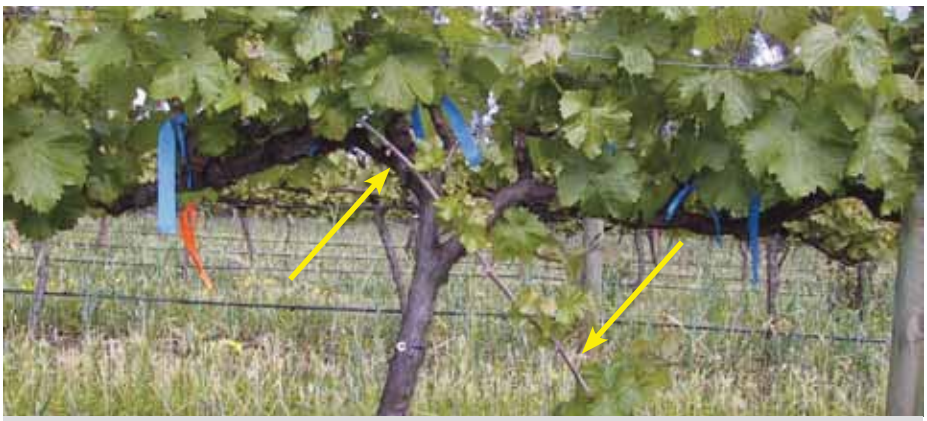
Mixed cost and quality effects from thinning

THE VITICULTURE TEAM at The Australian Wine Research Institute often field queries from grapegrowers at the AWRI's roadshows. Here are two of the more common questions we are asked.



A sacrificial cane (indicated by arrows) left on the vine at pruning in addition to the regular spurs.

I would like to try 'sacrificial' canes to reduce vine vigour and improve my fruit quality. How many extra canes should I use, one or two?

'Sacrificial' or 'kicker' canes are extra canes left on the vines at pruning (Figure 1). The concept is that the additional buds on the vines will reduce shoot vigour in spring and decrease canopy density. The system also has the benefit that if thinning is required, the extra canes (and bunches) can be removed with a single cut at or before veraison. Anecdotally, the resultant combination of reduced canopy density and yield is said to be more balanced vines with less fruit shading and better quality fruit. In 2003, the absence of any evidence to support this theory, AWRI viticulturist Mardi Longbottom and colleagues (unpublished) conducted experiments on four different varieties in South Australian vineyards. The treatments ranged from one to seven additional canes, which increased the number of nodes per vine by 130-300 per cent relative to the controls.

In terms of shoot vigour, the use of just one or two sacrificial canes per vine did not significantly affect growth rate. It was only when four or more sacrificial canes were used (increasing the total number of nodes per vine by more than double) that there was a devigorating effect. Berry size and yield also decreased and vine balance (yield to pruning weight ratio) improved with four sacrificial canes. Despite this, there were no significant differences in berry sugar concentration, pH, TA, colour or phenolic concentration, but the wine from the four-sacrificial cane treatment on one of the varieties was the most preferred (Longbottom *et al.* unpublished data).

The conclusions of this study were that the usual one or two sacrificial canes were insufficient to significantly affect fruit and wine quality. Vine balance was only improved when the number of nodes per vine increased by more than 50% with four sacrificial canes. This then raises the question: could the same improvement in vine balance be achieved with traditional pruning methods and higher node numbers? This would be a cheaper option to improve vine balance. On the other hand, one or two sacrificial canes might be beneficial as insurance against poor fruitfulness or poor fruitset and may offer a more economical option than traditional bunch thinning.

It seems that every year as harvest approaches, I am asked by the winery to do last minute bunch thinning. Does this really achieve anything?

The aim of bunch thinning is usually to decrease yield and, by way of improved vine balance, achieve better fruit quality. The effects of thinning on fruit composition and wine quality vary depending on its timing, the variety and the extent of thinning performed. Extensive research has occurred on the subject of fruit removal at or before veraison. In general, when performed at or before veraison, sugar ripeness may be advanced, resulting in a more full bodied wine. Wine colour, phenolics and sensory properties may also be improved to varying degrees.

Importantly, the results of bunch thinning are variable and do not always have an effect. It is also accepted that the earlier in the season that thinning is performed, the greater the possibility grape quality will be enhanced. The effect of removing bunches late in the season, however, has not been widely reported – except for the selective removal of diseased or otherwise inferior bunches.

Curious about the potential of late thinning as a means of improving fruit quality, Longbottom and colleagues (unpublished data) experimented with some bunch-thinning in two blocks of Cabernet Sauvignon vines, one at Padthaway and the other at Waite, South Australia. Fifty per cent bunch removal at three different developmental stages was applied: 1) at veraison, 2) veraison plus two weeks, and 3) veraison plus four weeks. When the blocks were harvested, bunches were collected from each of the treatments and the juice analysed for total soluble solids (TSS), pH and TA. While these measures may seem rudimentary, TSS (or sugar measured as Baumé) is the most basic 'quality' measure of most grape supply contracts. In these experiments, the late thinning treatments had no significant effect on any of these measures. In all cases thinning would have resulted in an economic loss.

Removing fruit at any time of the season must achieve a significant improvement in quality to justify the cost of the operation and to compensate for the loss of fruit.

Grape composition and wine quality are affected by more than just yield. Moreover, yield manipulation is more effective the earlier in the season it is performed. Removing fruit after veraison may actually be detrimental to ripening because of the decrease in photosynthetic activity that is known to occur in response to bunch removal at this stage of development.

Well-balanced vines and the production of fruit for a desired composition are best achieved by using an integrated approach. This should start with the assessment of pruning level and attention to irrigation and nutrition throughout the season. GW

Ask the AWRI is a monthly column that focusses on viticulture and oenology issues in alternate months. AWRI winemaking and viticulture specialists are available to help Australian wine and grape producers. Call on (08) 8313 6600 or email at: winemakingservices@awri.com.au or viticulture@awri.com.au.

References

Longbottom, M. L., Iland, P. G. and Dry, P. R. (2003) The use of sacrificial canes as a tool for vigour control – does it really work? The *Australian & New Zealand Grapegrower & Winemaker* Annual Technical Issue.