Can you achieve yield control in the vineyard without using bunch thinning?

Q. My winemaker insists that I carry out bunch thinning at the start of veraison because she says that it will improve wine quality. This is an expensive and tedious process because it must be done manually. I have tried doing this mechanically but the results have been unsatisfactory. Is there a better way to reduce yield than by bunch thinning?

A. Yield control by bunch thinning, usually prior to veraison, is commonly employed by growers in many parts of the world, particularly in cool climates. This is done in the belief that it will improve fruit composition or quality perception and thereby enable the grower to recoup lost revenue through higher grape prices. Manual bunch thinning is an expensive technique, particularly when carried out closer to veraison. Although bunch thinning can improve wine quality, there have been many studies that have failed to demonstrate any improvement. In fact, there are examples where bunch thinning has actually decreased wine quality—due to increased herbaceous character—or decreased consumer rating. If yield control is necessary, recent research has shown that there may be better ways to do it than by bunch thinning. These methods not only result in greater quality improvement but also in lower costs and better control of bunch rot.

The first of these methods is early leaf removal in the bunch zone. This is the removal of the six to eight or so basal leaves on fruiting shoots on one occasion between the start of flowering and fruit set. It can be done either manually or mechanically. Since the first research on Sangiovese and Trebbiano, this practice has also been successful with Tempranillo, Semillon, Carignan and Graciano. Yield reduction has typically been in the range 20 to 40% relative to the control. Research has mainly been conducted in cool regions but the practice has also been trialled successfully in warm to hot regions. Yield reduction is a consequence of smaller bunches or fewer bunches or both, depending on variety and location. Decreased bunch weight is perhaps the most common response, mainly due to reduced fruit set. This technique works because the basal leaves, prior to flowering, are the most important source of resources for the developing inflorescence.

Early defoliation may decrease bud fruitfulness and thus bunch number in following season; however, this is not necessarily a universal response. With red wine-grapes, early leaf removal may result in more intensely coloured wine due to a combination of increased relative skin mass (a result of increased bunch exposure) or increased leaf area to fruit weight and not as a consequence of smaller berries. For white varieties, grape quality (assessed by berry sensory analysis) may also be improved. Bunch compactness decreases (mainly as a result of fewer berries per bunch) and less bunch rot has also been observed. The increased bunch exposure that will result from early leaf removal may need be compensated for by the manipulation of shoots to provide protection of bunches, particularly on the west side of north-south rows. If vines are sufficiently vigorous, growth of lateral shoots in the bunch zone may provide adequate protection of bunches later in the season (in some experiments, the lateral shoots have not been removed at the time of defoliation although the leaves on lateral shoots were removed, i.e. the tips were retained). Early defoliation generally causes stimulated growth of the rest of canopy resulting in the same total leaf area as the control at harvest.

An alternative to leaf removal is the application of an anti-transpirant spray to the whole canopy from the start of flowering. This temporarily reduces photosynthesis in the leaves and thus greatly decreases the supply of photosynthate to the developing inflorescences. The anti-transpirant used in most research has been Vapor Gard® (a water emulsifiable concentrate of a terpenic polymer known as pinolene) and this is available in Australia.

In summary, both early defoliation in the bunch zone and whole canopy anti-transpirant spray are techniques that are worthy of trialling in Australian regions, either for yield reduction or for control of bunch rot. For the latter, these practices may produce better results than application of fungicides. Wine quality may be also improved. Furthermore, both techniques can be mechanised. More consistent results have been achieved with mechanical defoliation than with mechanical bunch thinning at bunch closure or early veraison.

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