



# The most popular practices in Europe against GTDs

## Result of observations from the field realized in Winetwork project framework

The WINETWORK project has the ambition to stimulate collaborative innovation in the wine sector. Project's approach is mainly based on the interactions between a network of facilitator agents, several regional technical working groups and one European scientific working group. A participatory approach is used to translate results from science and practical knowledge into technical datasheets that are used to prepare materials adapted to end-users. In the WINETWORK project, the approach will be implemented in ten regions from seven countries representing more than 90% of the EU wine production. The main topic addressed in the network concern the control and the fight against diseases that jeopardise the future production potential of the EU: Grapevine Trunk Diseases and Flavescence Dorée. As many winegrowers are testing innovative and sustainable approaches to fight these diseases, it is very beneficial to capture these ideas and to share them between EU countries. Innovative practices will be synthesized, tailored and translated to become fully accessible to innovation support services and to winegrowers. The project will then deliver a vast reservoir of existing scientific and practical knowledge related to sustainable vineyard management.

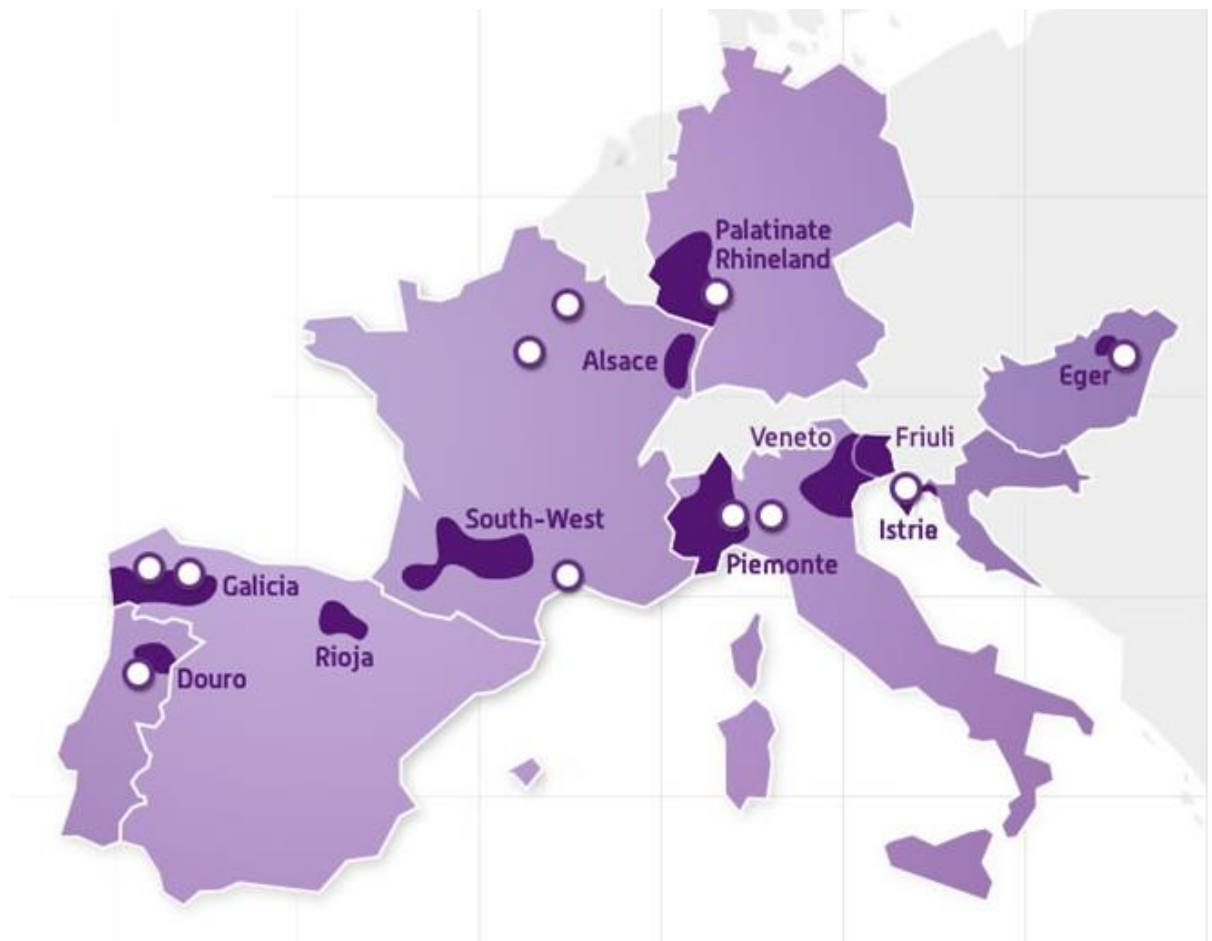
This document is the result of interviews made on field by the facilitator agents with the principal objective to highlight the diversity of techniques used in field. To date, no assessment, no validation or checking efficacy of these practices was made. In the absence of any assessment, their success in different conditions of the ones exposed is not guarantee and the responsibility of Winetwork partners can't be involved.



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The 10 facilitator agents of Winetwork project had the task to collect information from practice and to detect innovation. From december 2015 to May 2016 they collected practical knowledge on GTDs management on field across 10 wine regions of 7 european countries.



219 interviews were realized of winegrowers, technicians, advisors and cooperatives.

- ⇒ What is winegrower's knowledge regarding grapevine trunk diseases ?
- ⇒ What are they doing to control, to limit GTDs ?

The practices showed in this document are not exhaustives and are not representing the whole winegrowers population. This is the result of practices made on field by a sample of winegrowers (from 20 to 30 people according to the region). These people were previously selected for their good knowledge level and for their dynamism in field to implement methods to reduce GTDs incidence. The most popular ones and some atypical practices that have no scientific validation nor scientific basis are presented here.

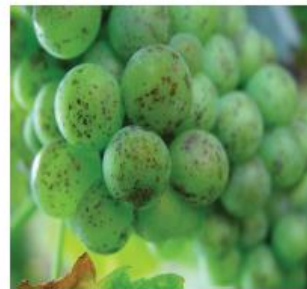


What diseases are we talking about ?

## Esca



Symptoms on leaves



Symptom on berries



Internal symptom

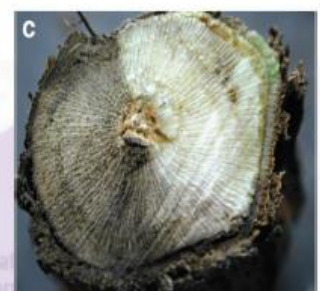
## Botryosphaeria dieback



Symptoms on leaves



External brown strip



Internal symptom

## Eutypa dieback



We focused knowledge gathering on 3 diseases Esca, Eutypa and botryosphaeria dieback. These diseases lead in short or long term to the death of grapevine. As no solution is existing since sodium arsenite's prohibition, people in field are implementing/testing methods to limit their incidence.

- Practices to replace dead vines
- Practices to repair diseased vines
- Prophylaxis measures
- Practices of protection of pruning wounds
- Atypical practices

- Uprooting of dead vine and planting a new one

A map of Europe showing the distribution of wine regions. The regions are highlighted in yellow and labeled: Douro, Galicia, Rioja, South-West, Alsace, Palatinate hineland, Veneto, Friuli, Eger, and Istria. The map also shows the outlines of major European countries.



Other practices : « Marcottage » layering plantaton.

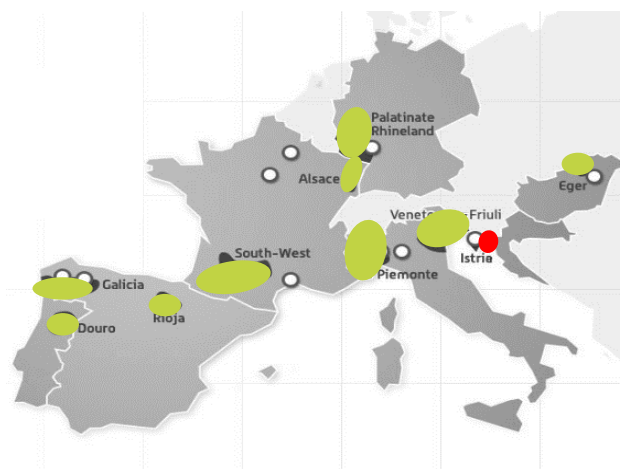




## 2- Practices to repare diseased vines

### ▪ Trunk renewal

Trunk renewal can be done when grapevine is dying or as soon as symptoms appears or in prevention. The trunk has to be cut below the necrosis. The success of this method is linked to cultivar, to the disease and to the region. For Eutypa dieback, trunk renewal has good results.



### ▪ Over-grafting

If rootstock is healthy the new grafting will work, if not, it doesn't work. The diseased vines need to be marked during pruning, then in May, when the plant is ready for grafting the diseased trunk is cut and a new healthy scions is inserted in the healthy rootstock. The best is to do it as first symptoms appears.

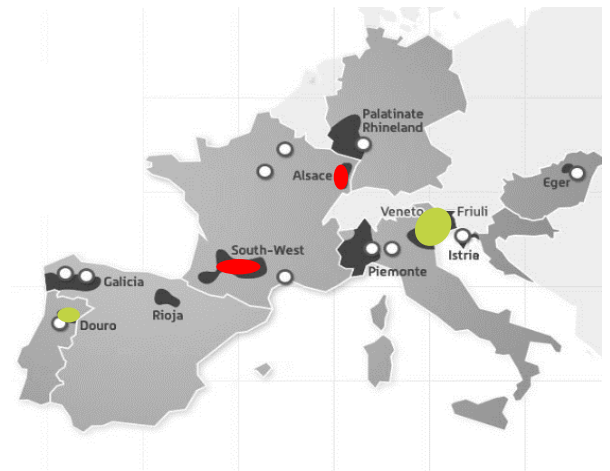


Problems encountered: time consuming : mark diseased vines, prepare the grapevine for the grafting, cut the trunk, prepare the scions, graft the scions, take-off shoots but low cost.



### ▪ Trunk cleaning

Trunk cleaning consists in digging in the trunk to remove grapevine diseased parts. They are often localized close to dead wood zones and below big pruning wounds. First, the trunk need to be open where dead wood has been detected. Once diseased parts (white rot) are detected, tissues need to be removed by scraping using the side of the chainsaw in the grapevine axe and taking care to not cutting sap flow.



Trunk cleaning can happen as soon as first symptoms appears when leaf are desiccating between June and September. If realized in June trunk cleaning allow to save the harvest of the current year.





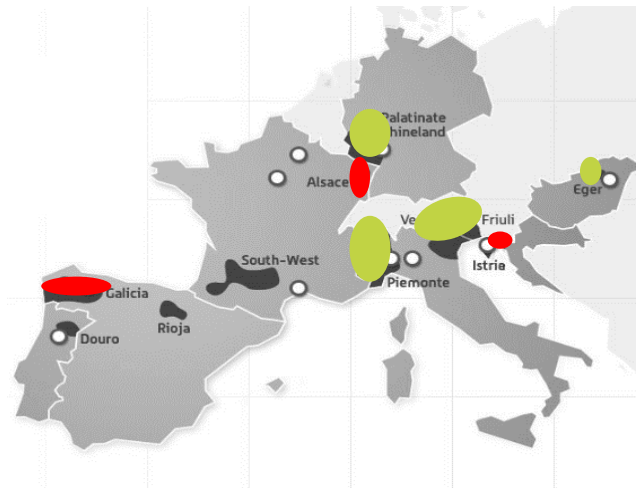
### 3- Prophylaxis measures

Prophylaxis measures will limit contamination at the vineyard by grapevine trunk diseases' pathogens (*Eutypa lata*, *Phaeomoniella chlamydospora*, *Phaeoacremonium minimum*, *Botryosphaeriaceae*...), it is a combination of several measures.

#### ▪ Inoculum reduction

By exporting dead vines (worldwide used), and by cutting symptomatic shoots (marginal).

All winegrowers interviewed are exporting the dead vines from the vine-plot. Sometimes with a timing more or less long. Some winegrowers are also composting the pruning debris and after use it on field. Most of winegrowers interviewed crushed the pruning debris and incorporate it in soil.



A less used practice is cutting the symptomatic shoot as soon as first symptoms are visibles.



Dead wood is a source of inoculum. These actions allow to reduce contamination risks.

Not use dead vine as stake

#### ▪ Pruning period

Two pruning periods : early pruning or late pruning. Winegrowers choose the pruning period according to risk of contamination by pathogen and to the cultivar.

It is difficult to implement when salarieds are pruning due to human constraint. Furthermore, pruning period is limited to climatic condition. It is not easy to prune in always good conditions. Relating to pruning, it has been also noticed that some people are pruning separately the diseased vines from the healthy ones.



Better to prune in dry time, because of the different pruning susceptibility to GTDs infections according to climate.





- **Alternative guyot pruning**

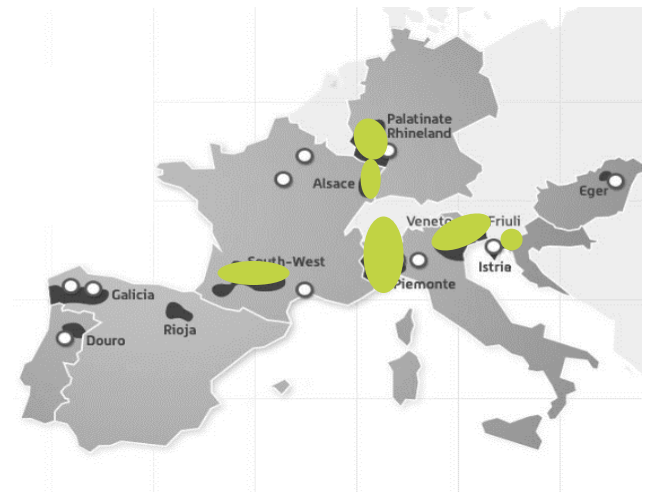
This type of pruning respects sap flux and consists in pruning in order to locate all pruning wounds on the upper part of the shoot allowing a continuous flow of sap.

This practice is used mostly in France, Italy, Germany, Croatia and Hungary.



To date, there is no scientific validated information on this type of pruning and its effect on GTDs.

Experimentations on this method are in process.







#### 4- Practices of protection of pruning wounds

- **Painting pruning wounds**

A popular practice but used by a decreasing number of winegrowers due to time consuming and uncertain effect of these mastic. The mastic form a physical barrier to prevent pathogens to enter pruning wounds.

Nevertheless it is still well used to protect the trunk after trunk renewal.



- **Biological protection by spraying biocontrol agent (mostly *Trichoderma* spp.)**

*Trichoderma* species colonise the pruning wounds and prevent GTDs pathogens to enter. Need to be applied every year to protect every wounds.

Application need to be done quickly after pruning and spraying need to be locate on the wounds zone.

The effect of BCA is depending on climatic conditions and efficacy is variable according to trichoderma strains. Winegrowers does not identy a clear efficacy of *Trichoderma* The sooner is the application the better.



Variability in the bio-control effect, due to environmental factors but also to plant-BCA interactions.



## 5- Atypical practices

### ▪ H2O2 injection

Several methods used by winegrowers :

- As soon as first foliar symptoms appears
- Right after pruning

Drill hole (one or more according to the technique) in the trunk (35-40° inclination), and inject H2O2 (around 3-4 ml). Reseal eventually.

A lot of questions on this practice! How many holes, where to drill? What quantity to inject and so on...

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Injections appears promising for winegrowers using this technique and according to them, the treated plants does not express symptoms anymore.

To date, we don't have any scientific information on this technique.



### ▪ Introduction of small wood sticks inoculated with Trichoderma into the trunk.



Used in Galicia (Spain) in a vines having esca and eutypa symptoms.

The practice consists in the introduction into the trunk of sticks innoculated with *Trichoderma*. Holes are made with a driller in the base and on the arms of the vine.

Good results on field.

Tests conducted in the past were not sucessfull, we still need more scientific information and more experimentation.





- Soaking plants into a fungicide solution

Grafted plants and scions immersion in a fungicide solution for about 50 minutes before planting. Winegrowers applying this technics present good results in control of GTDs pathogen complex. This technique is test by a winegrower from douro region (Portugal).

Warning : the fungicides used here are not approved for this used, not authorised for GTDs.

**A scientific trial on this technic is in process, results will coming soon.**



A lot of Information on GTDs will be available on Knowledge reservoir

- Scientific information
- Practical information
- Winetwork outputs

[www.winetwork.eu](http://www.winetwork.eu)

