Intra-varietal diversity in cv. 'Tempranillo Tinto': phenological stages

Javier Portu*, Luis Rivacoba, Sergio Ibáñez, Ignacio Martín, Javier Tello, Alicia Pou, Erika Herce, Álvaro Galán, Elisa Baroja

Instituto de Ciencias de la Vid y del Vino (Gobierno de La Rioja, CSIC, Universidad de La Rioja)

Corresponding author: javier.portu@icvv.es

Abstract (250 words)

'Tempranillo Tinto' is one of the most relevant grapevine cultivars worldwide. Despite its early ripening and relatively short vegetative cycle, which may not be ideal for high-quality grape and wine production in warming conditions, its long-standing cultivation has led to an intense multiplication by cuttings, which originated the high level of clonal variation currently available. Now, this intra-varietal diversity provides an interesting opportunity for cultivar improvement by identifying genotypes with better adaptation potential.

To explore this potential, we conducted a comprehensive study on 30 'Tempranillo Tinto' clones, chosen from a wide selection of 729 clones in the Rioja winemaking region of Spain. The focus was on characterizing four key phenological stages (budburst, full flowering, veraison, and harvest), for each clone over three consecutive seasons (2020-2022). Results revealed substantial differences among the studied clones, particularly in the duration of their vegetative cycle. Thus, whilst some early clones reached full maturity as early as September, others needed to be harvested at the end of the same month. The most significant difference among clones was observed in the interval between veraison and harvest dates, varying by up to 27 days. In conclusion, our findings suggest that clonal diversity in phenological traits can be an effective strategy to address varietal limitations towards climate conditions. This approach allows for the preservation of the typicity and added value conferred by ancient elite varieties in traditional winemaking regions, without the necessity of switching cultivars.

Keywords: climate change, phenology, late ripening, budburst, harvest