PEST RISK ANALYSIS

ISPM N° 2 NOV 2006
ISPM N° 11 April 2004

Background

SPS ENCOURAGES THE USE OF INTERNATIONAL STANDARDS

OR

REQUIRES THE SCIENTIFIC JUSTIFICATION OF THE MEASURE THROUGH RISK ANALYSIS

ISPM 11:

PEST RISK ANALYSIS FOR QUARANTINE PESTS, INCLUDING ANALYSIS OF ENVIRONMENTAL RISKS AND LIVING MODIFIED ORGANISMS

SCOPE

ISPM 11 Provides details for conduct PRA for quarantine pests and the integrated processes for risk assessment and risk management

1. **Includes details regarding the analysis of risks of plant pests to the environment and biological diversity, including those risks affecting uncultivated/unmanaged plants, wild flora, habitats and ecosystems contained in the PRA area;**

2. **Includes guidance on evaluating potential phytosanitary risks to plants and plant products posed by living modified organisms (LMOs).**

What is Risk?

- Combination of likelihood and impact
  - How likely an event is to happen, and how much of an effect it would have

Crossing the road

A

B

C

D

- 1. The likelihood of being hit crossing from A to B
- Impact on health of being hit by fast car

- 2. The likelihood of being hit crossing from C to D
- Impact on health of being hit by a slower car

What is Risk?

- Combination of likelihood and impact
  - How likely an event is to happen, and how much of an effect it would have
- So…
  - If an event cannot occur it cannot have an impact and there is no risk
  - If an event is likely to occur but it will have no impact then there is no risk

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.
- PRA AREA
  - 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.

DEFINITIONS (Continuation)

- 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.

DEFINITIONS (Continuation)

- PEST CATEGORIZATION
  - Determination of whether a pest has or has not the characteristics of a quarantine pest or those of a regulated non-quarantine pest
- PEST RISK ASSESMENT
  - Evaluation of the probability of introduction and spread of a pest and the associated potential economic consequences.
- PEST RISK MANAGEMENT
  - Evaluation and selection of options to reduce the risk of introduction and spread of a pest.

DEFINITIONS (Continuation)

- **living modified organism (LMO)**

Any living organism that possesses a new combination of genetic material obtained through the use of modern biotechnology [*Cartagena Protocol on Biosafety to the Convention on Biological Diversity*, 2000]

Question: what is the difference between GMO and LMO?

Why is the IPPC interested in LMO only?

PEST RISK ANALYSIS

The processes of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the strength of any phytosanitary measure to be taken against it.

- ✓ **PRA INITIATION**
- ✓ **PEST RISK ASSESSMENT**
- ✓ **PEST RISK MANAGEMENT**
- ✓ **PRA DOCUMENTATION**
- ✓ **PRA COMMUNICATION**

PRA STAGE I - INITIATION:

To identify the pest(s) and pathways of quarantine concern to be considered in the PRA for a specific area

1. **Initiation points:**
    1. **Identification of a pathway**
    2. **Identification of a commodity**
    3. **Identification of a pest**
    4. **Review or revision of phytosanitary policies**
2. **Identification of the PRA area**
3. **Information gathering**
    1. **Taxonomy**
    2. **Distribution**
    3. **Association with host plants**
    4. **Art VIII,1c obligation to provide information**
    5. **Previous PRA**
4. **Conclusion:** The pests of potential concern for the PRA area have been identified and the relevant information collected

Some LMOs may present a phytosanitary risk and therefore warrant a PRA.

For LMOs, the aim of the Initiation stage is to identify those LMOs that have the characteristics of a potential pest and need to be assessed further.

In order to be categorized as a pest, an LMO has to be injurious or potentially injurious to plants or plant products under conditions in the PRA area.

Discussion: country experiences with LMOs

INITIATION BY PATHWAY

- Incorporation of a new commodity to trade
- Importation of a commodity from a new origin.
- Importation of a new species for selection or research.
- Identification of a new pathway (natural spread, packing material, etc.).
- New treatment or phytosanitary procedure

INITIATION BY A NEW PEST

- New outbreak in the PRA area
- Interception of a new pest on an imported commodity
- A new pest risk is identified by scientific research
- A request is made to import an organism,
- An organism is genetically altered increasing its potential as plant pest.

INITIATION BY THE REVIEW OR REVISION OF A POLICY

- National decision to review phytosanitary regulations, requirements or operations.
- A proposal made by another country or international organization is reviewed.
- A new treatment or loss of a treatment system, a new process, or new information impacts on an earlier decision
- A dispute arises on phytosanitary measures
- The phytosanitary situation of a country changes

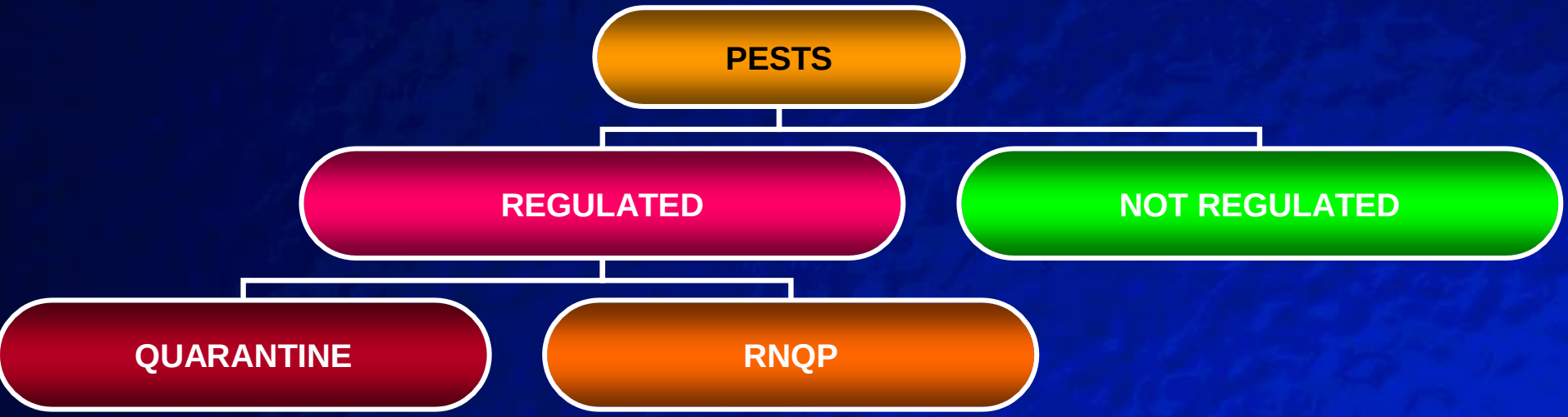
PRA – STAGE II: PEST RISK ASSESSMENT

1. PEST CATEGORIZATION
2. ASSESSMENT PROBABILITY OF INTRODUCTION AND SPREAD
3. ASSESSMENT POTENTIAL ECONOMIC CONSEQUENCES AND ENVIRONMENTAL IMPACT

PRA – PEST CATEGORIZATION

The categorization process examines for each pest whether the criteria in the IPPC definition for a quarantine pest is satisfied

IPPC PLANT PESTS CATEGORIES



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 CONTROLED

OFFICIAL CONTROL

THE ACTIVE ENFORCEMENT OF MANDATORY PHYTOSANITARY REGULATIONS AND THE APPLICATION OF MANDATORY PHYTOSANITARY PROCEDURES WITH THE OBJECTIVE OR ERADICATION OR CONTAINMENT OF QUARANTINE PESTS OR THE MANAGEMENT OF REGULATED NON-QUARANTINE PEST

ART. VI IPPC - REGULATED PESTS

1. CONTRACTING PARTIES MAY REQUIRE PHYTOSANITARY MEASURES FOR QUARANTINE PESTS AND REGULATED NON-QUARANTINE 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.

ELEMENTS OF PEST CATEGORIZATION

- Pest Identity
- Presence or absence in the PRA area
- Regulatory status
- Potential for establishment and spread Potential economic and environmental consequences

PRA STAGE II: INTRODUCTION AND SPREAD PROBABILITY ASSESSMENT

PEST INTRODUCTION PROBABILITY

ENTRY PROBABILITY + ESTABLISHMENT PROBABILITY

ENTRY PROBABILITY

- PATHWAY FROM EXPORTING TO DESTINATION
- FREQUENCY AND QUANTITY OF PESTS ASSOCIATED
  - **PREVALENCE OF THE PEST IN THE SOURCE AREA**
  - **LIFE STAGE ASSOCIATED TO THE COMMODITIES**
  - **VOLUME AND FREQUENCY OF MOVEMENT**
  - **SEASONAL TIMING**
  - **PEST MANAGEMENT PRACTICES AT THE ORIGIN**
- SURVIVAL DURING TRANSPORT OR STORAGE
- SURVIVAL EXISTING PEST MANAGEMENT PROCEDURES
- PROBABILITY OF TRANSFER TO A SUITABLE HOST
  - **DISPERSAL MECHANISMS**
  - **THE IMPORTED COMMODITY IS SENT TO A FEW OR MANY DESTINATION POINTS**
  - **PROXIMITY OF SUITABLE HOSTS**
  - **TIME OF THE YEAR IMPORTS TAKE PLACE**
  - **INTENDED USE**
  - **RISK FROM BY-PRODUCTS OR WASTE**

ESTABLISHMENT PROBABILITY

- availability, quantity and distribution of hosts in the PRA area
- Environmental suitability in the PRA area
- genetic potential for adaptation of the pest
- reproductive strategy of the pest
- Method of pest survival

AFTER ESTABLISHMENT: SPREAD PROBABILITY

- Suitability of the natural/or managed environment for natural spread of the pest.
- Natural barriers
- Movement with commodities or conveyances
- Intended use of the product
- Potential vectors of the pest in the PRA area
- Potential natural enemies of the pest in the PRA area

PRA STAGE II POTENTIAL ECONOMIC CONSEQUENCES

Direct Pest effects

- Known or potential host plants
- Types, amount and frequency of damage
- Crop losses, yield and quality
- Biotic factors affecting damage and losses
- Abiotic factors affecting damage and losses
- Rate of spread
- Control measures, efficacy and cost
- Effect on existing production practices
- Environmental effects

Larger grain borer

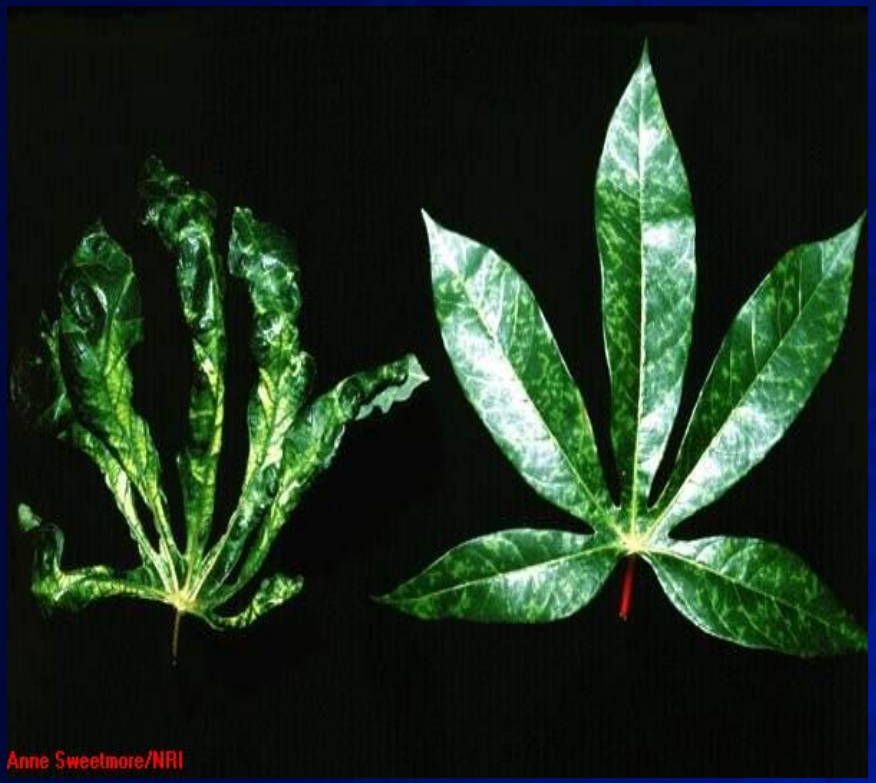
Georg Goergen/IITA Insect Museum, Cotonou, Benin

LGB on corn

LGB on Corn

LGB on Cassava

Cassava brown streak virus



Indirect Pest effects

- effect on domestic and export markets including market access
- changes in production costs
- environmental undesired effect of control measures
- resources for additional research and advice
- social and other effects (tourism)

CONCLUSIONS OF THE PEST RISK ASSESSMENT

1. CATEGORIZED PEST APPROPRIATE FOR RISK MANAGEMENT IDENTIFIED
2. ENDANGERED AREA IDENTIFIED
3. QUALITATIVE OR QUANTITATIVE ESTIMATE OF THE PROBABILITY OF INTRODUCTION AVAILABLE AND DOCUMENTED
4. QUALITATIVE OR QUANTITATIVE ESTIMATE OF THE ECONOMIC CONSEQUENCES AVAILABLE AND DOCUMENTED
5. ASSOCIATED UNCERTAINTIES IDENTIFIED

PRA STAGE III PEST RISK MANAGEMENT

Process of identifying ways to react to a perceived risk, evaluating the efficacy of the alternatives and identifying the most appropriate

Selection of appropriate risk management options

1. Cost effective and feasible
2. Not more trade restrictive than necessary
3. Should be applied to the minimum area required to protect the endangered area
4. No additional measures should be imposed if the existing are effective
5. Equivalency of the measures
6. Should not be discriminatory at domestic and international level.
7. Should be consistent (other pathways)

Categories of Phytosanitary Measures

1. Applied to consignments
2. Applied to reduce original infestation of the crop
3. Applied to ensure the area or place of production freedom
4. Prohibition of commodities

Measures applied to consignments

- Phytosanitary Certificate and additional declarations
- Inspection or testing for freedom or to a specified level of tolerance (sample size).
- Prohibition of parts of the host
- Pre or post-entry quarantine
- Specified conditions for consignment preparation and/or treatment
- Restrictions on end use, distribution or periods of entry

Measures to reduce infestation of the crop

- Treatment of the crop, field or place of production
- Restriction on composition of the consignment (resistant varieties).
- Growing under protected conditions.
- Harvest at certain age or time of the year
- Production under officially monitored certification scheme

Measures to ensure area of production is pest free

- Pest free area (ISPM 4)
- Pest free place of production (ISPM 10)
- Pest free site of production (ISPM 10)
- Crop inspection

Discussion: concepts of area, place, site

PRA STAGE IV DOCUMENTATION

ISPM 1 – Transparency principle (*on request, countries should make available the rationale for phytosanitary requirements*)

1. Purpose
2. Pest, pest list, pathways, PRA area, endangered area
3. Categorized pest list
4. Conclusions of risk assessment
   - probability
   - consequences
5. Risk management
   - options identified
6. Options selected

Requirements for Implementation of ISPM

- National legislation with provisions for PRA;
- Administrative provisions
- PRA team: experts in various aspects
- Procedures for PRA
- Internet, computer
- Surveillance data, regulated pest list ,interception records
- Pest information from exporting country and other information sources
- Communication: domestic and international
- Collaboration with relevant institutions
- Technical support (lab support, method development) and tools for PRA