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HAL Id: hal-04687412
https://hal.inrae.fr/hal-04687412v1

Submitted on 4 Sep 2024

TOWARDS STOPPING PESTICIDES USE IN VINEYARD: CHARACTERIZATION OF ON-FARM SOLUTIONS

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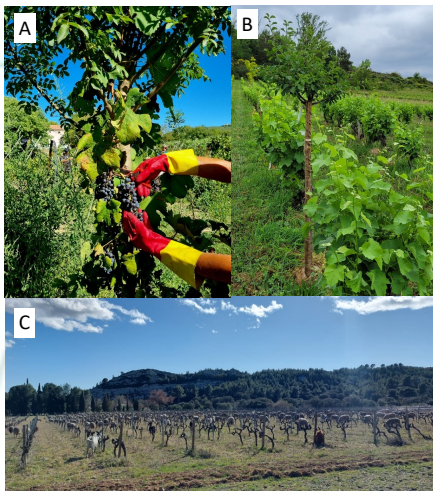*Corresponding author: anne.merot@inrae.fr

Figure 1: Vitiforestry (A,B) and sheep grazing (C) in vineyards

Context and purpose of the project

Changes in vineyards are necessary in order to stop using pesticides, and thus limit their harmful impacts on health and on environment. To address these issues, the VITAE project (2021-2026) aims at assessing and designing pesticide-free viticulture in France.

In this work, we characterized the functioning of existing commercial vineyards that have already adopted strategies strongly reducing chemical pesticide but also biopesticides. We assume that such vineyards are implementing solutions that could inspire the design of future pesticide-free systems.

A national plot network

We set up a network of 14 commercial plots spread across the six main French wine-regions (Figures 1 and 2). Plots were selected on their environmental performance only so that they covered a wide diversity of production contexts.

Figure 2: National vineyard network

An interdisciplinary protocol

Each plot was monitored during three years using an interdisciplinary protocol (Figure 1) that consisted in the characterization of all the compartments of the vineyard that influences the systemic pest and disease management: vine, cultivated associated vegetation in the plots mainly in the inter-row and under the row, pest and disease pressure, natural associated vegetation in the plot and in the surroundings, pests and diseases, soil and microbiota. We also monitored vineyard performances in quantity (yield) and quality.
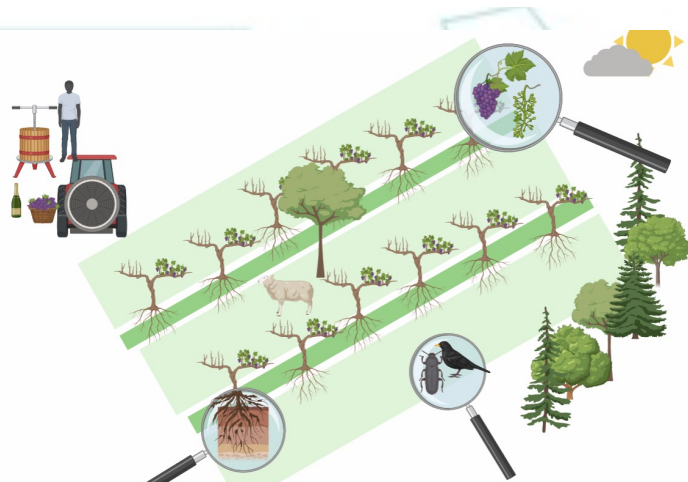
First results in 2023

The first results showed an important diversity among the plots on most of the indicators monitored. This year, vineyards faced high downy mildew pressure with important yield loss reported in half of the wine-growing regions. This particular context affected the strategy of disease control in the network. The agronomic performance (yield, grape quality) was reached for 9/14 plots. 11/14 plots presented a voluminous vegetation in the inter-row. Soil structure, represented by aggregate stability, complied with standard.

Perspectives : Building interdisciplinary analyses

A framework for the analysis is being built collectively to further analyze the results over the 14 cases studies and over the three years of observation. This framework will relate hypothesis on the levers and indicators measured for 4 identified families of processes (create unfavorable conditions for disease development, reinforce vine natural defense, favor biological regulation, manage treatments with low-toxicity products) to drastically limit pesticides.

Figure 3: characterization of unconventional agroecological vineyards

ID 60