

REPORT

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2008

**Standards
Committee
Working Group (SC-7)
May 2008**

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1. OPENING OF THE MEETING

1. The International Plant Protection Convention (IPPC) Secretariat opened the meeting and welcomed participants to the Standards Committee Working Group (SC-7) meeting. One SC-7 member (Mr Holtzhausen) was unable to attend. This was the first time that observers were allowed in the SC-7, as per the decision of the Third Session of the Commission on Phytosanitary Measures (CPM-3), and three observers were attending.

2. The IPPC Secretary informed the SC-7 that current IPPC Secretariat resources were overstretched and thanked those who had made extra-budgetary contributions to the work of the Secretariat. He indicated that IPPC activities should be considered in the wider context of climate change, and food prices and availability, and noted that FAO would host a High-level Conference on World Food Security: The Challenges of Climate Change and Bioenergy in early June. It was anticipated that this conference would be attended by many heads of states. The meeting was originally planned to focus only on climate change and biofuels, but given the current international crisis in regards to food prices and subsequent riots, the conference was retargeted to focus mostly on food security. He expected an increased demand on international systems such as those under the IPPC framework in the future and reiterated the importance of the IPPC for supporting action to safeguard food security. The SC-7 noted that the development of specific standards, such as the standard setting work programme topics on international movement of grain and regulating stored products in international trade, is needed and that facilitating trade would be a key component to assist developing countries.

2. ADOPTION OF THE AGENDA

3. The following points were raised:

- the draft on pest risk management for plants for planting was brought forward on the agenda, in order to discuss the concept first so that it could be determined if there would be benefit from submitting the concept for member consultation or just submitting recommendations on the next steps to the Standards Committee (SC).
- most stewards of draft ISPMs would be available during the week through conference calls or email, if necessary
- the 2008 meeting of the Technical Panel on Forest Quarantine (TPFQ) had been postponed to 2009 due to lack of funding. The United States had recently offered to fund the meeting in 2008, but specifications for topics to be worked on by the TPFQ had not yet been approved. In order to take advantage of the funding opportunity, the SC-7 had to finalize the specification for international movement of wood. The SC-7 agreed to move this agenda point forward
- as only the SC-7 was meeting, all items for SC decision-making, other than preparation of draft ISPMs for member consultation and approval of the specification on international movement of wood, were postponed to the SC meeting in November 2008.

4. The SC-7 adopted the agenda as presented in Appendix 1. The documents list is presented in Appendix 2.

5. The SC-7 elected Ms Aliaga as Chairperson and Mr Hedley as Rapporteur.

3. ISSUES ARISING FROM CPM-3 (APRIL 2008)

6. The Secretariat distributed extracts from the draft report of CPM-3. The participants did not have any comments.

4. DRAFT ISPMs FOR REVIEW AND APPROVAL FOR MEMBER CONSULTATION

7. The SC-7 discussed and revised the draft ISPMs submitted for approval for member consultation. Through the course of discussions the SC-7 agreed that, for each draft sent for member consultation, the Secretariat would indicate in a cover note, or in the text of the letter to members, that reports explaining the development or revision of each standard were posted on the International Phytosanitary Portal (IPP, <https://www.ippc.int>) and where on the IPP this background information could be found.

4.1 Revision of ISPM No. 15 (*Regulating wood packaging materials in international trade*)

8. The SC-7 reviewed the draft but found it difficult to see what changes had been made to the currently adopted ISPM No. 15. The SC-7 requested the Secretariat to provide them with a track changed version for their review. Later the group decided to modify the non-tracked version.

Scope

9. It was noted that the scope now refers to "movement" of wood packaging rather than its "use". This was changed in order to ensure that this standard also applies to wood packaging material that is moved in international trade as a commodity, which would later be used to export other consignments.

10. The SC-7 discussed the different terms used to describe components of wood packaging material including wood, wood-like, and woody plant material. It was noted that the TPFQ had included a footnote to clarify that the standard would include material such as bamboo and palm, which are not necessarily considered wood. The group removed the examples of raw wood from the scope to avoid duplicating the text of the footnote.

In section 2.1 Exemptions

11. The section was re-organized to group related articles together and ordered with the most relevant exemptions first.

In section 3.1 Approved phytosanitary measures

12. The SC-7 discussed the phrase "significantly effective against most pests", and whether a footnote should clarify its meaning. It was noted that it should be clear that, once wood packaging material is marked, a phytosanitary certificate should not be required for the wood packaging material unless technically justified. It was noted that this was the word set that a series of experts agreed on to communicate that the treatments reduce phytosanitary risk, but do not eliminate all pests.

In section 3.2 Approval of new or revised treatments

13. The text referred to the criteria being developed by the TPFQ for treatments, which the Technical Panel on Phytosanitary Treatments (TPPT) would use to evaluate efficacy of treatments. Reference to the procedure for adopting new treatments was removed, as it did not provide guidance for national plant protection organizations (NPPOs), and the text was modified to note that any new treatment was adopted by the CPM.

In section 4. Responsibilities of NPPOs

14. The different responsibilities of the exporting and importing NPPOs were clarified. It was noted that the country of export is not necessarily the manufacturing country that supervises the treatment and authorizes the use of the mark. There followed a discussion on whether the responsibility for ensuring the integrity of the marked wood packaging remains with the NPPO in the manufacturing country or the NPPO from which the consignment was exported. The SC-7 decided to not add text in regards to the responsibility of the manufacturing country.

In section 4.1 Regulatory considerations

15. The use of the term "official control" was discussed, as it was used in the draft in relation to the control of treatments and marks by NPPOs. It was decided not to use this term because its definition in the *Glossary* is more related to the control of a regulated pest rather than the control of a phytosanitary system.

Discussion of "mark" vs. "imprint"

16. The term "the imprint" had been proposed in some places instead of "the mark" to try to alleviate the issues encountered during the registration of the symbol in regards to intellectual property rights. This had been given extensive consideration by the steward, as the term "mark" is used in a different context for intellectual property protection and there was a potential for confusion between the ISPM No. 15 "mark", (i.e. symbol + box + text) and the intellectual property registration of the ISPM No. 15 symbol which is sometimes registered as a "trademark" or "certification mark" when registration is made in national intellectual property offices. The SC-7 found the use of "imprint" confusing. In consultation with the steward, the SC-7 decided to not use the term "imprint" but to maintain the use of the term "the mark" throughout the text.

In section 4.3 on reuse, repair and remanufacturing

17. The difference between repaired and remanufactured wood packaging material is based on the amount of components of a unit of wood packaging material which have been replaced. If more than 1/3 of the components are replaced, the unit of wood packaging material is considered to be remanufactured and the entire unit and/or all of its components must be re-treated. Some members questioned the basis for this ratio. The Secretariat explained that there was no scientific basis for this. The experts felt that if more than 1/3 of the unit of wood packaging material was replaced that would be considered more than a repair and decided that this would be the appropriate proportion to consider it remanufactured.

18. The requirements for repaired and remanufactured wood packaging material, as presented in the same section of the draft, differed (i.e. an NPPO may decide whether or not to have the repaired wood packaging re-treated, while it specified that all remanufactured wood packaging material must be re-treated). The SC-7 found this section not clear enough and reorganized the text to separate repair from remanufacturing for clarity.

In section 4.6 Measures for compliance at the points of entry

19. Minimum impact should be considered for determining actions to be taken on non-compliance. This was added to the text.

20. The text mentioned that importing countries should notify in case of the presence of live pests and may notify in other cases of non-compliance. It was noted that notification of cases of missing marks were also important, and should be given a higher level of obligation. The wording "is encouraged to notify" was used for this purpose and the text was slightly adjusted to imply that ISPM No. 13 be used for all these cases of non-compliance.

21. The issue was raised as to which country needed to be notified in case of non-compliance: the exporting country or the country of manufacture. The text was modified to refer to notification of the exporting country and, where applicable, country of manufacture, to help ensure that corrective actions would be taken in the appropriate country.

Use of should, shall and must in the standard

22. It was noted that the standard used mostly "should" to convey "obligation", but there were many instances applying to "recipes" or NPPO responsibilities that are crucial, especially regarding the treatments in annex 1 or the mark in annex 2 and more imperative to the implementation of the standard than the moral obligation conveyed by "should". Guidance given by the CPM was followed and in these cases, the use of "must" or "shall" was decided as being more appropriate. In its review of the draft, the SC-7 changed many instances of "should" to either to "must" or "shall". The SC-7 noted that the Technical Panel for the Glossary had been tasked to further develop guidance on the use of the terms "should", "shall", "must" and "may" in ISPMs, and it would also consider use of these terms when looking at the consistency of draft ISPMs sent for member consultation.

Annex 1 on treatments

23. It was explained that experts felt bark removal was a treatment but it was not clear in the draft that removal of bark should be applied in combination with one of the other treatments (heat treatment or methyl bromide treatment). The heading of Bark removal was deleted and the text modified. A reference to bark removal was then included under both the heat treatment and methyl bromide treatment text. In the case of methyl bromide treatment, it was also indicated that bark removal should be done prior to fumigation.

24. Modifications were made to the text to clarify which pieces of bark were prohibited and explain more clearly the two types of size limits; the one in regards to the bark piece being no wider than 3 cm regardless of its length and the other if the width exceeded 3 cm, what the maximum surface area limit would be.

25. In the section on heat treatment, one member noted that chemical pressure impregnation was not necessarily a heat treatment. However, it was clarified that the text applied only to those chemical pressure

impregnation treatments which were carried out under heat and resulted in the specifications under heat treatment being met.

Annex 2 on the mark and its application

26. The group suggested numbering the examples of marks given in Annex 2 to facilitate member comments. The group discussed the role and responsibilities of shippers and clarified that it is important that shippers ensure that dunnage used is in accordance with the standard and that the general oversight of shippers in this regard is by the NPPO.

Appendices 1 and 2

27. The SC-7 considered the deletion of appendix 1, but in consultation with the steward and after modification, decided to maintain it.

28. At the start of its discussion on this draft, the SC-7 thought that, when the text is sent for consultation, it should be accompanied by an annotated text with main changes as tracked changes and justifications for main technical changes, for example between brackets. After reviewing the standard and considering the difficulties to produce such a version before member consultation, the SC-7 thought that it would be acceptable that this draft be sent for member consultation without additional annotated text. It was noted that the main reasons for changes would be given in the reports of the TPFQ and SC-7.

29. The SC-7 agreed that the draft ISPM *Regulating wood packaging material in international trade* should be sent for member consultation (Appendix 3).

4.2 Categorization of commodities according to their phytosanitary risk

30. The Secretariat reminded the SC-7 that this draft had been sent for member consultation in 2007, so the SC had already approved it for member consultation once and had also incorporated many member comments into the draft. At the last SC meeting, it had been decided that the annex on industrial food processes should be reviewed by a FAO expert on industrial food processing. The comments of the expert would then be forwarded to the steward through the TPPT. Subsequently, the draft was further modified.

31. The SC-7 reviewed and modified the draft. The main discussions items were as follows.

Background

32. The SC-7 felt that this standard should stop some countries from imposing phytosanitary import requirements on processed commodities that pose no phytosanitary risk. In this regard the text was modified to indicate that some commodities moving in international trade "do not have" the potential to introduce regulated pests and so should not be regulated, rather than the wording "may not have". It was felt this stronger wording may help send a clearer message.

Use of the term *contracting parties*

33. The draft used the term "contracting parties" in some places. One participant questioned whether "NPPOs" or "countries" should be used instead of "contracting parties" to cover all countries involved in trade. It was noted that the CPM was developing standards for its members, and that using "contracting parties" would not preclude non-parties from using the standards.

In section 1.1 Method and degree of processing before export (3rd paragraph)

34. One participant felt that there should be something in the standard that would request importers to produce some form of verification that a commodity had been processed. Others felt that in many cases the fact that the commodity was processed would be evident. After some discussion, it was agreed that the NPPO may request information in order to verify the commodity had been processed. This may be particularly important where inspectors in the importing country are not sure what process had been applied and to what level, or cases where the processes may be applied differently in different countries.

Annex 1 Examples of methods of processing with resultant commodities that do not remain capable of harbouring or spreading pests

35. *Malting*. One participant reported that the enzyme activities of malting might not kill all fungi, and that malting should be moved to annex 2 (Examples of methods of processing with resultant commodities

that do remain capable of harbouring or spreading pests). The Secretariat was requested to seek clarification on this from the FAO expert previously consulted as to which types of organisms could survive the malting process. It was noted that traded malt is also subject to drying processes that involve heat, which may be useful to add. The FAO expert was unable to comment at the time. Additional technical information on this may be obtained during member consultation which may lead to amendment.

36. *Processes without details in Annex 1.* One participant noted that some processes in annex 1 of the standard are not accompanied by details on how they should be carried out, e.g. malting, pasteurization, sugar infusion. In the absence of base conditions, some commodities resulting from these processes may remain capable of harbouring pests. Several points of discussion followed:

- the appendix refers to resulting commodities that "usually" do not remain capable of harbouring or spreading pests
- for such processes, no specific temperatures or times are given because of the range of commodities involved
- parameters for temperature and time are sometimes established bilaterally.

37. However, no changes were made, noting that:

- there are always limited exceptions but the SC-7 felt that processes in annex 1 did not pose phytosanitary risk
- some of these processes apply to many different commodities and cases, and it would not be possible to include details for all. Precise conditions had been mentioned only when it was possible for the process concerned, e.g. freezing.
- details such as time and temperature used for such processes would be part of the information which could be requested by the NPPO of the importing country if they felt it was necessary to validate a process.

Intended use

38. The SC-7 debated at length the issue of intended use of the commodities, and the possible change of the risk when a commodity is used differently than intended.

39. Participants agreed that the final use of commodities differed from the intended use in a limited number of cases, i.e. commodities imported for consumption or processing ending up being planted. This is especially the case for some commodities such as table potatoes or cereal grain which are intended for consumption but may end up being planted. However, there was disagreement on whether this should be covered in this standard.

40. Some participants believed that the importing country should base its requirements on the intended use, and cannot impose more stringent phytosanitary measures on the exporting country based on the possibility that the final use may differ from the intended use. These participants felt it is not possible to technically justify that a commodity for consumption/processing should meet more stringent requirements, such as the requirements for commodities for planting, only because the intended use might change. It was felt that this could be used as a trade barrier imposing stricter phytosanitary requirements than needed. These participants thought that the change from the intended use to the final use had nothing to do with the IPPC and that it was an internal problem that had to be addressed by the importing country. They felt the burden should not be put on the exporting countries, i.e. the importing country cannot make its import phytosanitary requirements more stringent for a commodity for consumption on the sole ground that there is a small possibility that the intended use in its own territory might change. These participants suggested that the text be left as it was.

41. Other participants argued that an importing country should take account of the probability of changes in use when carrying out the pest risk analysis (PRA), i.e. if the final use is likely to differ from the intended use, and pest risk will be higher, this could be reflected in the phytosanitary measures. These participants supported that the text should give guidance to members on the possibility to re-categorize a commodity if there is a high probability that the final use might be different than the intended use. It was also noted that unprocessed commodities for consumption and processing are currently in the same category in the draft (category 3), but that processing a commodity might pose less risk (a more controlled environment) than distributing a commodity for consumption where the commodity, instead of being consumed, might be

planted. One participant suggested to add a note that intended use might change from consumption/processing to a final use of planting, and this may result in an increase of risks, and therefore appropriate measures should be considered in such cases by the importing country in order to reduce the phytosanitary risk. Addition of such a point was felt to offer guidance to countries on how to deal with cases where there is a high probability of a change to the intended use.

42. A compromise was agreed and a note was added to the requirements section which states that the standard does not consider deviations from the intended use.

43. The SC-7 agreed that the draft ISPM *Categorization of commodities according to their phytosanitary risk* should be sent for member consultation (Appendix 4).

4.3 Potato minitubers and micropropagative material

44. The SC-7 modified the text after discussing the following points in the draft.

Title

45. *Production and maintenance of* was removed to shorten and focus the title.

Definitions

46. "*edible*". It was decided to delete the word "edible" from the definitions of "seed potato" and "potato micropropagative material" in order to enlarge the scope of the standard to cover other possible uses, such as for starch production or pharmaceutical production.

47. *Clarification on the terms: potato propagative material, plants in vitro, microtubers*. The SC-7 found the way in which the terms "plants in vitro" and "potato micropropagative material" were used in the draft to be unclear. It was clarified that plants *in vitro* includes microtubers. "Potato micropropagative material" is therefore plants in vitro, including microtubers. The definition was modified and the text adjusted where appropriate.

Use of the term "seed potato certification scheme" throughout the text

48. Some members suggested that "national" be added in front of this term throughout the text, but it was not added as it was noted that seed potato certification scheme were sometimes run at sub-national level (e.g. state).

Use of the term "specified pest" throughout the text

49. The SC-7 wondered whether "specified pests" as used throughout the standard was the same as regulated pests. It was noted that the experts had used the word "specified" to indicate that it was essential to communicate to the exporting country which pests were of concern. Some members favoured that "specified pests" be changed to "regulated pests" as these were the only ones which mattered for phytosanitary purposes. Others felt there was a need to have flexibility as the pests specified might not necessarily be regulated in the country of export, but were included because they are regulated in the importing country, or in a seed potatoes certification scheme. The SC-7 decided that all of the uses of "specified pest" and "regulated pest" would be changed to "specified and regulated pest" as appropriate. One member noted that this solution was unsatisfactory, and that this issue should be reported as unresolved as it was unclear what "specified" really means.

Facilities "operated" or "authorized" by the NPPO

50. The standard mentioned facilities for production of potato micropropagative material "operated" or "authorized" by the NPPO. Some members questioned if facilities were directly operated by the NPPO in any country and thought that mostly such facilities were operated outside the NPPO, but submitted to its authorization and supervision. One member confirmed that some NPPOs were operating directly such facilities. Some others wondered whether there was a conflict of interest if the NPPO operated the facilities, and issued phytosanitary certificates for the material produced. However, it was noted that there would not be a conflict of interest, as long as two different bodies within the NPPO were responsible for operating the facilities and for issuing the PCs.

References to UN/ECE standard

51. Several references were made in the text to the "UN/ECE standard concerning the certification and commercial quality control of seed potatoes moving in international trade between and to UN/ECE member countries" and to seed certification labels that meet UN/ECE requirements for "pre-basic TC class" seed potatoes. Some members favoured deletion of the reference to UN/ECE, whose coverage is wider than phytosanitary matters and expands to quality issues. Some members noted that there was no international system for labelling, and it was not appropriate to mention a regional one. Others indicated that reference to a well-established system might provide guidance. The SC-7 agreed to delete all references to UN/ECE.

In section 3.1 Establishment of pest free potato micropropagative material

52. Some members wondered why the testing laboratories were mentioned before the facility used to establish the material. It was clarified that candidate plants are tested, and then moved to the facility. The section was divided into two sections to separate these two steps. In addition the text relating to candidate plants from which the plants in vitro are derived was expanded to provide additional guidance and moved before the sub-section on testing to respect the logical order.

In section 3.2 Maintenance and propagation of pest free potato micropropagative material

53. The SC-7 clarified requirements regarding both potato micropropagative material and other plant species which are proposed to be brought into and grown in a facility. The requirements aim at ensuring that any plant material, whether potato or other plant species, would not be a source of infestation for the potato micropropagative material. In both cases, only pest free material would be allowed to enter the facility and in the case of other plant species, NPPO approval would first have to be sought.

In section 5. Staff Competence

54. The wording "Records of staff training and competencies should be maintained" was found vague. The SC-7 discussed whether this statement should be qualified with a minimum duration for record keeping. It finally agree that this was for the NPPO to determine, depending on its operation, and "as determined by the NPPO" was added at the end of the sentence.

In section 7. Auditing

55. The text was modified to state that, in addition to facilities, the NPPO of the exporting country should audit the operational systems. In addition, the importing country should have the possibility to participate in such audits. A sentence was added to cover this. The Secretariat was requested to appropriately align this wording with similar wordings in adopted ISPMs.

56. The SC-7 agreed that the draft ISPM *Pest free potato micropropagative material and minitubers for international trade* should be sent for member consultation (Appendix 5).

4.4 Post-entry quarantine facilities

57. The SC-7 reviewed and modified the text. The main points of discussion were as follows.

General comments

58. A couple of participants noted that assigning post-entry quarantine (PEQ) levels was arbitrary and did not allow flexibility to allow adjustments to the biological aspects of the commodity and/or pest being considered. It was felt that biology should play a more important role in this regard.

Title

59. The title was shortened by removing *Guidelines* in accordance with previous SC decisions.

Scope

60. The SC-7 noted that the standard was seen as providing guidance or recommendations to help NPPOs to set up the appropriate type of facility to protect the area they are responsible for, and was not intended to harmonize PEQ facilities around the world. The text was modified to reflect this throughout the document.

61. It was clarified that the standard refers to "consignments of plants" and not just consignments, recognizing that plant products are not usually placed in PEQ facilities. This change was reflected throughout the document.

Security/containment levels

62. The text referred to "security" levels. The SC-7 felt that security usually refers to the act of keeping something out, and so "containment" was felt a more appropriate term for the concept in relation to PEQ facilities. This change was reflected throughout the document. One participant noted that the issue of facility security might not be covered well enough (e.g. security cameras, guards, fences etc.)

63. One participant felt that the containment offered by the facility should be based on the biological characteristics of the pest to be contained in the facility.

Background

64. Text was added to indicate that PEQ is for special high risk cases, and that it should be ensured that the risks were managed properly and that the decision to route a consignment through a PEQ should be based on a PRA. It was agreed that the standard does not cover organisms imported for research, and the draft was modified to reflect this. The list of reasons for requiring PEQ was elaborated to cover most situations.

New section 2.4 Release from containment

65. A new section was added to deal with release of consignments from containment and to indicate which actions may be taken following their release.

New Annex 1

66. Text from the draft was moved into an annex, entitled *Methods for assignment of PEQ containment levels*.

67. The SC-7 agreed that the draft ISPM *Structure and operation of post-entry quarantine facilities* should be sent for member consultation (Appendix 6).

4.5 Terminology of the Convention on Biological Diversity (CBD) in relation to the Glossary of phytosanitary terms (supplement to ISPM No. 5)

68. It was noted that the document had originally been drafted as an explanatory document, but the SC requested that it be a supplement to the Glossary. The following specific comments were made.

Introduction

69. Concern was expressed that the CBD definition excludes introduction by natural means. However, it was noted that the CBD definition for *introduction* only refers to movement of species by human agency.

70. There was discussion on the following terms:

- Invasive alien species
 - The SC-7 discussed the relationship between the terms invasive alien species and quarantine pest. The group noted that an invasive alien species impacts plants rather than plant products, and the reference to plant products was removed from the explanatory definition.
 - The related notes were amended to clarify the cases in which a *quarantine pest* that has an impact on biodiversity including the environment will also be considered an *invasive alien species*.
 - The SC-7 discussed the issue of crop damage being a kind of reduction of agrobiological diversity. Some participants felt this could be the case, in particular in regards to heritage crops, but most felt that this aspect is not major in regard to the relationship between invasive alien species and quarantine pests and this phrase was excluded.
- Risk analysis
 - The group noted that it was not clear whether risk assessment under the CBD would allow for the risk assessment to be conducted prior to entry of the organism (according to the definition of *alien species*) and felt the CBD guiding principals might suggest that measures could be put in place to prevent potential introductions. Note 21 was modified for clarify this point.

- The explanatory definition in IPPC terms was modified to specifically refer to phytosanitary measures as the options to be evaluated during pest risk analysis.

Reference section

71. It was suggested that ISPM No. 5 (*Glossary of phytosanitary terms*) be included as a reference, but it was noted that the document was proposed as a supplement to the *Glossary*. To clarify the source of IPPC definitions during the member consultation period, a reference to ISPM No. 5 was added to the introductory text.

72. The draft supplement to ISPM No. 5 *Terminology of the CBD in relation to the Glossary of phytosanitary terms*, as modified by the SC-7, was approved for member consultation (Appendix 7).

4.6 Amendments to ISPM No. 5 (*Glossary of phytosanitary terms*)

Incidence (of a pest)

73. One member noted that expressing the incidence as a proportion was not always meaningful, for example to express that five plants were found in a one hectare field. It was recognized that incidence would mostly be expressed as a proportion, but that in some cases it would need to be expressed as a number of units. The SC-7 modified the wording to read "proportion or number of units".

74. One member noted that the term "defined population" is not clear and wondered what other cases could be covered apart from those which are mentioned in the definition, i.e. sample, consignment and field. It was noted that population was used in its statistical sense and may be confused with its biological meaning. The SC-7 maintained the wording as it was.

Tolerance level

75. The SC-7 noted that the definition applied to pests and modified the term to read "tolerance level (of a pest)".

76. One member wondered if the wording "action against that pest" could be used instead of "action to control that pest or to prevent its spread or introduction". It was noted that the current wording would cover pests which are present and can be controlled, and those which are not yet present. The definition was not modified.

Corrective action plan

77. The SC-7 noted that the definition applied to areas, and changed the term to read "corrective action plan (in an area)".

Intended use

78. The definition refers to the "declared purpose [for which plants etc.] are used". This was discussed. Some members had reservations on this wording.

79. Some members thought that it should read "regulated articles". However, this was not changed noting that:

- this is in line with the definition of commodity
- at the time a commodity-based PRA is done and the intended use considered, the articles are not necessarily "regulated articles".

80. The SC-7 approved the definition for member consultation, but had reservations on the words "or used" in the definition and recommended this be examined.

Phytosanitary security (of a consignment), Reference specimen, Compliance procedure (for a consignment)

81. The SC had no comment on the definitions *phytosanitary security (of a consignment)*, *reference specimen* and *compliance procedure (for a consignment)* and approved them for member consultation.

82. The draft amendments to ISPM No. 5 (*Glossary of phytosanitary terms*), as modified by the SC-7, were approved for member consultation (Appendix 8).

4.7 Systems approaches for the pest risk management of fruit flies

83. The SC-7 did not discuss the draft standard on systems approaches for fruit flies and recommended that it be discussed at the May 2009 meeting.

4.8 Appropriate level of protection (supplement to ISPM No. 11)

84. The SC-7 discussed the draft. It was noted that the expert working group (EWG) did not follow the tasks outlined in the specification, but that the EWG report detailed why this was so. The SC-7 agreed that the draft did not provide any guidance for NPPOs to understand or set their appropriate level of protection, but was more focused on consistency in the development and use of phytosanitary measures.

85. The SC-7 decided that this was a complex concept of a strategic nature and that the draft should be discussed by the whole SC. They recommended that the SC consider how to proceed with the document, such as revising it to provide more guidance to NPPOs on appropriate level of protection or shifting the focus to give guidelines for promoting consistency, turning it into an IPPC recommendation, or recommending that the CPM remove it from the work programme.

4.9 Not widely distributed (supplement to ISPM No. 5)

86. SC-7 discussed the draft and decided that, since the draft was so closely linked with the *Glossary* supplement on official control, the draft should be submitted to the TPG (rather than for member consultation) for them to revise and consider how best to present both concepts together. The SC-7 suggested that TPG consider adding the text to the official control supplement. It was thought that text on not widely distributed could be integrated into the supplement in such a way as to not reopen discussion on official control.

4.10 Trapping procedures for fruit flies

87. The SC-7 reviewed the draft. Only a few modifications were made. It was suggested that the text be moved alongside each picture in order to shorten the standard. There were no major issues discussed as the standard was considered to be very technical and well prepared.

88. The SC-7 approved the draft annex 1 to ISPM No. 26 on *Fruit fly trapping* for member consultation (Appendix 9).

4.11 Pest risk management for plants for planting

89. The Secretariat outlined the history behind the development of the draft standard, indicating that two expert working groups had been held followed by a period of online drafting. The draft was further adjusted by the steward. The SC-7 reviewed the text, agreeing that more work needed to be done before it could be sent for member consultation. General and specific comments were prepared and the SC-7 decided they should be considered by the SC at their next meeting in November 2008.

90. The SC-7 made the following general comments:

- The draft focuses too much on high risk situations and is not suitable for situations where large volumes of lower risk plants for planting are moving in international trade. It should provide guidance for various situations depending on the risk. This specific text, tailored to high risk plants, could remain as part of a more general standard on risk management of plants for planting in international trade.
- More specific guidance is needed on PRA for importing countries.
- It was felt that the draft focused more on what was needed to support a bilateral agreement than on how to harmonize the international movement of plants for planting. Bilateral agreements may be necessary only for specific high risk situations. The draft should supply guidance for exporting countries when setting up systems and for importing countries when setting up specific requirements, without the need for specific bilateral agreement. It should also include guidance for the decision on whether a simple or complex system would be required.
- New "created" terms and acronyms should be avoided, such as phytosanitary manual (PM), crop protection specialist (CPS) etc. and if the term is not used often it should be written out in full.
- The SC-7 suggested that a new EWG, possibly with one or two members from the previous EWG, should be formed to revise the draft.

Title

91. Some participants felt the draft does not describe a systems approach and is more related to management of phytosanitary risks of plants for planting and it was felt that the title should be more related to the latter. Other references to systems approach in the text should also be adjusted in a similar manner

Scope

92. It was recommended to include considerations from the general comments above. Clarify that the standard is mainly addressed to exporting countries and how they should oversee their producers to establish such a system. This standard is also relevant for giving importing countries confidence that the export system is meeting their import requirements.

Background

93. The text should be simplified, should more directly focus on the risks specific for plants for planting and focus on the most important factors. It need not capture all the faults of the present system. The term phytosanitary security is not used appropriately and its use should be adjusted.

In section 1. General Requirements for the Systems Approach to Manage Plant Pest Risk

94. Heading and focus should be: *General requirements for pest risk management for plants for planting in international trade*. Systems approach could be one option. New text on this wider approach is required. The focus should be widened to also cover situations when no bilateral agreement is required and exclusive reference to bilateral agreements should be removed. Clarify the responsibilities of the NPPO of the exporting country, and of the producer under the supervision of the NPPO (this may also be necessary for other parts of the standard). Consider reordering the list of bullets, and shortening and clarifying the list.

In section 2. Requirements for the Place of Production

95. The reference to the ISO system is too specific, and a more general reference should be used. Provide clarification on "export programme", e.g. is it a certification programme for phytosanitary purposes.

In section 2.1 Place of production phytosanitary manual

96. The list of bullets should be reconsidered and reorganized by possibly grouping elements under the following headings: staff and labour related, physical conditions, traceability of material and review and audit. Clarify who develops the phytosanitary manual. Terms such "phytosanitary manual" should be explained upon first use. Consider how to say the same thing without creating new terms. Clarify the relationship between phytosanitary manual and pest management plan.

In section 2.2 Pest management plan

97. Consider adding prevention as an important element. Some elements in the section need to be put in the chapeau.

In section 2.3 Crop protection specialist

98. For "crop protection specialist", consider referring to the expertise needed rather than creating a new term. Refer to expertise required and indicate that one person with this expertise should be named and be responsible. Reporting requirements should be considered. Indicate more strongly that the NPPO is in control and that they authorize the system.

In section 2.4 Training of employees

99. More information on who is training employees is needed. Employees should be trained to recognize the pests of concern to the importing country.

In section 2.5 Examination of plant material

100. Clarify the respective responsibilities of the NPPO and the company in examining plant material. Clarify how specific the phytosanitary management plan should be. The standard should concentrate on the general requirements of a plan and possible considerations for different import requirements might need to be addressed but should not be the focus of the plan.

In sections 2.6 - 3

101. Text in these sections is general, and it should be checked if it is already covered by other standards. Links should be made to existing standards where possible.

In section 3.1 Critical non-compliance

102. Both the concept and the specific text need to be reviewed and clarified. There should be a clear link to appendix 2 of the standard.

In section 4.1 External audits

103. The text states that the NPPO of the exporting country authorizes export of specific products to specific countries. Consider widening the approach and mention that a more multilateral or less specific approach could be introduced.

In section 4.2 Export inspections

104. There was some concern that text in this section lowers the obligations of the NPPO. IPPC obligations relating to phytosanitary certificates should be maintained. If a specific approach is suggested, more explanation is required. Reference to documents other than phytosanitary certificates should be removed as this is outside the scope of the IPPC.

In section 5. Export Brokers

105. This section should be rewritten and responsibilities should be reconsidered. Terminology should be reconsidered and clarified. If it is intended to address phytosanitary security procedures in accordance with Article IV.2(g), this should be done reflecting the IPPC meaning of phytosanitary security.

In section 6. Requirements for the NPPO of the Importing Country

106. Consider adding guidelines for elements of post-entry activities, such as surveillance. Eligible and ineligible plant taxa was not easily understood, consider rewording.

In section 6.2 Import inspection

107. There is a concern that text in section lowers the obligation of the NPPO, adjust text accordingly.

In section 6.3 Auditing by the NPPO of the importing country

108. Remove obligatory elements for the NPPO of the importing country to audit and possibly specify situations in which such auditing may be appropriate. Provide criteria when such an audit may be justified. Consider linkages with ISPM No. 20, section 5.1.5

In section 7. Information Exchange between NPPOs

109. This should be limited to essential information and not repeat elements of administration of the programme or statements already included in ISPM No. 13. Reference to negotiation of export programme should be removed.

Appendix 1

110. The guidance in appendix 1 (risk categorization of plants for planting) is useful but should be linked to how to use these different categories in different situations and explained more in the requirements. Consider a new title that does not use the word "categorization".

Appendix 2

111. It was suggested that repeated cases of non-critical non-compliance should be considered to change the non-compliance to critical.

Appendix 3

112. It was suggested to consider deleting this appendix.

5. DRAFT SPECIFICATION FOR REVIEW OF MEMBER COMMENTS AND APPROVAL

5.1 International movement of wood

113. The Chairperson introduced the draft specification, noting that the text had been reviewed by the SC in November 2007, sent for member consultation and subsequently modified by the steward to incorporate

member comments. The SC-7 reviewed and modified the draft specification. The main items of discussion were as follows:

114. *Reason for the standard.* The group expressed concern with the reference to risks associated with treated wood, as wood that has been treated appropriately should present lower phytosanitary risks. The text was modified to refer to wood treated for non-phytosanitary purposes, to note that other kinds of treatments may not sufficiently lower phytosanitary risk.

115. *Title.* The SC-7 modified the title of the specification to clarify that the standard should address phytosanitary risk associated with the international movement of wood. It was noted that the title would likely evolve during the drafting process.

116. *Scope.* The group discussed the overlap between the proposed scope and the tasks, noting that the scope may be too detailed. However, it was noted that the specification had already been reviewed by the SC and submitted for member consultation, and extensive redrafting to abbreviate the scope may not be appropriate at this stage.

117. *Tasks.* Some participants expressed concern that some of the tasks, such as proposals of treatments or determination of pest status, may fall outside of the mandate of the TPFQ, and would cover too much information in a single standard. Others noted that this specification outlined work for an ongoing panel of experts, and that the TPFQ could consider how to address the linked issues such as wood as a commodity and pest status, possibly through separate standards or annexes.

118. The SC-7 approved the specification as Specification No. 46: *Management of phytosanitary risks in the international movement of wood* (Appendix 10).

6. OTHER BUSINESS

119. No other business items were raised.

7. DATE AND VENUE OF THE NOVEMBER SC MEETINGS

120. The SC was informed of the dates of the next meetings of the SC-7 and SC in 2008:

- SC-7: 3-7 November 2008
- SC: 10-14 November 2008.

8. ADOPTION OF THE REPORT

121. The SC-7 adopted the report of the meeting.

9. CLOSE

122. The Chair thanked the members of the SC-7 for the good discussions and productive meeting.

**Commission on Phytosanitary Measures
Standards Committee Working Group (SC-7)**

5-9 May 2008

FAO Headquarters, Rome, Italy

AGENDA

AGENDA ITEM	DOCUMENT
1. Opening of the meeting	--
2. Adoption of the agenda	2008-SC-May-01
• Documents list	2008-SC-May-02
• List of SC-7 members and meeting observers	2008-SC-May-03
• Report of SC November 2007	2008-SC-May-04
• Election of chair and rapporteur	--
3. Issues arising from CPM-3 (April 2008)	2008-SC-May-28
• IPPC standard setting work programme	2008-SC-May-29
4. Draft ISPMs for review and approval for member consultation	--
4.1 Revision of ISPM No. 15 (Steward: Greg Wolff) – HIGH priority	2008-SC-May-18
• Excerpts from TPFQ reports relating to the revision of ISPM No. 15	2008-SC-May-27
4.2 Categorization of commodities according to their phytosanitary risk (Steward: Diego Quiroga) – HIGH priority	2008-SC-May-22
• EWG report - 2nd meeting (2006)	2008-SC-May-23
4.3 Potato minitubers and micropropagative material (Steward: Greg Wolff) – HIGH priority	2008-SC-May-05
• EWG report	2008-SC-May-08
4.4 Post-entry quarantine facilities (Steward: Beatriz Melcho) – NORMAL priority	2008-SC-May-15
• EWG report	2008-SC-May-17
4.5 Terminology of the CBD in relation to the <i>Glossary of phytosanitary terms</i> (supplement to ISPM No. 5) (TPG Steward: John Hedley) – HIGH priority	2008-SC-May-11
• TPG report	2008-SC-May-21
4.6 Amendments to the <i>Glossary of phytosanitary terms</i> (TPG Steward: John Hedley) – HIGH priority	2008-SC-May-20
• TPG report	2008-SC-May-21
4.7 Systems approaches for the pest risk management of fruit flies (Steward: Mike Holtzhausen) – NORMAL priority	2008-SC-May-07
• TPFQ report (2006)	2008-SC-May-10
4.8 Appropriate level of protection (supplement to ISPM No. 11) (Steward: Fuxiang Wang) – HIGH priority	2008-SC-May-14
• EWG report	2008-SC-May-16
4.9 Not widely distributed (supplement to ISPM No. 5) (Steward: Julie Aliaga) – HIGH priority	2008-SC-May-06
• EWG report	2008-SC-May-09
4.10 Trapping procedures for fruit flies (Steward: Walther Enkerlin) – HIGH priority	2008-SC-May-12
• TPFQ report (2007)	2008-SC-May-13
4.11 Pest risk management for plants for planting (Steward: David Opatowski) – HIGH priority	2008-SC-May-19
• EWG report - 1st meeting (2006)	2008-SC-May-24
• EWG report - 2nd meeting (2007)	2008-SC-May-25
• EWG report - Online drafting (2007)	2008-SC-May-26
5. Draft specification for review of member comments and approval	--
5.1 International movement of wood (Steward: Greg Wolff) – HIGH priority	2008-SC-May-30-Rev1
• Member comments with steward responses	2008-SC-May-31
6. Other business	--
7. Date and venue of the November SC meetings	--
• SC-7: 3-7 November 2008	
• SC: 10-14 November 2008	
8. Adoption of the report	--
9. Close	--

**Commission on Phytosanitary Measures
Standards Committee Working Group (SC-7)**

5-9 May 2008

FAO Headquarters, Rome, Italy

DOCUMENTS LIST

In accordance with the CPM-3 decision, some documents for Standards Committee meetings are now available to contacting parties and regional plant protection organizations in addition to Standards Committee members. The documents accessible only to the Standards Committee are marked as “restricted access”.

DOCUMENT NUMBER	AGENDA ITEM	DOCUMENT TITLE	DATE POSTED / DISTRIBUTED
2008-SC-May-01	2	Provisional agenda	25-Apr-2008
2008-SC-May-02	2	Documents list	25-Apr-2008
2008-SC-May-03	2	Participants list	21-Apr-2008
2008-SC-May-04	2	Report of the SC November 2007 meeting	4-Feb-2008
2008-SC-May-05	4.3	Draft ISPM: Potato micropropagative material and minitubers	29-Jan-2008
2008-SC-May-06	4.9	Draft supplement to ISPM No. 5: Not widely distributed	29-Jan-2008
2008-SC-May-07	4.7	Draft ISPM: Systems approaches for fruit flies	29-Jan-2008
2008-SC-May-08	4.3	EWG report: Potato micropropagative material and minitubers	4-Feb-2008
2008-SC-May-09	4.9	EWG report: Not widely distributed	4-Feb-2008
2008-SC-May-10	4.7	TP report: TPF 2006 (for <i>Systems approaches for fruit flies</i>)	4-Feb-2008
2008-SC-May-11	4.5	Draft supplement to ISPM No. 5: Terminology of the CBD	8-Feb-2008
2008-SC-May-12	4.10	Draft annex to ISPM No. 26: Fruit fly trapping	8-Feb-2008
2008-SC-May-13	4.10	TP report: TPF 2007 (for <i>Fruit fly trapping</i>)	13-Feb-2008
2008-SC-May-14	4.8	Draft supplement to ISPM No. 11: appropriate level of protection	20-Feb-2008
2008-SC-May-15	4.4	Draft ISPM: guidelines for the structure and operation of post-entry quarantine facilities	20-Feb-2008
2008-SC-May-16	4.8	EWG report: appropriate level of protection	20-Feb-2008
2008-SC-May-17	4.4	EWG report: post-entry quarantine facilities	20-Feb-2008
2008-SC-May-18	4.1	Revision of ISPM No. 15: regulating wood packaging material in international trade	21-Feb-2008
2008-SC-May-19	4.11	Draft ISPM: Systems approach for managing pest risks associated with international trade of plants for planting	28-Feb-2008
2008-SC-May-20	4.6	Amendments to ISPM No. 5	28-Feb-2008
2008-SC-May-21	4.5 and 4.6	TP report: Glossary - 2007 meeting	6-Mar-2008
2008-SC-May-22	4.2	Draft ISPM: categorization of commodities according to their phytosanitary risk	6-Mar-2008
2008-SC-May-23	4.2	EWG report : classification of commodities - 2nd meeting	6-Mar-2008
2008-SC-May-24	4.11	EWG report: Pest risk management for plants for planting in international trade - 1st meeting	2-Apr-2008
2008-SC-May-25	4.11	EWG report: Pest risk management for plants for planting in international trade - 2nd meeting	2-Apr-2008
2008-SC-May-26	4.11	EWG report: Pest risk management for plants for planting in international trade – online drafting process	4-Apr-2008
2008-SC-May-27	4.1	Excerpts from TPFQ reports relating to the revision of ISPM No. 15	22-Apr-2008
2008-SC-May-28	3	Issues arising from CPM-3 (April 2008) [restricted access]	22-Apr-2008
2008-SC-May-29	3	IPPC standard setting work programme [restricted access]	22-Apr-2008
2008-SC-May-30-Rev1	5.1	Draft specification: International movement of wood	25-Apr-2008
2008-SC-May-31	5.1	Member comments and steward responses for draft specification for international movement of wood [restricted access]	25-Apr-2008

*Draft ISPM
For member consultation (regular process)
June 2008*

INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

Revision of ISPM No. 15

REGULATING WOOD PACKAGING MATERIAL IN INTERNATIONAL TRADE

(200-)

*[Work programme topic: Guidelines for regulating wood packaging material in international trade (revision of ISPM No. 15)]
[Specification No. 31]*

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INTRODUCTION

SCOPE

This standard describes phytosanitary measures that reduce the risk of introduction and/or spread of quarantine pests associated with the movement in international trade of wood packaging material made from raw wood. Wood packaging material covered by this standard includes dunnage but excludes wood packaging made from wood processed in such a way that it is free from pests.

The measures described in this standard are not intended to provide ongoing protection from contaminating pests (e.g. termites, mould fungi, snails, weed seeds) or other organisms (e.g. spiders).

REFERENCES

- Consignments in transit*, 2006. ISPM No. 25, FAO, Rome.
Export certification system, 1997. ISPM No. 7, FAO, Rome.
Glossary of phytosanitary terms, 2008. ISPM No. 5, FAO, Rome.
Guidelines for a phytosanitary import regulatory system, 2004. ISPM No. 20, FAO, Rome.
Guidelines for inspection, 2005. ISPM No. 23, FAO, Rome.
Guidelines on notification of non-compliance and emergency action, 2001. ISPM No. 13, FAO, Rome.
ISO 3166-1-alpha-2 code elements (http://www.iso.org/iso/english_country_names_and_code_elements).
International Plant Protection Convention, 1997. FAO, Rome.
The Montreal Protocol on Substances that Deplete the Ozone Layer, 2000. Ozone Secretariat, United Nations Environment Programme. ISBN: 92-807-1888-6 (<http://www.unep.org/ozone/pdfs/Montreal-Protocol2000.pdf>).

DEFINITIONS

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

OUTLINE OF REQUIREMENTS

Approved phytosanitary measures that significantly reduce the risk of pest spread via wood packaging material comprise a combination of approved treatments and recognized marking. Wood packaging material subjected to the approved treatments shall be identified by marking. The approved treatments, the mark and its application are described.

Exporting and importing countries have specific responsibilities. The National Plant Protection Organizations (NPPOs) that authorize the use of the mark must control application of the treatments, authorization of the use of the mark and marking by authorized third parties, and must establish inspection procedures. Specific requirements apply to wood packaging material that is reused, repaired or remanufactured. The NPPO of the importing country should accept the approved phytosanitary measures as the basis for authorizing entry of wood packaging material without further phytosanitary import requirements and should verify on import that the requirements of the standard have been met. NPPOs are also responsible for measures implemented and notification where wood packaging material does not comply with the requirements of this standard.

REQUIREMENTS

1. Basis for Regulating

Wood originating from living or dead trees may be infested by pests. Wood packaging material is frequently made of raw wood that may not have undergone sufficient processing or treatment to remove or kill pests and therefore becomes a pathway for the spread and introduction of quarantine pests. Dunnage has been shown to present a high risk of introduction of quarantine pests. Furthermore, wood packaging material is very often reused, repaired or remanufactured (described in section 4.3). The true origin of any piece of wood packaging material is difficult to determine, and thus its phytosanitary status cannot easily be ascertained. Therefore the normal process of undertaking risk analysis to determine if measures are necessary and the strength of such measures is frequently not possible for wood packaging material. For this reason, this standard describes internationally accepted measures that are approved and that may be applied to wood packaging material by all countries to reduce significantly the risk of spread and introduction of most quarantine pests as well as a number of other pests that may be associated with that material.

2. Regulated Wood Packaging Material

These guidelines are for all forms of wood packaging material¹ that may serve as a pathway for plant pests posing a threat mainly to living trees. They cover wood packaging material such as crates, dunnage, pallets and spools which can be present in almost any imported consignment, including consignments that would not normally be the target of phytosanitary inspection.

2.1 Exemptions

The following articles are usually considered to be of sufficiently low risk to be exempt from this standard²:

- wood packaging material made entirely from thin wood (6 mm or less in thickness)
- wood packaging made wholly of wood-based products such as plywood, particle board, oriented strand board or veneer that have been created using glue, heat or pressure, or a combination thereof
- barrels for wine and spirit that have been heated during manufacture
- gift boxes for wine, cigars and other commodities made from wood that has been processed and/or manufactured in a way that renders it free of pests
- sawdust, wood shavings and wood wool.

3. Phytosanitary Measures for Wood Packaging Material

3.1 Approved phytosanitary measures

The approved phytosanitary measures described in this standard comprise a number of official procedures including a combination of treatments and marking of the wood packaging material. These phytosanitary measures should be accepted by all NPPOs as the basis for authorizing the entry of wood packaging material without further requirements.

The treatments described in Annex 1 are considered to be significantly effective against most pests associated with wood packaging material used in transport. These treatments have been adopted based on consideration of:

- the range of pests that may be affected
- the efficacy of the treatment
- the technical and/or commercial feasibility.

Wood packaging material subjected to these approved measures shall be identified by marking with an official mark in accordance with Annex 2, the mark consisting of the symbol used in close conjunction with codes identifying the specific country and producer of the wood packaging material. Hereafter, all components of such a mark are referred to collectively as "the mark". Use of the mark addresses operational difficulties associated with the verification of compliance with the treatments for wood packaging material contained in this standard. An internationally recognized, non-language-specific mark facilitates verification during inspection at the point of export, at the point of entry or elsewhere. The mark as referred to in Annex 2 should be accepted by all NPPOs as the basis for authorizing the entry of wood packaging material without further requirements.

3.2 Approval of new or revised treatments

As new technical information becomes available, existing treatments may be reviewed and modified, and other treatments for wood packaging material may be adopted by the Commission on Phytosanitary Measures (CPM).

¹ Wood packaging material is usually made from true woody plants such as conifers and woody dicots. However, packaging may also be made of wood-like material from certain monocotyledonous plants such as bamboo and palm. Such material also presents risks of quarantine pests and should be considered to be within the scope of this standard.

² Not all types of gift boxes or barrels are constructed in a manner that renders them pest free, and therefore certain types may be considered to be within the scope of this standard. Where appropriate, specific arrangements related to these types of commodities may be established between importing and exporting NPPOs.

3.3 Alternative requirements

Alternative requirements for wood packaging material may be established bilaterally between countries. In these cases, the mark shown in Annex 2 must not be used.

4. Responsibilities of NPPOs

To meet the objective of preventing the spread and introduction of pests (Article I.1 of the IPPC), both exporting and importing countries have specific responsibilities outlined below and must verify that the requirements of this standard have been met.

4.1 Regulatory considerations

Those NPPOs that authorize the mark have the responsibility for ensuring that all systems authorized for implementation of this standard meet all necessary requirements described within the text, and that wood packaging material (or wood that is to be made into wood packaging material) bearing the mark has been treated and/or manufactured in accordance with this standard. Responsibilities include:

- registration or accreditation and auditing of any commercial companies that may have been authorized to apply the measures and/or apply the mark to the wood packaging material
- monitoring certification and marking systems in order to verify compliance (further information on related responsibilities is provided in ISPM No. 7: *Export certification system*)
- establishing inspection procedures (further information is provided in ISPM No. 23: *Guidelines for inspection*).

Treatment and marking must always be under control of the NPPO. The NPPO should supervise (or, as a minimum, audit or review) the application of the treatments, authorization of the use of the mark and marking by authorized third parties. To reduce or prevent the possibility of untreated wood packaging material bearing the mark moving in international trade, treatment should normally be carried out prior to marking.

4.2 Marking

Marks applied to wood packaging material treated in accordance with this standard must conform to the requirements described in Annex 2.

4.3 Treatment and marking requirements for wood packaging material that is reused, repaired or remanufactured

NPPOs of exporting contracting parties are responsible for ensuring and verifying that wood packaging material that bears the mark described in Annex 2 and that is repaired or remanufactured complies fully with this standard. Repaired and remanufactured wood packaging material may be constructed using wood originating from several sources. All new components added to such wood packaging material must be made of wood treated and marked in accordance with this standard or be constructed or fabricated from processed wood material.

4.3.1 Reuse of wood packaging material

A unit of wood packaging material that has been treated and marked in accordance with this standard and that has not been repaired, remanufactured or otherwise altered does not require re-treatment or re-marking when undergoing a second or subsequent use.

4.3.2 Repaired wood packaging material

Repaired wood packaging material is wood packaging material that has had one or more components removed and replaced. If less than approximately one-third of the components of a unit of wood packaging material are replaced, the unit is considered to be repaired. NPPOs of exporting countries should ensure that when marked wood packaging material is repaired, wood treated and marked in accordance with this standard is used.

In circumstances where there is any doubt that all components of a unit of repaired wood packaging material have been treated in accordance with this standard, the NPPO of the exporting country should require the repaired wood packaging material to be re-treated. Any previous applications of the mark must be permanently obliterated (e.g. by covering with paint or grinding) or, in the case of tags or labels, destroyed. The mark must then be applied anew in accordance with this standard.

4.3.3 Remanufactured wood packaging material

If more than approximately one-third of the components of a unit of wood packaging material are replaced, the unit is considered to be remanufactured. In a remanufacturing process, wood packaging material is dismantled (partially or completely), and the components (with additional reworking if necessary) are then reassembled into further wood packaging material. Remanufactured wood packaging material may therefore incorporate both new and previously used components.

Remanufactured wood packaging material, regardless of its intended use, must have any previous applications of the mark permanently obliterated (e.g. by covering with paint or grinding) or, in the case of tags or labels, destroyed. If the wood packaging material is to be used in international trade, the remanufactured wood packaging material must be re-treated and the mark must then be applied anew in accordance with this standard.

4.4 Transit arrangements

Where consignments moving in transit have wood packaging material that has not met the requirements for approved phytosanitary measures, the NPPO(s) of the country(ies) of transit may require measures to ensure that wood packaging material does not present an unacceptable risk. Further guidance on transit arrangements is provided in ISPM No. 25 (*Consignments in transit*).

4.5 Procedures upon import

The regulation of wood packaging material may require that NPPOs have policies and procedures for other aspects of their responsibilities related to wood packaging material.

Since wood packaging materials are associated with most shipments, including those not normally the target of phytosanitary inspections, cooperation with bodies not normally involved with meeting phytosanitary export conditions or import requirements is important. For example, cooperation with Customs organizations may be important to ensure effectiveness in detecting potential non-compliance of wood packaging material.

4.6 Measures for non-compliance at point of entry

Information on non-compliance and emergency action is provided in section 5.1.6 of ISPM No. 20 (*Guidelines for a phytosanitary import regulatory system*), and on notification of the exporting country in ISPM No. 13 (*Guidelines on notification of non-compliance and emergency action*).

Where wood packaging material does not carry the required mark or there is evidence of a failure of a treatment, action may be taken. Minimal impact should be considered for the action. This action may take the form of detention, removal of non-compliant material, treatment, destruction or re-shipment. Further examples of options for actions are provided in Appendix 1. The NPPO of the importing country should notify the exporting country or the manufacturing country, where applicable, in cases where live pests are found. NPPOs are also encouraged to notify cases of missing marks and other cases of non-compliance.

ANNEX 1

APPROVED TREATMENTS ASSOCIATED WITH WOOD PACKAGING MATERIAL

Note that when a revised schedule is adopted for treatment of wood packaging, material treated under the previous treatment schedule does not need to be re-treated, re-marked or recertified.

Removal of bark is to be applied in addition to one of the other treatments as specified below. However, any number of small pieces of bark may remain after removal of bark:

- if they are less than 3 centimetres in width (regardless of the length) or
- if greater than 3 centimetres in width, with the total surface area of an individual piece of bark less than 50 square centimetres.

Heat treatment

Wood packaging material should be heated in accordance with a specific time–temperature schedule that achieves a minimum temperature of 56°C for a minimum of 30 continuous minutes throughout the entire profile of the wood (including at its core). Various energy sources or processes may be suitable to achieve these parameters. For example, kiln-drying, chemical pressure impregnation, microwave or other treatments may be considered heat treatments provided that they meet the heat treatment requirements described in this standard.

Appendix 2 contains further guidelines for effective heat treatment.

Methyl bromide treatment

Methyl bromide is widely considered to be harmful to the ozone layer³. In accordance with the IPPC recommendation (*Replacement or reduction of the use of methyl bromide as a phytosanitary measure*), NPPOs are encouraged to promote the use of alternative measures approved in this standard.

The removal of bark stipulated above must always precede the application of fumigation.

The wood packaging material must be fumigated with methyl bromide in accordance with a schedule that achieves the minimum CT (concentration-time product⁴) over 24 hours at the temperature and final concentration specified in Table 1 throughout the wood (including at its core). The minimum temperature must not be less than 10°C and the minimum exposure time must be 24 hours. Monitoring of concentrations must be carried out at a minimum at 2, 4 and 24 hours.

Table 1: Minimum CT over 24 hours for wood packaging material fumigated with methyl bromide

Temperature	CT (g·h·m ⁻³) over 24 h	Final concentration (g/m ³)
21°C	650	24
16°C	800	28
10°C	900	32

One example of a schedule that may be used for achieving the specified requirements is shown in Table 2.

Table 2: Example of a treatment schedule that achieves minimum CT for wood packaging material treated with methyl bromide

Temperature	Dosage (g/m ³)	Minimum concentration (g/m ³) at:			
		2 h	4 h	12 h	24 h
21°C or above	48	36	31	28	24
16°C or above	56	42	36	32	28
10°C or above	64	48	42	36	32

NPPOs should ensure that the following factors are appropriately addressed within their official procedures governing the application of methyl bromide treatment:

- Fans must be used as appropriate during the period of fumigation and must be positioned to ensure that the fumigant is rapidly and effectively distributed throughout the fumigation enclosure.
- Fumigation enclosures must not be loaded beyond 80% of their volume.
- Fumigation enclosures must be gas tight.

³ Contracting parties to the IPPC may also have obligations under the Montreal Protocol on Substances that deplete the Ozone Layer.

⁴ The CT product utilized for methyl bromide treatment in this standard is the sum of g/m³ per hour over a period of 24 hours.

- The fumigation site floor must be impermeable to the fumigant if fumigation under gas-proof sheets is to be carried out.
- Methyl bromide must be applied through a vaporizer (hot gassing) in order to fully volatilize the fumigant prior to its entry into the fumigation enclosure.
- Methyl bromide treatment must not be carried out on wood packaging material exceeding 20 cm in minimum cross section. Wood stacks need separators at least every 20 cm in thickness to ensure adequate methyl bromide penetration.
- When calculating methyl bromide dosage, compensation must be made for any gas mixtures (e.g. 2% chloropicrin).
- Initial dose rates and post-treatment product handling procedures must take account of likely methyl bromide sorption by the treated wood packaging material or associated product (e.g. polystyrene boxes).
- Product temperature must be equivalent to the measured ambient air temperatures used to calculate methyl bromide dose, and should always be at least 10°C.
- Care should be taken to ensure any product associated with the wood packaging material will not be damaged by the application of a methyl bromide treatment.
- Wood packaging material to be fumigated must not be wrapped or coated in materials impervious to the fumigant.

THE MARK AND ITS APPLICATION

A mark indicating that wood packaging material has been subjected to approved phytosanitary treatment in accordance with ISPM No. 15 comprises the following required components:

- the symbol
- a country code
- a producer code.

Symbol

The design of the symbol (which may have been registered under national, regional or international procedures, as either a trademark or a certification/collective/guarantee mark) must resemble closely that shown in the examples illustrated below and must be presented to the left of the other components.

Country code

The country code must be the International Organization for Standards (ISO) two-letter country code (shown in the examples as "XX"). It must be separated by a hyphen from the producer code.

Producer code

The producer code is a unique code assigned by the NPPO to the producer of the wood packaging material, which is responsible for ensuring appropriate wood is used and properly marked (shown in the examples as "000"). The number and order of digits and/or letters are assigned by the NPPO.

The resulting mark must be legible. The size and position of the mark may vary, but its size must be sufficient to be both visible and legible to inspectors without the use of a visual aid. The mark must be contained within a border with a vertical line separating the symbol from the code components. To facilitate the use of stencilling, small gaps in the border and the vertical line may be present.

No other information shall be contained within the border of the mark.

The mark must be:

- legible
- durable and, in the case of tags or labels, not transferable
- placed in a visible location, preferably on at least two opposite sides of the article being certified.

The mark must not be hand drawn.

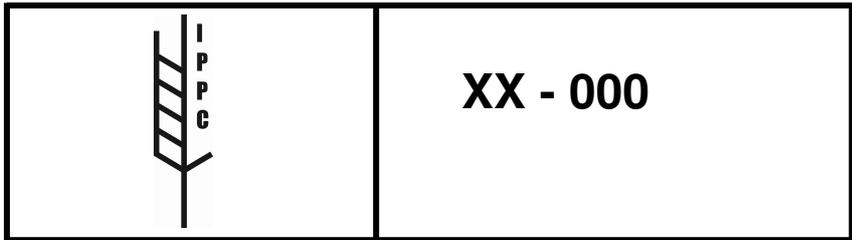
The use of red or orange should be avoided because these colours are used in the labelling of dangerous goods.

Where various components are integrated into a unit of wood packaging material, the resultant composite unit should be considered as a single unit for marking purposes. On a composite unit of wood packaging material made of both treated wood and processed wood material (where the processed component does not require treatment), it may be appropriate for the mark to appear on the processed wood material components to ensure that the mark is in a visible location and is of a sufficient size. This approach to marking applies only to composite single units, not to temporary assemblies of wood packaging material.

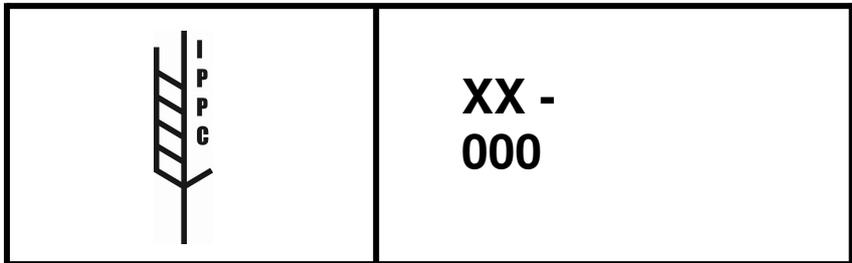
Special consideration of marking dunnage legibly may be necessary because treated wood for use as dunnage may not be cut to final length until loading of a conveyance takes place. It is important that shippers, under the supervision of the NPPO, ensure that all dunnage used to secure or support commodities is treated and displays the mark described in this annex, and that the marks are clear and legible. Options for achieving this include:

- marking of pieces of wood intended for use as dunnage along their entire length at very short intervals (NB: Where very small pieces are subsequently cut for use as dunnage, the cuts should be made so that an entire mark is present on the dunnage used. Small pieces of wood that do not include all the required elements of the mark should not be used for dunnage.)
- additional marking of treated dunnage in a visible location after cutting.

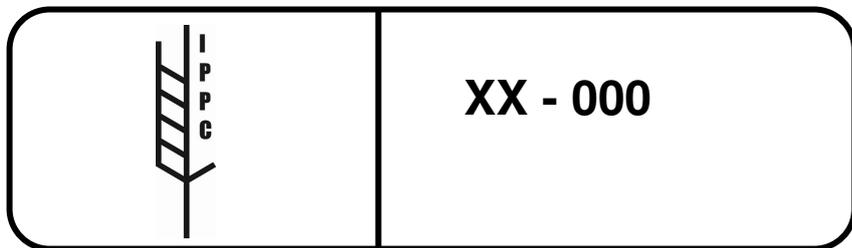
The examples below illustrate some acceptable variants of the required components of the mark that is used to certify that the wood packaging material that bears such a mark has been subjected to an approved phytosanitary measure.



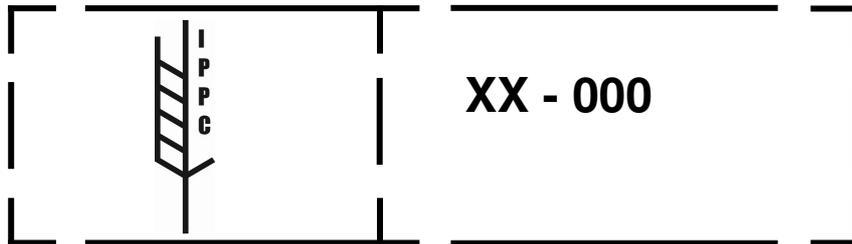
Example 1



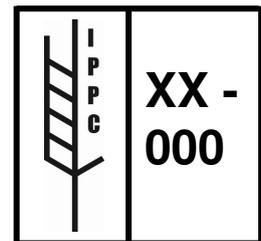
Example 2



Example 3



Example 4



Example 5



Example 6

APPENDIX 1

EXAMPLES OF METHODS OF SECURE DISPOSAL OF NON-COMPLIANT WOOD PACKAGING MATERIAL

Non-compliant wood packaging material may require treatment (as described in Annex 1 of this standard) or secure disposal in order to prevent escape of any pest(s) detected.

Secure disposal of non-compliant wood packaging material is a risk management option that may be used by the NPPO of the importing country when treatment is either not available or is not desirable. The methods listed below are recommended for the secure disposal of non-compliant wood packaging material where disposal is required:

- incineration
- deep burial in sites approved by appropriate authorities (NB: The depth of burial may depend on climatic conditions and the pest intercepted, but is recommended to be at least 1 metre. The material should be covered immediately after burial and should remain buried. Note, also, that deep burial is not a suitable disposal option for wood infested with termites.)
- processing (NB: Chipping should be used only if combined with further processing in a manner approved by the NPPO of the importing country for the elimination of pests of concern, e.g. the manufacture of oriented strand board.)
- other methods endorsed by the NPPO as effective for the pests of concern.

In order to minimize phytosanitary risks, secure disposal methods where required should be carried out with the least possible delay.

GUIDELINES FOR HEAT TREATMENT

This appendix is for reference purposes only and is not a prescriptive part of the standard. Guidelines for heat treatment will be added in the future when agreed by the CPM.

*Draft ISPM
For member consultation (regular process)
June 2008*

INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

CATEGORIZATION OF COMMODITIES ACCORDING TO THEIR PHYTOSANITARY RISK

(200-)

*[Work programme topic: Classification of commodities by level of processing and intended use and phytosanitary risk]
[Specification No. 18]*

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Flow chart illustrating categorization of commodities according to their phytosanitary risk

INTRODUCTION

SCOPE

This standard provides guidance for importing contracting parties on how to categorize commodities according to their phytosanitary risk when considering import requirements. This categorization could be useful in identifying whether further analysis is required or not.

The first stage of categorization is based on whether the commodity has been processed and, if so, the method and degree of processing to which the commodity has been subjected before export. A second stage of categorization of commodities is based on their intended use after import.

Contaminating pests or storage pests that may become associated with the commodity after processing are not considered in this standard.

REFERENCES

Glossary of phytosanitary terms, 2008. ISPM No. 5, FAO, Rome.

Guidelines for a phytosanitary import regulatory system, 2004. ISPM No. 20, FAO, Rome.

Guidelines for inspection, 2005. ISPM No. 23, FAO, Rome.

Guidelines for phytosanitary certificates, 2001. ISPM No. 12, FAO, Rome.

Guidelines for regulating wood packaging material in international trade, 2002. ISPM No. 15, FAO, Rome.

International Plant Protection Convention, 1997. FAO, Rome.

Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms, 2004. ISPM No. 11, FAO, Rome.

Pest risk analysis for regulated non-quarantine pests, 2004. ISPM No. 21, FAO, Rome.

Regulated non-quarantine pests: concept and application, 2002. ISPM No. 16, FAO, Rome.

DEFINITIONS

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

OUTLINE OF REQUIREMENTS

The concept of phytosanitary risk categorization of commodities combines the method and degree of processing to which a commodity has been subjected with the commodity's intended use and consequent potential of this pathway for the introduction of regulated pests.

This combination allows phytosanitary risks associated with specific commodities to be assigned to categories. The objective of such categories is to provide importing contracting parties with guidelines to better identify the need for a pathway-initiated pest risk analysis (PRA) and to facilitate the decision-making process regarding the possible establishment of import requirements.

This standard outlines four different phytosanitary risk categories (two for processed commodities, two for unprocessed commodities) and provides some examples of the methods of processing and the associated resultant commodities.

BACKGROUND

As a result of the method of processing to which they have been subjected, some commodities moving in international trade do not have the potential to introduce regulated pests and so should not be regulated (i.e. phytosanitary measures are not required). Other commodities, after processing, may still present a phytosanitary risk and so may be subject to appropriate phytosanitary measures.

Some intended uses of commodities (e.g. planting) have a much higher probability of introducing pests than others (e.g. processing) (see ISPM No. 11: *Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms*, 2004, section 2.2.1.5).

The concept of phytosanitary risk categorization of commodities considers the method and degree of processing to which a commodity has been subjected with its intended use and consequent potential as a pathway for introduction of regulated pests.

The objective of the categorization in this standard is to classify commodities according to their phytosanitary risk to provide importing contracting parties with guidelines to better identify the need for a pathway-initiated PRA and facilitate the decision-making process.

Article VI.1b of the IPPC states: “Contracting parties may require phytosanitary measures for quarantine pests and regulated non-quarantine pests, provided that such measures are ... limited to what is necessary to protect plant health and/or safeguard the intended use” This standard is based on the concepts of intended use of a commodity and the method and degree of its processing, which are also addressed in other ISPMs as outlined below.

Intended use:

- ISPM No. 11 (*Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms*, 2004), sections 2.2.1.5 and 2.2.3. When analysing the probabilities of transfer of pests to a suitable host and of their spread after establishment, one of the factors to be considered is the intended use of the commodity.
- ISPM No. 12 (*Guidelines for phytosanitary certificates*), section 2.1. Different phytosanitary requirements may apply to the different intended end uses as indicated on the phytosanitary certificate.
- ISPM No. 16 (*Regulated non-quarantine pests: concept and application*), section 4.2. Risk of economically unacceptable impact varies with different pests, commodities and intended use.
- ISPM No. 21 (*Pest risk analysis for regulated non-quarantine pests*), which uses extensively the concept of intended use.

Method and degree of processing:

- ISPM No. 12 (*Guidelines for phytosanitary certificates*), section 1.1, states: “Importing countries should **only** require phytosanitary certificates for regulated articles. ... Phytosanitary certificates may also be used for certain plant products that have been processed where such products, by their nature or that of their processing, have a potential for introducing regulated pests (e.g. wood, cotton). ... “Importing countries should not require phytosanitary certificates for plant products that have been processed in such a way that they have no potential for introducing regulated pests, or for other articles that do not require phytosanitary measures.”
- ISPM No. 15 (*Guidelines for regulating wood packaging material in international trade*), section 2, states: “Wood packaging made wholly of wood-based products such as plywood, particle board, oriented strand board or veneer that have been created using glue, heat and pressure, or a combination thereof, should be considered sufficiently processed to have eliminated the risk associated with the raw wood. It is unlikely to be infested by raw wood pests during its use and therefore should not be regulated for these pests.”
- ISPM No. 23 (*Guidelines for inspection*), section 2.3.2. Inspection can be used to verify the compliance with some phytosanitary requirements. Examples include degree of processing.

Intended use together with method and degree of processing:

- ISPM No. 20 (*Guidelines for a phytosanitary import regulatory system*), section 5.1.4, indicates that PRA may be done on a specific pest or on all the pests associated with a particular pathway (e.g. a commodity). A commodity may be classified by its degree of processing and/or its intended use.
- ISPM No. 23 (*Guidelines for inspection*), section 1.5. One of the factors to decide the use of inspection as a phytosanitary measure is the commodity type and intended use.

REQUIREMENTS

The use of the phytosanitary risk categories by National Plant Protection Organizations (NPPOs) in determining any phytosanitary regulations should take into account, in particular, the principles of technical justification, pest risk analysis, risk management, minimal impact, harmonization and sovereignty.

When the import requirements for a commodity need to be determined, the importing country may categorize it according to its risk level. Such categorization may be used to identify groups of commodities for which further analysis is required. In order to categorize the commodity, the following should be considered:

- method and degree of processing
- intended use of the commodity.

Commodities can be:

- processed: those in which the nature of the material is transformed in differing ways and degrees
- non-processed: those in which the nature of the material is not transformed.

This standard does not consider cases of deviation from intended use.

1. Elements of Categorization of Commodities according to their Phytosanitary Risk

To identify a commodity's phytosanitary risk category, the method and degree of processing to which a commodity has been subjected should be considered before its intended use. The method and degree of processing, by itself, could significantly change the nature of the commodity, rendering it unable to harbour pests. Such a commodity should not be deemed to require phytosanitary measures.

However, if, after processing, a commodity may still present a risk of harbouring or spreading regulated pests, the intended use should then be considered.

The presence of contaminating pests, as defined in ISPM No. 5 (*Glossary of phytosanitary terms*), or infestation by other pests that may become associated with the commodity after processing (e.g. storage pests) is not considered in the phytosanitary risk categorization process outlined in this standard. However, it is important to note that the methods of processing described in this standard will, in most cases, render the commodity free of pests at the time of processing, but that some such commodities may have the capacity to become subsequently contaminated, infested or reinfested. Common contaminating pests may be detected during inspection.

1.1 Method and degree of processing before export

The primary objective of processing is to modify a commodity for other than phytosanitary purposes, but processing may also have an effect on any associated regulated pest, and hence affect the potential of the commodity to harbour pests.

It is necessary to know the type of processing undertaken in order to categorize the commodity. In some cases it is also necessary to know the degree of processing (e.g. temperature and heating duration) in addition to the type of processing used.

The NPPOs of the importing countries may request information about the method and degree of processing and its verification, if appropriate (e.g. when the degree of processing is not evident).

Based on the method and degree of processing, commodities can be broadly divided into three types as follows:

- processed to the point where the commodity does not remain capable of harbouring or spreading pests
- processed to a point where the commodity remains capable of harbouring or spreading regulated pests
- not processed.

If an assessment of the method and degree of processing concludes that a commodity does not have the capacity to harbour regulated pests, there is no need to consider intended use and the commodity should not be regulated. However, if an assessment of the method and degree of processing concludes that a commodity retains the capacity to harbour or spread regulated pests, the intended use should then be considered.

For non-processed commodities the intended use should always be considered.

1.2 Intended use after import

Intended use is defined as the declared purpose for which plants and plant products or other regulated articles are imported, produced or used (ISPM No. 5: *Glossary of phytosanitary terms*). The intended use of a commodity may be for:

- planting
- consumption and other uses without further transformation, including decorative and functional uses
- processing.

The intended use may affect a commodity's potential to introduce or spread regulated pests, and hence the phytosanitary risks associated with the commodity. Some intended uses of the commodity (e.g. planting) are associated with a higher probability of introducing regulated pests than others (e.g. processing). This may result in the application

of different phytosanitary measures for a commodity based on its intended use (e.g. soybean seed for sowing and soybean grain for human consumption). Any phytosanitary measures applied should be consistent with the phytosanitary risk presented.

2. Phytosanitary Risk Categories and Measures

Taking into account the method and degree of processing to which a commodity has been subjected, its intended use and its subsequent potential for harbouring or spreading regulated pests allows phytosanitary risk categories to be assigned.

Each phytosanitary risk category is described below, along with guidance on the need for phytosanitary measures.

Category 1. Commodities have been processed to the point where they have no capacity to harbour or spread regulated pests. Hence, no further analysis should be necessary and phytosanitary measures should not be applicable. Annex 1 provides examples of processes and the resultant commodities that can meet the criteria for category 1.

Category 2. Commodities have been processed but may still harbour some regulated pests. The intended use may be, for example, consumption or further processing. The NPPO of the importing contracting party may determine that a PRA is necessary. Annex 2 provides examples of processes and the resultant commodities that can meet the criteria for category 2.

Although commodities in category 2 have been processed, the processing method may not eliminate all regulated pests of concern. If it is determined that the method and degree of processing do not eliminate regulated pests, consideration should then be given to the intended use of the commodity in order to evaluate the probability of establishment and spread of the pests. In this case, a PRA may be needed to determine this.

To facilitate the categorization, exporting contracting parties should, on request, provide detailed information on method or degree of processing (e.g. temperature of cooking, duration of boiling or size of chopping). Such information should assist importing contracting parties in judging the category of individual commodity appropriately.

In cases where the evaluation of the method and degree of processing has determined that the processed commodity presents no phytosanitary risk and therefore should not be subject to phytosanitary measures, the commodity should be reclassified into category 1.

Category 3. Commodities have not been processed and the intended use is, for example, consumption or processing. PRA should be carried out.

Examples of commodities in this category include fresh fruits and vegetables for consumption and cut flowers.

Because commodities in categories 2 and 3 have the potential to harbour or spread regulated pests, determining phytosanitary measures may be required based on the result of PRA. The phytosanitary measures determined through the PRA may differ depending on the intended use of the commodity (e.g. consumption or processing). This assessment may also include the risk of change of the intended use.

Category 4. Commodities have not been processed and the intended use is planting. PRA should be carried out.

Examples of commodities in this category include propagative material (e.g. cuttings, seeds, seed potatoes and other plants to be planted).

Because commodities in phytosanitary risk category 4 are not processed and their intended use is for propagation or planting, their potential to introduce or spread regulated pests is higher than that for other intended uses. Therefore a PRA is always needed to establish phytosanitary measures. For this category, some specific phytosanitary measures often already exist.

The analytical process outlined in this ISPM is illustrated in the flow chart of Appendix 1.

ANNEX 1

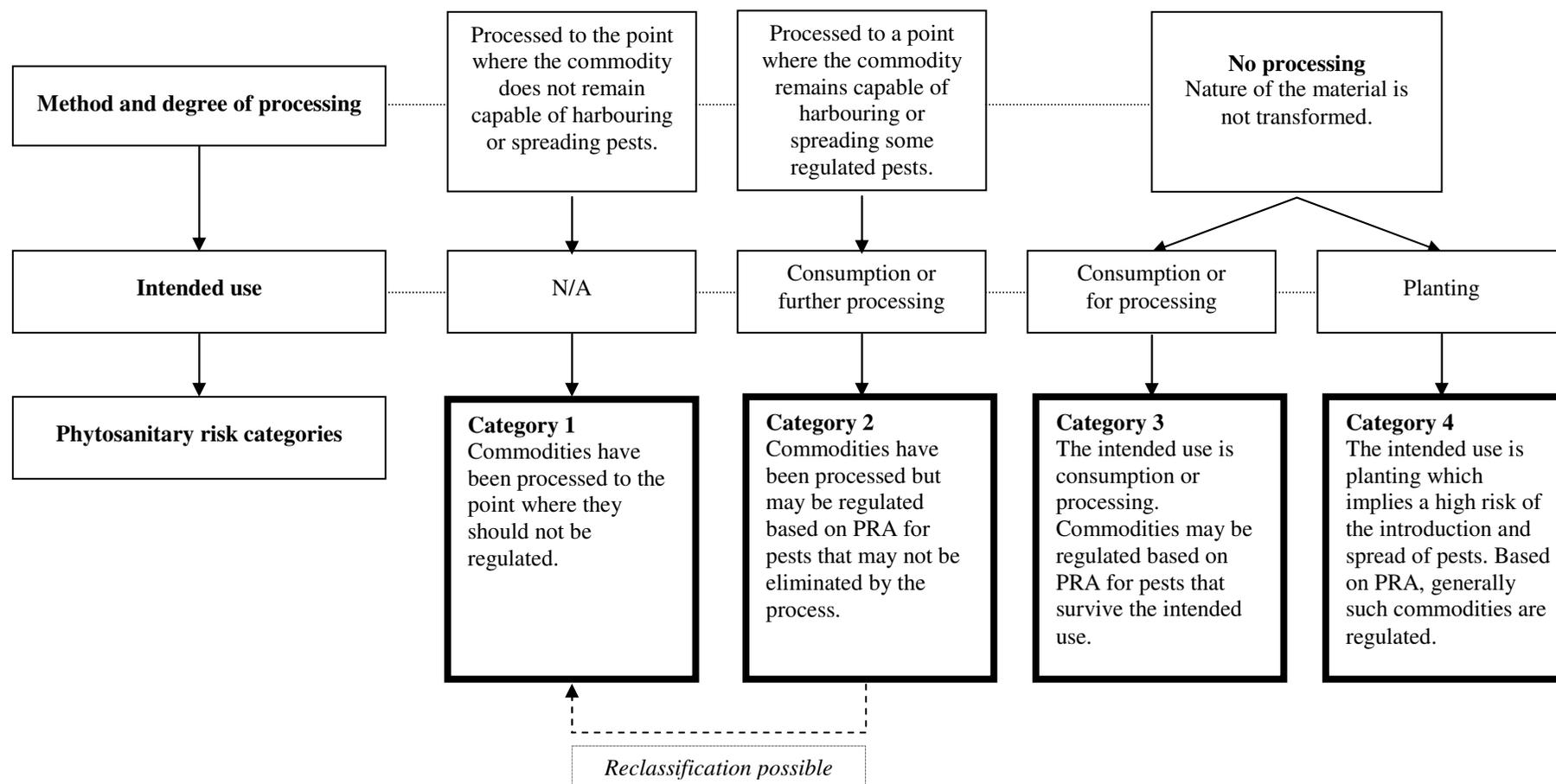
**EXAMPLES OF METHODS OF PROCESSING WITH RESULTANT COMMODITIES
THAT DO NOT REMAIN CAPABLE OF HARBOURING OR SPREADING PESTS**

PROCESS	DESCRIPTION	EXAMPLE OF RESULTANT COMMODITY	OBSERVATIONS
Carbonization	Action to reduce an organic body to charcoal	Charcoal	
Extraction	Physical or chemical process to obtain specific components and refined products, usually through mass-transfer operations	Oils, alcohol, essences	Normally done under high temperature conditions
Fermentation	A process by which food/plant material goes through a chemical change caused by enzymes produced from micro-organisms (bacteria, moulds or yeasts), usually rendering desirable end foods products	Wines, liquors, beer and other alcoholic beverages, fermented vegetables	May be combined with pasteurization
Freezing	Action of keeping fruits and vegetables at temperatures below freezing to preserve quality	Frozen fruits and vegetables	Product should be kept at a temperature as low as possible (–18°C for cold storage; –12°C for display). <i>Code of hygienic practice for refrigerated packaged foods with extended shelf-life</i> , 1999. CAC/RCP 46, Codex Alimentarius, FAO, Rome.
Malting	Action of allowing the germination of cereal seeds in order to develop its enzymatic activity to digest starchy materials into sugars to favour yeast fermentation and improve the palatability of fermented beverages	Malted barley	
Pasteurization	Thermal processing of foods in order to kill undesirable or harmful micro-organisms	Pasteurized juices, alcoholic beverages (beer, wine)	Combined with fermentation, refrigeration (at 4°C) and proper packaging and handling. Process time and temperature depends on type of product.
Preservation in liquid	The process of preparing foods in a suitable liquid medium (e.g. in syrup, brine, oil, vinegar or alcohol) to allow them to be kept for long periods of time without spoiling or deteriorating	Preserved fruits, vegetables, tubers, bulbs	Proper conditions of pH, salinity etc. must be kept
Roasting	To dry and brown by exposure to dry heat	Roasted peanuts, coffee and nuts	High temperature and long times of exposure destroy microbial populations
Sterilization	Complete destruction of pests and micro-organisms by the application of heat (vapours, dry heat and boiling water), irradiation or chemical treatments	Sterilized substrates, juices	Sterilization may not change the nature of the commodity in an evident way, but eliminates pests
Commercial sterilization	Thermal processing of foods that leads to shelf-stable products in containers by destruction of all pathogenic, toxin-forming and spoilage organisms	Canned vegetables, soups; UHT (ultra-high temperature) juices	Most commercially sterilized foods have a shelf life of 2 years. Process time and temperature for canned products depends on type of product, treatment and geometry of container. Aseptic processing and packaging involves commercial sterilization of a flowing product and then packaging in sterile environment and package.
Sugar infusing	Action of coating and infusing fruits with sugar	Crystallized fruit, fruit infused with sugar	Usually combined with pulping, boiling, drying
Tenderizing	A process to increase the moistness of dried or dehydrated items by the application of steam under pressure or submerging in hot water	Tenderized fruits	Usually applied to a dried commodity

**EXAMPLES OF METHODS OF PROCESSING WITH RESULTANT COMMODITIES
THAT DO REMAIN CAPABLE OF HARBOURING OR SPREADING PESTS**

PROCESS	DESCRIPTION	EXAMPLE OF RESULTANT COMMODITY	OBSERVATIONS
Chipping (of wood)	Wood reduced to small pieces	Chipped wood	
Chopping	To cut into pieces	Chopped fruit, nuts, grains, vegetables	
Cooking (enough boiling, heating, microwaving, including rice parboiling)	Transforming raw material and making suitable for consumption by adequate heating	Properly cooked items	Frequently involves chemically transforming a food, thus changing its flavour, texture, appearance, or nutritional properties
Crushing	Breaking plant material into pieces by application of mechanical force	Herbs, nuts	Usually applied to dried products
Drying/ dehydration	Removal of moisture by natural (e.g. sun) or artificial means, usually for preservation but also to decrease weight and bulk	Dehydrated fruit, sun dried tomatoes	If the product has low water activity, micro-organisms will not spoil it
Painting (including lacquering, varnishing)	To coat with paint	Wood and canes, fibres	
Peeling and shelling	Removal of the outer or epidermal tissues or pods	Peeled fruits, grains, nuts	
Polishing (of grain)	To make smooth and shiny by rubbing or chemical action removing the outer layers from grains	Polished rice	
Post-harvest handling	Operations such as grading, sorting, washing or brushing, and/or waxing fruits and vegetables	Graded, washed, or brushed fruit and vegetables	Usually carried out in packing houses
Pureeing (including blending)	Making homogenized and spreadable fruit and/or vegetable tissues, e.g. by high-speed mixing, screening through a sieve or using a blender	Pureed items	Normally combined with pulping fruits or vegetables

FLOW CHART ILLUSTRATING CATEGORIZATION OF COMMODITIES ACCORDING TO THEIR PHYTOSANITARY RISK



*Draft ISPM
For member consultation (regular process)
June 2008*

INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

PEST FREE POTATO MICROPROPAGATIVE MATERIAL AND MINITUBERS FOR INTERNATIONAL TRADE

(200-)

*[Work programme topic: Export certification for potato minitubers and micropropagative material]
[Specification No. 21]*

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Pests that are not consistently excluded by conventional micropropagation techniques and that are commonly tested for

APPENDIX 2

Pests commonly required to be excluded from potato minituber production

INTRODUCTION

SCOPE

This standard provides guidance on the production, maintenance and certification of pest free potato (*Solanum* spp.) micropropagative material and minitubers intended to be moved in international trade.

This standard does not apply to movement of field-grown seed potatoes or to potatoes intended for consumption or processing.

REFERENCES

Guidelines on lists of regulated pests, 2003. ISPM No. 19, FAO, Rome.

Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms, 2004. ISPM No. 11, FAO, Rome.

Pest risk analysis for regulated non-quarantine pests, 2004. ISPM No. 21, FAO, Rome.

Requirements for the establishment of pest free places of production and pest free production sites, 1999. ISPM No. 10, FAO, Rome.

The use of integrated measures in a systems approach for pest risk management, 2002. ISPM No. 14, FAO, Rome.

DEFINITIONS

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

For the purpose of member consultation, this section also contains terms or definitions that are new in the present draft standard. Once this standard has been adopted, these new terms and definitions will be transferred into ISPM No. 5, and will not appear in the standard itself.

potato micropropagative material	Plants <i>in vitro</i> of tuber-forming <i>Solanum</i> spp. (includes microtubers)
microtuber	A tuber produced <i>in vitro</i> from plants <i>in vitro</i> of tuber-forming <i>Solanum</i> spp.
minituber	A tuber produced in a protected environment from potato micropropagative material
seed potatoes	Tubers (including minitubers) and potato micropropagative material of cultivated tuber-forming <i>Solanum</i> spp. for planting

OUTLINE OF REQUIREMENTS

Facilities used for the production of potato micropropagative material should be officially authorized or operated directly by a National Plant Protection Organization (NPPO). The NPPO of the exporting country is responsible for the operation or supervision of these facilities. Pest risk analysis (PRA), carried out by the importing country, should form the basis for specific phytosanitary measures for specified and regulated pests in trade of potato micropropagative material and minitubers.

The primary phytosanitary measures for managing risks related to potato micropropagative material include testing for the pests specified and regulated by the importing country, and management systems for the maintenance and propagation of potato micropropagative material derived from pest free candidate plants in a closed, sterile environment. For the production of minitubers, measures include origin from pest free potato micropropagative material and production in a pest free production site.

Facilities for the establishment of pest free potato micropropagative material and testing for pest freedom are subject to strict requirements to prevent cross-contamination or infection of material. Facilities for maintenance and propagation of pest free potato micropropagative material are also subject to stringent requirements to maintain phytosanitary security. Staff should be trained and competent in techniques for the establishment of pest free plants *in vitro*, the maintenance of pest free potato micropropagative material, the production of pest free minitubers, diagnostic testing as required, and in following administrative, management and record-keeping procedures. The management system, and the policies and objectives of each facility and the testing laboratory, should be defined in a management systems manual. Throughout all production and testing, the identity of all propagative material should be preserved, and traceability should be maintained through adequate documentation.

All facilities should be officially audited at least once every 12 months. In addition, potato micropropagation facilities should be officially examined to ensure that each lot of micropropagative material is free from the specified and regulated pests and, if appropriate, complies with the requirements of the seed potato certification scheme of the exporting country. Pest free potato micropropagative material and minitubers moving in international trade may be required to be accompanied by a phytosanitary certificate. The use of seed certification labels would assist with lot identification.

BACKGROUND

Many pests have been reported to be associated with cultivated potato (*Solanum tuberosum* and related tuber-forming species) worldwide. Because potatoes are propagated mainly by vegetative means, there is considerable risk of spreading pests by international trade of seed potatoes. However, potato micropropagative material produced using certain techniques and under certain criteria that employ appropriate phytosanitary measures (usually within a seed potato certification scheme) may be considered free from all pests specified (e.g. within the parameters of a certification scheme). Trade of such material reduces the risk of regulated pest introduction and spread. Potato micropropagative material can be multiplied under specified protected conditions to produce minitubers. Provided that minituber production is carried out under pest free conditions, minitubers can also be traded with minimum risk.

REQUIREMENTS

1. Responsibilities

Only facilities officially authorized or operated directly by a National Plant Protection Organization (NPPO) should be recognized for the production of potato micropropagative material as described in this standard. The NPPO of the exporting country is responsible for auditing the phytosanitary aspects of these facilities and for the phytosanitary aspects of any related seed potato certification scheme. The NPPO of the importing country is responsible for pest risk analysis (PRA) and should, on request, have access to documentation and facilities to enable it to verify that the level of phytosanitary security in the exporting country meets its requirements.

2. Pest Risk Analysis

PRA is the basis for requiring specific phytosanitary measures for specified pests in trade of potato micropropagative material and minitubers. PRA should be carried out by the importing country in accordance with ISPM No. 11 (*Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms*, 2004) for the pathways of “potato micropropagative material” and “minitubers” from given origins. The PRA may identify pathway-specific quarantine pests. The PRA should also be carried out in accordance with ISPM No. 21 (*Pest risk analysis for regulated non-quarantine pests*) as appropriate in order to identify regulated non-quarantine pests that may be specified, for example, in a seed potato certification scheme of the importing country.

2.1 Pathway-specific lists of potato pests

The NPPO of the importing country should, on the basis of the above-mentioned PRAs, specify through regulated pest lists the pests that are regulated for potato micropropagative material and minitubers respectively. Guidance on regulated pest lists is provided in ISPM No. 19: *Guidelines on lists of regulated pests*.

2.2 Risk management options

The risk management measures are determined based on the PRA. It may be appropriate for the measures to be integrated into a systems approach (as described in ISPM No. 14: *The use of integrated measures in a systems approach for pest risk management*).

2.2.1 Potato micropropagative material

The primary phytosanitary measures for managing risks related to potato micropropagative material include:

- testing individual candidate plants for the pests specified and regulated by the importing country
- management systems for the maintenance and propagation of pest free potato micropropagative material in a closed, sterile environment.

2.2.2 Minitubers

The primary phytosanitary measures for managing risks related specifically to minituber production should take into account any pest risk assessment information related to the area of production and include:

- origin from pest free potato micropropagative material as part of a seed potato certification scheme, if appropriate
- production in pest free growing medium under a protected environment operated as a pest free production site free from the pests (and their vectors) specified and regulated by the importing country for minitubers.

3. Production of Pest Free Potato Micropropagative Material

3.1 Establishment of pest free potato micropropagative material

Candidate plants, from which the pest free plants *in vitro* are derived, should be grown through a complete vegetative cycle, inspected and found free from pests¹. As well as the laboratory testing procedure for specified pests described below, potato plants *in vitro* should be inspected and found practically free from all other pests and from general microbial contamination.

¹ Where candidate material is determined to be infested with certain types of pest, it may be feasible, at the discretion of the NPPO, for officially recognized techniques (e.g. meristem tip culture and thermotherapy) to be used in combination with conventional micropropagation to remove or eliminate the pest from the candidate material, and prior to the initiation of the *in vitro* multiplication programme. In such cases, laboratory testing must be used to confirm the success of this approach before multiplication commences.

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For member consultation - June 2008

3.1.1 Testing

A testing programme should be applied in an officially operated or authorized testing laboratory. This laboratory should meet recommended conditions (described in Annex 1) to ensure that all material moved into the facility and held as individual potato micropropagative material is free from the pests specified and regulated by the importing country and, if appropriate, from the pests specified in the seed potato certification scheme of the exporting country. The pests concerned are those that are not consistently excluded by conventional micropropagation, for example, viruses, viroids, phytoplasmas and some bacteria. A list of examples of the most common pests of concern to potato micropropagative material is provided in Appendix 1.

3.1.2 Secure phytosanitary environment

A facility used to establish pest free plants *in vitro* from new candidate material should be authorized by the NPPO specifically for this purpose. The facility should provide a secure phytosanitary environment for establishing individual plants *in vitro* from previously untested candidate plants and for holding these plants while awaiting required test results. Because both infected and pest free potato propagative material (tubers, plants *in vitro* etc.) may be handled in the same facility, strict procedures should be implemented to prevent cross-contamination or infection of pest free material. Such procedures should include:

- control of the entry of staff and provision for the use of protective clothing, disinfection of footwear and hand washing on entry (with particular care being taken if staff members work in areas of higher phytosanitary risk, e.g. the testing facility)
- chronological records of actions in handling material so that production can, if necessary, be checked easily for cross-contamination and infection if pests are detected
- stringent aseptic techniques, including sterilization of instruments by autoclaving or by using a glass-bead sterilizer² between materials of a different pest status
- disinfection of work areas between handling material of a different pest status.

3.2 Maintenance and propagation of pest free potato micropropagative material

A facility that maintains and propagates pest free micropropagative material should be operated as a pest free production site (as described in ISPM No 10: *Requirements for the establishment of pest free places of production and pest free production sites* for general requirements) with respect to the pests of potato specified and regulated by the importing country for potato micropropagative material. The facility should:

- maintain and propagate only officially certified pest free potato micropropagative material and permit only pest free material to enter the facility
- grow other plant species only if this is officially permitted and if:
 - the phytosanitary risks for potato propagative material have been assessed and if identified, the plants have been tested and found to be pest free before entering the facility
 - adequate precautions are taken to separate them in space or time from the potato plants
- operate separately from the facilities that establish plants *in vitro* and conduct the testing for pests
- implement officially approved operational procedures to prevent entry of pests
- control the entry of staff and provide for the use of protective clothing, disinfection of footwear and hand washing on entry (with particular care being taken if staff members work in areas of higher phytosanitary risk, e.g. the testing facility)
- use aseptic procedures
- implement and keep documentary records of regular management system checks by the manager or designated, responsible staff member to ensure that phytosanitary security is maintained.

3.3 Combined establishment and maintenance facilities

Establishment facilities may also maintain pest free plants *in vitro* provided that strict procedures are adopted to prevent cross-infection of maintained pest free plants *in vitro* from material of a lower plant health status.

These strict procedures include:

- the use of separate laminar flow cabinets and instruments for the maintained material and for material of a lower plant health status
- scheduled audit tests on the material maintained.

Pest free plants *in vitro* established and maintained in these facilities may be propagated further to produce minitubers, or may be internationally traded as such with appropriate documentation (further described in section 6).

Additional requirements for micropropagation facilities are provided in Annex 2 and may be required depending on the pests present in the area and the results of PRA.

² Flame sterilization using methanol/ethanol may not always be effective.

4. Production of Pest Free Minitubers

The following guidance for minituber production also applies to parts of minitubers, such as sprouts.

A minituber production facility should be operated as a pest free production site (as described in ISPM No. 10: *Requirements for the establishment of pest free places of production and pest free production sites* for general requirements) with respect to pests specified for minitubers and regulated by the importing country and, if appropriate, the pests specified in the seed potato certification scheme of the exporting country. The pests commonly specified include those for micropropagative material (i.e. viruses, viroids, phytoplasmas and bacteria, listed in Appendix 1) and also fungi, nematodes, arthropods etc. (Appendix 2).

The only potato germplasm allowed to enter the facility should be pest free potato micropropagative material. Plants of other plant species may be permitted to be grown in the facility provided that:

- the phytosanitary risks for minitubers have been assessed and if identified, the plants have been tested and found to be pest free before entering the facility
- adequate precautions are taken to separate them in space or time from the potato plants.

A systems approach (as described in ISPM No. 14: *The use of integrated measures in a systems approach for pest risk management*) may be required to reduce the risk of introduction of the specified and regulated pests. Production should be in a protected environment and additional precautions, depending on conditions in the area of production, may include:

- location of the facility in a pest free area, or an area that is free from or well isolated from sources of the specified pests
- a buffer zone around the facility for specified pests
- location of the facility in an area with low pest and pest vector pressure
- production timed to take place at a time of year when there is low pest and pest vector pressure.

However, if the facility includes adequate physical and operational safeguards against the introduction of the specified and regulated pests, these additional measures may not be required.

The pest free production site should be a growth room, glasshouse or (if appropriate, based on local pest status) a screen house, constructed and maintained to prevent the entry of pests. The entry of staff to the facility should be controlled and provision should be made for use of protective clothing, disinfection of footwear and hand washing on entry. It should also be possible to decontaminate the facility if required. The growing medium, water supply and fertilizer used in the facility should be pest free.

The facility should be monitored for the specified and regulated pests and pest vectors during the production cycle and, if necessary, pest control measures or other corrective actions should be undertaken and documented. The facility should be cleaned after each production run.

The minitubers should be handled, stored, packed and transported under conditions preventing infestation by the specified and regulated pests.

Additional requirements for minituber production are provided in Annex 3.

5. Staff Competence

Staff should be trained and competent in:

- techniques for the establishment of pest free plants *in vitro*, the maintenance of pest free potato micropropagative material, the production of pest free minitubers, and diagnostic testing as relevant
- following administrative, management and record-keeping procedures.

Records of staff training and competencies should be maintained as determined by the NPPO.

6. Documentation

The phytosanitary management system, and the policies and objectives of each facility and the testing laboratory, should be defined in a management systems manual. In developing such a manual, procedures should be produced and described for:

- the establishment, maintenance and propagation of pest free plants *in vitro* with particular attention paid to those control measures used to prevent cross-infection between the pest free potato micropropagative material and any material of a lower phytosanitary status
- the production of pest free minitubers, covering management, technical and operational procedures, with particular attention paid to those control measures used to prevent pest infection, infestation and contamination of the minitubers during their production, harvest and storage, and during transport to their destination
- all laboratory test procedures.

Throughout all production and testing, the identity of all propagative material should be preserved and traceability should be maintained by adequate documentation. Records of all tests done on the material, as well as the results and lineage, should be kept in a manner that ensures traceability for the importing country for at least five years. For potato micropropagative material, the records that determine its pest free status should be maintained for as long as the micropropagative material is maintained.

7. Auditing

All facilities and operational systems should be officially audited by the NPPO of the exporting country at least once every 12 months to ensure compliance with the procedures and maintenance of the pest free status of the plants.

In some circumstances the importing country may request to participate in such an audit.

8. Official Verification of Pest Freedom

The potato micropropagation facility should be officially examined to ensure compliance with the procedures and that each lot of micropropagative material meets the importing country requirements for freedom from the specified and regulated pests. In addition, if appropriate, compliance with the phytosanitary requirements of the seed potato certification scheme of the exporting country may also have to be officially verified.

The potato minituber production facility, relevant records, the growing crop, and each lot of minitubers should be officially inspected to ensure that the lot is free from the specified pests. In addition, if appropriate, compliance with the phytosanitary requirements of the seed potato certification scheme of the exporting country may also have to be officially verified.

9. Certification

Pest free potato micropropagative material and minitubers moving in international trade may be required to be accompanied by a phytosanitary certificate issued by the NPPO of the exporting country that complies with the requirements of the importing country. The use of existing seed certification labels would assist with lot identification, in particular when these labels specify the reference number of the lot, including where appropriate the producer's identification number. It is recommended that such reference numbers also appear on any phytosanitary certificates issued.

CRITERIA FOR OFFICIAL TESTING LABORATORIES

The requirements for official testing laboratories operated or authorized by NPPOs include the following:

- competent staff with knowledge and experience of conducting appropriate microbiological, serological, molecular and bioassay tests, and interpreting the results
- adequate and appropriate equipment to conduct microbiological, serological, molecular and bioassay tests
- relevant validation data for the tests conducted
- procedures to prevent cross-contamination of samples
- isolation from production facilities
- a management systems manual that describes policy, organizational structure, work instructions, and testing standards and any quality management procedures.

ANNEX 2

REQUIREMENTS FOR MICROPROPAGATION FACILITIES

The requirements for micropropagation facilities include, as appropriate, depending on the presence of pests in the area and the results of PRA, the following conditions for the physical structure, equipment and operating procedures:

- a double door entry with an air-curtain and with a changing area between the double doors
- a wash room, media room, subculture room and growth room
- high-efficiency particulate air (HEPA)-filtered positive air pressure systems for media, subculture and growth rooms
- growth rooms with appropriate light, temperature and humidity control
- subculture room fitted with ultraviolet (UV) germicidal lamps
- laminar flow cabinets for subculturing, which are serviced regularly
- laminar flow cabinets fitted with UV germicidal lamps
- a programme for periodic disinfection/fumigation of the facility
- use by staff of disposable/dedicated footwear or disinfection of footwear before entry
- appropriate hygienic practices for handling plant material (e.g. cutting *in vitro* plantlets with a sterile scalpel over a sterile disposable surface)
- a monitoring programme to check the level of air-borne contaminants in the subculture room and growth room
- an inspection and disposal procedure for contaminated potato micropropagative material.

The presence and effectiveness of these attributes should be verified during the audits described in section 7 of the main text of this standard.

REQUIREMENTS FOR MINITUBER PRODUCTION FACILITIES

The requirements for minituber production facilities may include, as appropriate, depending on the presence of pests in the area and the results of PRA, the following:

Physical structure

- double door entry with a change area for changing garments and donning protective overcoats and gloves, the change area to be provided with foot disinfecting pads and a washing facility for washing and disinfecting hands
- entry doors and all vents and openings covered with insect-proof screen with mesh appropriate to the local pests and pest vectors
- gaps between the external to internal environment to be sealed
- production isolated from soil (e.g. concrete floors or floors covered with a protective membrane)
- designated areas for washing and disinfection of containers, cleaning, grading, packing and storing of minitubers
- air filtration system

Environment controls

- appropriate temperature, light and humidity controls
- misting for acclimatization of transplants

Crop management

- regular pest and pest vector monitoring at specified intervals by use of appropriate methods (e.g. sticky insect traps)
- appropriate hygienic practices for handling plant material
- appropriate disposal procedures
- identification of production lots
- a suitable separation between lots

Growing media, fertilizer, water

- use of soil-less growing medium
- fumigation/disinfestations/steam sterilization of the growing medium before planting
- transport and storage of growing medium under conditions preventing contamination
- use of deep-well spring water or appropriately treated public water supply
- appropriate treatment of water to eliminate pests where necessary
- use of inorganic fertilizer
- appropriate treatment of organic fertilizer to eliminate pests

Post-harvest handling

- appropriate sampling of minitubers for post-harvest tuber testing for indicator pests (i.e. pests whose presence indicates that the pest free status of the protected environment has not been maintained)
- appropriate storage conditions
- grading and packing (if appropriate, according to a seed potato certification scheme)
- new containers used for packing minitubers
- containers for shipment adequate for preventing contamination by pests and pest vectors
- cleaning and disinfection of handling equipment and storage facilities.

The presence and effectiveness of these attributes should be verified during the audits described in section 7 of the main text of this standard.

APPENDIX 1

PESTS THAT ARE NOT CONSISTENTLY EXCLUDED BY CONVENTIONAL MICROPROPAGATION TECHNIQUES AND THAT ARE COMMONLY TESTED FOR

VIRUSES	ABBREVIATION	GENUS
<i>Alfalfa mosaic virus</i>	AMV	<i>Alfamovirus</i>
<i>Andean potato latent virus</i>	APLV	<i>Tymovirus</i>
<i>Andean potato mottle virus</i>	APMoV	<i>Comovirus</i>
<i>Arracacha virus B-oca strain</i>	AVB-O	<i>Nepovirus</i>
<i>Beet curly top virus</i>	BCTV	<i>Curtovirus</i>
<i>Belladonna mottle virus</i>	BeMV	<i>Tymovirus</i>
<i>Cucumber mosaic virus</i>	CMV	<i>Cucumovirus</i>
<i>Eggplant mottled dwarf virus</i>	EMDV	<i>Nucleorhabdovirus</i>
<i>Impatiens necrotic spot virus</i>	INSV	<i>Tospovirus</i>
<i>Potato aucuba mosaic virus</i>	PAMV	<i>Potexvirus</i>
<i>Potato black ring spot virus</i>	PBRV	<i>Nepovirus</i>
<i>Potato latent virus</i>	PotLV	<i>Carlavirus</i>
<i>Potato leaf roll virus</i>	PLRV	<i>Polerovirus</i>
<i>Potato mop-top virus</i>	PMTV	<i>Pomovirus</i>
<i>Potato rough dwarf virus</i>	PRDV	<i>Carlavirus</i>
<i>Potato virus A</i>	PVA	<i>Potyvirus</i>
<i>Potato virus M</i>	PVM	<i>Carlavirus</i>
<i>Potato virus P</i>	PVP	<i>Carlavirus</i>
<i>Potato virus S</i>	PVS	<i>Carlavirus</i>
<i>Potato virus T</i>	PVT	<i>Trichovirus</i>
<i>Potato virus U</i>	PVU	<i>Nepovirus</i>
<i>Potato virus V</i>	PVV	<i>Potyvirus</i>
<i>Potato virus X</i>	PVX	<i>Potexvirus</i>
<i>Potato virus Y (all strains)</i>	PVY	<i>Potyvirus</i>
<i>Potato yellow dwarf virus</i>	PYDV	<i>Nucleorhabdovirus</i>
<i>Potato yellow mosaic virus</i>	PYMV	<i>Begomovirus</i>
<i>Potato yellow vein virus</i>	PYVV	<i>Crinivirus</i>
<i>Potato yellowing virus</i>	PYV	<i>Alfamovirus</i>
<i>Solanum apical leaf curling virus</i>	SALCV	<i>Begomovirus</i>
<i>Sowbane mosaic virus</i>	SoMV	<i>Sobemovirus</i>
<i>Tobacco mosaic virus</i>	TMV	<i>Tobamovirus</i>
<i>Tobacco necrosis virus</i>	TNV	<i>Necrovirus</i>
<i>Tobacco rattle virus</i>	TRV	<i>Tobravirus</i>
<i>Tobacco streak virus</i>	TSV	<i>Ilarvirus</i>
<i>Tomato black ring virus</i>	TBRV	<i>Nepovirus</i>
<i>Tomato chlorotic spot virus</i>	TCSV	<i>Tospovirus</i>
<i>Tomato leaf curl New Delhi virus</i>	ToLCNDV	<i>Begomovirus</i>
<i>Tomato mottle Taino virus</i>	ToMoTV	<i>Begomovirus</i>
<i>Tomato mosaic virus</i>	ToMV	<i>Tobamovirus</i>
<i>Tomato spotted wilt virus</i>	TSWV	<i>Tospovirus</i>
<i>Tomato yellow leaf curl virus</i>	TYLCV	<i>Begomovirus</i>
<i>Tomato yellow mosaic virus</i>	ToYMV	<i>Begomovirus</i>
<i>Tomato yellow vein streak virus</i>	ToYVSV	<i>Geminivirus</i>
<i>Wild potato mosaic virus</i>	WPMV	<i>Potyvirus</i>

VIROIDS	ABBREVIATION	GENUS
<i>Mexican papita viroid</i>	MPVd	<i>Pospiviroid</i>
<i>Potato spindle tuber viroid</i>	PSTVd	<i>Pospiviroid</i>
<i>Potato deforming mosaic (Argentina)</i>		
Saq'O		
BACTERIA		
<i>Clavibacter michiganensis</i> subsp. <i>sepedonicus</i>		
<i>Erwinia</i> species <i>E. carotovora</i> <i>E. atroseptica</i> <i>E. chrysanthemi</i>		
<i>Ralstonia solanacearum</i>		
PHYTOPLASMAS		
e.g. purple top, stolbur		

APPENDIX 2

**PESTS COMMONLY REQUIRED TO BE EXCLUDED FROM POTATO
MINITUBER PRODUCTION**

In addition to pests listed in Appendix 1, many pests are commonly required to be excluded from certified minituber potato production either as quarantine pests or as regulated non-quarantine pests according to the pest status in the country concerned. Some examples are:

Bacteria

- *Streptomyces scabies*

Fungi

- *Angiosorus (Thecaphora) solani*
- *Fusarium solani*
- *Phytophthora infestans*
- *Polyscytalum pustulans*
- *Rhizoctonia solani*
- *Synchytrium endobioticum*
- *Verticillium dahliae* and *V. alboatrum*

Insects

- *Phthorimaea operculella*
- *Premnotrypes* spp.
- *Tecia solanivora*

Nematodes

- *Ditylenchus destructor*
- *Globodera pallida*
- *G. rostochiensis*
- *Meloidogyne* spp.

Protozoa

- *Spongospora subterranean*

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INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

STRUCTURE AND OPERATION OF POST-ENTRY QUARANTINE FACILITIES

(200-)

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

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3.4.1 Type of facility and use, PEQ4

3.4.2 Physical requirements, PEQ4

3.4.3 Operational requirements, PEQ4

ANNEX 1

Methods for assignment of PEQ containment levels

APPENDIX 1

Summary of major requirements for PEQ facilities by containment level

INTRODUCTION

SCOPE

This standard describes general guidelines for the design and operation of post-entry quarantine (PEQ) facilities for holding consignments of plants in containment. Four containment levels are specified.

REFERENCES

Glossary of phytosanitary terms, 2008. 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.

DEFINITIONS

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

OUTLINE OF REQUIREMENTS

The pest risk associated with importation of consignments of plants into a country may be managed by the use of post-entry quarantine (PEQ) facilities that provide the appropriate containment for the risk that has been identified with the consignments being imported. Pest risk assessment is required to determine the level of PEQ for a specified consignment of plants. Pest risk management requirements determine the design and operation of the PEQ facility. The PEQ facility may consist of a field site, screen house, glasshouse and/or laboratory.

Four levels of PEQ containment (PEQ1 to PEQ4) are described. For all PEQ containment levels, an operating procedures manual should show how the PEQ facility meets the containment requirements.

Field sites provide the lowest containment level, PEQ1, and are suitable for consignments of plants that may be infested with quarantine pests that are unlikely to escape and where the consequences of escape are low to moderate. A screen house may provide PEQ1 or PEQ2 containment level. For PEQ2 containment level, a facility should meet certain structural requirements (e.g. relating to openings) and operational requirements (e.g. decontamination of equipment before removal). A glasshouse may be capable not only of providing PEQ1 or PEQ2 containment but also of meeting PEQ3 requirements. PEQ3 introduces requirements relating to air pressure control and air filtration, as well as more physical security for the structure. A specialized quarantine laboratory is the only type of PEQ facility capable of providing PEQ4 containment level. PEQ4 imposes stringent conditions on all physical and operating requirements.

BACKGROUND

Imported consignments of plants can present a risk to plant health because they 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 policy 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 used. For many commodities that are traded internationally, importing NPPOs identify risk management measures that mitigate pest risk without requirements after entry. For some commodities, NPPOs may decide that certain consignments should be held after entry into the country within a facility providing a known level of containment in order to reduce the risk to an acceptable level. This allows for comprehensive testing for the presence of pests, time for the expression of symptoms, and appropriate treatment if necessary.

Containment facilities may also be required to conduct research with quarantine pests and other imported organisms, but this is outside of the scope of this standard.

Post-entry quarantine (PEQ) may be required for the following reasons:

- containment of imported plant material that needs to be screened for quarantine pests that cannot be detected by inspection at the point of entry
- containment of plant material suspected on import of being infested with quarantine pests for further investigation and possible confirmation of the identity of the pest
- following detection of pests, mitigation of risk by application of appropriate phytosanitary measures.

The purpose of PEQ is to contain both the plant and any quarantine pest potentially associated with it so that neither can escape the facility before the required inspection, testing, treatment and verification activities have been completed, and the consignment is released.

GENERAL REQUIREMENTS

1. PEQ Containment

The containment levels of PEQ facilities are based on the principles of pest risk analysis as described in ISPM No. 11 (*Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms*). The pest risk assessment determines the level of PEQ containment that is required. Pest risk management requirements determine the corresponding physical characteristics and operating procedures of the PEQ facility.

The NPPO should determine the containment level required for a specific consignment of plants entering PEQ facilities based on a pest risk assessment for the potential pests that may be associated with imported plant material or for the imported organism itself. The assignment of the appropriate containment conditions, and if appropriate the relevant PEQ levels, should also take into account relevant circumstances in the country and the biology of the pest.

Annex 1 contains information on methods for determining PEQ levels and describes four levels of PEQ containment, which range from low, PEQ1 (where the PEQ facility may be an open field), to high, PEQ4 (where the PEQ facility is a specialized quarantine laboratory). The containment levels differ in the number and type of requirements that are recommended (see Appendix 1). The requirements described below may need to be adjusted according to the specific pest risk management circumstances.

Once the required level of containment has been determined for a specific consignment entering quarantine, the NPPO determines whether that containment level can be provided by:

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

2. PEQ Facilities

These requirements apply to all PEQ containment levels.

PEQ facilities should provide the appropriate level of containment for the level of risk associated with the import of consignments. PEQ facilities may consist of a field site, screen house, glasshouse and/or laboratory.

2.1 Location

PEQ facilities should be located in areas that provide some isolation, if possible, stability (e.g. not earthquake-prone areas), a minimum of severe climatic events, and some separation from areas where related plant species are abundant (agricultural or horticultural production, forests or areas of high biodiversity).

2.2 Physical requirements

The physical design of the PEQ facility should take into consideration the biology of the pests, the operational procedures, the work flow in the facility 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 facilities as appropriate.

Physical requirements relate to:

- delimitation of the facility, external structural materials (for walls, floors, roof and windows)
- design of openings (for doors, windows, air vents, drains and other conduits)
- treatment systems (for air, water, solid waste)
- equipment (e.g. specialized safety cabinets, back-up generators).

2.3 Operational requirements

PEQ facilities should either be operated by or be authorized by the NPPO.

Operational requirements to meet a specified level of containment involve appropriate policies and procedures relating to management, personnel, general operation of the PEQ facility, record keeping, contingency planning, health and safety, and other aspects of the facility, as well as audit and review of the management system.

Specific procedures are required in the operation of the facility to manage the particular risks relating to containment of the consignments of plants in the quarantine facility. A procedural manual should show how the facility will meet the containment requirements. Where a quarantine pest is known or suspected to be present in the consignment, the operating procedures for PEQ facilities should take into account the biology of the pest, including how the pest is spread and its requirements for establishment in the environment.

The system should include, as appropriate:

- a qualified officer-in-charge (OIC) who has overall responsibility for maintaining PEQ and for all PEQ activities, plus necessary staff
- a list of staff authorized to enter the facility
- a training programme to ensure that all staff are adequately trained
- staff responsibilities clearly defined
- a site plan of the PEQ facility showing the location of the PEQ facility on the site and all facility entrances and access points
- criteria for what constitutes a breach of quarantine containment, and a reporting system to ensure that any breaches are reported to the NPPO
- provision for maintenance and calibration of critical equipment
- effective contingency plans for fires, accidental release of consignments from the facility and other emergencies
- a schedule for internal audits, if relevant, to check that the facility meets the PEQ requirements (e.g. structural integrity and hygiene requirements) and to review the components of the quality system
- a procedure for dealing with non-compliances
- a procedure for identifying consignments in quarantine by suitable means (e.g. labelling of plants) to enable traceability of the consignments through PEQ
- registry of visitors
- a register of all consignments in the facility
- a record of all PEQ activities conducted in the facility (e.g. experiments, treatments and disposal of consignments in quarantine)
- provision for the number of consignments in a PEQ facility not to exceed the capacity of the facility in a way that could impede inspection or compromise containment
- appropriate handling and sanitation procedures to prevent cross-contamination between different plants, lots and consignments
- adequate spatial separation of different consignments or lots within the facility as appropriate.

2.4 Release from containment

Consignments should be released from quarantine facilities on completion of the required inspection, testing, treatment and verification. NPPOs may implement systems to monitor or trace consignments once they have left the PEQ containment facility.

3. Specific Requirements for PEQ Facilities by Containment Level

In addition to the general requirements for all levels of containment, each level has specific requirements.

Each PEQ containment level incorporates the requirements of the previous levels; for example, a PEQ facility providing PEQ3 containment would include all applicable requirements of PEQ1 and PEQ2.

Appendix 1 provides a summary of the major requirements for PEQ facilities at all containment levels.

3.1 PEQ containment level 1

3.1.1 Type of facility and use, PEQ1

For PEQ1, the lowest containment level, the PEQ facility may consist of a field site or a structure such as a screen house or open glasshouse or laboratory. PEQ1 facilities are appropriate for consignments of plants that may be infested with quarantine pests that are highly unlikely to disperse naturally or to be spread by air, water, insects or other vectors (e.g. exclusively graft-transmitted viruses) and where the consequences of escape are low to moderate.

3.1.2 Physical requirements, PEQ1

For open sites or structures operating as PEQ1 facilities, appropriate separation from potential hosts should be maintained to prevent spread and establishment of quarantine pests that may be associated with the imported consignments of plants. PEQ1 sites should have appropriate signage. The PEQ area should be clearly delineated. A means and system for destruction of waste should be established.

3.1.3 Operational requirements, PEQ1

Access to the site should be restricted. It is recommended that sites provide conditions that are conducive for development of signs and symptoms of pests to be exhibited.

3.2 PEQ containment level 2

3.2.1 Type of facility and use, PEQ2

PEQ2 containment requires no special design features for the PEQ facility beyond those suitable for a well-designed and functional screen house, glasshouse or laboratory. PEQ2 facilities are suited for consignments of plants that may be infested with quarantine pests that are likely to disperse naturally or be spread by air, water, insects or other vectors

(e.g. nematode-transmitted viruses). There may be a moderate to high risk of escape of the pest, but the corresponding consequences of escape are moderate to low, respectively.

3.2.2 Physical requirements, PEQ2

The glasshouse should be constructed of regular glass or twin-skin plastic. Glasshouses, screen houses and laboratories should have appropriately sized mesh covering vents, drains or other openings. Local pests (e.g. rodents, white flies) should be controlled and excluded from the facility by sealing all the points of penetration, including electrical and plumbing conduits.

Entry into PEQ2 facilities should be through two doors separated by a vestibule or anteroom to reduce the risk of pests escaping or coming in. The doors should be self-closing and tight fitting, with appropriate seals and sweeps. Insect monitoring devices such as sticky traps or light traps should be installed as appropriate. A sink with hands-free operation should be provided in the anteroom.

The facility should have a concrete floor. All surfaces in the facility should be accessible for cleaning and constructed of smooth and impervious material to allow effective decontamination.

3.2.3 Operational requirements, PEQ2

All plants should be grown in pest-free growing medium (e.g. pasteurized potting mix).

All staff and visitors should wear protective clothing (e.g. a laboratory coat and dedicated footwear or shoe covers). Waste and equipment (e.g. cutting implements) should be sterilized or decontaminated before removal from the facility.

3.3 PEQ containment level 3

3.3.1 Type of facility and use, PEQ3

The physical and operational requirements for PEQ3 containment are substantially more stringent than those for lower levels. PEQ3 facilities may consist of a contained and secure glasshouse or laboratory. They are suited for containment of consignments of plants where there is a moderate to high probability of escape and where the consequences of an escape would be serious (e.g. aphid-transmitted viruses).

3.3.2 Physical requirements, PEQ3

Glasshouses and laboratory windows should be constructed of breakage-resistant material (e.g. laminated safety glass). Windows in laboratories should be sealed and locked shut.

Doors opening to the anteroom of the PEQ facility should be self-closing. Security measures should be in place surrounding the facility. A security alarm should also be installed in the PEQ facility.

The heating, ventilation and air-conditioning system (HVAC) should be capable of the containment of small aerially dispersed organisms. High-efficiency particulate air (HEPA) filtration and negative air pressure are required for this containment level.

Air pressure in the PEQ facilities should be lower than in adjacent areas so that a negative pressure differential is maintained to prevent passive egress of airborne organisms from containment. Egress of airborne organisms is also prevented by filtration of outgoing air through HEPA filters, which remove particles greater than 0.3 microns with 99.97% efficiency. Containment of some mite species may also require HEPA filtration.

3.3.3 Operational requirements, PEQ3

A shower may be required for staff members on leaving the facility. This requirement does not apply to facilities containing non-airborne plant pathogens and arthropods.

The opening doorways of the PEQ should be compatible with the pressure differential in the facility to maintain containment.

Appropriate processes should be implemented to ensure decontamination of equipment (including filters) before it is removed from the facility. If consignments are removed from the PEQ facility they should be free of quarantine pests.

3.4 PEQ containment level 4

3.4.1 Type of facility and use, PEQ4

PEQ4 facilities provide the highest containment level. These facilities are designed and operated specifically to contain consignments of plants in quarantine (whether deliberately imported or associated pests) where both the risk of escape and the consequences of escape are high (e.g. airborne plant pathogenic fungi).

3.4.2 Physical requirements, PEQ4

For a PEQ4 facility, there should be no direct access from the outside of the building. The laboratory should be physically separated from other areas, including offices used by laboratory personnel.

For added security the entry doors should be self-locking. To maintain containment, the vestibule doors should be interlocked so that only one door at a time can be open.

A ventilation system that establishes an inward flow of air into the laboratory should be provided so that there is a directional airflow into the working area. Where laboratories have supply air systems, the supply air and exhaust air systems should be interlocked to ensure inward flow at all times. All fume hoods that discharge to the outside atmosphere should be fitted with HEPA filters.

Tandem filters, parallel filters or other configurations should be installed that allow one filter to be replaced while another supplies air. Negative air pressure should progressively increase from the lowest risk areas to higher risk areas. Backup electricity is required to maintain negative air pressure gradients. Shower-out vestibule facilities should be installed if appropriate.

With high-risk consignments, procedures that could cause the release of pests should be conducted in a biological safety cabinet that contains a HEPA filter. Only preparations in which the organism is killed or contained (e.g. slides, sealed tubes) should be handled in the open laboratory.

3.4.3 Operational requirements, PEQ4

Operational processes required to maintain PEQ, such as pressure differentials and waste water treatment, should be monitored to prevent failure of essential systems.

A register of staff and visitors should be maintained providing a record of entries and exits of the laboratory. The facility should not be accessible to the general public. Disposable coverall suits should be worn in the facility.

Equipment used in a PEQ4 facility (e.g. autoclaves and biological safety cabinets) should be well maintained and calibrated. All surfaces within the cabinet should be cleaned with a suitable disinfectant as appropriate.

METHODS FOR ASSIGNMENT OF PEQ CONTAINMENT LEVELS

Several approaches can be used to assign containment levels of PEQ facilities. The PEQ containment requirements will depend on the specific organism and other circumstances in the country e.g. climatic, environmental.

The containment levels are described in a matrix that combines the likelihood of pest introduction and establishment with the consequence of their establishment (see Table 1). The risk of pest introduction is a function of the size of the organism, dispersal method, reproductive potential, potential for establishment etc., while the consequences of pest establishment relate to impact on the environment, trade implications, economic factors etc. ISPM No. 11 (*Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms*) provides guidelines for pest risk assessment.

Table 1: Assignment of PEQ containment levels based on a matrix of pest risk factors

Risk of escape and establishment	Consequence of escape and establishment		
	Low	Moderate	High
High	PEQ2	PEQ3	PEQ4
Moderate	PEQ1	PEQ2	PEQ3
Low	PEQ1	PEQ1	PEQ2

Other approaches may be used to designate containment levels that are more directly based on specific biological characteristics of the organism likely to be present in the consignment.

APPENDIX 1

**SUMMARY OF MAJOR REQUIREMENTS FOR PEQ FACILITIES
BY CONTAINMENT LEVEL**

Requirements	PEQ containment level and type of facility				
	PEQ1		PEQ2	PEQ3	PEQ4
	field site	screen house glasshouse laboratory	screen house glasshouse laboratory	glasshouse laboratory	laboratory
Physical requirements					
delineation of facility	R	R	R	R	R
breakage-resistant window/glasshouse materials	na	O	O	R	R
concrete floor	na	O	R	R	R
vestibule entrance	na	O	R	R	R
self-closing doors	na	O	O	R	R
self-locking doors	na	O	O	O	R
screen on openings such as air vents, drains	na	O	R	R	na
sealed windows	na	O	R*	R	R
all penetrations sealed	na	na	R*	R	R
negative air pressure	na	na	na	R*	R
air pressure gradient	na	na	na	O	R
HEPA filtration	na	na	na	R*	R
biological safety cabinet	na	na	O	O	R*
waste water treatment	O	O	R	R*	R
solid waste treatment	R	R	R	R	R
backup source of electricity	na	O	O	R*	R
Operational requirements					
good management practices	R	R	R	R	R
under NPPO or responsible authority	R	R	R	R	R
restricted access	R	R	R	R	R
protective clothing	O	O	R	R	R
decontamination of equipment upon egress	O	O	R	R	R
decontamination of implements upon egress	O	O	R	R	R
hand washing upon egress	O	O	R	R	R
shower out	na	na	na	O	R

na = not applicable; O = optional; **R** = required; **R*** = required, but exceptions exist.

For member consultation (regular process)
June 2008

DRAFT SUPPLEMENT TO ISPM NO. 5 (GLOSSARY OF PHYTOSANITARY TERMS)

Note for members at member consultation: in reviewing this document, please refer to the IPPC Glossary of phytosanitary terms (ISPM No. 5).

Supplement No. --

TERMINOLOGY OF THE CONVENTION ON BIOLOGICAL DIVERSITY IN RELATION TO THE GLOSSARY OF PHYTOSANITARY TERMS

1. Introduction

Since 2001, initiatives have been taken to address, within the framework of the IPPC, the protection of the environment and of biological diversity in relation to the introduction and spread of non-indigenous species. In particular, ISPM No. 11 on pest risk analysis for quarantine pests has been extensively adjusted to ensure that it covers risks arising from pests that primarily affect the environment and biological diversity, including harmful plants in particular. Supplement No. 2 of ISPM No. 5 (*Glossary of phytosanitary terms*) has analysed in detail how the concept of “potential economic importance”, which appears in the definition of a “quarantine pest”, can be understood to cover effects on the environment and biological diversity. This clarification of the scope of the IPPC is now basically understood and accepted by contracting parties.

As a result, there has been a need for relevant terminology concerning the environment and biological diversity for use in ISPMs. The Convention on Biological Diversity (CBD) has proposed a number of such terms and definitions in the framework of its “guiding principles for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species” (hereafter “CBD Guiding Principles”). However, attempts to incorporate these terms into IPPC language have proved unsuccessful because they are based on different concepts. In particular, the CBD is concerned only with species that are moved by human agency, and its terminology refers only to those species (“alien species”) which have already been moved into an area where they are non-indigenous. This movement is referred to as “introduction”, which accordingly does not include “establishment” (as it does for the IPPC). So it is not possible to include these fundamental CBD terms and definitions directly in the Glossary. Instead they are explained in the present supplement.

2. Presentation

In relation to each term considered, the CBD definition is provided first. This is followed by a proposed “explanatory definition in IPPC terms”, in which, as usual, Glossary terms are shown in **bold**. These explanatory definitions may also include CBD terms, in which case these are also in **bold** and followed by “[CBD]”. The explanatory definitions constitute the main body of this supplement. Each is accompanied by notes, providing further explanation and clarification of some of the difficulties.

3. Terminology

3.1 Alien species

CBD definition: a species, subspecies or lower taxon, introduced outside its natural past or present¹ distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce

Explanatory definition in IPPC terms: an **alien species [CBD]** is an individual² or population, at any life stage, of an **organism** that is non-indigenous to an **area** and that has been **introduced [CBD]**^{3,4} into that **area**.

Notes:

¹ The qualification concerning “past and present” distribution is not relevant for IPPC purposes because the IPPC is concerned only with existing situations. It does not matter that the species was present in the past if it is present now. The word “past” in the CBD definition presumably allows for the reintroduction of a species into an area where it has (recently) become extinct. Conservationists would not wish such a species to be considered alien. “Recently” is bracketed, because it is not stated explicitly; presumably, “ancient” extinctions, as attested by fossils, would not qualify.

² The CBD definition throws emphasis on the physical presence of individuals of a species at a certain time, whereas the IPPC concept of occurrence relates to the geographical distribution of the taxon in general.

³ For CBD purposes, an alien has already entered the **area** of concern (see **Introduction** below). For the IPPC, however, pests that have not already entered the area are of great concern, and the term alien is not appropriate. Terms such as “exotic”, “non-indigenous” or “non-native” have been used in ISPMs and can be considered to be synonymous. To avoid confusion, however, it would be preferable to use only one of these terms, in which case “non-indigenous” would be most suitable, especially as it can accompany its opposite “indigenous”. “Exotic” is not suitable because it presents translation problems.

⁴ A species that is non-indigenous and has entered an **area** through natural means is not an **alien species [CBD]**. It is

simply extending its natural range. For **IPPC** purposes, such a species could still be considered as a potential **quarantine pest**.

3.2 Introduction

CBD definition: the movement by human agency, indirect or direct, of an alien species⁵ outside of its natural range (past or present). This movement can be either within a country or between countries or areas beyond national jurisdiction⁶

Explanatory definition in IPPC terms: **introduction [CBD]** is the **entry** of a **species** into an **area** where it is non-indigenous, through movement by human agency, either directly from an area where the species is indigenous or indirectly⁷ (by successive movement from an area where the species is indigenous through one or several areas where it is not).

Notes:

⁵ As formulated, the CBD definition suggests that **introduction [CBD]** concerns an **alien species [CBD]**, and thus a species that has already been **introduced [CBD]**. However, it may be supposed from the text of many of the CBD Guiding Principles that this is not so, and that a non-indigenous species entering for the first time is being **introduced [CBD]**.

⁶ The issue of “areas beyond national jurisdiction” is not relevant for the IPPC.

⁷ In the case of indirect movement, it is not specifically stated in the definition whether all the movements from one **area** to another must be **introductions [CBD]** (i.e. by human agency, intentional or unintentional), or whether some can be by natural **spread**. This question arises, for example, where a species is **introduced [CBD]** into one **area** and then spreads naturally to an adjoining **area**. It seems that this may be considered as an indirect **introduction [CBD]**, so that the species concerned is an **alien species [CBD]** in the adjoining area, despite the fact that it **entered** it naturally. In the IPPC context, the intermediate country, from which the natural spread occurs, has no obligation to act to limit the natural spread, though it may have obligations to prevent intentional or unintentional **introduction [CBD]** if the importing country concerned establishes corresponding **phytosanitary measures**.

3.3 Invasive alien species

CBD definition: an alien species whose introduction and/or spread threaten biological diversity^{8,9}

Explanatory definition in IPPC terms: in the context of the IPPC, an **invasive¹⁰ alien species [CBD]** is an **alien species [CBD]** that by its **establishment** or **spread** has become injurious¹¹ to (or had a harmful impact on) **plants¹²**, or that by **risk analysis [CBD]** is shown to be potentially injurious to (or to have a potential harmful impact on) **plants**.

Notes:

⁸ The question arises to what extent **invasive alien species [CBD]** can be equated with **quarantine pest**. Invasive alien species that directly or indirectly affect **plants** and that are absent from an area (or if present are limited in distribution and subject to official control) are often **quarantine pests** that are regulated by countries based on PRA. ISPM No. 11 (*Pest risk analysis for quarantine pests, including analysis of environmental risks and living modified organisms*) clarifies that **quarantine pests** may directly affect **plants** or indirectly in case of environmental risks via other components of ecosystems. Environmental and biodiversity consequences of the **introduction** and **spread** of such invasive alien species should be considered in a PRA in accordance with ISPM No. 11. Also, the **IPPC quarantine pest** concept can be applied to **organisms** that have never entered the **endangered area**. See also note 3.

⁹ The CBD Guiding Principles also refer to **invasive alien species** as threatening “ecosystems, habitats or species”, rather than “biodiversity”.

¹⁰ The CBD definition and its interpretation concern the whole term **invasive alien species** and do not provide a definition of “invasive” as such. Strictly speaking, they leave it open. But the interpretation has been made that the term “invasive” can be used only with respect to an **alien species**. For example, a distinction is being proposed in French between “invasif” and “envahissant” for **alien species** and species in general, respectively. Apart from the fact that this cannot be done so easily in English, such a tendency to give words new artificial meanings is undesirable, and would be contrary to Glossary policy.

¹¹ This is an interpretation that tries to bring the definition of an **invasive alien species [CBD]** as close as possible to those of a **pest** and of a **quarantine pest**, taking particular account of the explanations in Supplement No. 2 of ISPM No. 5 on what is meant by “economic importance” in the **IPPC** context. This Supplement considers that, provided a species has a potential for **introduction** and **spread**, economic importance depends on a harmful impact on crops, or on the environment, or on some other specific value (recreation, tourism, aesthetics). The threat to biological diversity is accordingly covered.

¹² This interpretation is to be understood only in the context of the IPPC, i.e. of the protection of **plants**. It is clear that there are effects on biological diversity that do not concern **plants**, so that there are **invasive alien species [CBD]** that are not relevant to the **IPPC**.

3.4 Establishment

CBD definition: the process¹³ of an alien species in a new habitat successfully producing viable offspring¹⁴ with the likelihood of continued survival

Explanatory definition in IPPC terms: **establishment [CBD]** is the **establishment**, by successful reproduction, of an **alien species [CBD]** in a **habitat**¹⁵ in the **area** that it has **entered**.

Notes:

¹³ **Establishment [CBD]** is a process, not a result. It seems that a single generation of reproduction can be **establishment [CBD]**, provided the offspring have a likelihood of continued survival (otherwise there would be a comma after “offspring”). The **IPPC** concept of “perpetuation for the foreseeable future” is not clearly expressed.

¹⁴ “Offspring” is not clearly understood. In ordinary English, it implies new individuals. In the definition, it is not clear how far it applies to **organisms** that propagate themselves vegetatively, so that the concept of an “individual” is not always easy to recognize (many **plants**, most fungi, other microorganisms). By using “perpetuation”, the **IPPC** avoids the question of reproduction or replication of individuals altogether. It is the species as a whole that survives. Even the growth of long-lived individuals to maturity could be considered to be perpetuation for the foreseeable future (e.g. plantations of a non-indigenous **plant**).

¹⁵ Survival in an entirely man-managed situation is not **establishment [CBD]** because this is not “in a habitat”.

3.5 Intentional introduction

CBD definition: the deliberate movement and/or release by humans of an alien species outside its natural range

Explanatory definition in IPPC terms: **intentional introduction [CBD]** is the deliberate import of a non-indigenous species, including its **release** into the environment.

3.6 Unintentional introduction

CBD definition: all other introductions which are not intentional

Explanatory definition in IPPC terms: **unintentional introduction [CBD]** is **entry** of a non-indigenous species with a traded **consignment**, which it **infests** or **contaminates**, or by some other human-mediated **pathway** (passengers’ baggage, vehicles, artificial waterways, etc.)¹⁶

Notes:

¹⁶ This is the situation with which the **IPPC** is primarily concerned.

3.7 Risk analysis

CBD definition: “risk analysis” refers to (1) the assessment of the consequences¹⁷ of the introduction and of the likelihood of establishment of an alien species using science-based information (i.e., risk assessment), and (2) to the identification of measures that can be implemented to reduce or manage these risks (i.e., risk management), taking into account socio-economic and cultural considerations¹⁸

Explanatory definition in IPPC terms: **risk analysis [CBD]**¹⁹ is: (1) evaluation of the probability of **establishment** and **spread** within an area²⁰ of an **alien species [CBD]** that has entered that area, (2) evaluation of the associated potential undesirable consequences, and (3) evaluation and selection of phytosanitary measures to reduce the risk of such **establishment** and **spread**.

Notes:

¹⁷ It is noted that all kinds of consequences may be considered.

¹⁸ It is not clear at what stages in the process of **risk analysis [CBD]** socio-economic and cultural considerations are taken into account (during assessment, or during management, or both). No interpretation can be offered in relation to ISPM No. 11 or supplement 2 of ISPM No. 5.

¹⁹ This explanation is based on the **IPPC** definitions of **pest risk assessment** and **pest risk management**, rather than on that of **pest risk analysis**.

²⁰ Following the considerations under note 3, it is unclear whether **Risk analysis [CBD]** is to be conducted prior to entry. However, it may be supposed (on the basis of **CBD** Guiding Principles 7 and 10) that the measures can include such restrictions, in which case the definition of **pest risk analysis [IPPC]** does apply.

4. Other Concepts

The **CBD** Guiding Principles do not define other concepts, but they do use a number of terms that do not seem to be considered in the same light by the **IPPC**, or are not given a specific meaning under the **IPPC**. These include:

- border controls
- burden of proof
- control
- economic impact
- natural range or distribution
- precautionary approach

- provisional measures
- quarantine measures
- regulatory measures
- social impact
- statutory measures.

5. Reference

Guiding principles for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species, 2002. Decision VI/23, UNEP/CBD/COP/6/20.

For member consultation (regular process)
June 2008

AMENDMENTS TO ISPM No. 5 (GLOSSARY OF PHYTOSANITARY TERMS)

Members are asked to consider the following proposals made by the Standards Committee following recommendations by the Technical Panel for the Glossary (TPG) in relation to additions and revisions in ISPM No. 5 (*Glossary of phytosanitary terms*). A brief explanation is given for each proposal. For revised terms and definitions, explanations of the changes made to the last approved definition are also given. It is suggested that comments should relate to these changes.

1. NEW TERMS AND DEFINITIONS

1.1 Incidence (of a pest)

Background

A definition for *prevalence (of a pest)* was sent for member consultation in 2004, redrafted several times by the TPG and the Standards Committee, and sent again for consultation in 2007 as part of the *Amendments to ISPM No. 5*. Many comments supported that the term to be defined should be *incidence*, rather than *prevalence*. The SC agreed to the following TPG suggestions, based on comments received:

- that the definition be withdrawn from the amendments to the glossary to be presented for adoption by CPM-3
- that a definition for *incidence* be proposed to the SC in May 2008 prior to member consultation.

Some comments proposed that the terms *incidence*, *prevalence* and *tolerance level* should be explained in a separate document (either a supplement to ISPM No. 5 or an explanatory document). The SC agreed with the TPG proposal that the need for such explanation be considered once the definitions have been adopted.

The following points may be considered when reviewing the definition below:

- The concept of *prevalence* is rarely used independently in ISPMs. It is used in the context of *area of low pest prevalence*, which is appropriately defined in the IPPC, clearly expressing that the pest occurs at low level.
- The terms *prevalence* and *incidence* are used loosely in plant protection, sometimes interchangeably. *Prevalence* (in isolation) is a term that applies more to epidemiology and is used and defined more frequently in the context of human or animal health than in plant protection.
- There is no need for a definition of *prevalence*, but there is a need to define *incidence*. Use of the term *incidence* is more appropriate for plant protection, where it has several uses, in particular in relation to sampling and inspection. It is proposed that in the context of the IPPC *prevalence* be used solely in relation to *areas of low pest prevalence*, and that *incidence* should be used in other cases. The concept of prevalence would be linked to field situations (i.e. in relation to *areas of low pest prevalence*) and *incidence* would apply to both consignments and samples.
- *Incidence* is not linked to a particular moment in time.
- Although the proportion of units affected by a pest is the most common case for expressing incidence, there might be a need in some circumstances to express the incidence by a number of units affected by a pest, e.g. 5 plants infected in a one hectare field. The wording proposed is therefore *Proportion or number*.
- *Population* is used in its statistical sense. *Other defined population* is intended to cover cases other than those mentioned in the definition (sample, consignment or field).

Proposed definition

Incidence (of a pest) Proportion or number of units in a sample, **consignment, field** or other defined population that is affected by a **pest**

1.2 Tolerance level

Background

A definition for *tolerance level* was sent for member consultation in 2004, redrafted several times by the TPG and the Standards Committee, and sent again for consultation in 2007 as part of the *Amendments to ISPM No. 5*. It attracted comments in particular because it used the word *prevalence* (see also section 1.1).

The TPG considered the comments, and eventually the draft definition was withdrawn from the amendments to the glossary presented to the SC in November 2007. It was decided that new definitions for incidence and tolerance level would be proposed to the SC in May 2008 prior to member consultation. The SC agreed to the following TPG suggestions, based on comments received:

- that the definition be withdrawn from the amendments to the glossary to be presented for adoption by CPM-3

- that a definition for *tolerance level* be proposed to the SC in May 2008 prior to member consultation.

Some comments proposed that the terms *incidence*, *prevalence* and *tolerance level* should be explained in a separate document (either a supplement to ISPM No. 5 or an explanatory document). The SC agreed with the TPG proposal that the need for such explanation be considered once the definitions have been adopted.

The following points may be considered when reviewing the definition below:

- The term *tolerance* is used in various contexts, and the definition below, specific to IPPC use, applies to pests. The term *tolerance level* was proposed. The definition applies to pests and this is reflected in the term, which is qualified with (*of a pest*).
- In relation to pests, the term has a very wide application and the definition should be kept broad so as not to restrict its meaning and use.
- In order to keep the definition broad and not limit usage of the term, the definition uses *pest* (and not *regulated pest*) and *action* (and not *phytosanitary action*, which would limit it to regulated pests).
- The definition creates a link with *incidence* (see section 1.1).
- The proposed definition is applicable to both field situations and consignments.

Proposed definition

tolerance level (of a pest) **Incidence of a pest that is a threshold for action to control that pest or to prevent its spread or introduction**

1.3 Phytosanitary security (of a consignment)

Background

The term and definition were sent for member consultation in 2006 as part of the amendments to the glossary. CPM-2 decided that “The new proposed term and definition for *phytosanitary security (of a consignment)* was referred back to the SC for further work, in particular consideration of transit and the relationship to regulated pests.” (Also to be considered were comments submitted during CPM-2 by several countries.)

The following points may be considered when reviewing the definition below:

- The proposed definition now includes a link to regulated pests, since it corresponds to the purpose of phytosanitary security.
- Some comments suggested that it should refer to maintenance “through the application of appropriate measures”. The TPG noted that the use of the term *integrity* in the definition established a link with phytosanitary measures, but there was no harm in repeating this.
- There is no need to mention transit specifically; the definition applies to all situations, including transit, shipping etc., and there is no need to enumerate them.

Proposed definition

phytosanitary security (of a consignment) Maintenance of the **integrity** of a **consignment** and prevention of its **infestation** and **contamination** by **regulated pests**, through the application of appropriate **phytosanitary measures**

Note: the use of *security* in ISPM No. 10 in relation to consignments corresponds to a different meaning, and this could be corrected when ISPM No. 10 is reviewed.

1.4 Corrective action plan (in an area)

Background

After member consultation in 2006, the SC asked the TPG to consider the need for a definition of corrective action plan. The TPG thought a definition would be useful.

The following points may be considered when reviewing the definition below:

- The need for a definition arises from the confusion between *emergency action plan* and *corrective action plan*. Both terms are used in existing ISPMs. The former generally refers to findings of pests in consignments; the latter about maintaining the pest status in an area.
- The definition applies to areas and this is reflected in the term, which is qualified with (*in an area*).
- Corrective actions plans are linked to “an area officially delimited for phytosanitary purposes” (wording used in the definition of *buffer zone*, where the phrase covers pest free areas, areas of low pest prevalence, pest free places of production, pest free production sites), and this wording was introduced in the definition.
- Application of corrective action plans refers to detection of a pest or exceeding a specified pest level.
- A corrective action plan needs to be agreed with the importing country; it responds to an event that may be expected, and it therefore has to be documented.

Proposed definition

corrective action plan (in an area) Documented plan of **phytosanitary actions** to be implemented if a **pest** is detected or a specified pest level is exceeded in an **area officially** delimited for phytosanitary purposes

Notes:

- The use of “corrective actions” in ISPM No. 7 is confusing because it relates to phytosanitary actions and not to a corrective action plan. This should be corrected when ISPM No. 7 is reviewed.
- The use of “emergency action plan” in section 2.1 of ISPM No. 22 should be replaced with “corrective action plan”. This should be corrected when ISPM No. 22 is reviewed.

2. REVISED TERMS AND DEFINITIONS**2.1 Compliance procedure (for a consignment)****Background**

A revised definition for *compliance procedure (for a consignment)* was sent for member consultation in 2006 as part of the amendments to the glossary. The SC sent back the definition to the TPG, asking the TPG to consider whether the definition should be related to a consignment or should be broader, and provided alternative rewordings.

The following points may be considered when reviewing the definition below:

- There are two meanings of compliance. A very general meaning linked to compliance with a treaty, and a more restricted meaning related to compliance with phytosanitary import requirements. In ISPMs, the term is used in this context and therefore always in relation to consignments.
- A broader definition proposed by the SC In May 2007 referred to compliance for consignments moving within a country. In the framework of the IPPC, compliance is with import requirements, and there is no need to address compliance with national requirements, which is not an IPPC issue.
- The definition uses the wording “with phytosanitary import requirements or phytosanitary measures related to transit”, recognizing the fact that compliance procedure also applies to consignments in transit. Either one or the other apply and there is no need to use additional wording such as “if appropriate”.

Proposed definition

compliance procedure (for a consignment) **Official** procedure used to verify that a **consignment** complies with **phytosanitary import requirements** or **phytosanitary measures** related to **transit**

2.2 Intended use**Background**

In discussing the member comments received in 2007 on the draft ISPM on classification of commodities, in relation to consistency of use of terminology, the TPG identified a change needed in the adopted definition for intended use. The intended use, when considered during a commodity-based PRA, does not necessarily refer to regulated articles (because the PRA sets out to determine if the commodity should be regulated), and the definition was amended to read “or other articles”.

Proposed definition

Intended use Declared purpose for which **plants, plant products** or other articles are imported, produced or used

2.3 Reference specimen**Background**

ICPM-7 adopted the definition for *reference specimen(s)* as part of the revised ISPM No. 3 (2005), and decided that the glossary group should review the new and revised definitions in the standard, taking into account comments submitted at ICPM. A modified definition was submitted for consultation in 2006 but, on the basis of comments received, the TPG felt that there was no need for a specific definition for reference specimens in relation to biological control agents, and recommended deletion of the term and definition from the glossary (the alternative being to widen the definition to cover other uses, such as diagnostics). Deletion was proposed to CPM-2, which requested the SC to consider the expansion of the definition to cover all types of reference specimens.

The following points may be considered when reviewing the definition below:

- There are different types of specimen: “type specimen”, “reference specimen” or “evidence specimen”.
- The definition should not apply to “type specimen”, i.e. a unique specimen intended for taxonomic studies, which have no specific IPPC meaning.

- In the framework of the IPPC and in ISPMs, specimens are either *reference specimens*, kept to compare with future new samples, or *evidence specimens* kept for evidence purposes or trace-back in case of dispute. The definition covers only a reference specimen, i.e. a specimen used operationally by an NPPO for the purpose of identification, verification or comparison of future findings.
- The definition covers adequately the use of the term in ISPM No. 3 (in relation to identification of future individuals).
- The collection where a reference specimen is kept must be accessible to the people that need to access it. The previous definition contained “publicly available”; this would not be the case for all collections of reference specimens, and the phrase was deleted. On the other hand, the definition should be kept open, and should not mention that access could be restricted to the NPPO only.

Proposed definition**reference specimen**

Specimen (which may be a culture) from a population of a specific **organism** conserved in an accessible collection, for the purpose of identification, verification or comparison.

Draft ISPM
For member consultation (regular process)
June 2008

It is intended that, after adoption of this standard, Appendix 1 of ISPM No. 26 will be deleted, the annexes and appendices will be renumbered, and the references in the text of ISPM No. 26 will be adjusted.

Fruit fly trapping
Annex 1 to ISPM No. 26



**INTERNATIONAL STANDARDS FOR
PHYTOSANITARY MEASURES**

*Annex 1 to ISPM No. 26 (ESTABLISHMENT OF PEST FREE AREAS FOR FRUIT FLIES
(TEPHRITIDAE))*

Fruit fly trapping

(200-)

*[Work programme topic: Trapping procedures for fruit flies (Tephritidae)]
[Specification No. 35]*

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FRUIT FLY TRAPPING

This annex provides detailed information for trapping surveys under different scenarios of pest population and control situations for different fruit fly species (Tephritidae) of economic importance. Different trapping systems and procedures should be used depending on the fruit fly status of the target area, which can be either an infested area, an area of low pest prevalence (ALPP), or a pest free area (PFA). The information in this annex can therefore be applied to other ISPMs relating to fruit flies. The annex describes the most widely used trapping systems and procedures; nevertheless, there are others available that may be applied to obtain equivalent results for fruit fly surveys.

1. Trapping Survey Objectives and Control Situations

Depending on the pest status, there are three objectives of trapping surveys:

- To verify the characteristics of the pest population, **monitoring surveys** should be implemented.
- To determine if the pest is present in an area, **detection surveys** should be implemented.
- To determine the boundaries of an area considered to be infested or free from the pest, **delimiting surveys** should be implemented.

There are five types of control situations where trapping surveys should be applied:

- **No control.** The pest population is present but not subject to any suppression measures. Nevertheless, such a population should be monitored before the initiation of suppression measures.
- **Suppression.** The pest population is present and subject to control measures, and surveys are required to monitor the efficacy of these measures.
- **Eradication of established population.** The pest population is present and subject to control measures, and surveys are required to monitor the progress towards eradication of the pest population.
- **Exclusion.** The pest population is absent, the pest free area (PFA) is under exclusion measures, and surveys are required to detect the entry of the pest.
- **Eradication of incursion.** After detection of an incursion (any type of detection prior to determining if it is an outbreak) of the target pest, delimiting surveys are required. Once surveys have determined the nature and extent of the incursion and if it is actionable (an outbreak), eradication surveys may be required.

2. Trapping Scenarios

Based on the status of the target pest, there are two possible starting points for trapping surveys:

- **pest present** – starting from an established population with no control and gradually progressing to a control situation, which in some cases progresses toward an ALPP and eventually may reach a PFA
- **pest absent** – starting from a PFA where an incursion occurs, and where detection surveys have to be complemented with delimiting surveys.

Table 1 depicts which type of trapping survey is required for each specific control situation.

Table 1. Matrix of the different trapping surveys required for different control situations

Trapping surveys	Control situations				
	No control (FTD>Suppression)	Suppression (FTD>Eradication)	Eradication of established population (FTD~0)	Exclusion (FTD=0)	Eradication of incursion (FTD~0)
Monitoring	A	B	C		
Detection				D	
Delimiting					E

FTD = flies per trap per day.

According to Table 1, there are five possible scenarios, illustrating the interaction of the three types of trapping surveys and the five control situations:

- Scenario A: uncontrolled population subject to monitoring surveys
- Scenario B: population under suppression subject to monitoring surveys
- Scenario C: population under eradication subject to monitoring surveys
- Scenario D: no population, detection surveys for exclusion in a PFA
- Scenario E: incursion detected through ongoing detection surveys, therefore additional implementation of delimiting surveys.

3. Trapping Systems for Fruit Fly Surveys

Trapping systems used for fruit fly surveys consist of the following components:

- attractants (pheromones, para-pheromones or food attractants)
- killing agents (dry; wet; or dry or wet)
- devices for trapping
- procedures for use of the above items.

The major fruit fly species of economic importance and the attractants commonly used to attract them are presented in Table 2.

Table 2. Major fruit fly species of economic importance and their attractants

Scientific Name	Attractant
<i>Anastrepha fraterculus</i> (Wiedemann)	Protein attractants (PA)
<i>Anastrepha ludens</i> (Loew)	PA, 2C ¹ attractant
<i>Anastrepha obliqua</i> (Macquart)	PA, 2C ¹ attractant
<i>Anastrepha striata</i> (Schiner)	PA
<i>Anastrepha suspensa</i> (Loew)	PA, 2C ¹ attractant
<i>Bactrocera carambolae</i> (Drew & Hancock)	Methyl eugenol (ME),
<i>Bactrocera caryeae</i> (Kapoor)	ME
<i>Bactrocera correcta</i> (Bezzi)	ME
<i>Bactrocera dorsalis</i> (Hendel) ⁴	ME
<i>Bactrocera invadens</i> (Drew, Tsuruta, & White)	ME, 3C ²
<i>Bactrocera kandiensis</i> (Drew & Hancock)	ME
<i>Bactrocera occipitalis</i> (Bezzi)	ME
<i>Bactrocera papayae</i> (Drew & Hancock)	ME
<i>Bactrocera philippinensis</i> (Drew & Hancock)	ME
<i>Bactrocera umbrosa</i> (Fabricius)	ME
<i>Bactrocera zonata</i> (Saunders)	ME, 3C ² , ammonium acetate (AA)
<i>Bactrocera cucurbitae</i> (Croquillet)	Cuelure (CUE), 3C ² , AA
<i>Bactrocera cucumis</i> (French)	CUE, PB
<i>Bactrocera tryoni</i> (Froggatt)	CUE
<i>Bactrocera tau</i> (Walker)	CUE
<i>Bactrocera latifrons</i> (Hendel)	PA
<i>Bactrocera citri</i> (Chen)	PA
<i>Bactrocera tsuneonis</i> (Miyake)	PA
<i>Bactrocera minax</i> (Enderlein)	PA
<i>Bactrocera oleae</i> (Gmelin)	PA, ammonium bicarbonate, Spiroketal
<i>Ceratitis capitata</i> (Wiedemann)	Trimedlure (TML), Capilure, PA, 3C ² , 2C ³
<i>Ceratitis cosyra</i> (Walker)	PA, 3C ² , 2C ³
<i>Ceratitis rosa</i> (Karsh)	TML, PA, 3C ² , 2C ³
<i>Dacus ciliatus</i> (Loew)	PA, 3C ² , AA
<i>Myopardalis pardalina</i> (Bigot)	PA
<i>Rhagoletis cerasi</i> (Linnaeus)	Butyl hexanoate (BuH), ammonium salts (AS)
<i>Rhagoletis pomonella</i> (Walsh)	BuH, AS
<i>Toxotrypana curvicauda</i> (Gerstaecker)	2-methyl-vinyl-pyrazine (MVP)

¹ Two-component (2C) synthetic food attractant of ammonium acetate and putrescine, mainly for female captures.

² Three-component (3C) synthetic food attractant, mainly for female captures (ammonium acetate, putrescine, trimethylamine).

³ Two-component (2C) synthetic food attractant of ammonium acetate and trimethylamine, mainly for female captures.

⁴ Taxonomic status of some listed members of the *Bactrocera dorsalis* complex is uncertain.

3.1 Attractants and lures

3.1.1 Male specific

The most widely used traps contain para-pheromone attractants that are male specific. The para-pheromone trimedlure (TML) captures *Ceratitis* species (including *C. capitata* and *C. rosa*). The para-pheromone methyl eugenol (ME) captures a large number of *Bactrocera* species (including *B. dorsalis*, *B. zonata*, *B. carambolae*, *B. philippinensis* and *B. musae*). The para-pheromone cuelure (CUE) captures a large number of other *Bactrocera* species, including *B. cucurbitae* and *B. tryoni*. Para-pheromones are generally highly volatile, and can be used with a variety of traps (Table 3a). Controlled-release formulations exist for TML, CUE and ME, providing a longer-lasting attractant for field use.

3.1.2 Female biased

Female-biased attractants are based on food or host odours (natural, synthetic, liquid or dry) (Table 3b). Historically, liquid protein attractants have been used to catch a wide range of different fruit fly species. Liquid protein attractants capture both females and males. These liquid attractants are generally not as sensitive as the para-pheromone traps. In addition, the use of liquid attractants results in capturing high percentages of non-target insects. Several food-based synthetic attractants have been developed using ammonia and its derivatives.

For example, for capturing *C. capitata* a synthetic attractant consisting of three attractants (ammonium acetate, putrescine and trimethylamine) is used. For capture of *Anastrepha* species the trimethylamine attractant may be removed. A synthetic attractant will last approximately 6–10 weeks depending on climate conditions, captures few non-target insects and captures significantly less male flies, making this attractant suited for use in programmes releasing sterile flies. New synthetic food attractant technologies are available for use, including the long-lasting three-component and two-component mixtures contained in the same patch, as well as the three components incorporated in a single cone-shaped plug (Table 4).

Table 3a. Attractants and traps for male fruit fly surveys

Fruit fly species	Attractant and trap (see below for abbreviations)																						
	TML/CE									ME							CUE						
	CC	CH	ET	JT	LT	ST	SE	TP	YP	CH	ET	JT	LT	ST	TP	YP	CH	ET	JT	LT	ST	TP	YP
<i>Anastrepha fraterculus</i>																							
<i>Anastrepha ludens</i>																							
<i>Anastrepha obliqua</i>																							
<i>Anastrepha striata</i>																							
<i>Anastrepha suspensa</i>																							
<i>Bactrocera carambolae</i>										x	x	x	x	x	x	x							
<i>Bactrocera caryeae</i>										x	x	x	x	x	x	x							
<i>Bactrocera citri</i>																							
<i>Bactrocera correcta</i>										x	x	x	x	x	x	x							
<i>Bactrocera cucumis</i>																	x	x	x	x	x	x	x
<i>Bactrocera cucurbitae</i>																	x	x	x	x	x	x	x
<i>Bactrocera dorsalis</i>										x	x	x	x	x	x	x							
<i>Bactrocera invadens</i>										x	x	x	x	x	x	x							
<i>Bactrocera kandiensis</i>										x	x	x	x	x	x	x							
<i>Bactrocera latifrons</i>																							
<i>Bactrocera minax</i>																							
<i>Bactrocera occipitalis</i>										x	x	x	x	x	x	x							
<i>Bactrocera oleae</i>																							
<i>Bactrocera philippinensis</i>										x	x	x	x	x	x	x							
<i>Bactrocera tau</i>																	x	x	x	x	x	x	x
<i>Bactrocera tryoni</i>																	x	x	x	x	x	x	x
<i>Bactrocera tsuneonis</i>																							
<i>Bactrocera umbrosa</i>										x	x	x	x	x	x	x							
<i>Bactrocera zonata</i>										x	x	x	x	x	x	x							
<i>Ceratitis capitata</i>	x	x	x	x	x	x	x	x	x														
<i>Ceratitis cosyra</i>																							
<i>Ceratitis rosa</i>	x	x	x	x	x	x	x	x	x														
<i>Dacus ciliatus</i>																							
<i>Myopardalis pardalina</i>																							
<i>Rhagoletis cerasi</i>																							
<i>Rhagoletis pomonella</i>																							
<i>Toxotrypana curvicauda</i>																							

Attractant abbreviations

TML Trimedlure
 CE Capilure
 ME Methyl eugenol
 CUE Cuelure

Trap abbreviations

CC Cook and Cunningham (C&C) trap
 CH ChamP trap
 ET Easy trap
 JT Jackson trap

Trap abbreviations

LT Lynfield trap
 ST Steiner trap
 SE Sensus trap
 TP Tephri trap
 YP Yellow panel trap

Table 3b. Attractants and traps for female-biased fruit fly surveys

Fruit fly species	3C						2C ¹				2C ²	PA			SK+AC		AS (AA, AC)			BuH		MVP	
	ET	SE	MLT	OBDT	LT	TP	ET	MLT	LT	TP	MLT	ET	McP	MLT	CH	YP	RB	RS	YP	RS	YP	GS	
<i>Anastrepha fraterculus</i>													x	x									
<i>Anastrepha ludens</i>											x		x	x									
<i>Anastrepha obliqua</i>											x		x	x									
<i>Anastrepha striata</i>													x	x									
<i>Anastrepha suspensa</i>											x		x	x									
<i>Bactrocera carambolae</i>													x	x									
<i>Bactrocera caryeae</i>													x	x									
<i>Bactrocera citri</i>													x	x									
<i>Bactrocera correcta</i>													x	x									
<i>Bactrocera cucumis</i>													x	x									
<i>Bactrocera cucurbitae</i>				x									x	x									
<i>Bactrocera dorsalis</i>													x	x									
<i>Bactrocera invadens</i>				x									x	x									
<i>Bactrocera kandiensis</i>													x	x									
<i>Bactrocera latifrons</i>													x	x									
<i>Bactrocera minax</i>													x	x									
<i>Bactrocera occipitalis</i>													x	x									
<i>Bactrocera oleae</i>												x	x	x	x	x					x		
<i>Bactrocera philippinensis</i>													x	x									
<i>Bactrocera tau</i>													x	x									
<i>Bactrocera tryoni</i>													x	x									
<i>Bactrocera tsuneonis</i>													x	x									
<i>Bactrocera umbrosa</i>													x	x									
<i>Bactrocera zonata</i>				x									x	x									
<i>Ceratitis capitata</i>	x	x	x	x	x	x	x	x	x	x		x	x	x									
<i>Ceratitis cosyra</i>				x									x	x									
<i>Ceratitis rosa</i>			x	x									x	x									
<i>Dacus ciliatus</i>				x									x	x									
<i>Myopardalis pardalina</i>													x	x									
<i>Rhagoletis cerasi</i>																		x	x	x	x	x	
<i>Rhagoletis pomonella</i>																		x		x			
<i>Toxotrypana curvicauda</i>																							x

Attractant abbreviations

SK	Spiroketal
3C	(AA+Pt+TMA)
2C ¹	(AA+TMA)
2C ²	(AA+Pt)
AC	ammonium (bi)carbonate
AA	ammonium acetate

Attractant abbreviations

Pt	putrescine
TMA	trimethylamine
PA	protein attractant
BuH	butyl hexanoate
MVP	papaya fruit fly pheromone (2-methyl vinylpyrazine)

Trap abbreviations

CH	ChamP trap
ET	Easy trap
GS	Green sphere
LT	Lynfield trap
McP	McPhail trap
MLT	Multilure trap

Trap abbreviations

OBDT	Open bottom dry trap
RB	Rebell trap
RS	Red sphere
SE	Sensus
TP	Tephri trap
YP	Yellow panel trap

Table 4. List of attractants

Common name	Acronym	Formulation	Field longevity ¹ (weeks)	Survey programme			
				Monitoring/Detection		Delimiting	
				Inspection ² (days)	Service ³ (re bait) (weeks)	Inspection ² (days)	Service ³ (re bait) (weeks)
Para-pheromones							
Trimedlure	TML	Polymeric plug	4–10	7–14	6–10	2–3	4
		Laminate	3–6	7–14	4–6	2–3	3
		Liquid	1–4	7–14	2–4	2–3	1
Methyl eugenol	ME	Polymeric plug	4–10	7–14	8–10	2–3	4
		Liquid	4–8	7–14	6–8	2–3	4
Cuelure	CUE	Polymeric plug	4–10	7–14	8–10	2–3	4
		Liquid	4–8	7–14	6–8	2–3	4
Capilure (TML plus extenders)	CE	Liquid	12–36	7–14	12–26	2–3	12
Pheromones							
Papaya fruit fly (2-methyl-vinylpyrazine)	MVP	Patches	4–6	7–14	5–6	2–3	4
Olive Fly (spiroketal)	SK	Polymer	4–6	7–14	5–6	2–3	4
Food-based attractants							
Torula yeast/borax	PA	Pellet	1–2	7–14	2	2–3	1
Protein derivatives	PA	Liquid	1–2	7–14	2	2–3	1
Ammonium acetate	AA	Patches	4–6	7–14	5–6	2–3	4
		Liquid	1	7–14	1	2–3	1
		Polymer	2–4	7–14	3–4	2–3	2
Ammonium (bi)carbonate	AC	Patches	4–6	7–14	5–6	2–3	4
		Liquid	1	7–14	1	2–3	1
		Polymer	1–4	7–14	3–4	2–3	1
Ammonium salts	A	Salt	1	7–14	1	2–3	1
Putrescine	Pt	Patches	6–10	7–14	8–10	2–3	6
Trimethylamine	TMA	Patches	6–10	7–14	8–10	2–3	6
Butyl hexanoate	BuH	Vial	2	7–14	2	2–3	1
Ammonium acetate Putrescine Trimethylamine	3C	Cone/patches	6–10	7–14	8–10	2–3	6
Ammonium acetate Putrescine Trimethylamine	3C	Long-lasting patches	18–26	7–14	24–26	2–3	18
Ammonium acetate Trimethylamine	2C	Patches	6–10	7–14	8–10	2–3	6
Ammonium acetate Putrescine	2C	Patches	6–10	7–14	8–10	2–3	6

¹ Based on half-life.

² Inspection refers to checking traps for target fruit fly catches.

³ Service refers to rebaiting the trap based on half-life of the attractant.

In addition, because food-foraging female and male flies respond to synthetic food attractants at the sexually immature adult stage, these attractant types are capable of detecting female flies earlier and at lower population levels than liquid protein attractants.

3.2 Killing agents

Attracted flies are retained in a variety of traps. In some dry traps, killing agents are a sticky material or a toxicant such as dichlorvos, malathion, spinosad and pyrethroids (such as deltamethrin). Some organophosphates may act as a repellent at higher doses.

In other traps, liquid is the killing agent. When liquid protein attractants are used, 1.5 to 2 g of borax is added to preserve the captured fruit flies. There are protein attractants that are formulated with borax, and thus no additional borax is required. When water is used, 10% propylene glycol is added to preserve captured flies.

3.3 Trapping devices

Based on the killing agent, there are three types of traps commonly used:

- **Dry traps.** The fly is caught on a sticky material board or killed by a chemical agent. Some of the most widely used dry traps are Cook and Cunningham (C & C), ChamP, Jackson/Delta, Lynfield, Open bottom dry trap (OBDT) or Phase IV, Red sphere, Steiner and Yellow panel/Rebell.
- **Wet traps.** The fly is drowned in the attractant solution or in water with surfactant. One of the most widely used wet traps is the McPhail trap. The Harris trap is also a wet trap with a more limited use.
- **Dry or wet traps.** These traps can be used either dry or wet. Some of the most widely used are Easy trap, Multilure trap and Tephri trap.

Commonly used traps are described below.

Cook and Cunningham (C&C) Trap

General description

The C&C trap consists of three removable creamy white panels, spaced approximately 2.5 cm apart. The two outer panels are made of rectangular paperboard measuring 22.8 cm × 14.0 cm. One or both panels are coated with sticky material (Figure 1). The adhesive panel has one or more holes which allow air to circulate through. The trap is used with a polymeric panel containing an olfactory attractant (usually trimedlure), which is placed between the two outer panels. The polymeric panels come in two sizes – standard and half panel. The standard panel (15.2 cm × 15.2 cm) contains 20 g of TML, while the half size (7.6 cm × 15.2 cm) contains 10 g. The entire unit is held together with clips, and suspended in the tree canopy with a wire hanger.

Use

As a result of the need for economic highly sensitive delimiting trapping of *C. capitata*, polymeric panels were developed for the controlled release of greater amounts of TML. The C&C trap with its multi-panel construction has significant adhesive surface area for fly capture.

To be used for the following species: *Ceratitis capitata* (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

ChamP Trap



Figure 2. ChamP trap.

General description

The ChamP trap is a hollow, Yellow panel-type trap with two perforated sticky side panels. When the two panels are folded, the trap is rectangular in shape (18 cm × 15 cm), and a central chamber is created to place the attractant (Figure 2). A wire hanger placed at the top of the trap is used to place it on branches.

Use

The ChamP trap can accommodate patches, polymeric panels, and plugs. It is equivalent to a Yellow panel trap in sensitivity.

To be used for the following species: *Bactrocera oleae* and *Ceratitis capitata* (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

Easy Trap

General description

The Easy trap is a two-part rectangular plastic container with an inbuilt hanger. It is 14.5 cm high, 9.5 cm wide, 5 cm deep and can hold 400 ml of liquid (Figure 3). The front part is transparent and the rear part is yellow. The transparent front of the trap contrasts with the yellow rear enhancing the trap's ability to catch fruit flies. It combines visual effects with para-pheromone and food-based attractants.

Use

The trap is multipurpose. It can be used dry baited with para-pheromones (e.g. TML, CUE, ME) or synthetic food attractants (e.g. 3C and 2C attractants) and a retention system such as dichlorvos. It can also be used wet baited with liquid protein attractants holding up to 400 ml of mixture. When synthetic food attractants are used, one of the dispensers (the one containing putrescine) is attached inside to the yellow part of the trap and the other dispensers are left free.

The Easy trap is one of the most economic traps commercially available. It is easy to carry, handle and service, providing the opportunity to service a greater number of traps per man-hour than some other traps.

To be used for the following species: all fruit fly species (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

Jackson Trap (JT) or Delta Trap

General description

The Jackson trap is hollow, delta shaped and made of a white waxed cardboard. It is 8 cm high, 12.5 cm long and 9 cm wide (Figure 4). Additional parts include a white or yellow rectangular insert of waxed cardboard which is covered with a thin layer of adhesive known as "sticky material" used to trap flies once they land inside the trap body; a polymeric plug or cotton wick in a plastic basket or wire holder; and a wire hanger placed at the top of the trap body.

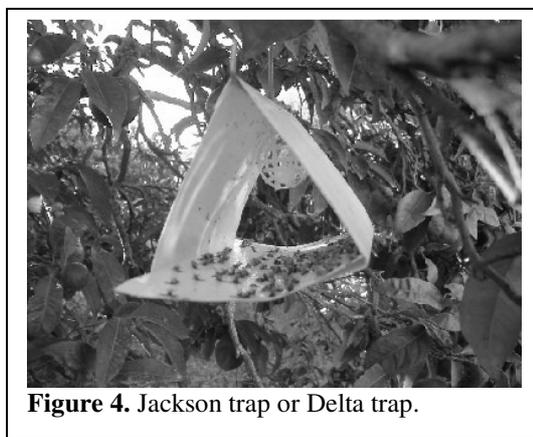


Figure 4. Jackson trap or Delta trap.

Use

This trap is mainly used with para-pheromone attractants to capture male fruit flies. The attractants used with JT/Delta traps are TML, ME and CUE. When ME and CUE are used a toxicant must be added.

For many years this trap has been used in exclusion and control programmes for multiple purposes, including population ecology studies (seasonal abundance, distribution, host sequence, etc.); detection and delimiting trapping; and surveying sterile fly populations in areas subjected to sterile fly mass releases. JT/Delta may not be suitable for some environmental conditions (e.g. rain or dust).

The JT/Delta traps are some of the most economic traps commercially available. They are easy to carry, handle and service, providing the opportunity of servicing a greater number of traps per man-hour than some other traps.

To be used for the following genus: *Bactrocera* spp., *Ceratitis* spp. and *Dacus* spp. (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

Lynfield Trap (LT)

General description

The conventional Lynfield trap consists of a disposable, clear plastic, cylindrical container measuring 11.5 cm high with a 10 cm diameter base and 9 cm diameter screw-top lid. There are four entry holes evenly spaced around the wall of the trap (Figure 5). Another version of the Lynfield trap is the Morocco trap (Figure 6).



Figure 3. Easy trap.

Use

The trap uses an attractant and insecticide system to attract and kill target fruit flies. The screw-top lid is usually colour-coded to the type of attractant being used (red, CAP/TML; white, ME; yellow, CUE). To hold the attractant a 2.5 cm screw-tip cup hook (opening squeezed closed) screwed through the lid from above is used. The trap uses the male-specific para-pheromone attractants CUE, Capilure (CE), TML and ME.



Figure 6. Morocco trap.

CUE and ME attractants, which are ingested by the male fruit fly, are mixed with malathion. However, because CE and TML are not ingested by either *C. capitata* or *C. rosa*, a dichlorvos-impregnated matrix is placed inside the trap to kill flies that enter.

To be used for the following species: *Bactrocera* spp. (including *B. tryoni*) and *Ceratitis* spp. (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.



Figure 5. Lynfield trap.

McPhail (McP) Trap type**General description**

The conventional McPhail (McP) trap is a transparent glass or plastic, pear-shaped invaginated container. The trap is 17.2 cm high and 16.5 cm wide at the base and holds up to 500 ml of solution (Figure 7). The trap parts include a rubber cork or plastic lid that seals the upper part of the trap and a wire hook to hang traps on tree branches. A plastic version of the McPhail trap is 18 cm high and 16 cm wide at the base and holds up to 500 ml of solution (Figure 8). The top part is transparent and the base is yellow.

Use

For this trap to function properly it is essential that the body stays clean.

Some designs have two parts in which the upper part and base of the trap can be separated allowing for easy service (rebaiting) and inspection of fruit fly catches.



Figure 8. Plastic McPhail trap.

This trap uses a liquid food attractant, based on hydrolysed protein or torula yeast/borax tablets. Torula tablets are more effective than hydrolysed proteins over time because the pH is stable at 9.2. The level of pH in the mixture plays an important role in attracting fruit flies. Fewer fruit flies are attracted to the mixture as the pH becomes more acidic.

To bait with yeast tablets, mix three to five torula tablets in 500 ml of water. Stir to dissolve tablets. To bait with protein hydrolysate, mix protein hydrolysate and borax (if not already added to the protein) in water to reach 5–9% hydrolysed protein concentration and 3% of borax.

The nature of its attractant means this trap is more effective at catching females. Food attractants are generic by nature, and so McP traps tend to also catch a wide range of other non-target tephritid and non-tephritid flies in addition to the target species.



Figure 7. McPhail trap.

McP-type traps are used in fruit fly management programmes in combination with other traps. In areas subjected to suppression and eradication actions, these traps are used mainly to track female populations. Female catches are crucial in assessing the amount of sterility induced to a wild population in a sterile insect technique (SIT) programme. In programmes releasing only sterile males or in a male annihilation technique (MAT) programme, MCP traps are used as a population detection tool by targeting feral females, whereas Jackson traps, used with male-specific attractants, catch the released sterile males, and their use should be limited to programmes with an SIT component. Furthermore, in fly-free areas, MCP traps are an important part of the exotic fruit-fly trapping network because of their capacity to catch fruit fly species of quarantine importance for which no specific attractants exist.

McP traps with liquid protein attractant are labour intensive. Servicing and rebaiting take time, and the number of traps that can be serviced in a normal working day is half that of some other traps described in this guideline.

To be used for the following species: all fruit flies species (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

Multilure Trap

General description

The Multilure trap (MLT) is a version of the McPhail trap described previously. The trap is 18 cm high and 15 cm wide at the base and can hold up to 750 ml of liquid (Figure 9). It consists of a two-piece plastic invaginated cylinder-shaped container. The top part is transparent and the base is yellow. The upper part and base of the trap separate, allowing the trap to be serviced and rebaited. The transparent upper part of the trap contrasts with the yellow base enhancing the trap's ability to catch fruit flies. A wire hanger, placed on top of the trap body, is used to hang the trap from tree branches.

Use

This trap follows the same principles as those of the McP. However, an MLT used with dry synthetic attractant is more efficient and selective than an MLT or McP used with liquid protein attractant. Another important difference is that an MLT with a dry synthetic attractant allows for a cleaner servicing and is much less labour intensive than a McP trap. When synthetic food attractants are used, dispensers are attached to the inside walls of the upper cylindrical part of the trap or hung from a clip at the top. For this trap to function properly it is essential that the upper part stays transparent.



Figure 9. Multilure trap.

When the MLT is used as a wet trap a surfactant should be added to the water. In hot climates 10% propylene glycol can be used to decrease water evaporation and decomposition of captured flies.

When the MLT is used as a dry trap, a suitable (non-repellent at the concentration used) insecticide such as dichlorvos or a deltamethrin (DM) strip is placed inside the trap to kill the flies. DM is applied to a polyethylene strip placed on the upper plastic platform inside the trap. Alternatively, DM may be used in a circle of impregnated mosquito net and will retain its killing effect for at least six months under field conditions. The net must be fixed on the ceiling inside the trap using adhesive material.

To be used for the following species: all fruit flies species (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

Open Bottom Dry Trap or (Phase IV) Trap



Figure 10. Open bottom dry trap (Phase IV).

General description

This trap is an open-bottom cylindrical dry trap that can be made from opaque green plastic or wax-coated green cardboard. The cylinder is 15.2 cm high and 9 cm in diameter at the top and 10 cm in diameter at the bottom (Figure 10). It has a transparent top, three holes (each of 2.5 cm diameter) equally spaced around the wall of the cylinder midway between the ends, and an open bottom, and is used with a sticky insert. A wire hanger, placed on top of the trap body, is used to hang the trap from tree branches.

Use

A food-based synthetic chemical attractant can be used to capture female and male *C. capitata*. Synthetic attractants for female fruit flies are attached to the inside walls of the cylinder. Servicing is easy because the sticky insert permits easy removal and replacement, similarly to the inserts used in the JT. This trap is less expensive than the plastic or glass McP-type traps.

To be used for the following species: *Ceratitis capitata* (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

Red Sphere Trap

General description

The trap is a red sphere 8 cm in diameter (Figure 11). The trap mimics the size and shape of a ripe apple. The trap is covered with a sticky material and baited with the synthetic fruit odour butyl hexanoate, which has a fragrance like a ripe fruit. Attached to the top of the sphere is a wire hanger used to hang it from tree branches.

Use

The red sphere trap can be used unbaited, but it is much more efficient in catching flies when baited. Flies that are sexually mature and ready to lay eggs are attracted to this trap.

Many types of insects will be caught by these traps. If the traps are used as a way to time insecticide sprays, it will be necessary to positively identify the target fly from the non-target insects likely to be present on the traps.

To be used for the following species: *Rhagoletis pomonella* (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.



Figure 11. Red sphere trap.

Sensus Trap



Figure 12. Sensus trap.

General description

The Sensus trap consists of a vertical plastic bucket 12.5 cm in high and 11.5 cm in diameter (Figure 12). It has a transparent body and a blue overhanging lid which has a hole just underneath it. A wire hanger placed on top of the trap body is used to hang the trap from tree branches.

Use

The trap is dry and uses male-specific para-pheromones or, for female-biased captures, dry synthetic food attractants. A dichlorvos block is placed in the comb on the lid to kill the flies.

To be used for the following species: *Ceratitis capitata* and *C. rosa* (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

Steiner Trap

General description

The Steiner trap is a horizontal, clear plastic cylinder with openings at each end. The conventional Steiner trap is 14.5 cm long and 11 cm in diameter (Figure 13). Other versions of the Steiner traps are 12 cm long and 10 cm in diameter (Figure 14) and 14 cm long and 8.5 cm in diameter (Figure 15). A wire hanger, placed on top of the trap body, is used to hang the trap from tree branches.

Use

This trap uses the male-specific para-pheromone attractants TML, ME and CUE.

The attractant is suspended from the centre of the inside of the trap. The attractant may be a cotton wick soaked in 2–3 ml of a mixture of para-pheromone or a dispenser with the attractant and an insecticide (usually malathion, dibrom or deltamethrin) as a killing agent.

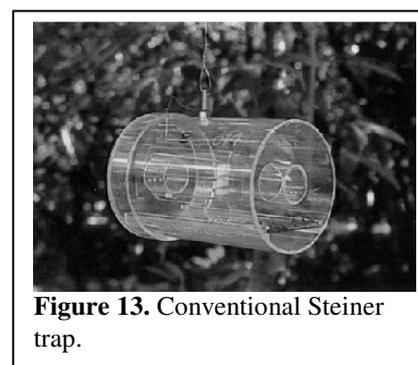


Figure 13. Conventional Steiner trap.

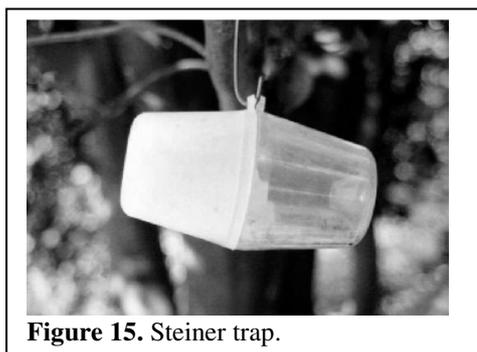


Figure 15. Steiner trap.



Figure 14. Steiner trap.

To be used for the following species: *Ceratitis capitata*, *Bactrocera* spp. and *Dacus* spp. (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

Tephri Trap



Figure 16. Tephri trap.

General description

The Tephri trap is similar to a McP trap. It is a vertical cylinder 15 cm high and 12 cm in diameter at the base and can hold up to 450 ml of liquid (Figure 16). It has a yellow base and a clear top, which can be separated to facilitate servicing. There are entrance holes around the top of the periphery of the yellow base, and an invaginated opening in the bottom. Inside the top is a platform to hold attractants. A wire hanger, placed on top of the trap body, is used to hang the trap from tree branches.

Use

The trap is baited with hydrolysed protein at 9% concentration; however, it can also be used with other liquid protein attractants as described for the conventional glass McP trap or with the female dry synthetic food attractant and with TML in a plug or liquid as described for the JT/Delta and Yellow panel traps. If the trap is used with liquid protein attractants or with dry synthetic attractants combined with a liquid retention system and without the side holes, the insecticide will not be necessary. However, when used as a

dry trap and with side holes, an insecticide solution (e.g. malathion) soaked into a cotton wick or other killing agent is needed to avoid escape of captured insects. Other suitable insecticides are dichlorvos or deltamethrin (DM) strips placed inside the trap to kill the flies. DM is applied in a polyethylene strip, placed on the plastic platform inside the top of the trap. Alternatively, DM may be used in a circle of impregnated mosquito net and will retain its killing effect for at least six months under field conditions. The net must be fixed on the ceiling of the inside of the trap using adhesive material.

To be used for the following species: *Bactrocera oleae*, *Ceratitis capitata*, *Rhagoletis cerasi* (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

Yellow Panel Trap/Rebell Trap

General description

The Yellow panel (YP) trap consists of a yellow rectangular cardboard plate (23 cm × 14 cm) coated with plastic (Figure 17). The rectangle is covered on both sides with a thin layer of sticky material. The Rebell trap is a three-dimensional YP-type trap with two crossed yellow rectangular plates (15 cm × 20 cm) made of plastic (polypropylene) making them extremely durable (Figure 18). The trap is also coated with a thin layer of sticky material on both sides of both plates. A wire hanger, placed on top of the trap body, is used to hang it from tree branches.

Use

These traps can be used as visual traps alone and baited with TML, spiroketal or ammonium salts (ammonium acetate). The attractants may be contained in controlled-release dispensers such as a polymeric plug. The attractants are attached to the face of the trap. The attractants can also be mixed into the cardboard's coating. The two-dimensional design and greater contact surface make these traps more efficient, in terms of fly catches, than the JT and McPhail-type traps. It is important to consider that these traps require special procedures for transportation, submission and fly screening methods because they are so sticky that specimens can be destroyed in handling. Although these traps can be used in most types of control programme applications, their use is recommended for the post-eradication phase and for fly-free areas, where highly sensitive traps are required. These traps should not be used in areas subjected to mass release of sterile flies because of the large number of released flies that would be caught. It is important to note that their yellow colour and open design allow them to catch other non-target insects including natural enemies and pollinators.



Figure 18. Rebell trap.



Figure 17. Yellow panel trap.

To be used for the following species: (YP or Rebell) *Ceratitis* spp. and *Rhagoletis* spp.; (YP only) *Bactrocera oleae* (Table 2).

For attractants used and rebaiting, see Tables 3 and 4.

For use under different scenarios and recommended densities, see Table 5.

3.4. Trapping procedures

3.4.1 Layout of trapping network

In suppression and eradication programmes, an extensive trapping network should be deployed over the entire area subject to survey and control actions.

The trapping network layout will depend on the intrinsic characteristics of the area. In areas where continuous compact blocks of commercial orchards are present and in urban and suburban areas where hosts exist, traps are usually deployed in a grid system which may have a uniform distribution.

In areas with scattered commercial orchards, rural areas with fruit hosts and in marginal areas where commercial and wild hosts exist, trap network arrays are normally distributed along roads that provide access to host material.

Trapping networks are also placed as part of exclusion programmes for early detection of introduced fruit flies of quarantine importance. In this case traps are placed in high-risk areas such as points of entry, fruit markets and urban areas, as appropriate.

3.4.2 Trap deployment (placement)

Trap deployment involves the actual placement of the traps in the field. One of the most important factors of trap deployment is selecting a proper trap site. It is of vital importance to have a list of the primary, secondary and occasional fruit fly hosts, their phenology, distribution and abundance. With this basic information, it is possible to properly place and distribute the traps in the field, and it also allows for effective planning of a programme of trap relocation.

When possible, pheromone traps should be placed in mating areas. Fruit flies normally mate in the crown of host plants or close by, selecting semi-shaded spots and usually on the upwind side of the crown. Other suitable trap sites are resting and feeding areas in plants that provide shelter and protect flies from strong winds and predators.

Protein traps should be deployed in shaded areas in host plants. In this case traps should be deployed in primary host plants during their fruit maturation period. In the absence of primary host plants, secondary host plants should be used. In areas with no host plants identified as potential fruit fly pathways, traps should be deployed in plants that can provide shelter, protection and food to adult fruit flies.

Traps should be deployed in the middle to the top part of the host plant canopy, depending on the height of the host plant, and oriented towards the upwind side. Traps should not be exposed to direct sunlight, strong winds or dust. It is of vital importance to have the trap entrance clear from twigs, leaves and other obstructions such as spider webs to allow proper air flow and easy access for the fruit flies.

Placement of traps in the same tree baited with different attractants should be avoided because it may cause interference among attractants and a reduction of trap efficiency. For example, placing a *C. capitata* male-specific TML trap and a protein attractant trap in the same tree will cause a reduction of female catches in the protein traps because TML acts as a female repellent.

Traps have to be relocated following the maturation phenology of the primary fruit hosts. By relocating the traps it is possible to follow the fruit fly population throughout the year and increase the number of sites being checked for fruit flies.

3.4.3 Trap mapping

Once traps are placed in carefully selected sites at the correct density and distributed in an adequate array, the location of the traps must be recorded. It is recommended that the location of traps should be geo-referenced with use of the global positioning system (GPS) equipment. A map or sketch of the trap location and the area around the traps should be prepared.

The application of the GPS and geographic information systems (GIS) in the management of trapping network has proved to be a very powerful tool. The GPS allows each trap to be geo-referenced through geographical coordinates, which are then used as input information in the GIS.

If GPS is not available, the references of the trap location should include visible landmarks, and in the case of traps placed in host plants located in suburban and urban areas, references should include the full address of the property where the trap was placed. The trap reference should be clear enough to allow trappers, control brigades and supervisors to find the trap easily.

A database or trapping book of all traps with their corresponding coordinates is kept, together with the records of trap services, rebaiting, trap catches etc. GIS provides high-resolution maps showing the exact location of each trap and other valuable information such as exact location of fly finds (incursions or outbreaks), historical profiles of the geographical distribution patterns of the pest, and relative size of the populations in given areas. This information is extremely useful in planning control activities, ensuring that bait sprays and sterile fly releases are accurately placed and cost-effective in their application.

3.4.4 Trap servicing and inspection

Trap servicing intervals are specific to each trap system. Capturing flies will depend, in part, on how well the trap is serviced. Trap servicing includes rebaiting and maintaining the trap in a clean and proper operating condition.

Attractants have to be used in the proper volumes and concentrations and replaced at the recommended intervals. The release rate of attractants varies considerably with environmental conditions. The release rate is generally high in hot and dry areas, and low in cool and humid areas. Thus, in cool climates traps may have to be rebaited less often than in hot conditions.

Inspection intervals (i.e. checking for fruit fly catches) should be adjusted according to the prevailing environmental conditions and control situations. The interval can range from one day up to 30 days. However, the most common inspection interval is seven days in areas where fruit fly populations are present and 14 days in fruit fly free areas. In the case of delimiting surveys inspection intervals may be more frequent (Table 4).

When changing attractants it is important to avoid spillage or contamination of the external surface of the trap body or the ground. Attractant spillage or trap contamination would reduce the chances of flies entering the trap. For traps that use a sticky insert to capture flies, it is important to avoid contaminating areas in the trap that are not meant for catching flies with the sticky material. This also applies for leaves and twigs that are in the trap surroundings.

The number of traps serviced per day per person will vary depending on type of survey, environmental and topographic conditions and trapper experience.

3.4.5 Trapping records

The following information must be included in order to keep proper trapping records: trap location, plant where the trap is placed, trap and attractant type, servicing and inspection dates, and target fly capture. Any other information considered necessary can be added to the trapping records. The trapping records should be retained for at least 24 months and made available to the NPPO of the importing country on request.

3.4.6 Flies per trap per day

Flies per trap per day (FTD) is a population index that indicates the average number of flies of the target species captured per trap per day during a specified period in which the trap was exposed in the field.

The function of this population index is to have a comparative measure of the size of the adult pest population in a given space and time.

It is used as baseline information to compare the size of the population before, during and after the application of a fruit fly control programme. The FTD should be used in all report of trapping surveys.

The FTD is comparable within a programme; however, for meaningful comparisons between programmes, it should be based on the same fruit fly species, trapping system and trap density.

In areas where sterile flies are being released it is used to measure the relative abundance of the sterile and wild flies.

FTD is obtained by dividing the total number of captured flies by the product obtained from multiplying the total number of inspected traps by the average number of days the traps were exposed. The formula is as follows:

$$\text{FTD} = \frac{F}{T \times D}$$

where,

F = total number of flies

T = number of inspected traps

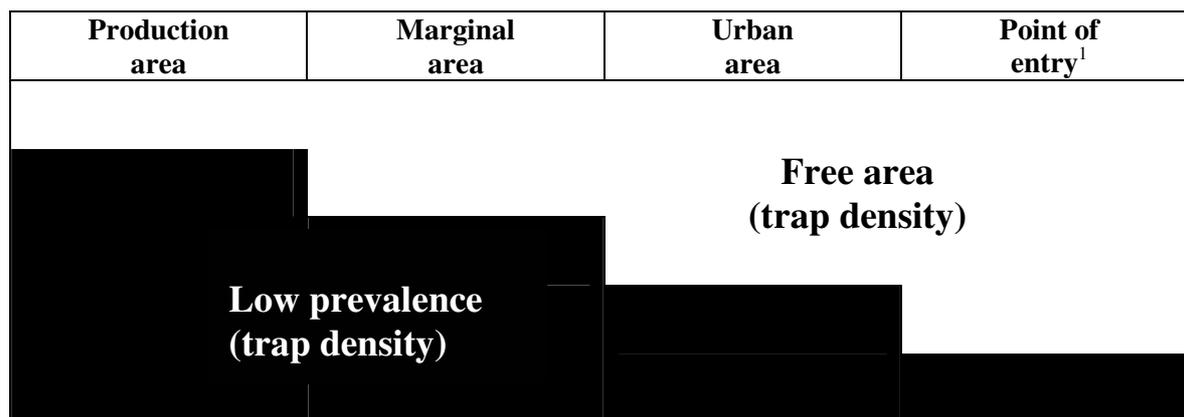
D = average number of days traps were exposed in the field.

4. Trap Densities

Trap density is critical for fruit fly surveys. The trap densities need to be adjusted based on many factors including type of survey, trap efficiency, location regarding type and presence of host, climate, topography and programme phase. In terms of type and presence of hosts, as well as the risk involved, the following types of location are of concern:

- production areas
- marginal areas
- urban areas
- points of entry (and other high-risk areas such as fruit markets).

Trap densities have to vary as a gradient from production areas to marginal areas, urban areas and points of entry. For example, in a pest free area, a higher density of traps is required at points of entry and a lower density in commercial orchards (Figure 19). Or, in an area where suppression is applied, such as in a low prevalence area or an area under a systems approach where the target species is present, the reverse occurs, and trapping densities for that pest should be higher in the production field and decrease toward points of entry (Figure 19).



Also applies to other high-risk areas.

Figure 19. Relative trapping densities required according to the status and type of areas

Tables 5a–5f show recommended trap densities for various fruit fly species. Trap densities are also dependent on associated survey activities, such as the type and intensity of fruit sampling to detect immature stages of fruit flies. In those cases where trapping survey programmes are complemented with equivalent fruit sampling activities, trap densities can be lower than the recommended densities shown in Table 5.

The density recommendations presented in Table 5 have been made taking into account:

- various survey objectives and control situations (Table 1)
- fruit flies of economic importance (Table 2)
- production and other areas (Figure 19).

Table 5a. Trap densities for *Anastrepha* spp.

Scenario	Trap type ¹	Attractant	Trap density/km ² (2)			
			Production area	Marginal	Urban	Points of entry ³
A. Monitoring survey, no control	MLT/McP	2C/PA	0.25–1	0.25–0.5	0.25–0.5	0.25–0.5
B. Monitoring survey for suppression	MLT/McP	2C/PA	2–4	1–2	0.25–0.5	0.25–0.5
C. Monitoring survey for eradication	MLT/McP	2C/PA	3–5	3–5	3–5	3–5
D. Detection survey for exclusion	MLT/McP	2C/PA	1–2	2–3	3–5	5–12
E. Delimitation survey after incursion in addition to detection survey	MLT/McP	2C/PA	20–50 ⁴	20–50	20–50	20–50

¹ Different traps can be combined to reach the total number.

(2) Refers to the total number of traps.

³ Also other high-risk sites.

⁴ This range includes high-density trapping in the immediate area of the detection (core area) and decreasing towards the surrounding trapping zones.

Trap type

McP McPhail trap
MLT Multilure trap

Attractant

2C (AA+Pt)
PA protein attractant

Table 5b. Trap densities for *Bactrocera* spp. responding to methyl eugenol (ME), cuelure (CUE) and food attractants¹ (PA = protein attractants)

Scenario	Trap type ²	Attractant	Trap density/km ²⁽³⁾			
			Production area	Marginal	Urban	Points of entry ⁴
A. Monitoring survey, no control	JT/ST/TP/LT/MLT/McP/TP	ME/CUE/PA	0.5–1.0	0.25–0.5	0.25–0.5	0.25–0.5
B. Monitoring survey for suppression	JT/ST/TP/LT/MLT/McP/TP	ME/CUE/PA	2–4	1–2	0.25–0.5	0.25–0.5
C. Monitoring survey for eradication	JT/ST/TP/MLT/LT/McP/TP	ME/CUE/PA	3–5	3–5	3–5	3–5
D. Detection survey for exclusion	CH/ST/LT/MLT/McP/TP/YP	ME/CUE/PA	1	1	1–5	3–12
E. Delimitation survey after incursion in addition to detection survey	JT/ST/TP/MLT/LT/McP/YP	ME/CUE/PA	20–50 ⁵	20–50	20–50	20–50

¹ *Bactrocera zonata*, *B. invadens*, *B. cucurbitae* (3- and 2-component lures and other ammonium-based synthetic food lures).

² Different traps can be combined to reach the total number.

⁽³⁾ Refers to the total number of traps.

⁴ Also other high-risk sites.

⁵ This range includes high-density trapping in the immediate area of the detection (core area) and decreasing towards the surrounding trapping zones.

Trap type

CH ChamP trap
JT Jackson trap
LT Lynfield trap
McP McPhail trap

MLT Multilure trap
ST Steiner trap
TP Tephri trap
YP Yellow panel trap

Table 5c. Trap densities for *Bactrocera oleae*

Scenario	Trap type ¹	Attractant	Trap density/km ²⁽²⁾			
			Production area	Marginal	Urban	Points of entry ³
A. Monitoring survey, no control	MLT/CH/YP	AC+SK/PA	0.5–1.0	0.25–0.5	0.25–0.5	0.25–0.5
B. Monitoring survey for suppression	MLT/CH/YP	AC+SK/PA	2–4	1–2	0.25–0.5	0.25–0.5
C. Monitoring survey for eradication	MLT/CH/YP	AC+SK/PA	3–5	3–5	3–5	3–5
D. Detection survey for exclusion	MLT/CH/YP	AC+SK/PA	1	2	2–5	3–12
E. Delimitation survey after incursion in addition to detection survey	MLT/CH/YP	AC+SK/PA	20–50 ⁴	20–50	20–50	20–50

¹ Different traps can be combined to reach the total number.

⁽²⁾ Refers to the total number of traps.

³ Also other high-risk sites.

⁴ This range includes high-density trapping in the immediate area of the detection (core area) and decreasing towards the surrounding trapping zones.

Trap type

CH ChamP trap
MLT Multilure trap
YP Yellow panel trap

Attractant

AC ammonium bicarbonate
PA protein attractants
SK Spiroketal

Table 5d. Trap densities for *Ceratitis* spp.

Scenario	Trap type ¹	Attractant	Trap density/km ² (²)			
			Production area	Marginal	Urban	Points of entry ³
A. Monitoring survey, no control ⁴	JT/MLT/OBDT/ST/SE/ET/LT/TP	TML/CE/3C/2C/PA	0.5–1.0	0.25–0.5	0.25–0.5	0.25–0.5
B. Monitoring survey for suppression ⁴	JT/MLT/OBDT/ST/SE/ET/LT/TP	TML/CE/3C/2C/PA	2–4	1–2	0.25–0.5	0.25–0.5
C. Monitoring survey for eradication ⁵	JT/MLT/OBDT/ST/ET/LT/TP	TML/CE/3C/2C/PA	3–5	3–5	3–5	3–5
D. Detection survey for exclusion ⁵	JT/MLT/ST/ET/LT/CC	TML/CE/3C/PA	1	1-2	1-5	3–12
E. Delimitation survey after incursion in addition to detection survey ⁶	JT/YP/MLT/OBDT/ST//ET/LT/TP	TML/CE/3C/PA	20–50	20–50	20–50	20–50

¹ Different traps can be combined to reach the total number.

(²) Refers to the total number of traps.

³ Also other high-risk sites.

⁴ 1:1 ratio (1 female trap per male trap).

⁵ 3:1 ratio (3 female traps per male trap).

⁶ This range includes high-density trapping in the immediate area of the detection (core area) and decreasing towards the surrounding trapping zones (ratio 5:1, 5 female traps per male trap).

Trap type

CC	Cook and Cunningham (C&C) Trap (with TML for male capture)
ET	Easy trap (with 2C and 3C lures for female-biased captures)
LT	Lynfield trap (with TML for male capture)
JT	Jackson trap (with TML for male capture)
MLT	Multilure trap (with 2C and 3C lures for female-biased captures)
OBDT	Open Bottom Dry Trap (with 2C and 3C lures for female-biased captures)
ST	Steiner trap (with TML for male capture)
SE	Sensus trap (with CE for male captures and with 3C for female-biased captures)
TP	Tephri trap (with 2C and 3C lures for female-biased captures)
YP	Yellow panel trap

Attractant

2C	(AA+TMA)
3C	(AA+Pt+TMA)
AA	Ammonium acetate
CE	Capilure
PA	Protein attractant
Pt	Putrescine
TMA	Trimethylamine
TML	Trimedlure

Table 5e. Trap densities for *Rhagoletis* spp.

Scenario	Trap type ¹	Attractant	Trap density/km ² (²)			
			Production area	Marginal	Urban	Points of entry ³
A. Monitoring survey, no control	RB/RS/YP/McP	BuH/AS	0.5–1.0	0.25–0.5	0.25–0.5	0.25–0.5
B. Monitoring survey for suppression	RB/RS/YP/McP	BuH/AS	2–4	1–2	0.25–0.5	0.25–0.5
C. Monitoring survey for eradication	RB/RS/YP/McP	BuH/AS	3–5	3–5	3–5	3–5
D. Detection survey for exclusion	RB/RS/YP/McP	BuH/AS	1	2–3	3–5	4–12
E. Delimitation survey after incursion in addition to detection survey	RB/RS/YP/McP	BuH/AS	20–50 ⁴	20–50	20–50	20–50

¹ Different traps can be combined to reach the total number.

(²) Refers to the total number of traps.

³ Also other high-risk sites.

⁴ This range includes high-density trapping in the immediate area of the detection (core area) and decreasing towards the surrounding trapping zones.

Trap type

McP McPhail trap
 RB Rebell trap
 RS Red sphere trap
 YP Yellow panel trap

Attractant

AS Ammonium salt
 BuH Butyl hexanoate

Table 5f. Trap densities for *Toxotrypana curvicauda*

Scenario	Trap type ¹	Attractant	Trap density/km ² ⁽²⁾			
			Production area	Marginal	Urban	Points of entry ³
A. Monitoring survey, no control	GS	MVP	0.25–0.5	0.25–0.5	0.25–0.5	0.25–0.5
B. Monitoring survey for suppression	GS	MVP	2–4	1	0.25–0.5	0.25–0.5
C. Monitoring survey for eradication	GS	MVP	3–5	3–5	3–5	3–5
D. Detection survey for exclusion	GS	MVP	2	2–3	3–6	5–12
E. Delimitation survey after incursion in addition to detection survey	GS	MVP	20–50 ⁴	20–50	20–50	20–50

¹ Different traps can be combined to reach the total number.

⁽²⁾ Refers to the total number of traps.

³ Also other high-risk sites.

⁴ This range includes high-density trapping in the immediate area of the detection (core area) and decreasing towards the surrounding trapping zones.

Trap type

GS Green sphere

Attractant

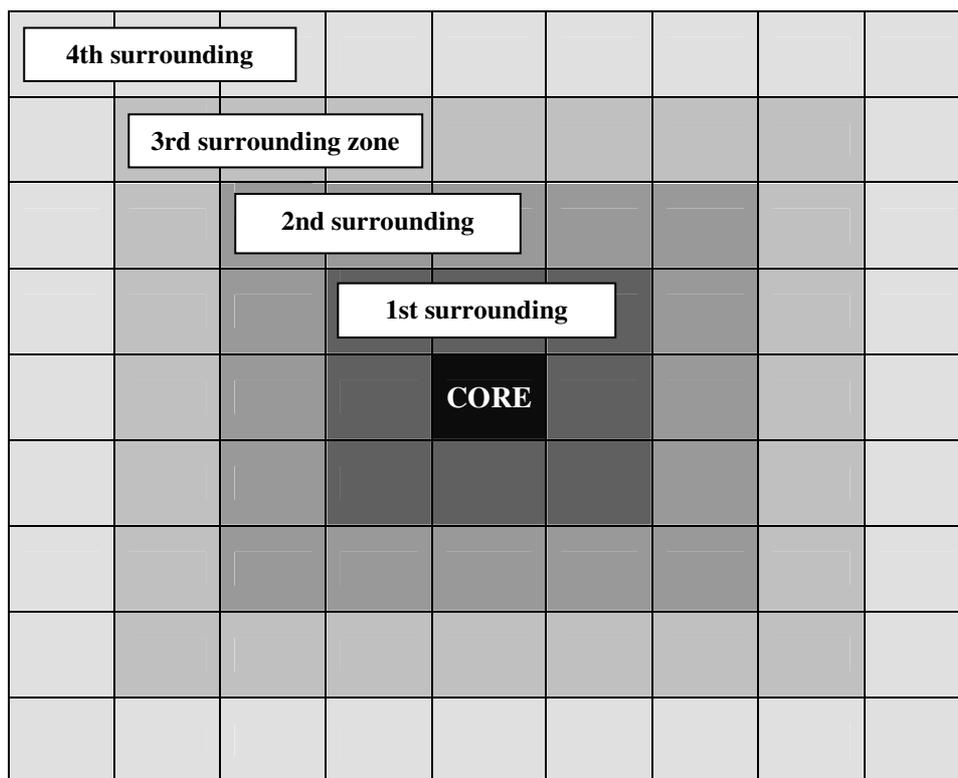
MVP Papaya fruit fly pheromone (2-methyl-vinyl-pyrazine)

5. Delimiting Surveys

A delimiting survey is designed to determine the boundaries of an incursion into a fruit fly free area and to determine if it is an outbreak. The trap density may vary by situation, but there are some commonalities. The area immediately surrounding each find is termed a core area. The core area is defined by a set radius surrounding each find. The area defined by this radius is often squared off to produce a grid. The trapping density in the core area is higher than that used for detection surveys. Around the core area may be one or more surrounding zones where the trap density is higher than for detection surveys but usually lower than that of the core area, as appropriate. Trap densities in the surrounding zones may be proportionally tiered in a decreasing density the further away they are from the core area. Examples of delimiting surveys for single and multiple core areas are presented in Figures 20 and 21, respectively.

A delimiting survey must be implemented as soon as possible after the initial detection of a targeted fly. The duration of a delimiting survey should be dependent on the developmental biology of the species. In general, delimiting survey trapping occurs for three life cycles past the last find for multivoltine species. However, one or two generations may be used for particular situations or fly species based on scientific information, as well as that provided by the surveillance system in place.

Figure 20. Example of delimiting survey using single km² core and surrounding zones for various flies (number of traps per km²)



Surrounding zones	km ²	<i>Anastrepha</i> McP	<i>Bactrocera</i> spp. CUE + McP (McP core only)	<i>B. dorsalis</i> ME + McP (McP core only)	<i>Ceratitis capitata</i> TML + MLT (MLT core only)
Core	1	32	20 + 10	10 + 10	40 + 10
1st	8	16	10	2	20
2nd	16	8	6	2	10
3rd	24	4	4	2	8
4th	32	2	2	2	4

Figure 21. Sample delimiting survey showing a multiple km² core and surrounding zones (number in squares represent traps per km²)

10	10	10	10	10	10	10	10
10	10	10	10	10	10	10	10
10	10	20	20	20	20	10	10
10	10	20	40	40	20	10	10
10	10	20	40	40	20	10	10
10	10	20	20	20	20	10	10
10	10	10	10	10	10	10	10
10	10	10	10	10	10	10	10

Surrounding zones	km ²	Number of traps per km ²	Total traps
Core	4	40	160
1st	12	20	240
2nd	48	10	480

6. Supervision Activities

Supervision of trapping activities includes assessing the quality of the materials used and reviewing the effectiveness of the use of these materials and trapping procedures.

The materials used should perform effectively and reliably at an acceptable level for a prescribed period of time. The traps themselves should maintain their integrity for the entire duration that they are anticipated to remain in the field. The attractants should be certified or bioassayed for an acceptable level of performance based on their anticipated use.

Formal independent evaluations should occur periodically to assess the effectiveness of the trapping survey. In order to allow for an independent evaluation, formal evaluations of the trapping programme should be conducted by someone who is not a part of the trapping programme. The timing of evaluations will vary by programme, but it is recommended to occur at least twice a year in programmes that run for six months or more. The evaluation addresses all aspects related to the ability of the trapping programme to detect targeted pests in a timely manner. Aspects of an evaluation include quality of trapping materials, record-keeping, layout of the trapping network, trap mapping, trap placement, trap condition, trap servicing, trap inspection frequency and capability for fruit fly identification.

The trap deployment should be evaluated to ensure that the prescribed types and densities of traps are in place. Field confirmation is achieved through inspection of individual routes.

Trap placement should be evaluated for proper host selection, trap relocation schedule, height, light/shade balance, fly access to trap, and proximity to other traps. Host selection, trap relocation and proximity to other traps can be evaluated from the records for each trap route. Host selection, placement and proximity can be further evaluated by field examination.

Proper record-keeping is key to the proper functioning of a trapping programme. The records for each trap route should be inspected to ensure that they are complete and up to date. Field confirmation can then be used to validate the accuracy of the records.

Traps should be evaluated for their overall condition, correct attractant, proper trap servicing and inspection intervals, correct identifying markings (such as trap identification and date placed), evidence of contamination and proper warning labels. This is performed in the field at each site where a trap is placed.

Evaluation of identification capability can occur via target flies that have been marked in some manner in order to distinguish them from wild trapped flies. These marked flies are placed in traps in order to evaluate the trapper's diligence in servicing the traps, competence in recognizing the targeted species, and knowledge of the proper reporting procedures once a fly is found. Commonly used marking systems are fluorescent dyes and/or wing clipping. In some programmes that survey for eradication or exclusion, the flies may also be marked by using sterile irradiated flies in order to further reduce the chances of the marked fly being falsely identified as a wild fly and resulting in unnecessary actions by the programme. A slightly different method is necessary under a sterile fly release programme in order to evaluate the screeners on their ability to accurately distinguish target wild flies from the released sterile flies. The marked flies used are sterile and lack the fluorescent dye, but are marked physically by wing clipping or some other method. These flies are placed into the trap samples after they have been collected in the field but before they are inspected by the screeners.

The independent evaluation should be summarized in a report detailing how many inspected traps on each route were found to be in compliance with the accepted standards in categories such as trap mapping, placement, condition, and servicing and inspection interval. Aspects that were found to be deficient should be identified, and specific recommendations should be made to correct these deficiencies.

In cases where the trapping programme is a component of an export programme, records of independent evaluations should be retained for at least 24 months because trading partners may request this information or some evidence of an active independent evaluation programme. Alternatively, trading partners may request that they conduct their own independent evaluation programme.

7. Selected References

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SPECIFICATION NO. 46

Title: Management of phytosanitary risks in the international movement of wood

Reason for the standard: Wood poses a significant phytosanitary risk for the transmission of pests. A variety of raw (“green”) and other wood treated for non-phytosanitary purposes moves in international trade, presenting such risks. Based on technical justification, NPPOs may establish specific requirements for phytosanitary treatment and/or phytosanitary certification of wood. Numerous countries stipulate specific import requirements for wood, including: heat treatment, kiln drying, chemical treatment, and/or bark removal. To assist NPPOs in determining what types of treatments may be appropriate, if treatments have been applied correctly, and if overall related phytosanitary certification is sufficient, a standard is required to outline key phytosanitary certification criteria and the processes available for verifying that import requirements are met. At present, no specific standard on this subject exists, nor do existing concept standards provide sufficient specific advice regarding the guidelines for relevant phytosanitary certification approaches for the international movement of wood.

Scope and purpose: The standard would provide guidelines for risk management for the international movement of wood through the application of phytosanitary measures. The standard should include information on: appropriate types of treatments to reduce risks associated with movement of wood; phytosanitary certification criteria and guidelines for sampling (if appropriate) and import inspection of treated and raw wood; indications of types of detection techniques for specific pest groups associated with wood including, but not limited to, bark beetles, wood borers, fungi, nematodes, etc.; the determination of pest status in an area; and, if appropriate, tools available for determining whether treatments have been applied appropriately. This standard would not apply to wood packaging material, which would remain wholly within the scope of ISPM No. 15.

Tasks: The expert drafting group (TPFQ) should:

1. Consider phytosanitary risks related to specific pest groups associated with wood and the related phytosanitary risks associated with the movement of wood;
2. Consider if it is appropriate to include in this draft guidance on specific procedures for the determination of pest status in an area in assessing risks associated with wood from different origins;
3. Consider and indicate types of available methods that could be used for the detection of pests that may be present within imported wood, including fungi and nematodes (individual diagnostic protocols are developed by the Technical Panel on Diagnostic Protocols);
4. Identify and describe suitable phytosanitary measures (e.g., bark removal, kiln drying, etc.) and indicate treatments for wood that reduce the risk presented by quarantine pests (specific treatments are evaluated and presented for adoption as part of ISPM No. 28 by the Technical Panel on Phytosanitary Treatments);
5. Consider and describe the role of bark in relation to the risks presented by the movement of wood, and appropriate measures related to this;
6. Consider and indicate appropriate sampling, and inspection and/or types of testing methodology, for identifying compliance with import requirements relating to specific treatments (e.g., heat treatment, fumigation and others);
7. Identify and describe key criteria that should form the basis for phytosanitary certification of wood;
8. Consider whether post-harvest infestation of wood should be addressed by this standard and, if so, provide guidance on specific phytosanitary measures accordingly and as appropriate;
9. Ensure that the standard indicates clearly the distinction between articles addressed by ISPM No. 15 (e.g., dunnage), and those that are addressed by this standard in order to avoid confusion over which standard has authority over which types of articles.
10. Propose an appropriate title for the standard;
11. Make recommendations to the Standards Committee, as appropriate, for further work and/or specific standards required in relation to this standard.

Provision of resources: Funding for the meeting is provided by the IPPC Secretariat (FAO). As recommended by ICPM-2 (1999), whenever possible, those participating in standard setting activities voluntarily fund their travel and subsistence to attend meetings. Participants may request financial assistance,

with the understanding that resources are limited and the priority for financial assistance is given to developing country participants.

Steward: Greg Wolff, Steward for the Technical Panel on Forest Quarantine.

Collaborator: To be determined.

Expertise: Expertise on forest crop protection as contained in the Technical Panel on Forest Quarantine.

Participants: Technical Panel on Forest Quarantine.

Approval: Introduced into the work programme of the TPFQ by the Standards Committee in November 2006. Specification approved by the Standards Committee Working Group (SC-7) in May 2008.

References: The IPPC (1997), ISPM No. 15, *Guidelines for regulating wood packaging material in international trade*, text of proposed supplement to ISPM No. 5 on debarked and bark-free wood (in draft form at time of preparing these specifications), other standards and international agreements as may be applicable to the tasks, discussion papers submitted in relation to this work. Text of draft supplement to the glossary on debarked and bark-free wood circulated for comment in 2007.

Discussion papers: Participants and interested parties are encouraged to submit discussion papers to the IPPC Secretariat (ippc@fao.org) for consideration by the expert drafting group.

**Commission on Phytosanitary Measures
Standards Committee Working Group (SC-7)**

5-9 May 2008

FAO Headquarters, Rome, Italy

PARTICIPANTS LIST

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