

Estimating the economic, social and environmental impacts of EU priority pests: a joint EFSA and JRC project with a focus on *Xylella fastidiosa*

2nd European conference on Xylella fastidiosa 29th– 30th Oct 2019



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How to establish EU wide priorities when resources are limited?

L 260/8

EN

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11.10.2019

COMMISSION DELEGATED REGULATION (EU) 2019/1702

of 1 August 2019

supplementing Regulation (EU) 2016/2031 of the European Parliament and of the Council by establishing the list of priority pests

Under the new Plant Health Law (applicable from 14 December 2019), 20 quarantine pests, including [Xylella](#), have been listed as **“priority pests”**

...based on their most severe **economic, environmental and social impacts** for the Union territory

JRC & EFSA: integrating economics & pathology



European Commission

JRC TECHNICAL REPORTS

The Impact Indicator for Priority Pests (I2P2): a tool for ranking pests according to Regulation (EU) No 2016/2031

Sánchez, Berta
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2019

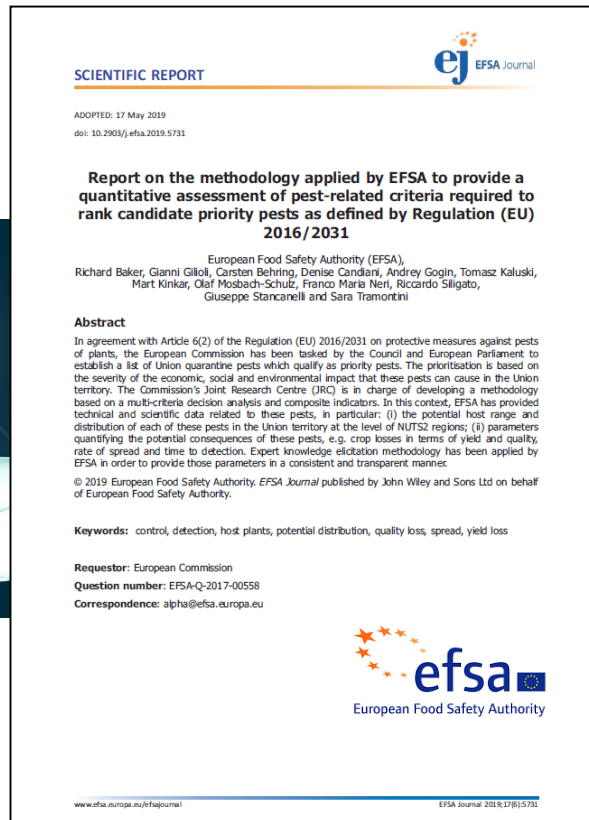
Joint Research Centre

EUR 29793 EN



European Commission
Directorate-General for Health and Food Safety (DG SANTE)

A joint methodology on Priority Pests



EFSA Journal

SCIENTIFIC REPORT

ADOPTED: 17 May 2019
doi: 10.2903/j.efsa.2019.5731

Report on the methodology applied by EFSA to provide a quantitative assessment of pest-related criteria required to rank candidate priority pests as defined by Regulation (EU) 2016/2031

European Food Safety Authority (EFSA),
Richard Baker, Gianni Gillio, Carsten Behring, Denise Candiani, Andrey Gogin, Tomasz Kaluski,
Mart Kinkar, Olaf Mosbach-Schulz, Franco Maria Neri, Riccardo Silligato,
Giuseppe Stancanelli and Sara Tramontini

Abstract

In agreement with Article 6(2) of the Regulation (EU) 2016/2031 on protective measures against pests of plants, the European Commission has been tasked by the Council and European Parliament to establish a list of Union quarantine pests which qualify as priority pests. The prioritisation is based on the severity of the economic, social and environmental impact that these pests can cause in the Union territory. The Commission's Joint Research Centre (JRC) is in charge of developing a methodology based on a multi-criteria decision analysis and composite indicators. In this context, EFSA has provided technical and scientific data related to these pests, in particular: (i) the potential host range and distribution of each of these pests in the Union territory at the level of NUTS2 regions; (ii) parameters quantifying the potential consequences of these pests, e.g. crop losses in terms of yield and quality, rate of spread and time to detection. Expert knowledge elicitation methodology has been applied by EFSA in order to provide those parameters in a consistent and transparent manner.

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Keywords: control, detection, host plants, potential distribution, quality loss, spread, yield loss

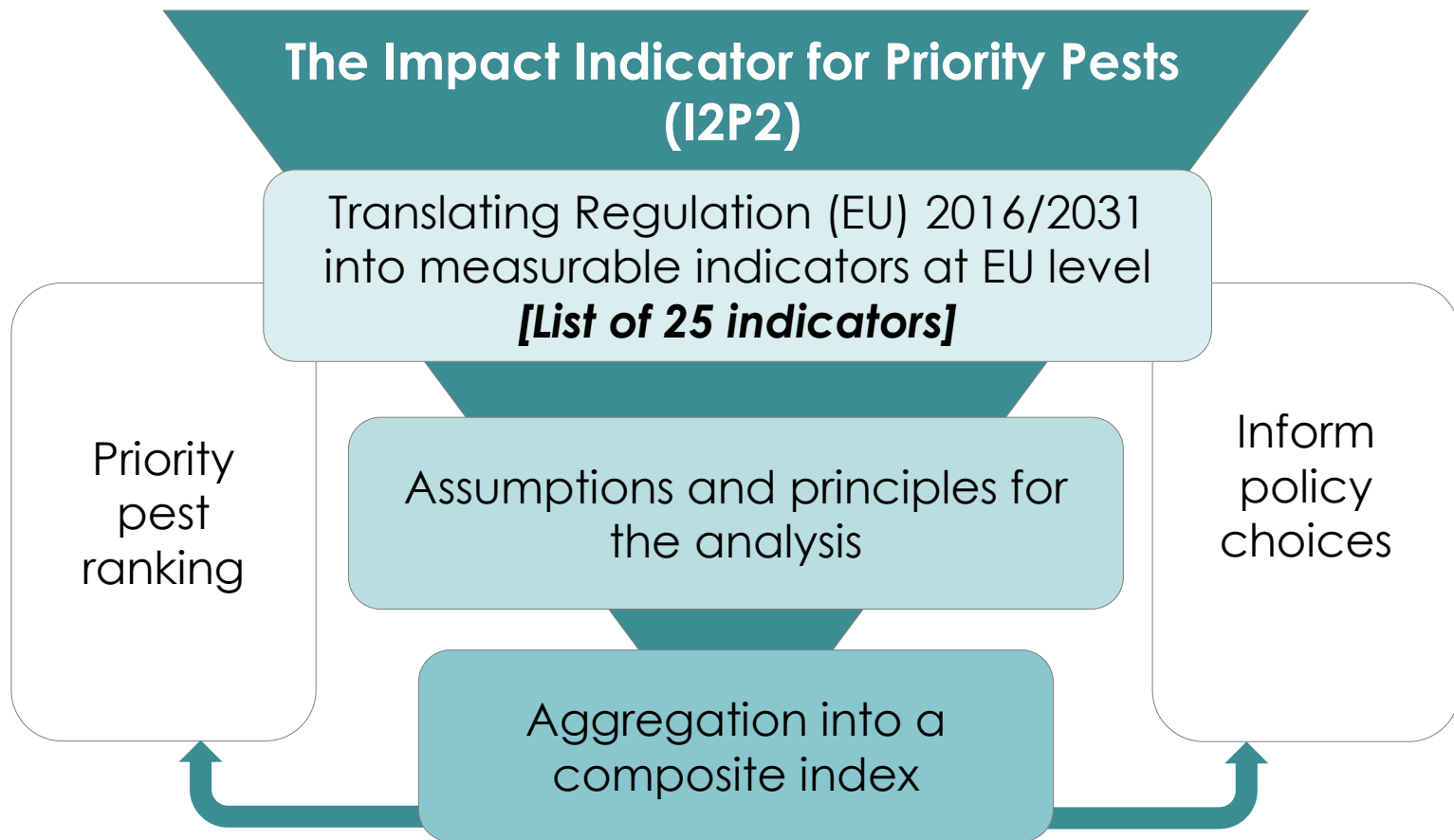
Requestor: European Commission
Question number: EFSA-Q-2017-00558
Correspondence: alpha@efsa.europa.eu

efsa
European Food Safety Authority

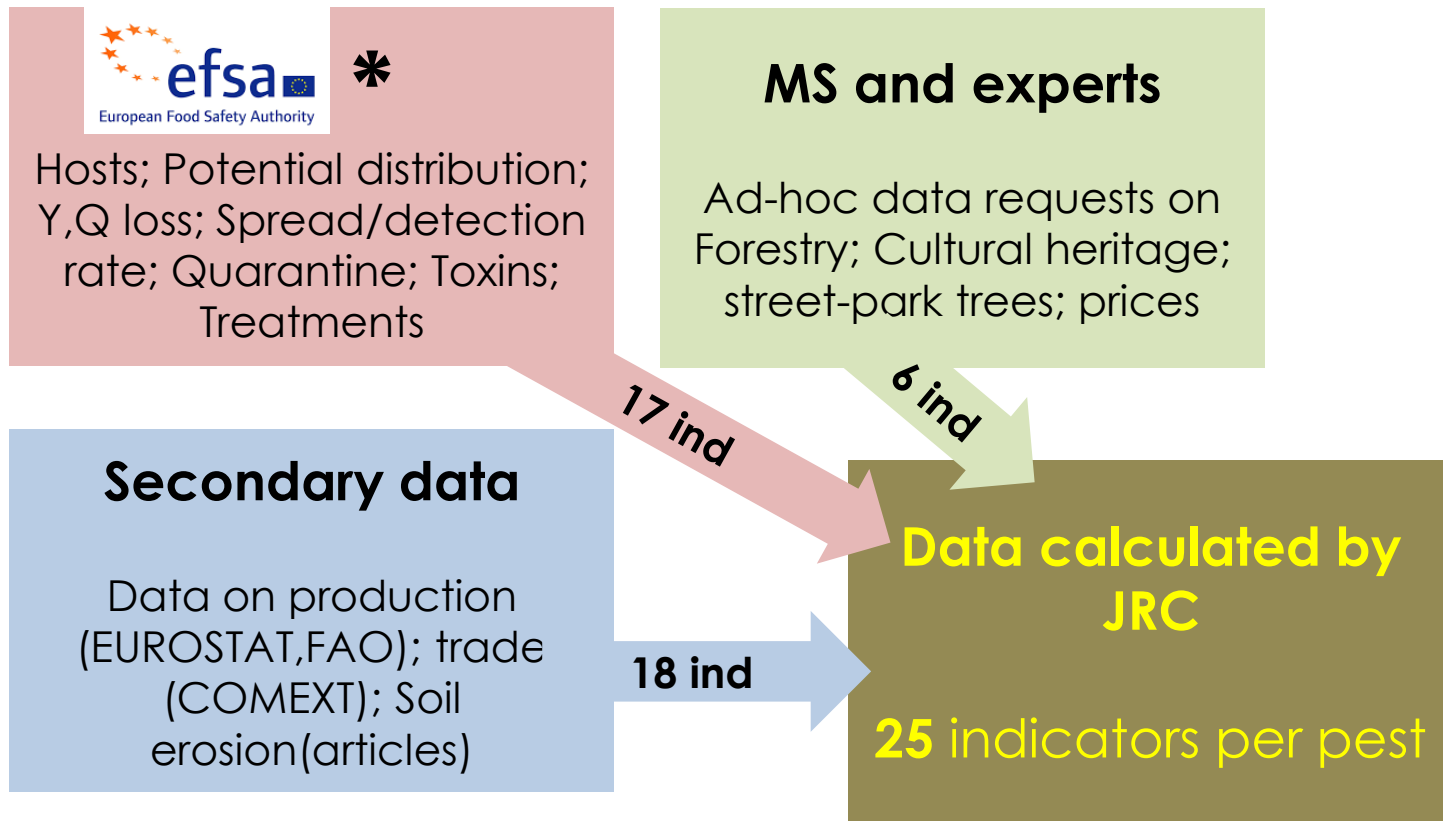
www.efsa.europa.eu/efsajournal EFSA Journal 2019;17(6):5731

How to rank pests based on economic, social and environmental impacts?

Composite indicators including multiple criteria



Different data sources for different indicators



*Max spread scenario - current environmental conditions & production practices, time frame long enough to set temporal variation

3 Domains

10 Sub-domains

25 Indicators

Economic

4

Production

Trade

Price

Other sectors

3 indicators

4 indicators

2 indicators

2 indicators

11

Social

3

Employment

Food Security and
Food Safety

Recreation and
landscape heritage

1 indicator

4 indicators

3 indicators

8

Environmental

3

Street trees and
parks

Undesired effects of
control measures

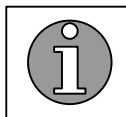
Biodiversity and
ecosystem services

1 indicator

1 indicator

4 indicators

6



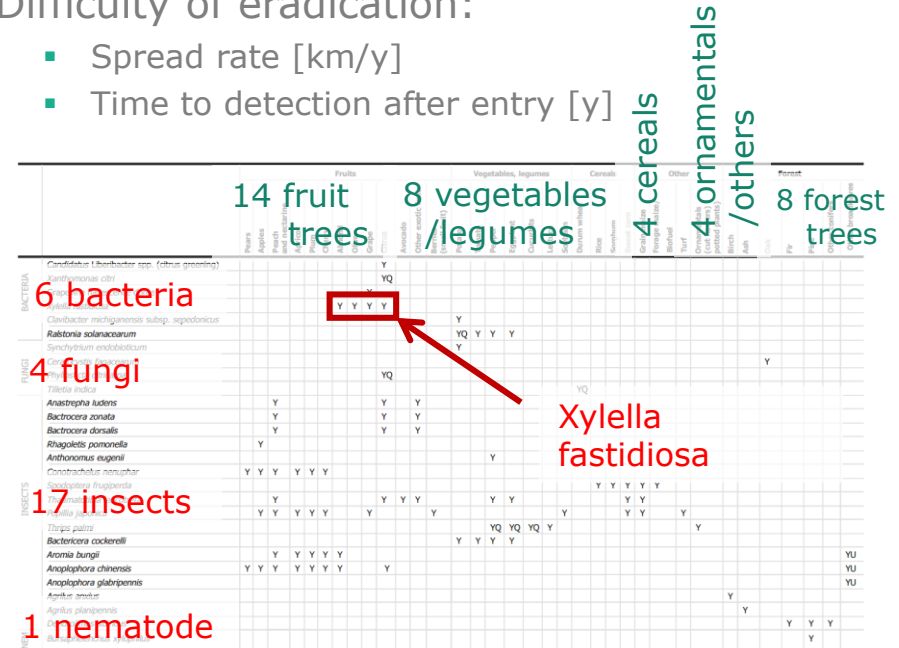
Xylella
ranked **FIRST**
in 13 out of
25 indicators
among the
other
analysed
priority pests
affecting
crops

How to compare different pests...

Preparation of “Pest Reports”:

- Pathology and taxonomy
- Host plants
 - Full list (incl. EPPO, Cabi, PRAs)
 - Important hosts (grouped)
- Area of potential establishment
 - NUTS 2 level
 - Affected NATURA 2000 sites
 - Transient populations
 - Glasshouses etc.
- Additional use of PPPs /levels:
 - 0 - PPPs are not available
 - 0 - Common practice is effective
 - 1 - PPPs effective, increased use
 - 2 - Integrated strategies needed

- Yield loss:
 - Rel. reduction in marketable yield [%]
 - Rel. proportion of yield in reduced quality [%]
- Difficulty of eradication:
 - Spread rate [km/y]
 - Time to detection after entry [y]



14 fruit trees **8 vegetables / legumes** **4 cereals** **4 ornamentals / others** **8 forest trees**

Pest	Fruit				Vegetables, legumes								Cereals	Ornamentals / others	Forest trees	
	Phara	Apples	Plum	Other	Asparagus	Avocado	Bean	Cucumber	Other	Pea	Potato	Tomato				Other
<i>Pseudomonas lundii</i> (Carpenter 1999)																
<i>Candidatus Liberibacter asiaticus</i>																
<i>Rabdionia solanacearum</i>				Y Y Y Y												
<i>Synchytrium endobioticum</i>																
<i>Campoplex</i> spp.																
<i>Taeniothrips</i>																
<i>Taeniothrips evansi</i>																
<i>Anastrepha ludens</i>		Y				Y	Y									
<i>Bactrocera zonata</i>		Y				Y	Y									
<i>Bactrocera dorsalis</i>		Y				Y	Y									
<i>Phytophthora parasitica</i>										Y						
<i>Atractodes eugeniae</i>																
<i>Coccophagus conchophorus</i>		Y	Y	Y	Y	Y	Y	Y	Y							
<i>Drosophila suzukii</i>		Y				Y	Y	Y	Y			Y	Y	Y	Y	Y
<i>Dirosophila melanogaster</i>		Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y
<i>Trioxys pallipes</i>												Y	Q	Y	Q	Y
<i>Bactericera cockerelli</i>												Y	Y	Y	Y	Y
<i>Aecina burgii</i>			Y	Y	Y	Y	Y	Y	Y							
<i>Anopliphora chitensis</i>		Y	Y	Y	Y	Y	Y	Y	Y							Y
<i>Anopliphora platypermis</i>		Y	Y	Y	Y	Y	Y	Y	Y							Y
<i>Aureoantrax</i>																
<i>Agrilus pilosipennis</i>																Y
<i>Xylella fastidiosa</i>																Y

6 bacteria **4 fungi** **17 insects** **1 nematode**

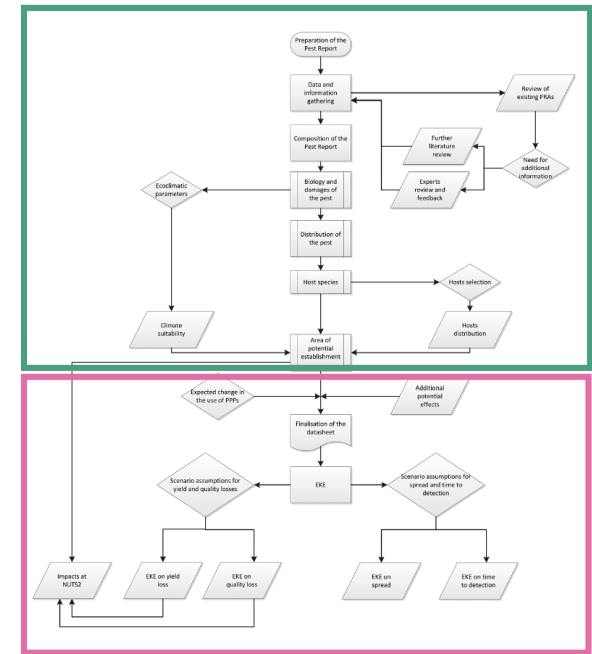
“Maximal impact” scenario (“Yield loss” scenario)

- The pest is **already present throughout the area** of potential distribution
- Its **abundance is in equilibrium** with the available resources (e.g. host plants) and environmental conditions
- Yield/quality is evaluated as **average of a production system** in a time frame taking into account temporal variation in pest population dynamics
- **Future changes in agricultural practice have not been taken into account**

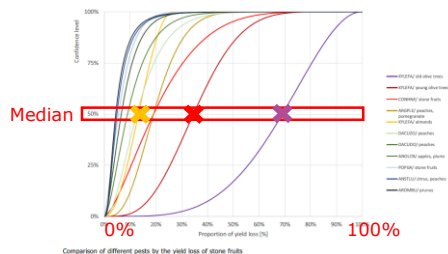
“Difficulty of eradication” scenario

- The pest is **present in an isolated focus** in the area of potential establishment. A **small population has established** on suitable host(s). (Time to detection)
- The spread rate is the outcome of the contribution of **natural dispersal** together with **local human assisted spread. Trade in commodities is not included**
- Spread rate is measured as the **linear increase** of the area. **Long-distance spread (e.g. human assisted ‘jumps’) are not included in the scenario**
- **Host availability is not a limiting factor** for pest establishment

- Review and summary of PRAs & literature
 - Pathology and taxonomy
 - Host plants
 - Potential distribution
- Structured expert judgements (EKE)
 - Yield/quality loss, spread rate, duration
 - Changes in PPP use
- Expert (working) group
 - 2 Permanent external members
 - 52 external experts, EFSA staff, facilitators
- Expert Knowledge Elicitation methodology
 - Quantitative estimates & uncertainties
 - Detailed reasoning on damage, spread, detection
 - Low/high risk scenarios, median and precision



Yield loss



Xylella fastidiosa

Median yield loss

Stone fruits

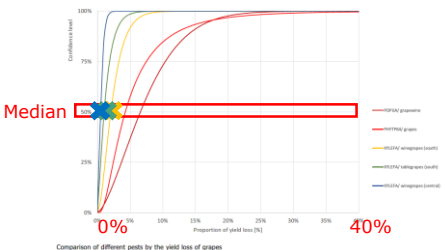
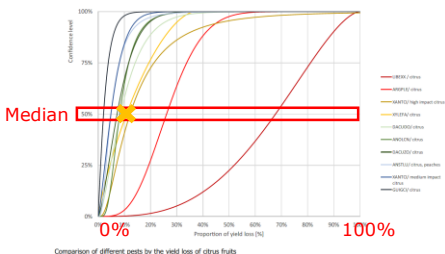
- Olives ($\geq 30y$): **69.1%**
- Olives ($< 30y$): **34.6%**
- Almonds: **13.3%**

Citrus fruits

- Citrus spp.: **10.9%**

Grapes

- Wine (Southern EU): **2.1%**
- Table Grapes: **1.0%**
- Wine (Northern EU): **0.5%**



Median spread rate:

5.2 km/year

in the upper third of all pests

Median time to detection:

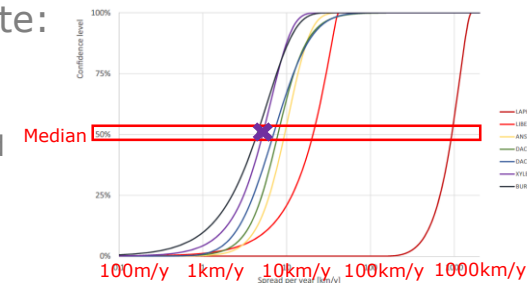
2.9 years

in the middle third of all pests

Read more on:
efsa.europa.eu

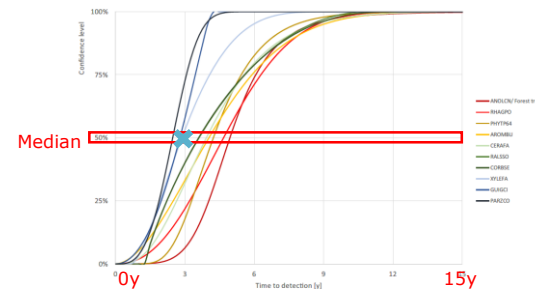
Difficulty of eradication

Spread rate



Comparison of different pests by the spread rate for species with high spread rate

Time to detection

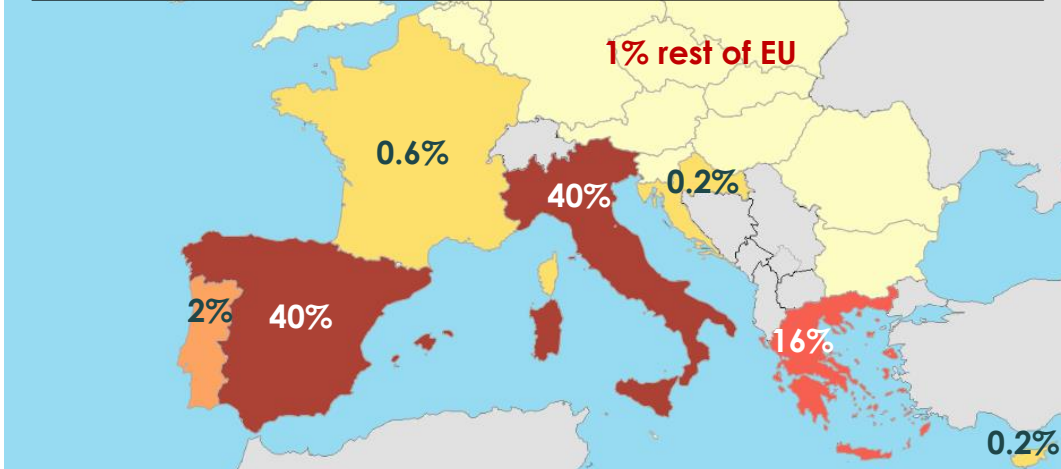


Comparison of different pests by the time for detection for species with medium detection

The economic cost of *Xylella fastidiosa* full spread

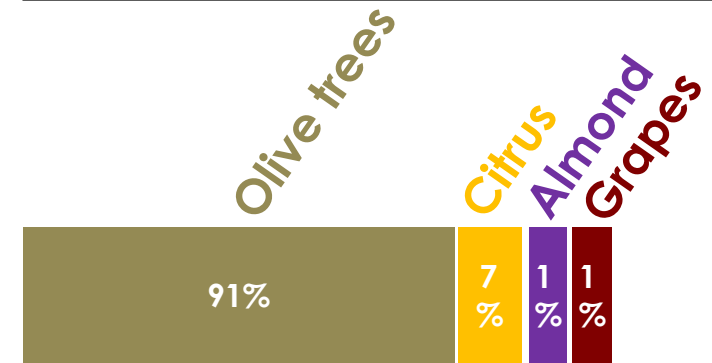
Potential EU loss of production: 5.5 billion EUR per year (from 4.2 to 6.9)

By country (major in Spain and Italy)



0 - 0.005 0.005 - 0.1 0.1 - 0.5 0.5 - 1 1 - 2.2 bill €

By host (mostly olives)



Potential EU export losses: 0.7 billion EUR per year

Cost of production loss

Potential EU loss of
production

5.5 billion (i.e. 5.500 million)
EUR per year

(4.2 - 6.9 billion EUR per year)

VS

Cost of surveillance

Total EU MS expenditure on
surveillance activities

In 2016 3.7 million EUR

In 2017 3.7 million EUR

In 2018 4.5 million EUR

In 2019 4.7 million EUR*

*In process (The final report for 2019 Survey programmes will be submitted by the end of April 2020)

The social cost of *Xylella fastidiosa* full spread



Nearly 300 000 jobs involved in production are at risk -
Only primary production of olive trees, citrus, almonds and grapes



70 different agricultural products that are covered by EU quality labels are susceptible to *Xf* (e.g., citrus fruits, olives, almonds, raisins, grapes, asparagus or cherries)



United Nations
Educational, Scientific and
Cultural Organization



World
Heritage
Convention

More than 18 different plant species susceptible to *Xf* are part of different UNESCO World Heritage sites distributed all across the EU



European
Commission

The environmental cost of *Xylella fastidiosa* full spread



Potential increase of insecticide spraying to control the vector – available plant protection products might not be sufficient to control the pest (need for integrated strategies)

Over 24 habitats and 20 species are associated to hosts susceptible of infection by *Xf* – From the Directive 92/43/EEC (Habitats Directive) and Directive 2009/147/EC (Birds Directive)

Thanks for your attention!

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