

Climate change effects on *Plasmopara viticola* incidence in vineyards

Introduction

Background

Plasmopara viticola (Berk. & Curt.) is a biotrophic parasite from the Oomycetes family which causes the Downy mildew disease that provokes great harvest losses

It was first detected in Catalonia in 1880.

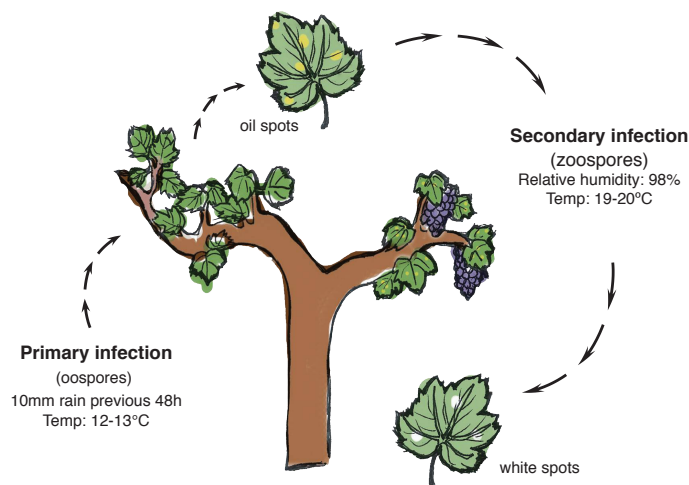
To avoid the Downy mildew disease preventive treatments are done.

Climate change is one of the worst problems of the 21st century. Pathogens have a great impact on global agriculture and climate change may aggravate the situation. (Gautam, 2013)

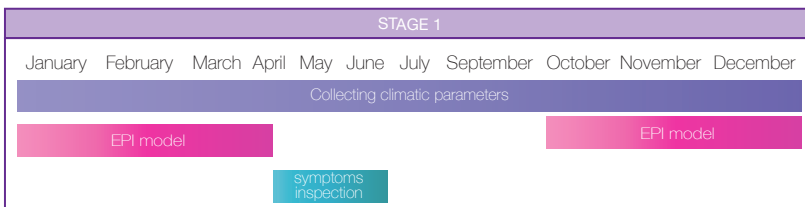
Hypothesis: Temperature will accelerate *P.viticola* life cycle and benefit its development.

Objective: Study the effects of climate change on *Plasmopara viticola* epidemics in Catalonia

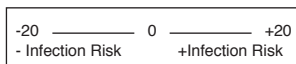
Cycle of life and climatic conditions



Methodology



2 EPI model: Downy mildew disease pressure measurement according to meteorological data (temperature and precipitation) from October to March (Reyes & Barrero, 2014). Weather conditions affect oospores maturation.

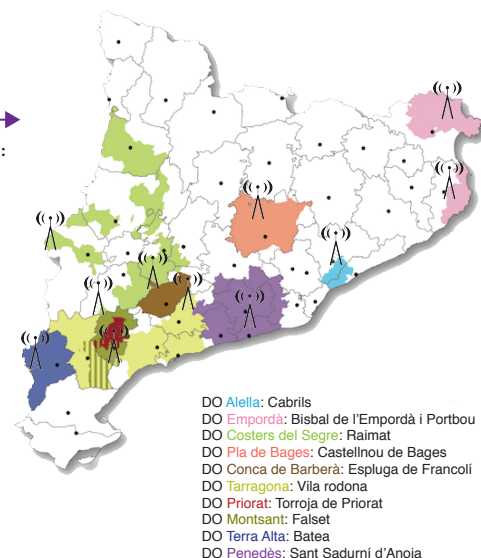


3 Early symptoms inspection: EPI model and meteorological data results help to know how the infection will occur.

inspections during:
end of April & May - early June. Every 5 - 10 days

Once symptoms are detected: Symptomatic clusters will be placed in a moist chamber to induce sporulation in order to confirm *P.viticola*'s presence. (Kenelly *et al.*, 2007)

1 Climatic Parameters:
Daily T°
Daily precipitation
Relative humidity
Humectation hours

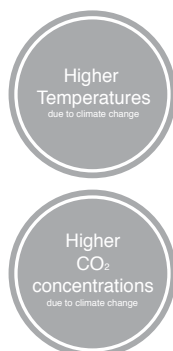


1 Critical path analysis (CPA): In order to know which weather parameters explain more the primary infection.

2 Catalonia's risk infection map: This map will be done according to T°, precipitation and the result of EPI model. Reclassification in 4 risk categories with SIG Miramon.

3 Catalonia's risk infection in future scenarios: Will be made with regional climate models for Spain. Scenarios A2 & B2.

Results & Discussion



accelerate oospores germination
(Salinari *et al.*, 2006)

change pathogen life cycle and increase pathogen fecundity
(Chakraborty, S. (2009))

Potential increase of *P.viticola* in the viticulture (Salinari *et al.*, 2006).

Premature infection in May.

More attention should be paid to the management of the Downy mildew

Future Improvements

High resolution climate change data for Catalonia isn't available nowadays.

This data is still in creation progress.
(A. Barrera-Escoda & J. Cunillera, 2011).

Using high resolution data for Catalonia will be an important improvement because the results will be more confident.