Pest Risk Analysis to Determine Regulated Nonquarantine and Quarantine Pests©

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As prescribed by the International Plant Protection Convention (IPPC), Pest Risk Analysis (PRA) is the process of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the strength of the phytosanitary measures to be taken against it. The process of PRA on plant pests is described for the purpose of preparing phytosanitary regulations by the South African National Plant Protection Organization (NPPO). This process is used to determine the regulated pests and their management options. The procedures followed in South Africa are predominantly based on ISPM Pub No. 2 (1996), International Standards for Phytosanitary Measures (ISPM) Pub No. 11 (2003), and ISPM Pub No. 1 (1995).

INTRODUCTION

Pest risk analysis (PRA) comprises of various elements, which are described in Paragraphs 1 to 5.

1. INITIATION POINTS

Pest risk analysis can be initiated when a **new pathway** has been identified, e.g., if a country receives an application for the importation of a new commodity that has not been imported into the country before. A commodity according to International Standards for Phytosanitary Measures (ISPM) Pub. No. 5 (1999) is a type of plant, plant product or other article being moved for trade or other purpose. Pest risk analysis can also be initiated when a **new pest** has been identified, e.g., a new pest species is identified by scientific research. The term pest, according to ISPM Pub. No. 5 (1999), refers to any species, strain, or biotype of plant, animal or pathogenic agent injurious to plants or plant products. Often, PRA is also initiated by the **review or revision of current policies and previous PRAs**. In South Africa, most PRAs are initiated due to the identification of new pathways.

During the initiation stage, the pests and the pathways of quarantine concern as well as the PRA area are identified. All previous PRAs relevant to the pest and the pathway identified are also taken into consideration. If a valid previous analysis has been conducted on the pest/pathway, the specific PRA would be stopped. In South Africa, the weediness potential of the commodity is also assessed.

2. PEST RISK ASSESSMENT

2.1 PEST CATEGORIZATION

The following elements should be taken into consideration when categorizing a pest:

- **Identity of Pest.** The identity of the pest should be clearly defined. The taxonomic unit used for a pest is usually that of spe-

cies. If a taxonomic level lower than species is used there must be evidence that the differences between the lower taxonomic units are enough to affect the phytosanitary status of these pests. It is important to note that vectors may also be considered as pests.

- **Presence or Absence in the PRA Area and the Regulatory Status.**

The following table indicates the difference between quarantine pests and regulated nonquarantine pests (RNQP) (ISPM Pub. No. 16, 2002). Importing countries can set control measures for both of these categories of pests. Pests not falling into these two categories may not be listed on the import conditions.

Table 1. Differences between quarantine pests and regulated nonquarantine pests (ISPM Pub No 16, 2002).

Quarantine pest	RNQP
Pest absent or of limited distribution	Pest present and may be widely distributed
Phytosanitary measures for any pathway	Phytosanitary measures only on plant for planting
Economic impact predicted	Economic impact known
If present, under official control with aim of eradication or containment suppression	Under official control with respect to the specified plants for planting with aim of

- Potential for establishment and spread in PRA area
- There should be evidence available that the pest may be able to establish and/or spread in the PRA area.
- Potential for economic consequences
- There should be a clear indication that the pest may have an unacceptable economic impact and/or environmental impact in the PRA area.

2.2 PROBABILITY OF INTRODUCTION AND SPREAD

The different possible pathways must first be identified for the pest initiated PRAs. Each pathway will then be assessed separately.

2.2.1 ENTRY

When assessing the entry potential the following are evaluated:

- Probability of pest being associated with pathway at origin
- Probability of pest surviving transport/storage
- Probability of pest surviving existing pest management procedures
- Probability of transfer to suitable host

2.2.2 ESTABLISHMENT

When assessing the establishment potential the following are evaluated:

- Availability of suitable hosts, alternate hosts, and vectors in PRA area
- Suitability of environment in PRA area
- Cultural practices and control measures currently in use on hosts and alternate hosts

- Other characteristics of the pest affecting the probability of establishment, e.g., adaptability

2.2.3 SPREAD

When assessing the spread potential the following are evaluated:

- Suitability of environment for natural spread
- Natural barriers
- Potential for movement with commodities
- Intended use of commodity
- Potential vectors in the PRA area
- Potential enemies in the PRA area

2.2.4

Those pests that may be introduced into and spread through the PRA area, or part there of, will then be assessed further. The rest of the pests will not qualify as quarantine pests on the commodity evaluated.

2.3 POTENTIAL ECONOMIC CONSEQUENCES

The following two categories are important to take into consideration when evaluating the potential economic consequences of the pest. Most economic consequences can be measured quantitatively, but for some it is not feasible, in which case qualitative information on these consequences may then be provided. In South Africa we mainly use qualitative data.

2.3.1

The direct pest effects evaluated include:

- Effect on known/potential host plants
- Types, amount, and frequency of damage
- Crop losses, in yield and quality
- Biotic factors (e.g., adaptability of pest) affecting damage and losses
- Abiotic factors (e.g., climate) affecting damage and losses
- Rate of spread and reproduction
- Efficacy and cost of control measures
- Reduction of keystone plant species

2.3.2

The indirect pest effects evaluated include:

- Potential loss of domestic and export markets
- Control costs
- Changes to consumer demand
- Environmental effects of control measures
- Feasibility and cost of eradication or containment
- Capacity to act as vector for other pests
- Effect on plant communities

Those pests that can cause an economically important impact will be listed on South African import conditions. The next step will be to determine the different control measures that can be used for each pest.

2.4 UNCERTAINTY

Areas of uncertainty, as well as the degree of uncertainty in the assessment, must be documented. This will enhance transparency and will also give an indication of research needs.

3. PEST RISK MANAGEMENT

The quarantine pests and the regulated nonquarantine pests as determined through the previous steps will proceed to the pest risk management stage. As described by the ISPM Pub No. 5 (1999), pest risk management refers to the evaluation and selection of options to reduce the risk of introduction and spread of a pest. The level of economic consequences of the pest may be used to evaluate the strength of measures used for risk management. The following are some of the important principles to keep in mind when selecting risk management options:

- **Principle of minimal impact** — measures should not be more trade restrictive than necessary
- **Principle of equivalence** — if different phytosanitary measures with the same effect are identified, they should be accepted as alternatives
- **Principle of nondiscrimination** — should not discriminate between exporting countries of same phytosanitary status

Management measures can be classified into the following categories and may also include a combination of options (see also ISPM Pub No. 14, 2002):

3.1 CONSIGNMENT OPTIONS FOR EXAMPLE:

- Consignment testing
- Prohibition of parts of the host
- Prescribed treatment procedures

3.2 OPTIONS PREVENTING OR REDUCING INFESTATION IN THE CROP FOR EXAMPLE:

- Treatment of place of production
- Growing plants under specially protected conditions
- Production within an officially monitored certification scheme

3.3 OPTIONS ENSURING THAT THE AREA, PLACE, OR SITE OF PRODUCTION OR CROP IS FREE FROM THE PEST

3.4 OPTIONS FOR OTHER TYPES OF PATHWAYS FOR EXAMPLE:

- Measures can be applied to human travelers and their baggage, e.g., sniffer dogs.
- Machinery, ships, trains, etc., could be subjected to cleaning or disinfestations.

3.5 OPTIONS WITHIN THE IMPORTING COUNTRY FOR EXAMPLE:

- Surveillance programs
- Eradication programs

3.6 PROHIBITION OF COMMODITIES

This measure should only be used as a last resort and should be considered in the light of the expected efficacy, especially where the incentives for illegal import may be significant.

It is important to note that phytosanitary measures should not be considered permanent. The pest risk analysis should be periodically reviewed to ensure that new information does not invalidate the previous decisions taken.

4. EXAMPLE OF SOUTH AFRICAN IMPORT CONDITIONS

***Clivia* sp. AMARYLLIDACEAE**

Rooted plants/cuttings less than 2 years in age

1. Additional declaration on the phytosanitary certificate that —

1.1 The country of production is free from *Pseudococcus comstocki* [Pseudococcidae] OR the consignment was inspected and found free from this pest

1.2 The plants were packed in a sterilised medium free from soil particles.

In order for an exporting country to provide official assurance that a consignment complies with the requirements as set by South Africa, the exporting NPPO is required to issue a phytosanitary certificate.

5. DOCUMENTATION AND COMMUNICATION STAGE

The following information should be documented for each PRA:

- Purpose of PRA
- Pest list, pathways, PRA area, endangered area evaluated
- Categorized pest list
- Conclusions of risk assessment
- Conclusions of risk management
- Management options selected
- Sources of information used

In conclusion, the PRA process as prescribed by the IPPC should be used by all NPPOs when preparing phytosanitary regulations. For detailed information on this process the ISPMs as set by the IPPC can be consulted (http://www.ippc.int).

LITERATURE CITED

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