The SUDOE "VINOVERT" project: Potential of pesticide use reduction in three South-West European vineyards regions

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INTRODUCTION

Consumer preferences may tend to select wines characterized by lower rates of chemical use (organic wines, zero-residue wines ...). Meanwhile, regulations for pesticide use are becoming more restrictive. These changes represent a challenge for European wine producers for their practices and competitiveness in a global market. **VINOVERT (http://vinovert.eu/en/) is an innovative EU project integrating several disciplines: Experimental Economy, Sociology, Agronomy, Chemistry & Pathology**. It will investigate potential long-term solutions for improving the control of major pests and diseases (resistant grapevine varieties; WP1), mid-term solutions with pesticide use reduction and IPM or organic practices (WP2) and short-term solutions for reduction of oenological sulphites (WP3). Lastly experimental-economy experiments will be carried out in order to reveal the willingness to pay of consumers according to the different wines produced. (NB: first 2017 results from Galicia are not presented here.)

OBJECTIVES & HIGHLIGHTS

- Transdisciplinary EU project evaluating possibilities to reduce pesticide use in viticulture & oenology in France & Spain by comparing low- *versus* high-input pesticide strategies
- Multi-pests incidences, pesticide application rates, and other indicators are developed and assessed to analyze effects on wine quality and consumer willingness to pay

MATERIALS AND METHODS

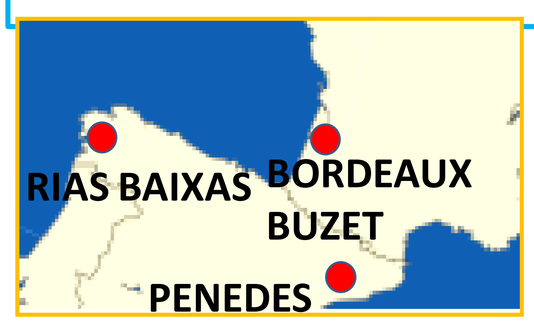
Network of 30 commercial vineyard plots monitored during 2 seasons in 3 grapevine growing regions in South West Europe:

i) **Rias Baixas (Galicia**, Spain) with Atlantic climate conditions
ii) **Penedés (Catalonia**, Spain) with Mediterranean climate
iii) **Bordeaux region in SW France** (Nouvelle Aquitaine)

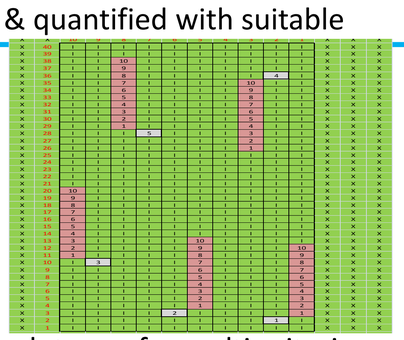
One cv. per area: Albariño, Tempranillo & Merlot, respectively.

Vineyards managed only by the local growers and associated in pairs, *i.e*. **plot couples, in which 2 plots are very close and similar (same slope, age, training & pruning systems...). However, the 2 plots differ by the level of pesticide use: high use (conventional) *vs*. low use (IPM or organic).**

The grower practices, diseases/pests rates, and yield parameters will be recorded & quantified with suitable indicators. Standardized micro-vinifications will be made from the selected plot pairs. The wines will be checked for chemical/oenological quality , pesticide residue levels...



Example of high pesticide plot, Bordeaux



Intra-plot map for multi-criteria monitoring

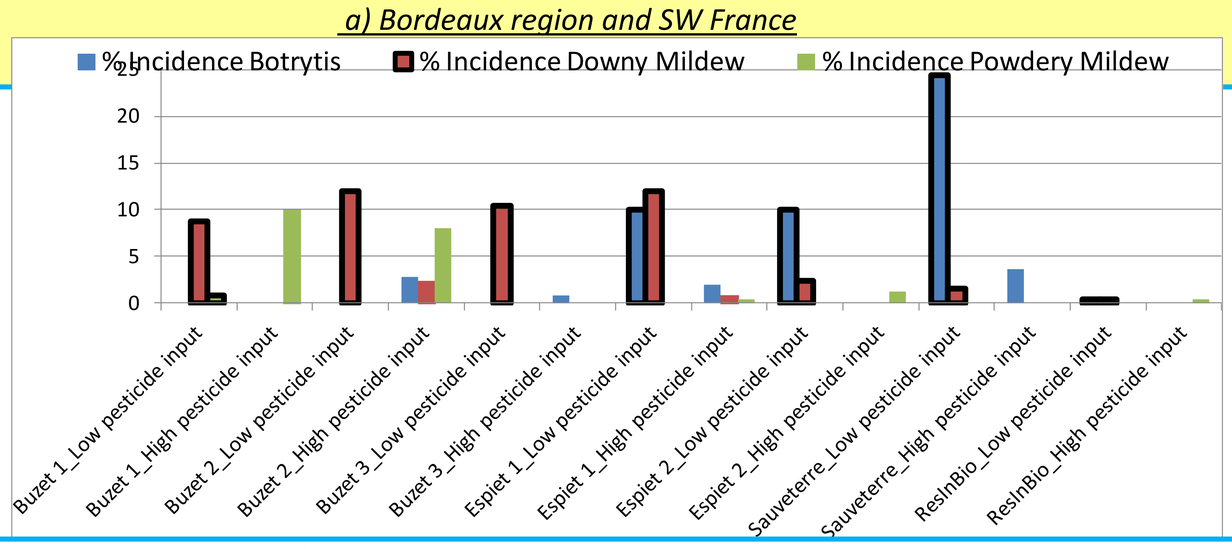
PLOT COUPLE NAME	TFI (pesticide input)	CERTIFICATION	VERAISON	HARVEST
Buzet 1	LOW	Conventional	25/07 - 10% veraison	5/09 Mechanical
	HIGH	Conventional	25/07 - 20% veraison	5/09 Mechanical
Buzet 2	LOW	Conventional	25/07 - 10% veraison	4/09 Mechanical
	HIGH	Conventional	25/07 - 5% veraison	4/09 Mechanical
Buzet 3	LOW	Conventional	26/07 - 10% veraison	5/09 Mechanical
	HIGH	Conventional	26/07 - 15% veraison	5/09 Mechanical
Espiet 1	LOW	ORGANIC	27/07 - 1% veraison	13/09 Mechanical
	HIGH	Conventional	27/07 - 0% veraison	13/09 Hand-made
Espiet 2	LOW	ORGANIC	27/07 - 1% veraison	13/09 Mechanical
	HIGH	Conventional	27/07 - 50% veraison	24/09 Mechanical
Sauveterre	LOW	Conventional	27/07 - 15% veraison	28/08 Mechanical
	HIGH	Conventional	27/07 - 5% veraison	28/08 Mechanical
ResInBio	LOW	ORGANIC	28/07 - 80% veraison	20/09 Hand-made
	HIGH	Conventional	28/07 - 70% veraison	20/09 Hand-made

Example in SW France of the 2017 plot network

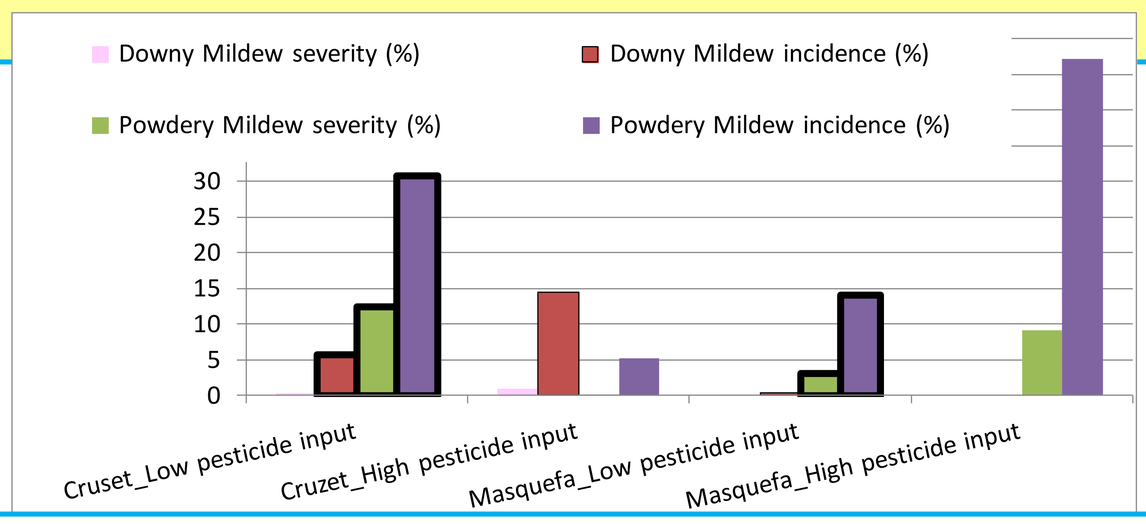
FIRST RESULTS

Example of data from multi-pests assessments at PreVeraison :

a) Bordeaux region and SW France



b) Catalonia, Spain (4 vineyard plots presented out of 8 studied)



The multipest assessments (incidence & severity) are carried out at three key phenological stages in the season: flowering, pre-véraison (results shown above) and at harvest.

From this data, the "AIDB+" indicator will be calculated as AIDB "Assessment Index of Damage in Bunches" previously published (Fermaud et al. 2016 Austral. J. Grape Wine Res., 22, 450).

The AIDB+ will integrate cumulative damage in fruit of major pests and diseases: powdery and downy mildews, Botrytis bunch rot, gape berry moth, black rot and grape trunk diseases.

FURTHER RESULTS AND FOLLOWING STEPS

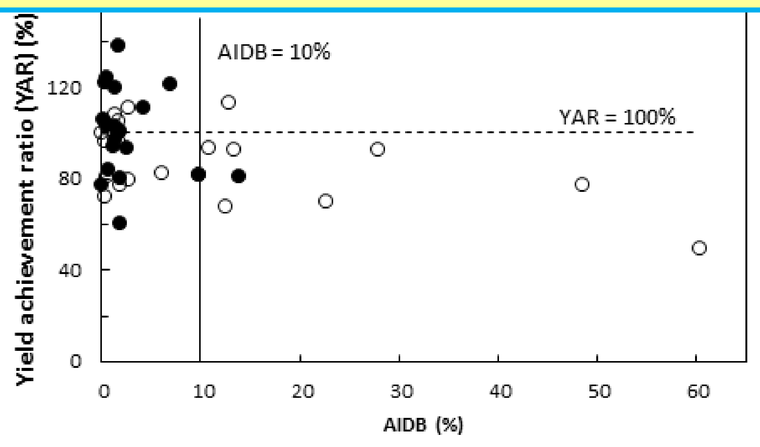
Production Cost Index: a general cost analysis of the vineyard production for every plot studied will be carried out (FADN guidelines: Farm Accountancy Data Network)

In addition, other indicators validated will be also used:

Treatment Frequency Index (TFI) designed to record the intensity of use of phytosanitary products (http://agriculture.gouv.fr/sites/minagri/files/ift_manuel_v1_octobre_2015.pdf). It integrates the number of registred pesticide doses per hectare during a growing season for groups of pesticides: herbicides, fungicides, insecticides/acaricides.

Yield components analysis will also be carried out to establish relationships between the diseases/pests levels and the yield achievement ratio (see Fig. hereunder with the AIDB indicator)

Measurement standardized protocols, field evaluations and wine-making processes using harvested grapes from every plot have been or are currently being conducted in 2017. Significant differences between plots, in the same pair, according to some of the different major indicators used, are expected.



Fermaud et al. 2016 Austral. J. Grape Wine Res., 22, 450