Xylella fastidiosa: state of play on French epidemiological situation and control measures

CPVADAAA 25 and 26 May 2016
Ministère de l'agriculture, de l'alimentation et de la forêt
Direction générale de l'alimentation
Epidemiological situation

Since 2012: Interceptions of infected Coffea (subsp pauca, fastidiosa et sandyi)

First detections on Polygala myrtifolia, sub-species multiplex

- 22nd July 2015 - Corse
- 13th October 2015 - Provence-Alpes-Côte d'Azur
## Surveillance: Sampling results from July 2015 to May 2016

<table>
<thead>
<tr>
<th>Modalities</th>
<th>nb of sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total of samples</td>
<td>8330</td>
</tr>
<tr>
<td>PACA</td>
<td>1030 (12%)</td>
</tr>
<tr>
<td>Corsica</td>
<td>6622 (80%)</td>
</tr>
<tr>
<td>Autres régions</td>
<td>708 (8%)</td>
</tr>
<tr>
<td>Total of positive samples (%)</td>
<td>610 (7.3%)</td>
</tr>
<tr>
<td>PACA</td>
<td>41 (7%)</td>
</tr>
<tr>
<td>Corsica</td>
<td>548 (90%)</td>
</tr>
<tr>
<td>Interceptions caféiers :</td>
<td>18</td>
</tr>
<tr>
<td>Number of sampled species</td>
<td>395</td>
</tr>
<tr>
<td>Number of host species found positive to multiplex subsp</td>
<td>23</td>
</tr>
</tbody>
</table>
Top 15 Most sampled genus

<table>
<thead>
<tr>
<th>Genres (total)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polygala (total)</td>
<td>2033</td>
</tr>
<tr>
<td>Olea (total)</td>
<td>1130</td>
</tr>
<tr>
<td>Quercus (total)</td>
<td>580</td>
</tr>
<tr>
<td>Nerium (total)</td>
<td>452</td>
</tr>
<tr>
<td>Rosmarinus (total)</td>
<td>427</td>
</tr>
<tr>
<td>Citrus (total)</td>
<td>384</td>
</tr>
<tr>
<td>Prunus (total)</td>
<td>362</td>
</tr>
<tr>
<td>Cistus (total)</td>
<td>302</td>
</tr>
<tr>
<td>Lavandula (total)</td>
<td>282</td>
</tr>
<tr>
<td>Myrtus (total)</td>
<td>235</td>
</tr>
<tr>
<td>Coffea (total)</td>
<td>147</td>
</tr>
<tr>
<td>Pelargonium (total)</td>
<td>132</td>
</tr>
<tr>
<td>Vitis (total)</td>
<td>122</td>
</tr>
<tr>
<td>Ficus (total)</td>
<td>106</td>
</tr>
</tbody>
</table>
### Sampling results – positive samples per species

<table>
<thead>
<tr>
<th>Species</th>
<th>Total</th>
<th>Total positive samples</th>
<th>Total percentage of positive samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polygala myrtifolia</td>
<td>1970</td>
<td>468</td>
<td>76.7</td>
</tr>
<tr>
<td>Spartium junceum</td>
<td>99</td>
<td>30</td>
<td>4.9</td>
</tr>
<tr>
<td>Lavandula sp.</td>
<td>262</td>
<td>27</td>
<td>4.4</td>
</tr>
<tr>
<td>Pelargonium sp.</td>
<td>118</td>
<td>18</td>
<td>3.0</td>
</tr>
<tr>
<td>Cistus monspeliensis</td>
<td>145</td>
<td>17</td>
<td>2.8</td>
</tr>
<tr>
<td>Cytisus sp.</td>
<td>108</td>
<td>8</td>
<td>1.3</td>
</tr>
<tr>
<td>Other host plants</td>
<td>924</td>
<td>21</td>
<td>3.4</td>
</tr>
</tbody>
</table>

Total of tested samples: 8390
Total of positive samples: 610 (7.2%)
Sampling during 2015 (outcomes per region)
Sampling during 2016

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of samples</th>
<th>Number of positive samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corsica</td>
<td>2080</td>
<td>44</td>
</tr>
<tr>
<td>PACA</td>
<td>499</td>
<td>18</td>
</tr>
<tr>
<td>Other regions</td>
<td>20</td>
<td>0</td>
</tr>
</tbody>
</table>
Total of sampling – Corse region

- Total of **6622** samples from July 2015
- Positive: **8%**
Total of sampling in PACA region

- Total of 1030 samples from July 2015
- Positive: 4%
Situation nationale au 3 mai 2016

- 262 outbreaks:
  - 22 - 07: 1 outbreak,
  - 4 - 09: 66 outbreaks
  - 12 - 10: 127,
  - 12 - 11: 185,
  - 11 - 01: 246,

- 2 regions: PACA et Corse
- One sub-species: *X.f. multiplex*
- Are mainly infected ornamental species.
Situation of Corse on the 3rd of May 16

- 249 outbreaks
  - Haute-Corse : 12 outbreaks
  - Corse du Sud : 237
- ~3900 km² = total surface of demarcated areas
  (total surface of Corsica 8680 km²)
Situation of the PACA region

13 outbreaks
- 2 in Var
- 11 in Alpes Maritimes

One outbreak reaching Monaco and Italy territories
Census of traders of specified plants in demarcated zones

Région Provence-Alpes-Côtes d'Azur:
- 98 establishments (Plant passport),
- 668 retailers (specialized or not)
No trade movement out of the demarcated areas

Corse:
- 50 establishments (Plant passport)
- 400 retailers (specialized or not)

Trade movements out of Corsica:
- vitis plants (TEC)
Actions and measures carried out
Tracing survey
Polygala myrtifolia

French market: 150,000 plants/year

Producers countries
• (from the most to the least):
  ➢ Italy
  ➢ Spain
  ➢ Portugal
  ➢ France
  ➢ Netherlands
Species and subspecies identification

**Sampling:**
One plant – one sample
1 gramme petioles / midribs

**qPCR**
(Harper et al., 2010, erratum 2013)

**Identification of the subs.**
(PCR – Hernandez-Martinez et al., 2006)

**Sequencing of the 7 housekeeping genes and Multilocus Sequence Analysis**
(Yuan et al., 2010)

**Whole genome sequencing**
(technology Illumina MiSeq)

*If needed*

**Whole genome sequencing**
(technology PacBio)
Network of official labs

- National ref lab: ANSES
Improve the scientific knowledge
Development of new technics (« Haut débit » (Barcoding) - Inra

**Targets**: identify vectors, bactera strain, ingested plants,
Modeling of the bacteria propagation - Inra

> Parameters:

- Genomic data
- Epidemiological dynamics of Xf in other countries (America)
- Climate conditions
- Spacial distribution of host plants and vectors

Source: Inra
Pathogenicity tests – Inra/Anses

On different strains of Xf: subsp. fastidiosa, subsp multiplex (included the Corsica strains), subsp. pauca ; subsp. sandyi

Tested on:

- Olea europaea
- Nerium oleander ,
- Coffea arabica,
- Vitis vinifera,
- Malus domestica,
- Citrus clementina, Citrus medica (cedratier), Citrus maxima
- Pyrus communis,
- Prunus domestica, Prunus armeniaca.
Audit conclusions

From 3 to 12 février 2016

Presentation carried out on 15 April 15 (PAFF Committee)

Draft report received on the 26th April 2016

==>Taking into account the report recommandations in order to implement the French eradication strategy
Audit conclusions 1

« Overall conclusion

• The high level of alert and awareness promoted by the French CAs and the comprehensive survey programme ensured the finding of the Xf outbreaks;

• Measures were implemented quickly in line with provisions of Decision 2015/789/EU concerning demarcation, insect vector treatment, removal and destruction of host plants;

• Additional human and financial resources were mobilised;

• An adequate sampling protocol and testing regime was implemented;

• The implementation of the measures was still in progress at the time of the audit. »
Overall conclusions II.

Non-compliances identified
- Intensity of surveys in and outside the DAs;
- Sampling and testing in 100m radius around the infected plants;
- Nurseries in DAs are allowed to market host and specified plants outside their DA, without fulfilling all EU requirements;

Outbreak sites not revisited to remove newly identified host plants.

Factors hindering the implementation of provisions of Decision 2015/789/EU
- High number of outbreaks;
- Time
- Accessibility of private property, nature sites
Overall conclusions III.

• France is committed to eradicating *Xf*.

• The non-compliances reduce the efficiency and effectiveness of the efforts.

• The risk of spread with human assistance is mitigated to some extent by the fact that all outbreaks of *Xf* to date have been recorded in areas with no large-scale production of plants for planting of the major hosts.

• The eradication efforts are further compromised by the high number of outbreaks and level of spread, particularly in Corsica. This is compounded by the multitude of identified host plants, the inaccessibility of risky areas and by uncertainties about hosts and mode of transmission.
Reply of the French authorities: reinforce the surveillance

Since the first positive case, French strategy is based on risk analysis: priority

- to identification of the extension of the geographic spread and
- to first emergency measures: removal of infected plants and Polygala (75% positive cases)

Outside demarcated areas: surveillance plan

In the buffer zones:

- Surveillance measures
- Priority to areas close to infected zone
Reply of French authorities about surveillance measures

- **infected zones**: sampling of 100 specified plants tested qPCR

- **buffer zones**: exhaustive surveillance
  
  - Priority to 1000 m radius area surrounding infected zone: 2 inspections per 100m X 100m square (sampling of symptomatic plants (cf EFSA report)
  
  - 2 Inspections per 1000 m X 1000m square beyond the 1000 m radius area
  
  - 2 special situations underlined in the draft audit report
    - Private areas: awareness to the accessibility matter, help of the municipalities
    - Natural areas in Corse (« maquis »): analysis based on aerial pictures followed, if necessary, by pedestrian surveillance
Reply of the French authorities:
removal of the totality of the host plants in the infected zones

- removal of the new host plants which were unknown at the time of the first removal
- at the latest, at the time of the surveillance (confer previous dia)
Reply of the French authorities: Specified plants movements

In order to prevent any risk of spread of the bacteria out of the demarcated areas:

- The trade of specified plants is quasi-exclusively a proximity trade in PACA

- Corse: the plants moved to professionnals out of this region are exclusively vitis plants and citrus plants (no citrus plants produced in demarcated zones)

- Information and awareness of professionnals and citizen, specially on retail places and controls

- Placing on internet sites: detailed map of the demarcated areas

- Implementation of the article 9 provisions.
Surveillance plan 2016 outside the demarcated areas
Plants to survey

- All the specified species
- Priority to:
  - the 37 host species (subsp pauca et multiplex) de Xylella fastidiosa (of both subsp pauca and multiplex)
  - Risky productions
    - Arboriculture
    - Vine
    - Ornamental cultivation
    - Medicinal & aromatic plants
Official Scheduled Monitoring

Targeted phytosanitary inspections specific to Xylella fastidiosa;

Targeted phytosanitary inspections non specific to Xylella fastidiosa;

Inspections as part of issuing the EC plant passports (EPP);
Official Scheduled Monitoring as part of issuing the EPP

• All establishments that produce and sell plants subjected to the EPP are concerned

• Visuel checks and systematic sampling symptomatic plants

• Special case: samples on asymptomatic plants
  ➢ Mother plants of host plants (5 sample/host species)
  ➢ Specified plants originating from a third country contaminated (5 sample/specified species)
Phytosanitary inspections

- **Systematic symptomatic samples**
- **Locations:** production plots, markets not subject to EPP, markets, retail stores
- **Target plants**
  - Arboriculture: olive, citrus, almond, peach, apricot, plum, cherry
  - Ornamental: ornamental vines, ornamental Prunus, plane trees, oaks, mulberry, ash, maple, etc.
  - Vine young plantations (2014) including material originating from outside France
  - « PPAMC »: Lavender officinale, lavender, officinal rosemary, thyme, savory, lemon balm, oregano, sweet clover
Unofficial Scheduled Monitoring

Xylella fastidiosa monitoring integrated with observations made in the context of existing epidemiological surveillance networks and for regulated pests or not: Forest Health Network (DSF) and Biological Surveillance of the Territory (SBT) (over 15,000 observation plots)

SBT network: vine, Citrus, Prunus, oaks, plane trees, olive trees

DSF: oaks
« Passive » monitoring

- **Goal**: the earliest possible detection of symptomatic infections in the territory.
- **Based on spontaneous reports of suspicion of infection of plants by Xylella fastidiosa by any person (individuals, professionals or observers outside their scheduled activities).**
Request of France

Update of the EFSA report from January 2015 as to reflect new knowledge gained since
Thank you