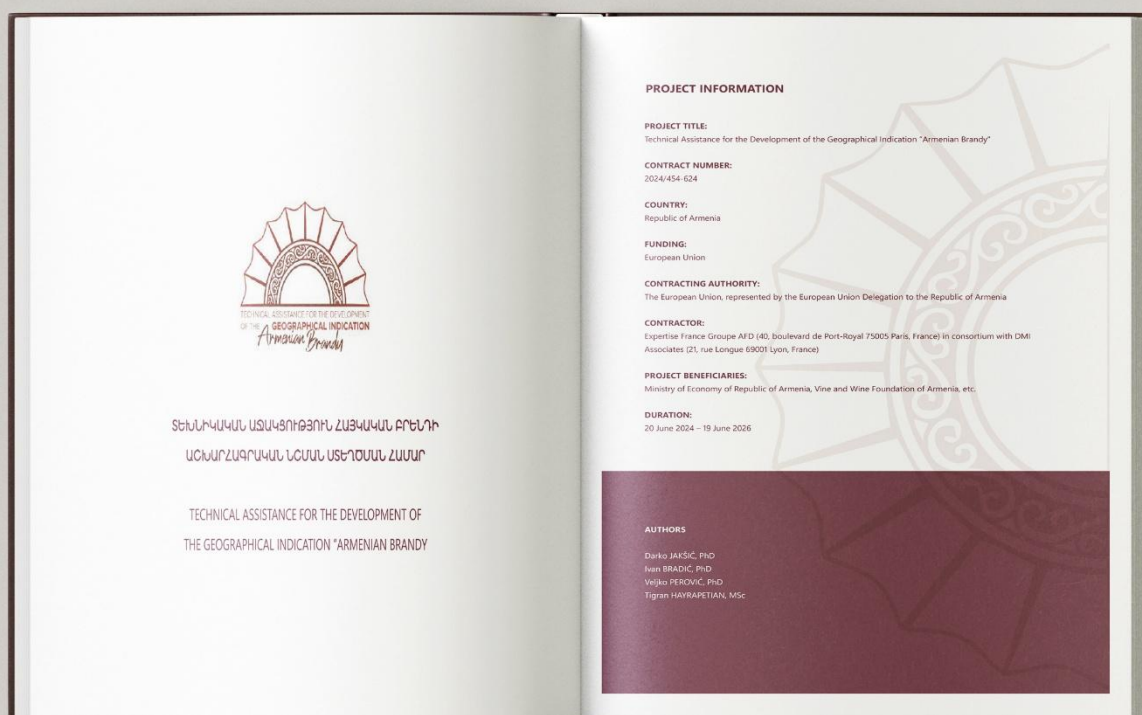




# INTRODUCTION

Armenia is one of the world's historically significant viticultural regions, where grape cultivation, wine production and the use of indigenous grapevine genetic resources are deeply embedded in the agricultural, cultural and economic identity of the country. Archaeological discoveries at the Aghakot cave complex, including a wine press, fermentation jars and storage vessels, grape remains and viticultural equipment, point to a long history of viticulture in the region. The long continuity of viticulture gives Armenian grape production not only economic importance, but also emotional value and prestige.

The Viticulture Division of the Ministry of Agriculture of Armenia (hereafter: Ministry) has been preparing within the project 'Technical Assistance for the Development of the Cooperatives' (hereafter: 'Technical Assistance') funded by the European Union and implemented by the International Centre for Agricultural Sciences (ICAS) in Armenia, a series of studies aimed at providing a scientific basis for the development of the viticulture sector. The purpose of the present study is to provide a scientific basis for the development of the viticulture sector, by providing a scientific basis for the development of the viticulture sector.

The present study is particularly important because grapevines in most Armenian grape production zones are still genetically related to their own roots. This practice is part of the country's viticultural heritage and has been possible due to the historical absence of large-scale vineyard replanting. The development of the viticulture sector is closely linked to the development of the wine industry, which is a key sector of the Armenian economy. The present study is particularly important because grapevines in most Armenian grape production zones are still genetically related to their own roots. This practice is part of the country's viticultural heritage and has been possible due to the historical absence of large-scale vineyard replanting. The development of the viticulture sector is closely linked to the development of the wine industry, which is a key sector of the Armenian economy.

The historical experience of Europe clearly demonstrates why this issue requires strategic attention. Grape vines are still genetically related to their own roots. This practice is part of the country's viticultural heritage and has been possible due to the historical absence of large-scale vineyard replanting. The development of the viticulture sector is closely linked to the development of the wine industry, which is a key sector of the Armenian economy.

The reason for this change was biological and agronomic. European Vitis vinifera vines are highly susceptible to the root-killing fungi of phylloxera, while several American Vitis species developed different levels of tolerance or resistance through long co-evolution with the pest. For this reason, American species such as Vitis riparia, Vitis rotundifolia and Vitis vulpina were introduced to Europe. The grafting of European Vitis vinifera onto American rootstocks became the foundation of modern rootstock breeding and global viticulture.

Nevertheless, the introduction of rootstocks is not simply a question of resistance to phylloxera. Rootstocks strongly influence vine vigor, rooting depth, water and nutrient uptake, drought tolerance, tolerance to soil salinity, adaptation to soil texture and depth, erosion resistance and, very importantly, tolerance to lime and calcareous-rich soils. This is particularly relevant for Armenia, where many viticultural production areas are characterized by calcareous soils and variable calcium carbonate content in the soil. Excessive or insufficient calcium can lead to poor vine establishment, reduced nutrient availability, increased susceptibility to diseases and reduced vine vigor and lower vineyard longevity. Therefore, the selection of rootstocks must be based on the combined assessment of local soil, topographic and environmental conditions, rather than on general recommendations.

Recent molecular and genomic research on grape phylloxera has further emphasized that this pest should not be viewed only through the viticole question of whether it is present or absent. Population-genomic studies have shown that phylloxera populations differ generally, that invasion routes can be reconstructed through DNA analysis, and that different populations may have different adaptive potential. A meta-genome study found that

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