

Interview with Mr.Nicolas Aveline

Position: Engineer

Institution: French Institute for Grapevine and Wine - ResaQ Vitibio

Subject : Grapevine protection

Eager to have further information on the use of organisms to protect crops and especially grapevines, we decided to contact the French Institute for Grapevine and Wine. We left a message on their websites and Mr.Nicolas Aveline kindly answered us. We then had a telephonic meeting with him to ask him questions about our project, biocontrol, and what products/techniques are used on grapevines in general.

-What phytosanitary product do you use on your grapevines and can we assess how they will interact with our microorganism?

We use fungicides regularly. To assess the impact of these product you can use tools to measure presence of microorganisms on the plant. Botector, our product, has indeed a compatibility list with existing products.

-You applied kaolinite (clay) on your fields to treat *Empoasca vitis*. We think about using a mineral element such as calcium carbonate to make a biocoat against sunlight. What is your opinion on this strategy?

Mineral products are generally washed off by 20mm of cumulative rainfall. Talc stays usually longer. These products are eliminated during settling (Editor's note : precipitation of sediments during winemaking).

Talc has actually been used by the company Compo to avoid sunlight damages. Other strategies such as taking the leaves off in summer to create a less moist microclimate and avoid fungal diseases are also employed.

-How are microorganisms sprayed on crops usually? What do you think about tunnel sprayers?

We use wettable powders (Editor's note : see "Foliar Application" report for more details). These are powders that are put in solution just before the application. Tunnel sprayers permit to limit drifting and limit product loss, so they are very interesting.

-In Biocontrol, do you measure the impact of the sprayed organism on the plant microbiota? Do you take measures to wash away the organisms for wine making? How can you control the impact of the organism on wine taste?

We don't have reliable methods right now to anticipate the impact of our organisms on the plant microbiota. However microorganisms are totally destroyed during winemaking, as they are totally outcompeted by yeasts.

You can do wine taste test with micro winemaking processes as compared with a control.

-You used a product called Armicrab with which you modified the pH of the phylloelma (free water at the surface of leaves) to counter *Botryotinia fuckeliana*, did you measure the impact of such change on the plant microbiota?

On the grapes, the product indeed did damages and induced huge problems. The product is still on the market however. The Agricultural Chamber is in charge of the test of the impact of the products. Note that we use more and more yeasts that are already located on the grape.

-How is being controlled contamination of soil and water by your organisms?

We clearly see that there is contamination of these environments but it is difficult to evaluate since the organisms we use are already ubiquitous. We could use Metabarcoding on the grapevines however, and the INRA is using indigenous organisms.

-We noticed that you used adjuvants,, which one would you recommend for our project?

We don't use adjuvants for biocontrol directly, but the INRA uses fatty acids with their bacteria.

-What chassis would you recommend for our project?

You should look upon *Bacillus subtilis*, *Bacillus amyloliquefaciens*, *Aureobasidium pullulans* and *Bacillus thuringiensis*.

-Can we measure how much time our organism will stay on the target plant?

Yes but it is difficult. You can make sample, rinse them and incubate the collected organisms on petri dishes to identify them and see if you find your organism. The Bordeaux University does that on grapes but have few results.

-To test our product in open fields, would we use the same techniques as yours with *Botryotinia fuckeliana*?

Yes, these are called CEB 143 methods, there are two types, one with dozens of ranks, the other with 4x10 fields with backpack sprayer and under close control. You can then ask the

farmer to use your product on larger fields. You should know that GMOs are strictly restricted in France though.

-Any other remarks?

Even though GMOs are very restricted in France, I think your project is done the best year since frost damages have recently been atrocious for vineyards near Bordeaux.

Thanks to Mr. Nicolas Aveline for his very interesting answers and his time !

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