GRUPPI QUESITI NON ESTRATTI ALLA PROVA ORALE DEL 23.12.2022 DEL CONCORSO PUBBLICO, PER ESAMI, A N. 1 POSTO DI CATEGORIA C, POSIZIONE ECONOMICA C1, AREA TECNICA, TECNICO-SCIENTIFICA ED ELABORAZIONE DATI, PER LE ESIGENZE DELLA SEDE DISTACCATA DI AVELLINO (SEZIONE DI SCIENZE DELLA VIGNA E DEL VINO) DEL DIPARTIMENTO DI AGRARIA DELL'UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II (COD. RIF. 2224)

GRUPPO QUESITI 3

1) I principali vitigni a bacca rossa italiana
2) Esigenze pedoclimatiche della cultivar Aglianico
3) Dati i seguenti valori: 0,76; 1,23; 2.64; 0,89; 1,01; inserirli in una colonna Excel e calcolarne la media

QUESITO IN LINGUA INGLESE DA LEGGERE E TRADURRE

Impact of Crop Control Strategies on Performance of High-Yielding Sangiovese Grapevines

Oriana Silvestroni,[1] Vania Lanari,[1] Tania Lattanzi,[1] Alberto Palliotti,[2] and Paolo Sabbatini[3]*

Abstract: Climate change will require grapegrowers to develop improved viticultural practices to control vine yield and the rate of fruit maturation. The impacts of five canopy management regimens on vegetative growth, yield, and grape quality were investigated over three years, and carryover effects on vines in the fourth year were examined. Winter pruning (*Wp*, the control), shoot thinning (*St*), shoot thinning with preanthesis defoliation (*St+Dpa*), shoot thinning with preveraison defoliation (*St+Dpv*), and shoot thinning with preveraison defoliation plus cluster thinning (*St+Dpv+Ct*) were applied to Sangiovese vines from 2011 to 2013. Neither *St* nor *St+Dpv* changed yield or grape quality compared to *Wp*. The *St+Dpa* treatment reduced leaf area and yield by 33% compared to *Wp* and *St* and led to increased sugar concentrations and a carryover effect into 2014 that reduced vine capacity. A management strategy that combines shoot thinning with preanthesis defoliation, which will increase sugar concentrations and suppress yield, offers the strongest potential for long-term regulation of vine yield and grape quality. However, in a nonirrigated vineyard of medium vigor, *Wp*, *St*, and *St+Dpv* could be used to achieve yield and fruit quality levels that meet defined thresholds while reducing costs in respect to other additional interventions such as *Dpa* or *Ct*.

Key words: cluster thinning, defoliation, leaf removal, shoot thinning, winter pruning

Given the threat of climate change (IPCC 2014), grapegrowers in Italy and other major grapegrowing countries are focused on developing strategies to better manage grape and wine production under conditions of rising temperature (Schultz 2000, Palliotti et al. 2014). This includes characterizing varieties, clones, and rootstocks to find those that demonstrate inherent resistance to abiotic stress, such as thermal and radiative excesses and water limitation (Chaves et al. 2010). However, it is likely that at least five to ten years of effort will be needed before results are ready for the field. Near-term strategies are also required, and a new set of cultural management techniques capable of regulating the grape-ripening process has been developed for improved yield and/or fruit sensory characteristics (Palliotti et al. 2013a, 2013b, Herrera et al. 2015).

One of the most important outcomes of increasing temperatures is acceleration of the ripening process, which leads to increases in grape sugar concentration and an often-undesirable increase in alcohol levels in the resulting wines (Jones et al. 2005). This can cause deviations from the expected wine style and failure to meet consumer expectations for taste. One solution is to alter vineyard cultural practices. Shoot thinning (*St*) is one of the most common practices used to adjust canopy density and crop load via the removal of extra shoots arising from count nodes of spurs or canes. Malformed or sterile shoots are first removed, but fertile shoots are also often eliminated. However, shoot removal can cause short-term loss of leaf area followed by vegetative compensation with longer shoots and more lateral shoots (Kliewer and Dokoozlian 2005, Myers et al. 2008, Bernizzoni et al. 2011). *St* can decrease the ratio of yield to pruning weight (Naor et al. 2002, Myers et al. 2008), i.e., the Ravaz index (Ravaz 1911), which is commonly used to assess the balance between vine growth and yield. Ravaz index values between 5 and 10 kg/kg indicate a good balance between yield (kg fruit per vine) and vine vigor (dormant pruning weight) (Kliewer and Dokoozlian 2005). Investigations of French–American hybrids, such as Aurore, Chancellor, and Villard noir (Morris et al. 2004) have shown that timely *St* can improve grape quality (Keller et al. 2008, Susaj et al. 2013). In addition, when this technique is used in tandem with cluster thinning, vegetative growth increases, yield decreases, and wine quality increases, the latter as a result of improved wine fruit (Sun et al. 2012).

Defoliation is another technique that has been studied extensively, and it is generally applied at two different times during the growing season and with different objectives. The effects of leaf removal on canopy density, yield capacity, fruit characteristics, or disease resistance differ depending on the time of application. If the first six or seven basal leaves are removed before bloom (*Dpa*), which temporarily limits carbohydrate sources, then the result will likely be a reduction in the

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GRUPPO QUESITI 8

1) Quali sono i vini DOC della Campania
2) Da quale vitigno è prodotto il Taurasi. Descrivere brevemente il vitigno
3) Dato il seguente testo:
"In questo studio pluriennale condotto in Trentino sono stati analizzati alcuni parametri fisiologici e biochimici legati alla senescenza fogliare della vite."
- CENTRARE IL TESTO E TRASFORMARE IL CARATTERE IN CALIBRI E, INFINE, SALVARE IL FILE SUL DESKTOP

QUESITO IN LINGUA INGLESE DA LEGGERE E TRADURRE

Early Leaf Removal to Improve Vineyard Efficiency: Gas Exchange, Source-to-Sink Balance, and Reserve Storage Responses

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Abstract: Based on earlier findings showing the effectiveness of preflowering leaf removal at reducing yield in several *Vitis vinifera* L. genotypes, a 3-year study was carried out on Sangiovese vines to evaluate how the technique also affects vegetative growth, wood carbohydrates reserves, and specific physiological traits such as intrinsic water use efficiency (WUEi) and leaf chlorophyll fluorescence. Early defoliation (D) applied before flowering with elimination of ~80% of the leaf area as compared with a non-defoliated control (C) was confirmed as quite effective in limiting yield per vine, cluster weight, cluster compactness and rot incidence, and berry set and mass in two of three seasons. Defoliation also markedly improved relative berry skin mass regardless of season. Vine vigor (pruning weight, cane diameter, and main leaf area) was significantly reduced in D vines (2008–2009 data), whereas vine capacity as total leaf area per vine was not. The leaf-to-fruit ratio dropped dramatically after defoliation to 1 m^2/kg in D vines, which recovered thereafter and had a higher ratio from veraison onward. Intrinsic WUE and tolerance to photoinhibition increased in D vines for both main and lateral leaves, which were formed after leaf stripping and which had reached full maturity by the time measurements were made. Berry sugaring was accelerated in D vines, which also showed, at harvest, higher must Brix and phenolic and anthocyanin concentrations than C vines as well as more stable anthocyanins in the wine.

Key words: defoliation, yield, water use efficiency, berry composition, vine vigor

In Italy, over the last decade, ~250,000 ha of vineyards have been renewed under fairly strict rules established by the European Union, which require that new plantings should have medium-to-high vine densities (≅4000 to 6000 vines/ha). For high-yielding cultivars (i.e., high node fertility associated with large clusters), such rules have given rise to the conflict that the yield limits required by law cannot be complied with unless massive shoot and/or cluster thinning is carried out (Guidoni et al. 2002, Reynolds et al. 2005), which is costly and not always effective in improving grape composition (Keller 2010). A paradox arises when, despite the low yields resulting from these crop-adjustment techniques, grape composition does not show the expected improvement simply due to excessive vegetative growth; rather, undesirable leafy flavors may occur (Chapman et al. 2004).

Identification of the best approach for grape improvement requires a better understanding of current constraints. Vine growth and yield are dependent not only on CO_2 fixation capability but also on the integrated processes of carbon allocation, accumulation, and utilization. Short-term experiments on the direct consequences of canopy manipulation on yield may overlook components of the vine carbon budget, and hence misrepresent the long-term consequences.

Several articles have been published on the effects of preflowering leaf removal, either manual or mechanical, on crop regulation and final grape and wine quality (Poni et al. 2006, 2008, Intrieri et al. 2008, Diago et al. 2009). While these studies were carried out in largely different environments and on different genotypes, the results showed that significant yield reduction and improved grape composition were achieved almost systematically. This response implies that the physiological control imposed on the vine through early leaf removal is dominant over other variability factors, which is remarkable as the final outcome of any summer pruning operation is generally unpredictable because of the complexity and dynamics of the factors involved.

Yet, constancy and repeatability of the effect on crop regulation due to early leaf removal are not surprising. Carbohydrate supply at the preflowering stage is the primary regulator of subsequent fruit set (Coombe 1962) and a temporary foliar stress may reduce cell division rates during the green stage of berry growth, which negatively affects final berry size (Palliotti et al. 2009). In almost all cases, this technique has also shown significant improvement in final grape composition and greater wine appreciation. Among the several seasonally related regrowth and compensation mechanisms triggered, the most widely investigated is post-defoliation photosynthesis recovery. At the shoot or whole-canopy level (Poni et al. 2008), the defoliated vines regain a photosynthetic capacity that is similar to non-defoliated vines around the time of veraison.

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IL SEGRETARIO DELLA COMMISSIONE
F.TO GIANNIELLO NICOLA