

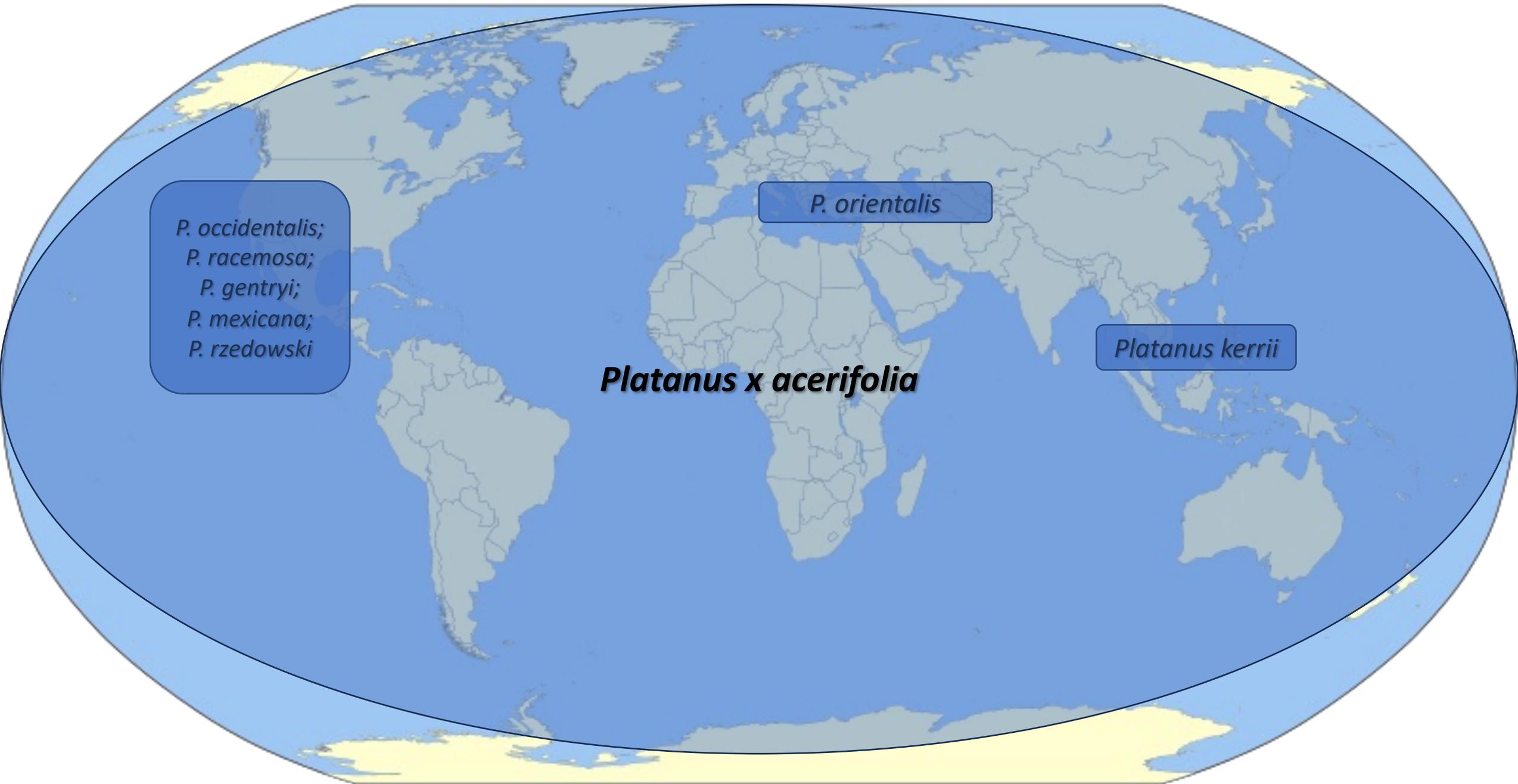


Canker stain of Plane tree: an increasing threat to urban and natural forests in the Mediterranean Basin (and not only!!!!)



Istituto per la Protezione Sostenibile delle Piante
Consiglio Nazionale delle Ricerche





P. occidentalis;
P. racemosa;
P. gentryi;
P. mexicana;
P. rzedowski

P. orientalis

Platanus kerrii

Platanus x acerifolia

Plane trees, a major component of urban forests in many cities all over Europe

The oriental plane (*Platanus orientalis*)

- Native to southeastern Europe and Middle East
- Planted in gardens and cities during Egyptian, Greek and Roman antiquity
- Widely planted as an urban tree in its native range



The London plane (*Platanus ×hispanica*, syn. *P. ×acerifolia*)

- Interspecific natural hybrid of the oriental plane and the American sycamore (*Platanus occidentalis*) (born in 1700s)
- Natural hybridization of the parental species during the 17th century
- Popularized during the 18th century and extensively planted in many cities, along roads and canals in Europe
- 40% of urban trees in Paris and more than 50% in London

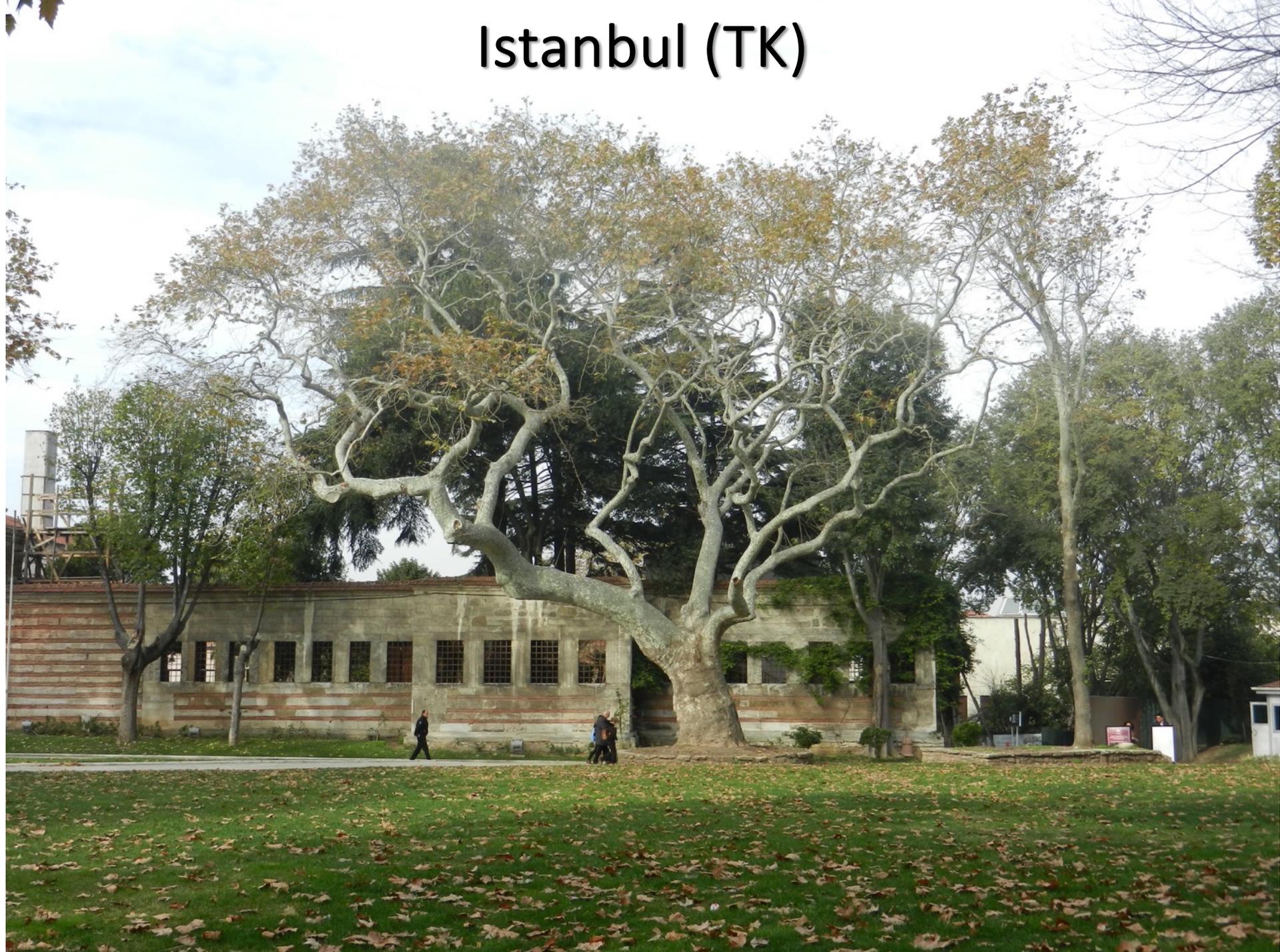


Plane trees, a major component of urban forests in many cities all over the world

- Large trees, reaching 30-50 m tall, and 3 m in trunk circumference
- Very long-lived (up to 2000 years)
- Particularly appreciated as urban trees
- Resistant to damage from pruning, air pollution, and compacted soil
- 3 out of the 14 outstanding trees selected for the “European Tree of the Year 2021” contest were plane trees
- Including a 1000-year-old oriental plane tree from southern Italy

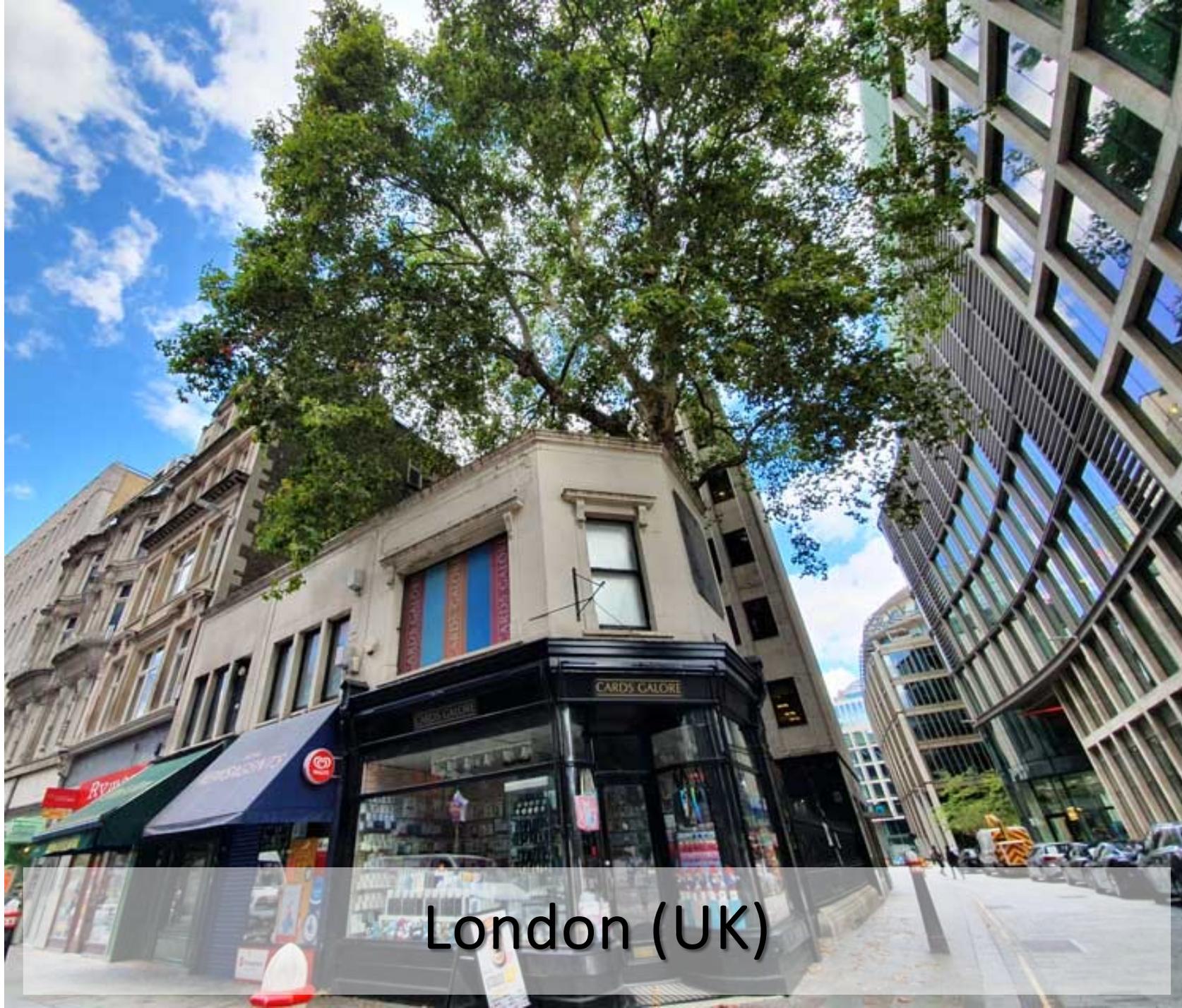


Istanbul (TK)



Malmö (SE)





London (UK)

Canal du Midi (FR)





Pietermaritzburg (ZA)



Sidney (AU)



Seoul (ROK)

Pyongyang (DVR)



Qingdao (PRC)





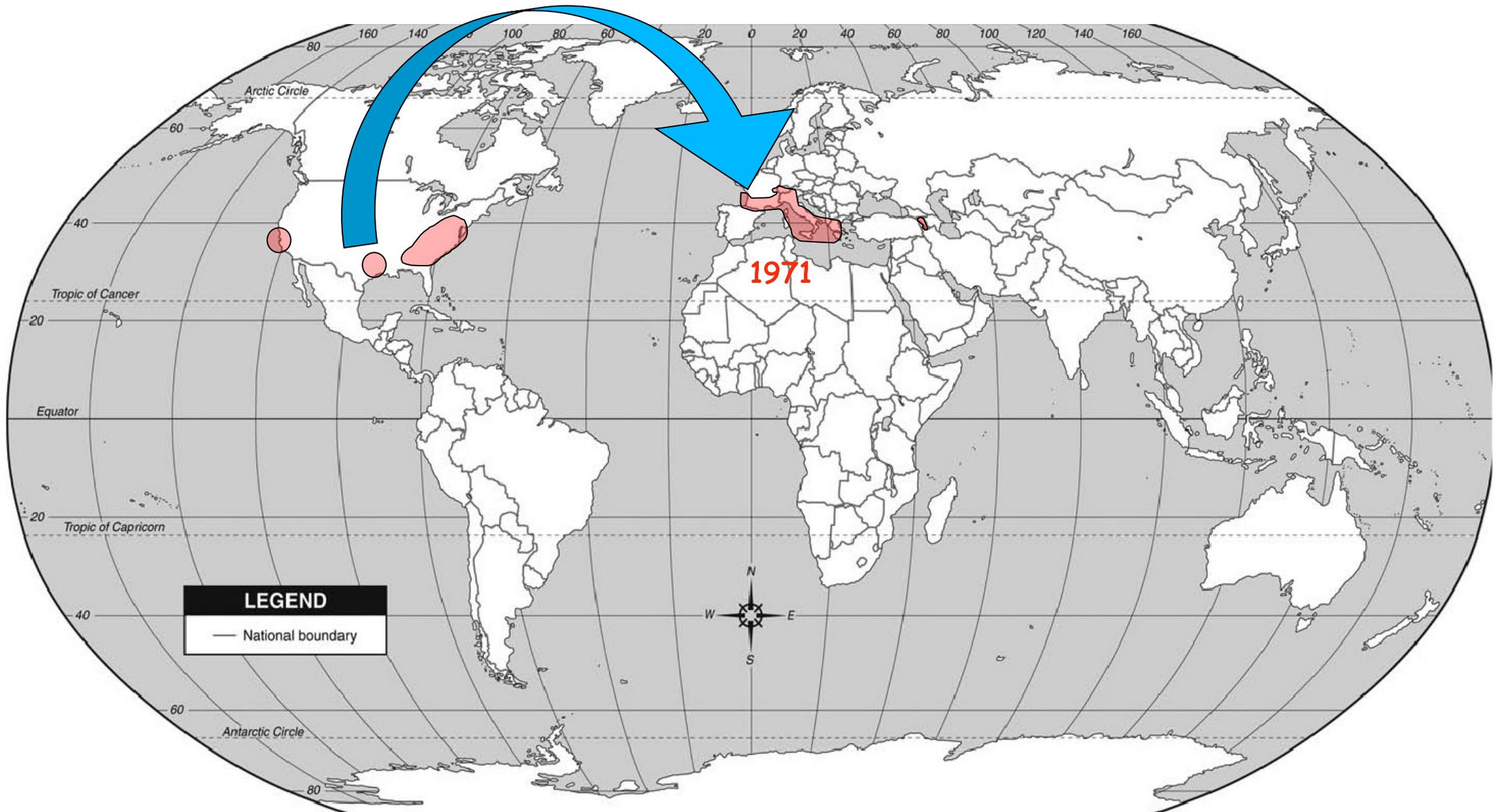
Axel Erlandson



Canker stain disease of Plane tree

- Caused by the ascomycete fungus *Ceratocystis platani*
- Pathogen is native to North America
- American sycamore: fairly resistant (co-evolution)
- Oriental and London plane: very susceptible
- Usually fatal (1-5 years after infection)
- Accidentally introduced by the US army in Italy and France on infected plane wood packaging during WWII
- Clonal spread all over Italy, SE-France and Switzerland
- Recent spread to Greece, Albania and Turkey
- Dispersal: contaminated pruning tools, road construction machinery, rivers (running water)
- Quarantine pathogen -> stringent and costly eradication measures are implemented

Ceratocystis platani (J.M. Walter) Engelbr. & T.C. Harr. 2005



Spread in Europe



Spread (report)
of *C. platani* in
Italy since its
first report

1972



1973



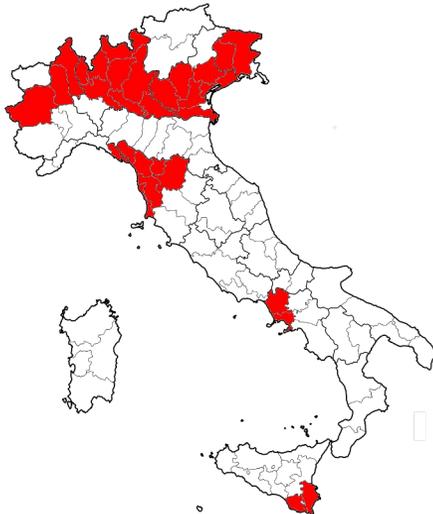
1978



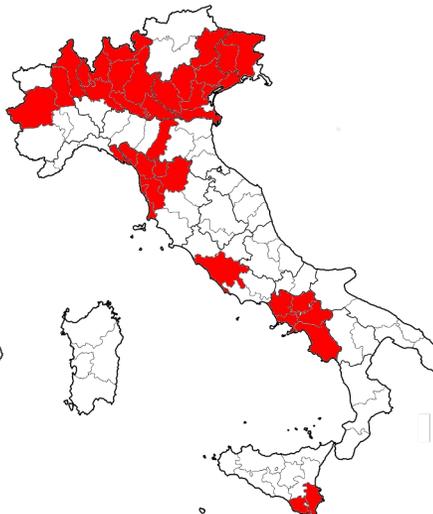
1983



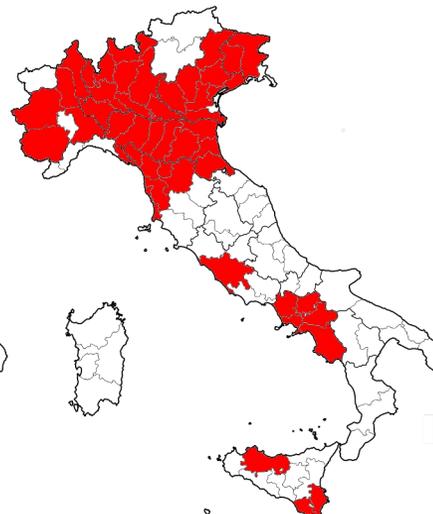
1988



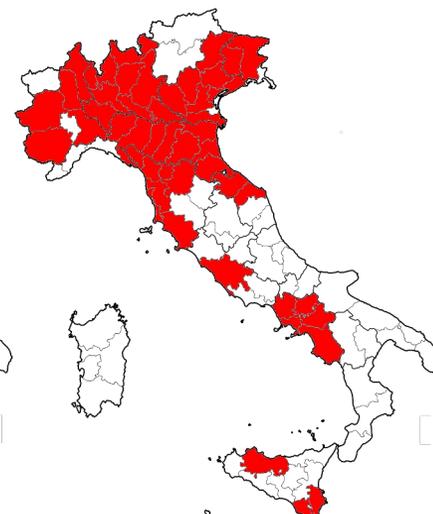
1993



1998



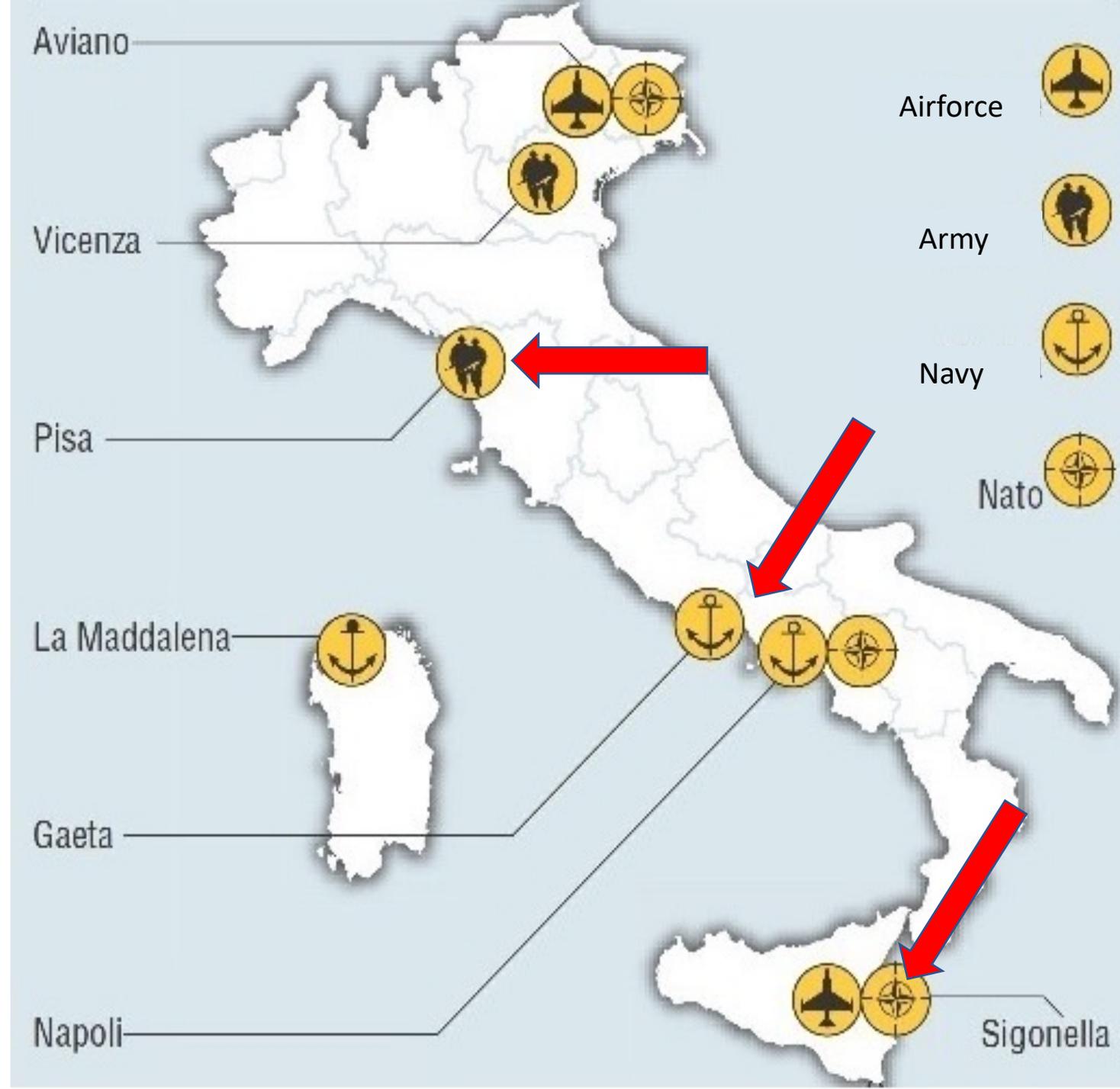
2003



2022



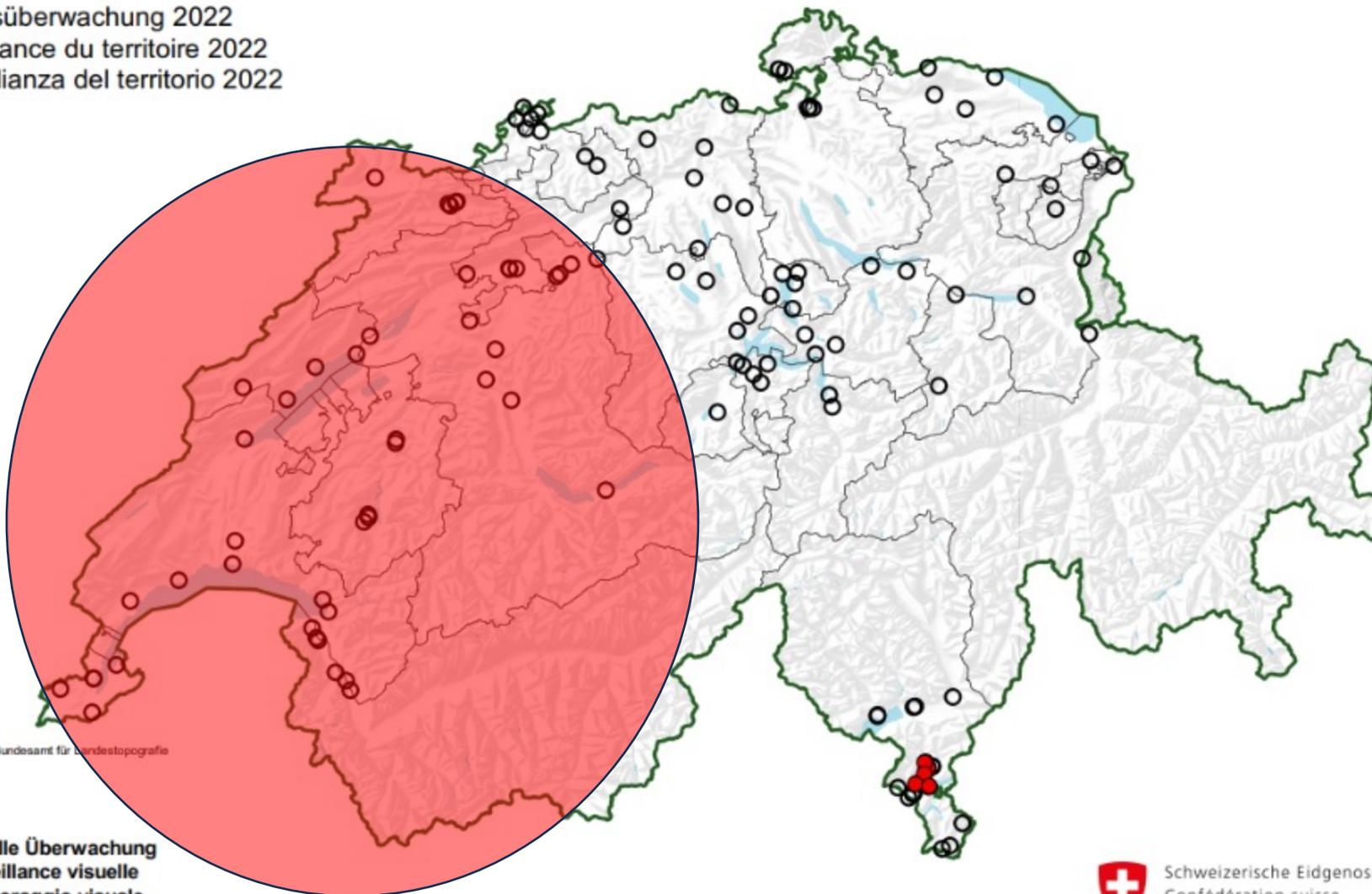
USA and NATO bases in Italy



Ceratocystis platani

16.11.2022, wejn

Gebietsüberwachung 2022
Surveillance du territoire 2022
Sorveglianza del territorio 2022



Quelle: Bundesamt für Landestopografie

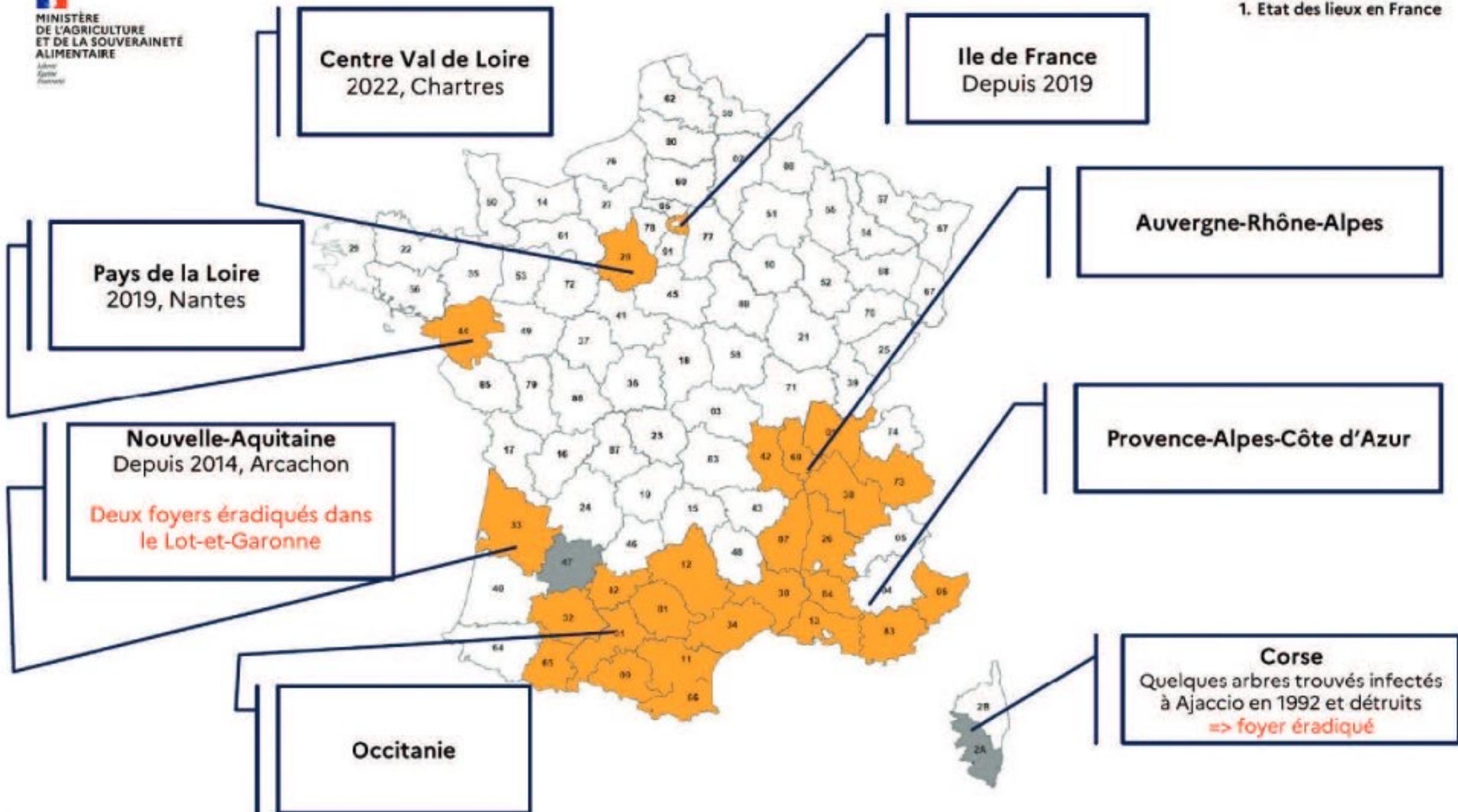
Visuelle Überwachung
Surveillance visuelle
Monitoraggio visuale

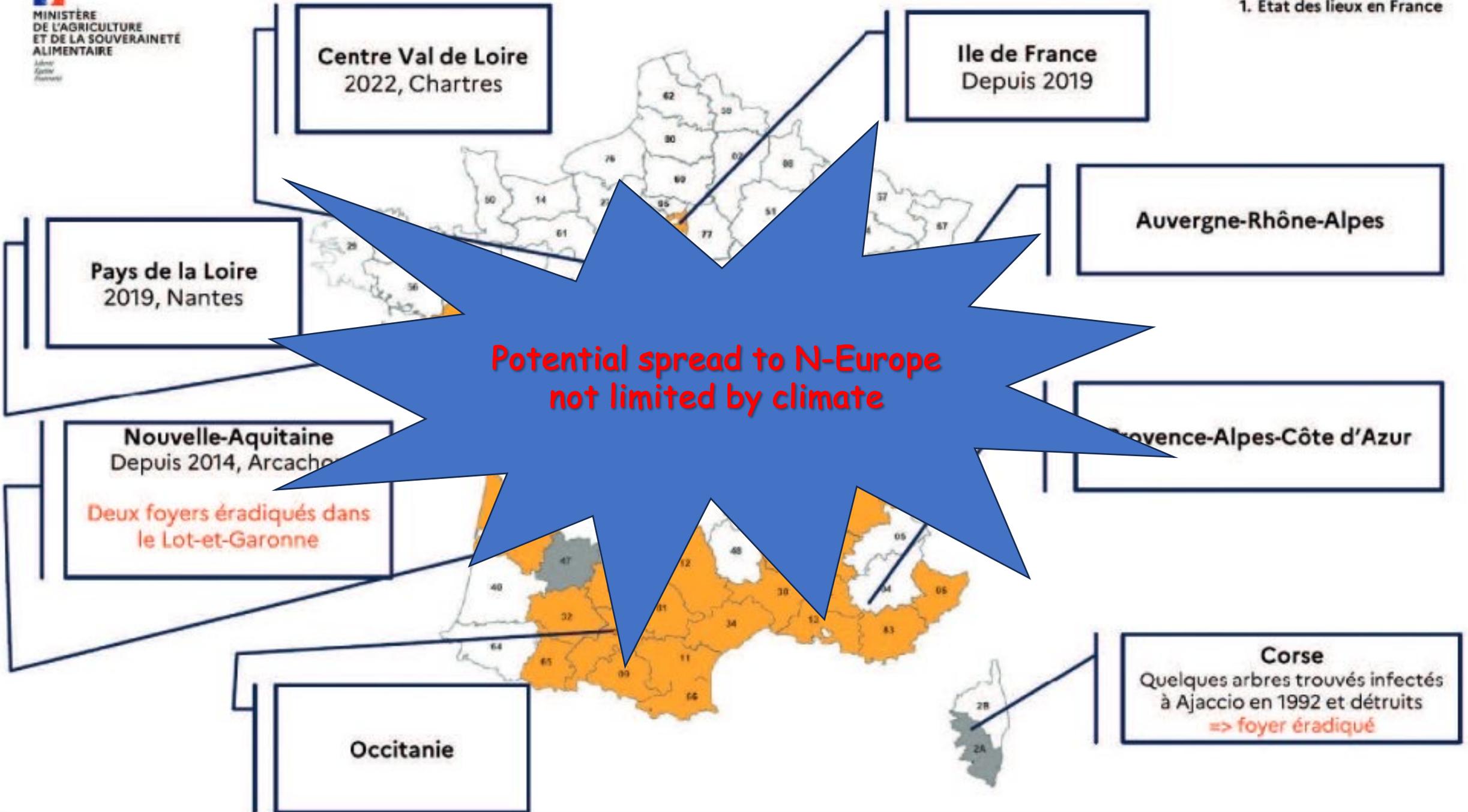
- Verdachtsprobe positiv / Échantillon suspect positif / Campione sospetto positivo
- Verdachtsprobe negativ oder kein Verdacht / Échantillon suspect négatif ou pas de suspicion / Campione sospetto negativo o nessun sospetto

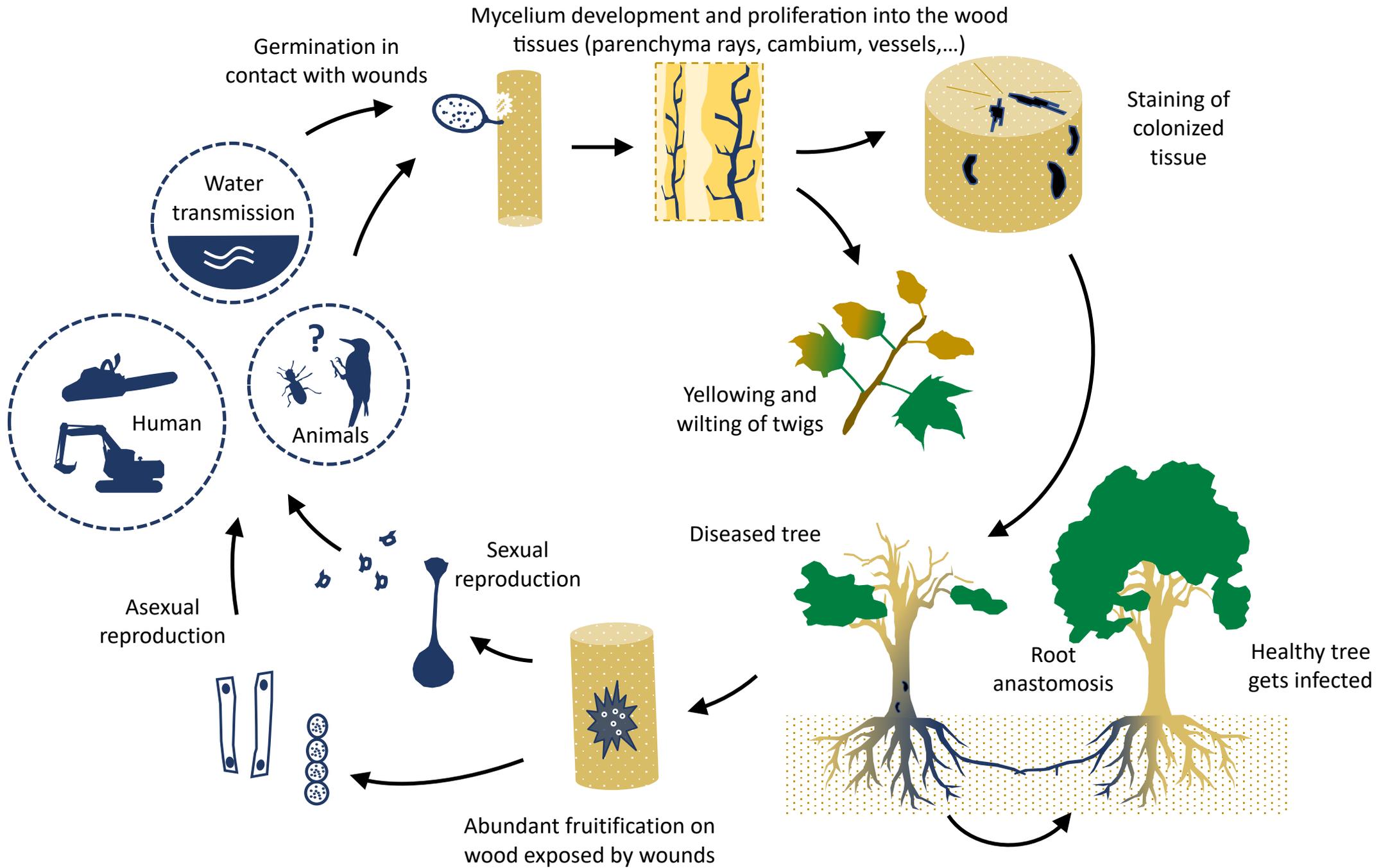


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Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Eidgenössisches Departement für
Wirtschaft, Bildung und Forschung WBF
Agroscope







May



September









What can we do

- **A plane cultivar resistant to canker stain is available...**
- INRAE breeding program 1990-2000
- 960 *P. occidentalis* x *P. orientalis* hybrids screened
- One clone with quantitative resistance: 'Platanor'
- ~ 10,000 trees have been planted in southern France and Italy
- Rare cases (0.3%) of canker stain symptoms and mortality were reported
- Replanting of 'Platanor' in soil heavily contaminated by *C. platani* following the uprooting of dead plane trees is not recommended



What can we do

- ~~A plane cultivar resistant to canker stain is available...~~

- INRAE bre

- 960 *P. occ*

- One clone

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and Italy

- Rare case
mortality

- Replantin

C. platani following the uprooting of dead plane trees is not recommended

'Platanor' is not considered anymore resistant and its use is NOT RECCOMENDED ANSES 2018-SA-0069



What can we do, then?

Prevention, prevention, prevention

Early detection at ports of entry.

HOW?

- qPCR (Luchi et al., 2013 Appl. Environ. Microbiol. 2013, 79(17):5394)
- LAMP (Aglietti et al., 2019 AMB Expr (2019) 9:50)
- MVOCs (Brilli et al., 2020 Forest Path. 2020;50:e12618)

Thank you!



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