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New approaches to rapid risk analysis and prioritisation of plant health risks in Europe

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Background

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- Several hundred pests listed in Europe
- Limited resources (staff and financial)
  - need to optimize actions of NPPOs
  - need to focus efforts on the most important pests (e.g for surveillance and implementation of control measures)
- New tools have been developed in Europe
  - to help NPPOs to make quick decisions: e.g the EPPO express PRA system
  - to help NPPOs to categorize pests : tools for prioritisation (e.g. the French and UK approaches)

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The UK approach to rapid PRAs and the EPPO Express PRA system

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Objectives of assessment

- To identify and assess risks to plants from harmful exotic organisms that can spread internationally or be introduced to new areas
- To identify management measures & support risk management decision making
- To comply with WTO rules (SPS Agreement)
- Is a public good (society benefits)

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PRA formats

- In the UK, style of PRA has evolved and used various formats
  - Detailed (e.g. EPPO scheme)
  - Rapid (most commonly used)
- All formats consider factors contributing to pest risk to a greater or lesser level of detail
- Shows a pragmatic, flexible approach to PRA

PRA complexity, application and scientific input

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Type of PRA	Main Applications	Inputs to assessment
Rapid PRAs (days)	Following new **interceptions** & new **outbreaks**	Rapid **qualitative** evaluation of the literature, online datasets and other evidence
PRAs (weeks / months)	To modify EU **legislation** (with EU partners?)	Detailed **qualitative** evaluation of the literature, online datasets and other evidence
Detailed analysis of PRA components (weeks / months) research projects	To resolve major **uncertainties** To support **emergency** action To guard against **challenges** to the PRA	Detailed **quantitative** assessment with modelling, & mapping of, e.g. interception data, climatic suitability, spread and potential impacts

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Why use a rapid PRA scheme

- Ever increasing number of risks to consider
- Not possible to complete ‘full’ PRAs for all
    - Resource availability
    - Lack of availability of information
- Rapid assessments allow NPPOs to quickly and effectively assess the risk of a much larger number of pests than would be possible using detailed PRA schemes.

Fera Rapid Assessment

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- Rapid assessment of the risks posed by the pest to the UK in order to assist Risk Managers in deciding on a response to a new or revised pest threat.
- It does **not** constitute a detailed PRA but includes advice on whether it would be helpful to develop such a PRA and, if so, whether the PRA area should be for the UK or the EU and whether to use the UK or the EPPO PRA scheme.

Microsoft Word Document

EPPO Express PRA Scheme PM 5/5 adopted in 2012

EPPO Secretariat

Background and Scope

- Rapid PRA to determine whether an organism has the characteristics of a quarantine pest, and if appropriate, to identify potential management options
- Particularly suitable to support recommendation of phytosanitary measures for an emerging pest.
- May also be used for a pathway-initiated PRA to evaluate individual pests likely to be carried by this pathway.
- The EPPO Express PRA scheme is based on existing national schemes and was further elaborated within EPPO Panels (still covers all elements of ISPM 11).
- The EPPO Express PRA scheme was approved as an EPPO Standard in 2012.

General

A computerized version of the scheme is in development

Complimentary Standards:
The EPPO Decision-support scheme for Pest Risk analysis (PM 5/3)

An EPPO Standard on "*generic elements for contingency planning*" (PM 9/10) describing essential elements for an emergency response for a pest outbreak or a suspected pest outbreak was adopted in 2009.

A decision-support scheme for prioritizing action during outbreaks is under development to decide on measures to be applied in an outbreak area

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THE FRENCH APPROACH TO PRIORITISATION:

DEVELOPMENT OF A TOOL TO RANK PESTS ACCORDING TO THEIR RISK

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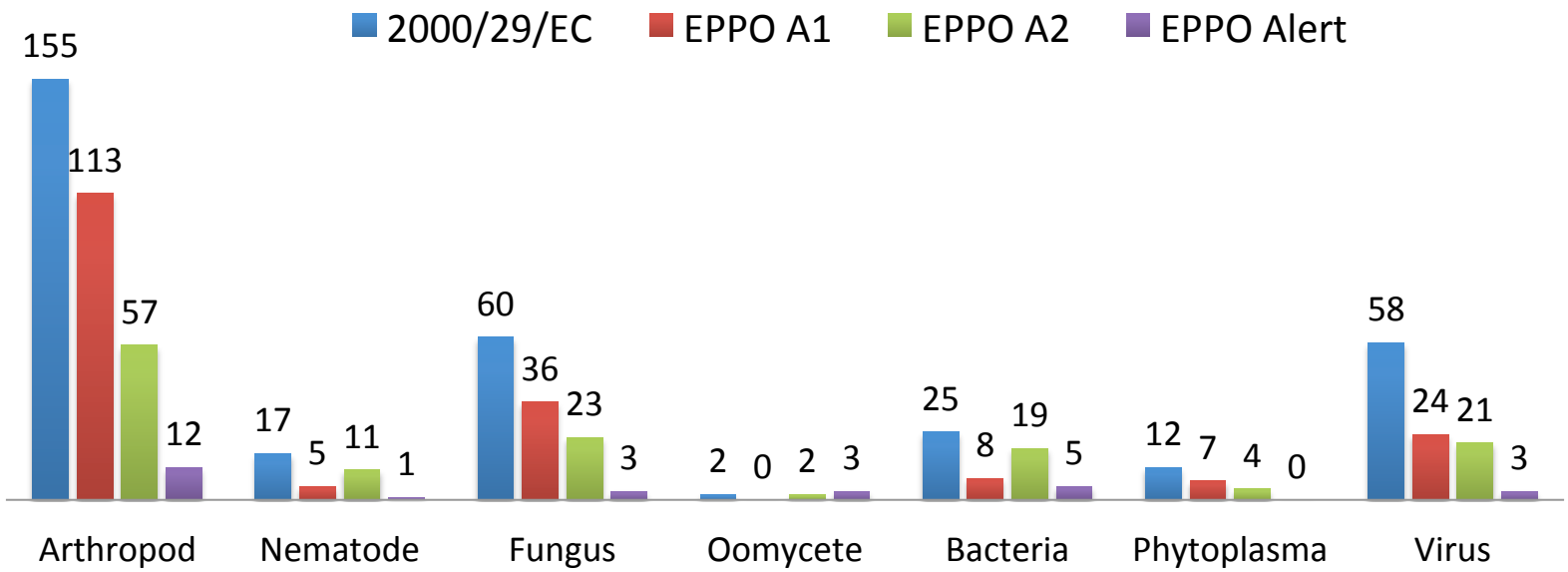
THE REGULATORY CONTEXT OF PLANT HEALTH

- **Several hundreds of pests are listed in Europe:**
  - EU Directive: annexes I and II
  - EPPO: A1 and A2 lists + Alert list



THE STUDY

- **Organization:**
  - Leader: Laboratory for plant health of the French agency for food, environmental and occupational health and safety (Anses)
  - Participation of decision makers, research and extension organizations, industry partners and an environmental organization
  - Period: 2011-2013
- **Objectives:**
  - Developing a methodology to rank pests according to their pest risk
    in the context of the French mainland
  - Ranking a selection of pests
  - Planning the development of diagnostic protocols

1

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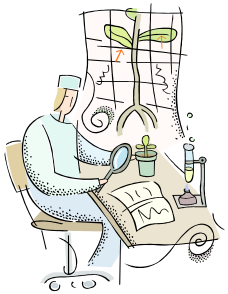

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MAIN STEPS: PROCESS DEVELOPMENT

PRIORISATION METHODOLOGY

1. IDENTIFYING RISKS

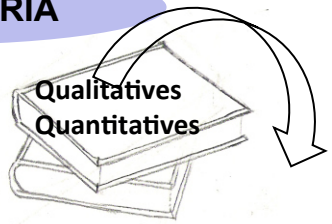
2. DEFINING AN ASSESSMENT FRAMEWORK

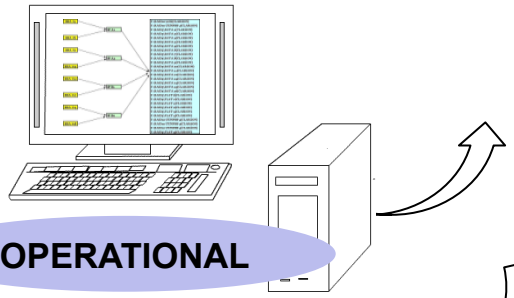
3. DESIGNING A TOOL

4. RANKING

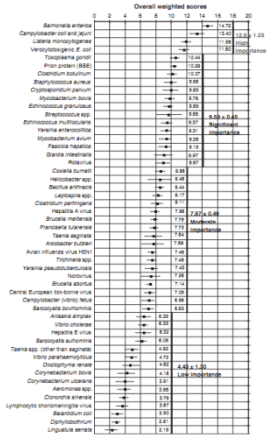
5. ANALYSIS OF RESULTS

MULTICRITERIA





OPERATIONAL



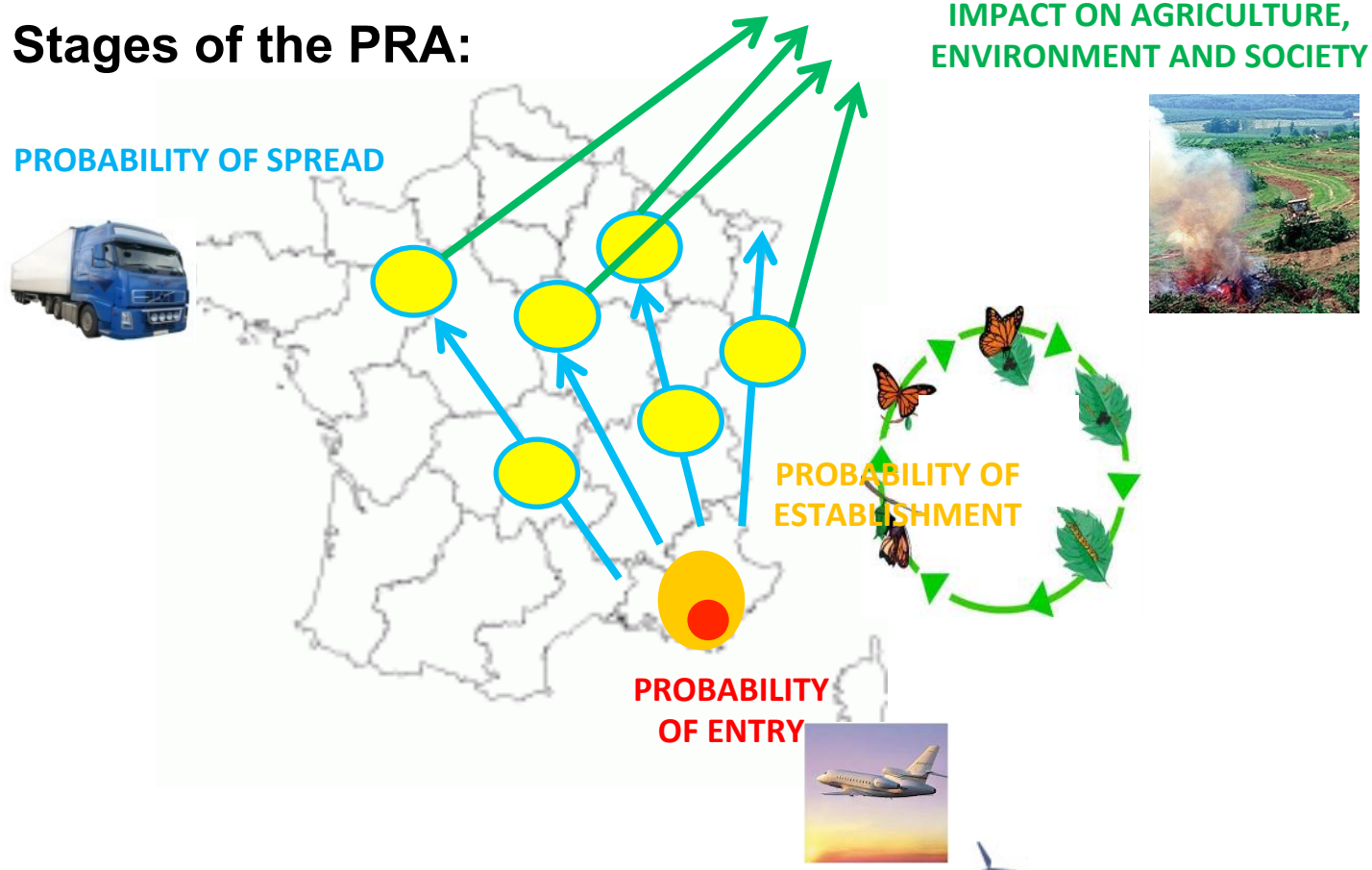
From Cardoen et coll., 2009

ROBUST

TRANSPARENT

A PROCESS BASED ON PRA

- **Scope of the PRA:**
  - Quarantine pests
  - Emerging pests
- **Stages of the PRA:**



SELECTION OF CRITERIA FOR PEST PRIORITISATION

- **First selection of 54 criteria based on:**
  - the EPPO decision-support scheme for quarantine pests (PM 5/3) which is based on the ISPM 11
  - bibliography
  - experts

- **Final selection of 24 criteria based on:**
  - relevance to compare pests from different phylogenetic lineages
  - suitability to discriminate pest risk profiles
  - availability of data

ORGANIZATION OF CRITERIA

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Pest risk

Capacity for entry

- I.1 The pest's range of host plants
- I.2 Volume of host plants imported into France originating in countries where the pest is present
- I.3 Notifications of interception of the pest by European countries
- I.4 Degree of vigilance required for the pest by French regulations
- I.5 Capacity of pest to enter in France naturally

Capacity for establishment

- II.1 Current area of distribution characterised by eco-climatic conditions equivalent to those in mainland France
- II.2 Control of eco-climatic conditions favourable to pest development
- II.3 Reproduction strategy for establishing a local population
- II.4 Presence of the obligatory vector or alternative host in mainland France
- II.5 Success of the pest in establishing in other regions than its native one

Capacity for spread

- III.1 Surface area where host plants are found
- III.2 Spatial distribution of host plants
- III.3 Pest's natural methods of spread
- III.4 Methods of spread of the pest via human activities
- III.5 Ecological plasticity of the pest

Impact on agricultural and forestry crops

- IV.1 Production value of cultivated host plants
- IV.2 Export value of cultivated host plants
- IV.3 Potential harm to production of host plants
- IV.4 Regulatory recommendations by regional plant protection organizations

Impact on the environment and society

- V.1 Benefit of host plants to non-agricultural areas
- V.2 Host plants are protected species in mainland France
- V.3 Other impacts of pest on the environment
- V.4 Impact of pest on human and animal health
- V.5 Impact of pest on society

Features of the pests

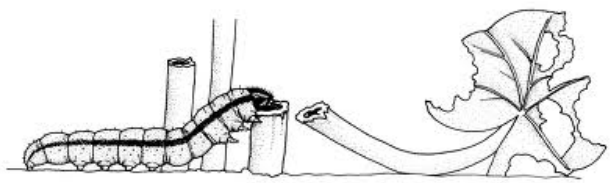
Features of the host plants

Risk management

SCORING SYSTEM

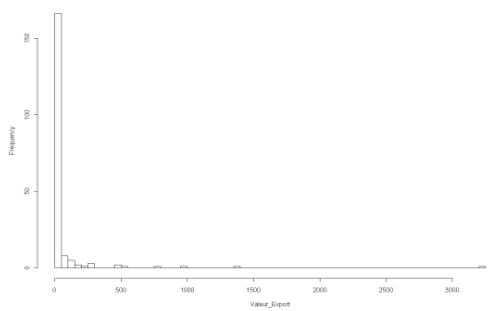
➢ **Definition of gradual risk classes for each criterion**

- A consistent assessment between pests is required for ranking
- 4 to 5 classes of gradually increasing risk were defined per criterion
- Classes are based on qualitative or quantitative data depending on the criteria



Host plant range

1. **A single plant species**
2. **Species belonging to the same genus**
3. **Several genera within the same family**
4. **Several families**

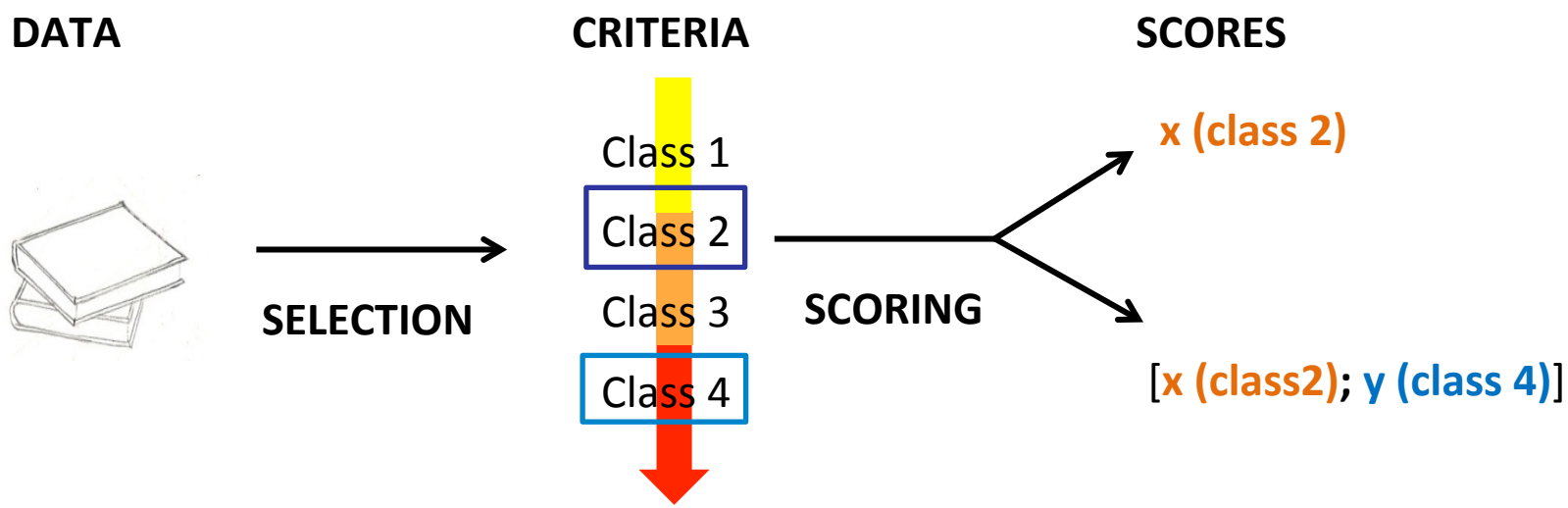


Export value of host plants (Millions €)

1. **[0-0,7[**
2. **[0,7-4[**
3. **[4-18[**
4. **[18-200[**
5. **[200-3000[**

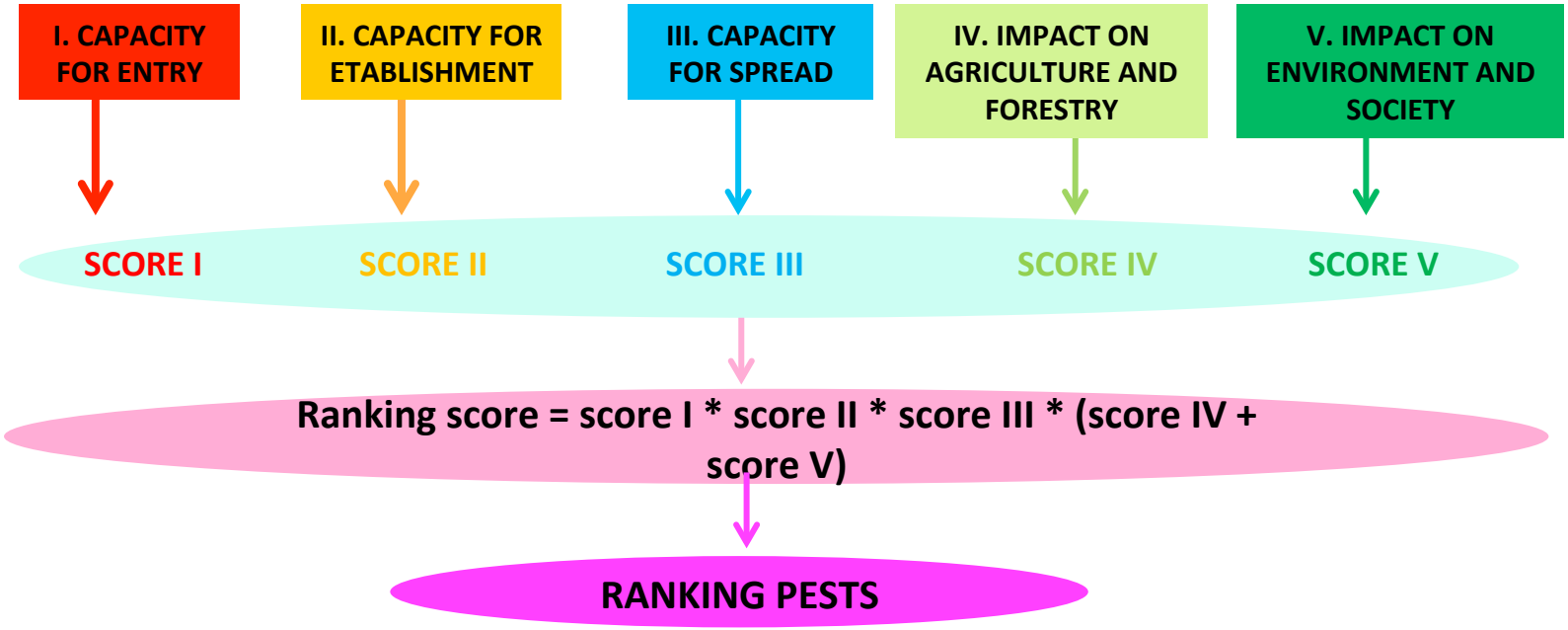
SCORING SYSTEM

- **Semi-quantitative model**
  - Attributing numerical scores to the risk classes
  - Providing a means of combining qualitative and quantitative estimates to produce an aggregated ranking score which can
    be used to prioritise risks
- **Uncertainty of assessment taken into account**



CALCULATION OF A RANKING SCORE

1. The assessor selects a risk class for each criterion
2. The tool defines a score for each criterion
3. The tool defines a score for each metacriteria
4. The tool defines a ranking score
5. The tool ranks the pests



A METHOD IMPLEMENTED IN A COMPUTER APPLICATION

➢ **Application functioning in Microsoft Excel ®**

- Intuitive organization
- Guidelines incorporated
- Data are written directly in the spread sheets
- Automatic calculation and ranking of pests

➢ **Data referencing**

- Statistic data collected for 450 plants and plants products (surfaces, values, volume of import) and accessible in one file
- List of 433 plant species protected in France classified in 239 genera
- List of 781 plant genera classified according to their planting frequency in non-agricultural zones
- Scientific articles and other technical documents referenced in software EndNotes ®

VALIDATION OF THE METHODOLOGY

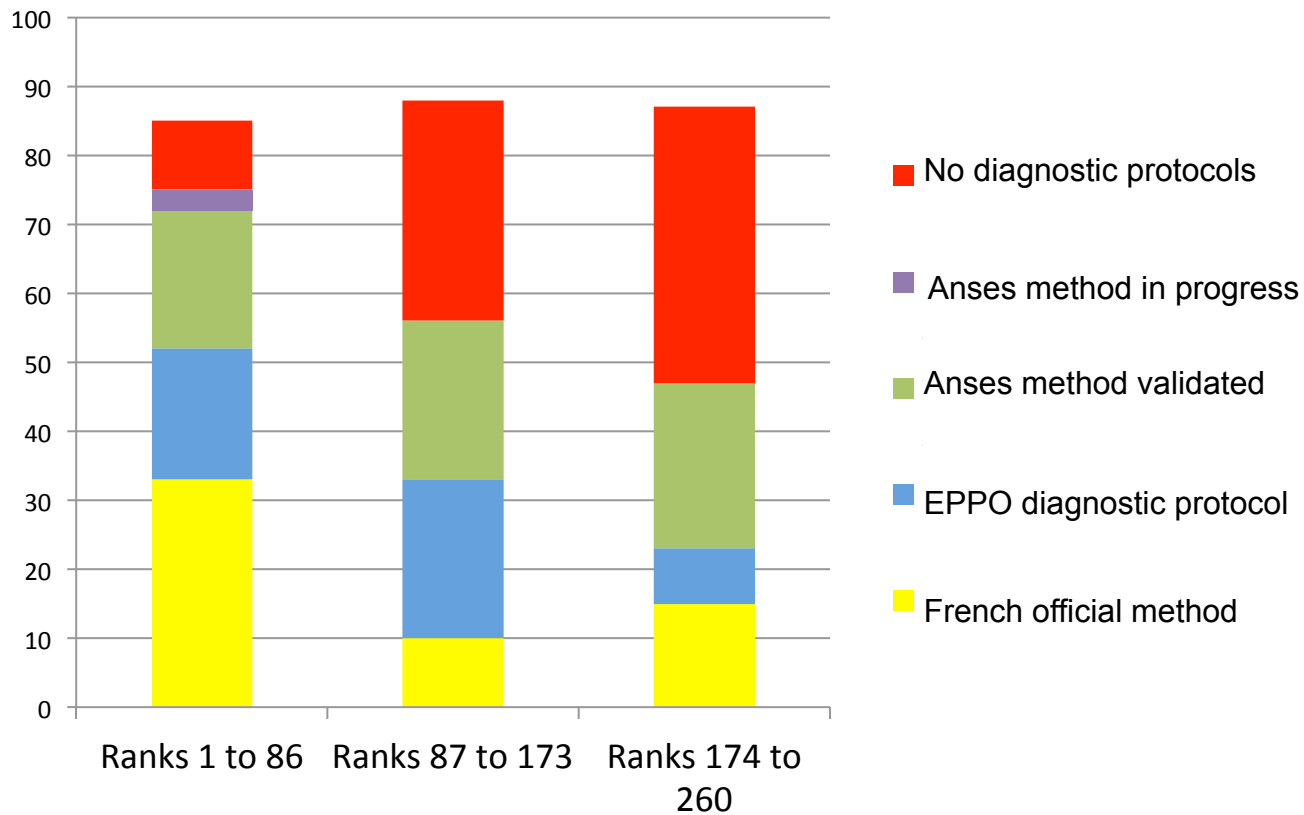
- **The ranks of 25 pests were compared with the expert judgment**
  - Criteria to select the 25 pests:
    - covering all taxa (viroids, viruses, bacteria, fungi, nematodes, arthropods)
    - targeting the main types of crops (cereals, fruit, vegetable, forest trees, shrubs)
    - covering the 3 levels of pest risk
  - Experts were asked to qualify the pest risk of these 25 pests as high, moderate or low, with no attribution instructions

- **The prioritisation method made it possible to identify without ambiguity pests with a high risk profile and those with a low risk profile:** pests classified at the highest / lowest rank were qualified as high / low risk by the experts

RANKS AND DIAGNOSTIC PROTOCOLS

261 pests were assessed and ranked with the method

Diagnostic protocols are available for pests ranked at high levels:



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CONCLUSION

- **This pest prioritisation method provides an essential scientific basis for progress in French phytosanitary policy**

  Pests are going to be classified in 3 categories:

  - pests of category 1: general interest, regulated pests, mandatory control measures any time and in any place
  - pests of category 2: collective interest, regulated pests or non-regulated pests being the object of a collective voluntary program recognized by the State
  - pests of category 3: private interest

- **An adapted priorisation method is being deployed in the French overseas departments and territories (island context)**

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THANK YOU FOR PAYING ATTENTION

For more details, please see the online magazine *EuroReference*, Spring 2013, Journal No. 9 « Plant health » special edition, pp. 5–9:
http://www.ansespro.fr/euroreference/
(available in French and in English)

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UK PLANT HEALTH RISK REGISTER

Prioritisation and Transparency

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What (is it for)

1. To quickly identify the pests that pose the greatest threat to UK crops, trees, gardens and ecosystems and to suggest appropriate actions
2. To allow for fast prioritisation of actions by government and plant health stakeholders

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What (does it do)

- Highlights risks
- Allows rapid identification of different priorities e.g.
  - Priority for PRA
  - Priority for regulation (justified by PRA)
  - Priority for research (to improve PRA)
- Helps target effort/spending on pests presenting highest risk

How

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- Rules and rating scheme developed:
  - Risk Scenario
    - Pest absent = introduced
    - Pest present = spread to maximum extent
  - Entry (1-5)
  - Establishment (1-5)
  - Impact (1-5)
  - Value at risk

Risk Ratings

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Unmitigated risk

- Likelihood (entry x establishment) x impact x value at risk

Mitigated risk

- Take existing mitigations into account
- Re-evaluate unmitigated risk to determine residual risk

Prioritised actions to further reduce risk

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Determine priorities for additional:

- Regulation
- Deregulation or reduced regulation
- Management by industry
- Targeted survey
- PRA
- Contingency plan
- Publicity
- Research

How will it not be used?

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- To create a “top ten” list of threats
- To replace the PRA process
- To consider endemic pests where there is no prospect of co-ordinated action (Government and stakeholders)

Key differences between the Risk Register and Pest Risk Analysis

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Topic	Risk Register	Pest Risk Analysis
Role of the risk ratings	To ***inform prioritisations*** and actions in Plant Health for all pest threats	To identify and ***justify phytosanitary decisions*** for selected pests
Methods used	***Simple rules*** to rate scenarios based on key information about the pest	Structure based on ***international standards*** with a ***thorough evaluation*** of the evidence
Precautionary approach	Rules aim to be ***precautionary*** and are designed to highlight the most important pests	Risks ***assessed as accurately as possible***
Risks assessed	Unmitigated ***and mitigated*** risks to the sector and to the UK	Unmitigated risks to the sector and the identification of ***risk management options***

Many benefits, e.g:

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Challenges	Solution
Many threats	Risk Register can cover many pests quickly and identify priority actions (668 pests initially added to the register)
Limited resources (inc. budget)	Screen out clearcut issues through RAs leaving more time to deal with complex and important issues
Stakeholder engagement	Allows better stakeholder engagement in decisions making
Comparability with other sectors (e.g. animal health)	Working with all sectors to present information on threats (to Ministers and others) in a consistent format

Principal contributors

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Organisation & Team
Food and Environment Research Agency: Consultancy team
Defra: Office of the UK Chief Plant Health Officer
Food and Environment Research Agency: Diagnostic teams
Food and Environment Research Agency: IT Systems Development
SASA (Science and Advice for Scottish Agriculture)
Forest Research
Forestry Commission
Joint Nature Conservation Committee
Defra: Plant Health Evidence & Analysis