# Summer pruning as an agronomic alternative in cherry trees to improve water productivity in mountain areas

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## Introduction

The irrigated highland areas of **northern Extremadura (Spain)** present a structural deficit in water storage capacity that does not guarantee the total availability of irrigation resources for cherry orchards during the summer (Nieto, 2020). Other cultivation techniques, such as pruning in fruit trees, can **improve fruit quality by enhancing light penetration and carbon allocation**. This study aimed to evaluate the effect of summer pruning (non traditional technique in the zone) on plant water status, yield and fruit weight under high water stress conditions.

## Materials and methods

A two-year field trial was conducted in a commercial orchard of sweet cherry trees (*P. avium* L. cv Early Lory) located in the Jerte Valley (Extremadura, Spain). This is a mountainous area characterized by a continental Mediterranean climate. **Two pruning treatments were evaluated**: winter pruning (WP) performed during winter dormancy and summer pruning (SP) performed after harvest. **Midday steam water potential, pruning weight, yield and fruit weight were evaluated**.

## Results

The change in pruning practices produced similar pruning weights in the first year and higher summer pruning weights in 2019 (Fig. 1). The reduction of tree canopy due to the **summer-pruning resulted in a better plant water status** during the period of highest evaporative demand (postharvest) compared to winter-pruned trees in both years (Fig. 2). Also, there was an **increase in yield and fruit weight compared to winter pruning in the first year** (2019). However, no significant differences were detected between WP and SP in the second year (Fig. 3). Our results highlight the importance of considering the timing of tree pruning as a key factor to an efficient use of the available water.

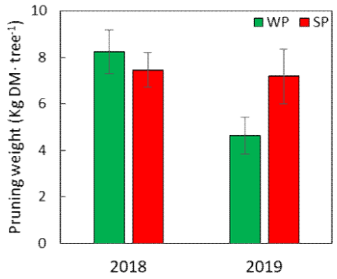


**Fig. 1.-** Dry Pruning weight (kg tree$^{-1}$) in summer pruning and winter pruning treatments. The vertical bars represent the standard error of the mean.

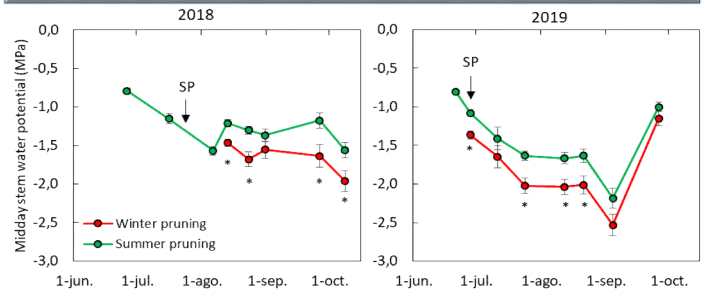


**Fig. 2.-** Difference between summer and winter pruning treatments in the evolution of midday stem water potential (MPa). SP indicates the date of summer pruning.
Each point is the mean of 16 measurements in 2018 and 32 measurements in 2019. The vertical bars represent the standard error of the mean. * indicate statistically significant differences between treatments at $P<0,05$ (t of Student test).

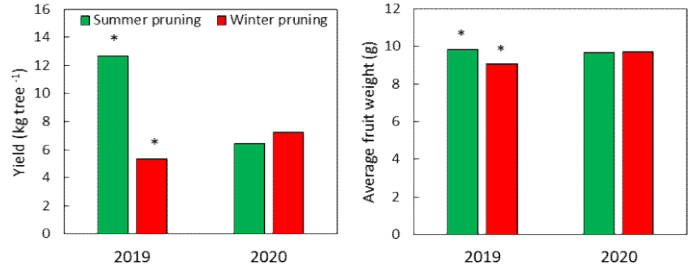


**Fig. 3.-** Effects of summer pruning and winter pruning treatments on tree yield and average fruit weight.
Each value is the mean of 16 trees.
* indicate statistically differences between treatments at $P<0,05$ (t of Student test).

## Conclusions

**Summer pruning can be a good cultural practice to mitigate the effects of drought in early maturing sweet cherry trees, improving yield without additional costs.**

## References

Nieto Serrano, E. (2020). Respuesta de dos variedades de cerezo frente a diferentes estrategias de riego en el Valle del Jerte. (PhD). Universidad de Extremadura.

## Acknowledgements

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