



# Effects of organic mulches on the soil environment and yield of grapevine



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## Abstract

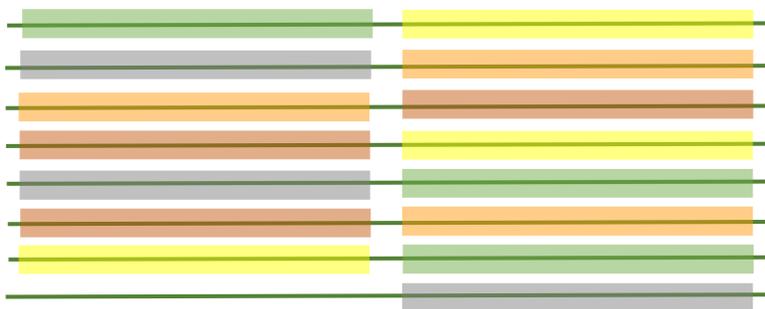
- ✓ Organic mulching is an effective method to manipulate the crop-growing microclimate
- ✓ The effectiveness of different organic mulching materials applied within the row of a vineyard was evaluated in a Tempranillo vineyard located in La Rioja (Spain).
- ✓ Organic mulch had a positive impact on soil-moisture storage and soil temperature, thus favoring crop growth and grape yields. The extent of these effects depends on the type of mulching materials.



Figure 1. Organic mulching: spent mushroom compost (SMC), Straw (S) and Grapevine pruning debris (GPD)

## Methods

### Experimental design (randomized):



### Organic mulches VS Conventional practices



- **Volumetric water content (WVC) and soil temperature measurements:** 15 Drill & Drop probes (Sentek, Stepney, Australia) equipped with 3 sensors at different depths (5, 15 and 25cm) have been placed.



- **Climatic data:** Radiation and precipitation data have been obtained from La Rioja Agroclimatic Information Service station located in Aldeanueva de Ebro

## Results

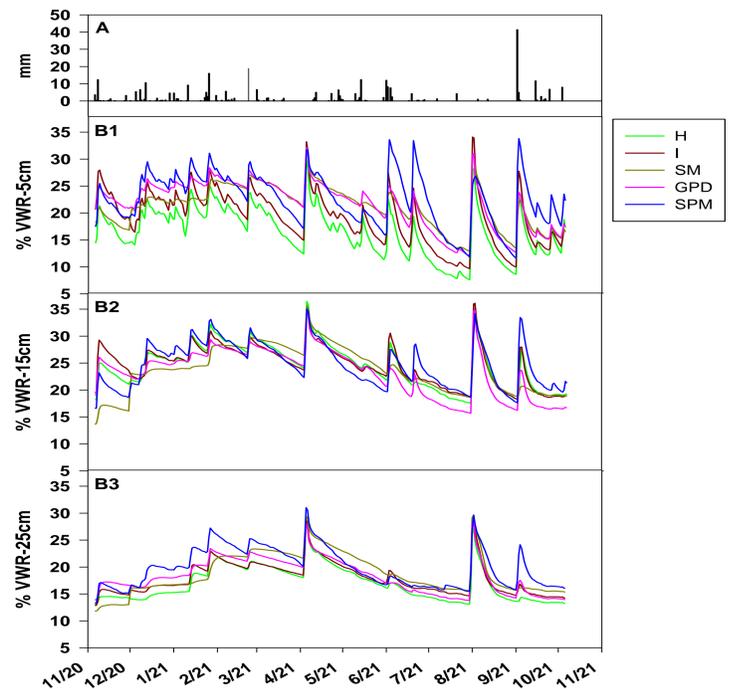


Figure 2. Daily precipitation (A) and soil volumetric water content variation under different depths: 5 cm (B1), 15cm (B2) and 25cm (B3) for different management soil strategies.

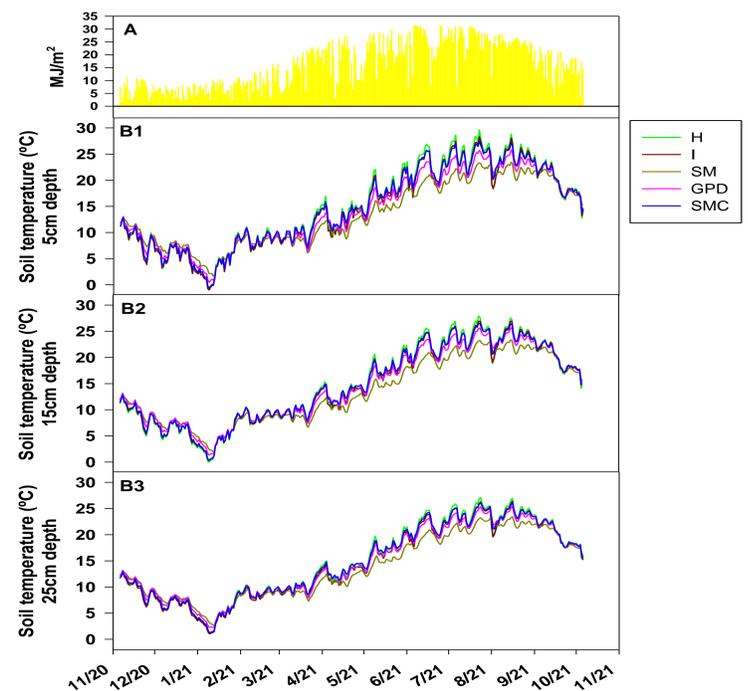


Figure 3. Solar radiation (A) and daily variation of the soil temperature under different depths: 5 cm (B1), 15cm (B2) and 25cm (B3) for different management soil strategies

## Conclusions

- ❖ Mulching retained up to 25% more water as compared to traditional treatments.
- ❖ Of the different mulch materials, S was the one that retained more water in the months of higher evaporative demand, compared to GPD and SMC. Soil moisture changes in the upper surface layer (0–10 cm) were highly dynamic, probably due to water vapor fluxes across the soil-atmospheric interface.
- ❖ Organic mulches reduced soil temperature in summer and raised it in winter. The same buffering effect was also maintained in the deeper layers.

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