August 1998

منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Organización de las Naciones Unidas para la Agricultura y la Alimentación

Item 5 of the Provisional Agenda

INTERIM COMMISSION ON PHYTOSANITARY MEASURES

Rome, 03-06 November 1998

ADOPTION OF INTERNATIONAL STANDARDS

1. In 1993 the Twenty-seventh FAO Conference adopted an approval system for International Standards for Phytosanitary Measures. Standards are developed by the Secretariat with the assistance of experts and through a consultation process with countries and Regional Plant Protection Organizations. Standards are considered by the Committee of Experts on Phytosanitary Measures prior to being circulated for country comments. The Committee then again reviews the Standards before recommending submission to the Commission. Two Standards, given in Annexes 1 and 2 of ICPM-98/3 are now submitted to the Interim Commission for consideration and, if found suitable, for adoption.

Annex 1 Determination of Pest Status in an Area

Annex 2 Guidelines for Pest Eradication Programmes

DRAFT STANDARD

INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

DETERMINATION OF PEST STATUS IN AN AREA

Secretariat of the International Plant Protection Convention
Food and Agriculture Organization
of the United Nations
Rome, 199-

CONTENTS

INTRODUCTION

SCOPE

This standard describes the content of a pest record, and the use of pest records and other information in the determination of pest status in an area. Descriptions of pest status categories are provided as well as recommendations for good reporting practices.

REFERENCES

Glossary of phytosanitary terms, 1997. ISPM Pub. No. 5, FAO, Rome.
Guidelines for pest eradication programmes, FAO, Rome (in consultation).
Guidelines for pest risk analysis, 1996. ISPM Pub. No. 2, FAO, Rome.
Guidelines for surveillance, 1998. ISPM Pub. No. 6, FAO, Rome.
International Plant Protection Convention, 1992. FAO, Rome.
New Revised Text of the International Plant Protection Convention, 1997. FAO, Rome.
Principles of plant quarantine as related to international trade, 1995. ISPM Pub. No. 1, FAO, Rome.

DEFINITIONS AND ABBREVIATIONS

Area	An officially defined country, part of a country or all or parts of several countries.
Delimiting survey	Survey conducted to establish the boundaries of an area considered to be infested by or free from a pest.
Detection survey	Survey conducted in an area to determine if pests are present.
Establishment	Perpetuation, for the foreseeable future, of a pest within an area after entry.
Incursion	The presence of an individual or an isolated population of a pest in an area where it may survive into the immediate future but is not expected to establish.
Interception (of a pest)	The detection of a pest during inspection of an imported consignment.
IPPC	The International Plant Protection Convention, a multilateral treaty for cooperation in plant protection, approved and deposited in 1951 with FAO in Rome, having come into force in 1952 and amended in 1979 (the Revised Text) and 1997 (the New Revised Text).

Monitoring survey	Ongoing survey to verify the characteristics of a pest population.
National Plant Protection Organization (NPPO)	Official service established by a government to discharge the functions specified by the IPPC.
Occurrence	The presence in an area of a pest officially reported to be indigenous or introduced and/or not officially reported to have been eradicated.
Official	Established, authorized or performed by a National Plant Protection Organization.
Outbreak	An isolated pest population, recently detected and expected to survive for the immediate future.
Pest	Any species, strain or biotype of plant, animal, or pathogenic agent, injurious to plants or plant products.
Pest free area (PFA)	An area in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained.
Pest record	A document providing information concerning the presence or absence of a specific pest at a particular location at a certain time, within an area (usually a country) under described circumstances.
Pest status (in an area)	Presence or absence, at the present time, of a pest in an area, including where appropriate its distribution as officially determined using expert judgement on the basis of current and historical pest records and other information.
Phytosanitary measure	Any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of pests.
Phytosanitary regulation	Official rule to prevent the introduction and/or spread of quarantine pests, by regulating the production, movement or existence of commodities or other articles, or the normal activity of persons, and by establishing schemes for phytosanitary certification.

Quarantine pest	A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled.
Regional Plant Protection Organization (RPPO)	Intergovernmental organization with the functions laid down by Article IX of the IPPC.
Regulated pest	A quarantine pest or a regulated non-quarantine pest.
Survey	An official procedure conducted over a defined period of time to determine the characteristics of a pest population or to determine which species occur in an area.
Transience	Presence of a pest that does not lead to establishment.

OUTLINE OF REQUIREMENTS

Pest records are essential components of the information used to establish the status of a pest in an area. All importing and exporting countries need information concerning the status of pests for risk analyses, the establishment of and compliance with import regulations, and the establishment and maintenance of pest free areas.

A *pest record* provides information concerning the presence or absence of a pest, the time and location of the observations, the damage observed, as well as references or other relevant information pertaining to a single observation. The reliability of pest records is based on consideration of the data in regard to the collector/identifier, the means of technical identification, the location and date of the record, and the recording/publication of the record.

The *determination of pest status* requires expert judgement concerning the information available on the present-day occurrence of a pest in an area and the significance of its presence. Pest status is determined using information from individual pest records, pest records from surveys, data on pest absence, findings of general surveillance, and scientific publications and databases.

Pest status is outlined in this standard in terms of three categories incorporating various final determinations:

- *presence* of the pest - leading to determinations such as “present in all parts of the country”, “present in specified areas only”, etc.

- *absence* of the pest - leading to determinations such as “no pest records”, “pest eradicated”, “pest no longer present”, etc.

- *transience* of the pest - leading to determinations such as “non-actionable incursion”, “actionable incursion”, and “outbreak under eradication”.

To facilitate international cooperation among contracting parties in meeting their obligations in reporting the occurrence, outbreak or spread of pests, the National Plant Protection Organizations (NPPOs), or other organizations or persons involved in recording the presence, absence, or transience of pests, should follow good reporting practices. These practices concern the use of accurate, reliable data for pest records, the sharing of pest status information in a timely manner, respecting the legitimate interests of all parties concerned, and taking into account the pest status determinations in this standard.

GENERAL REQUIREMENTS FOR DETERMINATION OF PEST STATUS

1. Purposes of Pest Status Determination

A pest record is documented evidence[1] that indicates the presence or absence of a specific pest at a particular location and certain time, within an area, usually a country, under described circumstances. Pest records are used in conjunction with other information for the determination of the status of the given pest in the area.

In general, the provision of reliable pest records and the determination of pest status are vital components of a number of activities covered under the International Plant Protection Convention (IPPC) and by the principles noted in the ISPM:*Principles of plant quarantine as related to international trade,* and the international standards for phytosanitary measures that have been developed from them.

Importing countries need pest status information to:

- conduct a pest risk analysis (PRA) on a pest in another country
- establish phytosanitary regulations to prevent the entry, establishment or spread of a pest
- conduct a PRA on a non-quarantine pest in their own territory with a view to regulating it.

Exporting countries need pest status information to:

- comply with import regulations by not exporting consignments infested with the regulated pests of the importing country
- meet requests for information from other countries for the purpose of PRA on pests in their territory.

All countries may use pest status information for:

- PRA purposes
- planning national, regional or international pest management programmes
- establishing national pest lists
- establishing and maintaining pest free areas.

Information on the status of a pest in areas, countries and regions may be used to establish the global distribution of a pest.

[1] Including electronic documentation

2. Pest Records

2.1 Pest record

The ISPM: *Guidelines for surveillance* describes the elements of information from general surveillance and specific surveys that may be included in a pest record. The basic information needed in a pest record includes the following:

- current scientific name of the organism including, as appropriate, subspecific terms (strain, biotype, etc.)
- life stage or state
- taxonomic group
- identification method
- year, and month if known, recorded. Normally the day will only be required for specific circumstances (e.g. the first detection of a particular pest, pest monitoring)
- locality, e.g. location codes, addresses, geographical coordinates. Important conditions such as if under protected cultivation (e.g. greenhouses) should be indicated
- scientific name of host, as appropriate
- host damage, or circumstances of collection (e.g. trap or soil sample), as appropriate
- prevalence, indication of the level of pest presence orpest numbers
- bibliographical references, if any.

A list of references is noted in the Appendix to this standard for consultation in the preparation of a pest record.

2.2 Reliability

Pest record information is available from many sources and has varying levels of reliability. Some key components are identified in the following Table. Although the Table ranks the categories in descending order of relative reliability, it must be recognized that these are not rigid and are only designed to provide guidance in evaluating the record. In particular, it should be noted that pests differ in the level of expertise needed for their identification.

NPPOs have responsibility to provide accurate information on pest records upon request.

Table. Guidance for Evaluating the Reliability of a Pest Record (Sources listed from most reliable to least reliable).

1. Collectors / Identifiers	2. Technical identification	3. Location and date	4. Recording / Publication
a. Taxonomic specialist	a. Discriminating biochemical or molecular diagnosis (if available)	a. Delimiting or detection surveys	a. NPPO record/RPPO publication (where refereed)
b. Professional specialist, diagnostician	b. Specimen or culture maintained in official collection, taxonomic description by specialist	b. Other field or production surveys	b. Scientific or technical journal refereed
c. Scientist	c. Specimen in general collection	c. Casual or incidental field observation, possibly with no defined location/date	c. Official historical record
d. Technician	d. Description and photo	d. Observation with/in products or byproducts; interception	d. Scientific or technical journal non-refereed e. Specialist amateur publication
e. Expert amateur f. Non-specialist	e. Visual description only	e. Precise location and date not known	f. Unpublished scientific or technical document g. Non-technical publication; periodical/newspaper
g. Collector/identifier not known	f. Method of identification not known		h. Personal communication; unpublished

3. Pest Status in an Area

3.1 Describing pest status in an area

Determination of pest status requires expert judgement on the current distribution of a pest in an area and on its phytosanitary significance. This judgement is based on a synthesis of pest records and information from other sources. Both current and historical records are used in assessing the present-day situation. Pest status can be described under the following categories:

3.1.1 Presence

A pest is present if records indicate that it is indigenous or introduced. If a pest is present and sufficient reliable records are available, then it may be possible to characterize its distribution using phrases, or a combinations of phrases, such as the following examples:

Present: in all parts of the area
Present: only in specified areas
Present: except in specified pest free areas
Present: in all parts of the area where host crop(s) are grown
Present: only in specified areas where host crop(s) are grown
Present: only in protected cultivation
Present: seasonally
Present: but managed[2]
Present: under eradication
Present: at low prevalence.

Other similar descriptive phrases may be used, as appropriate. If few reliable records are available, it will be difficult to characterize the distribution.

As appropriate, it is useful to characterize the prevalence of the pest (e.g. common, occasional, rare), and the level of damage and/or losses caused by the pest on relevant hosts.

3.1.2 Absence

If there are no records of the presence of the pest in the general surveillance data of an area, it may be reasonable to conclude that a pest is or has always been absent. This may be supported by specific records of absence.

It is also possible to conclude that a pest is absent even if there are pest records suggesting the contrary. These different situations are described below. Absence may also be confirmed by specific surveys (see ISPM: *Guidelines for surveillance*) and, in that case, the phrase "**confirmed by survey**" should then be added.

[2] According to: (details to be listed)

Absent: no pest records
General surveillance indicates that the pest is absent now and has never been recorded.

Absent: pest eradicated
Pest records indicate that the pest was present in the past. A documented pest eradication programme was conducted and was successful (see ISPM: *Guidelines for pest eradication programmes*). Surveillance confirms continued absence.

Absent: pest no longer present
Pest records indicate that the pest was transient or established in the past, but general surveillance indicates the pest is no longer present. The reason(s) may include:

- climate or other natural limitation to pest perpetuation
- changes in hosts cultivated
- changes in cultivars
- changes in agricultural practices.

Absent: pest records invalid
Pest records indicate the presence of a pest, but the conclusion is reached that the records are invalid or no longer valid, as in the following officially declared cases:

- changes in taxonomy
- misidentification
- erroneous record
- changes in national borders where reinterpretation of the record may be needed.

Absent: pest records unreliable
Pest records indicate the presence of a pest, but the determination leads to the conclusion that the records are unreliable, as in the following officially declared cases:

- ambiguous nomenclature
- outdated identification or diagnostic methods
- records cannot be considered reliable (see Table).

Absent: intercepted only
The pest has only been reported on consignments at a point of entry or initial destination or while under detention before release, treatment or destruction. Surveillance confirms that the pest has not established.

3.1.3 Transience

Pest status is considered transient when a pest is present but establishment is not expected to occur. There are three types of transients:

Transient: non-actionable incursion
The pest has only been detected as an individual occurrence or isolated population, not expected to survive and no phytosanitary measures have been applied.

Transient: actionable incursion
The pest has been detected as an isolated population that may survive into the immediate future, but is not expected to establish. Appropriate surveillance is being conducted.

Transient: outbreak under eradication
The pest has been detected as an isolated population which may survive into the immediate future and, without phytosanitary measures for eradication, may establish. Appropriate phytosanitary measures have been applied for its eradication.

3.2 Determination of pest status in an area

Determination of the status of a pest is normally carried out by an NPPO. It results in deciding upon the most appropriate description of the pest status in an area (see Section 3.1) based on supporting information. This may include:

- individual pest records
- pest records from surveys
- records or other indication of pest absence
- results of general surveillance
- information from scientific publications and databases
- phytosanitary measures used to prevent introduction or spread
- other information relevant to assessing pest absence or presence.

The reliability and consistency of the information should be considered. In particular, careful judgement is needed when there is conflicting information.

4. Recommended Reporting Practices

Contracting parties have obligations under the IPPC (see New Revised Text: Article VIII 1a) to report "the occurrence, outbreak or spread of pests", of which, in the terms of this standard, information pertaining to "pest status in an area" is a part. This standard is not concerned with reporting obligations, but with the quality of the reported information. Accurate reports are an essential part of the international cooperation to facilitate trade. Failure to discover and report pests, or inaccurate, incomplete, untimely, or misinterpreted reports can lead to the establishment of unjustified trade barriers, or to the introduction and/or spread of pests.

Persons or organizations involved in collecting pest records should follow the recommendations in this standard, and provide the NPPO with accurate and complete details before reporting the information generally.

To observe good reporting practices, NPPOs should:

- base determinations of pest status in an area on the most reliable and timely information available

- take into account the categories and pest status determinations set out in this standard when exchanging pest status information between countries

- inform the NPPO of trading partners as soon as possible, and their Regional Plant Protection Organization (RPPO) where appropriate, of relevant changes in pest status and especially reports of newly established pests

- report interceptions of regulated pests which suggest a change in pest status in the exporting country to other countries only after consultation with the exporting country

- when becoming aware of an otherwise unreported record of a pest in another country, the NPPO may report it to other countries or RPPOs only after informing and where possible consulting with the NPPO concerned

- exchange pest status information in conformity with Articles VII (2j) and VIII (1a and 1c) of the IPPC to the extent practicable, and in a medium and language acceptable to both parties.

Appendix. Useful References.

This listing is for reference purposes only. The references here are widely available, easily accessible and generally recognized as authoritative. The list is not comprehensive or static, nor is it endorsed as a standard under this ISPM.

Nomenclature, Terminology and General Taxonomy

Bayer coding system, 1996. European and Mediterranean Plant Protection Organization, Paris, France.

BioNET-INTERNATIONAL: Global Network for Biosystematics, CAB International, Wallingford, UK.

Codes for the representation of names of countries, ISO 3166. International Organization for Standards, Geneva, Switzerland (English/French).

Dictionnaire des agents pathogènes des plantes cultiveés, 1992. I. Fiala & F. Fèvre, Institut National de la Recherche Agronomique, Paris, France (English/French/Latin).

Glossary of Plant Pathological Terms, 1997. M.C. Shurtleff & C.W. Averre, American Phytopathological Society, St. Paul MN, USA.

Glossary of phytosanitary terms, 1997. ISPM Pub. No. 5, FAO, Rome, Italy (Arabic/Chinese/ English/French/Spanish).

International Code of Botanical Nomenclature, International Botanical Congress.

International code of nomenclature for cultivated plants, International Bureau for Plant Taxonomy and Nomenclature, Utrecht, Netherlands.

International code of zoological nomenclature, International Commission on Zoological Nomenclature.

United Nations Terminology Bulletin No. 347, 1995. Office of Conference and Support Services, United Nations, NY (UN Member names in Arabic/Chinese/English/French/ Russian/Spanish).

General Pest Identification and Distribution

CABPESTCD-ROM, CAB International, Wallingford, UK.

Crop Protection Compendium CD-ROM, CAB International, Wallingford, UK.

Descriptions of Fungi and Bacteria, CAB International, Surrey, UK.

Distribution Maps of Pests, CAB International, Wallingford, UK.

Hojas de datos sobre plagas y enfermedades agrícolas de importancia cuarentenaria para los países miembros del OIRSA, volúmenes 1-4, 1994-1996. Organismo Internacional Regional de Sanidad Agropecuaria, El Salvador.

Mammal Species of the World: a taxonomic and geographical reference, 1982. Honacki *et al.* eds, Allen Press Inc., Kansas, USA.

Plant Pathologist's Pocketbook 2nd ed., 1983. CAB International Mycological Institute, Surrey, UK (Arabic ed., 1990, CABI/FAO; Spanish ed., 1985, published by FAO Regional Office for Latin America and the Caribbean, Santiago, Chile, in cooperation with CABI).

Quarantine Pests for Europe 2nd ed.: Data sheets on quarantine pests for the European Union and for the European and Mediterranean Plant Protection Organization, 1997. I.M. Smith *et al.* eds, CABI/EPPO, CAB International, Wallingford, UK.

Bacteria

Guide to Plant Pathogenic Bacteria 2nd ed., 1997. J.F. Bradbury & G.S. Saddler, CAB International Mycological Institute, Surrey, UK.

Names of Plant Pathogenic Bacteria 1864-1995, 1996. J. Young *et al.*, *Ann. Rev.*

Phytopathology: 721-763.

Fungi
Ainsworth & Bisby's Dictionary of The Fungi 8th ed., 1995. D.L. Hawksworth *et al.*, CAB International Mycological Institute, Surrey, UK.
Index of Fungi, CAB International Mycological Institute, Surrey, UK.

Insects and Mites
ANI-CD: Arthropod Name Index on CD-ROM, CAB International, Wallingford, UK.
Insects of Economic Importance: A Checklist of Preferred Names, 1989. A.M. Wood, CAB International, Wallingford, UK.

Nematodes
Aphelenchida, Longidoridae and Trichodoridae: their systematics and bionomics, 1993. D.J. Hunt, CAB International, Wallingford, UK.
Catalog of the Order Tylenchida, 1991. B.A. Ebsary, Agriculture Canada.
NEMA-CD-ROM, CAB International, Wallingford, UK.

Plant Diseases
Common Names for Plant Diseases, 1996. Compiled by APS Committee on Standardization of Common Names for Plant Diseases, American Phytopathological Society, St. Paul, MN, USA. Searchable on the APS*net* Internet site at: http://www.scisoc.org/resource/common/.
Disease Compendium Series, American Phytopathological Society, St. Paul, MN, USA.
Distribution Maps of Plant Diseases, CAB International, Wallingford, UK.
Multilingual Compendium of Plant Diseases, vols. 1 (1976), 2 (1977). American Phytopathological Society, St. Paul MN, USA (Crosslingual: 23 languages).
Plant Diseases of International Importance, 4 vols., 1992. Prentice Hall, NJ, USA.

Plants and Weeds
A Checklist of Names for 3,000 Vascular Plants of Economic Importance. Rev., 1986. E. Terrell *et al.*, USDA Agricultural Research Service, Washington DC, USA.
Grass Weeds 1 (1980), Grass Weeds 2 (1981), Monocot Weeds 3 (1982). Ciba-Geigy Ltd., Basle, Switzerland (English/French/German/Spanish).
Index Kewensis, Royal Botanic Gardens, Kew, Surrey, UK.
Plants and Plant Products, 1983. FAO Terminology Bulletin 25, Rome, Italy (English/ French/German/Spanish).
Scientific and Common Names of 7,000 Vascular Plants in the United States, 1995. L. Brako *et al.*, American Phytopathological Society, St. Paul MN, USA.
Vascular Plant Families and Genera, 1992. R.K. Brummitt, Royal Botanic Gardens, Kew, Surrey, UK.
World Weeds: Natural Histories and Distribution, 1997. L.G. Holm *et al.*, John Wiley & Sons, NY, USA.

Viruses

Descriptions of Plant Viruses, Association of Applied Biologists, Institute of Horticultural Research, Wellesbourne, UK.

VIDE Database, A. Brunt *et al*. eds, Searchable on the *Plant Viruses Online* site on the Internet at: http://biology.anu.edu.au/Groups/MES/vide/refs.htm.

Viruses of Plants, 1996. A. Brunt *et al.*, CAB International, Wallingford, UK.

Virus Taxonomy: Classification and Nomenclature of Viruses, 1995. F.A. Murphy *et al.* eds, Sixth Report of the International Committee on Taxonomy of Viruses. Archives of Virology/Supplement 10, Springer Verlag, Vienna, New York. The *Index virum* files are searchable on the Internet at: http://life.anu.edu.au/viruses/Ictv/index.html.

DRAFT STANDARD

INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

GUIDELINES FOR PEST ERADICATION PROGRAMMES

Secretariat of the International Plant Protection Convention
Food and Agriculture Organization
of the United Nations
Rome, 199-

CONTENTS

INTRODUCTION

SCOPE

This standard describes the components of a pest eradication programme which can lead to the establishment or re-establishment of pest freedom in an area.

REFERENCES

Agreement on the Application of Sanitary and Phytosanitary Measures, 1994. World Trade Organization, Geneva.
Determination of pest status in an area, FAO, Rome (in consultation).
Glossary of phytosanitary terms, 1997. ISPM Pub. No. 5, FAO, Rome.
Guidelines for pest risk analysis, 1996. ISPM Pub. No. 2, FAO, Rome.
Guidelines for surveillance, 1998. ISPM Pub. No. 6, FAO, Rome.
International Plant Protection Convention, 1992. FAO, Rome.
New Revised Text of the International Plant Protection Convention, 1997. FAO, Rome.
Principles of plant quarantine as related to international trade, 1995. ISPM Pub. No. 1, FAO, Rome.
Requirements for the establishment of pest free areas, 1996. ISPM Pub. No. 4, FAO, Rome.

DEFINITIONS AND ABBREVIATIONS

Area	An officially defined country, part of a country or all or parts of several countries.
Containment	The application of phytosanitary measures in and around an infested area to prevent spread of a pest.
Control (of a pest)	Suppression, containment or eradication of a pest population.
Delimiting survey	Survey conducted to establish the boundaries of an area considered to be infested by or free from a pest.
Detection survey	Survey conducted in an area to determine if pests are present.
Endangered area	An area where ecological factors favour the establishment of a pest whose presence in the area will result in economically important loss.
Entry (of a pest)	Movement of a pest into an area where it is not yet present, or present but not widely distributed and being officially controlled.
Eradication	Application of phytosanitary measures to eliminate a

	pest from an area.
Establishment	Perpetuation, for the foreseeable future, of a pest within an area after entry.
Introduction	Entry of a pest resulting in its establishment.
IPPC	The International Plant Protection Convention, a multilateral treaty for cooperation in plant protection, approved and deposited in 1951 with FAO in Rome, having come into force in 1952 and amended in 1979 (the Revised Text) and 1997 (the New Revised Text).
National Plant Protection Organization (NPPO)	Official service established by a government to discharge the functions specified by the IPPC.
Occurrence	The presence in an area of a pest officially reported to be indigenous or introduced and/or not officially reported to have been eradicated.
Outbreak	An isolated pest population, recently detected and expected to survive for the immediate future.
Pathway	Any means that allows the entry or spread of a pest.
Pest	Any species, strain or biotype of plant, animal or pathogenic agent, injurious to plants or plant products.
Pest free area	An area in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained.
Phytosanitary legislation	Basic laws granting legal authority to a National Plant Protection Organization from which phytosanitary regulations may be drafted.
Phytosanitary measure	Any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of pests.
Quarantine pest	A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled.

Regulated article	Any plant, plant product, storage place, packaging, conveyance, container, soil and any other organism, object or material capable of harbouring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved.
Spread	Expansion of the geographical distribution of a pest within an area.
Surveillance	An official process which collects and records data on pest occurrence or absence by survey, monitoring or other procedures.
Survey	An official procedure conducted over a defined period of time to determine the characteristics of a pest population or to determine which species occur in an area.
Treatment	Officially authorized procedure for the killing, removal or rendering infertile of pests.

OUTLINE OF REQUIREMENTS

A programme for pest eradication may be developed by a National Plant Protection Organization (NPPO) as:

- an emergency measure to prevent establishment and/or spread of a pest following its recent entry (re-establish a pest free area), or
- a measure to eliminate an established pest (establish a pest free area).

After a preliminary investigation that includes the consideration of data collected at the site(s) of detection or occurrence, the extent of the infestation, information on the biology and potential economic impact of the pest, current technology and available resources for eradication, a cost-benefit analysis of the pest eradication programme should be undertaken. Whenever possible, it is also useful to gather information concerning the geographical origin of the pest, and pathways for its reintroduction. Pest risk analysis (PRA) provides a scientific basis for informed decision-making (see ISPM *Guidelines for pest risk analysis*). From these studies, one or more options should be made available to decision-makers.

The eradication process involves three main activities: surveillance, containment, and treatment and/or control measures.

When an eradication programme is completed, the absence of the pest must be verified. The verification procedure should use criteria established at the beginning of the programme and should be supported by adequate documentation of programme activities and results. The verification stage is integral to the programme, and should involve independent analysis if trading partners require this reassurance. Successful programmes result in a declaration of eradication by the NPPO. When unsuccessful, all aspects of the programme should be reviewed, including the biology of the pest to determine if new information is available, and the cost-benefit of the programme.

GENERAL REQUIREMENTS FOR PEST ERADICATION PROGRAMMES

This standard provides guidance on the development of a pest eradication programme and for reviewing the procedures of an existing eradication programme. In most instances, the pests considered for these programmes have newly entered the area where eradication is undertaken, and emergency eradication measures may be needed. However, eradication programmes may also be directed toward established exotic pests or indigenous pests in defined areas.

1. General Information and Planning Processes

1.1 Evaluation of pest reports

NPPOs should systematically evaluate pest reports and the impact of these pests to determine if eradication is required. This should involve an official contact point for pest reports and, to the extent possible, experts available to evaluate the information and recommend a course of action.

1.2 Contingency plans

It is desirable to have contingency plans to address specific pests or pest groups that have a high potential for introduction, and for which an eradication plan is deemed to be both feasible and necessary, before the pest is found in an area. The development of such plans is advantageous because it provides additional time for deliberation, evaluation and research necessary to ensure that an eradication programme is well designed and can be executed quickly and effectively. Such plans are particularly important where cooperative programmes are anticipated, as they allow for the actions of cooperating parties to be specified and agreed upon prior to implementing the programme. Knowledge gained from previous successful eradication programmes can be extremely useful for developing contingency plans or judging the feasibility of eradication programmes under consideration. A general contingency plan is also particularly useful for ensuring rapid action in the case of emergency eradication measures.

It should be recognized that the biology of pests varies considerably as do the technologies available for eradication. Therefore, not all the factors listed in this standard for consideration will be of value in planning every eradication programme.

1.3 Reporting requirements and information sharing

Verification of the occurrence of a new pest of immediate or potential danger initiates the process that leads to reporting requirements for the NPPO under the International Plant Protection Convention (see New Revised Text: Article VII 2j and Article VIII 1a and 1c) and is described in the ISPM: *Determination of pest status in an area.*

Prior to the implementation of a pest eradication programme, public information programmes or other means for sharing information with broader audiences such as growers, residents, and local governments, should be considered for raising the level of awareness and understanding of the programme.

2. Decision to Undertake an Eradication Programme

The decision to undertake an eradication programme results from an evaluation of the circumstances of detection of a pest, its identification, the risk identified by a pest-initiated PRA, estimation of the present and potential distribution of the pest, and assessment of the feasibility of conducting an eradication programme. It is normally good practice to give due consideration to all the elements recommended. However, this approach may be limited in practice by the availability of data and resources. Particularly in cases where emergency eradication measures seem necessary (e.g. recent entry of a pest capable of rapid dispersal), the need to take action rapidly should be carefully balanced against the benefits of more detailed analyses and planning.

2.1 Initiation

The eradication programme may be initiated by detection of a new pest arising from general surveillance or specific surveys (see ISPM: *Guidelines for surveillance*). In the case of established pests, the eradication programme will be initiated by policy considerations (e.g. a decision taken to establish a pest free area).

2.2 Identification

Accurate identification of the pest is essential so that the appropriate means of eradication can be selected. NPPOs should proceed with the identification process recognizing that it may have to withstand scientific or legal challenge. Therefore, it may be appropriate to have the identification confirmed by acknowledged independent experts.

Identification may be immediate when the pest is easily and confidently recognized by the NPPO.

Identification methods may range from recognition based only on morphological characteristics to more sophisticated bioassay, chemical or genetic analyses. The method ultimately adopted by the NPPO will depend on the organism in question and the most widely accepted and practical means to confirm identification.

In cases where a conclusive identification is not immediately possible, the actions to be taken may be justified by other factors such as the extent of damage to host plants.

2.3 Estimating present and potential pest distribution

An estimate of the present distribution of the pest is necessary for both new and established pests. The potential distribution is usually of greater importance for new pests, but may have relevance as well in evaluating established pests. The data elements identified for initial investigation include a level of detail not necessarily required for a programme directed toward established pests.

2.3.1 Initial investigation

Data associated with the detection of a new pest, the geographical origin of the pest, and the pathway, should be compiled and reviewed. This information is not only useful for decision-making related to eradication, but is also helpful for identifying and correcting weaknesses in pest exclusion systems that may have contributed to the entry of the pest.

2.3.1.1 Data gathered at the site of detection or occurrence

Information should be gathered concerning the pest and conditions at the site of detection or occurrence, including:

- geographical location
- hosts infested at the site
- extent and impact of damage and level of pest prevalence
- how the pest was detected and identified
- recent imports of plants or plant products
- history of the pest on the property or in the area
- movement of people, products, equipment, conveyances
- mechanism of spread within the area
- climatic and soil conditions
- condition of infested plants
- cultivation practices.

2.3.1.2 Geographical origin

To the extent possible, information should be obtained on the country or area most likely to be the origin of the pest. Information concerning countries of re-export or transit may also be considered when attempting to determine the source and pathway.

2.3.1.3 Pathways of the pest

To the extent possible, the NPPO should determine the pathways by which the pest may have entered or spread, to ensure that eradication programmes are not jeopardized by new pest entries, and to help identify potential exclusion options. Pathway information includes identifying the commodities or items that may have carried the pest as well as the possible mode of movement. Where there is a possible association with newly imported plants or plant products, similar material should be located and examined.

2.3.2 Distribution

The preliminary processes should provide sufficient information to determine if a survey is required.

Surveys may be of two types:

- delimiting survey at each outbreak
- survey based on pathway studies.

These surveys should be designed and executed to provide the level of statistical confidence necessary for the results to be meaningful for regulatory purposes.

In cases where survey data are to provide the basis for establishing a pest free area for export purposes, it may be desirable to consult trading partners in advance to determine the quantity and quality of data necessary to meet their phytosanitary requirements.

2.3.3 Predicting spread

Data collected during a preliminary investigation should be used to estimate the potential for spread and the anticipated rate of spread, and to identify endangered areas.

2.4 Feasibility of undertaking an eradication programme

An estimate of the impact and extent of the infestation, the potential for spread, and the anticipated rate of spread is necessary to judge the feasibility of an eradication programme. PRA provides a scientific basis for this estimate (see ISPM:*Guidelines for pest risk analysis*). Possible eradication options and cost-benefit factors should also be considered.

2.4.1 Biological and economic information

Information needs to be obtained on:

- pest biology
- potential hosts
- potential spread and anticipated rate of spread
- possible eradication strategies:
  - financial and resource costs
  - availability of the technology
  - logistical and operational limitations
- impact on industry and the environment:
  - without eradication
  - with each eradication option identified.

2.4.2 Conducting cost-benefit analysis for eradication programmes

One of the first actions to be taken is the preparation of a list of the most feasible eradication techniques. The total cost and the cost-benefit ratio for each strategy should be estimated over the short and long term. The option to take no action, or to take a pest management approach, should be considered as well as eradication options.

All feasible options should be described or discussed with decision-makers. Anticipated advantages and disadvantages, including cost-benefit should be outlined to the extent possible. One or more options should be recommended, recognizing that the ultimate decision requires consideration of the technical options, cost-benefit, the availability of resources, and political and socio-economic factors.

3. Eradication Process

The eradication process involves the establishment of a management team followed by the conduct of the eradication programme, which should preferably follow an established plan. Three main activities are included in the programme:

- surveillance: to fully investigate the distribution of the pest
- containment: to prevent the spread of the pest
- treatment: to eradicate the pest when it is found.

Direction and coordination should be provided by a management authority (normally the NPPO), ensuring that criteria are established to determine when eradication has been achieved

and that appropriate documentation and process controls exist to provide sufficient confidence in the results. It may be necessary to consult with trading partners over some aspects of the eradication process.

3.1 Establishment of a management team

A management team is established to provide direction and coordination to eradication activities once it has been decided to undertake an eradication programme. The size of the management team will vary depending on the scope of the programme and the resources available to the NPPO. Large programmes may require a steering committee or an advisory group including the various interest groups that may be affected. Where a programme includes several countries, a regional steering committee should be considered.

The management team should have responsibility for:

- ensuring that the eradication programme meets the agreed criteria for successful eradication
- formulating, implementing, and modifying as necessary an eradication plan
- ensuring programme operators have appropriate authority and training to undertake their duties
- financial and resource management
- appointing and defining duties of operators, ensuring operators understand their responsibilities, and documenting their activities
- managing communication, including a public relations programme
- communicating with affected parties, e.g. growers, traders, other government departments and non-governmental organizations
- implementing an information management system, including programme documentation and appropriate record-keeping
- daily management of the programme
- continuous monitoring and evaluation of critical elements
- periodic overall programme review.

3.2 Conducting the eradication programme

3.2.1 Surveillance

A delimiting survey should be completed either initially or to confirm earlier surveys. Monitoring surveys should then continue in accordance with the eradication plan to check the distribution of the pest and assess the effectiveness of the eradication programme (see ISPM: *Guidelines for surveillance*). Surveillance may include a pathway analysis to identify the source of the pest and its possible spread, the inspection of clonally and/or contact-linked material, inspection, trapping, and aerial observation. This may also include targeted inquiries to growers, those responsible for storage and handling facilities, and the public.

3.2.2 Containment

The NPPO should define a quarantine area using surveillance information. The initial investigations will provide information that is used to identify plants, plant products, or other articles whose movement out of the quarantine area needs to be regulated to prevent the spread of the pest. Owners of affected plants, plant products and other

regulated articles should be notified of the regulations. Others interested or affected by regulations should also be provided with adequate information. It may be appropriate to verify compliance using methods described in the eradication plan.

Arrangements should be made for the release of plants, plant products or other regulated articles from the quarantine area, by clearance following verification of compliance with phytosanitary measures such as inspection, treatment or destruction. Provision should be made for the withdrawal of regulations when an eradication programme has been declared to be successful.

3.2.3 Treatment and/or control measures

Methods to eradicate pests may include:

- host destruction
- disinfestation of equipment and facilities
- chemical or biological pesticide treatment
- soil sterilants
- leaving land fallow
- host-free periods
- the use of cultivars that suppress or eliminate pest populations
- restriction of subsequent cropping
- trapping, lures or other physical control methods
- inundative release of biological control agents
- use of sterile insect technique
- processing or consumption of infested crop.

In most cases, eradication will involve the use of more than one treatment option. The selection of treatment and/or control options may be limited by legislative restrictions or other factors. In such situations, exceptions for emergency or limited use may be available to the NPPO.

3.3 Verification of pest eradication

This involves verification by the management authority (normally the NPPO) that the criteria for successful pest eradication established at the beginning of the programme have been achieved. The criteria may specify the intensity of the detection method and how long the survey must continue to verify the absence of the pest. The minimum period of time of pest freedom to verify eradication will vary according to the biology of the pest, but should take into consideration factors such as:

- sensitivity of detection technology
- ease of detection
- life cycle of the pest
- climatic effects
- efficacy of treatment.

The eradication plan should specify the criteria for a declaration of eradication and steps for the withdrawal of regulations.

3.4 Documentation

NPPOs should ensure that records are kept of information supporting all stages of the eradication process. It is essential that NPPOs maintain such documentation in case trading partners request information to support claims of pest freedom.

3.5 Declaration of eradication

A declaration of eradication by the NPPO follows the completion of a successful eradication programme. The status of the pest in the area is then '**absent : pest eradicated'** (see ISPM: *Determination of pest status in an area*). It involves communication with affected and interested parties, as well as appropriate authorities concerning the fulfilment of programme objectives. Programme documentation and other relevant evidence supporting the declaration should be made available to other NPPOs upon request.

4. Programme Review

Throughout the eradication, the programme should be subject to periodic review to analyse and assess information gathered, to check that objectives are being achieved, and/or to determine if changes are required. Reviews should take place at:

- any time when unforeseen circumstances are encountered that could affect the programme
- pre-set intervals
- the termination of the programme.

Where the criteria for eradication are not met, the eradication plan should be reviewed. This review should take into account any newly gained knowledge that might have contributed to that result. Cost-benefit factors and operational details should be reviewed to identify inconsistencies with initial predictions. Depending on the outcome, a new eradication plan may be developed or altered to become a pest suppression or pest management programme.