WINETWORK

European Knowledge Transfer

# Flavescence Dorée

## *The importance of the territory monitoring*

Guide of good practices for regions without FD

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# Introduction

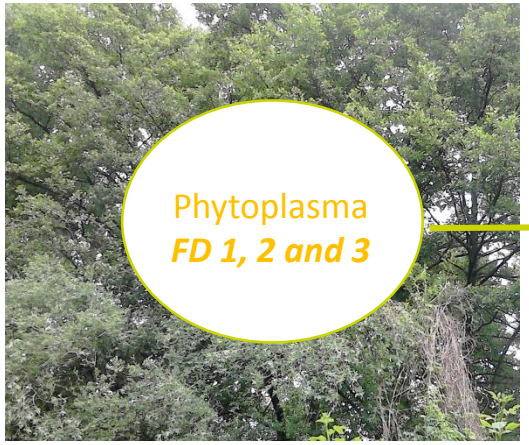
Flavescence dorée has been detected since 1950 in France

- Incurable quarantined disease
- Liste A2 EPPO
- Grapewine yellows symptoms
- Combination of a phytoplasma, a vector and a host

**→ Rapid spread, important yield losses and vineyard dieback**

# Spread of flavescence dorée

- Phytoplasma : European origin




*Alnus and Clematis*

Several hypothesis of spread

*Oncopsis Alni*
©Tristan Bantock

*Dictyophara europaea*
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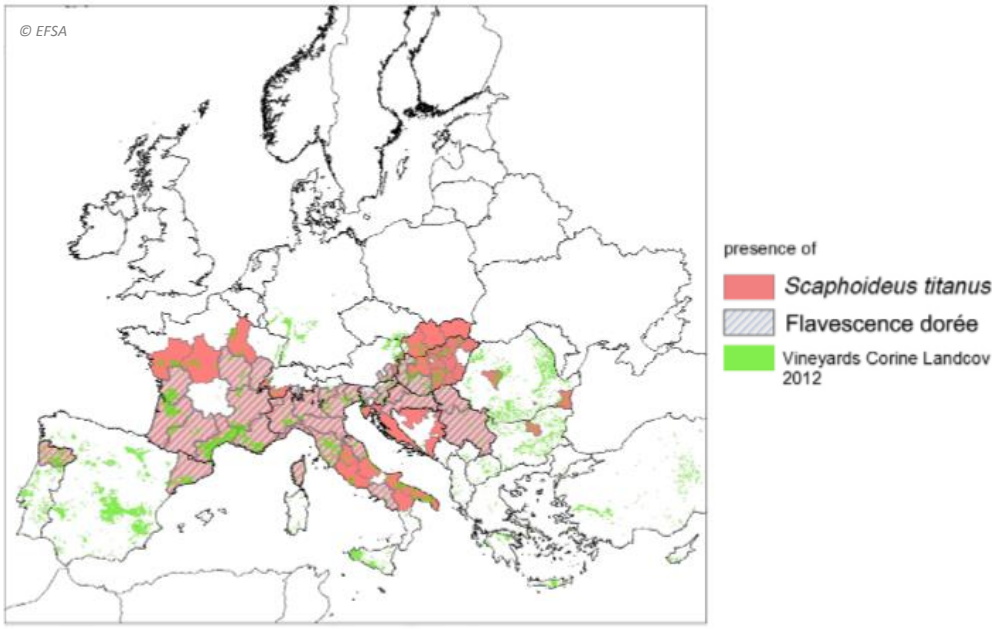
*Scaphoïdeus titanus*

*Vitis Vinifera*

- Vector : leafhopper named *Scaphoïdeus titanus* imported from North America

# Spread of flavescence dorée

- Phytoplasma : European origins and spread from wild plant to grapevine
- Vector : leafhopper named *Scaphoïdeus titanus* imported from North America




→ Distribution of the leafhoppers is wider than the phytoplasma

→ Leafhopper *S. titanus* discovered in Alsace in 2016

# Symptoms and impacts

## Main symptoms but non distinguishable from other grapevine yellows

### First symptoms

- Delay of budburst
- Lack of budburst

### In spring

- Reducing growth of fruiting cane
- Change in leaf colour and curling leaves
- Premature leaf fall

### In summer

- Failure to lignify
- Dessication of inflorescences and grapes

# Symptoms and impacts

## In case of any doubts

### Check the simultaneous presence of the three following symptoms

Discoloration and curling leaves

Failure to lignify

*©Canadian Food Inspection Agency*

Dessication of the grapes

# Symptoms and impacts

Characteristic symtoms and non distinguishable from other grapevine yellows

→ More or less visible depending on the variety

→ Rootstocks can be asymptomatic

Similar symptoms to Stolbur disease

→ If a flavescence dorée hypothesis exists, a **PCR analysis** is done to identify the phytoplasma

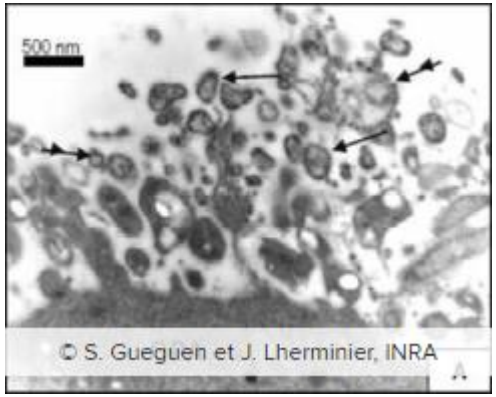
# The actors of the disease

## 1) Infectious agents : FD 1, 2 and 3 phytoplasma

- Intracellular bacterium without wall living in the screened tubes of phloem → Transmitted by a vector or cuttings / grafting

- 3 genetic groups causing flavescence dorée:
  - FD1, mainly located in the South West of France
  - FD2, major group in Europe
  - FD3 mainly in Italy

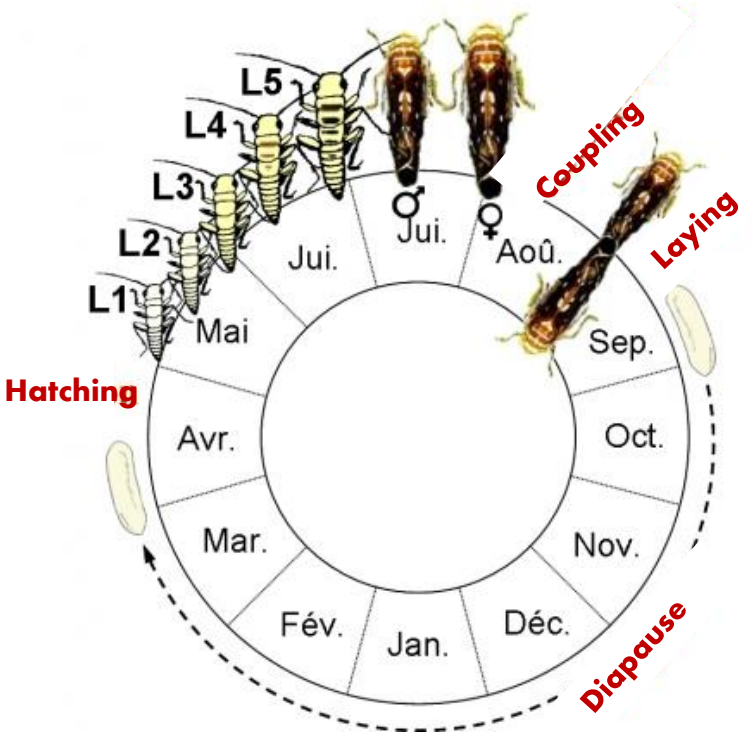
  - Wild compartiment : *Aulnus* and *Clematis*




*Phytoplasma*

# The actors of the disease

## 2) The vector : *Scaphoïdeus titanus*




©Cuche

Life cycle

- Only one generation per year
- Usually larvae remain on the plant where they hatch
- Adults are very mobile and fly from vines in vines

# The actors of the disease

## 2) The vector : *Scaphoïdeus titanus*

Feeding behavior

- A stinging and sucking insect that feeds on vine leaves
- Acquisition of the phytoplasma possible from the first larval stage
- Incubation period of one month and then infectious for life

# The actors of the disease

## 3) The host: the vine

- *Scaphoïdeus titanus* depends vitaly on vines *:* the leafhopper can only carry out its life cycle on *Vitis vinifera*

  → very epidemic disease

- Phytoplasma present on other wild plants : *Alnus* or *Clematis*

  → Associated with other vectors: possible transmission

*Oncopsis Alni*
©Tristan Bantock

*Dictyophara europaea*
© Dimitri Geystor

*Clématis vitalba*
© Visoflora

*Alnus glutinosa*
© Visoflora

# Prospecting and monitoring

## Recognition of the leafhopper

2 symmetrical black points in dorso-lateral position

*Larval stages : L1 on the left, L3 in the center and L5 on the right*

- Brown color
- Size between 4.8 and 5.8 mm
- 3 strips on the head for females

*Scaphoïdeus titanus*

# Prospecting and monitoring

## Detection of the leafhopper

- Possible from the first larval stage by trained technicians
- Visual inspection on 100 to 200 leaves, on suckers and leaves close to the base
- Sticky traps to capture the adult leafhopper in the plots or near wild vines

*Sitcky trap use by IFV*

# Prospecting and monitoring

**Preventing infection by acting on potential reservoirs:**

- Potential reservoirs of the vector: wild vines and other plants such as *Clematis* or *Alnus*:
  - Risk of epidemic emergence
  - BUT also important for biodiversity and ecosystems

→ To reason according to the situation

# Prospecting and monitoring

## Monitoring of the territory

- Concerns all actors → collective prospecting sector
- Mandatory reporting of cases → confirm the diagnosis and inform the official authorities
- Laboratory analyzes to identify the phytoplasma

# Use of healthy material plants

- Three possibilities for the disease spread :
  - Circulation of infected planting material
  - Transport or flight of infected vectors
  - Transfer from the wild compartment

- Vine nurseries:
  → Monitoring of mother vines
  → HWT

# Conclusion

- Rapidly spreading serious disease and considerable economic losses
- Some areas free but monitoring is paramount
- Awareness and involvement of all stakeholders in the sector to ensure better prospecting