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[1]Draft ISPM: International movement of growing media in association with plants for planting (2005-004)

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[38]CONTENTS [to be inserted]

[39]Adoption

[40]This standard was adopted by the Commission on Phytosanitary Measures in [Month 201-].

[41]INTRODUCTION

[42]Scope

[43]This standard provides guidance for the assessment of the pest risk of growing media in association with plants for planting and describes phytosanitary measures to manage the pest risk of growing media associated with plants for planting in international movement.

[44]Growing media moved as a separate commodity, contaminating a commodity or used as packaging material are not considered in this standard.

[45]References

[46]The present standard refers to ISPMs. ISPMs are available on the International Phytosanitary Portal (IPP) at <https://www.ippc.int/core-activities/standards-setting/ispms>.

[47]Definitions

[48]Definitions of phytosanitary terms used in this standard can be found in ISPM 5 (Glossary of phytosanitary terms).

[49]In addition to the definitions in ISPM 5, in this standard the following definition applies.

[50][Soil: Naturally occurring growing medium (except peat) consisting of a mixture of minerals and organic material.]

[51]Outline of Requirements

[52]Pest risk analysis (PRA) should provide the technical justification for phytosanitary import requirements for growing media in association with plants for planting.

[53]The origin and the production method of constituents of growing media can affect the pest risk of the growing media associated with plants for planting. Growing media should be produced, stored and maintained under conditions that prevent contamination or infestation. These conditions will depend on the type of growing medium used. Growing media may need to be appropriately treated before use.

[54]The production methods of plants for planting may affect the pest risk of growing media associated with these plants for planting.

[55]Pest risk management options related to growing media in association with plants for planting – including phytosanitary measures such as treatment, inspection, sampling, testing, post-entry quarantine and prohibition – are described in this standard.

[56]BACKGROUND

[57]A number of growing media are recognized internationally as pathways for the introduction and spread of quarantine pests. Soil as a growing medium is considered to be a high-risk pathway because it can harbour numerous quarantine pests. The pest risk of growing media in association with plants for planting depends on factors related to both the production of the growing media and the production of the plants, as well as the interaction of the two.

[58]Many countries therefore regulate the import of growing media in association with plants for planting. Growing media, particularly soil, are often prohibited. While it is possible to remove growing media from some plants for planting, it may be difficult to completely avoid the movement of growing media in association with plants for planting. Some plants can survive transport only when moved in growing

media. This standard provides guidance on internationally harmonized phytosanitary measures to minimize the probability of introduction or spread of quarantine pests with the international movement of growing media in association with plants for planting.

[59]IMPACT ON BIODIVERSITY AND THE ENVIRONMENT

[60]Pests associated with the international movement of growing media in association with plants for planting may have negative impacts on biodiversity. Implementation of this standard could significantly reduce the introduction and spread of quarantine pests associated with growing media and consequently reduce their negative impacts. In addition, the application of phytosanitary measures in accordance with this standard could also reduce the probability of introduction and spread of other organisms that may become invasive alien species in the importing country and thus affect biodiversity.

[61]Certain phytosanitary measures (e.g. some treatments with fumigants) may have a negative impact on the environment. Countries are encouraged to promote the use of phytosanitary measures that have a minimal negative impact on the environment.

[62]REQUIREMENTS

[63]1. Pest Risk Analysis

[64]Phytosanitary import requirements for growing media in association with plants for planting should be technically justified. This technical justification should be based on a PRA in accordance with ISPM 2 (Framework for pest risk analysis), ISPM 11 (Pest risk analysis for quarantine pests) and ISPM 21 (Pest risk analysis for regulated non-quarantine pests), and that includes the consideration of factors that affect the pest risk of growing media described in this standard and factors related to the production of plants for planting described in Annex 1 of ISPM 36 (Integrated measures for plants for planting). The pest risk of plants for planting and that of the associated growing media in which the plants were grown should be assessed together.

[65]Pests that may be associated with growing media include: bacteria, phytoplasmas, fungi, oomycetes, nematodes, viruses, viroids, insects, mites, molluscs, plants as pests and seeds of plants as pests. It should be noted that quarantine pests carried with growing medium in association with a plant may be pests of other plants, or may act as a vector for other pests.

[66]2. Factors That Affect the Pest Risk of Growing Media in Association with Plants for Planting

[67]The production methods of plants for planting may affect the pest risk of the growing media used. While some growing media may pose a low pest risk by nature of their production, they may become contaminated or infested depending on the type of growing medium during the production process of plants for planting.

[68]The national plant protection organization (NPPO) of the importing country may take into consideration the pest risk of growing media in association with plants for planting (as outlined in Annex 1, Annex 2 and Appendix 1) when conducting a PRA to identify appropriate phytosanitary measures. Based on the pests regulated by the importing country, the PRA should consider the pest status in the importing and exporting countries. Furthermore, pest risk may also depend on:

- [69]whether the growing media are new or reused
- [70]the origin of the growing media
- [71]the constituents of the growing media
- [72]the measures used in the production of the growing media, including the degree of processing and any treatments applied

- [73]the measures to prevent contamination or infestation of the growing media before planting, such as during transportation and storage, and during plant propagation and production (e.g. avoiding exposure to soil, treatment of the irrigation water)
- [74]the length of the plant's production cycle
- [75]the quantity of growing media associated with each individual plant
- [76]the purpose of the plants for planting associated with the growing media (e.g. whether plants are to be grown as annuals or perennials, whether they are to be grown indoors or outdoors, whether they are to be grown in an urban area, field or nursery).

[77]In the assessment of pest risk, data on historical or existing import of soil or other growing media may be relevant.

[78]The origin and the production method of constituents of growing media both affect the pest risk of growing media in association with plants for planting. Annex 1 lists common constituents of growing media and indicates their relative pest risk under the assumption that they were not previously used as growing media and that they have been handled and stored in a way that prevents their contamination or infestation.

[79]Growing media containing organic constituents may be more likely to harbour pests than purely mineral or synthetic growing media. Growing media consisting of plant debris generally pose a greater pest risk than mineral or synthetic growing media. If soil is part of the growing medium the pest risk may be particularly difficult to fully assess because of the likely presence of many different pests and other organisms.

[80]3. Pest Risk Management Options

[81]The following measures may be used singly or in combination to ensure the pest risk of growing media in association with plants for planting is adequately managed.

[82]3.1 Growing media free from quarantine pests

[83]Growing media free from quarantine pests may be achieved by:

- [84]using growing media produced in a process that renders the growing media free from pests
- [85]using growing media or their constituents collected from a pest free area or a pest free production site
- [86]applying appropriate treatments to growing media that are not pest free, before their use.

[87]Growing media should be produced under a system that allows appropriate trace back and forward of both the media and their constituents, where appropriate.

[88]Pest free growing media should be stored and maintained under conditions that keep them free from quarantine pests. The growing media should not be exposed to plants, pests, or untreated soil or other untreated growing media. If this has not been achieved, the growing media may need to be appropriately treated before use.

[89]Plants intended to be planted in the pest free growing media should be free from relevant quarantine pests.

[90]The following measures may be used to prevent contamination or infestation of the growing media after planting the plants:

- [91]keeping the plants (with the associated growing media) in a pest free area or pest free place of production
- [92]using water free from quarantine pests
- [93]using physical isolation (e.g. protected conditions, prevention of pest transmission by wind, production on benches separated from contact with soil).

[94]3.2 Treatments

[95]Treatments to mitigate the risks associated with quarantine pests in the growing media may be applied at various stages in the production cycle of plants for planting. Treatments that may be applied singly or in combination include:

- [96]treatment of growing media before planting (e.g. steam treatment, heat treatment, chemical treatment, a combination of treatments)
- [97]treatment of fields or planting beds intended for the production of plants for planting
- [98]treatment (e.g. filtration, sterilization) of water or water-based nutrient solution used for irrigation or as a growing medium
- [99]treatment of plants before planting
- [100]treatment of growing media in association with plants for planting
- [101]removal of growing media¹ (e.g. by root washing or plant shaking).

[103]Factors such as temperature may affect the results of treatments. Also, some pesticides may suppress, rather than eradicate, pest populations. Verification of the effectiveness of a treatment after application may be necessary.

[104]After treatment, appropriate measures should be taken to avoid contamination or infestation.

[105]3.3 Inspection, sampling and testing

[106]The places of production of and the processing or treatment procedures for growing media may be inspected, monitored and approved by the NPPO of the exporting country to ensure that phytosanitary import requirements are met.

[107]Plants for planting and associated growing media may need to be inspected to determine if pests are present or to determine compliance with phytosanitary import requirements (ISPM 23 (*Guidelines for inspection*)). However, most pests in growing media cannot be detected by inspection alone.

[108]The NPPO of the importing country may require or undertake sampling and testing of the growing media associated with plants for planting (ISPM 20 (*Guidelines for a phytosanitary import regulatory system*); ISPM 31 (*Methodologies for sampling of consignments*)). However, sampling and testing may not detect some types of pests, in particular at low-level contamination or infestation of the growing media. To verify that required measures have been carried out, testing may include testing for indicator organisms (easily detectable organisms whose presence indicates that required measures failed to be effective or were not implemented).

[109]3.4 Post-entry quarantine

[110]In certain circumstances, such as for quarantine pests that are not easily detectable in growing media, the NPPO of the importing country may require post-entry quarantine for plants for planting associated with growing media to verify compliance with phytosanitary import requirements. Post-entry quarantine may be the only option apart from prohibition for such cases.

[111]Post-entry quarantine may also be used for monitoring in cases where knowledge about the pest risk is incomplete or there is an indication of a failure of measures taken in the exporting country (e.g. a significant number of interceptions).

[112]3.5 Prohibition

[113]In cases where the measures outlined above are not deemed applicable, feasible or sufficient for growing media (in particular soil) in association with certain plants for planting, the entry of consignments of plants for planting associated with those particular growing media may be prohibited.

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[102]¹ In some cases, removal of growing media may be followed by replanting in not previously used pest free growing media shortly before export, if authorized by the NPPO of the importing country.

[114]This annex is a prescriptive part of the standard.

[115]ANNEX 1: Common constituents of growing media ranked in order of increasing relative pest risk

[116]The ranking provided in this table is for constituents of growing media that have not previously been used for planting and have been handled and stored in a way that prevents contamination or infestation (e.g. they are free from soil).

[117]The table outlines the relative pest risk posed by different constituents of growing media, but not in association with plants for planting.

[118]Constituents of growing media	[119]Support pest survival	[120]Comments
[121]Baked clay pellets	[122]No	[123]Inert material
[124]Synthetic media (e.g. glass wool, rock wool, polystyrene, floral foam, plastic particles, polyethylene, polymer stabilized starch, polyurethane, water-absorbing polymers)	[125]No	[126]Inert material
[127]Vermiculite, perlite, volcanic rock, zeolite, scoria	[128]No	[129]Heat of production renders vermiculite and perlite virtually sterile
[130]Pure clay	[131]No	[132]
[133]Pure gravel, sand	[134]No	[135]
[136]Paper	[137]Yes	[138]High level of processing
[139]Tissue culture medium (agar-like)	[140]Yes	[141]Autoclaved or otherwise sterilized before use
[142]Coconut fibres (coir/coco peat)	[143]Yes	[144]Risk depends on level of processing (e.g. <i>Bursaphelenchus cocophilus</i> , the red ring nematode, has been found in the husks of fallen nuts)
[145]Sawdust, wood shavings (excelsior)	[146]Yes	[147]Size of particles may affect the probability of pest survival
[148]Water	[149]Yes	[150]Risk depends on source and treatment
[151]Wood chips	[152]Yes	[153]Size of particles may affect the probability of pest survival
[154]Cork	[155]Yes	[156]Risk depends on level of processing

[118]Constituents of growing media	[119]Support pest survival	[120]Comments
[157]Peat (excluding peat soil)	[158]Yes	[159]Risk is lower where the origin has had no agricultural exposure (e.g. certified bogs). Seeds of plants as pests are common.
[160]Non-viable moss (sphagnum)	[161]Yes	[162]Risk depends on level of processing. Seeds of plants as pests are common in living moss (sphagnum).
[163]Other plant material (e.g. rice hulls/chaff, grain hulls, coffee hulls, fallen leaves, sugar-cane refuse, grape marc, cocoa pods, oil palm shell charcoal)	[164]Yes	[165]Risk is reduced if treated or from a clean non-infested source
[166]Bark	[167]Yes	[168]Risk depends on source (potential to harbour forest pests) and degree of processing or fermentation
[169]Biowaste	[170]Yes	[171]Risk depends on source and degree of processing
[172]Compost (e.g. humus, leaf mould)	[173]Yes	[174]Risk depends on source and degree of processing or fermentation
[175]Soil	[176]Yes	[177]Risk can be reduced if treated
[178]Tree fern slabs	[179]Yes	[180]
[181]Vermicompost	[182]Yes	[183]May include remains of undigested organic material

[184]This annex is a prescriptive part of the standard.

[185]ANNEX 2: Examples of growing media and measures that may effectively manage the pest risk of the growing media associated with plants for planting

[186]Growing medium [187]	[188]Water/nutrients	[189]Measures	[190]Examples
[191]Water	[192]Water or water-based nutrient solution	[193]Sterilized, treated or filtered water may be required	[194]Plants rooted in water
[195]Tissue culture medium	[196]Incorporated in sterile medium	[197]Maintained in aseptic conditions	[198]Tissue cultured plants transported in closed containers
[199]Inert material that is not capable of	[200]Sterilized water-based nutrient solution	[201]Maintained in conditions to prevent pest infestation	[202]Plants for hydroponic cultivation where the absence of pests can be verified

supporting pest growth (e.g. perlite)			
[203]Growing medium that has been sterilized (e.g. by heat to a specified temperature for a specified duration)	[204]Pest free (sterilized, treated or filtered) water supply	[205]Maintained in conditions to prevent pest infestation	[206]Plants grown from seed under protected conditions

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

[208]APPENDIX 1: Examples of plants for planting in international movement and the growing media commonly associated with them

[209]Plant type	[210]Growing media	[211]Comments
[212]Plants rooted in water or water-based nutrient solution	[213]Water	[214]Some plants may be grown from cuttings in water or in water-based nutrient solution, with or without synthetic growing media
[215]Tissue cultured plants	[216]Sterile, agar-like	[217]Tissue cultured plants are produced in association with sterile agar-like growing media. They may be shipped in sealed aseptic containers or ex-agar.
[218]Epiphytic plants	[219]Tree fern slabs, bark, non-viable moss (sphagnum), volcanic cinder, rock	[220]Epiphytic plants, such as bromeliads and orchids, are often shipped in association with tree fern slabs, bark, wood, non-viable moss (sphagnum), volcanic cinder, rock and so forth. These materials are generally intended for support and ornamentation rather than being true growing media.
[221]Rooted herbaceous cuttings	[222]Various (including peat, coco peat, synthetic media, non-viable moss (sphagnum))	[223]Rooted herbaceous cuttings are generally rooted and moved in soil-free growing media that may be contained in peat-pots or coco-pots. The roots are tender and the growing media cannot be removed without injuring the plants.
[224]Plants grown from seed	[225]Various (including peat, vermiculite, perlite)	[226]Annuals and biennials are generally grown from seed in growing media and moved as rooted in growing media
[227]Ornamental and flowering houseplants	[228]Various (including synthetic media, vermiculite, perlite, coco peat)	[229]The plants may be field-grown in soil, grown as containerized nursery stock, or grown as potted greenhouse plants in soil-free growing media
[230]Liners, whips	[231]Various (including peat, vermiculite, soil as a contaminant)	[232]These young plants are generally rooted in soil or in soil-free growing media in containers or trays

[233]Dormant bulbs and tubers, tuberous roots and herbaceous perennial roots	[234]Soil, peat or none	[235]Bulbs, tubers (including corms and rhizomes), tuberous roots and herbaceous perennial roots are generally propagated and grown in fields but shipped dormant and free from growing media. However, dormant bulbs may sometimes be packed as "growing kits", with growing media. These growing media may be considered as a separate commodity (packing material) provided the plants are not rooted in the media.
[236]Bare root nursery stock	[237]Soil or none	[238]Bare root is a technique of arboriculture whereby a field-grown tree or shrub is dug up in order to put it into a dormant state. The nursery stock may be shaken to remove some of the soil, or it may be washed free from all soil and growing media. The size and root structure of the plant and the type of soil has a large impact on the ability to remove soil from the root system.
[239]Artificially dwarfed nursery stock	[240]Soil	[241]The plant roots are typically very difficult to wash free from soil. The plants may be transplanted to soil-free growing media and grown in greenhouses using integrated risk mitigation measures in an effort to minimize the pest risk associated with them.
[242]Trees and shrubs with soil	[243]Soil	[244]Older trees and shrubs, including specimen trees, are often moved in the nursery trade as dug trees or "ball and burlap". This material includes a large amount of soil.
[245]Turf or grass sod	[246]Soil	[247]Turf or grass sod contains a large amount of soil and is a potential pathway for many soil pests

[248]Potential implementation issues

[249]This section is not part of the standard. The Standards Committee in May 2016 requested the secretariat to gather information on any potential implementation issues related to this draft, please provide details and proposals on how to address these potential implementation issues.