SENSORY EVALUATION OF 'SAUVIGNON BLANC' GRAPES BY A TRAINED PANEL•

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1. INTRODUCTION

Stellenbosch Wine District (South Africa) is characterised by a Mediterranean climate. Vineyards are associated with mid- and foot slopes, which could be ascribed to the hills and mountains of the region and their exposure to the influence of the ocean. Variations in soil are related to varying geological, parent material and mesoclimatic conditions. This results in diverse conditions for viticulture and in contrary grape composition from the different vineyards. Preliminary studies in the Stellenbosch region have linked the grapevine response to their growing conditions (Carey, 2005). In order to further investigate these results and to understand the response of 'Sauvignon blanc', sensory evaluation was performed on grape berries from five vineyards with different soil and mesoclimate situations. Two-hundred and fifty berries were sampled from three mini-plots of 10 vines within the five vineyards. The grapes were picked at the same ripeness level (23 ˚B ± 1 ˚B). Descriptive sensory analysis was performed by 12 panel members after eight training sessions of one hour each. Twenty-seven attributes related to the berry, skin and seed characteristics were evaluated. Analysis of variance (5 % significance level) was performed on the resulting data. The most significant descriptors for the vineyard effect were touch resistance, tropical notes, acidity and berry juiciness. As expected, these attributes are strongly linked to ripening period, soil and topography. The study showed it is possible to train judges for cultivar characteristics and to use sensory analysis as a tool to distinguish between terroirs. The implications of plant water status, vegetative growth and reproductive performance for berry sensory properties and wine style were also evaluated.

1. INTRODUCTION

Final wine quality is determined, *inter alia* by the grape quality at harvest. Grape quality is linked directly to the composition of various fruit tissues (pulp, skin and seed) and indirectly to the winemaking process (Le Moigne *et al.,* 2008). Changes during the ripening are not simultaneous. Biochemical and physical modifications of grape berries begin during *véraison* and continue throughout berry maturation altering grape composition (Coombe, 1992).

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Terroir (climate, soil and topography) contributes to classes of compounds evolving differently (Ribereau-Gayon *et al*., 1998). Climate and growing location can be highlighted as the two main factors which result in each compound evolving differently. Grape biochemical and physical modification can be assessed through sensorial evaluation of the berries. Over the past several years grape tasting has been used increasingly by wine professionals as a tool to evaluate grape biochemical and physical modifications.

Rousseau and Delteil (2000) proposed a grape sensory evaluation based on the segmentation of the three main grape tissues: skin, pulp and seeds that include 20 descriptors. Martinez's method (2002) is based on 9 descriptors and a structured line scale. Le Moigne *et al.* (2008) proposed a method based on 30 descriptors that provide quantitative means of description for sensory characteristics. Grape sensory evaluations are used as a tool by wine professionals to determine comparative berry ripeness. Ample descriptive sensory evaluation is done on wine and very little data exists on formal sensory attribute assessment of grape berries (Lohitnavy *et al*., 2010). To date, there are no published studies on the correlation between the grape sensory attributes and the wine style.

The aim of this study was to determine whether a trained panel could evaluate the characteristics of 'Sauvignon blanc' grapes and wines made from different viticultural parcels in the Stellenbosch Wine of Origin District.

2. MATERIALS AND METHODS

2.1. Field Experiments

The experimental trial was carried out in the Stellenbosch Wine of Origin District. Five commercial vineyard of 'Sauvignon blanc' were used for this study. Three mini-plots (1, 2 and 3) of 10 vines each were selected within each commercial vineyards.

2.1.1 Sample collection

250 Berries with pedicels attached were randomly picked in each mini-plot and sorted into groups with similar sugar concentration by the flotation technique (Singleton *et al*., 1966) limiting the grape sample heterogeneity. The grapes were picked at the same ripeness level (23 ˚B ± 1˚B) and stored at 4 °C for one night before evaluations were performed.

2.1.2 Grape sensory evaluation

12 Panel members were recruited according to their motivation and availability (10 women, 2 men; ranging between 19 to 49 years old). Eight one-hour training sessions were carried out to describe the sensory properties according to recommendations of AFNOR (1995). For the evaluation, each panel member was provided with 6 berries per mini-plot, in duplicate (6 samples of 6 berries each per vineyard). 27 attributes relating to the berry, skin and seed characteristics were evaluated and noted on a linear scale ranging from "very weak" to "very intense". Analysis of variance was applied on each of the 27 attributes studied. A significance level of 5% was considered.

2.1.3 Wine sensory evaluation

Mini-plots were harvested and vinified (according to standard winemaking practices at Stellenbosch University). 12 Panel members were trained with aroma standards and

evaluated the wines using generic descriptive analysis. Analysis of variance was applied on each of the 14 attributes evaluated. A significance level of 5 % was considered.

3. RESULTS AND DISCUSSION

3.1 Grape sensory evaluation

At the 5% level the assessor (judge) effect was significant for all descriptors (data not shown). This could be ascribed to the fruit heterogeneity (despite sorting the berries based on flotation), since each panel assessed a different berry from each mini-plots. Eight descriptors were significant based on the mini-plot. Twenty Attributes had a significant mini-plot - judge interaction. This indicates that more training is needed for future evaluations. Mini-plots were grouped together based on attributes such as touch resistance, acidity, aromas (tropical and green notes) and seed hardness (fig 1).

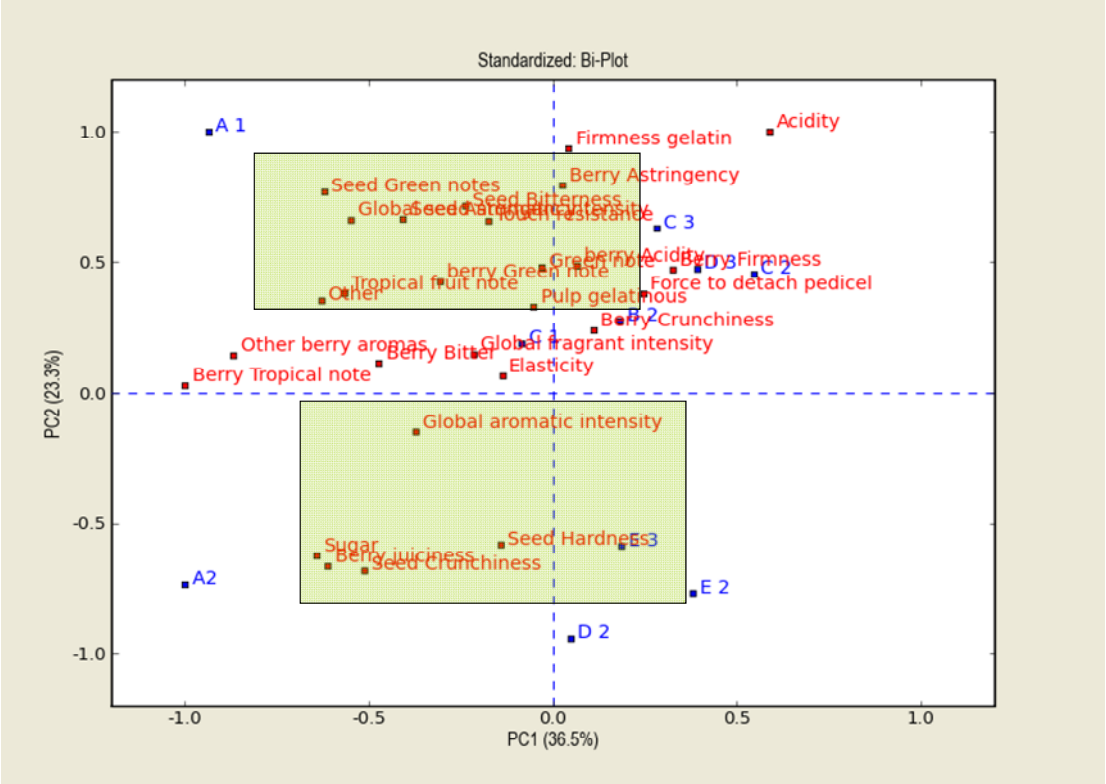

Fig. 1 - Principal component analysis performed on grape sensory evaluation.

3.2. Wine sensory evaluation

At the 5 % level the product effect was significant for all descriptors (data not shown). This could be ascribed to the fruit heterogeneity from all of the various commercial vineyards. This indicates that there are parcel differences between each of the plots (fig 2).

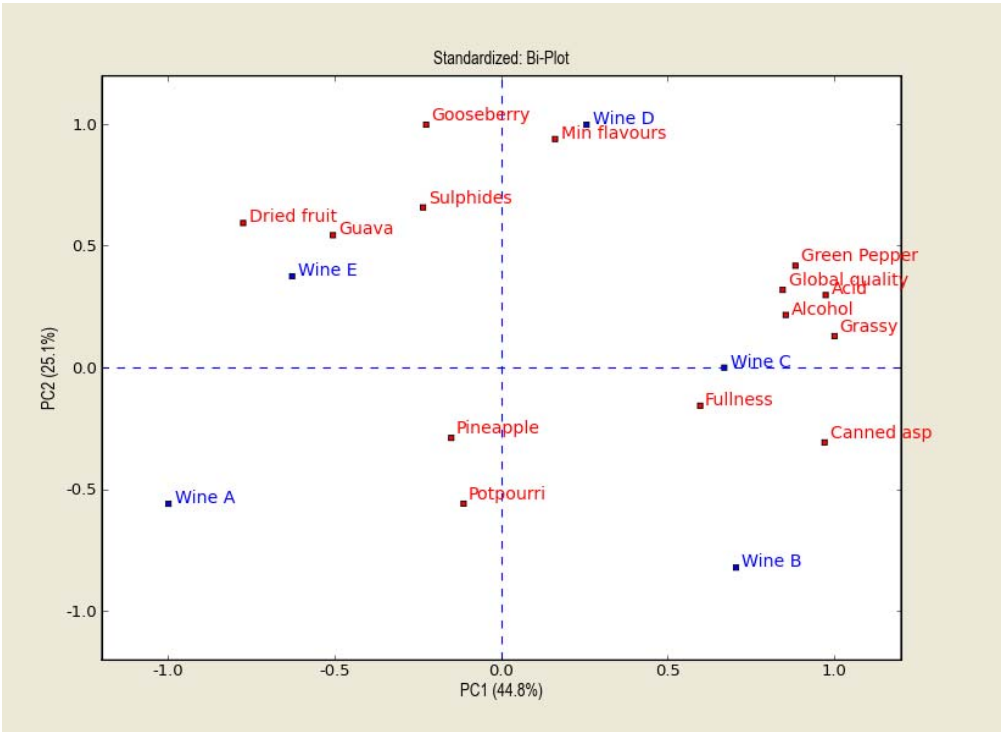

Fig. 2 - Principal component analysis of descriptive sensory analysis on wines.

Abstract

The study described the effect of sensory analysis on commercial 'Sauvignon blanc' vineyards within the Stellenbosch Wine of Origin District. The sensorial evaluation of the berries was able to give a description of each parcel type and relate it to the cultural practices. The parcel was discriminated by descriptors such as touch, odour and flavor. Descriptors such as touch resistance, tropical fruit notes and berry acidity were significant on a 5 % significance level. Textural and skin descriptors such as berry juiciness and tropical notes were also significant on a 5 % level.

Descriptive sensory analysis performed on the wines showed that it was able to be related to the viticultural parcel. The attributes that were discriminate between the wines were the green character (green pepper, grassy and canned asparagus), acidity and tropical flavours (guava).

This sensory technique seems to be a good indicator of grape quality and wine style. This will be continued to get a predictive model of wine style based on grape sensory attributes.

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