# DEFICIT IRRIGATION, BASED ON ETo, IN TEMPRANILLO VINEYARDS CULTIVATED WITH ALTERNATE COVER CROP AT HIGH ALTITUDE: PRODUCTIVE AND QUALITATIVE EFFECTS IN THE DUERO VALLEY

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## INTRODUCTION

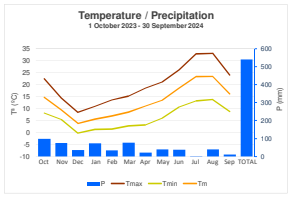
The vineyards behavior shows different adaptation capacity depending on water availability and soil maintenance in situations of emerging climate pressure, what should be taken in to account for environmental sustainability.

## OBJECTIVE

Quantify the agronomic and qualitative effects of deficit irrigation in summer on a Tempranillo vineyard cultivated with cover crop from autumn to late spring in the Duero valley.

## METHODOLOGY

**LOCALIZATION:** Sardón de Duero (Valladolid, Spain).
**DOMAINE:** Quinta Sardonia winery. **EXPERIMENTAL CAMPAIGN:** 2024.
**VEGETAL MATERIAL:** Tempranillo /Fercal (planted in 1999).
**VINE DISTANCES:** 2.5 m * 1.2 m (3,333 vines/ha). **ORIENTATION:** N-S.
**TRAINING SYSTEM:** vertical trellis; Guyot Poussard.
**PRUNING LOAD:** 12 buds /vine (1 shoot, 2 spurs).
**EXPERIMENTAL TREATMENTS:**
**N** = No irrigation **I** = irrigation
* **Irrigation**: weekly drip (0.30 ETo, pea size to harvest)
* **Cover crop:** alternated inter-rows (from winter, preserved until June)
**DESIGN**: 4 blocks, 40 vines / elementary plot
**SOIL:** clayey (water capacity > 100 mm/m)




| IRRIGATION (mm) – 2024 | |
|---|---|
| No Irrigation | 0 |
| Irrigation | 99 *30% ETo* |
| *Period* | 17 jul – 16 sep |

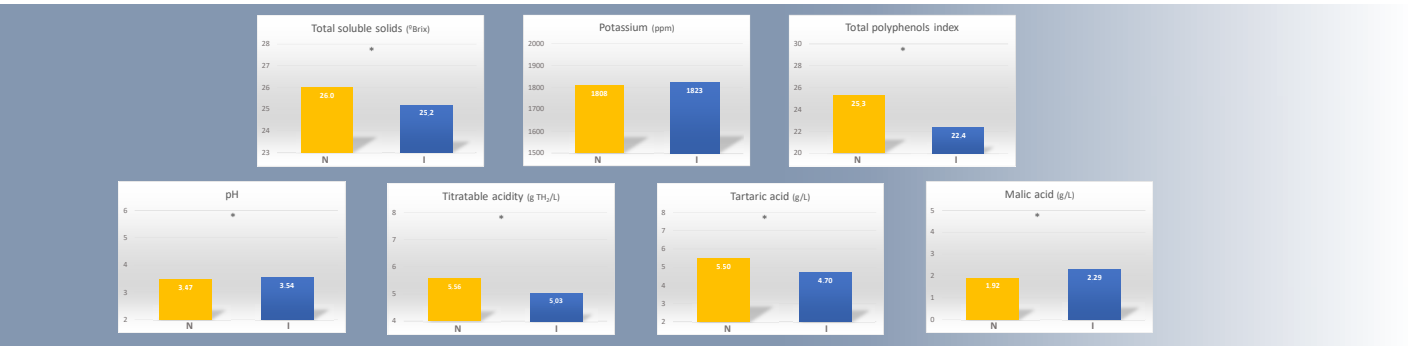
**SOIL MANAGEMENT**. **Sowing**: autumn 2023. **Species**: Barley (20 kg/ha), Wheat (20 kg/ha), Sainfoin (4 kg/ha), Mustard (4 kg/ha) and Vetch (8 kg/ha).

## RESULTS

Statistical significance level: p<0.05 (*).

GROWTH / YIELD


GRAPE COMPOSITION




## CONCLUSIONS

- Although the differences were not statistically significant for most of the parameters analyzed, pruning wood weight was increased 7% by irrigation, due to a slight increase in the shoots number per vine. Grape production was more enhanced by irrigation, with a 14% increase in yield, as a result of the increase in both bunch weight and number of bunches per vine.
- The grape composition was clearly affected by deficit irrigation. Sugar concentration, titratable acidity, tartaric acid, and total polyphenol index showed reductions in their values resulting from irrigation, while pH and malic acid levels were increased. Potassium content was the only parameter not affected by irrigation.
- It is advisable to continue the experimental work throughout the following years, given the influence that annual weather conditions can have on the behavior of vineyards, which, in turn, are correlated with the soil structure and the seasonal water capacity of its profile.

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