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STELLENBOSCH
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MECHANICAL PRUNING OF WINE GRAPES

3. INFLUENCE OF MECHANICAL PRUNING ON WINE QUALITY

Producers often ask the question and rightfully so, whether mechanical pruning (small box pruning) has any effect on the eventual quality of the wine. Theoretically speaking, the quality of the wine should not be affected since there are more and smaller berries and bunches present with mechanical pruning than is the case with conventional hand pruning.

3.1 Local experience:

- Alternative pruning systems have been tested on farms in three different places and on a variety of cultivars. Vineyards in Elsenburg, Nietvoorbij and ARC Robertson experimental farm were used for the trial. The treatment included a control, mechanical pruning, minimum pruning and non-pruning. Noteworthy savings in labour costs were achieved by all three the mechanical actions, compared to the control. A decrease in shoot length (shorter internodes) and an increase in harvest size was achieved in all the cultivars. Wine quality was not affected and in certain cases was even better compared to the hand pruning method. The adaptability of certain cultivars to the alternative pruning methods differed. Cabernet Sauvignon, Pinotage and Chardonnay adapted well. Sauvignon blanc and Merlot adapted poorly, however. The explanation for the latter is that both are cool climate cultivars which do not adapt well to the mechanical pruning systems. In contrast, Chenin blanc, Shiraz, Colombar and Ruby Cabernet fared extremely well.
- Alternative pruning systems, especially mechanical pruning, improved the flavour profile of the grapes due to the fact that the summer shoots were hanging open and thus ensured better light penetration in the bunch zone. This led to the application of mechanical pruning on a large scale in some red wine blocks on certain estates to enhance flavour in the blends. In rot-sensitive white wine blocks, botrytis rot was successfully eliminated by making use of minimum pruning. Concomitantly, higher yields were achieved in all cases.
- These results led to the large scale application of mechanical pruning in certain areas of the Breede River Valley, where as much as 80 % of the total grape intake of some cooperative cellars come from mechanically pruned vineyards.

3.2 Experience abroad:

- In Australia it was found that mechanical pruning which was applied over a wide variety of environments did not have a negative effect on wine quality, except where the capacity of the vine did not have the ability to ripen the harvest. There were also cases where too much dry wood arrived at the cellar, which can impair the wine making process.

- It was found that the wine judging points were slightly lower with small box pruning of Cabernet Sauvignon, compared to spur pruned and Guyot pruning systems. There were discernible differences in wine style with small box pruning, mainly as a result of the fact that higher concentrations of anthocyanins and phenols were present in the Guyot pruning system.
- Minimum pruning leads to decreased shoot growth with less and shortened internodes. Self-pruning occurs in the sense that shoots which did not fully develop as a result of overshadowing, tend to ligate themselves and die back. Minimum pruning leads to weaker budding with well exposed bunches with small berries. This system is easy to harvest with a mechanical harvester. The open system facilitates control of diseases such as Botrytis and powdery mildew. The system also leads to improved quality properties, provided sufficient sugar ripeness can be achieved. Minimum pruned vines normally have higher organic acid, improved wine colour and higher phenolic content than ordinary pruning at the same stage of maturity. Due to the changed fruit composition, grapes derived from minimum pruning are more suited to the production of low alcohol wines.
- Also refer to the Mechanical Harvesting fact sheets no. 3 and no. 4 for more information regarding mechanisation and the influence thereof on the quality of wine.

3.3 Conclusion:

- Vineyards which were mechanically pruned, must be mechanically harvested.
- Mechanical pruning leads to significant labour savings.
- Due to the changed microclimate around bunches during ripening, the chemical composition of the grapes change and this produces a wine with a different style than those achieved with other pruning methods.
- If the capacity of vines to ripen grapes is not impeded, grape quality is not necessarily impaired by mechanical pruning.