

## Effects of canopy covering on yield and quality of 'Nero d'Avola' (*Vitis vinifera* L.) grown in hot-arid climate condition

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The impact of climate change on grapevine ecophysiology and vineyard management is predicted to be a serious problem in the next years. In fact, it has an influence on the fruit-set, yield, and in modulating decoupling between technological and phenolic ripening. Thus, it is essential to identify cost-effective and easy-to-implement solutions to deal with the issue. For this purpose, the present study aims to test different shade treatments (ST) applied directly to the canopy of 'Nero d'Avola' cultivar (*Vitis vinifera* L.), trying to limit the excess of light and heat that, usually occur in hot-arid climate areas as in Sicily. Two ST were imposed during the 2020 vegetative season from fruit set (BBCH-71) to harvest (BBCH-89). Both ST, a green net (V) (27% shade) and a white net (B) (32% shade) resulted effective in mitigating stress from excess solar radiation compared to control (T) (no shading). V and B showed also higher leaf chlorophyll concentration and Nitrogen Balance Index (NBI). ST affected negatively the vegetative parameters inducing a lower shoot length, and consequently lower leaf area and pruning wood than T. Moreover, also berry weight and yield were reduced. However, ST involved limited changes in canopy temperature and microclimate. Significant results were also found in mitigating bunch temperature. V showed a delay in ripening in terms of Total Soluble Solids (TSS) and Titratable Acidity (TA). Therefore, V and B showed higher anthocyanin content at full ripening (BBCH-89). The obtained results highlight some positive effects that ST can have on the canopy microclimate conditions, on the vegetative and productive parameters, and on grape quality. From this point of view, the technique of covering with nets can be a tool to control the ripening processes in the context of climate change. However, the reduction of vine vigor, yield, and the low effect on canopy temperature require further investigation.

**Keywords:** level of shade, high temperatures, light interception, shoot growth, berry ripening.