



# EPPO's work on assessing risks to forestry, using *Heterobasidion irregulare* as an example

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# Outline of the presentation

- Brief introduction to the context of Pest Risk Analysis activities of EPPO
- The Pest Risk Analysis process in EPPO and illustration with *Heterobasidion irregulare*



# Aims of EPPO

- To protect plant health in agriculture, **forestry** and the uncultivated environment
- To ensure cooperation and harmonization in all areas of plant protection where Governments take official measures (regulated pests or “Quarantine”)
- **To develop a common strategy against the introduction and spread of pests (recommend phytosanitary measures)**
- To promote the use of modern, safe and effective pest control methods
- To provide information services for provision and exchange of information

# *“Pest risk analysis”*

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

International Standards for Phytosanitary Measures (ISPMs) on PRA have been developed

**ISPM No. 2 (1996)** *Guidelines for pest risk analysis* **revised in (2007)** *Framework for pest risk analysis*

**ISPM No.11 (2004)** *Pest risk analysis for pests, including analysis of environmental risks and living modified organisms*

# *EPPO Activities on Pest Risk Analysis*

Initiated in the 1990's

PM 5/3 (5) Decision-support scheme for quarantine pests

PM 5/5 (1) Decision-Support Scheme for an **Express** Pest Risk Analysis

PM 5/6 (1) EPPO prioritization process for invasive alien plants

PM 5/7 (1) EPPO Screening process to identify the need for a commodity PRA to import plants for planting

## **Other standards on PRA**

- PM 5/1 (1) Check-list of information required for PRA
- PM 5/2 (2) PRA on detection of a pest in an imported consignment

# 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 or EFSA

PRAs performed by an EPPO Expert Working Group for PRA

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

EPPO recommendations may serve as a basis for establishing the EPPO member countries regulations on plant health.



# Selection of pests for PRA

Usually pests are select from:

- the EPPO Alert List
- proposals from EPPO countries
- Commodity studies

Priorities for PRA evaluated by the Panel on Quarantine Pests for Forestry and the Panel on Phytosanitary Measures

Final selection by the Working Party on Phytosanitary Regulations

European and Mediterranean Plant Protection Organization  
Organisation Européenne et Méditerranéenne pour la Protection des Plantes

EPPO Alert List  
(last updated in 2014-06)

The purpose of the Alert List is to draw the attention of EPPO member countries to certain pests possibly presenting a risk to them and achieve early warning. Pests are marked with an asterisk\* in the Table below when PRAs are planned or under development within EPPO. The entry date corresponds to the date when the pest was added to the Alert List.

Read a short [introduction on the purpose and maintenance of the EPPO Alert List](#).

Pest Names	Main host plants or habitats	PRA	Entry date
<b>Insects and mites</b>			
<a href="#">Agrilus auroguttatus</a> (Coleoptera: Buprestidae)	<i>Quercus</i>		2013-03
<a href="#">Aproceros leucopoda</a> (Hymenoptera: Argidae)	<i>Ulmus</i>		2011-09
<a href="#">Aromia bungii</a> (Coleoptera: Cerambycidae)	<i>Prunus</i> spp., and other fruit tree species	*	2012-05
<a href="#">Chrysophtharta bimaculata</a> (Coleoptera: Chrysomelidae)	<i>Eucalyptus</i>		2010-05
<a href="#">Myiopardalis pardalina</a> (Diptera: Tephritidae)	<i>Cucumis melo</i> and other cucurbits		2013-06
<a href="#">Neoleucinodes elegantalis</a> (Lepidoptera: Crambidae)	Solanaceae	*	2012-03
<a href="#">Ophiomyia kwansonis</a> (Diptera: Agromyzidae)	<i>Hemerocallis</i>		2013-01
<a href="#">Polygraphus proximus</a> (Coleoptera: Scolytidae)	<i>Abies</i>	*	2011-10
<a href="#">Strauzia longipennis</a> (Diptera: Tephritidae)	<i>Helianthus annuus</i>		2011-02
<a href="#">Thaumastocoris peregrinus</a> (Hemiptera: Thaumastocoridae)	<i>Eucalyptus</i>		2012-07
<a href="#">Xylosandrus crassiusculus</a> (Coleoptera: Scolytidae)	Polyphagous (woody deciduous plants)		2009-03
<b>Nematodes</b>			
<a href="#">Heterodera elachista</a>	Rice ( <i>Oryza sativa</i> ) and maize ( <i>Zea mays</i> )		2014-03
<a href="#">Heterodera zea</a>	Maize ( <i>Zea mays</i> ) and other cereals ( <i>Triticum</i> , <i>Hordeum</i> )		2012-01
<a href="#">Meloidogyne ethiopica</a>	Polyphagous		2011-01
	Polyphagous		2014-06

Programme of EWG in 2014 included:  
**Thousand cankers disease (*Geosmithia morbida* and its insect vector *Pityophthorus juglandis*)**  
***Heterobasidion irregulare***

# *Heterobasidion irregulare*

Dr Gonthier (University of Torino) and Dr Garbelotto (University of California, Berkeley) contacted the EPPO Secretariat in August 2013 and suggested that this pathogen should be added to the EPPO Alert List because of the risk it may present to pine trees in the EPPO region.



*Heterobasidion irregulare* added to the EPPO Alert List in 2013-10.

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## *Heterobasidion irregulare*

**Why:** *Heterobasidion annosum* sensu lato, associated with root and butt rots, was long regarded as a single species until mating experiments, phylogenetic studies, and the existence of different host preferences led to the description of separate fungal species. Among these, *Heterobasidion irregulare* has recently been described as a new species belonging to the *H. annosum* complex and originating from North America. However, *H. irregulare* was introduced into Lazio region in Italy, most probably during World War II by US troops via infected wood material. Research studies have demonstrated that *H. irregulare* has spread from its initial introduction site (Castelporziano) and is currently causing extensive mortality in several *Pinus pinea* stands. Dr Gonthier (University of Torino) and Dr Garbelotto (University of California, Berkeley) who have studied *H. irregulare* extensively during the last decade, recently contacted the EPPO Secretariat and suggested that this pathogen should be added to the EPPO Alert List because of the risk it may present to pine trees in the EPPO region.



*Heterobasidion irregulare* on a pine stump. All pictures were kindly provided by Paolo Gonthier (University of Torino, IT), Matteo Garbelotto (University of California, Berkeley, US) and Angelo Mazzaglia (University of Studies of Tuscia, Viterbo, IT)

[View more pictures >](#)

## Review Alert List in Spring 2014

Panel on Phytosanitary Measures: spreads slowly and could still be contained **PRA needed**

Panel on Quarantine Pests for Forestry limited spread over a long period **PRA not needed**

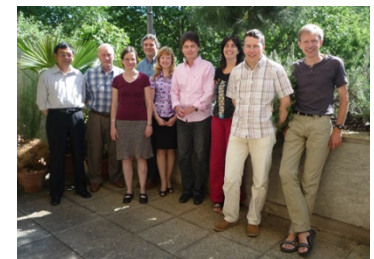
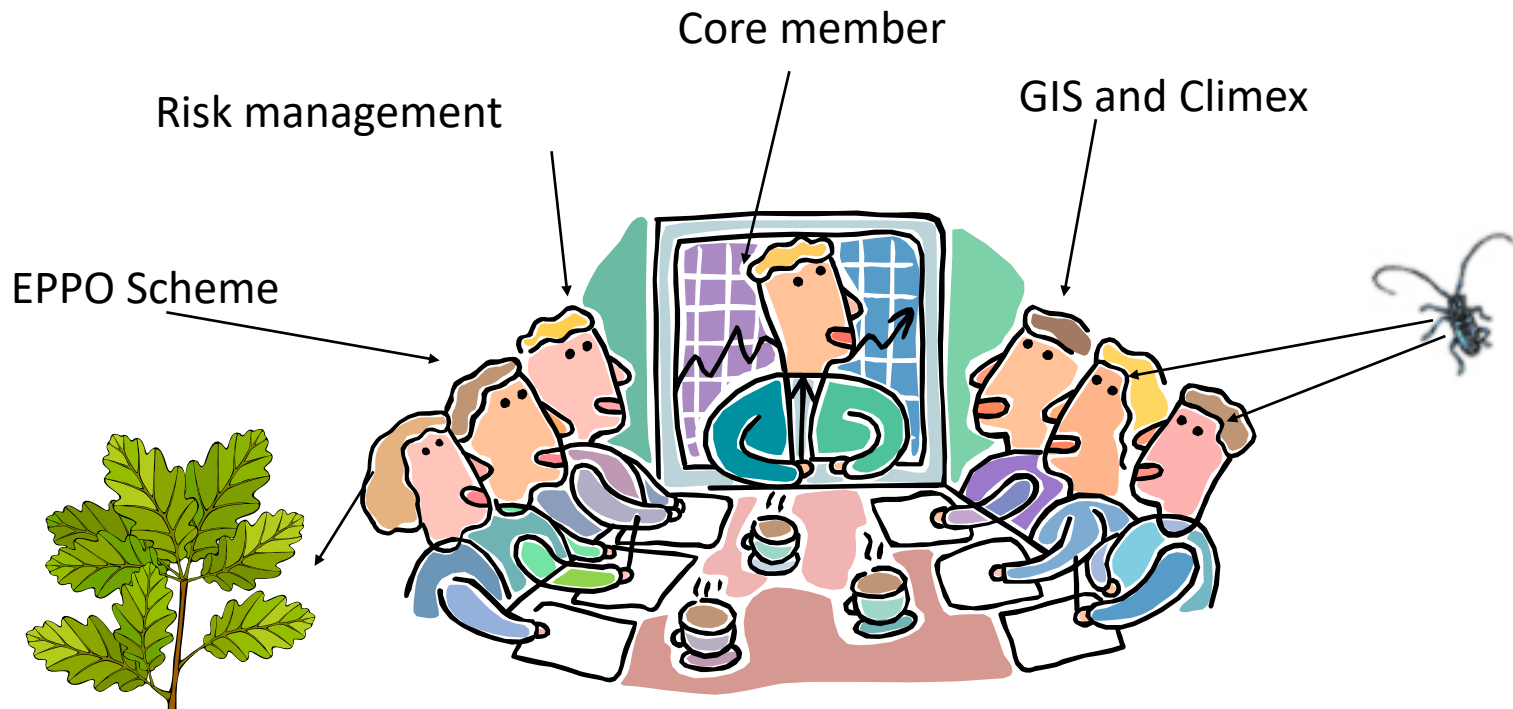
Working Party considered it was a priority for PRA (June 2014)



# PRA to be performed in an Expert Working Group

Usually 5 Expert Working Groups per year

Objectives:  
Perform risk assessment  
Identify the endangered area  
Identify risk management options



# Expert Working Group on *Heterobasidion irregulare* 2014-12-01/04

Call for experts sent to NPPOs and relevant EPPO Panels in August 2014 + contacts with specific experts.  
Experts selected in October 2014

## Group composition

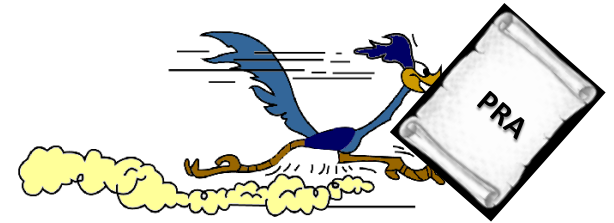
DOUANLA-MELI Clovis (Mr)	Mycologist, Germany
DUTECH Cyril (Mr)	Forest mycologist, France
GARBELOTTO Matteo (Mr)	Forest mycologist, USA (pest present there alerted EPPO )
GONTHIER Paolo (Mr)	Forest mycologist, Italy (researched on the Italian outbreak and alerted EPPO)
HIETALA Ari Mikko (Mr)	Forest mycologist, Norway
MATTHEW-BERRY Sharon (Ms)	Risk manager, United Kingdom
MONTECCHIO Lucio (Mr)	Member of the Panel on Quarantine pests for Forestry, Core member for PRAs, Italy (Forest mycologist)
STENLID Jan (Mr)	Forest mycologist, Sweden
GROUSSET Fabienne (Ms)	EPPO Secretariat

# DRAFT PRA preparation

- Draft PRA prepared using the EPPO Express PRA scheme (PM 5/5) by the EPPO Secretariat (Ms Grousset)

Draft circulated for comments to all members of the EWG end of October 2014 (comments by 20th of November)

Compiled comment version prepared and circulated in advance for discussion at the meeting



The Pest Risk Analysis for *Heterobasidion  
irregulare*

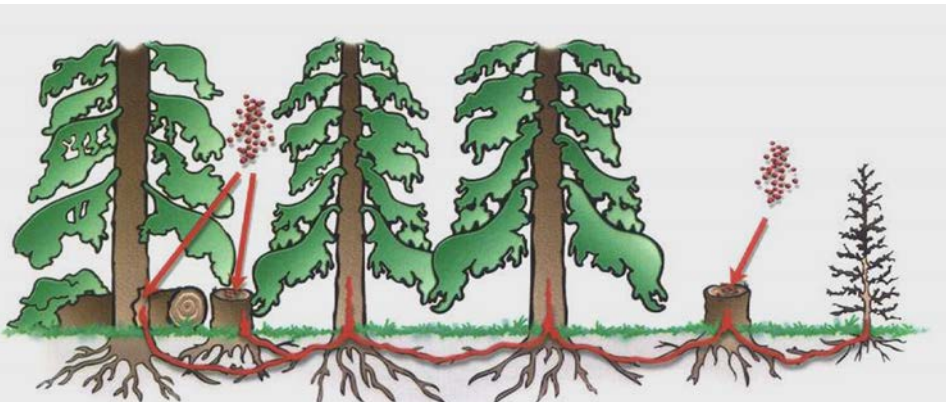
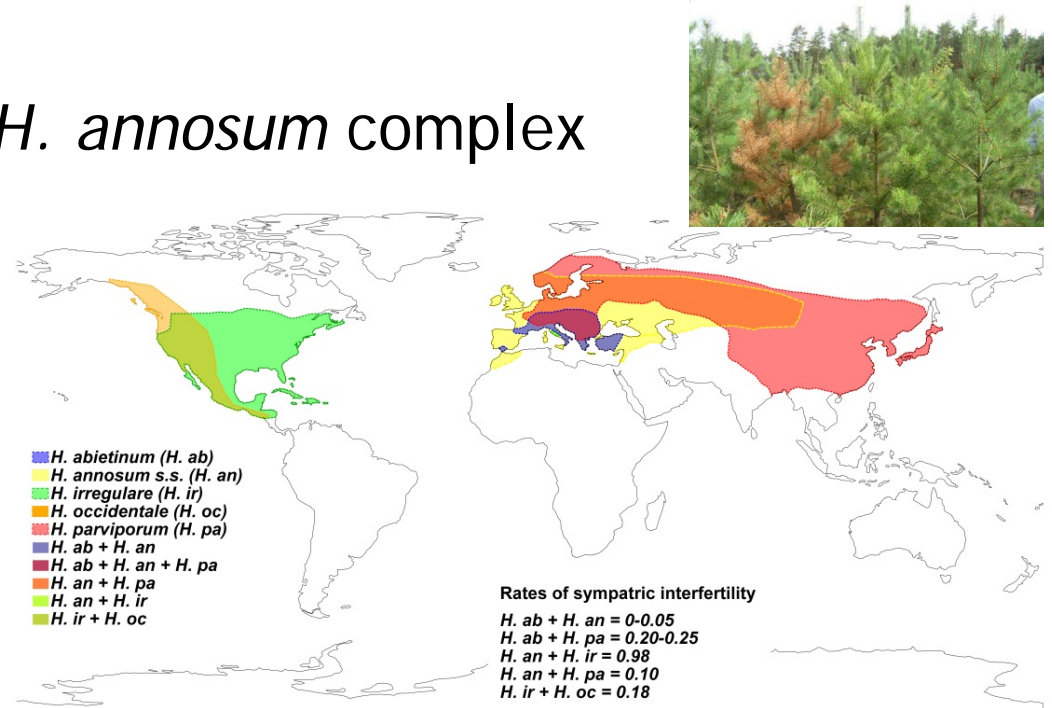




# Heterobasidion irregulare

- Fungi
- *H. irregulare* is part of *H. annosum* complex
- recently considered as distinct species

Infection through spores or mycelial spread



# *Heterobasidion irregulare*

- Host plants: Most important hosts are in the families Pinaceae and Cupressaceae, in particular the genera *Pinus* and *Juniperus*, and the species *Calocedrus decurrens*, but also other coniferous hosts (including *Abies balsamea*, *Pseudotsuga menziesii*).
- Also non-coniferous host (sporadic records)
- Symptoms: Root rot and butt rot. Mortality within a few years in species whose roots are extensively attacked.



# Symptoms and damages caused by *Heterobasidion* spp. From a presentation Paulo Gonthier (2014/12)





# *Heterobasidion irregulare*

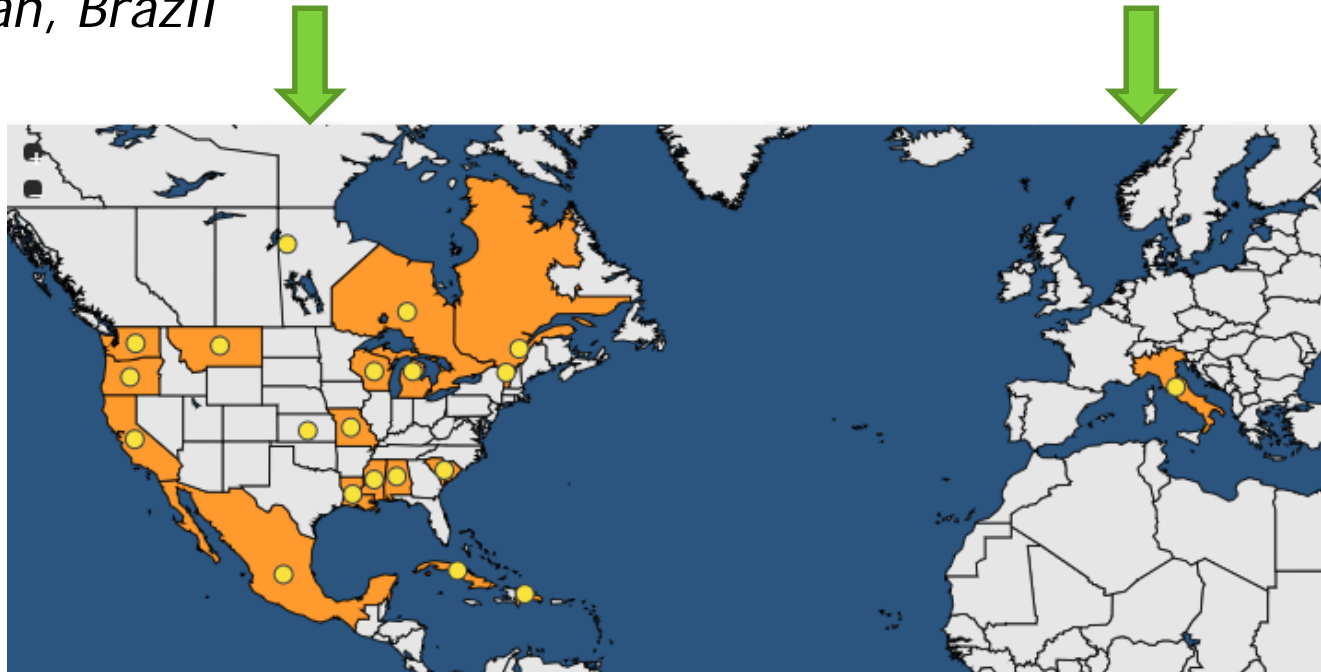
## ***Geographical distribution***

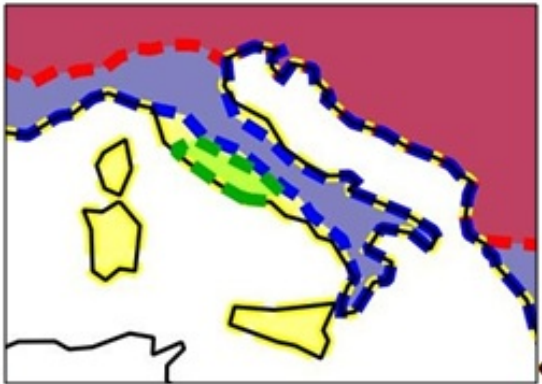
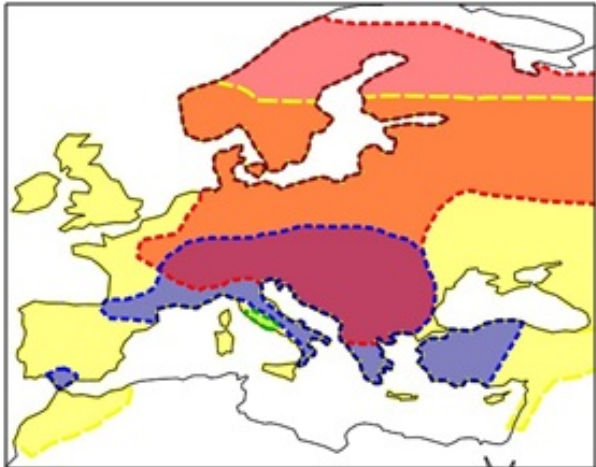
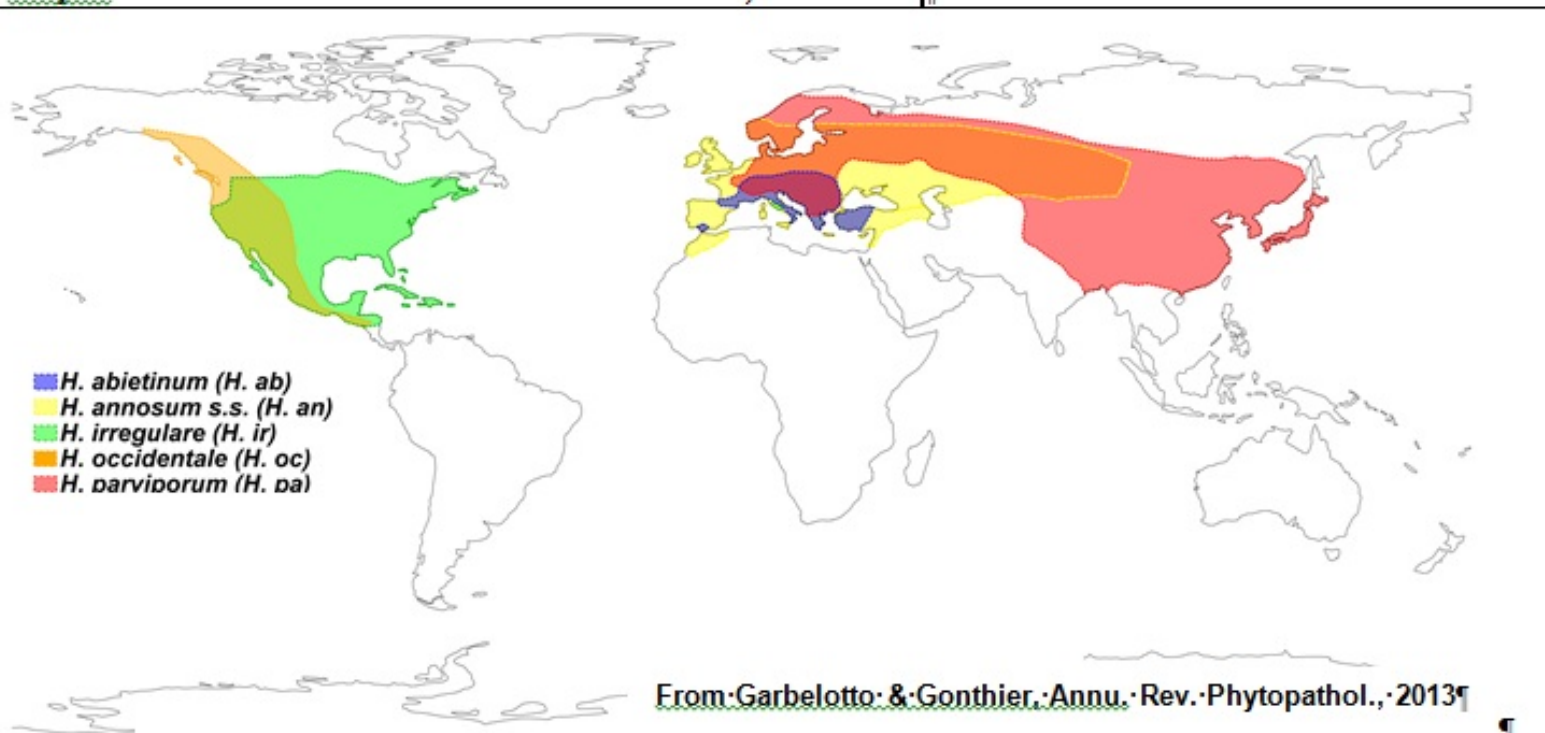
North America: Canada, Mexico, USA

Caribbean: Cuba, Dominican Republic

*Uncertainties for Central America, Caribbean, Brazil*

**EPPO region:**  
Central Italy (Lazio) –  
restricted distribution





# *Heterobasidion irregulare*: risk of entry

Pathway for entry in the EPPPO region and further spread were considered

## **Unusual pathway of introduction in the EPPPO region....**

However trade pathway exists

Main pathways considered

Natural spread from infested area in Italy (probability of entry moderate-high)

Untreated wood packaging material (probability of entry moderate-high) .

Wood of conifer host species (probability of entry moderate/low).

Plants for planting (probability of entry low risk, except for large ornamental trees)

# *Heterobasidion irregulare*

## ***Establishment:*** Probability high (low uncertainty)

- Probability of establishment: high with low uncertainty
- Potential to establish throughout the EPPO region where *Pinus* occurs, possibly up to the northern distribution border of *H. annosum* s.s. (62°N in Sweden).

## ***Impact:*** probability High (low uncertainty)

- Root and butt rots, tree mortality
- Affect quantity and quality of wood (staining)
- Decrease pine nuts production
- Environmental impact
- Social impact (amenity trees)
- Interaction/Hybridization with *H. annosum* s.s.?

# *Heterobasidion irregulare*

## *Competitive advantages over H. annosum s.s. include*

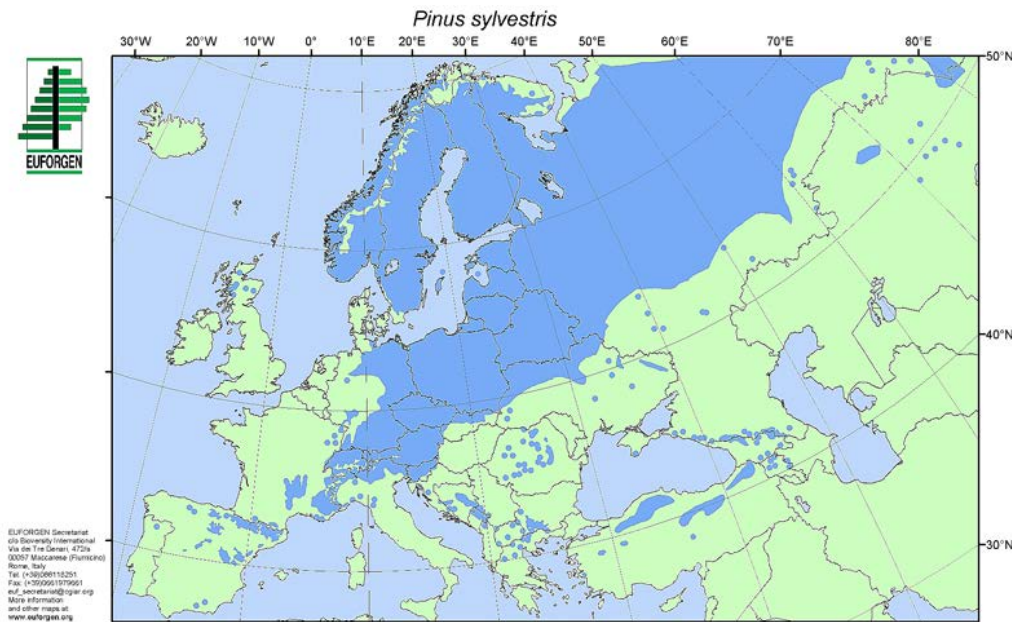
- Higher production of fruiting bodies.
- Higher production of basidiospores.
- Develops in both dry and wet forest stands.
- Basidiospore production occurs throughout the year
- Higher infectivity.
- Higher ability to saprophytically colonize wood leading to higher inoculum potential for secondary infection (5 time larger).



# *Heterobasidion irregulare*

## *Endangered area*

throughout the EPP0 region where *Pinus* occurs, possibly up to the northern distribution border of *H. annosum* s.s. (62°N in Sweden)



# *Heterobasidion irregulare*

## *Management*

- **Wood packaging material:**  
Treatment according to ISPM 15
- **Wood of conifers**
  - Pest-free Area
  - Treatment (heat - 56°C for 30 min)
- **Bark of conifers:** if needed similar to wood



# *Heterobasidion irregulare*

## *Management*

- **Plants for planting**
  - PFA
  - Grown under complete physical protection throughout their life + transported in condition preventing infestation
  - Systems approach (on the basis of bilateral agreement): Plants younger than 5 years + grown in pots in sterilized substrate + wounds should be avoided + at least 20 km from the closest infestation (or, if the proposed containment plan is applied, at least 10 km from the demarcated infested area) + intensive monitoring in the space between the nursery and the closest infestation
- *If needed*, similar measures may be taken for **Christmas trees of host species**

# *Heterobasidion irregulare*

## Management: requirements for a Pest-free Area

- PFA should be separated by 100km of the nearest infested area
- Based on:
  - surveillance for at least 3 years (monitoring with visual examination and spore trapping)
  - +
  - measures to prevent entry of the pest + prevention of infection during transport outside PFA.

PFA requirement only need to be applied to North America and Italy, the Caribbean, and possibly Central America, but not to countries from other continents where the pest is known not to occur.



**Distances for buffer zones have caused concern with risk managers and currently under review.**

# *Heterobasidion irregulare*

## Management: natural spread

- Containment programme
- Infested area (10 km beyond known infestations) + buffer zone (80 km)
  - Treatment of stump surfaces immediately after felling,
  - Thinning and felling operations when spore production is the lowest
  - Avoidance of logging injuries
  - Green logs and untreated wood of hosts must not be moved outside of the infested area
  - Sanitation
  - Monitoring



**Distances for buffer zones have caused concern with risk managers and currently under review.**

# *What about the process after the meeting?*

## Further stages after the EWG were

Further steps	timing
Email consultation of core members (group of experts reviewing each PRA prepared by EWG)	January 2015
Review by the Panels on Phytosanitary Measures and Quarantine Pests for Forestry	March 2015
Review of the PRA by the Working Party on Phytosanitary regulations (June 2015)	June 2015
Recommendation for regulation Executive Committee and Council	Yesterday!!



# Communication on PRA

PRA documents available on the EPPO website:

## PRAs conducted by EPPO Expert Working Groups

Since 2006, EPPO organizes meetings of Experts Working Groups which are conducting PRAs on specific pests following the EPPO Decision-support scheme and its computerized version CAPRA (see above). The conclusions resulting from these PRAs are addressed to the EPPO member countries only (the area potentially at risk that is considered during these PRAs is the EPPO region, not the other parts of the world).



### • Finalized PRAs

Pest	PRA Documents	Data sheets	Final decision
<b>Insects and mites</b>			
<i>Agrilus anxius</i>	PRA ( <a href="#">11-16987</a> ) - PRA rep ( <a href="#">11-16988</a> )	<a href="#">Final DS</a>	A1 - 2011
<i>Aulacaspis yasumatsui</i>	PRA ( <a href="#">08-14021</a> ) - PRA rep ( <a href="#">08-14022</a> )	-	Not added
<i>Bactericera cockerelli</i>	PRA ( <a href="#">12-17835</a> ) - PRA rep ( <a href="#">12-18190</a> )	Final DS (in prep)	A1 - 2012
<i>Bactrocera invadens</i>	PRA ( <a href="#">10-16103</a> ) - PRA rep ( <a href="#">10-16120</a> )	-	A1 - 2010
<i>Diocalandra frumenti</i>	PRA ( <a href="#">11-16940</a> ) - PRA rep ( <a href="#">11-16939</a> )	Draft DS ( <a href="#">10-15862</a> )	Not added
<i>Drosophila suzukii</i>	PRA ( <a href="#">11-17189</a> ) - PRA rep ( <a href="#">11-17190</a> )	-	A2 - 2011
<i>Epitrix</i> spp.	PRA ( <a href="#">11-17790</a> ) - PRA rep ( <a href="#">11-17791rev</a> )	-	A1/A2 - 2010
<i>Keiferia lycopersicella</i>	PRA ( <a href="#">12-17836</a> ) - PRA rep ( <a href="#">12-17837</a> )	Draft DS ( <a href="#">12-17589</a> )	A1 - 2012
<i>Megaplatypus mutatus</i>	PRA ( <a href="#">07-13322</a> ) - PRA rep ( <a href="#">07-13558</a> )	<a href="#">Final DS</a>	A2 - 2007
<i>Metamasius hemipterus</i>	PRA ( <a href="#">09-15223</a> ) - PRA rep ( <a href="#">09-15446</a> )	Draft DS ( <a href="#">09-15171</a> )	A1 - 2009
<i>Raoiella indica</i>	PRA ( <a href="#">08-14675</a> ) - PRA rep ( <a href="#">09-15197</a> )	-	Not added
<i>Saperda candida</i>	PRA ( <a href="#">11-16589</a> ) - PRA rep ( <a href="#">10-16044</a> )	-	A1 - 2010
<i>Tetranychus evansi</i>	PRA ( <a href="#">08-14559</a> ) - PRA rep ( <a href="#">08-14562</a> )	Draft DS ( <a href="#">07-13924</a> )	A2 - 2008
<b>Nematodes</b>			
<i>Bursaphelenchus xylophilus</i>	PRA ( <a href="#">09-15449</a> ) - PRA rep ( <a href="#">09-15450</a> )	<a href="#">Final DS</a>	A1 - transferred to A2 in 2010
<i>Meloidogyne enterolobii</i>	PRA ( <a href="#">10-16243</a> ) - PRA rep ( <a href="#">10-16246</a> )	-	A2 - 2010
<b>Fungi (and fungus-like)</b>			
<i>Phytophthora lateralis</i>	PRA ( <a href="#">06-12730</a> ) - PRA rep ( <a href="#">06-12731</a> )	<a href="#">Final DS</a>	A1 - transferred to A2

Datasheets  
Reports of PRA  
Collection of all  
existing PRAs  
Working documents

*EPPPO's achievements are based on collaboration between experts from our region but also from other parts of the world.*



*Thank you for your attention!*