

SESSION I: PLANT-MICROORGANISMS INTERACTIONS IN AGRICULTURE AND ECOSYSTEM MANAGEMENT

Enhancing Agroecological Practices in Vineyards: Evaluating Biotechnological Tools for Soil Health and Grapevine Performance in the Douro Region

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Agroecological (AE) practices in viticulture, such as ground cover management to reduce erosion and enhance soil health and biodiversity, are gaining attention but remain inconsistently applied across Europe. The recently approved VinAE project (Agroecology partnership) addresses this challenge by establishing a network of pilot vineyards in five major wine-producing countries: Italy, France, Spain, Portugal, and Turkey. Located across Mediterranean, Atlantic, and Anatolian biogeographic regions, these sites represent diverse edaphoclimatic conditions and vineyard systems.

In addition to traditional strategies, the project aims to test biotechnological tools (e.g., hydrogels, microbial inoculants) to enhance the effectiveness of AE solutions. At the Portuguese site, the Catholic University of Portugal (UCP), in collaboration with ADVID, is leading fieldwork at the experimental vineyard located at Quinta dos Aciprestes (Real Companhia Velha). This trial will evaluate the effects of hydrogels, both alone and in combination with cover crops established in the interrows, as well as the application of microbial inoculants in soil health and grapevine performance. A multidisciplinary evaluation will be done comprising grapevine performance, must quality, water use, soil carbon dynamics, microbial and faunal diversity, and nutrient balance. Socio-economic and policy factors influencing AE adoption will also be examined.

The multidisciplinary and multi-actor nature of VinAE enables a robust, context-specific evaluation of AE practices. Results will contribute to designing resilient viticulture systems and guiding policy recommendations for broader adoption of AE methods, particularly relevant under changing climate conditions.

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