

# *Xylella* – what the future holds?

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# Objectives

- Brief overview of *Xylella* distribution in EU
- High risk hosts and symptoms
- Action being taken by UK Government
- Changes to the EU Emergency Decision and what they mean for you
- Update on FERA research

## *Xylella fastidiosa* subspecies - a brief summary

- *Xylella fastidiosa* ssp *pauca* – a strain related to ssp. *pauca* has been causing mortality of olive trees in Italy where it is classed as ‘present but limited distribution’. Present in parts of France, under eradication. This strain is less likely to be able to survive in the UK than other strains.
- *Xylella fastidiosa* ssp *multiplex* – the ssp. that has been found in Corsica, mainland France, Valencian Community of mainland Spain. Classed as under eradication. In North America, it causes scorch symptoms on a range of broadleaved trees. Has the widest host range of all the of *Xylella fastidiosa* subspecies. Highest risk rating, important to keep out of UK.
- *Xylella fastidiosa* subsp *fastidiosa* – found on a *Nerium oleander* and a rosemary plant in a glasshouse in Saxony, Germany, spring 2016.
- All three ssp. are in the Balearic Islands of Spain (Ibiza, Mallorca, Menorca).

## *Xylella fastidiosa* and vectors

The bacterial pathogen, *Xylella fastidiosa*, colonises xylem vessels; and when the vessels become blocked, disease symptoms are produced, which include wilts, diebacks, stunts and leaf scorches.

The bacterium is spread by xylem feeding insects, such as the meadow spittlebug (*Philaenus spumarius*), a very common species in the UK and Europe.



## *X. fastidiosa* impacts – wider environment





## *X. fastidiosa* impacts – severe symptoms on almond



*Xylella fastidiosa* (XYLEFA) - <https://gd.eppo.int>

## *X. fastidiosa* impacts – symptoms on nerium



## *X. fastidiosa* impacts – symptoms on polygala



*Xylella fastidiosa* (XYL)



*Xylella fastidiosa* (XYLEFA) - <https://gd.eppo.int>



## *X. fastidiosa* impacts – symptoms on lavender

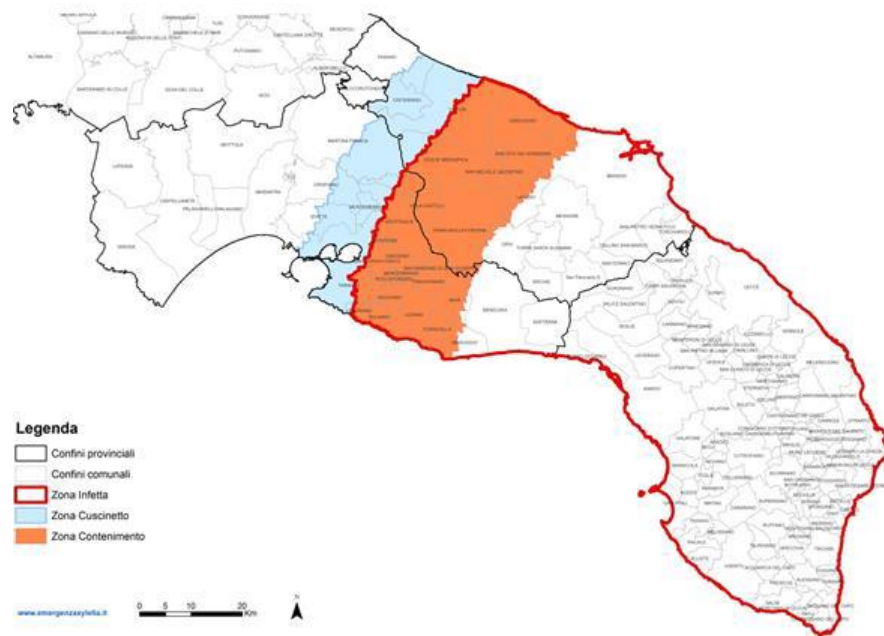


## *Xylella fastidiosa* and subspecies - implications

- Anyone 'importing' host plants from the EU needs to ensure they are accompanied by a **plant passport** confirming they have been sourced from disease free areas/sites. Plant passporting obligation applies to all 'professional operators'.
- An outbreak could lead to '**host**' **destruction within 100m, and a 5km-wide** zone banning all specified plant movements for **five** years.
- **Period of restrictions:** the requirements for the demarcated area of the outbreak will remain in force for a minimum of **5 years** after official surveys have confirmed that *X. fastidiosa* is not present.
- Important to determine if an interception or an outbreak – strict requirements to be met to be able to declare an Interception.

## *X. fastidiosa* ssp. *pauca* – Italy

**Map of the Demarcated Area established in Apulia (Italy)**



## *X. fastidiosa* ssp. *pauca* — host plants in Italy

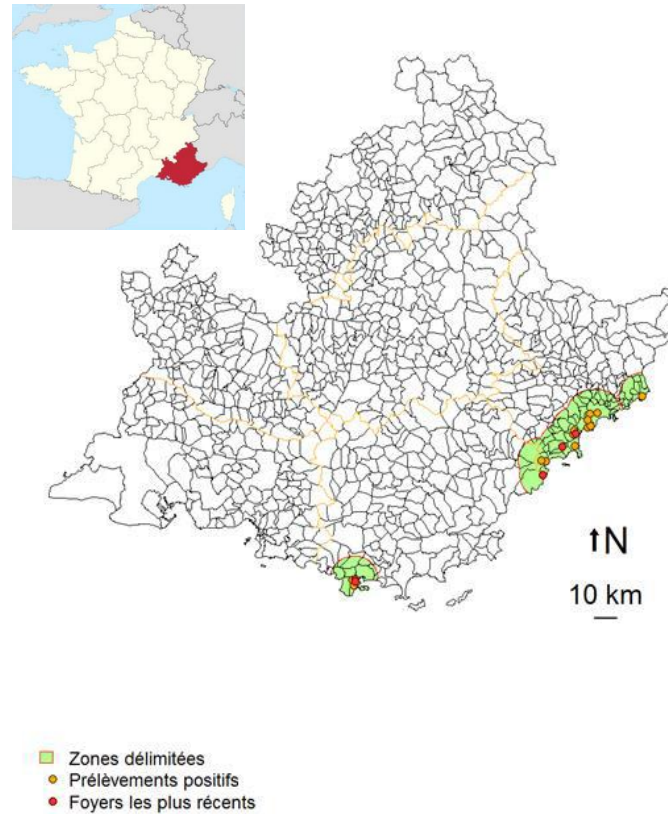
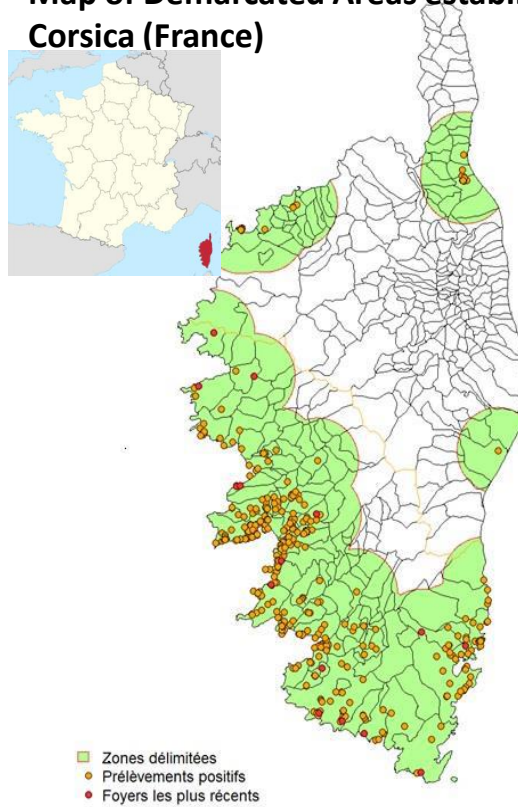
- *Acacia saligna*
- *Asparagus acutifolius*
- *Catharanthus* species
- *Chenopodium album*
- *Cistus creticus*
- *Dodonaea viscosa*
- *Eremophila maculata*
- *Erigeron sumatrensis*
- *Erigeron boanariensis*
- *Euphorbia terracina*
- *Grevillea juniperina*
- *Laurus nobilis*
- *Lavandula angustifolia*
- *Lavandula stoechas*
- *Myoporum insulare*
- *Myrtus communis*
- *Nerium oleander*
- *Olea europaea*
- *Pelargonium x fragrans*
- *Phillyrea latifolia*
- *Polygala myrtifolia*
- *Prunus avium*
- *Prunus dulcis*
- *Rhamnus alaternus*
- *Rosmarinus officinalis*
- *Spartium junceum*
- *Vinca* species
- *Westringia fruticosa*
- *Westringia glabra*





## *X. fastidiosa* ssp. *multiplex* — France

**Map of Demarcated Areas established in Corsica (France)**



## *X. fastidiosa* ssp. *multiplex* — host plants France

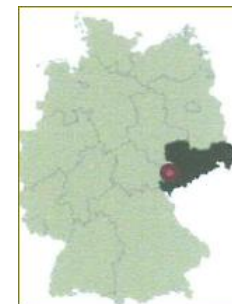
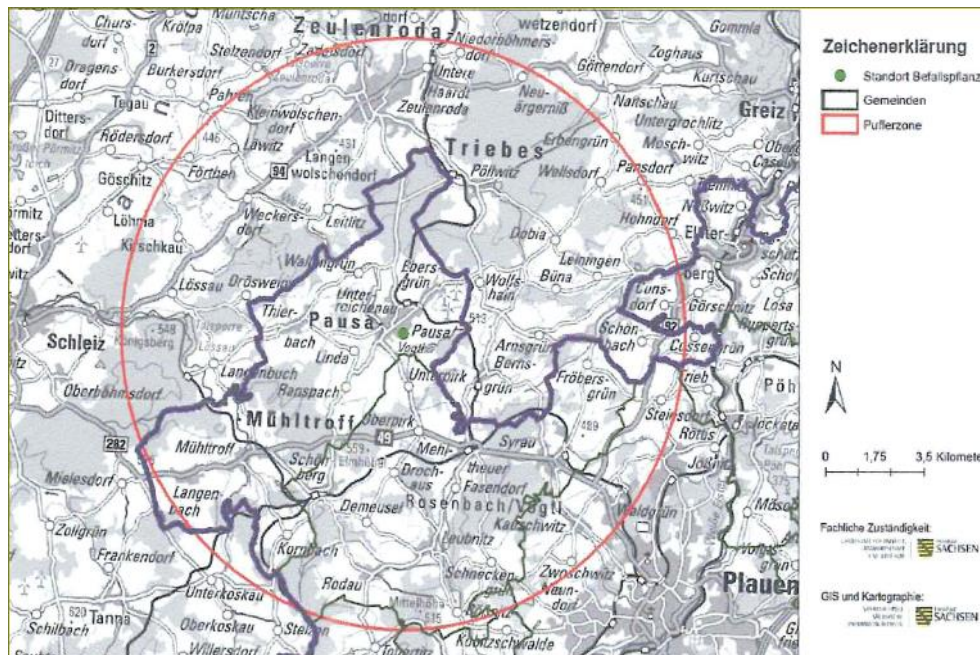
- *Acacia dealbata*
- *Acer pseudoplatanus*
- *Anthyllis hermanniae*
- *Artemisia arborescens*
- *Asparagus acutifolius*
- *Calicotome villosa*
- *Cercis siliquastrum*
- *Cistus creticus*
- *Cistus monspeliensis*
- *Cistus salviifolius*
- *Cytisus villosus Pourr*
- *Coronilla valentina*
- *Cytisus racemosus*
- *Cytisus scoparius*
- *Genista corsica*
- *Genista ephedroides*
- *Hebe* sp.
- *Helichrysum italicum*
- *Lavandula angustifolia*
- *Lavandula x allardii*
- *Lavandula dentata*
- *Lavandula x intermedia*
- *Lavandula stoechas*
- *Metrosideros excelsa*
- *Myrtus communis*
- *Pelargonium graveolens*
- *Phagnalonsaxatile*
- *Polygala myrtifolia*
- *Prunus cerasifera*
- *Prunus dulcis*
- *Quercus suber*
- *Rosa canina*
- *Rosmarinus officinalis*
- *Spartium junceum*
- *Westringia fruticosa*



## *X. fastidiosa* ssp. *fastidiosa* - Germany

Hosts: *Nerium oleander*, *Rosmarinus*, *Erysimum* and *Streptocarpus*

Map of demarcated area located between Saxony and Thuringia, 4 Oct 2016



# *X. fastidiosa* three subspecies –

Spain: Balearics – Nov '16 first notification:



| HOST PLANT                      | TOTAL POSITIVES | POSITIVES MALLORCA | SUBSPECIES MALLORCA                                                            | POSITIVES IBIZA | SUBSPECIES IBIZA             | POSITIVES MENORCA | SUBSPECIES MENORCA               |
|---------------------------------|-----------------|--------------------|--------------------------------------------------------------------------------|-----------------|------------------------------|-------------------|----------------------------------|
| <i>Acacia saligna</i>           | 3               | 1                  | Pending                                                                        | 2               | 1 <i>pauca</i><br>1 Pending  | 0                 | -                                |
| <i>Cistus monspeliensis</i>     | 1               | 1                  | 1 <i>fastidiosa</i>                                                            | 0               | -                            | 0                 | -                                |
| <i>Ficus carica</i>             | 2               | 2                  | 2 <i>multiplex</i>                                                             | 0               | -                            | 0                 | -                                |
| <i>Fraxinus angustifolia</i>    | 1               | 1                  | 1 <i>multiplex</i>                                                             | 0               | -                            | 0                 | -                                |
| <i>Lavandula dentata</i>        | 5               | 2                  | Pending                                                                        | 3               | 1 <i>pauca</i><br>2 Pending  | 0                 | -                                |
| <i>Nerium oleander</i>          | 5               | 1                  | Pending                                                                        | 4               | Pending                      | 0                 | -                                |
| <i>Olea europaea</i>            | 17              | 0                  | -                                                                              | 17              | 2 <i>pauca</i><br>15 Pending | 0                 | -                                |
| <i>Olea europaea europaea</i>   | 45              | 12                 | 4 <i>multiplex</i><br>9 Pending                                                | 27              | 7 <i>pauca</i><br>20 Pending | 6                 | 1 <i>multiplex</i><br>5 Pending  |
| <i>Olea europaea sylvestris</i> | 109             | 64                 | 10 <i>multiplex</i><br>54 Pending                                              | 19              | 19 Pending                   | 26                | 8 <i>multiplex</i><br>18 Pending |
| <i>Polygala myrtifolia</i>      | 18              | 14                 | 3 <i>fastidiosa</i><br>4 <i>multiplex</i><br>2 <i>multiplex</i> ?<br>5 Pending | 1               | 1 <i>pauca</i>               | 3                 | Pending                          |
| <i>Prunus avium</i>             | 3               | 3                  | 3 <i>fastidiosa</i>                                                            | 0               | -                            | 0                 | -                                |
| <i>Prunus domestica</i>         | 1               | 1                  | Pending                                                                        | 0               | -                            | 0                 | -                                |
| <i>Prunus dulcis</i>            | 63              | 63                 | 7 <i>fastidiosa</i><br>56 Pending                                              | 0               | -                            | 0                 | -                                |
| <i>Rosmarinus officinalis</i>   | 7               | 6                  | Pending                                                                        | 0               | -                            | 1                 | 1 <i>multiplex</i>               |
| <i>Vitis vinifera</i>           | 1               | 1                  | 1 <i>fastidiosa</i>                                                            | 0               | -                            | 0                 | -                                |
| <b>TOTAL</b>                    | <b>281</b>      | <b>172</b>         |                                                                                | <b>73</b>       |                              | <b>36</b>         |                                  |



# *X. fastidiosa* ssp *multiplex* –

Spain: mainland – end June '17

*X. fastidiosa* ssp. *multiplex* in almond orchard, Alicante



Zona Demarcada

|                                                                            |            |
|----------------------------------------------------------------------------|------------|
| Conselleria d'Agricultura, Medi Ambient,<br>Canals i Desenvolupament Rural |            |
| Direcció General de Agricultura, Ramaderia i Pesca                         |            |
| PLAN DE CONTROL DE<br><i>Xylella fastidiosa</i>                            |            |
| PROVINÇA DE ALICANTE                                                       |            |
| Zona Demarcada                                                             |            |
| Format                                                                     | Fecha      |
| 1:200.000                                                                  | 18/12/2017 |



## *X. fastidiosa* three subspecies –

Spain: mainland – end June '17

*X. fastidiosa* ssp. *multiplex* in almond orchard, Alicante



- Which area was first infected? How long? What genera of plants affected? How wide spread is *Xylella* in Spain? Investigations ongoing.

## *X. fastidiosa* - What is Government doing?

- Requirements for 3<sup>rd</sup> country **imports**.
- New **plant passporting obligation** for higher risk hosts/genera on EU Commission 'host list'.
- **Surveillance** inspections risk rated to take account of various factors including genera and source/origin. Includes EU Plant and Tree Notifications and general quarantine surveillance at production, trade and retail premises.
- Defra works **across the UK** with Scotland, Wales, N. Ireland, Crown dependencies, FC, FR and Fera via the Plant Health Risk Group that meets monthly.



## *X. fastidiosa* - What is Government doing?

- Defra attend, influence and give the UK position to the EU Commission SCOPAFF – covers all PH issues including *Xylella*.
- Pest information and disease factsheets - UK **Plant Health Portal**  
**[www.planthealthportal.defra.gov.uk](http://www.planthealthportal.defra.gov.uk)**
- Defra *Xylella* Pest Specific Contingency Plan – being sent out for **stakeholder consultation in Feb** via AHDB and related bodies, publication April/May.
- Planning and developing multi agency response (APHA, Forestry Commission, Defra) including scenario planning, response exercises.
- Raising awareness – public, trade and retailer events.



# Changes to the EU Emergency Decision

## What does it mean for me?

### Plant Passports

- From 1<sup>st</sup> March 2018 the six highest risk hosts (*Coffea*, *Lavandula dentata* , *Nerium oleander*, *Olea europaea* , *Polygala myrtifolia* and *Prunus dulcis* (Almond) require inspection sampling and testing at sites where plants are grown.
- Plants need to have been on site for more than two weeks (during the growing season) or changed state to be considered as being grown rather than traded.
- Records of plants bought/supplied must be kept for three years.
- Ask your suppliers to confirm testing has been carried out and origin of plants bought / supplied from. Are they coming from where you think?



# Changes to the EU Emergency Decision

## What does it mean for me?

### Findings of *Xylella*

- What is the risk? Has it spread?
- First job of Plant Health service will be to determine subspecies present and if it is an Interception or an Outbreak – many factors to consider. Time of year it is found and length of time since arrival / exposure to vectors will be crucial.
- Risk analysis will determine need (or not) for a demarcated area to be set up.
- The better records you have of how plants have been kept and treated on site the more information we can use to assess risk.

# Changes to the EU Emergency Decision

## What does it mean for me?

### Findings of *Xylella*

- If an Interception cannot be declared:
- Demarcated area of 5km wide around the infected zone will need to be set until able to determine the extent of any spread.
- All host plants in 100m radius of infected plants (the infected zone) required to be destroyed.
- Extensive surveys required in 1km buffer and 5km buffer zone of host and specified plants. Requires sampling of symptomatic plants and asymptomatic plants nearby.
- No movement or trade of host plant material while surveys are completed.

# Changes to the EU Emergency Decision

## What does it mean for me?

### Findings of *Xylella*

- Demarcated area can be reduced from 5km-wide to 1km-wide if ALL following conditions met:
- All host plants in 100m radius of infected plants (the infected zone) have been destroyed.
- No other plants positive in infected zone since destruction carried out, sampling and testing required to confirm.
- No infected vectors detected in infected zone since destruction – **two vector surveys required during adult flight period (summer).**
- No other infected plants detected in 5km buffer zone. **Plant surveys must be done in summer to early autumn.**

# Changes to the EU Emergency Decision

## What does it mean for me?

### Findings of *Xylella*

The Demarcated area can be lifted after a period of 12 months ONLY IF:

- It has already met the conditions needed to reduce the buffer from 5km to 1km-wide **i.e. all vector and plant surveys have been carried out.**
- There is high confidence there has been no further spread.
- As close to time of lifting, official sampling and testing has been carried out on symptomatic plants and asymptomatic ones nearby.
- Specified plants remaining in the area are subject to intensive surveys for a further two years.

# Changes to the EU Emergency Decision

## What does it mean for me?

### Findings of *Xylella*

- If infected vectors are found or further infected plants are found in the buffer zone it will not be possible to reduce the size of the buffer zone or to lift it after 12 months.
- Demarcated area of 5km-wide will have to remain in place for five years from the last finding of *Xylella*.
- Restrictions would apply to any plant passporters within the demarcated area for movement of host or specified plants.
- Restrictions on plant movement and disposal of green waste will be required for all landowners e.g. retailers, contractors, parks / amenity spaces, residential gardens etc.



## FERA research update

### What's currently possible?

- Detection in **symptomatic** plant samples (based on 10-25 leaves/petioles per sample) of all *X. fastidiosa* with a single qPCR (TaqMan) that picks up all known subspecies.
- Improved DNA extraction and TaqMan test now allow up to 40 samples to be tested per lab technician per week.
- Additional TaqMan tests developed for identification of five *X. fastidiosa* subspecies (*fastidiosa*, *multiplex*, *pauca*, *sandyi* and *morus*).
- MLST method to confirm subspecies is available.
- **Same-day TaqMan identification of subspp.** now possible directly from extracted plant tissues (so far validated on naturally or artificially infected *Catharanthus roseus*, *Myrtus communis*, *Genista* sp., *Helichrysum* sp., *Calicotome* sp. and *Rosmarinus officinalis*).

## FERA research update

### What's currently possible?

- **Validated laboratory serological tests (IF/ELISA) available for higher throughput screening of samples in an outbreak situation** (but not sufficiently accurate for EU acceptance for screening during routine surveillance outside of known outbreak areas).
- **TaqMan detection of *X. fastidiosa* directly from meadow spittlebug vector (*Philaenus spumarius*)**. LAMP tests have also been used for this purpose in outbreak situations in Italy.

## In-field diagnostics

- **In-field testing using LFD serological test kits.** Available test kits are **only reliable when used on pure cultures** of the bacterium.
- **In-field testing of plant material using LAMP tests.** Intensive sampling and **complex DNA extraction methods** are required which make this **impractical in the field.**

## Useful resources on *Xylella*

### **Plant Health Information Portal**

[www.planthealthportal.defra.gov.uk/pests-and-diseases/high-profile-pests-and-diseases/xylella/](http://www.planthealthportal.defra.gov.uk/pests-and-diseases/high-profile-pests-and-diseases/xylella/)

### **Guidance and implications for trade for importers**

[www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/662219/xylella-fastidiosa-impl-trade.pdf](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/662219/xylella-fastidiosa-impl-trade.pdf)

### **Guidance on sourcing *Xylella* hosts:**

[www.planthealthportal.defra.gov.uk/assets/uploads/Xylella-host-info-note-version5.pdf](http://www.planthealthportal.defra.gov.uk/assets/uploads/Xylella-host-info-note-version5.pdf)

Plant Health will need to continue to be a joint effort between UK wide plant health service working with people like yourselves to make changes, influence sourcing decisions and extra 'eyes on the ground'.

Thank you

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