

## Effects of late shoot trimming and irrigation regime on the composition of Aglianico grapes

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Recently there is a growing interest in developing and introduce novel vineyard management strategies to adapt viticulture to climate change. This is particularly crucial in wine-growing regions such as those located in southern Italy where droughts, heat waves and extreme climatic events are becoming progressively more frequent resulting in significant effects on grape yield and berry composition. Among these, it is well known that global warming is causing an increase in sugar accumulation in the berries that is often undesired because of the excessive increase in alcohol concentration in the wines. The aim of this study was to investigate the effect of late shoot trimming and different irrigation strategies on yield components and berry composition at harvest. The experiment was carried out over a period of four years (2017-2020) in Mirabella Eclano (Avellino, Italy) in a commercial vineyard planted with 15 years-old 'Aglianico' grapevines (*Vitis vinifera* L.) grafted onto K5BB and trained to a double spur cordon. The experiment compared nine treatments resulting from the combination of three intensities of late shoot trimming applied at 12 °Brix and three levels of irrigation. The three intensities of shoot trimming consisted in a control (no trimming) and two treatments where 30% or 50% of leaf area was removed, respectively. The three levels of irrigation were the following:(i) a non-irrigated control treatment (rainfed), (ii) a treatment where 50% of the calculated crop evapotranspiration (ET<sub>c</sub>) was replaced with irrigation and (iii) a treatment where 100% of ET<sub>c</sub> was replaced with irrigation. The results showed that the irrigation, the shoot trimming and the irrigation x shoot trimming interaction influenced significantly grape composition at harvest. Shoot trimming applied at high intensity significantly reduced soluble solids content at harvest. Skin phenolics (anthocyanins and tannins) resulted also reduced by severe shoot trimming. Conversely, shoot trimming applied at light-moderate intensity tended to increase soluble solid content at harvest and increased both anthocyanins and tannins. In general, irrigation increased soluble solids content and influenced phenolics concentration at harvest by improving photosynthetic activity. The interaction between shoot trimming and irrigation treatments was found to influence phenolics concentration. When conditions of moderate-severe water stress occurred, fruit yield was negatively affected by the application, in consecutive years, of severe shoot trimming. Thus, severe shoot trimming reduces soluble solids content in the berries at harvest but it may result in negative carry over effects on fruit yield and possible detrimental effects on phenolic composition of the grape at harvest.

**Keywords:** *Vitis vinifera*, climate change, soluble solids content, phenolics, summer pruning.