material within the place of production has remained free of all regulated pests and practically free of all other pests or, if the material has been infested by regulated pests, the NPPO was informed and appropriate measures were taken to ensure that the risk of further spread has been mitigated.

[96] Upon successful completion of the documentation audit and the implementation audit, the place of production may be authorized by the NPPO of the exporting country to export specific plants for planting.

#### [97] **4.3 Oversight of authorized places of production**

[98] After authorization, the NPPO should oversee the place of production, in particular through monitoring or auditing of the production system. The frequency and timing of monitoring or auditing should be determined according to the pest risks and on the place of production's record of compliance. Monitoring or auditing should include inspection and where applicable, testing of plants for planting, and verification of the documentation and management practices as they relate to the integrated measures approach.

#### [99] **4.4 Export inspections and issuance of phytosanitary certificates**

[100] The integrated risk management measures may reduce the need for growing season inspections and intensive export inspections of every individual consignment (if agreed to by the importing NPPO of the importing country). Phytosanitary certificates are issued in accordance with ISPM 12:2001. If required by the importing country an additional declaration may be added to phytosanitary certificates that refers to the application of this ISPM and specific parts thereof being in compliance with ISPM 12:2001.

**[101] 4.5 Providing adequate information**

[102] Upon request the NPPO of the exporting country should provide adequate information to the NPPO of the importing country to support the evaluation and acceptance of the integrated measures approach.

**[103] 5 Responsibilities of the NPPO of the Importing Country**

[104] The NPPO of the importing country is responsible for setting and communicating technically justified phytosanitary import requirements.

[105] Plants produced under an integrated measures approach may not require intensive import inspection of every consignment. The NPPO of the importing country may decide to only monitor imported plants produced under an integrated measures approach, including testing samples for the presence of pests and verifying that agreed procedures are followed.

[106] The NPPO of the importing country may:

- review the authorization programme presented by the NPPO of the exporting country
- provide feedback on the results of monitoring to the NPPO of the exporting country.

The NPPO should notify the NPPO of the exporting country of any non-compliances (see ISPM 13:2001).

**[107] 5.1 Traceability procedures**

[108] The NPPO of the importing country is encouraged to establish procedures that ensure that plants imported under an integrated measures approach can be traced back and forward from the importer and that the importer notifies the NPPO of the occurrence of regulated pests and other pests not normally present in the area. This may be accomplished through a registration/authorization process for importers.

**[109] 5.2 Auditing by the importing NPPO**

[110] The NPPO of the importing country may request the NPPO of the exporting country to provide the reports on audits undertaken by the place of production and by the NPPO of the exporting country. The NPPO of the importing country may request the NPPO of the exporting country to audit the integrated measures approaches as established by the exporting country. This audit may consist of documentation review, inspection and testing of plants produced under the integrated measures approach, and, where appropriate, site visits provided that there is justification, e.g. in high-risk situations or in cases of non-compliance (see ISPM 20:2004, section 5.1.5 and ISPM 13:2001).

[111] This appendix is for reference purposes only and is not a prescriptive part of the standard.

## [112] APPENDIX 1: Examples of pest management measures to reduce the phytosanitary risk of plants for planting

[113] **Table 1.** Measures to reduce the phytosanitary risk of plants for planting categorized by pest group

[114] The following table provides examples for different measures.

	<b>Pest group</b>	<b>Available measures</b>
1	Pests causing latent infections and those that are likely to be transmitted by plants for planting without signs or symptoms	<ul style="list-style-type: none"> <li>• Production in a pest free area or at a pest free place of production/production site</li> <li>• Derivation from mother plants that have been tested and found free from the relevant pest</li> <li>• Isolation from sources of infection (e.g. buffer zone or geographical distance from other host plants, physical isolation using a glasshouse or polytunnel, temporal isolation)</li> <li>• Testing of samples of the plants for freedom from pests</li> <li>• Production within a specified certification scheme or clean stock programme that takes into consideration the pests of concern to the importing country</li> </ul>
2	Visible stages of pests and pests causing visible symptoms during the growing season	<ul style="list-style-type: none"> <li>• Growing season inspection for freedom from pests or symptoms (e.g. at timed intervals, for example monthly for the three months before export or at different growth stages, if appropriate)</li> <li>• Growing season inspection of the mother plants</li> <li>• Inspection after harvest to meet a specified tolerance for a pest (e.g. tolerance for bulb rots by fungi/bacteria)</li> <li>• Routine pesticide applications</li> </ul>
3	Pests spread by contact	<ul style="list-style-type: none"> <li>• Production in a pest free area or at a pest free place of production/production site</li> <li>• Prevention of contact with sources of infection (e.g. other plants)</li> <li>• Hygiene measures for handling pruning tools and equipment between different batches/lots</li> <li>• Planning of activities to work with high-health plants first</li> <li>• Use of dedicated clothing and equipment in isolated places (e.g. screen houses)</li> <li>• Routine pesticide applications</li> </ul>
4	Pests transmitted by vectors	<ul style="list-style-type: none"> <li>• Production area/place of production free from vectors</li> <li>• Production in a pest free area or at a pest free place of production/production site [confirmed by monitoring or measures specified below]</li> <li>• Isolation from sources of infection (e.g. buffer zone or geographical distance from other host plants, physical isolation using a glasshouse or polytunnel, temporal isolation)</li> <li>• Pre-planting soil testing for freedom from or to meet a tolerance for soil-borne viruses or their nematode vectors</li> <li>• Pesticide treatments for control of insect vectors of viruses (e.g. aphids)</li> </ul>

	<b>Pest group</b>	<b>Available measures</b>
5	Pests spread by wind	<ul style="list-style-type: none"> <li>• Production in a pest free area or at a pest free place of production/production site [confirmed by monitoring or measures specified below]</li> <li>• Isolation from sources of infection (e.g. buffer zone or geographical distance from other host plants, physical isolation using a glasshouse or polytunnel)</li> <li>• Routine pesticide applications</li> </ul>
6	Pests spread by water	<ul style="list-style-type: none"> <li>• Production in a pest free area or at a pest free place of production/production site [confirmed by monitoring or measures specified below]</li> <li>• Use of uncontaminated water sources</li> <li>• Irrigation water to be disinfected or sterilized before use</li> <li>• Isolation from sources of infection (e.g. buffer zone or geographical distance from other host plants, physical isolation using a glasshouse or polytunnel, temporal isolation)</li> </ul>
7	Soil-borne pests able to colonize the plant	<ul style="list-style-type: none"> <li>• Production in a pest free area or at a pest free place of production/production site [confirmed by monitoring or measures specified below]</li> <li>• Isolation from sources of infection (e.g. buffer zone or geographical distance from other host plants, physical isolation using a glasshouse or polytunnel, growth of plants on raised benches, temporal isolation)</li> <li>• Derivation from mother plants that have been tested and found free from the relevant pest</li> <li>• Production within a specified certification scheme or clean stock programme</li> <li>• Testing of samples of the plants for freedom from pests</li> <li>• Pre-planting soil testing for freedom from pests such as fungi, nematodes, viruses transmittable by nematodes</li> </ul>
8	Soil-borne pests in growing medium attached to plants	<ul style="list-style-type: none"> <li>• Growing medium to be sterilized before use</li> <li>• Use of inert growing media</li> <li>• Use of soil-less growing media</li> <li>• Isolation from sources of infection, maintenance of plants in such a way that contact with soil is prevented (e.g. on raised benches)</li> <li>• Pesticide treatment (e.g. drench or fumigation) prior to export</li> <li>• Roots washed free from growing medium (and repotted in sterile growing medium)</li> </ul>
9	Soil-borne pests in natural soil attached to plants	<ul style="list-style-type: none"> <li>• Production in a pest free area or at a pest free place of production/production site [confirmed by monitoring or measures specified below]</li> <li>• Isolation from sources of infection (e.g. buffer zone or geographical distance from other host plants, temporal isolation)</li> <li>• Pre-planting soil testing for freedom from pests (especially nematodes, fungi)</li> <li>• Pesticide treatment (fumigation) prior to export</li> <li>• Roots washed free from soil (and repotted in sterile growing medium)</li> </ul>



[115] **Table 2.** Examples for measures to reduce the phytosanitary risk of plants for planting based on the type of plant material

Type of plant	Examples of pest types ranked according to importance	Available measures
Meristem culture and <i>in vitro</i> culture	Viruses and virus-like diseases, bacteria, fungi, stem nematodes, mites and insects	<ul style="list-style-type: none"> <li>• Derivation from mother plants, that have been tested and found free from the relevant pest</li> <li>• Cultivation in sterile medium under sealed aseptic conditions</li> <li>• Testing of samples of the plants for freedom from pests</li> </ul>
Unrooted cuttings	Insects, viruses, bacteria, fungi and other pests	See groups 1 to 8 in table 1 <ul style="list-style-type: none"> <li>• Hot water treatment</li> </ul>
Budwood/graftwood	Bacteria and viruses, insects and other pests	See groups 1 to 8 in table 1
Bulbs	Nematodes, viruses, bacteria, fungi, insects and other pests	See groups 1 to 8 and 10 in table 1 Hot water dipping to control bulb-borne nematodes
Bare root plants	Nematodes and all other pests of the aerial plant part possible	See groups 1 to 8 and 10 in table 1
Rooted cuttings	Nematodes, insects, viruses and bacteria and other pests	Measures depend <i>inter alia</i> on the risk of the growing medium used See groups 1 to 8 in table 1
Plants in growing medium	Nematodes and all other pests of the aerial plant part possible	See groups 1 to 9 in table 1
Plants in soil	Nematodes and all other pests of the aerial plant part possible	See groups 1 to 10 in table 1

[116] This appendix is for reference purposes only and is not a prescriptive part of the standard.

## [117] APPENDIX 2: Examples of non-compliance

### [118] Critical non-compliance

[119] Examples of critical non-compliance with the place of production include the following:

- detection of quarantine pests or regulated non-quarantine pests (in excess of tolerance limits) of concern to the exporting or importing country on plant material from the place of production
- failure to undertake required laboratory tests or analyses or correctly follow procedures to identify pests
- failure to carry out control measures at the place of production for regulated pests
- failure to notify the NPPO of the presence of regulated pests at the place of production
- export of ineligible plant taxa, plants from non-authorized origins, or plants not meeting other phytosanitary import requirements
- failure to correctly list the botanical names of all the plants on documents accompanying shipments
- failure to keep consistent, accurate pest management records
- failure to keep consistent accurate records of country of origin of plant material
- failure to undertake ordered corrective action(s)
- failure to perform internal audits as required
- operating without a duly qualified programme manager or crop protection specialist
- modification of the phytosanitary manual or pest management practices without prior authorization from the NPPO
- failure to examine incoming or outgoing plant material
- lack of sufficient or adequately trained staff
- failure to keep plants for planting that have been examined for export separate from other plant material that has not been examined.

### [120] Non-critical non-compliance

[121] Examples of non-critical non-compliance include the following:

- failure to notify the NPPO when the programme manager or crop protection specialist changes
- failure to record the identity of a substitute programme manager or crop protection specialist
- failure to undertake corrective actions ordered by the programme manager in a timely manner
- failure to prevent the buildup of pest populations
- failure to maintain sanitation management practices at the place of production
- failure to maintain records as specified in the phytosanitary manual
- failure to periodically provide staff with relevant training
- failure to maintain training records for staff involved in implementing the phytosanitary manual
- failure to maintain an up-to-date list of all employees involved in implementing the phytosanitary manual
- failure to consistently sign and date reports or records
- failure to record relevant changes to the lists of plant taxa produced, their location in the place of production and the plant material to be exported
- failure to detect and record low-level populations of pests
- failure to inform the NPPO of any changes to business practices as outlined in the phytosanitary manual.