M2 student internship

REVERSE: REVitalization of vinEyard soils by innovative pRactices and Solutions to support the agroEcological transition

The basis of agroecology is to move towards more sustainable production systems by making the best use of nature's goods and services (thus not damaging natural resources) to produce food. In viticulture, farmers have been suffering for a few years from (i) a depreciation of their profession, and (ii) a decrease in their yields which can be explained by a general syndrome of "soil fatigue", and especially the soil contamination in copper. While farmers are looking for innovative practices and solutions to improve the quality of their soil, scientists have to assess the consequences of these innovative "alternative" practices on physico-chemical and biological characteristics of the soils. Working together, farmers and scientists can propose innovative solutions to boost soil vitality and fertility, and to participate in the agroecological transition.

This internship project is at the interface of territorial socio-economic and scientific issues (interdisciplinary project) on the biological quality of vineyard soils. It proposes to participate in their 'revitalization' using practices that are either known but little used in viticulture (massive field application of organic wastes), or innovative (introduction of earthworms) to boost soil biological interactions.

The research questions are the following:

1. What are the modifications linked to massive and repeated applications of green waste composts on the properties of vineyard soils and the functions they provide (e.g., production, biodiversity, water regulation)?

2. Can the inoculation of earthworms adapted to the Mediterranean pedoclimate be seen as an innovative solution to accelerate the revitalization at work when composts are added?

This project will create strong links with regional agricultural partners invested in the development of new techniques for the sustainable improvement of their production and the well-being of the wine sector. From a scientific point of view, it will make it possible to develop new tools for revitalizing vineyard soils and to monitor changes in soil physical and biological quality.

The originality and innovative aspects of this internship subject is based on (i) the co-construction of a research subject with a network of winegrowers engaged in alternative practices, (ii) the use of ecological engineering to improve production systems of importance on a regional scale, and (iii) the consideration of the soil and its quality as potential agronomical solutions in viticulture.

During the internship, the student will acquire skills in agroecology, soil biology, ecological engineering, and functional ecology. Its activities will be to:

- Participate in the field campaign to sample soil micro-, meso-, and macroorganisms, and to measure functions (water and organic matter dynamics) in amended and unamended fields.
- Elaborate lab experiment to test the most adapted species that will be inoculated in the field (regarding pedo-climatic and agronomical contexts)
- Position its research activity and results in the existing literature
- Analyze the data and write reports

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