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## **Cabernet Sauvignon and Aglianico grapevine (*V. vinifera* L.) response to different pedo-climatic environments in Italy**

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Climate change affects the agricultural sector and, in particular, viticulture where water is a key factor for fruit development and quality. A scarcity of water determines a reduction in biomass production, and for some plants, as in the case of grapevine, it can endorse fruit quality.

The monitoring and management of plant water stress in the vineyard is critical as well as the knowledge of how each specific cultivar reacts to it. This study reports the preliminary results of the Italian National project "Influence of agro-climatic conditions on the microbiome and genetic expression of grapevines for the production of red wines: a multidisciplinary approach (ADAPT)". A multidisciplinary study was carried out to compare the Cabernet Sauvignon and Aglianico, both black grapevine cultivars, responses to different pedoclimatic conditions of southern Italy. The research was conducted in Campania, Molise, and Sicilia regions, three areas devoted to high-quality wine production. In each site, the environmental characterization was designated, and the soils were characterized through a pedological survey. During 2020-2021, soil water content and the principal weather variables (e.g., temperature, rainfall, solar radiation, etc.) have been monitored by means of in situ stations, while plant responses were collected by means of field campaigns (LAI, LWP, grapes composition). The agro-hydrological model SWAP was used to solve the soil water balance in each site to determine the Crop Water Stress Index (CWSI) from April to October in the years 2020 and 2021. The obtained CWSI index was compared with data collected on plant status (e.g., LWP) and correlated to grapes quality (e.g., sugar content, acidity). Finally, the comparison between the calculated current CWSI (2020-2021) and the potential one obtained from the analysis of local reference climate has shown a significant agreement. This data underlines the appropriateness of the different pedo-climatic conditions chosen to evaluate the influence of agro-climatic conditions on the microbiome and genetic expression of wine grapevines.