

Cross-border cooperation in the field of viticulture. The University of Craiova and the Institute of Viticulture and Enology - Pleven with a new project

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Since December 2025, the Institute of Viticulture and Enology has been working on the project "Adapting Viticulture to Climate Change through the Application of Ecosystem Measures to Maintain Economic Viability (VitiClimRoBg-Hard ROBG00370)", funded under the Interreg VI-A Romania-Bulgaria Programme, specific objective 2.4: Promoting adaptation to climate change, disaster risk prevention and resilience, taking into account ecosystem-based approaches.

The program supports cross-border initiatives for sustainable development in viticulture, emphasizing adaptation to climate change through monitoring, innovative measures, and the preservation of biodiversity and the economic competitiveness of the sector in the Bulgaria-Romania border regions. IVE's partners are: the University of Craiova (lead partner), the Vidin Chamber of Commerce and Industry, and the "Justice and Youth" Association – JUST (Romania). An associated partner on the project from the Bulgarian side is the "Danube Winemakers" Association.

The project provides an opportunity to secure specialized equipment to achieve an integrated comprehensive approach directly linked to adaptation to climate change.

Climate change undoubtedly affects crops, but also the accompanying pests. In addition to the direct impact of climate on the vine, diseases and pests also leave their mark. Often, the vine's responses, expressed through disease symptoms or pest damage, are insufficient to define problems of a complex nature, which requires precise laboratory diagnostics. Advances in modern world technologies offer opportunities for precise monitoring, digital recording, and analysis of these parameters. In this direction, the project plans to equip a molecular biology laboratory. Studies will be conducted on the possibility of determining water deficit and the health status in vineyards using multispectral photography, including multispectral images of surveyed vineyards to identify potential problem areas; investigations on soil moisture, water potential, and the health status of the vines.

The project will enable the development of new scientific solutions through the collection of genetic resources and assessment of their response to stress; creation of a collection of genetic resources with grapevine varieties and rootstock-scion combinations adapted to climatic stress; research and conservation of grapevine genetic resources; identification and accumulation of genetic material from new grape varieties and hybrids with increased resistance to abiotic stress; analysis and assessment of genetic diversity in Bulgarian grapevine populations and development of strategies for its sustainable management under climatic stress, based on microsatellite analysis to determine the genetic profiles of the collected varieties and identify the presence of resistance genes in their DNA.

Part of the project work is aimed at establishing the socio-economic benefits of breeding stress-resistant grape varieties. Studying the influence of different rootstocks on drought resistance in

vines through analysis of leaf water potential (water stress) will allow the identification of the most adaptive grape varieties and rootstock-scion combinations. Systems will be developed to optimize some agronomic practices to improve vine resilience to stress factors (use of cover crops and moisture-saving biological mulching covers for weed control and preservation of soil fertility; assessment of the influence of summer pruning on the vegetative growth of the vine).

Within the project, an analysis will be made of the influence of climate change and anomalies on vine development and grape quality, and the possibilities for correcting grape quality parameters and its potential for producing wines through green pruning.

The observed intensive climatic changes in many regions on a global scale in recent decades, associated with rising temperatures, droughts, reduced precipitation, and the occurrence of a number of climatic anomalies, are reflected in the development of viticulture and directly influence winemaking. The project includes research on the influence of climate imbalances and the observed significant changes in the metabolism of the grapevine plant on lowering titratable acidity, disproportions in phenolic fractions, which have a direct negative impact on some organoleptic characteristics of wines – color, taste, body, etc. Based on an analysis of the influence of climate change on the complex quality of wines, their stability, sensory characteristics (color, aroma, taste, clarity), possibilities for reducing negative effects and limiting the reduction of biological potential (antioxidant activity) will be established.

Broad-spectrum results are expected to serve as a basis for building strategies for sustainable viticulture, depending on various scenarios related to climate change. The scientific and applied research work on the project, as well as the popularization of its conclusions, will support the introduction and incorporation of systems for precise monitoring and adaptation through the implementation of a number of measures – precision agriculture, selection of resistant varieties, adapted technological practices in the vinification process, optimization of protection practices, aiming to control and counteract the harmful effects of climatic stress in the border regions of Bulgaria and Romania.