



# How to cultivate grape without pesticide, the VITAE project

François Delmotte, Hervé Hannin

## ► To cite this version:

François Delmotte, Hervé Hannin. How to cultivate grape without pesticide, the VITAE project. Montpellier Vine & Wine sciences - International seminar: Sharing knowledge & designing research programs to address key challenges of the vine-wine sector, MUSE Montpellier Université d'Excellence; Université de Montpellier (UM); INRAE - Institut national de recherche pour l'agriculture, l'alimentation et l'environnement; L'Institut Agro Montpellier, Oct 2022, Montpellier, France. pp.16-16. hal-03869054

**HAL Id: hal-03869054**

**<https://hal.inrae.fr/hal-03869054>**

Submitted on 24 Nov 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

OCTOBER 11-12-13, 2022 MONTPELLIER

# MONTPELLIER VINE & WINE SCIENCES INTERNATIONAL SEMINAR

Sharing Knowledge & Designing Research  
Programs to Address Key Challenges  
Of the Vine-Wine Sector



**MUSE**  
MONTPELLIER UNIVERSITY OF EXCELLENCE

KEY INITIATIVE  
MONTPELLIER  
VINE & WINE  
SCIENCES



**INRAE**  
la science pour la vie, l'humain, la terre

**L'INSTITUT  
agro Montpellier**



# SEMINAR PROCEEDINGS

# Table of contents

INTRODUCTION .....	5
CONFERENCES .....	6
Climate Change: adaptation and mitigation .....	7
A global overview on adaptive strategy to climate change of the wine industry.....	8
Characterization of genomic diversity in Vitis.....	9
Genetic diversity of the local criolla germplasm and adaptation strategies to a changing environment in Chile .....	10
Temperature dynamics and impact on cold hardiness, deacclimation, and budbreak phenology ..	11
Breeding of drought tolerant cultivars.....	12
Integrated grape-to-wine studies to evaluate adaptation and resilience of grapevine scion / rootstocks to water limitation.....	13
Reduction of inputs .....	14
Microbiological approaches to reduce bentonite requirements.....	15
How to cultivate grape without pesticide, the VITAE project.....	16
Developing a satellite image-based sampling protocol for leaf blade nutrient monitoring in vineyards .....	17
Tools to discover resistance phenotypes and haplotypes in diverse germplasm.....	18
Reducing inputs, adapting to climate change and supporting the agro-ecological transition of grapevine systems through biodiversity management.....	19
Building quality.....	20
Building authenticity in the wine sector: a narrative analysis of newcomers' stories.....	21
Varietal thiols: from vine to wine.....	22
Enzyme treatment enhances astringency through decreasing polysaccharide and increasing polyphenolic content in Cabernet Sauvignon wines.....	23
Interplay of water deficit and grape berry chemical composition.....	24
Metabolic QTL analysis for characterisation of the genetic potential of grapevine flavour formation .....	25
Phenolic compounds, from grape to wine .....	26
Biodiversity, microbiomes and ecosystems .....	27
Conserving biodiversity and ecosystem services in vineyards through agroecology .....	28
Microbial interactions between grapevine pathogens and the leaf microbiome.....	29
Microbial flux from grape to wine.....	30
Effects of regenerative management on vineyard soil biodiversity and climate change mitigation	31
Inter-row cover crop applications and their influence in the soil microbiome .....	32
Ecological patterns and molecular signatures in fermentation ecosystems.....	33

POSTERS .....	34
New plant biopolymers for the colloidal stability of the coloring matter of red wines.....	35
Selected Ion Flow Tube Mass Spectrometry: a promising technology for the high throughput phenotyping of grape berry volatilome .....	36
Impact of VvTPS24 genetics on farnesyl pyrophosphate bonding and production of $\alpha$ -guaiene, the rotundone direct precursor.....	37
The impact of <i>Saccharomyces</i> yeasts on wine varietal aroma, wine aging and wine longevity.....	38
Soil and climate zoning determining grapevine resource yield-gaps in Languedoc-Roussillon vineyards .....	39
Investigating the conceptualization and practices linked to peppery notes in Syrah red wines by French winemakers from different regions .....	40
Impact of different commercial <i>Saccharomyces cerevisiae</i> strains in Savatiano wines harvested at two ripening stages .....	41
Volatile and phenolic composition of Agiorgitiko wines from fifteen different regions of PDO Nemea zone.....	42
Exploring the microbiota of resistant varieties in organic farming.....	43
Diffusion of phenolic compounds during a model maceration in winemaking: role of skins, flesh, and seeds.....	44
Characterising innovations and sustainability in wine firms. An exploratory study of French wine industry.....	45
LiDAR, a tool to inform sits-specific spraying: Application in a New York Concord grape production area.....	46
New glutathionylated precursors of polyfunctional thiols in grapes: focus on Chardonnay and white interspecific cultivars grown in Belgium .....	47
Potential of N-CovSel for variable selection: a case study on time-series of multispectral images .	48
PARTICIPANTS.....	49

# INTRODUCTION

In cooperation with scientists from USA (University of California Davis, Cornell University), South Africa (Stellenbosch University) and Chile (Universidad de Chile, INIA La Platina), the Key Initiative (KIM) **Montpellier Vine & Wine Sciences**, supported by the University of Montpellier, and its partners INRAE and Institut Agro Montpellier, organized a 3-days scientific seminar on the campus Institut Agro-INRAE of Montpellier in October 2022.

This event, which follows the remote seminar organized in June 2021, brought together involved world-class scientific speakers from local and international institutions with the aim of sharing knowledge to design cooperative research programs tackling some of the current challenges of the wine industry.

One hundred and twenty scientists and staffs from fourteen countries participated in conferences and workshops, organized around four key topics:

- Adaptation and mitigation of climate change issues;
- Reduction of chemical inputs;
- Building wine quality;
- Biodiversity, microbiomes and ecosystems.

Several initiatives were formalized to combine international expertise and construct international research partnerships.

# CONFERENCES

# **Climate Change: adaptation and mitigation**



## **How to cultivate grape without pesticide, the VITAE project**

François DELMOTTE, UMR Santé et Agroécologie du Vignoble, INRAE, France

Hervé HANNIN, UMR MOISA, Institut Agro Montpellier, France

francois.delmotte@inrae.fr

herve.hannin@supagro.fr

Growing vine without chemical pesticides is a big challenge for this emblematic crop. Eliminating pesticides requires multiple management solutions – biological regulation, plant immunity stimulation, genetic resistance, for example – each of which yields only partial effects. The goal is to move to an agroecological approach based on prophylaxis, monitoring and better resilience of winegrowing systems. These control methods must be integrated into new protection strategies that maximize their combined effects while adapting them to local environmental factors, socio-economical contexts, and market issues.

VITAE is an interdisciplinary project that adopt a pesticide-free paradigm to address economic and technological conditions that will favor the transition in winegrowing systems. Founded by the National Research Agency (3 M€, 2021-2026), research fronts addressed in Vitae are related to four strategies: (1) mobilizing microbiota and diversifying biocontrol strategies, (2) broadening the scope of grape breeding towards durable resistance (3) redesigning cropping systems to enhance prophylaxis and biodiversity (4) elaborating the structural alternatives and economic/regulatory incentives that will support the transition. VITAE also carries out foresight studies with stakeholders to generate scenarios for pesticide-free vine growing at the regional level. These scenarios will help organizations and policy makers to implement pesticide-free strategies with appropriate incentive programs.