



REGIONAL PERSPECTIVE OF «*INVASIVE*» FUNGI IN FORESTS



Lucio Montecchio, University of Padova, Italy

«*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.





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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.



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



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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
D. W. FRENCH
D. B. SCHROEDER

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 acre of \$0.01-\$0.05. Application of chemical silvicides resulted in less mortality at higher cost. The fungus spread to only three uninoculated trees outside of the 6.6 total acres (2.7 hectares) on which the trees were inoculated.

Additional key words. Biological control, oaks.

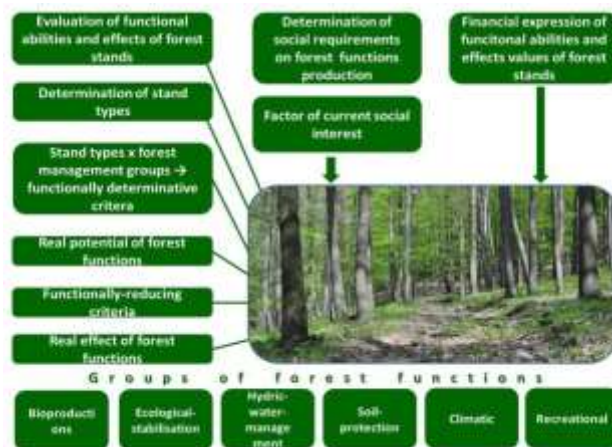
Biological Services B. 107, 204, 2045
© 2014 Elsevier Academic Publishers. Printed in the Netherlands

**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**

Gertra Schuster* & Jens Georg Unger

05 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 dispute the theory that oak wilt is an exotic disease (McIlwain et al., 1998; Kariyala et al., 1995). 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., 1996). This would pose an immense threat to oak 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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From https://is.mendelu.cz/teknichovna/opory/zobraz_cast.pf?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)



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OPINION

AUGUST 30, 2016

HUMAN OVERPOPULATION: HAVE WE BECOME AN INVASIVE SPECIES?

RENO BERKELEY

THE FOLLOWING ARTICLE IS ENTIRELY THE OPINION OF RENO BERKELEY AND DOES NOT REFLECT THE VIEWS OF THE INQUISITR.

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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 ?



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We pay !

Red Cross (2016-12/15-17)

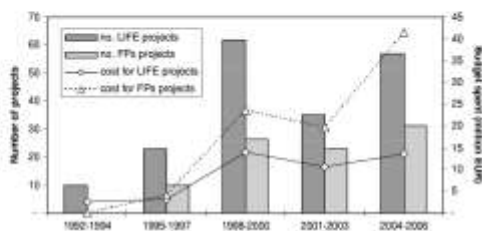
www.redcross.org.uk

ORIGINAL PAPER

How much is Europe spending on invasive alien species?

Richard S. Sutherland

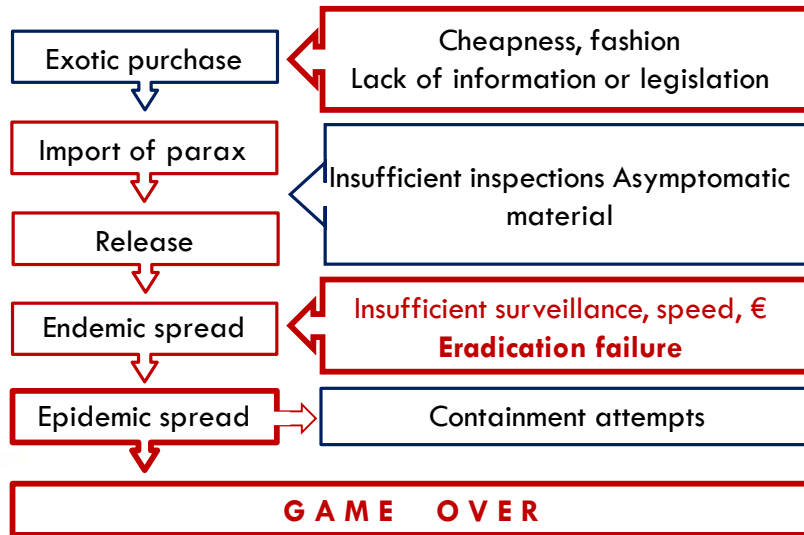
Fig. 1 Number of projects and budget spent by LIFE and the IPAs over the years



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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



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Unknown parasites

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



**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).



<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.

Phytopathology Mediterranean CTR1154, 1-400-478
DOE 11.144EL/Phytopathol_Mediterr-16276

RESEARCH PAPER

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

Luigi MONTESCHIO¹, Geon TRANCHIEP², Valeria BERTON³ and Lavin SCATTOLINI⁴



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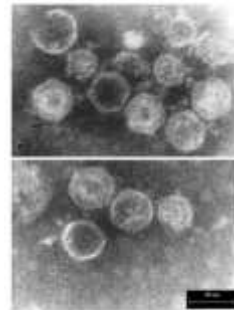


Figure 7. Knocked-out virus-like particles with diameters of approximately 20 nm and observed only in 5D samples.

What can we do, realistically?

**We can decrease the
probability 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).



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Early warning and detection through multi-level surveillance

also at Citizen level, and through Social media.



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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 until the post-eradication surveys.
3. **No overlaps** in responsibilities.

Technical support and prompt Legislation



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



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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



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A collective responsibility

Knowledge, Communication, Efficiency
are priority keywords



... and, please,
stop calling them
invasive

www.gradjanske.org



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