

# HORIZON SCANNING & RISK ANALYSIS tools for pest organisms and invasive alien species in Europe

*Etienne Branquart & Jean-Claude Grégoire*



Cellule  
interdépartementale  
**Espèces invasives**

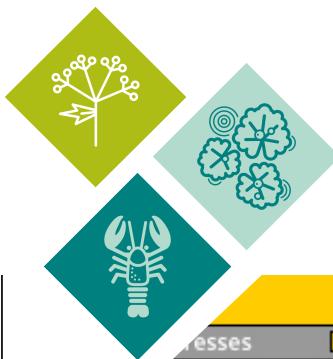
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1





# 1. Prevention is better than cure

## Biobest website, April 2000

best.be

NED FRA ENG ESP

Produits Liens Distributeurs Pollinisation Ravageurs  
Produits Cultures Biobulletin Presse Jobs  
Effets secondaires

**biobest**  
BIOLOGICAL SYSTEMS

Produits Contrôle biologique: auxiliaires Harmonia-System Auxiliaires Fiche Technique

**Le mangeur de pucerons !**

Harmonia axyridis est un prédateur de différentes espèces de puceron. Les larves aussi bien que les adultes sont d'excellents auxiliaires.

Biologie: *Harmonia axyridis*

  
© Biobest NV

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# **1. Prevention is better than cure**

Biobest website, April 2002



**NED**

**FRA**

**ENG**

**ESP**

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Adresses      Profile      Liens      Distributeurs      Pollinisation      Ravageurs  
Produits      Cultures      Biobulletin      Presse      Jobs  
Effets secondaires

## Bio-Bulletin

### La coccinelle, *Harmonia axyridis* & le principe de précaution

*Harmonia axyridis* est une coccinelle d'origine asiatique connue pour être une grande dévoreuse de pucerons. Introduite dès 1916 en Californie, elle a été importée en France en 1982 par l'inra, et maintenue en quarantaine jusqu'en 1990. Une souche dite « mauvais voilier » a été sélectionnée afin de sédentariser les adultes et de réduire leurs déplacements. Cependant, *H. axyridis* ne se nourrit pas que de pucerons. Elle s'attaque à de nombreux ravageurs et même à d'autres auxiliaires! Aggressives, les larves prédatent aisément les larves d'espèces de coccinelles sauvages. Des études démontrent que les populations d'*H. axyridis* progressent au détriment des espèces de coccinelles indigènes. Chaque hiver, les américains observent même un phénomène singulier, l'envahissement des habitations par des milliers d'individus. Finalement, sa principale qualité tient à sa production: on peut l'élever facilement sur une nourriture artificielle (œufs de la teigne de la farine, *Ephestia kuhniella*). Cette coccinelle exotique s'avère un redoutable prédateur dont la voracité, si prometteuse, interpelle désormais les scientifiques. Absente à l'origine de l'écosystème européen, elle semblerait s'y installer et même le coloniser, avec le risque potentiel de remplacer un jour les espèces locales. La médiocrité du vol des coccinelles dites « mauvais voilier » freine probablement sa progression, mais n'est pas, en l'état actuel des

Aucune étude d'impact n'a par ailleurs attesté la faune locale. Devant le nombre grandissant de protéger leur faune sauvage, Biobest a décidé le principe de précaution et d'accroître la producti



Statement about the detrimental impacts of the Asiatic ladybird on other aphidophagous organisms, large winter aggregations in houses, etc. and its capacity to establish populations in the wild!

That's why Biobest decided to stop rearing this ladybird species in the name of the precautionary principle.

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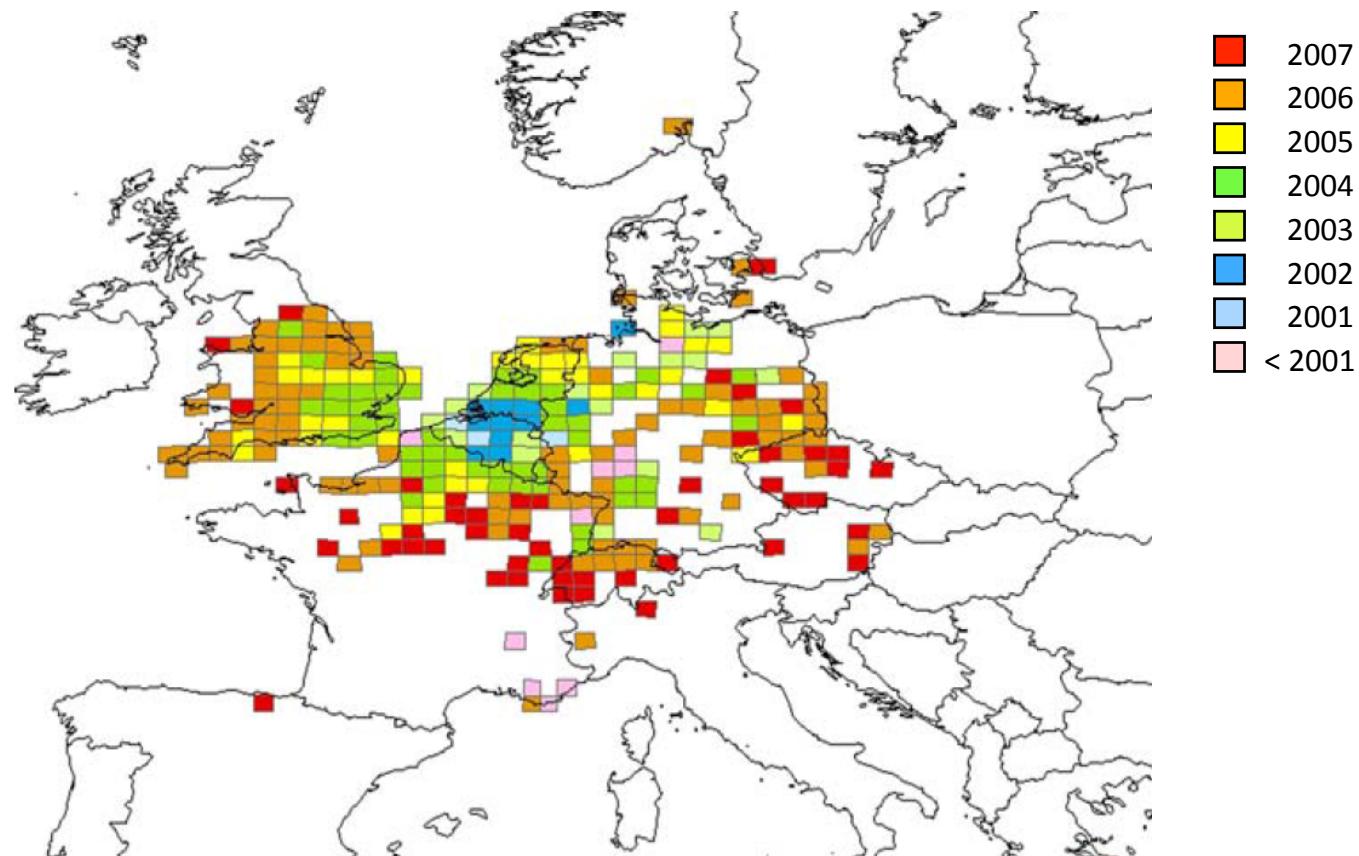
3

wallonie.be



# 1. Prevention is better than cure

## Spread in Europe from 2000 to 2007



PMJ Brown *et al.*, BioControl, 2008



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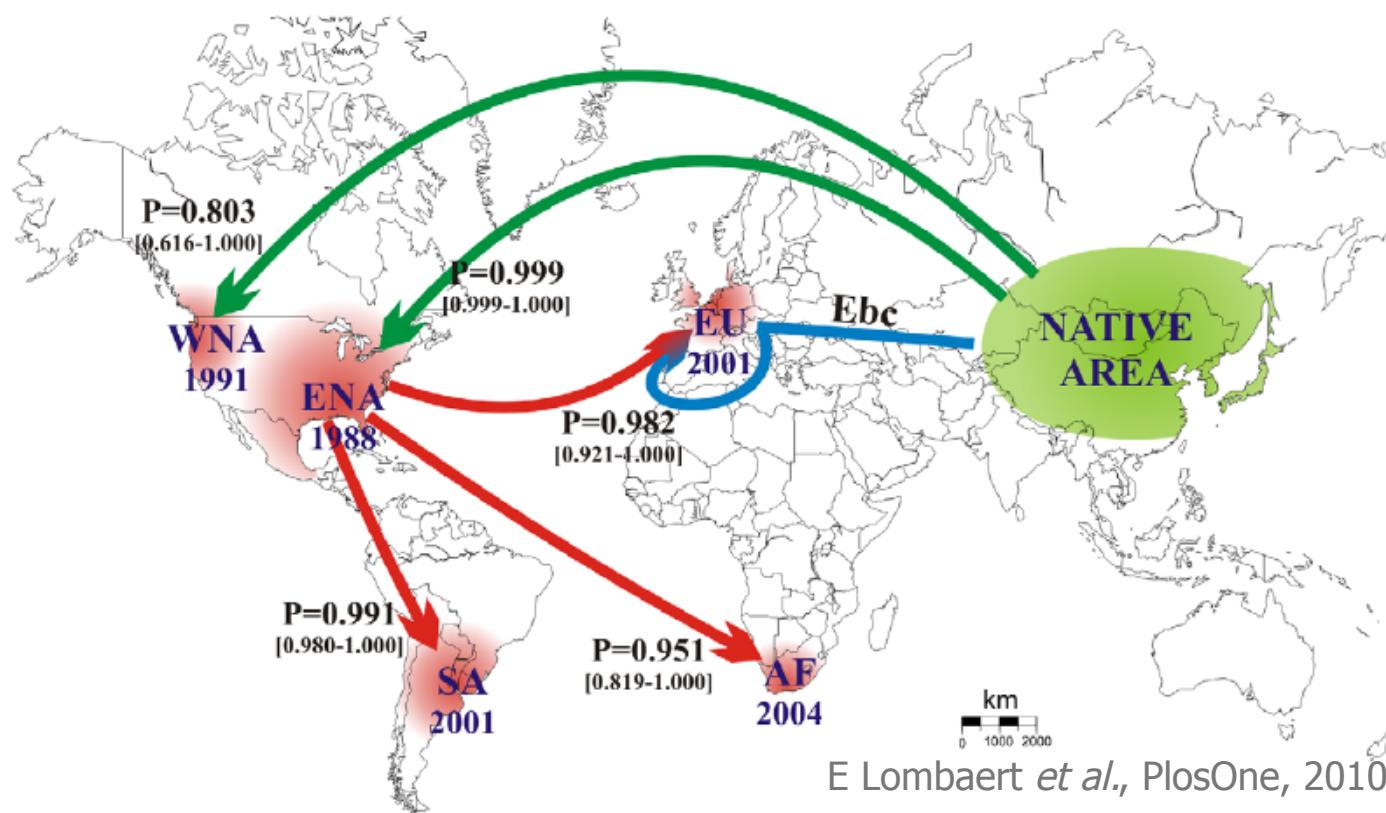


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# 1. Prevention is better than cure

## Learning from invasion histories



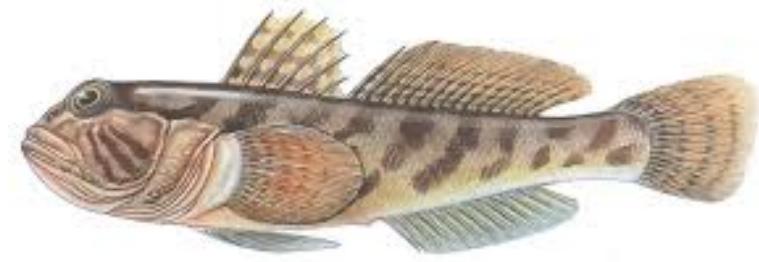
World distribution of the Asiatic ladybird, *Harmonia axyridis*





# 1. Prevention is better than cure

## Prediction based on life-histories



	ESTABLISHMENT	SPREAD	IMPACT
Adult length	-		
Egg size			-
Growth rate	+	-	
Salinity range tolerance	+	-	+
Temperature range tolerance	+	+	

CS Kolar & DM Lodge, Science 2002



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# 1. Prevention is better than cure

## Prediction based on life-histories

RESEARCH ARTICLE



Breaking taboos in the tropics: incest promotes colonization  
by wood-boring beetles

BH Jordal *et al.*, Global Ecology & Biogeography, 2001



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## 2. Regulatory framework

### Focus on three domains



	Plant health	Animal health	Biodiversity
Targets	Plant pests and diseases	Animal (and human) diseases	Invasive Alien Species
International framework	International Plant Protection Convention (IPPC, 1952)	World Organization for Animal Health (OIE, 1924)	Convention on Biological Div. (CBD, 1992)
European framework	Directive 2000/29/EC	(in progress)	(in progress)
Black list approach	Lists of quarantine and quality pests	Listed diseases and vector species	List of IAS of EU concern
Risk assessment standards (pre-entry assessment)	IPPC (ISPM) (1951)	OIE (2002)	-

**Focus put on preventive measures, surveillance and rapid response (the "*prevention is better than cure*" principle, adopted by EU Commission in 2007)**

Proposals for EU Regulations on (i) protective measures against plant pests, (ii) animal health and (iii) invasive alien species.





## 2. Regulatory framework

### Three domains, one common approach

1. **Listing of diseases, quarantine pests and invasive organisms which are likely to constitute a serious risk at EU level**
  - *Movements restriction of listed diseases and organisms (incl. trade),*
  - *Establishment of quarantine measures,*
  - *Setting up monitoring and surveillance,*
  - *Take control actions when disease or organism is detected.*
2. **Possibility for Member States to adopt temporary emergency measures when a new emerging threat appears**
  - *Adoption of temporary measures (similar as above),*
  - *Notification to the Commission and other Member States,*
  - *Carry out a pest risk assessment for inclusion in EU lists,*
  - *Possibility for the Commission to include the new disease or a new organism in the EU list through an implementing act.*



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## 2. Regulatory framework

### Example of quarantine lists



2000L0029 — EN — 19.07.2007 — 014.002 — 41

▼ **B**

#### *ANNEX I*

#### PART A

##### HARMFUL ORGANISMS WHOSE INTRODUCTION INTO, AND SPREAD WITHIN, ALL MEMBER STATES SHALL BE BANNED

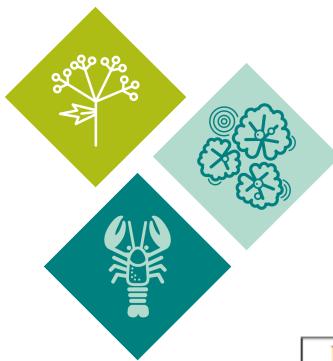
###### Section I

###### HARMFUL ORGANISMS NOT KNOWN TO OCCUR IN ANY PART OF THE COMMUNITY AND RELEVANT FOR THE ENTIRE COMMUNITY

- (a) Insects, mites and nematodes, at all stages of their development
  - 1. *Acleris* spp. (non-European)
  - 2. *Amauromyza maculosa* (Malloch)

Annexes of Directive 2000/29/EC are legally binding.  
Prohibition of introduction and spread of listed harmful organisms.





## 2. Regulatory framework Emergency measures



EN

Official Journal of the European Union

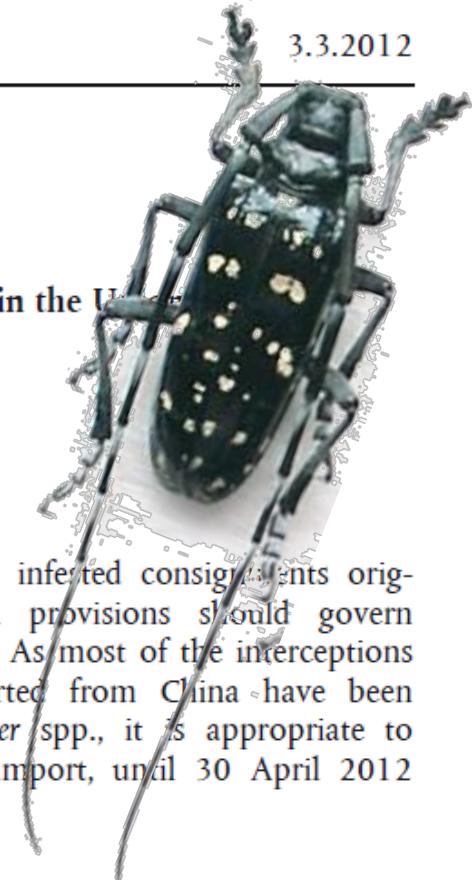
3.3.2012

### COMMISSION IMPLEMENTING DECISION of 1 March 2012

as regards emergency measures to prevent the introduction into and the spread within the Union of  
*Anoplophora chinensis* (Forster)

(notified under document C(2012) 1310)

(2012/138/EU)



THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community (<sup>1</sup>), and in

(5) Given the experience with infested consignments originating in China, special provisions should govern imports from that country. As most of the interceptions on specified plants imported from China have been reported on plants of *Acer* spp., it is appropriate to maintain a ban on their import, until 30 April 2012 as previously laid down.

(6) The movement of plants within the Union should be



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## 2. Regulatory framework Prevention in SPS Agreement



**What?** WTO Agreement on the application of (phyto-) sanitary measures;

**Aim?** Adoption of measures to protect human, animal and plant life without creating arbitrary discrimination or disguised restriction on trade;

**How?** Use of international standards and available scientific evidence to justify trade restrictions (focus on (pest) risk assessment tools).





## 2. Regulatory framework Notification to COM

2011/0208/NL



Staatsblad  
van het Koninkrijk der Nederlanden

Jaargang 2011

410

Besluit van 2 september 2011, houdende wijziging van het Besluit aanwijzing dier- en plantensoorten Flora- en faunawet inzake de aanwijzing van eekhoornsoorten als soorten in de zin van artikel 14, derde lid, Flora- en faunawet (Bezit en handelsverbod exotische eekhoornsoorten)

Wij Beatrix, bij de gratie Gods, Koningin der Nederlanden, Prinses van Oranje-Nassau, enz. enz. enz.  
Op de voordracht van de Staatssecretaris van Economische Zaken, Landbouw en Innovatie van 8 april 2011, no. 125531;  
Gelet op artikel 14, derde lid, 75, eerste lid, en 76 van de Flora- en faunawet;

De Afdeling advisering van de Raad van State gehoord (advies van 20 juli 2011, W15.11.0236/IV);  
Gezien het nader rapport van de Staatssecretaris van Economische Zaken, Landbouw en Innovatie van 30 augustus 2011, no. 22538;

Haben goedgevonden en verstaan:

### ARTIKEL I

Artikel 6, tweede lid, van het Besluit aanwijzing dier- en plantensoorten Flora- en faunawet komt te liden:  
2. Als diersoort als bedoeld in artikel 14, derde lid, van de wet zijn aangewezen de:

- Amerikaanse vossehoorn
- grijze eekhoorn
- muntjak
- Pallas' eekhoorn

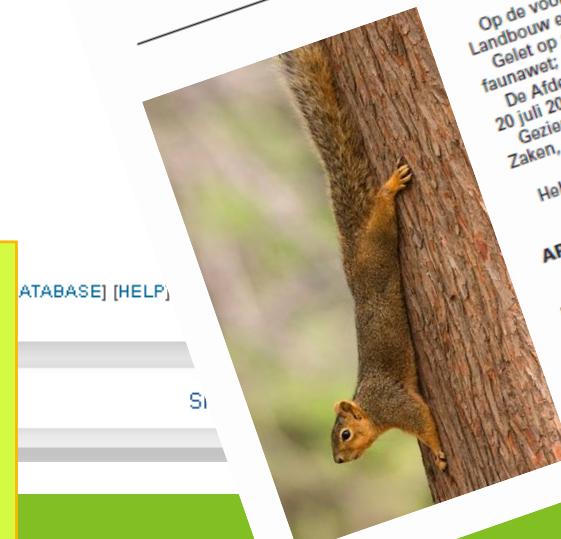
Scirus niger;  
Scirus carolinensis;  
Muntiacus reevesi;  
Callosciurus erythraeus.

The screenshot shows the European Commission's website for Enterprise and Industry. The page title is "ENTERPRISE AND INDUSTRY". Below it, a link reads "European Commission > Enterprise and Industry > TRIS". There is a "Word" document icon with the file name "120110208EN.DOC" and a size of "50.2 Ko". Below the document icon is the text "Click on the link to download and view the draft proposal". To the right of the document icon is a small image of a squirrel climbing a tree trunk.

### Brief statement of grounds:

- Necessary
- Non-discriminatory
- Proportionality

Directive 98/34/EC, provision of information in the field of technical standards and regulation.



ATABASE] [HELP]

Si

Search

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## 3. Risk assessment Definitions

**[SPS/WTO]** The evaluation of the likelihood of entry, establishment or spread of a pest or disease within the territory of an importing MS according to the sanitary or phytosanitary measures which might be applied, and of the associated potential biological and economic consequences;

**[IPPC]** Evaluation of the probability of the introduction and spread of a pest and of the associated potential economic consequences.

**[CBD]** The assessment of the consequences of the introduction and of the likelihood of establishment of an alien species using science-based information.



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## 3. Risk assessment

### Common principles



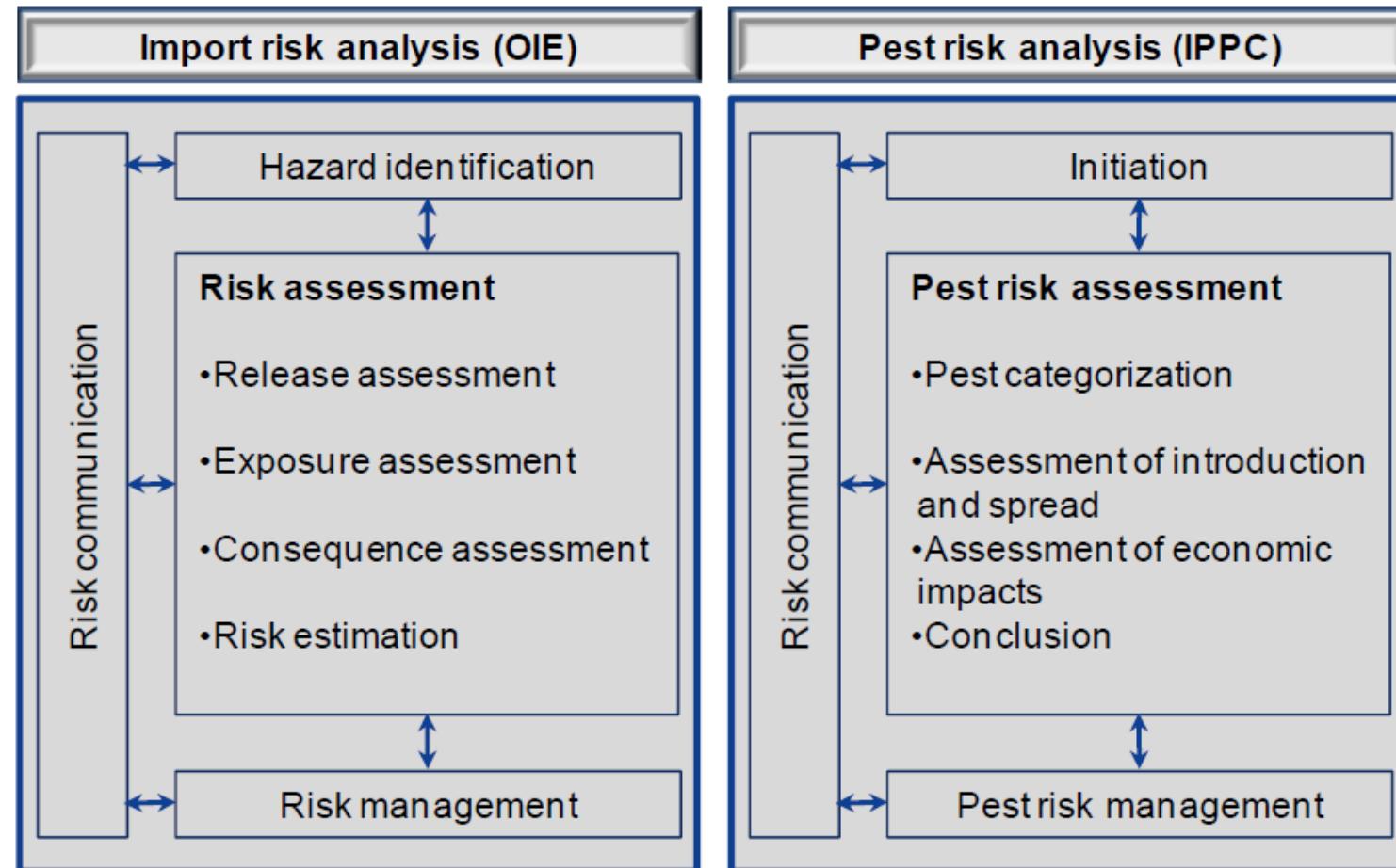
- Based on available scientific evidence
  - Undertaken in an independent, objective and transparent manner
  - Provide justification about:
    - necessity
    - proportionality
    - minimal impact
    - non-discrimination
    - feasibility
- } of proposed risk management measures





# 3. Risk assessment

## Structure of international standards



Production cost at EU level?

> 50 000 EUR per species



DIF  
DE

16

EFSA Scientific Committee, EFSA Journal 2012

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# 3. Risk assessment

## Belgian risk analyses for IAS



Risk analysis report of non-native organisms in Belgium - American bullfrog *Lithobates catesbeianus* (Shaw)

Tim Adriaens, Sander Devisscher and Gerald Louette



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17

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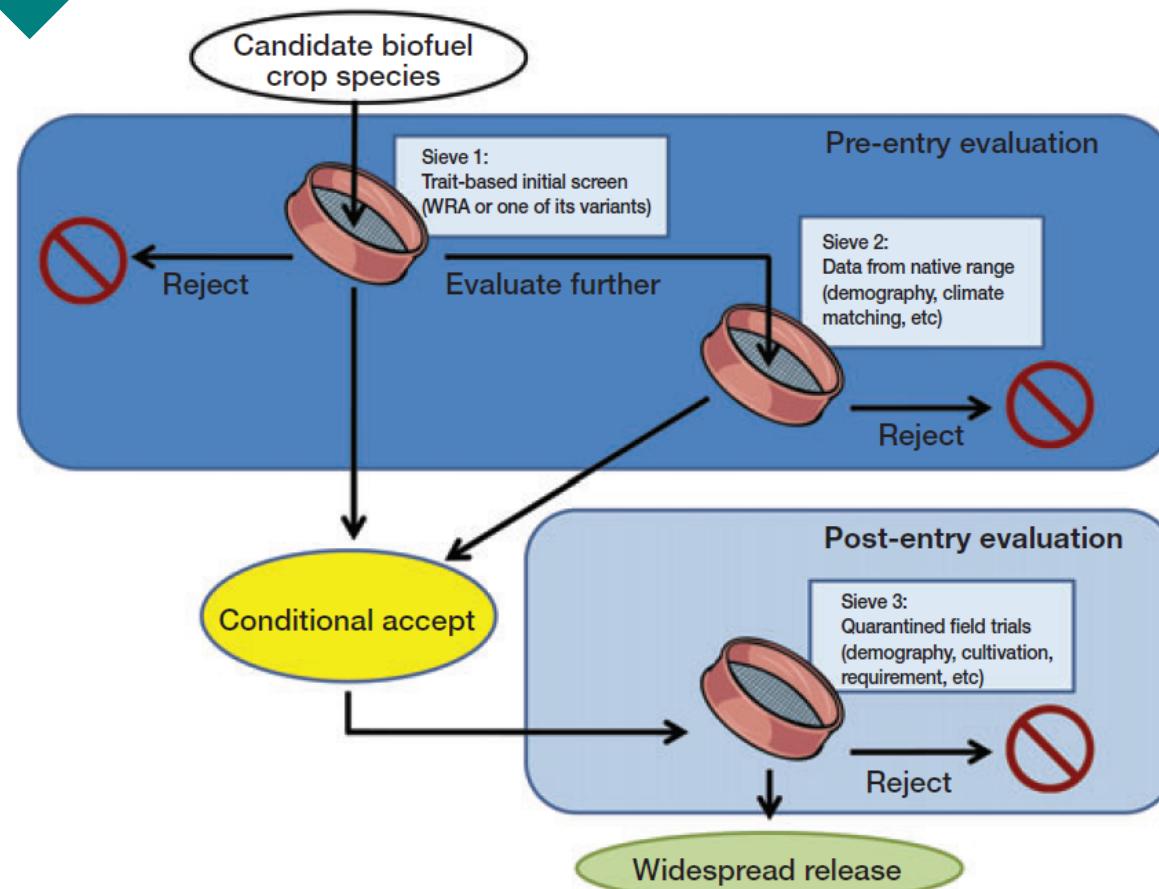


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# 3. Risk assessment

## Pre- and post-entry risk evaluation



AS Davis *et al.*, Front. Ecol. Environ. 2010



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## 4. Identification of emerging risks

### Limitations of current approaches

*The oriental chestnut gall wasp, Dryocosmus kuriphilus.*  
Reduces fruiting by more than 50%.



Pest insect not listed in the appendices of Directive 2000/29/EC.

First observation in Italy (Piemonte) in 2002.  
Currently established in 8 countries.



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## 4. Identification of emerging risks

### Limitations of current approaches

*The New Zealand pigmy weed, Crassula helmsii. Depletes oxygen in water bodies and causes the decline of animal life.*



Invasive plant recommended by EPPO for regulation as quarantine pest in 2007.  
First observation in England in 1956. Recently established in Italy, Portugal and Spain.



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## 4. Identification of emerging risks

### Limitations of current approaches



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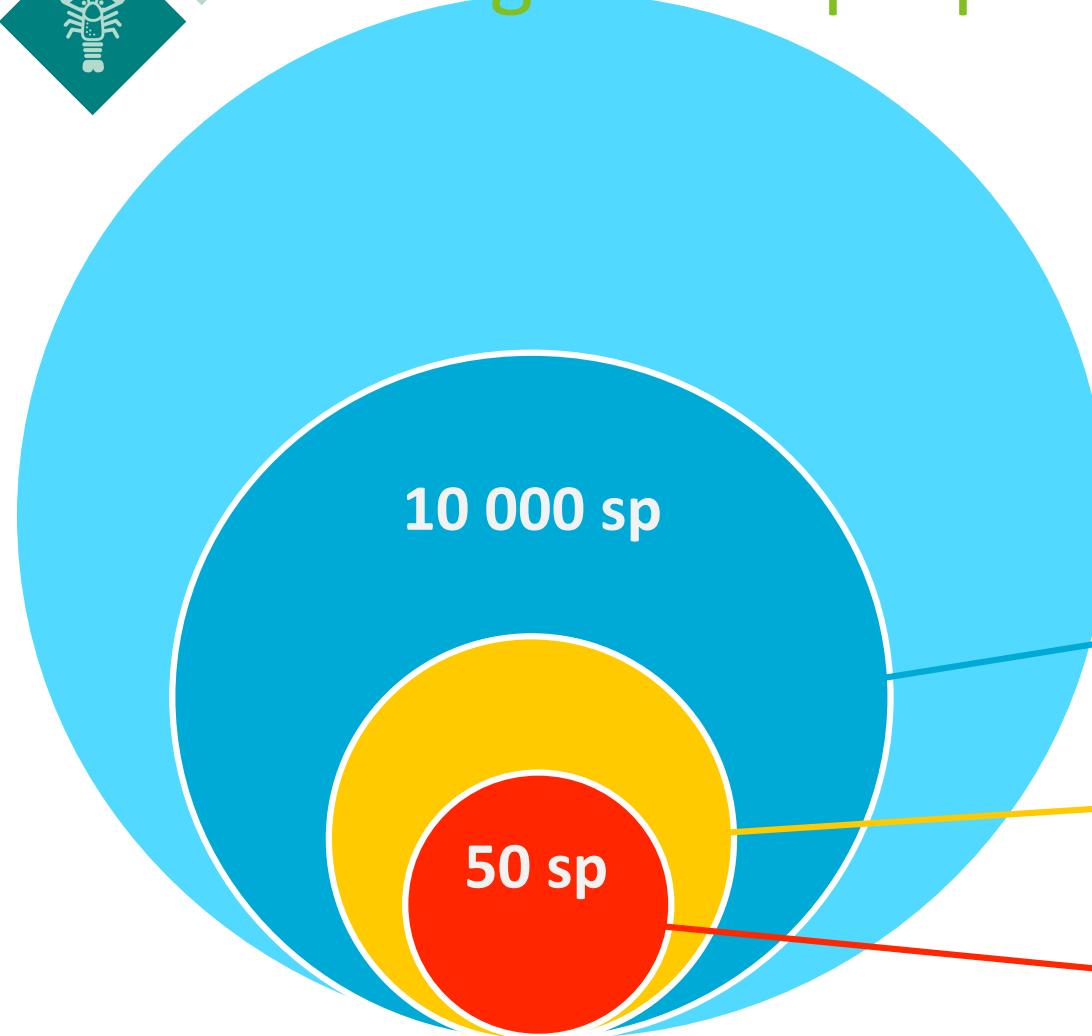


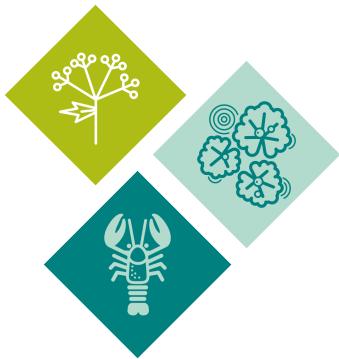
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## 4. Identification of emerging risks

### Regulation proposal on IAS



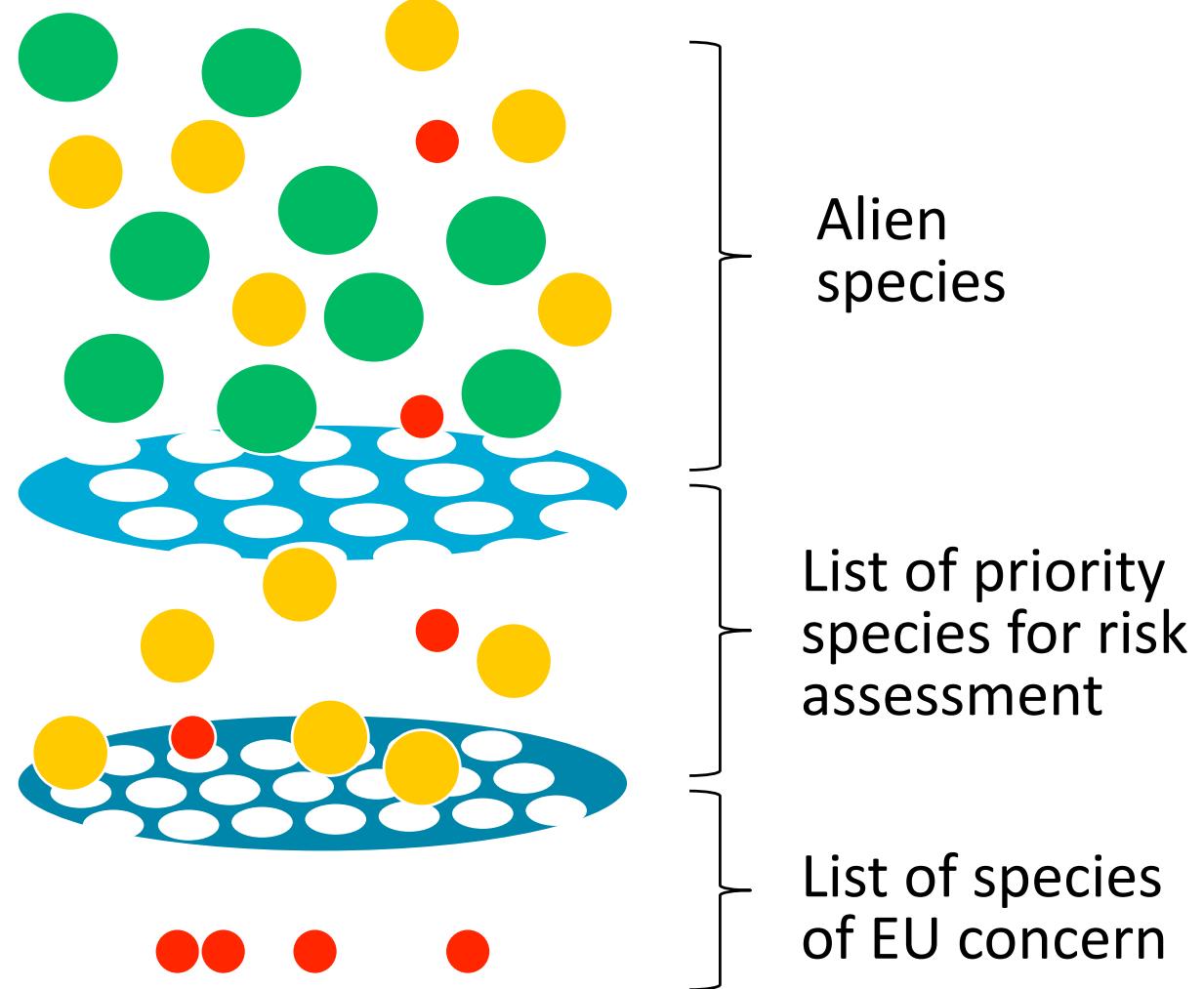


## 4. Identification of emerging risks

### A two-step approach for prioritization

Horizon scanning and prioritization tools

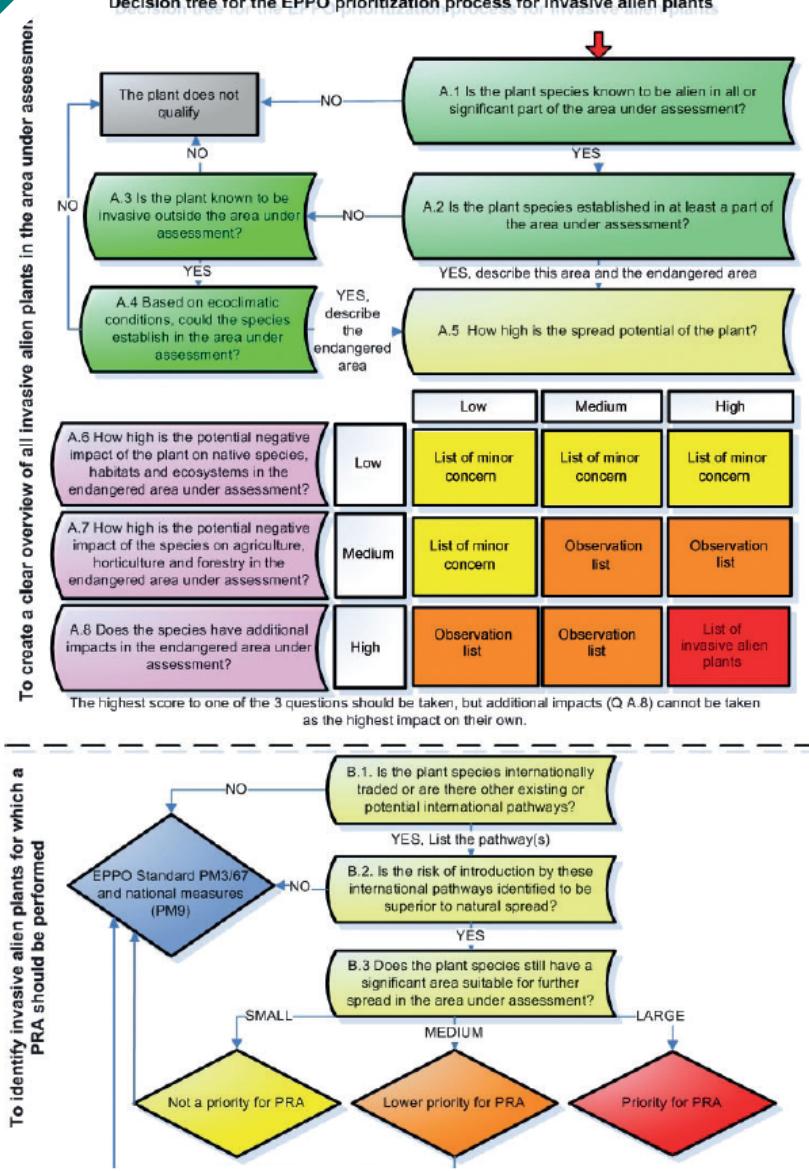
Risk assessment





# 4. Identification of emerging risks

## A two-step approach for prioritization



**The EPPO prioritization process of invasive alien plants.**

- species allocation to different list categories based on plants establishment, spread and impact
- Identification of priority species for pest risk analysis

EPPO Standard PM5/6

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# 4. Identification of emerging risks

## Production of alert lists

Natural England Commissioned Report NECR009

Horizon scanning for new invasive non-native animal species in England

First published 22 May 2009

[www.naturalengland.org.uk](http://www.naturalengland.org.uk)



25

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Invasion stage in England ↪	Locally established	C <sub>2</sub>	B <sub>2</sub>	A <sub>2</sub>	BLACK LIST	
		C <sub>1</sub>	B <sub>1</sub>	A <sub>1</sub>		
Absent	C <sub>0.5</sub>	B <sub>0.5</sub>	A <sub>0.5</sub>	WATCH LIST	ALERT LIST	
	C <sub>0</sub>	B <sub>0</sub>	A <sub>0</sub>			
Low		Medium	High			
Impact (environmental risk) ⇨						

Aim at identifying potential new invasive animal species in England. Focus on new and emerging threats (i.e. species not yet observed in the wild). Use of the Belgian ISEIA protocol as a screening tool.



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## 4. Identification of emerging risks

### Pathway risk analysis (plant health)

**Pathways** are any means that allows the entry or spread of a pest or a disease through the (unintentional) intervention of man.

**Pathway risk analysis** is the analysis of a set of sequential events along a pathway that affect phytosanitary risk.

**Examples:** nursery plants for planting, fruits and vegetables, etc. represent a pathway.





European Food Safety Authority

Committed since 2002 to ensuring that Europe's food is safe



## Declarations of Interests database

### SCER Emerging Risks (Standing Working Group)

This database contains the Annual Declarations of Interest (ADols) of all experts with active EFSA involvements.

Also available:

- Previous ADols not included in this database are available on [request](#)
- ADols of other EFSA Panels, Networks and Working Groups are available on [this link](#).

EFSA's working groups consist of scientists from the relevant EFSA Scientific Panel(s) and may in addition contain external scientific experts with the required specialisation. In order to further support its work, EFSA can also invite other scientists with particular and relevant knowledge to contribute to one or more meetings of a working group by providing additional data, reports and publications and answering questions. These hearing experts are not members of the scientific bodies and they do not participate in the deliberations of the working group nor in the drafting and the adoption of the scientific outputs.

Experts	
Name	Role
CHAUDHRY Mohammad Qasim	Member
DU JARDIN Patrick	Member
GOTT David	Member
GREGOIRE Jean Claude	Member

Aim at identifying of drivers and emerging issues based on innovative approaches like General Morphological Analysis). See Jean-Claude !



## 5. Conclusion and perspectives

- Prevention actions should preferably be adopted before the introduction of organisms and diseases on a territory,
- Need to produce alert lists gathering organisms and diseases that could establish and cause damages on a territory before their introduction,
- Cost-efficient tools for horizon scanning and other innovative approaches have to be developed to reach that goal,
- Lists of EU concern deserve to be established through a two-step approach including both horizon scanning tools and risk assessment schemes,
- Need to develop international standards to carry out risk assessment for IAS (// plant and animal health).





**Thank you very much for your attention!**



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