REGIONAL PERSPECTIVE OF *«INVASIVE»* FUNGI IN FORESTS

Food and Agriculture Organization of the United Nations

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«Fiat Panis»
Let there be bread

Plant protection concept and legislations come from

an anthropocentric perspective
not to save plants, but to reduce production losses.


A taste of traditional Forestry


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Ash Dieback Fungus
Episode 5 of 5

Do not hide the obvious

Do we really care for and about our Forests health ?
We care for losses of productive species.

We care of Hazelnut when planted for nuts.
But we cut them when competing with Beech in a first-generation forest.

We go so far to suggest the spread of lethal, epidemic parasites to **"biocontrol" undesired species**!

1969. Forest Science journal, vol. 15, n.2

Ceratocystis fagacearum as a Cheap, Selective Silvicide !

Oak Wilt Fungus, Ceratocystis fagacearum, as a Selective Silvicide

BY
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Abstract. Inoculation with the oak-wilt fungus, *Ceratocystis fagacearum*, and treatment with chemical silvicides were compared as means of eradicating oak trees in central Minnesota from 1953 to 1967. Inoculation with the fungus resulted in 92 to 99 percent mortality at a cost per stem of $0.01–$0.02. Application of chemical silvicides resulted in less mortality at higher cost. The fungus spread to only three noninoculated trees outside of the 6.6 total acres (2.7 hectares) on which the trees were inoculated.

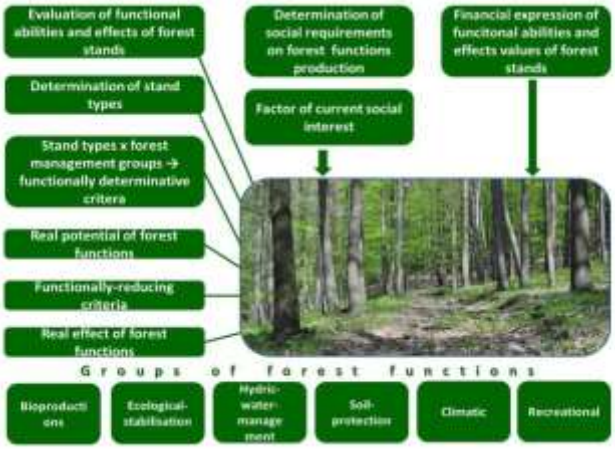
Additional key words. Biological control, oaks.

Plant quarantine as a measure against invasive alien species: the framework of the International Plant Protection Convention and the plant health regulations in the European Union

Gritta Schrader* & Jens-Georg Unger

(i) The fungus *Ceratocystis fagacearum* affects plants directly and is transmitted by insect vectors or directly from tree to tree by root grafts. It causes the North-American oak wilt. The fungus was first identified in 1944 and is thought by most scientists to be native to the eastern United States, but some plant pathologists discuss the theory that oak wilt is an exotic disease (McDonald et al. 1998; Kardyla et al. 1999). Introduced into North America, but *C. fagacearum* has never been reported from any country other than the United States (USDA Forest Service 1999). Introduced into Europe, it could cause a die back of European oak species, comparable to the Dutch elm die back (MacDonald et al. 1998). This would pose an immense threat to oaks and oak-dominated ecosystems. European phytosanitary measures against

Fortunately, common people know that
a Forest is not only a "timber machine"



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6-7 September 2016, Minsk, Belarus

From https://is.mendelu.cz/eknihovna/opory/zobraz_cast.pl?cast=73072

All living beings look for the best

Every existing species
(fungi to humans)
look for room and nutrients to survive, reproduce and spread.

http://ecologywithemily.weebly.com

https://en.wikipedia.org/wiki/Ecological_facilitation

High competition? Migration !

Colonization strategies are
similar in all animals
(fishes, birds, insects, humans)

But **fungi have no legs, nor wings**

They do not travel thousand kilometers in few days to invade and colonize our plants.

Import of cheap commodities is «invasive»
Fungi are not, they behave like pioneers in a new world

Trade is the main way of introduction of known and unknown pathogens

«Fiat lucrum»

Who pays ?

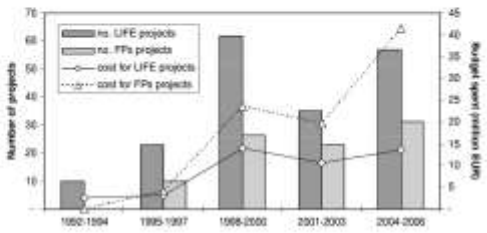
We pay !

ORIGINAL PAPER

How much is Europe spending on invasive alien species?

Riccardo Scalera

Fig. 1 Number of projects and budget spent by LIFE and the FPs over the years



Imported

~~Invasive~~ species !

Import

of parasitic species known to be lacking or spotty present and highly dangerous

is unlegal

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

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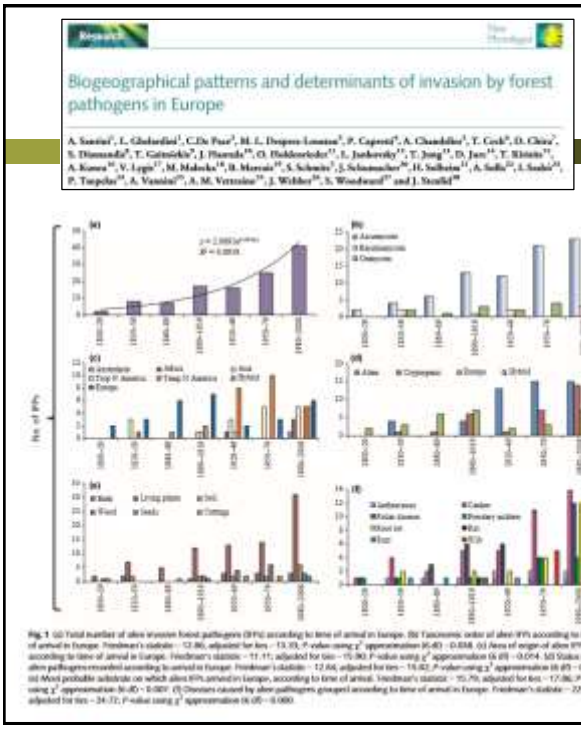
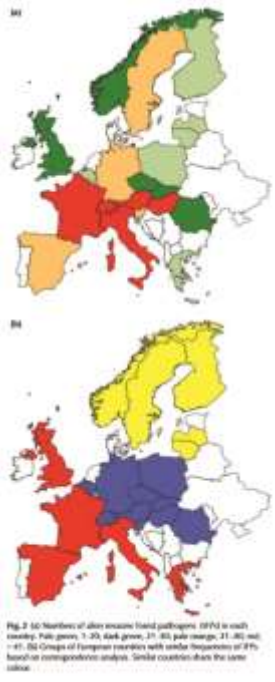
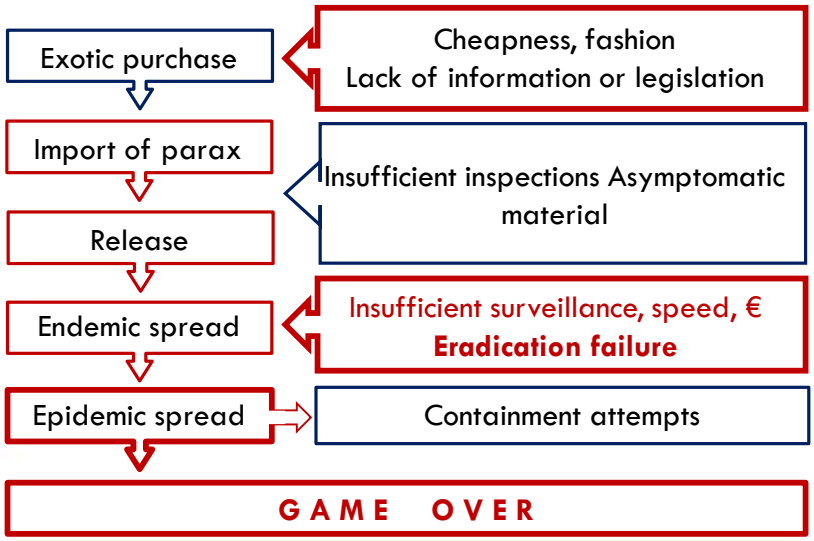


Biogeographical patterns and determinants of invasion by forest pathogens in Europe



Events and Failures



Can we avoid introduction of known and unknown plant pathogens?

"Phasing out of all trade in plants and plant products determined to be of high risk to forested ecosystems"

The IUFRO Montesclaros declaration (May 2011)

Quite difficult to stop a trade officially

Unknown parasites

What about the dozens unknown species regularly imported and **then reported as pathogens** ?

This shoe is mine, back from holidays in a foreign Country in August 2016. I cannot exclude it's contaminated.

In theory Eradication measures could work but ….

N O O N E

of the Quarantine Forest Pathogens

was 100% eradicated

in the whole UE.

A quintessential example: ***Cryphonectria parasitica***

1904: 1st report in the US (through Japanese nursery stocks?)

Main reason for the **USA "Quarantine Act" (1912)**

Reported in Europe in 1947, likely present since 1938

EPPO A2 List (1975), **Quarantine status in the EU (1992, 17 yrs later).**

Still spreading (UK, 2011).

http://www.cabi.org/isc/datasheet/21108

Ceratocystis platani

From the US through WPM

Reported in Europe in 1972, likely present since 1945 ca.

EPPO A2 1978; **Quarantine status in the EU (1992, 14 yrs later)**

Still spreading (2015 new outbreaks in France).

http://www.cabi.org/isc/datasheet/12143

Phytophthora ramorum

From Asia (?) through Plants for planting
First report in Europe 2002 (UK)
Forest tree hosts: *Larix, Quercus, Fagus, Castanea, Aesculus, Pseudotsuga, Picea, ….*
EPPO A2 List (2013), EU «Emergency measures», no Quarantine jet.
Still spreading (Germany, 2015).

The above images were from: http://www.aphis.usda.gov/hungrypests/cons/SOD200.jpg, http://www.arbortech1.com/images/sudden_oak_death3.jpg and http://www.jgi.doe.gov/News/news_8_31_06.html, respectively.

http://www.cabi.org/isc/datasheet/40991

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Hymenoschiphus pseudoalbidus

From Cina (?) through nursery stocks (?).
Reported in Europe in 2007 (Poland, Lithuania, … ?)
EPPO A2 List (2007, deleted in 2014), no **Quarantine status in the EU.**
Still spreading.

http://www.cabi.org/isc/datasheet/108083

Geosmithia morbida

From the US (?) with its vector, likely through logs
Reported in Europe in 2014.
Quarantine status in the US.
Still importing walnut logs from the US with no restrictions.
EPPO A2 List (2015), no **Quarantine status in the EU.**
Still spreading.

Phytopathologia Mediterranea (2015) 54, 3, 469–478
DOI: 10.14601/Phytopathol_Mediterr-16276

RESEARCH PAPERS

Vegetative incompatibility and potential involvement of a mycovirus in the Italian population of *Geosmithia morbida*

Luisa MONTECCHIO, Gianni FANCHIN, Vivana BERTON and Laura SCATTOLIN

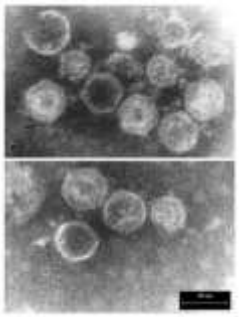

Figure 1: Icosahedral virus-like particles with diameters of approximately 28 nm and observed only in MI samples.

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What can we do, realistically?

We can <u>decrease the probability</u> of introduction and spread

Step By Step

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A science-based approach

Known parasites must be **studied before their arrival**, according to climatic and environmental features, looking for vulnerabilities (i.e. PRAs; Forecasting models).

Early warning and detection through multi-level surveillance

also at Citizen level, and through Social media.

Inspectors with the right toolbox
(information, training, labs, resources).

Quick response at supranational level

1. «Ready to move» according to common **Contingency plans**.
2. **Financial resources available in advance** and untill the post-eradication surveys.
3. **No overlaps** in responsabilities.

Technical support and prompt Legislation

International Plant Protection Convention
Protecting the world's plant resources from pests

efsa
European Food Safety Authority

PLANTS
Plant health and biosecurity

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Quick, Easy and Cheap Containment measures






Gibberella circinata, Spain, 2006.

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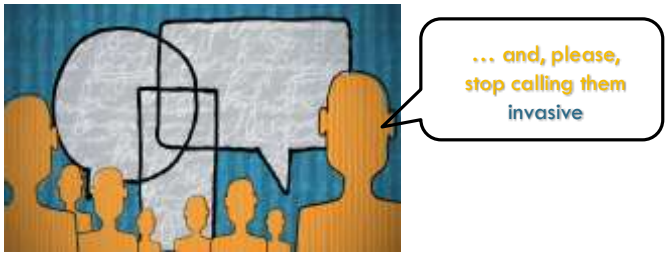
Compensations

Owners are the best stewards of «our» trees

A collective responsability

Knowledge, Communication, Efficiency are prioritary keywords



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