CHARACTERISATION OF BERRY SHRIVEL IN VITIS VINIFERA L. CULTIVARS IN THE STELLENBOSCH WINE REGION

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Abstract:

Context and purpose of the study – Late season dehydration, bunch stem necrosis, sugar accumulation disorder and sunburn are various types of berry shrivel occurring in vineyards. The incidence of these types of shrivel, and the degree to which it occur are influenced by various factors in the vineyard. These factors include the presence of pests and diseases in the vineyard, genetic traits expressed in certain cultivars, as well as climatic and environmental factors. The occurrence of berry shrivel in the vineyard could negatively impact the quality and quantity of the fruit produced. The aim of this study was to visually characterise the different types of berry shrivel occurring and the corresponding in two cultivars *Vitis vinifera* L. Chenin blanc and Shiraz in the Stellenbosch Wine region.

Material and methods – In this study the occurrence of berry shrivel in Chenin blanc and Shiraz grapes were studied in two vineyards in the Stellenbosch Wine of Origin district during the 2017/2018 ripening season. Two distinct microclimates were established by implementing a leaf removal treatment in the bunch zone of the canopies on the morning side of some of the experimental panels around véraison, leading to a more exposed microclimate (leaf removal treatment) versus untreated control panels. To confirm microclimatic impacts, loggers were placed in the vineyards to measure the temperatures in the bunch zone of the control and treatment panels. Additionally, grape composition (berry fresh weight, berry volume, total soluble solids, pH and TA was monitored during the growing season for each of the grape cultivars.

Results – Bunches on vines where leaves were removed were exposed to more direct sunlight and temperature extremes, hence sunburn-related berry shrivel was induced in these vines, especially in the Chenin blanc cultivar. Other types of berry shrivel were however also identified in both cultivars to various degrees during the ripening season, but late stage dehydration also occurred in both cultivars at the overripe stage. It was possible to visually follow the progress of shrivelling throughout the season and a grading scale was implemented to calculate the affected bunch areas. Slight differences were observed in the grape composition of the control (shaded) and exposed (treatment).

Keywords: berry shrivel, dehydration, necrosis, sunburn

1. Introduction

Characterisation of berry shrivel in *Vitis vinifera* L. cultivars in the Stellenbosch Wine region

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INTRODUCTION & OBJECTIVE

Late season dehydration, bunch stem necrosis, sugar accumulation disorder and sunburn are various types of berry shrivel occurring in vineyards. The incidence of these types of shrivel, and the degree to which it occur are influenced by various factors in the vineyard. These factors include the presence of pests and diseases in the vineyard, genetic traits expressed in certain cultivars, as well as climatic and environmental factors. The occurrence of berry shrivel in the vineyard could negatively impact the quality and quantity of the fruit produced. The aim of this study was to visually characterise different types of berry shrivel occurring and the corresponding in two cultivars *Vitis vinifera* L. Chenin blanc and Shiraz in the Stellenbosch Wine region. Furthermore, the impact of berry shrivel on grape chemical composition was investigated in these two cultivars.

MATERIALS AND METHODS

- Chenin blanc cv. clone SN1064 and Shiraz cv. clone SH21K, both planted on 101-14 Mgt, on coffeestone (koffieklip) soils with a clay subsoil in the Stellenbosch wine region
- Row direction for both vineyards are East-West with drip-irrigation system.
- A Control (standard viticultural practices with no leaf removal) and
- A treatment (leaf removal in bunch zone on morning side of the canopy) were implemented in each vineyard.
- Gemini Tinytag Plus 2 loggers placed in vineyard canopies to determine temperatures of the grape berries in the control and treatment every 15 minutes.
- Brix, pH and Titratable Acidity (TA) was determined on a weekly basis until harvest.
- Berry shrivel symptoms were visually assessed throughout the ripening season until harvesting.

Figure 1. Shiraz vineyard with (a) standard viticultural practices and no leaf removal and (b) Leaf removal in the morning side of the canopy .

RESULTS

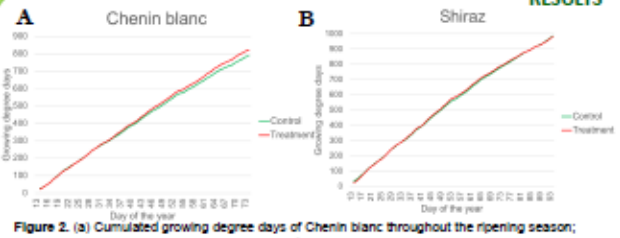

Figure 2. (a) Cumulated growing degree days of Chenin blanc throughout the ripening season; (b) cumulated growing degree days of Shiraz throughout the ripening season.

Table 1. Seasonal means of classical berry parameters and berry weights.

Treatment	Brix	pH	TA	Berry weight (g) / 50 berries
Chenin blanc				
Control	22,43	3,47	5,61	81,33
Leaf Removal	22,40	3,51	5,54	78,03
Shiraz				
Control	20,86	3,58	5,38	73,86
Leaf Removal	21,01	3,59	5,22	75,15

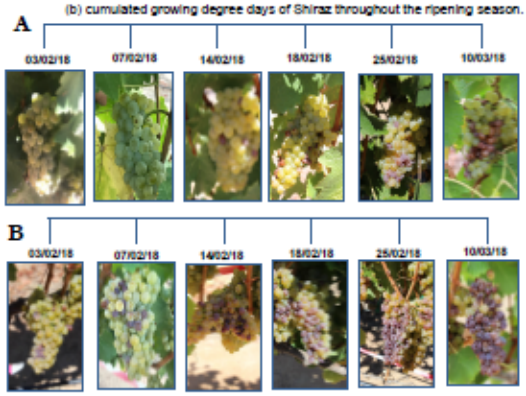

Figure 3. Berry shrivel in Chenin blanc. (a) depicts shrivel phenomenon in the control and (b) the berry shrivel in the leaf removal treatment throughout the ripening season

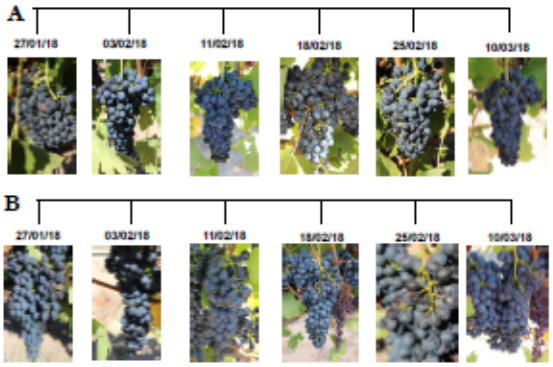

Figure 4. Berry shrivel in Shiraz. (a) depicts shrivel phenomenon in the control and (b) the berry shrivel in the leaf removal treatment throughout the ripening season

DISCUSSION

- The cumulated growing degree days were higher in the Chenin blanc treatment compared to the Chenin blanc control vineyard. No difference were observed in the cumulated growing degree days of the Shiraz vineyard.
- Sunburn and dehydration were prevalent in the Chenin blanc leaf removal treatment. This had an impact on the berry weights of the leaf removal treatment (Table 1).
- Berry shrivel was noticed less in the Chenin blanc control, but sour rot and grey rot developed later in the season. This is ascribed to the higher relative humidity due to an increased leaf layers.
- Bunch stem necrosis and dehydration developed later in the Shiraz cultivar.
- Dehydration developed irrespective of treatment in the Shiraz very late in the season.

CONCLUSION

- Morphological changes in grape clusters were observed in both cultivars.
- Increased temperatures did seem to play a role in the level of berry shrivel experienced within a season.
- The degree of berry shrivel and the type of shrivel observed differed between the cultivars.
- The impact of the identified shrivels should be further explored and the wine quality should be assessed.
- High leaf layer number in the Chenin blanc resulted in the prevalence of sour and grey rot. This makes it unfavourable for winemaking purposes.

ACKNOWLEGEMENTS

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