EFFECTS OF PRUNING WOUND PROTECTION PRODUCTS ON GRAPEVINE WOOD STILBENES.

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INTRODUCTION

The increasing incidence of **grapevine trunk diseases** (GTDs) is mainly linked to the lack of effective control and mitigation strategies providing adequate protection. The most common field control and mitigation strategies to contain ~~of~~ grapevine trunk diseases are preventive measures, such as the application of plant protection products on pruning wounds.

However, **plant protection products can influence plant secondary metabolism**, and this interference may be decisive in countering pathogen attacks.

AIM

The goal of the present study was to understand whether and how fungicides may affect the accumulation of stilbenes in fruiting-cane pruning wounds, to evaluate the grapevine ability to activate natural defense mechanisms, in response to treatments.

MATERIALS AND METHODS

In winter 2022 (at the DISAFA vineyard), we pruned one-year-old shoots of Cabernet Sauvignon and Syrah and we treated pruning wounds with:

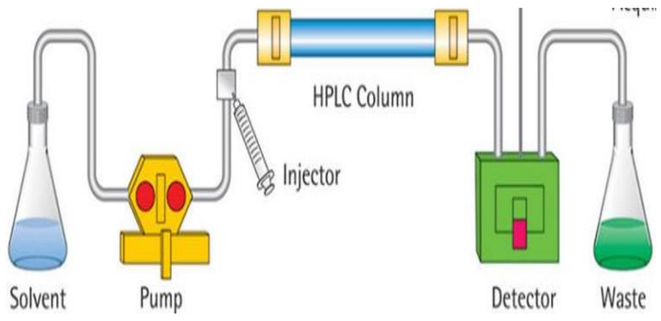
- **Cuprocol** (copper oxychloride);
- **Tessior** (0,95 % (w/w) boscalide, 0,48 % (w/w) pyroscstrobin);
- **Esquive** (*Trichoderma atroviride*);
- **Bentogran** (sodium bentonite);
- **deionized water** (control).

We sampled at three different phenological phases:

- dormant bud;
- second leaf stretched;
- sixth leaf stretched and visible inflorescences.

Evaluation of the **stilbene compounds** using HPLC/DAD:

- concentration (g kg^{-1} dry weight);
- profile (based on UV-spectrum and standard injection).

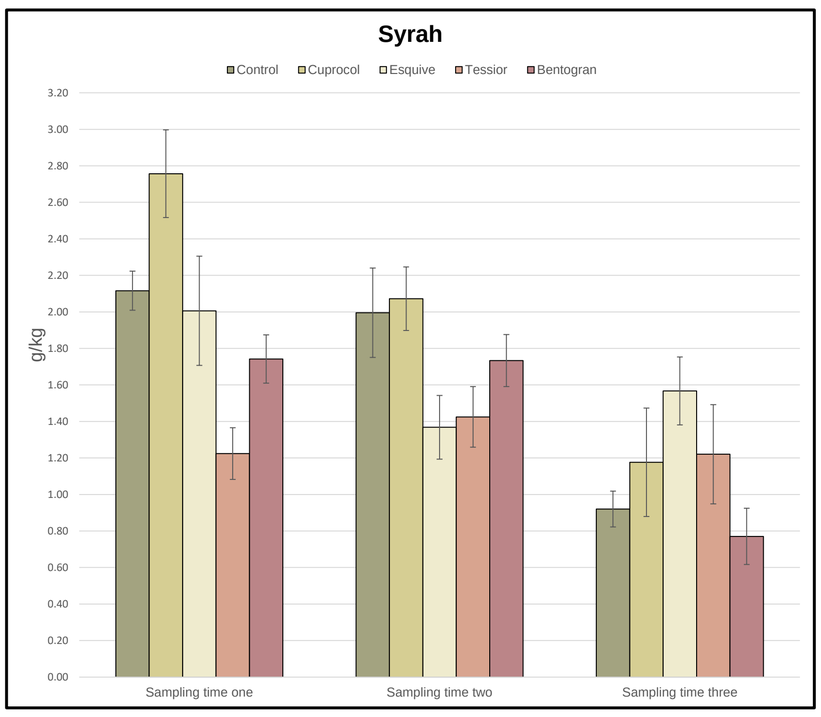


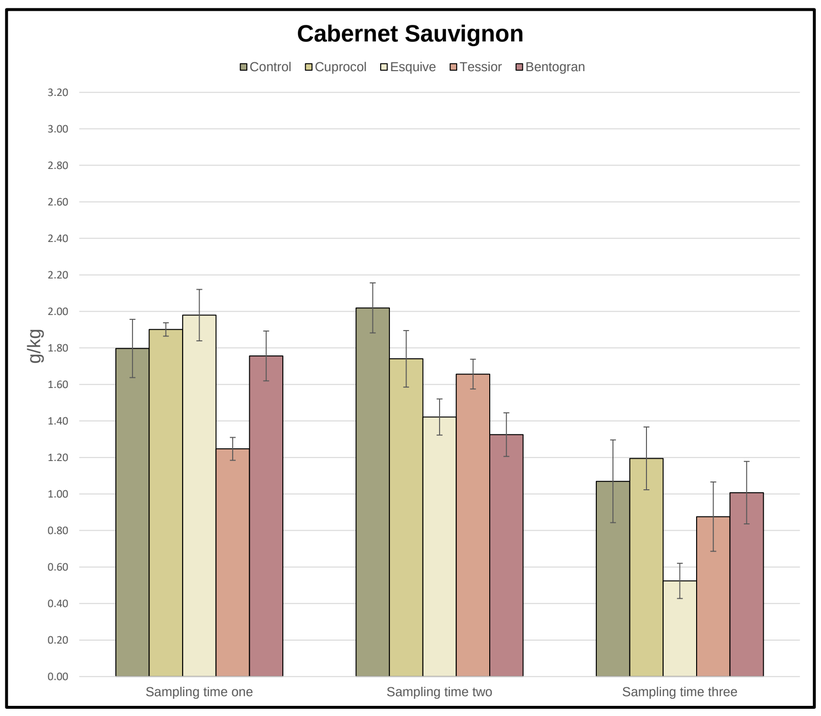
RESULTS AND CONCLUSIONS

The total stilbene accumulation **was slightly higher in Syrah,** with concentrations ranging from 0.8 g to 2.8 g/kg, compared to Cabernet Sauvignon, (from 0.5 to 2.0 g/kg). Significant **differences between the cultivars** (P≤ 0.01) emerged.

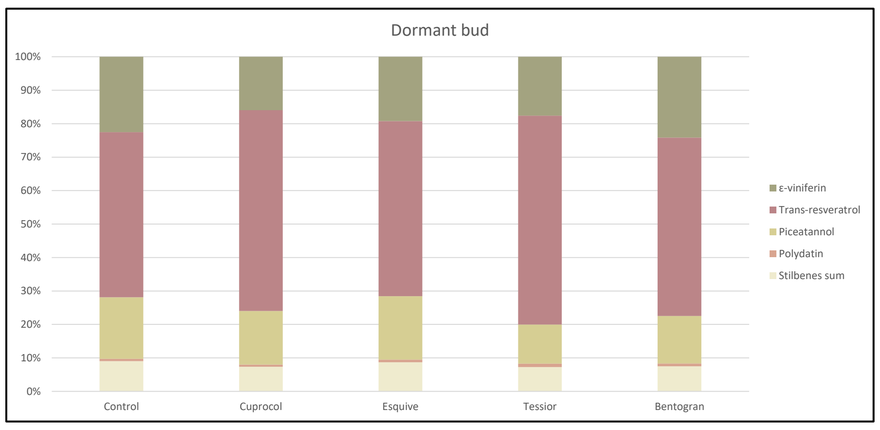
In Syrah, total accumulation increased after **Cuprocol** treatment, reaching 2.8 g/kg, respect to controls and to the other treatments. In Cabernet Sauvignon, **Esquive** samples exhibited slightly higher concentrations than controls, whereas Cuprocol, Tessior, and Bentogran resulted in similar accumulation, compared to control samples. **Differences** were found **among treatments** (P≤ 0.0001).

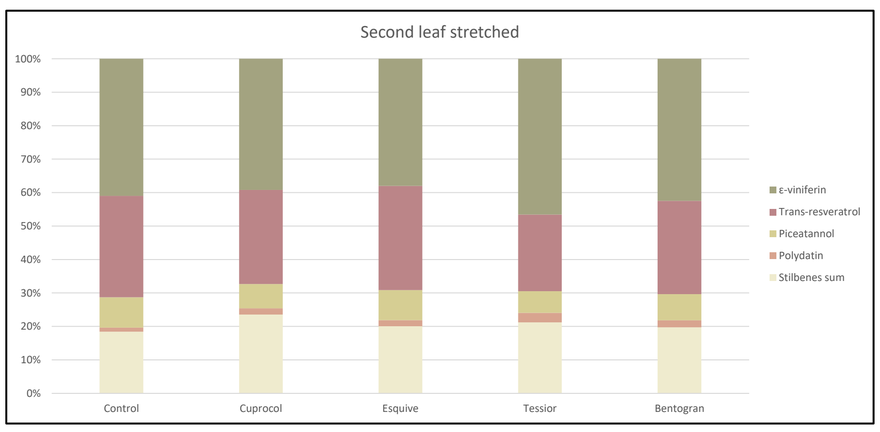
The most evident trait was the behavior of stilbene accumulation during the vegetative season: regardless the cultivar and the treatment, we found **a decreasing trend in total stilbene accumulation,** with significant differences (P≤0.0001). Differences were also found in the bipartite interaction treatment*sampling time (P≤0.0001) and in the tripartite interaction treatment*sampling time*cultivars (P≤ 0.01).

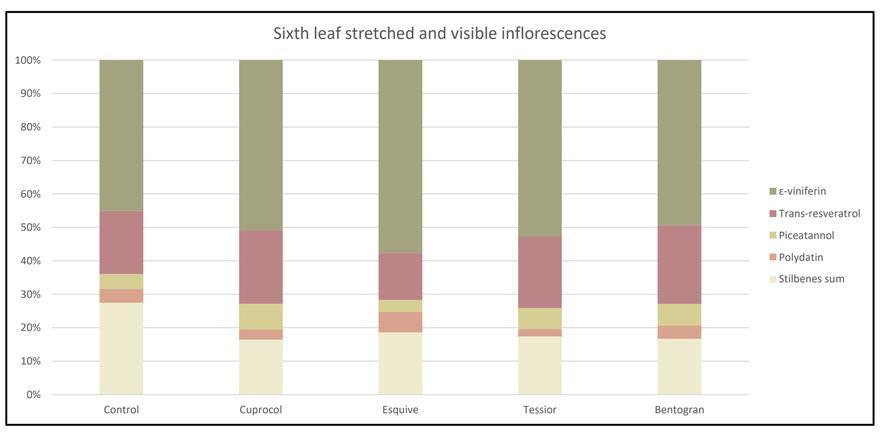




At the stage of dormant bud, in both Syrah and Cabernet Sauvignon, regardless the treatments, the prevalent compound was *trans*-resveratrol (60%), followed by ε-viniferins (22%), piceatannol (17%) and polydatin (1%). At the third sampling the percentage of *trans*-resveratrol (26%) and piceatannol (7%) decreased whereas ε-viniferins (62%) and polydatin (5%) increased.







Treatments **influenced** the total accumulation of stilbenes: some couverture products can have repercussions on the wood secondary metabolites that act as phytoalexins. However, treatments **did not affect** the profile. The seasonal evolution of the profile might be a specific and characteristic trait of wood metabolism, or a consequence tied to the increase in xylem flow, responsible for the translocation of these compounds.

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