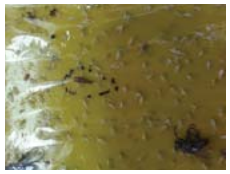
COLLECTIVE DISEASE MANAGEMENT

- **PLANTING CERTIFIED (HEALTHY) PLANTING MATERIAL**
- **VECTOR MANAGEMENT PRIOR PHYTOPLASMA TRANSMISSION**
  1. **Activities prior insecticide treatments:**
     a) Removal of grapevine suckers prior insecticide treatment to improve vector control since larvae are spread on lower parts of grapevine
     b) Mulching of flowering cover-crops prevents poisoning of pollinators
  2. **Insecticide treatment (beware of pollinator populations):**
     a) Organic production: 1st treatment of L1-L2 larvae in the beginning of June (prior flowering), 2nd treatment of L3 larvae in mid-June (post flowering)
     b) Integrated production: 1st treatment of L3 larvae in mid-June (post flowering), 2nd treatment 2-3 weeks later. Some insecticides are efficient for control of both *S. titanus* and grapevine moths (*Lobesia botrana, Eupoecilia ambiguella*).
- **MANAGEMENT OF REMAINING OR REINTRODUCED VECTOR POPULATIONS**

  Yellow sticky traps should be installed when *S. titanus* L4 – L5 larval stage (mid or end of June) are present in the vineyard. Adult flights are usually observed from July until mid-October depending on the region). Vector monitoring even after 2nd insecticide application is significant for control of remaining vector populations. Implementation of a 3rd treatment is required if adults are observed on yellow sticky traps.
- **MANAGEMENT OF PHYTOPLASMA - INFECTED GRAPEVINE**
  a) Uprooting of singular symptomatic vines with root or extirpation of complete vineyards if more than 20% symptomatic vines are present,
  b) Laboratory analysis of symptomatic vines (potentially FD-infected vines) is essential in areas where FD in not spread yet in order to timely identify and eradicate potential FD introduction
  c) Management of wild vines as potential sources of vector and phytoplasma,
  d) Hot water treatment of planting material in nursery production.



ADDITIONAL INFORMATION ON WINETWORK KNOWLEDGE RESERVOIR

www.winetwork-data.eu

FLAVESCENCE DORÈE

HOW TO PREVENT THE INFECTION

Flavescence dorée is a quarantine grapevine disease indexed on A2 EPPO list, present in numerous winegrowing regions of Europe with a tendency of further spreading.

Planting **certified (healthy) planting material**, preventive **symptoms monitoring** and **vector (*Scaphoideus titanus*) management**, prior **Flavescence dorée introduction is fundamental** in regions where the disease is not spread yet in order to avoid significant economic losses and potentially epidemical disease spread.

ACTIVITIES IN CASE OF PHYTOPLASMA INTRODUCTION :

1. Producers need to contact at least one national or regional institution:
   - Phytosanitary service,
   - Regional advisory service,
   - Research and/or technical institute,
   - Organization of winegrowers.
2. Collection and analysis of grapevine samples for identification of Flavescence dorée phytoplasma.
3. Collective disease management with a priority on disease eradication.

WINETWORK European Knowledge Transfer

This project has received funding from the European Union's Horizon 2020 research and innovation program

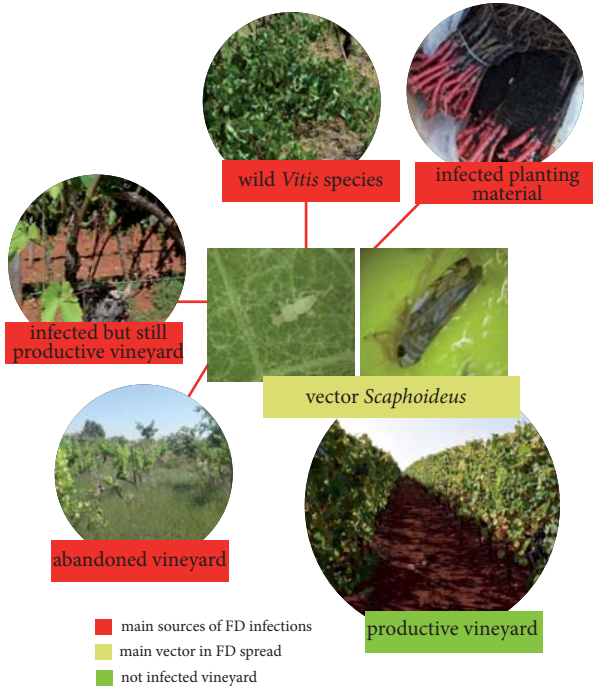
FLAVESCENCE DORÉE DISTRIBUTION

Flavescence dorée (FD) phytoplasma and vector *Scaphoideus titanus* are spread over a large part of the EU winegrowing regions, and have a tendency of further spread in unaffected areas.

FLAVESCENCE DORÉE EPIDEMIOLOGY

Flavescence dorée (FD) is a complex disease that integrates three essential elements present either in a vineyard or in the surrounding environment:

- causal agent – phytoplasma *Ca.* Phytoplasma vitis,
- main insect vector *Scaphoideus titanus* that spreads the phytoplasma,
- main host plants – grapevine species (*Vitis spp.*), that serve as a source of phytoplasma and vector *S. titanus* in epidemical disease spread.



EPIDEMICAL DISEASE OUTBREAKES?

Outbreaks of FD in producing vineyards are related to the presence of **both FDp in grapevine and high populations of vector *S. titanus*.** The insect vector *S. titanus* has a feeding preference for grapevine species. *S. titanus* is present in the vineyard from larval (May) to adult development stage (October) and transmit the FDp by feeding from larval L4 (approximately end of June) until the end of the adult development stage. Current experiences with FD management indicate that **an increase in FD incidence from 10-fold/year up to 40-fold/year** may occur if **no insecticide treatments** for *S. titanus* control and **no uprooting of infected vines** had been implemented.

FLAVESCENCE DORÉE SYMPTOMS

There is not one singular and typical symptom that is always present in FD phytoplasma infection. Moreover, symptoms may vary depending on the grapevine variety. Identification of FD needs to be based on more than one

LEAF SYMPTOMS - WHITE VARIETIES (LEAF DISCOLORATION AND DISTORTION)

LEAF SYMPTOMS – RED VARIETIES (LEAF DISCOLORATION AND DISTORTION)

SYMPTOMS ON INFLORESCENCES AND CLUSTERS (NECROSIS AND DESSICATION)

SYMPTOMS ON FRUITING CANES (GUMOSIS AND LACK OF LIGNIFICATION)