

**Expert Consultation on Regional Standards for
Phytosanitary Measures and Information Sharing
29 October – 1 November 2002
FAO/RAP, Bangkok, Thailand**

1. Introduction

The APPPC Expert Consultation on Regional Standards for Phytosanitary Measures was held in Bangkok on 29 October to 1 November. The purpose of the meeting was to discuss two draft standards concerning guidelines for training Plant quarantine inspectors and guidelines for heat disinfestation treatments for fruit fly host commodities and to discuss information exchange mechanism within the APPPC member countries. The meeting was attended by experts from Bangladesh, China, Indonesia, Korea, Malaysia, New Zealand, Pakistan and Thailand, and members of the FAO/RAP APPPC and IPPC Secretariat.

2. Opening session

Professor C. Y. Shen welcomed experts to Bangkok. The participants each introduced themselves to the group. See Appendix 1 for a list of experts.

Dr He Changchui, FAO Regional Representative for Asia and the Pacific, noted in his introductory address the importance attached by FAO to normative work. He described the development of standards and congratulated the APPPC in producing the draft standards so quickly. Dr He mentioned the assistance of Australia in regard to the standard on heat disinfestation treatments for fruit fly host commodities. The draft standards would, Dr He hoped, be adopted at the next session of the Commission.

Dr He noted the presence of Dr Nowell from the IPPC Secretariat to assist with the discussions on an information exchange mechanism for the APPPC. Dr Nowell would be describing the operation of the International Phytosanitary Portal. After noting the efforts of APPPC in the region supporting plant protection, Dr He wished the experts successful and constructive discussions in the preparation of draft regional standards for phytosanitary measures. See Appendix 2 for the address provided by Dr He.

Dr John Hedley, Chair of the APPPC Standing Committee on Plant Quarantine, stressed the relevance of the present meeting in the development of the APPPC. The Commission had reviewed the Plant Protection Agreement for Asia and the Pacific, it had established procedures for standard setting and was now considering its first regional standards. This was significant progress in a short time.

Dr Hedley went on to discuss the recent developments regarding the ICPM programme to increase the funding for the IPPC. He described the efforts of the Bureau and the Strategic Planning and Technical Assistance Informal Group and the results achieved at the meetings of the FAO Finance and Programme Committees. Dr Hedley encouraged experts to obtain the support of their country delegates to FAO for the programme to increase the funding for the IPPC.

3. Adoption of the Agenda

The agenda was adopted by the group. The meeting was chaired by Dr J. Hedley with Mr Somboon Chareonridhi acting as rapporteur for the amendments to the standards and the preparation of the meeting report.

4. Discussion of draft APPPC Regional Standards for Phytosanitary Measures

4.1 Guidelines for the development of heat disinfestation treatments of fruit fly host commodities

The group considered the draft as a whole at first considering general comments. After this, the experts discussed the standard section by section. Other than the introduction of a purpose, some heading changes and a structural change renaming a section now called Determination of heat disinfestation treatments, no major changes were made. See Appendix 3 for the revised draft.

4.2 Training requirements for plant quarantine inspectors

Again, the group considered the draft standard generally at first before moving on to examine the draft section by section. The contents of a number of sections of the draft were re-ordered and some sections moved within the standard. A section referring to the development of training systems was added to section 2 of the draft. Many small terminological changes were made. See Appendix 4 for the revised draft.

4.3 Format of the APPPC regional standards

The group agreed to use the same basic format for the presentation of standards as that used by the IPPC. The group then considered the wording for the Administration page of APPPC regional standards. This is shown in Appendix 5.

5. Recommendations for priorities for further standard development

The group recommended the following subjects:

- Manual of fumigation treatments
- Pest free areas for fruit flies.

6. Information exchange mechanisms for the APPPC

6.1 The IPP

Dr David Nowell of the IPPC Secretariat discussed information exchange and the responsibilities of NPPOs and the IPPC Secretariat. He noted that although the information sharing obligations not changed, the primary responsibilities for supplying information would now lie with the NPPOs. The Secretariat responsibilities are limited and now concentrate on information dissemination with the associated facilitation of working groups and commission meetings. Dr Nowell went on to describe the obligations of NPPOs in detail. (These are available in the report of ICPM 3.) The IPP and associated policy was approved by ICPM 4. An IPP support group has been established. An IPP system has been set up and is now functioning.

Dr Nowell went on to describe the requirements of an information exchange mechanism. These included the requirements to: be Internet based; be cost effective; be secure; allow remote access; have no duplication of data entry etc. He noted that if a country has no web

site, it can use the IPP instead. Where a country has no internet access, a CD-ROM will be made available.

Dr Nowell noted the fact that the IPP is concerned with official information at this stage and not other types of information. The group was shown the pages for RPPOs under the IPPC heading within the IPP. Dr Nowell then illustrated how to enter information into the APPPC section. This was a simple and quick process.

6.2 The APPPC information exchange mechanism

6.2.1 Recommendations regarding the place and form of the APPPC mechanism

The group discussed the use of the IPP as the site of a database for the APPPC. It was decided to recommend to the APPPC that a site within the IPP would be suitable for all the information that the APPPC would need for its information exchange purposes.

A list of categories for the information exchange mechanism was prepared. The list included the following headings:

. Categories for APPPC information.

- Introduction of the region
 - History
 - Agreement
 - Membership
 - Sub-regions
 - Structure and organizations
- News
- Calendar
- Publications
 - Reports
 - Standards
 - Documents for meetings
 - Country reports (in full)

6.2.2 Recommendations dealing with the other items in the TOR

The group went on to discuss the items in the Terms of Reference created for the Information Exchange group established at the 22nd Session of the APPPC in Ho Chi Minh City.

Plan of action

A plan of action for the development of the mechanism was proposed as a development plan for the site was no longer necessary. This included the following stages:

November 2002: Basic system is establishment for information network

January 2003: The APPPC Secretariat begins to add some information in the database of the network

June 2003: The APPPC Secretariat provides the questionnaire regarding the Commission country reports and adds the final draft standards

August 2003: The Information Networking group reports to the Commission

September 2003: The country reports of member countries is added to the database

January 2004: Extra staff specially for the information exchange should facilitate database development.

Information priorities for the region

The items below were considered as priorities within the region. It was recognised by the group that a number of these priorities would be covered by the development of the IPP.

- Phytosanitary legislation, NPPO organization
- Phytosanitary requirements
- Listing of phytosanitary capabilities, expert training institutes, specific equipment,
- Pest Outbreaks
- Current events
- Exchange of comments for draft ISPMs
- Plant quarantine techniques and methods.

Sources of sponsorship

Sources of sponsorship for the establishing of new web site for APPPC is no longer considered necessary with the use of the IPP.

Means of helping countries with less advanced systems

The following suggestions were made:-

- Assistance with information exchange including in CD-ROM for the countries with no access to the internet
- Assistance in setting up country web site.

Liaison with the IPPC secretariat (International Phytosanitary Portal)

This item of the TOR was complied with as Dr David Nowell from IPPC Secretariat attended the meeting to discuss the establishment of the APPPC information exchange mechanism.

Review of other information systems

Because of the decision to use the IPP system as a basis for the APPPC mechanism, the meeting felt unnecessary to consider other information systems at this stage.

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Opening Address

by

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FAO Regional Representative for Asia and the Pacific

Expert Consultation on Regional Standards

FOR PHYTOSANITARY MEASURES AND INFORMATION SHARING

29 October – 01 November 2002

Food and Agriculture Organization of the United Nations
Regional Office for Asia and the Pacific (RAP)
Bangkok, Thailand

Opening Address

by

Dr. He Changchui
FAO Regional Representative for Asia and the Pacific

Bangkok, Thailand

Mr. Chairman

Distinguished Expert

and my FAO colleagues:

1. On behalf of the Director-General of FAO, Dr Jaques Diouf, and on my own behalf, I have the honour and great pleasure to welcome you all, as members of the Standards Committee for the Asia and Pacific Plant Protection Commission (APPPC), at this FAO Regional Office for Asia and the Pacific (FAO-RAP).

2. As you know, I have just recently been appointed as Regional Representative for Asia and the Pacific, so I have not had the chance to meet you before. However, I look forward to getting to know you in the future and the work that you will be doing as members of the APPPC Standards Committee.

3. Of the work that is supported by FAO, I believe that the normative function is one of the most important. This work uses all the facilities of the FAO – its scientific background, its expert involvement in agriculture and forestry, its role as a neutral forum for consultations – formal and informal, its services to collect, assemble and disseminate information, and its knowledge and involvement in production and trade. I am very pleased that RAP, is able to facilitate this important APPPC work on phytosanitary standards in Asia and the Pacific, which is a part of FAO's normative programme in this very important area of phytosanitary.

4. I understand that this meeting is the first meeting of the APPPC Standards Committee. The Commission has worked very efficiently to develop the APPPC Regional Standard Setting Procedural Guidelines at meetings held last year (and I know that many of you were involved in this process) and to have them adopted at the 22nd biennial Session of the APPPC held in Ho Chi Minh City in September 2001. I have had a look at the Procedural Guidelines in the report of the 22nd Session and am impressed with the order, the clarity and the comprehensiveness of the guidelines. The work and effort you have put into these guidelines will stand you in good stead in the future.

5. I noticed that in June 2002 a working group meeting was convened to draft the standards for your consideration during this meeting. It is gratifying to note that you have been able to draft these standards at such a short notice. Australian experts have been most helpful by providing an initial draft of standard on guidelines for the development of heat disinfestation treatment of fruit fly host commodities. I compliment you on the efficiency and quality of the work. Both the draft on the heat disinfestation treatments and that on training requirements for plant quarantine inspectors will be excellent guidelines for your colleagues in national plant protection organizations throughout the region.

6. During the meeting, you will consider these draft standards and modified them as necessary. The revised documents will be sent to all members of the APPPC for their comments as part of the consultative procedure in developing the standards. We hope that by next year, you will have one more opportunity to consider the comments and incorporate them into the standards, before submitting for consideration by the Commission session in Malaysia. Hopefully, you will be able to adopt the draft standards at the 23rd Session of the APPPC in Malaysia late next year.

7. Mr. Chairman, in line with the theme of this Consultation, let me now turn to quote the following recommendation on Information Network for your kind attention which was raised by the Standing Committee on Plant Quarantine and adopted by the 22nd biennial Session of the APPPC:

After considerable discussion, the Standing Committee on Plant Quarantine identified the area of information networking as important with many countries requiring assistance. The Committee recommended the formation of a sub-committee with the following terms of reference:

The sub-committee on information networking was asked to report to the 23rd Session of the APPPC on:

- **Plan for the development of an information exchange mechanism.**
- **Information priorities for the region.**
- **Sources of sponsorship.**
- **A means of helping countries with lesser advanced systems.**
- **Liaise with the IPPC Secretariat (International Phytosanitary Portal – IPP).**
- **Review of other information systems.**
- **Ensure mechanisms are not too complex.**

It is proposed that the sub-committee be chaired by Malaysia with Committee members from Australia, China and Vietnam”.

We are pleased to find here with us Mr. Dave Norwell, expert from the Plant Protection Service at FAO Headquarters in Rome to introduce and discuss on the above points emphasizing on the new development on International Phytosanitary Portal (IPP) and suggesting the member countries of the APPPC on the information sharing issues.

8. I am very glad to note that following its genesis and in line with the revised Agreement of the FAO International Plant Protection Convention (IPPC) and Sanitary and Phytosanitary (SPS) Agreement of the World Trade Organization (WTO), the FAO-APPCC has been playing a notable role in the

extension of the development of various areas of plant quarantine to prevent the spread of dangerous exotic plant pests and diseases through international trade of agri-produce. It is a pleasure to note that most of the countries in the region have recognized the importance of the role on phytosanitary measure in the trade policy of agri-commodities, and to meet their obligations for the need of science based pest and pathogen risk assessment under the WTO-SPS Agreement. Several countries in the region are emphasizing on the move to amend their current National Plant Quarantine Act particularly to adjust the Standards which are being developed by FAO-IPPC in co-operation with concerned international organizations.

9. In conclusion, I would like to extend again a most cordial welcome to you all. I wish you have a successful and constructive discussion on the preparation of a first draft of APPPC Regional Phytosanitary Standards and get ready to move into the consultation process. I have the confidence that the standards will be adopted next year in Malaysia, and you will soon be the fourth regional body that have produced regional phytosanitary standards, after EPPO, NAPPO and COSAVE. I would assure you that FAO will continue to do what it can to support the APPPC in its standard setting activities and to support the implementation of the standards amongst the phytosanitary agencies in the region.

Administrative page

Endorsement

This APPPC Regional Standard was endorsed by the 23 Session of the APPPC held in Kuala Lumpur, Malaysia, 4-6 August 2003.

REVIEW

APPPC regional standards are subject to periodic review. The next review date for this standard is 2009. The standard may be reviewed earlier if the APPPC decides this is necessary.

DISTRIBUTION

APPPC regional standards are distributed by the Executive Secretariat of the APPPC to all APPPC members, the Administrative Heads of Regional Plant Protection Organization, and the FAO IPPC Secretariat. This standards is available on the APPPC webpage at <http://..>

NUMBERING OF THE REGIONAL STANDARDS

A system of numbering was recommended as following:
APPCC RSPM.....

I November 2002

**APPPC
DRAFT REGIONAL STANDARD**

**GUIDELINES FOR THE DEVELOPMENT OF HEAT DISINFESTATION
TREATMENTS OF FRUIT FLY HOST COMMODITIES**

**First Meeting of the APPPC Standards Committee
29-30 October 2002
FAO, Bangkok, Thailand**

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Introduction

SCOPE

These guidelines describe methods for identifying and developing appropriate heat disinfestation treatments against quarantine fruit flies in host commodities traded by APPPC member countries.

REFERENCES

ACIAR 1996. *Guidelines for the Development of Quarantine Disinfestation Heat Treatments for Fresh Horticultural Produce for Fruit Flies* (Australian Centre for International Agricultural Research Project No. 9051, 1996)

Glossary of phytosanitary terms, 2002. ISPM Pub. No. 5, FAO, Rome.

Guidelines for pest risk analysis, 1996. ISPM Pub. No. 2, FAO, Rome.

Requirements for the establishment of pest free areas, 1996. ISPM Pub. No. 4, FAO, Rome.

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

DEFINITIONS AND ABBREVIATIONS

APPPC	Asia and Pacific Plant Protection Commission
area	An officially defined country, part of a country or all or parts of several countries [FAO, 1990; revised FAO, 1995; CEPM, 1999; based on the World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures]
commodity	A type of plant, plant product, or other article being moved for trade or other purpose [FAO, 1990; revised ICPM, 2001]
disinfestation *	Application of a phytosanitary treatment to kill a pest in a commodity.
eclosion *	Metamorphosis to the adult from the egg, pupa, cocoon, puparium or last nymphal instar (for some insect).
endangered area	An area where ecological factors favour the establishment of a pest whose presence in the area will result in economically important loss [FAO, 1995]
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 [FAO, 1995]
equivalence	The situation of phytosanitary measures which are not identical but have the same effect [FAO, 1995; revised CEPM, 1999; based on the World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures]

establishment	Perpetuation, for the foreseeable future, of a pest within an area after entry [FAO, 1990; revised FAO, 1995; IPPC, 1997; formerly established]
fecundity *	The potential reproductive capacity of an organism or population; the number of eggs an animal produces during each reproductive cycle.
heat disinfestation *	Application of a heat treatment to kill a pest infesting a commodity
heat treatment	The process in which a commodity is heated until it reaches a minimum temperature for a minimum period of time according to an officially recognized technical specification [ISPM Pub. No. 15, 2002]
host range	Species of plants capable, under natural conditions, of sustaining a specific pest [FAO, 1990]
Instar *	The period or stage between moults, numbered to designate the various periods, e.g. the first instar is the stage between the egg and the first moult.
introduction	The entry of a pest resulting in its establishment [FAO, 1990; revised FAO, 1995; IPPC, 1997]
IPPC	International Plant Protection Convention, as deposited in 1951 with FAO in Rome and as subsequently amended [FAO, 1990; revised ICPM, 2001]
National Plant Protection Organization (NPPO)	Official service established by a government to discharge the functions specified by the IPPC [FAO, 1990; formerly Plant Protection Organization (National)]
pest	Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products [FAO, 1990; revised FAO, 1995; IPPC, 1997]
Pest Risk Analysis (PRA)	<u>The process of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the strength of any phytosanitary measures to be taken against it</u> [FAO, 1995; revised IPPC, 1997]
pest risk assessment (for quarantine pests)	Evaluation of the probability of the introduction and spread of a pest and of the associated potential economic consequences [FAO, 1995; revised ISPM Pub. No. 11, 2001]

pest risk management (for quarantine pests)	Evaluation and selection of options to reduce the risk of introduction and spread of a pest [FAO, 1995; revised ISPM Pub. No. 11, 2001]
phytosanitary measure (agreed interpretation)	Any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests [FAO, 1995; revised IPPC, 1997; ISC, 2001]
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 [FAO, 1990; revised FAO, 1995; IPPC 1997]
spread	Expansion of the geographical distribution of a pest within an area [FAO, 1995]
SPS Agreement	The WTO_Agreement on the Application of Sanitary and Phytosanitary Measures,
systems approach(es)	The integration of different pest risk management measures, at least two of which act independently, and which cumulatively achieve the appropriate level of phytosanitary protection [ISPM Pub. No. 14, 2002]
treatment	Officially authorized procedure for the killing or removal of pests or rendering pests infertile [FAO, 1990, revised FAO, 1995; ISPM Pub. No. 15, 2002]
WTO	World Trade Organization
* terms not included in the Glossary of phytosanitary terms	

OUTLINE OF REQUIREMENTS

Development of a heat disinfestation treatment involves a number of steps. Prior to the development of the treatment, the fruit fly pest or pests should be correctly identified and biological data collected. An appropriate heat disinfestation method should be selected and then small-scale trials undertaken to determine the most heat tolerant stage of the most heat tolerant species of fruit fly. Fruit may be infested using natural or artificial means and may use 3000-5000 fruit fly individuals.

Confirmatory trials to demonstrate the efficacy of the treatment to the level required by the importing country (according to the appropriate level of protection for that country) may use 30,000 or more fruit fly individuals. Appropriate care should be taken over the siting of heat sensors and temperature recording during treatment and the security of the fruit after treatment.

The consideration of other factors that reduce the risk of entry and establishment may allow the heat disinfestation treatment to be used as a component of a systems approach. Large-scale trials may be needed to confirm the commercial and operational feasibility of the treatment.

GENERAL REQUIREMENTS

BACKGROUND

Phytosanitary measures are often required for imported commodities to prevent the introduction of quarantine pests, including fruit flies. Such measures need to be appropriate for a specific commodity and effective against the quarantine pests of that commodity.

APPPC member countries cover a wide climatic range and the many different pests, including fruit fly species, have different geographic distributions and host ranges. For this reason, there may be differences between countries in their phytosanitary requirements for the importation of fruit fly host commodities.

Usually, phytosanitary measures are developed on a country/commodity/pest specific basis through a process of bilateral negotiation between the National Plant Protection Organizations (NPPOs) of the importing and exporting country.

In developing phytosanitary management options, APPPC member countries should take note of the principle of equivalence and be prepared to use different treatments that are equivalent.

For example, alternative phytosanitary management options such as cold disinfestation treatments, chemical disinfestation treatments, irradiation, area freedom, systems approaches, or combinations of the above may be appropriate for consideration of equivalence where feasible.

Among the above measures, heat treatment is regarded as one of the measures that is environmentally friendly and free from residues.

PURPOSE

The purpose of the standard is to provide a sound basis for APPPC member countries in developing heat disinfestation treatment against quarantine fruit flies in host commodities. It is intended to facilitate trade of the commodities by member countries

1. IDENTIFICATION OF QUARANTINE FRUIT FLY SPECIES ASSOCIATED WITH A COMMODITY

Fruit fly species associated with the country/commodity combination should be identified by a pest risk assessment. Information on the status of fruit fly pests in the importing and exporting country and on host preferences should be comprehensive and well documented. Where not available, research should be undertaken.

A fruit fly can be listed as a quarantine pest for a country only if it meets the criteria of the definition of quarantine pest.

2. IDENTIFICATION AND DEVELOPMENT OF APPROPRIATE HEAT DISINFESTATION TREATMENT

2.1 Identification of suitable heat disinfestation treatment

Heat is commonly used as a physical disinfestation treatment for fruit flies. Heat treatments include hot water dips, vapour heat treatment (VHT) and high temperature forced air (HTFA).

Factors influencing the selection of a treatment include:

- impact on commodity
- effectiveness on the target pests
- post-harvest shelf-life
- feasibility including cost
- requirement of importing country

Heat disinfestation options are best developed on a case by case basis for each country/commodity/pest combination using the general guidelines described in this standard.

2.2 Development of heat disinfestation treatment

2.2.1 Determination of the most tolerant developmental stage of the most tolerant fruit fly species for country/commodity combination

Where more than one quarantine fruit fly species is identified for a specific country/commodity combination, it is necessary to determine which stage of which species is the most tolerant to the treatment that is being proposed. Any large scale confirmatory testing that is required can then be restricted to this species and life stage.

It is important to seek relevant technical expertise (e.g. from biometricians, entomologists) and to consult the relevant scientific literature to ensure that laboratory tests and trials are designed and conducted appropriately. At all stages, untreated controls are required.

Where new treatments are to be developed, it is appropriate for the relevant NPPOs to agree bilaterally on experimental design including the quantity and quality of data required to meet the importing country's requirements.

2.2.1.1 Materials

Experimental fruits

Fruit for use in disinfestation experiments should:

- be identified botanically, including details of variety or cultivar if this may impact pest response to the treatment
- be free from any chemical treatment before its use in the trial
- be described in relation to stage of maturity, size, shape and quality
- be infested at a susceptible stage
- be in normal commercial condition.

Experimental insects

The following points must be considered when insects are used in heat disinfestation experiments:

- the insects should be identified taxonomically; it may be necessary to test for differences within the pest population

- reference specimens should be made available
- the laboratory colony should be founded from an appropriate source, preferably from a large quantity of field infested host fruit; ensuring that other species, parasites and disease are removed. This can be aided by rearing different fruit fly species in different rooms
- the laboratory colony should be founded from appropriate numbers of individuals (100-1000)
- the laboratory colony should be appropriately handled during its rearing history to ensure peak vigour for the duration of experiment
- laboratory colonies should be regularly refreshed with new wild flies so that the genetic diversity of the laboratory specimens can be considered to be representative of the population in the field
- the health of the laboratory colony should be regularly checked by monitoring such factors as per cent hatchability, mean pupal weight, developmental time, eclosion percentage, sex ratio of enclosed flies and the fecundity of each generation
- methods of rearing should be carefully documented.

2.2.1.2 *Methods*

Infestation of experimental fruit

Experimental fruit can be infested through natural (this is preferred) or artificial means.

If not known, it may be necessary to conduct studies on the fruit to determine the most susceptible stage and conditions for infestation.

Natural infestation involves exposing the experimental fruit to ovipositing females of the most heat tolerant species for a set period of time to achieve the most tolerant stage. This is usually done in a laboratory cage under strict conditions. If this method is used then the developmental times of the insect in the experimental fruit should be determined so that the treatment can be carried out at the correct developmental stage (the most tolerant stage). Care should be taken to ensure that the population of ovipositing females in the cage are at peak vigour (see 2.2.1.2), that the number of flies per cage, exposure time, number of fruit per cage and environmental conditions are adequately controlled. The time allowed for oviposition in the fruit should be kept as short as possible.

Artificial infestation involves placing the most tolerant stage of the most tolerant species into the trial fruit. A known number of eggs or larvae of appropriate stage are placed directly into the fruit using a method that is biologically appropriate and minimizes damage to the fruit and insects. Appropriate untreated controls are required.

Small scale trials to determine the most tolerant developmental stage

The most tolerant developmental stage of the most tolerant species should be identified through small-scale trials by determining appropriate dose response curves. Small-scale trials should be conducted using replicates of fruit fly individuals (each replicate should have 100 or more fruit fly individuals).

“Naked” (*in vitro*) insect trials are only appropriate to determine the most tolerant species. This involves taking differently staged eggs and larvae of the different species, dipping them directly into hot water (or appropriate heat source) and then

transferring them to an appropriate rearing medium. Care should be taken to select an appropriate number of insects, treatment levels and exposure times. Thermometers and other measuring devices must be accurately calibrated.

To identify the most tolerant developmental stage (of the most tolerant species), it may be more appropriate to conduct small-scale trials in artificially or naturally infested fruit (*in vivo*, see below) rather than on “naked” insects. Also, importing countries are likely to require efficacy to be determined by *in vivo* trials.

2.2.2 Determination of heat desinfestation treatment

Treatments of infested experimental fruit would normally be undertaken first on a small scale. Small-scale trials should be conducted using 3,000-5,000 individuals. Following this, confirmatory test on large-scale trials would normally be required to establish the technical validity of the treatment and to demonstrate the required level of efficacy. 30,000 or more fruit fly individuals should be used in a large-scale trial.

It is necessary to demonstrate that the treatment unit has adequate heating, cooling, insulation, humidity and thermostat controls. In the case of VHT and HTFA units, the coolest points should be determined based on a temperature map of the inside of the unit. Heat sensors should be located at these points and placed in the largest fruit in the treatment batch. The rate of heating and cooling should be accurately recorded with measurements taken at appropriate pre-determined intervals (e.g. every 2 mins.).

Treatment units and facilities may need to be approved or certified by the NPPO before treatment commences. It may be agreed between the NPPO of the importing and exporting countries for officials from the importing countries to observe the trials.

Treatment facilities must be located in a secure area to prevent reinfestation of treated fruits (post-treatment security).

Treated experimental fruit and untreated controls must be held in a secure location under physical conditions that are favourable for the fruit and for the survival of the insect species.

Pupae should be retrieved under appropriate conditions at an appropriate time. All fruit should be examined to find any remaining larvae.

2.3 Treatment efficacy

The level of efficacy required by importing countries for individual phytosanitary treatments must meet the ‘appropriate level of protection’ (ALOP) of the importing country. ALOP is defined by the WTO in the SPS Agreement as:

the level of protection deemed appropriate by the [WTO] Member establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory.

WTO Members have the sovereign right to determine their own ALOP. The ALOP may therefore vary from country to country but it must be based on scientific justification and applied consistently within each country.

NPPOs generally require a very high degree of efficacy for treatments developed against quarantine pests such as fruit fly. Often, lengthy, large scale trials are required to show that individual treatments are highly effective against the target pest on the commodity.

Traditionally, many of the treatments developed against fruit fly have used Probit 9 mortality as a measure of treatment efficacy. However, it is a measure of mortality but pest risk must be recognised as being related to the number of survivors and therefore the initial infestation rate must be considered in determining whether the level of efficacy corresponds to the ALOP.

To attain the level of protection to deal with the level of risk associated with fruit fly pests, other factors that may reduce the risk of entry and establishment such as the likelihood of infestation in the imported commodity, survival rate, reproductive potential or establishment potential should be considered. This heat disinfestation treatment could also be used as a component in a 'systems approach' or combination treatment (see ISPM No. 14).

2.4 Treatment evaluation

Before commercial trade commences, further large-scale trials may also be required to confirm that the treatments are not only technically sound but also commercially and operationally feasible. The treatment system must be reliable under commercial loading methods and likely product distributions.

2.5 Approval

Where the evaluation exercises are successful, both parties need to endorse the treatment. The approved treatment may then be part of the trade access agreement between the two countries for the commodity involved.

2.6 Documentation

All records and data should be kept and made available for audit by NPPO officials if this is required.

1 November 2002

**APPPC
DRAFT REGIONAL STANDARD**

TRAINING REQUIREMENTS FOR PLANT QUARANTINE INSPECTORS

**First Meeting of the APPPC Standards Committee
29-30 October 2002
FAO, Bangkok, Thailand**

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INTRODUCTION

SCOPE

The standard provides guidance on the development of training requirement for plant quarantine inspectors in phytosanitary inspection systems, methods and procedures.

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- Australian Quarantine and Inspection Service (AQIS). Certificate II in Quarantine Inspection: Various Generic, Technical and Site-Specific modules.
- USDA Module Phytosanitary Legislation Background documents
- Biological References PCE
- Agreements WTO (SPS), IPPC, APPPC and other relevant international agreements as appropriate
- National Legislation

DEFINITIONS AND ABBREVIATIONS

APPPC	Asia and Pacific Plant Protection Commission
Codex	Codex Alimentarius Commission
consignment	A quantity of plants, plant products and/or other articles being moved from one country to another and covered, when required, by a single phytosanitary certificate (a consignment may be composed of one or more commodities or lots) [FAO, 1990; revised ICPM, 2001]
Control point	A step in a system where specific procedures can be applied to achieve a defined effect and can be measured, monitored, controlled and corrected [ISPM Pub. No. 14, 2002]

IPPC	International Plant Protection Convention, as deposited in 1951 with FAO in Rome and as subsequently amended [FAO, 1990; revised ICPM, 2001]
ISPM	International Standard for Phytosanitary Measures [CEPM, 1996; revised ICPM, 2001]
LMO	Living modified organisms
NPPO	National Plant Protection Organization [FAO, 1990; ICPM, 2001]
OIE	Office International des Epizooties
pathway	Any means that allows the entry or spread of a pest [FAO, 1990; revised FAO, 1995]
Phytosanitary Certificate	Certificate patterned after the model certificates of the IPPC [FAO, 1990]
phytosanitary measure (agreed interpretation)	Any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests [FAO, 1995; revised IPPC, 1997; ISC, 2001] <i>The agreed interpretation of the term phytosanitary measure accounts for the relationship of phytosanitary measures to regulated non-quarantine pests. This relationship is not adequately reflected in the definition found in Article II of the IPPC(1997)</i>
post-entry quarantine	Quarantine applied to a consignment after entry [FAO, 1995]
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 [FAO, 1990; revised FAO, 1995; IPPC 1997]
regulated non-quarantine pest	<u>A non-quarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contracting party [IPPC, 1997]</u>
regulated pest	<u>A quarantine pest or a regulated non-quarantine pest [IPPC, 1997]</u>
risk profiling	The use of specific information to direct phytosanitary procedures to areas of highest risk.
SPS Agreement	WTO Agreement on the Application of Sanitary and Phytosanitary Measures

wood packaging material

Wood or wood products (excluding paper products) used in supporting, protecting or carrying a commodity (includes dunnage) [ISPM Pub. No. 15, 2002]

OUTLINE OF REQUIREMENTS

National Plant Protection Organisations (NPPOs) have the obligation to train plant quarantine inspectors. NPPOs may utilise educational organisations, special training institutes, modular programmes or in-service systems.

A number of subject areas for such training include :

- Human Resource Management to deal with personal skills and occupational health and safety issues;
- Plant health and impact on trade and the environment to cover plant identification, risk analysis, international agreements and standards, basic plant health, phytosanitary principles regulated pests, legislation, regulations and national policies;
- Administrative procedures such as conveyance clearance, mail clearance, cargo clearance, phytosanitary certification, general phytosanitary documentation, liaison with relevant border agencies and authorities, prosecution for non-compliance with phytosanitary regulations and auditing accredited service providers;
- Technical procedures such as pest and disease diagnosis, sampling regimes for inspection, inspection procedures for different commodities, the use of electronic detection systems, phytosanitary actions and treatments, post-entry quarantine and passenger systems.

GENERAL REQUIREMENTS

1. PURPOSE

Plant quarantine inspectors face a wide variety of tasks on a daily basis in the inspection of imported and export regulated articles. To effectively accomplish this work, it is desirable for the inspectors to have a sound educational background in agriculture and general knowledge in trade and the environment and have specific training in phytosanitary procedures used in compliance assurance. Harmonization of inspector training across the APPPC region will increase understanding and cooperation among NPPOs in the region. This standard lists most, if not all, of the areas of training for inspectors whilst recognising that inspectors need specific training in regard to the areas in which they are responsible.

The standard, in describing subject areas for training of plant quarantine inspectors, aims to:

- provide a sound basis for the development of effective and efficient plant quarantine inspectors
- achieve a consistent approach to training of inspectors across the APPPC region

2. ADMINISTRATION OF TRAINING SYSTEMS

The NPPO should undertake to provide opportunities for training plant quarantine inspectors (IPPC Article IV.2 (h)) in the appropriate subject areas listed below.

It is recognized that different countries may have different areas of concern and may focus on those phytosanitary areas deemed to have the greatest potential need, use and benefit (e.g. different potential pathways for pests). NPPOs should provide suitable expertise and resources for the conduct of a training programme.

Each NPPO has to determine the most efficient way of training its staff. At present there are many methods used by different agencies. These include:

- training at a special training institute
- training at an existing educational institute with special courses
- using training modules as part of a course, as stand-alone units or as self study unit
- on the job training by NPPO officials in the home country or in another country.

Also, such training would involve the preparation of training programmes for each inspector over a period of years. This is likely to involve continuing training as an officer's job responsibilities change or new procedures are introduced.

Each training system would involve the normal administration including the identification of qualification levels, examination setting and marking and appropriate record keeping.

Some countries within the region have quarantine inspectors with multiple responsibilities - for plant health, animal health and food. In such cases, the training programme described in this standard would only cover the plant health aspects of training required.

It may be possible for countries of a region to share training opportunities and hence the costs of establishing training systems.

NPPOs are encouraged to consider the following subject areas for their training programmes. Nevertheless, the modules in which specific training is provided may be different from the heading of the listed subject areas. Some NPPOs have training modules relating to specific areas of operation. For example, training for inspectors at an airport may include aspects of aircraft, passenger and baggage clearance, garbage disposal, etc.

3. SUBJECT AREAS FOR TRAINING

3.1 Human resource management

Training modules for plant quarantine inspectors may include these aspects of human resource management:

3.1.1 *Personal skills*

These may include:

- communication skills
 - interpersonal communication
 - dealing with clients
 - conflict management
 - cultural sensitivity
 - language skills
- computer literacy
- report writing
- taking legal statements
- on the job training of other staff

3.1.2 *Occupational health and safety issues*

These may include:

- safety in the work place
- dangerous work areas such as wharves and ship inspections

- recognition and handling , where authorized, of hazardous materials
- handling equipment
- handling toxic and treated commodities
- handling suspect packages and commodities
- identification of safety signs and symbols
- maintenance of equipment/facilities
- application of quarantine treatments.

3.2 General knowledge of plant health, trade and the environment

3.2.1 Basic plant health

A basic knowledge of the biotic factors involved in plant health e.g. insects, mites arachnids, nematodes, molluscs, weeds, fungi, bacteria, viruses and allied entities is essential. This would include also a knowledge of how these pests may be carried with regulated articles and moved between countries. The basic information should include an understanding of the impact of pests on commercial production, the environment and human health.

3.2.2 International agreements and standards

Inspectors need to be aware of the WTO SPS Agreement, IPPC and relevant regional plant protection agreements and the associated standard setting by IPPC, CODEX, OIE and regional plant protection organizations. Inspectors need to have an understanding of the use of the Glossary (ISPM 5) terminology.

Inspectors need to be aware of the role of the IPPC in describing the responsibilities of NPPOs and the relevant ISPMs to commodity import and export certification.

3.2.3 Phytosanitary principles

Inspectors need to understand the basic principles of phytosanitary measures such as prevention, eradication, control/containment of quarantine pests. Inspectors should be aware of the *Principles of plant quarantine as related to international trade* (ISPM No. 1).

3.2.4 Legislation, regulations and national policies

It is essential that inspectors are familiar with their national quarantine regulations and policies. They must understand the structure of the NPPO, their lines of reporting and know their powers, and their limitations, under the legislation. Inspectors may need to be aware of related legislation of other government agencies (e.g. customs, immigration, health, port, airport and border authorities as appropriate).

3.2.5 Risk analysis

Inspectors should understand the need for risk analysis, the components of assessment and risk management, and how the process is involved in the preparation of import requirements or export certification (ISPM Pub. No. 2 and No. 11, FAO, Rome)

Inspectors need to be aware of the risk assessment process associated with the introduction and spread of quarantine pests on plant materials.

Inspectors should be able to supervise/apply appropriate required risk management procedures that are commensurate with the risk.

3.2.6 Regulated Pests

Inspectors should be aware of regulated pests that may threaten their domestic industries and the environment. This should involve knowledge of the origin and the major pathways of introduction of these pests and the risk of their introduction and spread. They should be able to report such pests.

3.2.7 Product identification

Inspectors need to be able to recognize a variety of products in order to apply regulations correctly e.g. fruit, vegetable, cereals, seeds, flowers, ornamental, processed plant material, propagative material, timber (manufactured, finished and unfinished), cane products, and growth media.

Inspectors may also need to be aware of the operation of CITES regarding endangered species and the Convention on Biological Diversity, particularly in relation to the entry of invasive alien species that may threaten the environment.

Some countries may require inspectors to deal with documentation concerning LMO material and issues relating to the Cartagena Protocol.

3.3 Administrative procedures

3.3.1 Clearance procedures

Conveyance clearance (air, sea, land)

Inspectors need to be able to apply the procedures relating to phytosanitary clearance when a conveyance (aircraft, ship, train, truck, etc.) enters the country. These procedures may involve inspection, documentation checking, treatment, seizure, rejection, containment of risk items, and garbage disposal.

Mail clearance

Inspectors should be familiar with the handling and screening process for mail and the appropriate inspection techniques to detect regulated articles.

Cargo clearance

Procedures used include: documentation checking, inspection, applying/supervising any appropriate treatment, detention, destruction, and refusal of entry. Inspectors should be able to apply entry clearance procedures for consignments of plant material and other regulated articles.

Passenger clearance

Inspectors should be trained in dealing with passengers and passenger baggage. This includes:

- questioning skills for dealing with passengers
- baggage inspection skills
- using profiling data to target inspections and other phytosanitary procedures.
- liaise effectively with associated agency personnel (the use of customs codes)
- procedures for seizure, release and treatment of goods.

3.3.2 Phytosanitary certification

Inspectors should be able to check:

- compliance with the import requirements of the importing country
- application of the export certification system of the exporting country
- implementation of the Guidelines for Phytosanitary Certificates as described in ISPM Pub.No. 12 and Export certification system, ISPM Pub. No.7.

3.3.3 General phytosanitary documentation

Inspectors should be familiar with the phytosanitary documents relating to:

- the import and release of biological control agents (ISPM Pub. No.3)
- wood packaging materials (ISPM Pub.No. 15)
- notification of non-compliance (ISPM Pub. No.13)
- import requests and permits
- regulated non-quarantine pests (ISPM Pub. No.16)
- declarations
- this may include CITES documentation in some countries.

3.3.4 Liaison with relevant border agencies and authorities

Inspectors should be aware of appropriate procedures and protocols to liaise with relevant government agencies including:

- customs
- immigration
- environment
- health
- banks
- port, airport and any other border authorities as appropriate.

3.3.5 *Prosecution for non-compliance with phytosanitary regulations*

Inspectors should be familiar with the documentation and procedures to support prosecutions for non-compliance with phytosanitary regulations. Non-compliance includes:

- the smuggling of prohibited materials
- erroneous entry or falsification of import-permits (including false product descriptions), phytosanitary certificates or other phytosanitary documents
- breaking of quarantine seals on containers or packaging.

In some countries inspectors undertake prosecution and may require appropriate training.

3.3.6 *Auditing of accredited service providers*

Inspectors may be trained to undertake audits of third party service providers and audits of approved quarantine premises and facilities.

3.4 Technical procedures

3.4.1 *Use of detection systems*

Inspectors should be trained in the use of various detection systems where they are used by NPPOs such as:

- X Ray Transmission Imaging machines
- scanners used for containers
- thermal scanners for wood and logs
- animal detectors

3.4.2 *Sampling regimes for inspection*

Inspectors need to be familiar with sampling regimes for the inspection of different commodities and quantities of plant materials. This will involve the determination of the sample size, the number of samples required, and the method of collection of samples from the different types and volumes of plant material and regulated articles.

3.4.3 *Inspection procedures for different commodities*

Inspectors need to be able to use different inspection techniques for different commodities and consignments such as bulk, containers, various forms of packaging, bags, sacks or boxes, individual items, passenger baggage using the following methods:

- visual examination
- microscopic examination
- electronic tests or analysis

- analytical methods.

3.4.4 *Pest diagnosis*

Inspectors need to be trained to be able to:

- recognise the signs, symptoms and presence of pests associated with regulated articles.
- use diagnostic tools to aid in primary identification of biotic agents
- collect and preserve specimens for submission to experts for identification
- recognise weed seed contaminants and collect samples for submission to experts for identification
- know where to refer specimens when special expertise is required
- recognise contamination of non-regulated articles with regulated articles

3.4.5 *Phytosanitary actions and treatments*

Inspectors need to be trained in the use of and supervision of those actions and treatments that may be required. These may include:

- phytosanitary actions to hold, prohibit, destroy material or refuse entry.
- fumigation
- cold disinfestation
- heat disinfestation
- chemical disinfestation
- devitalization
- irradiation
- burial/incineration
- processing for a different end use with negligible quarantine risk.

3.4.6 *Post-entry quarantine*

Inspectors should be familiar with the principles and application of post-entry quarantine. Post-entry quarantine may be undertaken in authorized specially designed and secure glass-house, isolated planting areas or special monitoring programmes to observe the imported materials for the incidence of pests. Post-entry quarantine may have different degrees of security to deal with different levels of risk, for example:

- high security using special secure facilities with diagnostic and destruction equipment
- medium security facilities which are audited by the NPPO.

Inspectors should be able to use correct procedures for handling material destined for post entry quarantine.