

PEST RISK ANALYSIS (ISPMs & EPPO)

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What is Pest Risk Analysis (PRA)?

- 'Pest Risk Analysis (PRA)' The 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 any phytosanitary measures to be taken against it [ISPM 5]
- 'Phytosanitary measure' Any legislation, regulation or official procedure having the purpose to prevent the introduction or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests [ISPM 5]

Other important terms and definitions

Definitions of the 'Glossary of phytosanitary terms' (ISPM 5):

- Pest Risk Assessment Evaluation of the probability of the introduction and spread of a pest and the magnitude of the associated potential economic consequences
- Pest Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products
- 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

Who does PRA?

- Nations (NPPOs)
- Regional Plant Protection Organisations (RPPOs)
- Trading Blocs (EU, etc...)



SIGNIFICANCE OF PRA

PRA - key point of national phytosanitary systems:

- National lists of regulated pests includes species qualified as QPs or RNQPs in the result of PRAs
- National phytosanitary requirements are based on the conclusions of pest risk management stage of PRAs
- Documented PRAs are "technical justifications" of phytosanitary measures (requirement of the SPS Agreement and IPPC)

Stages of PRA

- Stage 1: Initiation
- Stage 2: Pest Risk Assessment
 - Step 1: Pest Categorization
 - Step 2: Assessment of the probability of entry
 - Step 3: Assessment of the probability of establishment
 - Step 4: Assessment of the probability of spread
 - Step 5: Impacts (economic, environmental, social)
 - Step 6: Overall Assessment of Risk
 - Step 7: Uncertainty
- Stage 3: Pest Risk Management
- Stage 4: PRA documentation

Stage 1: Initiation

- 1. Options of initiation (reasons to conduct PRA, could be from very specific to very wide):
 - 1. Identification of a consignment or other pathway
 - 2. Identification of a pest
 - 3. Пересмотр фитосанитарной стратегии
- 2. Identification of the PRA area
- 3. Collection of information on:
 - 1. Taxonomy and biology of the pest(s)
 - 2. Pest distribution
 - 3. Pest impact
 - 4. Host plants of the pest(s)
 - 5. Availability of previous PRAs
- 4. Conclusion: the pest(s) and the PRA area identified, available information collected
- 5. PRA could be initiated for pests or for pathways

Initiation through identification of a pathway

- Inclusion of a new commodity in trade
- Import of a commodity from a new origin
- Import of a new plant for breeding or research
- Identification of a new pathway (plants for planting, fruits or vegetables, packaging, etc.)
- New treatment or phytosanitary procedure became available

Initiation through identification of a pest

- New outbreak of a pest with high impact
- Detection of a new pest in an imported commodity
- New risk identified through research
- Genetic modification of a known pest increasing the potential impact

Initiation through the revision of phytosanitary strategy

- National decision on the revision of phytosanitary regulations, requirements or operations
- Revision of proposals made by another country or regional/international organization
- Availability or loss of treatment systems require to change previous decisions

MORE DEFINITIONS

ENDANGERED AREA

- An area where ecological factors favor the establishment of a pest whose presence in the area will result in economically important loss
- PRAAREA
 - -Area in relation to which a PRA is conducted
- ENTRY
 - Movement of a pest into an area where it is not yet present, or present but no widely distributed and being officially controlled

MORE DEFINITIONS

- ESTABLISHMENT
 - The perpetuation, for the foreseeable future, of a pest within an area after entry
- INTRODUCTION
 - Entry of a pest resulting in its establishment
- ENTRY POTENTIAL
 - Probability of entry
- ESTABLISHMENT POTENTIAL

 Probability of establishment of a pest
- INTRODUCTION POTENTIAL
 - Probability of introduction of a pest

Stage 2: Pest risk assessment

- 1. Pest categorisation
- 2. Assessment of probability of introduction (entry and establishment) and spread
- 3. Assessment of potential impact (economic, social and environmental)

Pest categorization

The process of categorization consists in check of each pest against the IPPC definition of 'quarantine pest (QP)' or 'regulated non-quarantine pest (RNQP)'

DEFINITIONS

• 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
 RNQP

– 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





ART. VI OF IPPC -REGULATED PESTS

- Contracting parties may require phytosanitary measures for quarantine pests and regulated nonquarantine pests, provided that such measures are:
 (A) no more stringent than measures applied to the same pests, if present within the territory of the importing contracting party; and
 - (B) limited to what it is necessary to protect plant health and or safeguard the intended use and can be technically justified by the contracting party concerned
- 2. Contracting parties shall not require phytosanitary measures for non- regulated pests

Categorization for QPs



Categorization for QPs



PROBABILITY OF ENTRY

- PATHWAY OF SPREAD FROM PLACE OF **EXPORT TO PLACE OF DESTINATION PREVALENCE OF THE PEST**
 - pest prevalence at origin
 - pest stage associated with the commodity
 volume and frequence of import

 - seasonal distribution of import
 pest control practices at origin
- PEST SURVIVAL AT TRANSPORT AND STORAGE - PEST SURVIVAL AT EXISTING PROCEDURES - PROBABILITY TO FIND THE HOST PLANT
 - range of spread of the commodity at destination
 - availability of suitable hosts at arrival
 - season of import
 - intended use of the commodity
 - risk from byproducts and waste

PROBABILITY OF ESTABLISHMENT

- Availability, prevalence and distribution of host plants in the PRA area
- Suitability of the environment in the PRA area
- Genetic potential of the pest to adaptation
- Reproductive strategy of the pest
- Mechanisms of pest survival

PROBABILITY OF SPREAD AFTER ESTABLISHMENT

- Suitability of the environment to natural spread of the pest
- Abilities of the pest to natural spread
- Natural barriers
- Spread with commodities and transport means
- Intended use of the commodity
- Potential vectors of the pest in the PRA area
- Potential natural enemies of the pest in the PRA area

POTENTIAL DIRECT ECONOMIC IMPACT

- -Known and potential host plants
- Types, importance and frequence of damage
- Losses of productivity and quality
 Biotic and abiotic factors influencing impact
- -Pest spread rate
- -Control measures, their efficacy and costs
- -Impact on the existing practices of production
- -Impact on the environment

Direct and indirect pests

Direct pests: consume or cause diseases to plants



<u>Indirect pests</u>: indirectly injurious to plants, e.g. through competition, or by harming those species which are beneficial to plants, such as earthworms or pollinators



POTENTIAL INDIRECT ECONOMIC IMPACT

- Impact on domestic and export markets including market access
- Impact on production costs
- Negative impact of control measures on the environment
- Costs of additional research and consultations
- Social and other impacts (e.g. on tourism)

GENERAL CONCLUSIONS OF PEST RISK ASSESSMENT

- 1. Pest category identified to decide on Pest Risk Management
- 2. Endangered areas identified
- 3. Probability of pest introduction assessed
- 4. Potential impact assessed
- 5. Uncertainties of assessments identified

ACCEPTABILITY OF RISK

- If the level of risk assessed at the Stage of pest risk assessment is unacceptable then it is necessary to identify risk management measures to reduce the level of risk to or below an acceptance level
- Measures are not justified if the risk is:
 - 1. already acceptable
 - 2. not manageable (e.g. natural spread: example - *Cameraria ohridella*)

Stage 3: Pest risk management

Selection of phytosanitary measures:

- For QPs evaluation and selection of options to reduce the risk of introduction and spread of a pest
- For RNQPs evaluation and selection of options to reduce the risk that a pest in plants for planting causes (economically unacceptable impact on the intended use of those plants)

PHYTOSANITARY MEASURES

- Applied to consignments (e.g. PC, inspection, prohibition of parts of the host, treatments) in exporting or importing countries or in transit
- In exporting countries (e.g. growing in specified conditions, treatment of the crop, place of production freedom, harvest at certain age or time of the year, certification schemes)
- In importing countries (e.g. post-entry quarantine, restriction of end use or periods of entry)
- Area freedom (PFA) or prohibition of commodities

Measures applied to consignments

- Phytosanitary certificates
- Inspection or testing to check presence of QPs or level of RNQPs
- Prohibition of import of parts of commodities (e.g. bark on wood)
- Specified conditions of preparation or treatment of consignments
- Restricted end use of imported commodities or time of import

Measures to reduce infestation of commodities

- Treatment of crops, places of production and production sites
- Restrictions of consignment composition (e.g. only resistant varieties)
- Growing in protected/isolated conditions
- Harvest at specified stage or season
- Growing according to an official scheme of certification

Measures to ensure pest freedom

- Pest free areas (ISPM № 4)
- Pest free places of production and production sites (MCΦM № 10)
- Basis pest surveillance

Stage 4: Documentation

Principle of transparency (ISPM № 1) (upon request, countries are obliged to provide technical justification of their phytosanitary requirements and measures)

- Purpose
- Purpose
 The pest or the list of pests analised, pathway(s), PRA area, endangered area
- List of pests following categories
 Conclusions of pest risk assessment
 List of uncertainties
- 6. Conclusions of pest risk management
- Selected phytosanitary measures 7.

EPPO Standards on PRA

- Developed according to ISPMs №№ 2 & 11
- Specify all steps of PRA in details
- Validated at practical use in EPPO and EPPO countries

EPPO Standards on PRA

- PM 5/1 Check-list of information required for pest risk analysis (PRA)
- PM 5/2 Pest risk analysis on detection of a pest in an imported consignment
- PM 5/3 Decision-support scheme for quarantine pests
- PM 5/5 Decision-support scheme for an Express Pest Risk Analysis
- PM 5/6 EPPO prioritization process for invasive alien plants
- PM 5/7 Screening process to identify priorities for commodity PRA for plants for planting
- PM 5/8 Guidelines on the phytosanitary measure 'Plants grownunder complete physical isolation'
- PM 5/9 Preparation of pest lists in the framework of commodityPRAs
- PM 5/10 Guidelines on the design and implementation of a buffer zone

EPPO Program CAPRA

- CAPRA: Computer-Assisted PRA
- Developed by EPPO and used for many years for conducting PRAs and conducting PRA trainings
- Withdrawn now because of computer difficulties with system compatibilities

The use of Biological Control Agents (BCAs)

- Three biological control methods using BCAs (except the use of microbiological pesticides):
- 1. Classical biocontrol (introduction & releases of non-indigenous BCAs aiming their establishment)
- 2. Augmentative biocontrol (using indigenous or non-indigenous BCAs)
- Inundative biocontrol (mass releases of BCAs produced by biofactories)
- Seasonal colonisations (releases of BCAs produced by biofactories)
- 3. Conservation biocontrol (manipulation of habitats to support indigenous BCAs)

Use of BCAs against nonindigenous pests

- Non-indigenous pests are specifically important and damaging in new areas because of the absence of their natural enemies which suppress their populations at origin
- Therefore it is logical to introduce natural enemies from the pest origin

Assessment of non-indigenous BCAs before their introduction

- It is now recognised that non-indigenous BCAs should be assessed for possible negative non-target effects before being released
- For the assessment of potential risks from the BCAs introductions, it had been recommended to use Pest Risk Analysis (PRA) schemes, but the EPPO/IOBC BCA Panel believed that PRA is not appropriate for BCAs assessment for several reasons
- The EPPO/IOBC Panel decided that a specific scheme should be developed for BCAs assessment as a tool for EPPO countries

Pest Risk Analysis

Post Risk Analysis

The scheme is aimed to assess BCAs (beneficials) and not pests: the use of <u>Pest</u> Risk Analysis create the assumption that <u>BCAs are pests</u> and therefore damages the image of biocontrol

Port Risk An ysis

We cannot call is 'analysis' but just 'assessment' because we do not have 'management' stage and selection of options to prevent entry of BCAs

Pot Rix An ysis

The scheme should be comparative

(environmental risk/benefits): environmental benefit coming from reduction of invasive pest populations and from replacement/reduction of pesticide treatments should also be assessed

EPPO Standard on BCA assessment

- EPPO developed the Standard PM 6/4: Decision-support scheme for import and release of biological control agents of plant pests
- Composed of two schemes:
- 'Express assessment' with three conclusions possible on the potential BCA releases: (1) yes (to allow), (2) no (to prohibit) and (3) to go to 'Full assessment'
- 'Full assessment' which allows to take a decision on the acceptability of a BCA releases or identifies research necessary to make such a decision possible

Thank you for your attention

