Toolkit for *Xylella fastidiosa* risk-based surveillance in the EU Member States

Sybren Vos

Scientific officer in Plant Health Team,
ALPHA Unit, **EFSA**

THE REGULATORY CONTEXT FOR…

Prevention, Risk-targeting, Statistics

PLH regulation EU 652/2014
(Co-financing the MSs)

PLH regulation EU 2016/2031
(Plant health regime)

Art. 22,23,2 …here the pest is … to be present

…,34: Protected zones

Art 18,19: Demarcated infested zones

International Stand…s for Phytosa… Measu… …Ms)

…SPM 6 Surveillance and ISPM 31 Sampling consignments

ISPM 4 Pest Free Areas, ISPM 8 Pest status, ISPM 9 Eradication , ISPM 10 PFPP, ISPM 17 Pest Reporting, ISPM 22,23 low pest prevalence, ISPM 27 Diagnostic protocols

Detection, Delimiting and Monitoring surveys

EFSA MANDATE

The **MSs:**

-
-
-
-

EFSA

Su

3 pilot o

- *Xylella*

PEST SURVEY CARD

efsa European Food Safety Authority Supporting Publications

APPROVED: 3 June 2019

doi:10.2903/sp.efsa.2019.EN-1667

Pest survey card on *Xylella fastidiosa*

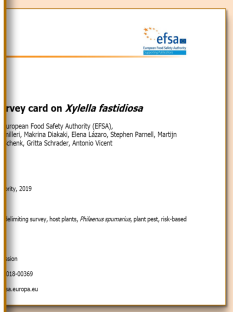
European Food Safety Authority (EFSA),
Sybren Vos, Melanie Camilleri, Makrina Diakaki, Elena Lázaro, Stephen Parnell, Martijn Schenk, Gritta Schrader, Antonio Vicent

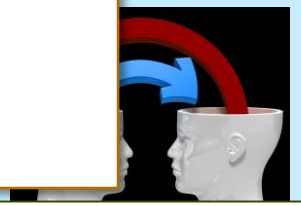
Keywords: detection survey, delimiting survey, host plants, *Philaenus spumarius*, plant pest, risk-based surveillance, *Xylella fastidiosa*

Requestor: European Commission

Question number: EFSA-Q-2018-00369

Correspondence: ALPHA@efsa.europa.eu





The *Xylella fastidiosa* pest survey card is available online:
https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/sp.efsa.2019.EN-1667

PEST FREEDOM SURVEYS

Target population:
Host plants – size - structure

Epidemiological unit:
Homogeneous spatial units

Risk-based approach:
Relative risk and optimal targeting

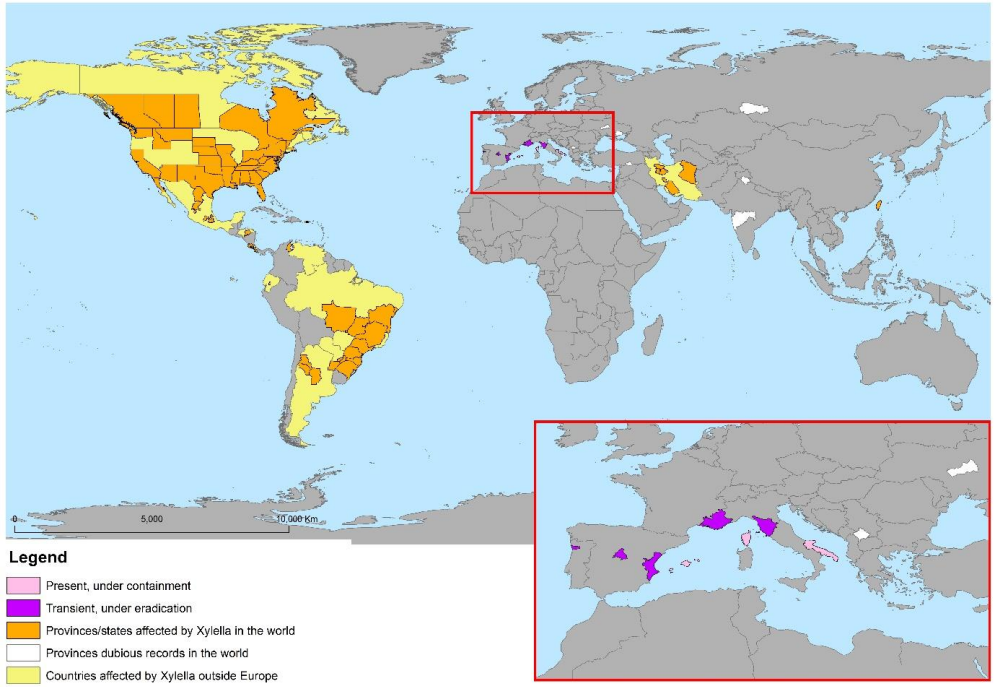
Detection and diagnostic method:
Visual examination and laboratory tests – methods sensitivity

Confidence & Design prevalence:
Acceptability of the risk (risk managers)
Confidence around the estimation of the real prevalence OR of the freedom statement

NEED FOR TAILORING TO EACH SITUATION

Different *X. fastidiosa* subspecies, different STs

+ Different environments



Different epidemics

TARGET POPULATION: WHERE?

- Hosts: EFSA Xylella host plant database (EFSA, 2018)
  - 563 host plant species in the scientific literature
  - 312 host plant species confirmed by at least 2 different molecular tests
  - **192 host plant species infected under natural conditions**

- Organised in four host plant categories:

Agricultural

Semi natural

Ornamental

Forestry

RELATIVE RISKS OF HOST PLANTS: WHERE?

Ongoing work:
Ranking of host plant genera

470,000 data points: survey and monitoring data from Apulia, Corsica, PACA, Alicante and the Balearic islands

Probability of infection

Better target the detection surveys in the EU

Probability of infection in the different regions

Better target the surveys within the demarcated areas (Buffer zones)

Probability of infection for symptomatic plants

Better target the surveys within demarcated areas

RISK-BASED SURVEILLANCE: WHERE?

- **Risk factor:** a biotic or abiotic factor that **increases the probability of infection** by the pest in the area of interest
- **Use risk factors:** to better focus the survey efforts

Risk activities

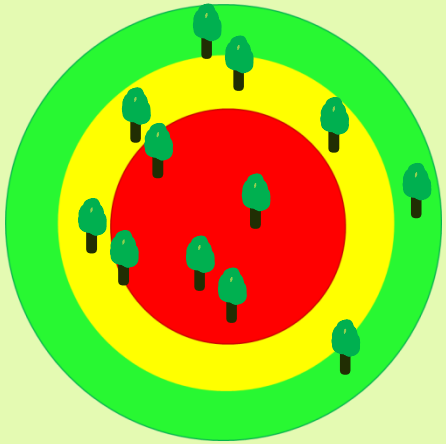
Trade, movement, import and preparation of plant propagating material

Risk locations

Nurseries and garden centers that handle imported host plants from areas where *X. fastidiosa* occurs

Risk areas

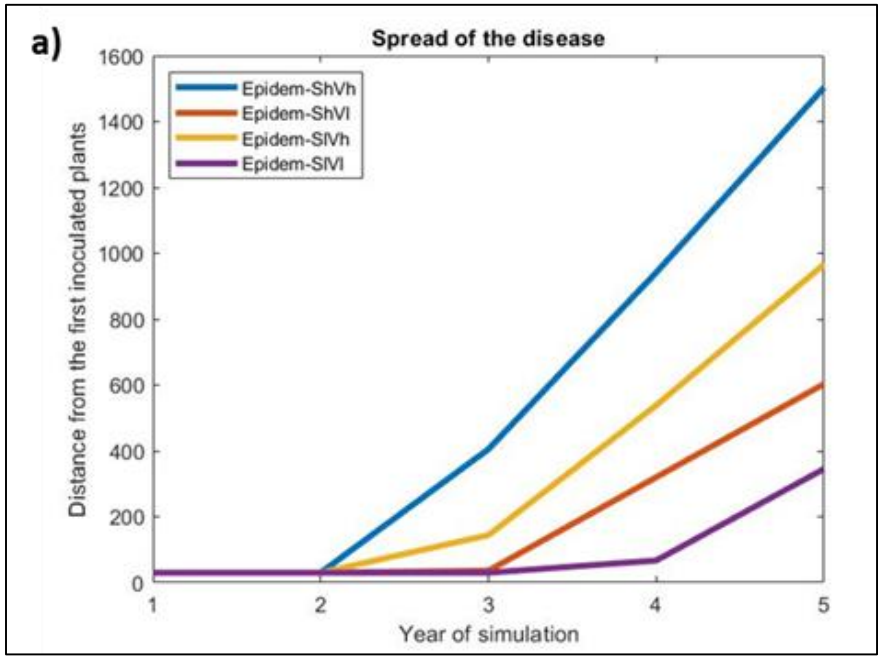
Calculated using vector spread capacity and host plant availability



2019: How resea

SPREAD CAPACITY: WHERE?

Short-distance spread of the disease



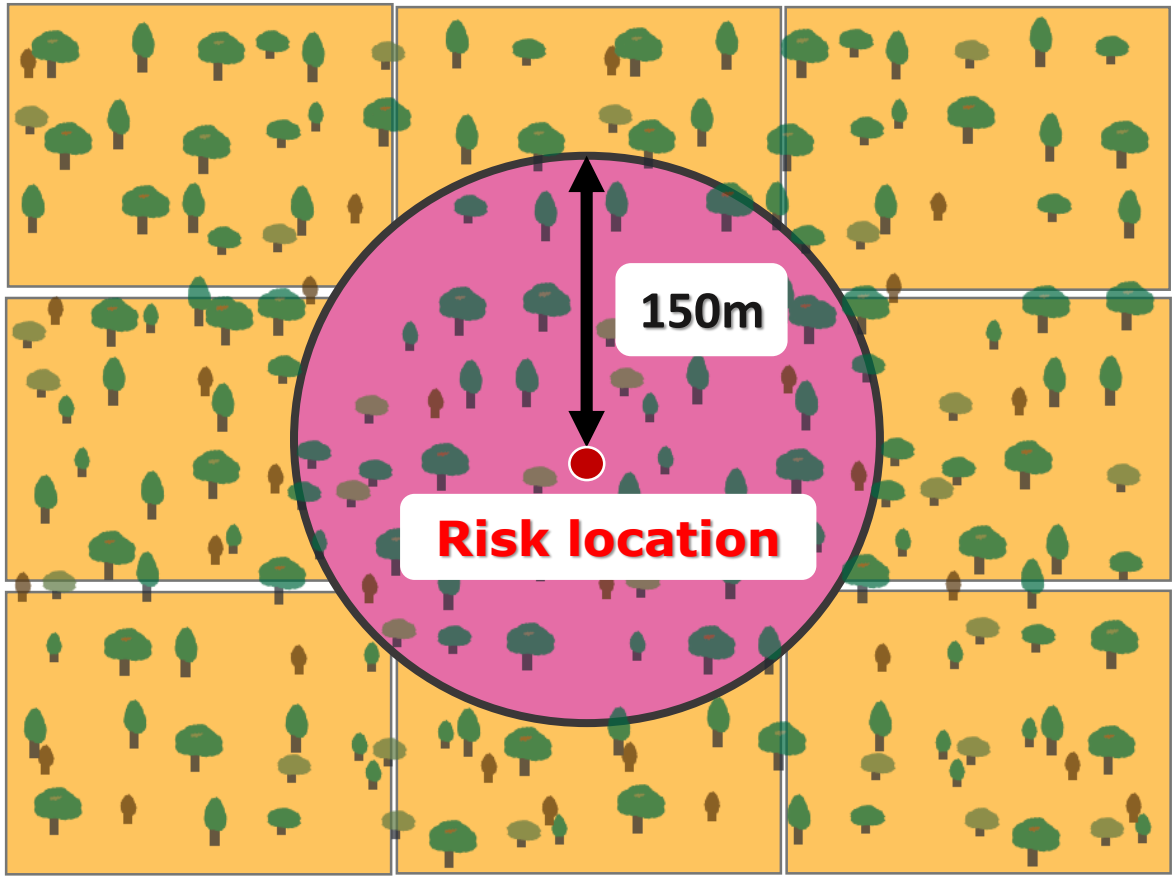
Year 1	150 m
Year 2	300 m
Year 3	500 m
Year 4	1000 m
Year 5	1500 m

Median of short-distance dispersal kernel(km) 0.151 (0.043–0.431) (Fitted to the spread rate in Apulia and consistent with limited mark-recapture data on vector movement range)

([Pest Risk Assessment, EFSA 2019])

RISK-BASED: DETECTION SURVEY; WHERE?

POSTER 44: Detection survey
POSTER 45: Delimiting survey



- **Risk area considered:** 150m wide (40m-430m) and with higher RR
- **Survey objective:** detect the pest if it is present
- *X. fastidiosa* **infections are persistent** in host plants

RISK-BASED: DELIMITING SURVEY; WHERE?

Upon a **positive finding**, a delimiting survey is initiated for defining the infected zone and demarcating it with a Buffer zone

Step 1: Identification of the most plausible infection source

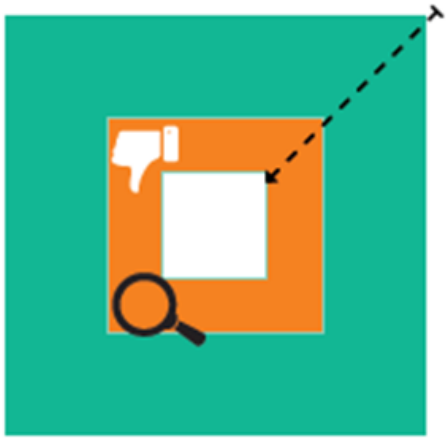
Step 2: The potentially infected area

Years since last detection survey in the area	Distance from source
Year 1	300m
Year 2	500m
Year 3	1000m
Year 4	1500m

Step 3: survey peripherical bands of 400 m

When the pest is not found in a 400m band it is excluded from the delimited area

If the pest is found in a peripherical band, it becomes the outer band of the delimited area



DETECTION AND IDENTIFICATION: HOW?

- Molecular methods are recommended for detection in pest-free areas and buffer zones given their higher diagnostic sensitivity

- Visual examination to detect Xylella-like symptoms is important!

  increase the effectiveness of the sampling

For statistically sound surveillance the estimate of the overall method sensitivity is required

Me Se = Sampling effectiveness X Diagnostic Se

NEXT STEPS

- **Workshop** with the MSs on surveys in demarcated areas on 18-19-20 November in Parma

- **Workshop** with the MSs on annual detection surveys on 2-3 December in Brussels

- Finalisation of the **general guidelines for surveillance**

- Finalisation of the **specific guidelines for *Xylella fastidiosa***

PEST SURVEYS WORKING GROUP MEMBERS

EFSA Staff from different Teams/Units:

AHAW	G. Zancanaro
AMU	J. Cortinas
PLH	M. Kinkar, M. Diakaki, M. Camilleri, S. Vos

EFSA PLH Panel : S. Parnell, A. Vicent

External Expert: E. Lazaro

Tasking grants G. Schrader et al.

M. Schenk, J Schans et al.

Netherlands Food and Consumer Product Safety Authority
Ministry of Economic Affairs

THANK YOU!