

GASCOGN'INNOV - Diagnosis of soil quality and evaluation of the impact of viticultural practices on soil biodiversity

Short description of the OG

Soil quality is seen as a lever to move towards more sustainable viticulture but is little considered in the implementation of viticultural practices. The Gascogn'Innov project aims to acquire technical knowledge about the impact of viticultural practices on soil biology in a dynamic way through a participative approach involving farmers, researchers and advisors. In the framework of the project, a methodology was implemented to integrate information provided by the soil bioindicators to manage farming systems.

Benefits

The main added ecological value for the farmer addressed by the OG: acquisition of knowledge so that farmers can perform soil quality diagnoses themselves; improved soil fertility; better understanding of the soil's overall functioning and the impact of their practices on it. Bio-indicators of soil quality should be included as part of sustainable crop management practices.

Stage of implementation

GASCOGN'INNOV has ended (2017–2022).

Key Data Box

Theme

Soil health – biodiversity – cover crop/green manure

Context

Geographical coverage: south of France, Gascony context (near Toulouse)
Soil specification: several test plots with different soil types

Duration

5 years (2017-2022), 3 stages:
2017: Initial soil diagnosis on 13 vineyard plots
2018: Redesign of viticultural system in collaboration with winegrowers and an interdisciplinary group of experts (agronomists, biologists)
2021: Final diagnosis on 23 plots (redesigned system vs control)

Partners involved:

Independent winegrowers, cooperatives, farmers associations, chamber of agriculture, technical institute, Interdisciplinary Expert Group

Budget:

416 970,00€

Main achieved or expected results

- **At the wine grower level:** detailed characterization of the biological functioning of the soil in each plot and its evolution over time. Linkage to the cropping system.
- **At the OG level:** creation of a **regional viticultural soil quality database** that allows positioning in relation to national reference systems.
- **Evaluation of the effect of practices on soil biology according to soil types, thanks to a set of indicators.**

A set of soil biological quality indicators has been evaluated: microorganisms (abundance and diversity of bacteria and fungi), fauna (abundance and diversity of nematodes and earthworms), physico-chemical characteristics, soil structure assessment and degradation rate of organic matter. Based on a network of 13 plots that were subject to an initial diagnosis in 2017, several

agronomical practices to restore soil fertility were tested to redesign the cropping system (e.g., plant cover, organic matter inputs, reduction of herbicides, mineral fertilizers). System redesign was done in collaboration between winegrowers and an interdisciplinary group of experts (agronomists, biologists). Several indicators were measured on vine and soil at each vintage to assess vine health and productivity. One of the observed results: **decreasing the intensity of tillage and increasing the duration and diversity of grass coverage tends to increase the abundance of all the organisms studied.**

Figure 1. One of the indicators implemented to evaluate the population status of the soil: earthworm count





Figure 2. One of the indicators implemented to measure the organic matter degradation rate of the soil: litterbag

Related materials

Videos

-  Congress – 6° Assises des Vins du Sud-Ouest: <https://www.youtube.com/watch?v=k8DWvdVZObA&t=9s> (YouTube subtitles available)
-  OG presentation: https://www.youtube.com/watch?v=tjUNi5bhgpl&ab_channel=CLIMED-FRUIT

Web links

-  Symposium proceedings – 6° Assises des Vins du Sud-Ouest: <https://www.vignevin-occitanie.com/wp-content/uploads/2022/05/gascogn-innov.pdf>
-  Poster – TERCLIM International Terroir Congress: <https://ives-openscience.eu/12910/>

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Project website:

<https://climed-fruit.eu/>
(no Gascogn’Innov website)

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