



[Home](#) [IVES](#) » [IVES Conference Series](#) » [International Congress on Grapevine and Wine Sciences](#) » [2ICGWS-2023](#) » Irrigation frequency in four grapevine red varieties in Spain. Effect on must volatile composition

Irrigation frequency in four grapevine red varieties in Spain. Effect on must volatile composition

Abstract

The irrigation water management in the vineyard is a crucial aspect to obtain sustainable quality production over time. Previous studies have set the water requirements to be applied in the vineyard at 30 % of the reference evapotranspiration (ET_0), although there are no studies that settle the effects of the frequency of irrigation application on red varieties in Spain. The present study contemplates the application of deficit irrigation (30 % ET_0) applying a weekly dose in a single irrigation (T07) or in two irrigation events (T03) per week. The study has been carried out in 2021-2022 with four red varieties in different Spanish wine regions: Garnacha Tinta (Badajoz), Tempranillo (Valladolid), Syrah (Albacete) and Mencía (Lugo). The effects of irrigation frequency on must volatile composition have been evaluated through GC-MS.

Results showed higher effect of the year than the treatment in grape yield. In 2021 season, the total volatile composition (sum of free and glycosidically fractions) showed a trend to increase in T07 vs T03 in Garnacha, Syrah and Mencía cultivars due to the bound-glycosidically fraction. In 2022, the same trend was observed in Garnacha and Syrah, however the total volatile concentration in T03 was higher than T07 in Tempranillo cultivar. In the same way that in 2021 season, these tendencies were motivated by bound-glycosidically fraction. In general, applying a weekly dose in a single irrigation increased the total musts volatile concentration. An effect of the season and cultivar also was observed.

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