

## Oral presentations

### Water use efficiency as a novel target for grapevine breeding programs

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#### Abstract

Water scarcity is one of the main limiting factors for grapevine cultivation in semiarid regions, which is increasing in a context of climate change. To face this challenge, it could be useful to consider plant water use efficiency (WUE) as new criteria in current and future breeding programs. Considering the relation photosynthesis/ stomatal conductance ( $A_N/g_s$ ) and  $\delta^{13}C$  as selection targets, several long-term studies of WUE variability among grapevine cultivars, clones within a cultivar and rootstocks was carried out, considering field and pots experiments at different environmental and water availability conditions. Results showed a significant variation of WUE among cultivars according to the different stomatal regulation capacity under drought when comparing ancient and commercial cultivars. Moreover, up to 30% of clonal variability in WUE was found within Tempranillo and Grenache cvs, mainly under moderate water stress conditions. Although seasonal and environmental conditions affected this inter and intracultivar variability, a multilevel methodology analysis made it possible to rank genotypes by their WUE. Regarding rootstocks, some field and pot experiment comparing behavior of commercial and new lines of genotypes, showed both a variability in plant water status regulation and WUE under drought. This variability was clearly related with plant hydraulics capacity. All these results support the interest of exploring genetic resources to cope with the effects of climate change on viticulture considering WUE as a selection criteria for breeding programs.

**Keywords:** *Vitis vinifera*, rootstock, clone, drought