

REPORT OF THE APPPC SYSTEMS APPROACHES WORKSHOP

4 - 8 November, 2013
Bangkok, Thailand



Summary

The meeting was opened by Dr Nanthiya Unprasert, Deputy Director General, National Bureau of Agricultural Commodity and Food Standards. The key principles of systems approaches (SAs) were outlined. These included elements from the IPPC, ISPM 14 *The use of integrated measures in a systems approach for pest risk management*, and the WTO *Agreement on the Application of Sanitary and Phytosanitary Measures*. The strength of measures used, how they work and their efficacy in an SA were discussed. The concepts of equivalence and of independent and dependent measures were noted. The first exercise undertaken by participants involved the consideration of the principles and the way they affect the use of measures.

The process of pest risk analysis was described with the stages of initiation, pest risk assessment and pest risk management. Participants then conducted a second exercise outlining the chain of events in pathways (a pathway being any means that allows the entry or spread of a pest) concerning pests with several commodities.

The options for pest risk management that an SA provides were studied by examining the characteristics of an SA (such as being least trade restrictive, adequately documented, monitored and validated etc) and aspects of the application of measures – including the application of measures at pre-planting, pre-harvest, harvest, post-harvest etc. Exercise three asked participants to describe what were the biological characteristics that might a hypothetical insect quarantine pest might be expected to possess. Further factors that influenced risk were considered including the influence of commodity end-use, of commodity processing, of plant propagation materials and of audit and verification procedures.

Participants then looked at the building of an SA. This involved considering a number of factors in the initiation of the SA, the responsibilities of the parties and the work plant development and export protocol. Two case studies of SA were discussed. The first was of exporting apples using SA to deal with a codling moth from New Zealand. Pre-harvest, harvest and post-harvest activities were noted. System features such as the use of independent and dependent measures, traceability, management of records, verification/audit, the management of contingencies were discussed. The importance of industry cooperation and compliance were stressed. The second study provided an introduction to the Korean SA for fruit import and export. The process to obtain market access to Korea was described consisting of eight steps – request filing, initiation, pest categorisation, assessment, management, drafting, public notice and enforcement. Information on imports of avocados from Mexico, mangoes from Viet Nam, and fruit from Chile was provided.

In the fourth exercise, participants were asked to consider developing an export SA, with independent and dependent measures, to deal with a problem of glassy-winged sharpshooter that could transmit the Pierce's disease pathogen affecting citrus and grapes using SAs and to estimate the effectiveness of the system.

This was followed by a case study of the import of bulk wheat into Australia for processing. In this particular situation the quarantine pests were determined and PRAs conducted for on the most important pathogens which were *Alternaria tritici*, *Cephalosporium gramineum*, *Tilletia controversa*, and *T. indica*. Other concerns included weed seeds, live insects, and contaminants which are taken care of by the processing of the wheat. Wheat was imported from Canada and England using the system developed.

The system had the major components: sourcing grain from low risk area, using pre-export procedures to manage cross-contamination of handling and transport units, on arrival verification of grain health status in Australia, operational procedures to ensure secure transport of grain, and metropolitan processing of the grain.

The final exercise for the participants, divided into two paired teams, involved the building of export market access requests, using system approach methods with scientific information provided, for presentation to respective team trade partners. Negotiations were undertaken between pairs of “countries” to achieve respective exports and import acceptances. The

results of the negotiations were then documented for presentation to all participants. The exercise was deemed by all participants to be most successful.

The results of the evaluation conducted by participants were discussed and changes suggested if the workshop is undertaken elsewhere. The training was generally approved and participants felt the workshop had provided a sound introduction to SA. Suggestions for material to be included in a follow-up meeting to this one included: an introduction to PFAs; the development of a check-list of possible SA components for each of the potential main sections of and SA (pre-planting, field production, harvest, post-harvest etc); examples of SAs from different parts of the world in the workshop; the development of means for measuring efficacy; the amendment of each of the workshop discussions and exercises to allow for the integration of the relevant industry or stakeholder group in the development and negotiation of SAs; information on other developmental work on SA being conducted by other groups/countries; and discussion of movement from end-point treatments to SA in international trade in plants and plant products.

REPORT

1. Opening of the meeting

Opening remarks by Executive Secretary of APPPC

Dr Piao Yongfan welcomed the participants and experts to the meeting. He noted the importance of systems approaches as providing options for pest risk management. He described the history of the development of this meeting also mentioning that the work plan already includes a further session of systems approaches. He thanked Thailand for hosting this meeting.

Opening of Workshop by Deputy Director General of ACFS

Dr Nanthiya Unprasert, Deputy Director General, National Bureau of Agricultural Commodity and Food Standards, welcomed participants and experts to the meeting.

Dr Nanthiya noted that a meeting on systems approaches was first proposed for the work programme at the 27th session of the APPPC in Manila. The systems approaches methodology, which uses several elements, is one of the most important options for pest risk management. This is described in ISPM 14. Thailand has had some experience in the use of these techniques. Dr Nanthiya thanked Mr R.B. Schwartz and Dr Piao for arranging the meeting and wished participants every success in their considerations.

2. Overview of the Workshop

Mr Schwartz described this programme as a pilot. This workshop will allow all participants to share their experience in systems approaches (SAs). For many years countries have depended on single treatments but many are now developing SAs. The programme will include group exercises. The response of participants to the operation of the workshop will be sought during and at the end of the meeting. A special response sheet will be provided. One of the key outcomes of this meeting will be the development of the next steps of the future work programme.

Another programme, “Beyond Compliance”, has covered much of this material in a different manner. This week will deal with the same area but will be concentrating on basic principles the biology of pests and association with the export pathway. The presence of biological data is most important and its absence in many cases where SAs are developed needs to be dealt with. The pathways of import and the pests involved will be examined with some commercial systems being used as examples.

The general structure of the programme was discussed. Dr Grant will be describing the basic principles; with information on systems in use being discussed by Dr Wilson and Dr Choi. Dr Maynard will present a series of exercises. On day three, participants will look at policies for grain processing in Australia and then undertake more work on the theoretical aspects of model systems. The content of the field trip was described.

In the final day participants will look at what has been achieved, particularly noting what has worked well and where further work is needed.

3. Key Principles of systems approaches

3.1 ISPM 14 Overview

Dr Grant explained the form of the sessions and how they would operate. He hoped that the sessions would be interactive and a benefit to all participants.

The purpose of ISPM 14 was discussed – pest risk management options leading to increased safe trade. The document presents a framework allowing management methods to be put together so that countries can confidently trade with few biosecurity risks. Firstly, the group will examine the development of risk measurement, and how to deal with the risk using different measures.

The use of different elements is discussed in the ISPM, how the efficacy measures is determined and how to deal with the lack of information. Dr Grant discussed the nature of independent measures – when one fails this does not affect others. Systems approach uses a system of measures so that several measures are used. The endorsement of equivalence and facilitation of trade using SAs were noted. The SA is not a stand-alone measure – it is a series of sequential measures that can be applied at different stages of the development of the product. These measures will gradually reduce the prevalence of the pest concerned.

The discussions later in the meeting will deal with validation of the efficacy of measures in an SA. With an SA, less stringent measures might be able to be used – with not so large sampling sizes. Probit 9 is not appropriate for SAs.

Dr Grant then discussed the elements of ISPM 14 in the form of knowledge building blocks. The starting point is the relationship of the SPS agreement with the ISPMs; the knowledge of the commercial activities of the production chain is critical; also, the knowledge of the export commodity and the biology of the pests involved. The next factor is “how do they relate” and how they mitigate risk and to determine the gaps that measures must address. There must be an understanding of what measures can be applied and which might work. The strengths and weaknesses of the various measures must be known. Where the measures might be applied

must be determined. The efficacy of measures should be known along with their confidence levels in the process of reducing risk.

Participants discussed independent measures which can include inspection systems, production systems, processing systems, and quarantine measures on arrival. Dependent measures include greenhouse doors and screening (see page 14, ISPM 14). The use of Probit 9 was noted – the percentage kill is very high – and used where a high degree of efficacy is required. Probit 9 is not used in SA. SA can use a series of measures of much lower stringency.

3.2 WTO SPS Agreement

This agreement applies to all measures that countries apply if they have an impact on international trade. The agreement allows the application of measures for their human, animal and plant protection that are linked to their ALOP and that have the least negative trade effects. The appropriate level of protection is a principle of the SPS Agreement and defines the level of risk a country finds acceptable.

The fundamental principles include: the undertaking of a risk assessment that is appropriate to the circumstances (ie not one size fits all); based on scientific principles; considers appropriate biological, environmental evidence; and takes into account international agreements and guidelines. The WTO then supports harmonisation using the three international standard setting agreements – IPPC, OIE and Codex Alimentarius.

The principles as described in ISPM 1 are mirrored in the SPS Agreement to some extent. It offers the basic operation phytosanitary principles. The revised definition of SA which is out for country consultation at the moment was mentioned.

The concept of equivalence was discussed – with the use of different measures to obtain the same effect. SA measures are part of this with a combination of measures to obtain the desired outcome. Countries should consider regional conditions, the pest prevalence and official controls that are in place (eg areas of low pest prevalence).

Consistency in the application of ALOP is essential to avoid discrimination or disguised trade restrictions. The ALOP should be applied to all commodities with similar risk and restrictions cannot be applied in a different manner to those applied domestically against the same pest.

First Exercise

Participants were asked: How do the components restrict the options available, what does the framework allow to be done, and what are the Member's obligations?

There is the basic requirement to identify the building blocks of SA. Participants should undertake a careful examination of ISPM 14. The determination of these building blocks is required for this exercise. Participant needed to think about the principles and the way they affect the use of measures.

The following notes provide a summary of the results of the group discussions:

ALOP – this is a decision point indicating where measures are needed or not – it defines the level when measures should be applied. This depends on the risk assessment. Each country is able to apply its own ALOP. This refers to whatever pest is under consideration. Therefore pest of high risk can have strong measures.

PRA - a tool to evaluate the risk involved – different levels for different pests. There is the need to identify the quarantine pests. This is most important for the selection of risk management measures and needs a scientific basis. The PRA provides justification for the application of measures.

Harmonisation – trade partners use standards of international treaties. Measures need to be consistent with standards. National standards should be based on international standards where available. If no international standard available, measures can be applied according to the PRA.

Equivalence – importing countries should recognise other measures if they meet the required strength of measures. The outcome is the important point, measures should be appropriate – and should be the least trade restrictive. Equivalent measures require justification.

Consistency – restrictions should be applied as disguised restrictions on trade. The measures used should be of similar strength for similar risks. Measures should be applied in an unbiased manner and not more trade restrictive than required to meet a country's ALOP.

3.3 Pest Risk Analyses

PRA is a process of evaluating biological or other scientific and economic evidence to determine whether an organism is a pest, whether it should be regulated and the strength of measures if they are to be applied.

- Initiation – this includes the identification of the PRA area, pathway and pests of concern
- Pest risk assessment – deals with the evaluation of the probability of the introduction and spread of a pest and the magnitude of the associated potential economic consequences.
- Pest risk management – identification of measures that reduce the risk to an acceptable level.

Communication is regarded as critical. All parties involved need to know what is going on.

There are five key questions for all PRAs:

Is the pest associated with the entry pathway into the PRA area?

Is the pest absent or present, and if in the PRA area, under official control?

What is the likelihood of the pest entering and establishing?

What are the negative consequences?

What measures need to be applied if the pest risk exceeds the ALOP?

Interest is limited to pests and in particular to quarantine pests i.e. those that are of economic importance and are not present (or present and under official control) in the country.

Regarding Stage 1- initiation The PRA area needs to be defined (where the pest may get into), as well as the export area (where it may come from), the pathway, and the pest of potential concern.

Regarding Stage 2 - pest risk analysis. This is a two-step process:

Step 1 - pest categorisation – this is a filtering process and finds the quarantine pests on the pathway.

Step 2 - detailed risk assessment estimates the level of risk, and identifies the quarantine pests that exceed ALOP on the pathway..

In these discussions, the pathway is defined as – any means that allows the entry or spread of a pest. In this process, analysts are trying to prove that the pest is associated with an import pathway – that the chain is unbroken, define the commercial practices, and the unrestricted risk.

Second exercise

Participants were asked to: Describe the chain of events that describe the entry pathway.

- The following notes provide a summary of points regarding the elements of the pathways and measures for the cases studied by each subgroup:

- Pineapple – mealy bugs

Field – planting material could be treated. Production area sprayed with fungicides and insecticides

Harvesting – fruits not put on the ground, vehicles should be treated

Packing house – air-blowing, dipping in chlorine, grading visual, categorising the fruit, boxed, use of cool room

Transport to port – vehicles treated and at right temperature

Ship transport – ensure right temperature

Retail – Consumer – waste to host

- Mango – insect pests – Fruit fly etc

Production area – control of insect pests,

Harvesting - fruit packing to protect fruit, mealy bug use cleaning, protection at time, use steam box to prevent contamination

Export - inspection before export

Transportation – special storage

Import - importing country might have inspection – if ff – could establish, but scale insect could more easily establish, seed weevil could establish.

- Orchid – cut flowers

Pre-production – tissue culture material testing, pest

Production – pesticide treatment, soil less medium, removal of disease material, check for insect pests

Packing house – protected packing material, check for insects

Transport – air transport, use cold temperature, some sanitary control

Import port – inspection on entry

Distribution – to consumer and possibly host.

- **Mango – fruit fly**

Production pre-harvest – use trapping, spraying, bagging, SIT in some areas, orchard sanitation

Post-harvest – sorting, quality sorting, Vapour heat treatment,

Packaging – protected boxes

Entering – intended use important – processing vs fresh consumption, fruit fly has wide host range, depends on environment, and volume of exports.

Dr Grant summarised the elements and noted that to determine the elements of an SA, it is necessary to look at all of the stages from production to consumption where risk is may be influenced.

4. Options for Pest Risk Management

This is when ALOP is considered – is the risk too high. Measures can be looked at different ways and applied at different stages of the pathway and include:

- Mitigation measures
- Safeguard measures
- Procedure measures

SA is a cumulative addition of measures. With dependent measures, if one fails they all fail. But this is not the case with independent measures. Where figures are not available, expert judgment should be used. It does not matter whether figures or terms are used – as long as some final assessment/value is obtained.

Measures can be applied at any stage of the pathway. The system is scalable to risk and least trade restrictive.

4.1 The characteristics of an SA

In setting up the system, the following need to be understood: pest biology, commercial export practice, residual risk that needs application of SPS measures, points where measures can be applied.

Measures in any SA must be:

- Least trade restrictive
- Explicit and mandatory
- Linked to a named pest
- Effective against the named pest
- Adequately documented, monitored and validated
- With mechanisms for corrective action.

4.2 Aspects of SA that need to be considered

Pest prevalence in the export area

- Considering factors influencing the risk – environmental conditions, seasonal pest changes, natural enemies, pest reproduction strategies plus factors concerning commercial production practices and systems.

SA Pre-planting

- Healthy plant materials
- Resistant cultivars
- Pest exclusion
- Registration of export areas and training

SA Pre-harvest

- Field pest management (treatments, cultural controls including sanitation, pest mating disruption)
- Protected conditions (glasshouse production, fruit bagging, netting)
- Area of low pest prevalence

Commodity form and pest association

- Commodity factors – e.g. above or below ground produce, smooth or rough surface
- pest factors – size, visibility, internal-external life stages, damage caused, behaviour
- contaminants – trash, weed seeds, soil etc, pest not associated with the commodity part exported.

Harvest

- harvesting conditions – time of year, stage of development, harvest technique (picking, handling)
- pathway exclusion/removal of – infested product, contaminants – trash
- selection and /or inspection

Post-harvest treatment and handling

- commercial quality treatments and processes (controlled atmosphere, wahinsg brushing)
- inspection and grading
- sanitation (removal of parts of host plant)
- packing processes and conditions
- screening of storage and export areas

Transportation, import and distribution

- supply chain/transport conditions –temperature, atmosphere, packaging, duration
- disinfection treatments – fumigation, chemical dips, irradiation
- Restrictions on – end use, distribution and points of entry, import windows
- Post-entry quarantine

Pest mobility

- Factors influencing risk – natural or assisted dispersal (vector), fly or crawl, need for a vector, mechanical transmission
- Other issues – consider the completer life cycle, explicit evidence of how a pest will find a host.

Exercise 3

What are the biological characteristics might you expect a hypothetical insect quarantine pest to have?

The groups made the following suggestions:

- High mobility and spread easily
- High reproductive ability
- Small size and difficult to detect i.e. cryptic
- Short life cycle
- Resistant to chemical treatment
- Wide host range
- Minimum of natural enemies

It is critical to have an understanding of the biology of the pest.

4.3 Further factors for consideration that influence risk

These included:

Influence of commodity end-use

- Consumption, propagation
- Distribution in the PRA area
- Waste
- Other factors – end use

Influence of commodity processing

- Processing (e.g. peeling, cooking)
- Pest removed or killed
- Pathway from pest to host broken

Plant propagation materials

- Provide pest, host, environment
- Form imported
- High health source
- Quarantine
- Other factors include weed risk..

Audit and verification activities include:

Audit of export

- Production and packing processes
- Treatment facilities
- Surveillance systems
- See how the competent authority is working

Verification

- Accreditation/registration of export produce
- Phytosanitary notification

Visual inspection

- Verification of pest freedom to a specified tolerance – in field, pre-export or on arrival

5. Building a Systems Approach

The next stage is how these factors of an SA can be brought together.

5.1 The initiation involves the following steps:

The PRA identifying the pest risk

- Pest biology and association with export pathway
- Proposes what and where measures can be applied
- Identify independent and dependent measures
- Assess the efficacy of measures
- Ensure feasibility and trade restrictiveness

Data collection for evaluating SA

- Existing data from SA for similar commodities
- Specific data on pests and procedures

Determination of the efficacy of measures

- Not one size fits all
- Quantative or qualitative approaches

Mapping out the pathway

- Include commercial processes, procedures and practices from the export area through to the pest finding a host in the PRA area.

Identifying how commercial activities influence the risk

- Does the pathway mitigate the risk
- If not, determine what measures are appropriate

Mapping out the pathway with measures applied

- Define the measures
- Define the SA
- Document the SA requirements and party responsibilities

5.2 Responsibilities of the parties

- Importing country
 - o Provide pests of concern, import requirements
 - o Points needing further clarification
- Exporting country
 - o Provide pest /host, production and export pathway data sufficient to support the proposed SA
 - o Monitoring reporting, reviewing and maintaining and certifying the effectiveness of the SA.

5.3 Work plan development– export protocol

- Bilateral agreement between NPPOs
- Details include:
 - o Commodity exported
 - o Pests covered
 - o Area of production
 - o Participating organisations and their responsibilities
 - o Operational procedures including verification and review
 - o Contingency or corrective action plans

6. Examples of SAs

6.1 Fresh Produce example from New Zealand

This was presented by Dr Joanne Wilson. The case study was of exporting apples using a systems approach.

New Zealand has the problem of codling moth. To maintain quality the SA is used. 391 orchards and 70 pack houses are registered for export. – exporting some 280,000 tonnes. The main production areas were noted. The PRA for codling moth was discussed. Attacked fruit tend to drop prematurely and can become deformed. Pheromones are used for trapping. Several importers accept the use of integrated measures in a SA for CM management.

The following notes were discussed:

Activities for the SA include:

Pre-harvest

- Registration of production sites
- Pre-season training
- CM trapping and mating disruption, application of pesticides
- Removal of non-apple hosts
- Requirements for diaries and records
- Audit systems

Harvest

- Harvesting by separate lines
- CM survey of harvested apples – verification step

Post-harvest

- Registration of pack houses
- Facility are MPI approved and document systems in place
- Facility sanitation
- Grading and sorting done at least twice or more
- Packaged and labelled – detailed traceability procedures
- CM detection contingencies – allows removal of product
- Product inspected, certified, segregated and secured
- Audit

Some aspects of the CM SA system were discussed in more detail:

Pre-harvest activities

- Registration
 - o Information on production site
 - o Growers nominate pack house and monitoring organisation
 - o Registration audit required
 - o End to end fruit traceability
- Pre-season workshop – run by industry – mandatory attendance
- CM trapping and mating disruption

- Has many components trapping identification, period, distances, pheromone concentrations etc
- Mandatory pesticide sprays at defined periods, storage conditions for pesticides, record keeping, contingency options
- Alternate host removal
- Spray diaries – information made available for audit purposes to ensure requirements of the programme are met
- Pre-harvest activities audited by a nominated compliance agency

Harvest activities

- Harvested by separate lines.
- In-field grading and sorting – 1000 apples from 10 bins examined by MPI approved person

Post-harvest activities

- Mandatory registration
- Attendance at pre-season workshop
- Pack houses must be MPI approved and have document systems in place
- Sanitation and exclusion – insecticide applied routine cleaning
- Grading and sorting – sorted at least twice, downgraded material removed daily – this can be done by computer
- Product is packaged, labelled, inspected, certified, segregated and secured for export.
- Phytosanitary inspection and certification - 600 randomly selected apples per lot officially inspected – and PC issued if no regulated pests detected

Dr Wilson went on to discuss the **system features of the CM programme**. This has:

The systems approach

Independent measures

Pest reduction

Pest exclusion

Dependent measures

Fruit traceability

Verification of system components

Compliance system checking

Industry ownership

- The system was developed by MPI and industry but owned by industry
- The system is verified by MPI
- There are strong information sharing mechanisms with participants
- The system is risk-based.

Traceability is right through the system.

Management of records – for each component of the system for verification

Verification / audit – the aspects of this system was described. MPI audits the compliance organisations. The compliance organisations checks the growers, pack houses.

Re contingencies

- The industry collate and analyse data

Dr Wilson then discussed the system and its effectiveness with some additional comments :

- ICM was found in 2010 and another in 2011. = 1 larva in 16,610 tonnes = 91 million apples
- The system was improved

The system is accepted by three countries, underpinned by qualitative science and is risk based. In a SA it is often unusual to have a specific quantitative data for efficacy of the individual components of the system. It has multiple verification steps and operational systems to provide assurances for trading partners.

There are two compliance agencies in New Zealand. These are audited by MPI and an international accreditation organisation.

Industry compliance is important – and if an SA can be built into an industry system the more likely it is to be successful and be followed by industry. The matter of end-point treatments was discussed. These can fail. An SA can have sufficient cover to be able to make up when one component fails. This needs to be considered with the application of SA and how they are managed.

6.2 Introduction to Korean Systems Approaches for Fruit Importation and exportation

The official definition of SA was discussed. The SA is developed from an evaluation of information on efficacy of measures, surveillance and interception, pest-host relationship, crop management practices, verification procedures, trade impacts and costs.

Dr Deuk-Soo Chooi from Korea provided an introduction to PRA in Korea. It was noted that under Korean regulations all plants and plant products can be imported except those prohibited. Prohibited articles include beneficial organisms, host plants and plant products from where a prohibited pest exists. Prohibited pests include fruit flies, codling moth, PCN, fire blight etc. Prohibited articles cannot be imported without a PRA/IRA being conducted.

The organisation of the PRA section within the QIA was described. The Risk Management Division of 13 staff is in the Department of Plant Quarantine.

The procedure for Korean market access - consists of 8 steps (Filing of the request, initiation, pest categorisation, assessment, management, drafting, public notice, enforcement) with stages 2-5 dealing with PRA. A figure of the overall procedure of Korean market access (IRA flow chart) was shown.

Case studies of Korean SA for fruit imports

E.g. *Avocado from Mexico*

The PRA noted 6 species of fruit fly and one pathogen, *Nectria galligena*. Limited to one variety (Hass) and limited areas. A surveillance programme is undertaken, and QIA monitors in the export area during season.

Mango from Viet Nam

PRA noted 2 pathogenic species and 8 pest insect species. Pest management measures include: monitoring and management of orchards, monitoring for pest incursion, hot water treatment for seven fruit fly species, QIA undertake export inspection and check conditions for hot water treatment.

Fruits from Chile (blueberry, orange, lemon, Kiwifruit, grapes)

Measures – PFA for medfly, trap monitoring, fruit cutting and inspection monitoring. If found non-export area established

Export of Apples to Taiwan

Peach fruit moth (*Carposina sasakii*). Packing house registration, bagging for each apple, orchard surveillance, Taiwan inspectors check export processes.

Many negotiations are on-going for market access. There are a total of 160 at different stages of the IRA process (64 commodities from 37 countries). The number of finalized IRAs at this stage is - 44 items from 24 countries.

Outline of guideline

Korean SA for fruit exports

Korea does not allow the transit of commodities which may carry pests that are quarantine pest for Korea. This is because Korea believes the pests might escape.

The process of development of market access proposals will normally include several measures to meet the PIR. Measures are discussed between countries and the measures of the exporting countries will be considered in the discussion document. New Zealand separates risk management from the PRA. This contains the preferred options.

Exercise 4

The details of the exercise were presented. It involved a new pest, the glassy-winged sharpshooter that transmits Pierce's disease of citrus and grapes and the export of grapes.

The participants were asked what an SA would contain, and what were the independent and dependent measures, and how would the effectiveness of the system be measured?

The range of measures proposed by the groups included:

Pre-planting

- Registration of vineyards
- The area could be an ALPP

Field production

- Monitoring to have low pest level and use biological pest control, plus sanitation plus bunch shaking and the use of a sticky trap to catch the insects....
- monitoring and bagging of the fruit,
- Removal of lower leaves Natural enemies release. Bt could be used

Harvesting

- grapes should be trash-free, so the only concern is the adult insect.

- inspection and grading and sanitation – separate lines, field checking of fruits and rubbish removed.

Pack-house

- If packing is done in packing house – a blower could be used. If packed in the field, no blower can be used.
- grading, sorting, inspection – minimising chance of adult being present
- After packing, fumigation would be carried out for spider control then cool storage – these would be independent measures.

Transportation

- use cold treatment Transportation – 23 days at -1 kills the insect.

Effectiveness of the system would be measured by checks and audit by importing country... and export inspection

Dr Wilson noted that the systems devised are very strong and probably more than would be required. It was agreed that there was a requirement to remove leaves and there could be a cold treatment for the pest adults. Mr Schwartz noted that the minimum measures only can be applied. The measures devised are really too strong and would not be justified under the SPS agreement.

In the case of Australia and its examination of this pest, its primary association with the pathway is leaves, the association with adults is less clear – it is not a pest of fruit. Field packing and house packing will disturb and remove the pest. Trash must be removed with a zero tolerance. Adults could be dealt with a MBr fumigation offshore. This system was to be reviewed after significant trade. Following pathway analysis, nothing was found in inspections and the treatments ameliorated. The use of measures based on biological aspects did provide the control needed. The biology of the pest is important – so the focus should be on the product not the orchard.

6.3 Bulk grains for processing

This was a case study of bulk wheat into Australia. Wheat is imported when shortfalls occur in drought situations, for stockfeed.

In these situations quarantine pests are determined and PRAs conducted for wheat for processing and *Alternaria tritici*, *Cephalosporium gramineum*, *Tilletia controversa*, and *T. indica* were identified as pests of concern. Other concerns included weed seeds, live insects, and contaminants.

A. tritici is seedborne and infected seeds without symptoms. *C. gramineum* has a clear pathway association. *T. controversa* is more of a problem where snow cover is present. Karnal bunt is a major quarantine concern. The pathogens are present in all major wheat growing areas other than Australia.

The critical control points were identified – field growth, offshore transport – inspection, on and off shore transport and processing. The existing policy was to source from low risk areas and metropolitan processing. Looking at the components:

- Re off shore transport – 3rd party certification from the exporting country
- Off shore inspection – to have freedom from *Trogoderma*
- On shore inspection for clearance of shipments

- On shore transport – secure containment from port to processing facility – sealed trucks under quarantine supervision
- Processing – in metropolitan area and correct processing (hammer milling – grinds and shatters the seed - and a steam conditioner) This process dealt with weed seeds, insects and seed transmitted pathogens.

The PRA identified the areas of main risk – and this was seed-borne pathogens. It was considered the potential presence of spores of identified fungi pathogens could be a risk when loading trucks. Sourcing wheat from low risk areas –ALPPs, production area freedom and PFAs were considered. The appropriate standards were utilised.

Canada was a source country – *T. indica* and *A. triticina* absent. There were areas of limited distribution for *T contraversa*. The certification of Canada was satisfactory.

England was also a source as it had freedom for three of the pathogens and tested for *C. granareum*. The systems used were satisfactory for the import. Certification for *Trogoderma* was provided with secure transport.

This import system continues to be used. Mr Schwartz noted that time can be saved by restricting the PRA to key quarantine pests. The system had the major components: sourcing grain from low risk area, using pre-export procedures to manage cross-contamination of handling and transport units, on arrival verification of grain health status in Australia, operational procedures to secure grain in transport, and metropolitan processing of grain.

7. Exercise 5 - Creation of a model system using rice as host

This exercise required each of the four teams to study information provided that outlined the biological characteristics of a number of “pests” of rice in their country (these were specially designed fictitious pests) and a number of rice pests in their potential trading partner. The teams then had to:

Prepare SAs for export and to examine the SAs of a trade partner

- Prepare an SA to support rice export to their potential trade partner
- Check the biology of pests the potential trade partner would have to deal with in an SA they would present for their rice exports.

Undertake negotiations on the model SAs

Negotiations were undertaken between pairs of “countries” to achieve respective exports and import acceptances. The results of the negotiations were then documented for presentation to all participants.

Present the outcomes, rationale and unresolved issues of model system

Presenters used power point slides to show the results of their considerations. The following notes illustrate the points considered by the teams.

The first pair of countries:

The presenter from the first country provided lists of the pests in their country and those not in the prospective trade partner's country. The exporter was to deal with a smut disease. A series of proposals were made by the exporting country to which the importing country added further measures. The control of alternative hosts (weeds) was required. A lab test was provided.

The second presenter noted the pest list. The pests the importing country did not have was an insect pest. The measures proposed included the registration of fields followed by GAP. The importer required seed treatment. Chemical control would be provided when necessary, with isolation, with water level control and weed control (the weeds were alternate hosts). Seed was to be sorted to reduce contamination. The NPPO would certify the warehouse etc. The importer required grain inspection, annual auditing and NPPO inspection – with tolerance of 1%. Fumigation might be required if the insect damage level was high.

The second pair of countries:

Rice seed export – There were four pests not in the importing country – a snail, insect, bacterium and a weed. The insect was unlikely to be transmitted with the commodity – but the weed was important and could contaminate consignments. The fields were required to be registered. The importing country requested a buffer zone. The field should have a controlled water regime as this enabled control of some of the pests. Cultural controls were required to break the cycle of the insect. Varieties resistant to the bacterial disease were to be used. A herbicide was to be used for weed control. Surveillance and inspection were to be regularly undertaken. Air blowing techniques were to be used to free consignments of weed seed. Phosphine would be used for fumigation. Audits would be carried out.

Rice for consumption

Milled rice grain is for export – for processing. The pest list was provided. There were only 4 organisms not in the importing country. The SA consisted of registration of farmer, use disease free seed and GAP – removal of alternate hosts for insect, and the application of a herbicide for weed control. At harvest the trash must be removed to stop pest transmission. Post-harvest measures included – drying of the grain and storage in moisture free stores or bins. Blowers etc could be used to remove weed seeds. With transport, shipments will have to be kept dry by using covers where necessary. Pre –export measures might include inspection and PC issue, and audit by the importing country prior to export in the first year of export.

Exercise evaluation

Mr Schwartz discussed the results of the presentations and mentioned the need for justification for the application of measures. In some of the cases described in the exercise, the need for these was obscure. The pathways for the pests need to be complete for measures to be justified. It is possible that not all systems approaches devised for this exercise needed to include components from the earlier part of the production system. However, the import of seed does require careful consideration of all factors in the production of the seed. Mr Schwartz complimented the participants on their performance.

The benefits of property registration were discussed – in particular that of traceability.

The systems used in the exercise followed those used commercial practices. In practice this use of commercial practice is useful in obtaining cooperation from industry and obtaining the collaboration of the more efficient and competent growers. The non-quarantine pests inserted into the exercises were detected by the participants and not included in their considerations.

Dr Maynard noted the hard work of the participants in carrying out this exercise. The cooperation amongst the participants had produced excellent results.

8. Field trip to rose-apple orchard, Radchaburi province

The group visited a rose-apple orchard that used an SA to obtain pest-free material for export and for the local market. The SA was described by the Thailand DoA participant at the meeting with the assistance of the grower.

It was noted that the fruit fly traps used were simple and extremely effective and the ground underneath the trees was clean and weed-free. It was suggested by one participant that the placing of the pack-house in the middle of the orchard placed great pressure on the fruit fly control system of the pack-house. The timing of the infestation of the two pests was discussed – fruit flies affecting the more adult fruit, the weevil affecting the very young fruit so measures were applied early. An attractant spray was used to reduce the numbers of flies in the orchard. Fruit bagging was done at a particular time before flowering to minimise the likelihood of flies infesting the fruit early. The bagging produces better product quality fruit in this case, but this may not always be true in all circumstances. Commercial practice, the SA and market quality requirements were working together in this orchard. The SA was effective, there was strong industry buy-in, and the system was strongly biology based. There is the need to consider how likely it is that infested fruit would be detected and removed by visual quality inspections.

9. Key issues from the Workshop

9.1 Evaluation results

Dr Grant discussed the results of the evaluation. Participants mentioned that the introductory material was not considered to be too long; pre-reading could be extended with more real-life links with SA and pests; the individual presentations were appropriate; SPS links were important, the most valuable aspect was the creation of models. Some of the introductory material was not totally on target (section on ISPM14 could be covered mostly in pre-reading requirement) but the exercises were well received. Suggestions included: more information on what other countries were doing, more practical examples, information on developing a PFA and setting up an SA, and the presentation of PP-slides in a folder.

Mr Schwartz went on to discuss the evaluation in detail. The reading of material before the workshop was discussed; this could be specified. This material might have to be reviewed in the workshop but the time doing this could be reduced. The PRA linkage session was found to be useful. It was felt that the SPS Agreement linkage was important and should be strongly integrated into the introductory session.

9.2 Changes that could be considered

The changes recommended included:

- breaks could be shorter;
- more real-life SAs could be discussed; the assessment of SAs could be dealt with at the next workshop;
- the SA building exercises were well received and it was suggested that more commodities could be used (though it was recognised that this could make the process much more complicated (real life pests and countries were not used as these bring in more conflict and difficulties));
- the end use of the commodity should be made clearer;
- the SAs were over-engineered and in future workshops the necessity of some of the SA components should be challenged;
- a stakeholder component could be built into some part of the exercises; there could be more time for discussions and evaluation of the SAs devised;
- there could be a challenge put into the negotiations to restrict the number of components in the SA to the minimum that could be technically justified;
- it was suggested that a list of SA components be developed and more background material on the components be made available.

The training was generally approved as suitable and satisfactory. Participants recommended the workshop as suitable training for colleagues. It was recognised that participants of this workshop had had a sound introduction to SA. If further developmental training workshops are to be undertaken in SA in the APPPC work programme, it was considered that participants should have at least the level of training of the participants of this workshop. Key recommended changes were shorten breaks, more in depth evaluation of SAs produced in the group exercise, including ensuring refinement to “least trade” restrictive options, more background on relevant ISPMs were appropriate to SA.

10. Further activities for Systems Approach training in the APPPC region

Participants supported the continuation of training in the development and use of SAs. It was suggested that a further workshop be considered. The topics/ areas for such a work-shop could include:

- Study of PFAs – a sound introduction would be helpful in developing SAs
- Check-list of possible SA components for each of the potential main sections of and SA (pre-planting, field production, harvest, post-harvest etc)
- The examination of certain commodity groups and the description of the production chains
- The basis of SAs – the dependence of SAs on the biology of the pest and host, the area and the end use – needs to be stressed
- More examples from different parts of the world in the workshop should be included. This is really important
- The development of means for measuring efficacy - using qualitative and quantitative methods
- The amendment of each of the workshop discussions and exercises to allow for the integration of the relevant industry or stakeholder group in the development and negotiation of SAs.
- Information on other developmental work on SA being conducted by other groups/countries

- Discussion of movement from end-point treatments to SA in international trade in plants and plant products.

Key future activities agreed were:

- Develop list of measures available in SA (e.g. checklist or guidance document) at various points along the entry pathway
- Illustrating SA with a crop, or various crops to show the relationship between pest, host and environment, and how measures interact with them
- How to move from endpoint treatments to SAs
- More detail on what other people are doing in SAs

11. Close of the Workshop

Mr Schwartz noted the work and cooperation of the participants and that this made the meeting successful. He thanked the sponsors and organisers of the meeting respectively for their generous and effective inputs

Dr Piao discussed the work programme of the APPPC and noted that this meeting constituted work on the third ISPM that the APPC has carried out - ISPM 6, ISPM 15 and now ISPM 14. This last-mentioned ISPM is an extremely important standard and members had requested workshops on this. The workshop has met the needs of members in this regard. The facilitators of this workshop have stimulated and motivated the participants. The evaluation undertaken was valuable and indicated the success of the meeting; the meeting has provided a good development opportunity for participants. Papers contributed by participants on SAs used in their own countries would be most useful in future workshops.

Dr Piao thanked participants for their hard work and cooperation, the sponsors of the meeting, and the facilitators from Australia and New Zealand. He thanked the Thai participants for the field trip which was most instructive. The considerations on future meeting will be most helpful in designing the next meeting. He wished participants safe travel home.

Agenda

Day 1 – Monday 4 November 2013

10:00	Opening Ceremony Opening remarks by Secretary of APPPC Opening of Workshop by Secretary General of ACFS	Piao Yongfan
10:30	Overview of the Workshop	Rob Schwartz
10:45	Group Photograph / Morning Tea	
11:00	Key Principles ISPM 14 Overview WTO SPS Agreement Pest Risk Analysis	Neil Grant
12:30–14:00	Lunch	
14:00	Options for Pest Risk Management	Neil Grant
15:00–15:30	Afternoon tea	
15:30	Building a Systems Approach	Neil Grant
17:00	Close of Day 1	
19:00	Welcome Dinner by ACFS	

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Day 2 – Tuesday 5 November 2013

9:00	Fresh Produce examples from New Zealand	Joanne Wilson
10:30–11:00	Morning tea	
11:00	Fresh Produce examples from New Zealand (cont.)	Joanne Wilson
12:00	Introduction to Korean Systems Approach for Fruit Importation and exportation	Deuksoo Choi
12:30–14:00	Lunch	
14:00	Creation of a model system using rice as host Group exercises in teams	Glynn Maynard
15:00–15:30	Afternoon Tea	
15:30	Creation of a model system using rice as host (cont.)	Glynn Maynard
17:00	Close of Day 2	



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Day 3 – Wednesday 13 November 2013

9:00	Bulk grains for processing	Rob Schwartz
10:30–11:00	Morning tea	
11:00	Group Exercises – negotiations on model systems	Glynn Maynard
12:30 – 14:00	Lunch	
14:00	Groups - negotiation on model systems (cont.)	
15:00 - 15: 30	Afternoon Tea	
15:30	Presentations on the outcomes, rationale and unresolved issues of model system	Glynn Maynard
17:00	Close of Day 3	
19:00	Dinner hosted by FAO	



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Day 4 – Thursday 7 November 2013

Field Trip – Rose apple farm in Radchaburi province and floating market.

8:00 Depart hotel

17:00 Return to the hotel

Day 5 – Friday 8 November 2013

9:00 Key issues from the Workshop
Further activities for Systems Approach Rob Schwartz

10:30 -11:00 Morning tea

11: 00 Further activities for Systems Approach (cont.)

12:30 -14:00 Lunch

14:00 Workshop summary and outcomes Rob Schwartz

15:00 -15:30 Afternoon tea

15:30 Close of Workshop Piao Yongfan



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List of Participants

AUSTRALIA

1. Mr. Robert Bertrand Schwartz
Senior Director
Plant Biosecurity
Department of Agriculture
7, London Circuit, Canberra City
G.P.O. Box 858, Canberra ACT 2601
Australia
Tel: 61 2 6272 4865
Mobile: +61 418 671 391
Fax: 61 2 6272 3307
Email: Rob.Schwartz@daff.gov.au

2. Dr. Glynn Maynard
Director
Plant Biosecurity
Department of Agriculture
7, London Circuit, Canberra City
G.P.O. Box 858, Canberra ACT 2601
Australia
Tel: +61 262725391
Email: Glynn.Maynard@daff.gov.au

3. Dr. Neil Grant
Assistant Director
Plant Biosecurity
Department of Agriculture
7, London Circuit, Canberra City
G.P.O. Box 858, Canberra ACT 2601
Australia
Tel: +61 262724849
Email: Neil.Grant@daff.gov.au

BANGLADESH

Ms. Mahbuba Khatun
Entomologist
Plant Protection Wing, Department of Agricultural Extension
Khamarbari, Dhaka-1215
Cell No : +88 01712470524
Email: Mahatahmid48@yahoo.com

CAMBODIA

Mr. HENG Chhun Hy
Deputy Director
Department of Plant Protection Sanitary and Phytosanitary
General Directorate of Agriculture
54B, St 656, Sangkat Toeuk Laak, Khan Toul Kok
Phnom Penh, Cambodia
H/P:(855) 12 954 963
Email: chhunhyheng@gmail.com

CHINA

Ms. Li Xiaonan
National Agricultural Technology Extension and Service Centre
No. 20 Maizidian Street, Chaoyang District
Beijing 100125, China
Tel: 8610-59194524, 15810153303
Fax: 8610-59194726
Email: lixiaonan@agri.gov.cn

LAO

Mr. Souliya Souvandouane
Head of Plant Health Sector
Plant Quarantine Division
Department of Agriculture
Ministry of Agriculture and Forestry
Lane Xang Avenue, Patuxay Square
P.O. Box 811, Vientiane Lao PDR
Tel: (856 21) 412350
Fax: (856 21) 452649/412349
Email: Souliya_ss@yahoo.com

MALAYSIA

Ms. Zaiti Akmal binti Dahlan
Department of Agriculture,
Plant Biosecurity Unit,
256, Jalan Abdul Samad,
80100 Johor Bahru, Johor, Malaysia
Tel : 07-226 9122/ 07-2239395
Fax : 07-2239398
hp. Number : 012-7712660
Email: zaitiakmal@yahoo.com

MYANMAR

Daw Thin Thin Yi
Staff Officer
Plant Protection Div.
Department of Agriculture

Ministry of Agriculture and Irrigation
Bayintnaung Road, West Gyogone Insein
Yangon, Myanmar
Tel: 095-1-644214
Email: ppmas.moai@mptmail.net.mm

NEPAL

Ms. Sabnam Shivakoti
Senior Plant Quarantine Officer (Acting Chief)
National Plant Quarantine Program
Department of Agriculture
Ministry of Agricultural Development
Hariharbhawan, Lalitpur
Tel: 977- 9841330283 (Cell)
Email: shabaryal@yahoo.com; shabnam.shivakoti@gmail.com

NEW ZEALAND

1. Dr. John Hedley
Principal Adviser, International Coordination – Plants
Biosecurity New Zealand
Ministry of Agriculture and Forestry
P.O. Box 2526, Wellington
Email: John.Hedley@mpi.govt.nz

2. Dr. Joanne Wilson
Senior Adviser
Produce Imports
Plants, Food & Environment
Standards Branch
Ministry for Primary Industries
Pastoral House, 25 The Terrace, PO Box 2526
Wellington, New Zealand
Tel: 64-4-894 0528
Fax: 64-4-894-0662
Web: www.mpi.govt.nz
Email: Joanne.Wilson@mpi.govt.nz

PHILIPPINES

Ms. Loreta C. Dulce
Senior Agriculturist
692 San Andres Street
Malate, Manila, Philippines 1004
Tel: (632) 4040409
Fax: (632) 5243749
Email: loretadulce@yahoo.com

REP. OF KOREA

1. Dr. Hyokin Lee
Assistant Director, Export Management Division
Department of Plant Quarantine, QIA
178 Anyang-ro, Manan-gu, Anyang-si
Gyeonggi-do, Rep. of Korea
Tel. :+82 31 420 7668
Fax. :+82 31 420 7605
Email: clavibacter@korea.kr

2. Dr. Deuksoo Choi
Researcher, Risk Management Division
Department of Plant Quarantine, QIA
178 Anyang-ro, Manan-gu, Anyang-si
Gyeonggi-do, Rep. of Korea
Tel. :+82 31 420 7654
Fax. :+82 31 420 7606
Email: dschoi@korea.kr

SRI LANKA

Mr. W.M P.T. Bandara
Deputy Director
Plant Protection Service
Department of Agriculture
Peradeniya, Sri Lanka
Mobile - 0094718216683
Email - ptbandara48@gmail.com

THAILAND

1. Dr. Manita Kongchuensin
Senior Expert in Plant Pest
Plant Protection Research and Development Office (PPRDO)
Department of Agriculture (DOA)
Ministry of Agriculture and Cooperatives (MOAC)
50 Phaholyothin Rd. Ladyao, Chatuchak
Bangkok 10900, Thailand
Tel: 662 579 3053
Fax: 662 940 5396
Email: manitathai@gmail.com

2. Mr. Sarute Sudhi-aromna
Senior Entomologist
Plant Protection Research and Development Office (PPRDO)
Department of Agriculture (DOA)
Ministry of Agriculture and Cooperatives (MOAC)
50 Phaholyothin Rd. Ladyao, Chatuchak
Bangkok 10900, Thailand
Tel: 662 579 5583

Fax: 662 940 5396
Email: sarutes@yahoo.com

3. Dr.Nuttima Kositcharoenkul
Senior Plant Pathologist
Plant Protection Research and Development Office (PPRDO)
Department of Agriculture (DOA)
Ministry of Agriculture and Cooperatives (MOAC)
50 Phaholyothin Rd. Ladyao, Chatuchak
Bangkok 10900, Thailand
Tel: 662 579 8599
Fax: 662 940 6371
Email: n.kosit@hotmail.com; nuttima.k@doa.in.th

4. Ms. Areewan Jaipetch
Senior Subject Matter Specialist
Bureau of Agricultural Product Quality Development
Department of Agriculture Extension (DOAE)
Ministry of Agriculture and Cooperatives (MOAC)
50 Phaholyothin Rd. Ladyao, Chatuchak
Bangkok 10900, Thailand
Tel: 662 579 3664
Fax: 662 940 6190
Email: are-ewan@hotmail.com

5. Ms. Tasanee Pradyabumrung
Senior Expert, Office of Standard Development
National Bureau of Agricultural Commodity and Food Standards (ACFS)
Ministry of Agriculture and Cooperatives (MOAC)
50 Phaholyothin Rd. Ladyao, Chatuchak
Bangkok 10900, Thailand
Tel. +662 561 2277 #1421
Fax +662 561 3357
Email: tasanee@acfs.go.th

TONGA

Dr. Viliami Kami
Deputy Director
Quarantine and Quality Management Division
Ministry of Agriculture and Forestry
P.O. Box 14, Nuku'alofa
Kingdom of Tonga
Tel: 676 24257, 676 24922
Email: pilakami@gmail.com

VIETNAM

Mr. Le Nhat Thanh
Director of Post entry Plant quarantine Centre Number 1
PPD, Hanoi, Vietnam
Tel: +8438388800
Handphone: +84903496888
Email: thanhln04@yahoo.com; thanhln.bvtv@mard.gov.vn ; kdtvsnk1.bvtv@mard.gov.vn

FAO/RAP

1.Mr. Piao Yongfan
Senior Plant Protection Officer
FAO Regional Office for Asia and the Pacific
39 Maliwan Mansion, Phra Atit Road
Bangkok 10200, Thailand
Tel: 662 697 4268
Fax: 662 697 44445
Email: yongfan.piao@fao.org

2.Ms. Michiko Ikeya
Consultant
FAO Regional Office for Asia and the Pacific
39 Maliwan Mansion, Phra Atit Road
Bangkok 10200, Thailand
Tel: 662 697 4166
Fax: 662 697 44445
Email: michiko.ikeya@fao.org

3.Ms. Nongyao Ruenglertpanya
Secretary
FAO Regional Office for Asia and the Pacific
39 Maliwan Mansion, Phra Atit Road
Bangkok 10200, Thailand
Tel: 662 697 4264
Fax: 662 697 44445
Email: N.Ruenglertpanya@fao.org