EPPO Activities on Potential Invasive Pests

Anne-Sophie Roy - roy@eppo.fr
21 boulevard Richard Lenoir, 75011 Paris (France) – NEW EPPO’s ADDRESS
What is EPPO?
European and Mediterranean Plant Protection Organization

- EPPO is an intergovernmental organization
- Created in 1951 by 15 countries
- It has now 50 member countries
- International cooperation in plant protection: plant quarantine and plant protection products

- Work with National Plant Protection Organizations - NPPOs (Plant Protection Services)
EPPO and the European Union

27 EU members are all EPPO members
EU prepares regulations
EPPO makes recommendations
Regional Plant Protection Organizations
Plant quarantine can be a useful tool to prevent pest and disease introductions

All activities designed to prevent the introduction and/or spread of quarantine pests or to ensure their official control [FAO definition].

- Plant Quarantine can be seen as a prophylactic tool to prevent pest introductions and outbreaks (this may also apply to invasive pests)
- Plant quarantine activities are conducted by Governments and their official bodies
- To prevent pest movements, countries or groups of countries (e.g. EU) will define rules (phytosanitary regulations) which mainly regulate trade of plants and plant products
  - List ‘risky’ pests (quarantine pests)
  - Define management options (phytosanitary regulations)
Plant Quarantine: EPPO’s missions

Prevent entry and spread of harmful organisms (crops, forests, natural environments)

- Recommendations on pests which should be regulated as quarantine pests (EPPO A1 and A2 Lists)
- Prepare standards (e.g. phytosanitary measures, diagnostic protocols)

Provide information to EPPO members
EPPO A1 & A2 Lists of pests recommended for regulation

- EPPO pest lists started in the 1970s
- Lists are prepared by EPPO Panels (groups of European experts)
- Modified yearly (additions/deletions, taxonomic changes)
- Now elaborated on the basis of PRA

**A1**: Absent from the EPPO region

**A2**: Present in the EPPO region but not widely distributed
EPPO A1 and A2 Lists of pests recommended for regulation

- Fungi
- Bacteria and phytoplasmas
- Viruses and virus-like organisms
- Insects
- Mites
- Nematodes
- Parasitic plants
- Invasive plants
Invasive species

- Invasive species are often defined as introduced species (mainly by human activities) that have become pests.
- But not all introduced species are becoming pests.
- Some native species may, under certain circumstances, become pests.
- The definition of ‘invasive species’ may also depend on the viewpoint of the observer.

Impact can be severe

SPAIN: estimated costs of official control from 2002 to 2009:

45 500 000 euros

NPPO of Spain - International Conference ‘Red palm weevil control strategy for Europe’ (Valencia, 2010-05-05/06)
Potential Invasive Pests: EPPO strategy

- Manage an early warning system (EPPO Alert List) and maintain a database (geographical distribution, host plants, datasheets, diagnostic protocols, pictures, ...)

- Evaluate possible risks presented by potential invasive pests (Pest Risk Assessment)

- Make recommendations on pests which should be regulated in Europe, as plant quarantine can be a useful tool to prevent entry and spread in certain cases
Early warning
Early warning: the EPPO Alert List

- Initiated in 1999
- Provides early warning
- Suggests possible candidates for Pest Risk Analysis
- Critically reviewed every year (when alert has been given and no further action taken, pests are deleted after 3 years on the list)
- Freely available on the EPPO website: www.eppo.org/QUARANTINE/Alert_List/alert_list.htm
EPPO Alert List

www.eppo.org

It provides information on:
• distribution,
• host plants,
• biology,
• damage,
• transmission,
• pathway,
• possible risks

Drosophila suzukii (Diptera: Drosophilidae)

Spotted wing drosophila

Why: Drosophila suzukii is an Asian pest of fruit crops which has almost simultaneously been introduced into North America and in Italy (in 2008 and 2009, respectively). In 2010, it was reported from other European countries. Because the pest has a high potential for spread and can cause economic damage to many fruit crops, the EPPO Secretariat decided to add D. suzukii to the Alert List.

View EPPO Fact Sheet

Adults of Drosophila suzukii (left: male - right: female). Please note that because of the angle at which the male specimen was photographed, wings appear oval but in reality they are elongate. View more pictures.

Pictures were kindly provided by Dr Gary Steck, Florida Dept. of Agriculture & Consumer Services, Gainesville (US).

Where:
EPPO region: France (first found in 2010 in Alpes-Maritimes, Corse, Var), Italy (Trentino-Alto Adige, Toscana), Russia (Far East), Spain (near Barcelona).
Asia: China (Guangxi, Guizhou, Henan, Hubei, Yunnan, Zhejiang), India (Chandigarh, Jammu and Kashmir, Uttar Pradesh), Japan (Hokkaido, Honshu, Kyushu, Ryukyu), Korea Republic (Including Cheju Island), Myanmar, Russia (Primor’e region - Far East), Thailand.
North America: Canada (British Columbia, first found in autumn 2009 in the Fraser Valley area and caught in a cherry orchard in the Central Okanagan Valley), USA (Hawaii introduced into the 1980s; California (2008), Oregon (2009), Washington (2009)).
**EPPO Alert List: current contents**

<table>
<thead>
<tr>
<th>Insects</th>
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<tbody>
<tr>
<td><strong>Agrilus anxius</strong></td>
<td><strong>Epitrix similaris</strong></td>
<td><strong>Psacothea hilaris</strong></td>
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<tr>
<td><strong>Bactrocera invadens</strong></td>
<td><strong>Halyomorpha halys</strong></td>
<td><strong>Raoiella indica</strong></td>
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<tr>
<td><strong>Diaphania perspectalis</strong></td>
<td><strong>Leptocybe invasa</strong></td>
<td><strong>Saperda candida</strong></td>
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<tr>
<td><strong>Diocalandra frumenti</strong></td>
<td><strong>Leucinodes orbonalis</strong></td>
<td><strong>Xylosandrus crassiusculus</strong></td>
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<tr>
<td><strong>Drosophila suzukii</strong></td>
<td><strong>Nysius huttoni</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Enaphalodes rufulus</strong></td>
<td><strong>Phaedon brassicae</strong></td>
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**Diaphania perspectalis**  
**Bactrocera invadens**  
**Saperda candida**  
**Leucinodes orbonalis**  
**Drosophila suzukii**  
**Xylosandrus crassiusculus**
Information sharing
Collect and store information on pests

- Official pest reports from Plant Protection Services
- Literature, Internet surveys

Stored data
EPPO Reporting Service: a free monthly newsletter

It contains:

- New data on biology, host plants, diagnostic methods and geographical distribution of quarantine pests and pests of potential quarantine significance
- Interception reports
- Additions to the EPPO Alert List, etc.

Available by e-mail
EPPO Reporting Service: example of a first record

2007/022 First report of *Rhynchophorus ferrugineus* in Cyprus

The NPPO of Cyprus informed the EPPO Secretariat that *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae - EPPO A2 List) has recently been found on palm trees on its territory. The pest was observed for the first time on 2006-09-14 and its identity was confirmed on 2006-09-18 by the laboratories of the Plant Protection Section of the Department of Agriculture and the Agricultural Research Institute in Cyprus. *R. ferrugineus* was found on 4 palm trees (*Phoenix canariensis*) in the garden of a hotel located on the coastal area of Lemesos. The pest was then detected in isolated cases, in the areas of Nicosia and Larnaca, also on *P. canariensis* grown in private and public gardens. All infested plants were removed and burned. In addition, the NPPO of Cyprus has taken measures in: 1) training all plant health inspectors in the identification and handling of infested palm trees; 2) informing the public on the appearance of *R. ferrugineus* (newspapers, announcements on radio and television programmes). Further surveys are being carried out to delimit the extent of the infestation of *R. ferrugineus* in Cyprus.

The pest status of *Rhynchophorus ferrugineus* in Cyprus is officially declared as follows: Present, first recorded in Cyprus in 2006, 3 outbreaks, official measures are taken for its eradication.

Source: NPPO of Cyprus, 2006-12.

Additional key words: new record

Computer codes: RYCFE, CY
EPPO Global database

Database which contains information about many plant pests and invasive alien plants (EPPO A1/A2 pests, EU regulated pests and many other regulated pests for other parts of the world)

- Host plants
- Geographical distribution
- Plant commodities liable to carry quarantine pests

At present, the earlier version of the database (formerly called PQR) can be downloaded from the EPPO website, but it is now under re-construction (it will be an online database, called EPPO global database)
EPPO Global database

Details about geographical distribution

EPPO Reporting Service

The NPPO of Austria recently informed the EPPO Secretariat of the introduction of Anoplophora glabripennis (Coleoptera, Cerambycidae – EPPO A1 quarantine pest) in Austria. In July 2001, the first beetles were detected in the small city of Braunau am Inn (near the German border) and a few days later they were identified as A. glabripennis by the Institute of Forest Protection. Gnath additional visible symptoms were found on 40 trees (all Acer species, and mainly A. platanoides). Eradication measures were immediately taken. All infested trees and all those suspected of being infested were cut down and wood was cut into small pieces. All living beetles (approximately 100) which feed on the leaves and trunks were collected and killed by the Plant Protection Service. All infested trees were situated along a small avenue over a distance of a few hundred metres. Surveys were done and as of August 17, no other beetles were found in the city, in its surroundings nor in the state of Oberösterreich. Further monitoring will continue. This report of A. glabripennis in Austria constitutes the first record for Europe.

Source: NPPO of Austria, 2001-08.

Additional key words: new record
Data collection and storage

Geographical distribution, host plants, short reports of EPPO Reporting Service, pictures etc. are stored in the EPPO Global Database (under construction)
Pest Risk Analysis
Potential invasive pests
PRA & phytosanitary regulations

- When new pests are emerging, studies can be done to evaluate whether phytosanitary regulations are appropriate to prevent introduction and spread

- Pest Risk Analysis can be performed

<table>
<thead>
<tr>
<th>Risk perception</th>
<th>Risk assessment</th>
<th>Risk management</th>
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<td><img src="image1" alt="Risk perception" /></td>
<td><img src="image2" alt="Risk assessment" /></td>
<td><img src="image3" alt="Risk management" /></td>
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</table>
What is Pest Risk Analysis (PRA)?

**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 [FAO definition].

**ISPM No. 11:** Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms [FAO, 2004].

**The objective of PRA is to answer these ‘simple’ questions:**

- Can the pest studied be considered as a quarantine pest?
- Can phytosanitary measures (prohibitions, restrictions on trade ...) be taken to reduce the risk to an acceptable level?
EPPO Standard PM5/3(3) Decision-support scheme for quarantine pests

**Initiation**
- Which pest to analyse?
- Definition of the PRA area
- Does an earlier PRA exist?

**Pest Risk Assessment**
- Probability of entry (pathways, detection, survival in transit)
- Probability of establishment and spread (host plants, vectors, climate)
- Economic impact assessment (direct/indirect damage)
- Is it a quarantine pest?

**Pest Risk Management**
- Is the risk acceptable?
- For each possible pathway evaluate the efficacy of possible phytosanitary measures
- Propose management options
PRA tools
Climate matching studies to predict pest establishment

*Saperda candida* (round-headed apple tree borer)
North American pest of *Rosaceae* (including apple)
Climatic zones which are similar to the area of origin and where the pest could establish (CLIMEX studies)
Performing and reviewing PRA to recommend regulation of pests

Any request for addition to the EPPO Lists should be supported by a PRA

PRAs prepared by EPPO member countries

PRAs performed by an EPPO Expert Working Group for PRA

PRAs are reviewed by EPPO Panels and pests are eventually added to the EPPO A1/A2 Lists with recommendations on management options (phytosanitary measures)

EPPO recommendations may then serve as a basis for establishing the EU regulations on plant health.

Council Directive 2000/29/EC on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community
Standards
Development of EPPO Standards

To help its member countries EPPO has developed Standards on:

- Diagnostic protocols
- Eradication /containment programmes

In practice, for potentially invasive species which have newly been introduced, the difficulty is that field or lab experience is lacking (and takes time to build up) – so how to react promptly?
EPPO Standards: Diagnostic protocols

Drafts are reviewed by relevant Panels and other EPPO bodies. Protocols are thus based on experience of specialists.

- 98 protocols for pests and diseases have been approved (freely available on the EPPO website)
- more are still under preparation

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Rhynchophorus ferrugineus
Rhynchophorus palmarum

Diabrotica virgifera

Tecia solanivora

Trioza erytreae and Diaphorina citri
EPPO Standards: eradication and containment

National regulatory control systems: recommendations on delimiting surveys, sampling, trapping, measures in infested areas:
- *Bursaphelenchus xylophilus*
- *Diabrotica virgifera*
- *Heterodera glycines*

Standard on ‘Generic elements for contingency planning’: to ensure a rapid and effective response of NPPOs to pest outbreaks (containment/eradication):
- a general framework
- pest specific contingency plans remain to be drafted...
Conclusions

- Invasive pests are challenges for researchers, growers, plant protection services, international bodies...

- Research is needed to better understand the biology and epidemiology of invasive pests, and to better understand the mechanisms of biological invasions.

- Need to develop tools to predict patterns of spread and establishment potential of invasive pests.

- Timely detection and availability of suitable diagnostic tools is a key element in the management of potential invasive pests.

- International cooperation and information exchange should continue.
Thank you for your attention