

## Leaf removal to regulate grape sugar accumulation

### *Bendigo Winegrowers Association RITA Project*

Changes in climatic conditions, principally increased temperatures, have resulted in significant increases in sugar concentration at harvest. This has led to increased wine alcohol concentrations and unbalanced wines that have elicited negative responses from some consumers and wine judges. The Bendigo Winegrowers Association obtained GWRDC RITA funding to examine aspects of premature ripening. Part of the project looks at slowing down ripening in a field demonstration and the other part provides information back to the growers through seminars and industry journal articles.

In the first season in 2008-09 the field demonstration involved removing leaves to slow down sugar accumulation in the berries. The first year of the trial showed that there were no differences in ripening between the timing of leaf removal either at the end of rapid shoot growth or at veraison. However the degree of leaf removal had an impact on ripening with 50% leaf removal delaying ripening by around 7 days and 75% leaf removal producing a delay of up to 29 days to reach a target sugar concentration of 25° Brix. In the berries, leaf removal produced lower berry weights, higher phenolic and tannin concentrations and lower anthocyanin concentrations compared with control vines. These results and other related topics were discussed in a seminar in November 2009.

In the second season in 2009-10 only one leaf removal treatment was tested in the field (75% leaf removal just prior to veraison) but sufficient grapes were produced to harvest at three sugar concentrations and make small batches of wine. Leaf removal delayed ripening by 20 to 42 days depending on the target sugar concentration, although in 2009-10 the season cooled off after March and this contributed to delaying sugar accumulation. Harvesting at successively higher sugar concentrations produced lower weight berries, lower titratable acidity and higher pH in the berries, along with higher colour density, total phenolics and tannin concentrations in the wines.

Leaf thinning produced lower berry weights, lower titratable acidity and higher pH in the berries. In the wines, leaf thinning produced lower colour density, total phenolics and anthocyanin concentrations, but there were no differences in tannin concentration compared with control treatments. Preliminary wine tasting assessments showed differences in wine colour, aroma and on the palate between the harvests at different sugar concentrations and leaf thinning. The primary impact of the leaf thinning was reduced wine colour but aroma and taste were also less intense to some tasters. The latest harvested grapes (mid April) had developed eucalypt characters. A seminar planned for December 2010 to discuss these results and address related topics has been delayed due to growers being preoccupied with a very wet season.

In summary leaf removal will delay sugar accumulation but it probably needs to be around 75% to provide a significant delay. Whilst leaf removal seems to have minimal impact on tannins in the fruit and wine, grape and wine colour is reduced by leaf thinning (despite leaf thinning producing smaller berries) and it is not clear how this occurs. These results may have some application for the 2010-11 season where downy mildew has depleted the leaf area on many vines.