The Australian Wine Research Institute

Sensory properties of Sauvignon Blanc wines made from vines of different clones

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Introduction

The purpose of this study was to characterise aroma differences between wines made from vines of five different Sauvignon Blanc clones. Vines were from a single Adelaide Hills vineyard with the study conducted by Adelaide Hills Vine Improvement Inc. The clones in this trial were F4V6, F7V7, H5V10, Q97/20C and 5385.

Materials and Methods

Wines were made as single fermentations (no winemaking replicates) by WIC winemaking services. For sensory descriptive analysis, the wines were presented to a trained, experienced descriptive panel which had completed two other Sauvignon Blanc descriptive studies immediately prior to descriptive analysis of these wines. The terms used to describe these wines were the same terms used for the previous two studies.

Training
A panel of nine assessors (five male, four female) was convened for this study, all of whom are part of the AWRI trained descriptive analysis panel with extensive experience in sensory analysis.

The wines from both prior Sauvignon Blanc trials were included in the training sessions, for the purposes of training and development of a suitable list of attributes. Panellists attended three training sessions to determine appropriate descriptors for rating in the formal sessions. During these sessions the panellists assessed wines which represented the full range of sensory properties by aroma only.

A final list of 15 aroma attributes was assessed in a series of practice and formal sessions (14 defined terms and “other”). The attributes rated are listed in Table 1.

Table 1: Attributes and reference standards.

Attribute	Reference standard composition[1]
Passionfruit	1 tsp fresh passionfruit pulp including three seeds
Pineapple	2 x 1cm square of fresh pineapple
Lemon	1 cm piece of fresh lemon rind
Apricot/peach	10 mL Ardmona apricot nectar
Floral	5 µL *cis*-rose oxide
Capsicum	1 cm square piece fresh green capsicum
Fresh green	5 x 1cm freshly cut blades of grass plus 1 cm piece of fresh green bean.
Box hedge	6 fresh box hedge leaves (not in wine), synonym cat urine
Cooked veg	1 piece cooked, canned green bean plus 10 mL juice from can (Coles Brand)
Sweaty	10 µL hexanoic acid
Yeasty	¼ tsp dried yeast granules (Tandaco)
Pungent	10 mL AR grade ethanol
Nail polish remover	10 µL ethyl acetate

[1]Made up in 40 mL of base wine (Yalumba Classic Dry White 2009 vintage, 2L bag-in-box).

Formal sensory analysis
Samples were presented to panellists in 30 mL aliquots in 3-digit-coded, covered, ISO standard wine glasses at 22 – 24°C, in isolated booths under daylight lighting, with randomised presentation order within each tray of samples across judges. In the formal booth sessions the assessors were presented with five trays of three wines per tray, so that three presentation replicates were assessed by each judge. The assessors were forced to have a 40 second rest between samples and a ten minute rest between trays. During the 10 minute break assessors were requested to leave the booths and they were directed to a different booth for each tray. Samples were assessed in one day of formal sessions.

The intensity of each aroma attribute was rated using an unstructured 15 cm line scale with indented anchor points of 'low' and 'high' placed at 10% and 90% respectively. Data was acquired and analysed using Fizz sensory software (version 2.46, Biosystemes, Couternon, France).

Analysis of variance (ANOVA) was conducted for the effects of clone, presentation replicate and judge and their two way interactions, with judge treated as a random effect. Principal component analysis was performed on the mean data using the correlation matrix.

Results

From the ANOVA, there were significant ($p<0.05$) differences among the five clones for the attributes *green capsicum*, *fresh green* and *sweaty*, with the attributes *lemon*, *box hedge* and *yeasty* being significant at $p<0.1$. Table 2 shows the mean values for the fourteen aroma descriptors rated. Note that differences among the mean values that are greater than the least significant difference (LSD) value can be considered significantly different.

Table 2. Mean data and Least Significant Difference value (LSD, P=0.10) for each aroma attribute.

Attribute	F4V6	F7V7	H5V10	Q97/20C	5385	*LSD*	*p*-value
Overall fruit	2.94	2.61	2.96	2.46	2.72	-	0.281
Passionfruit	1.01	0.85	0.95	0.90	0.81	-	0.982
Pineapple	0.89	0.51	0.99	1.26	0.95	-	0.184
Lemon	1.23	1.23	1.07	0.69	1.15	*0.36*	0.088
Apricot/Peach	0.43	0.84	1.26	0.74	1.06	-	0.223
Floral	0.5	0.63	0.59	0.82	0.77	-	0.826
Green Capsicum	1.55	0.76	0.54	0.19	0.57	*0.70*	0.034
Fresh Green	2.51	1.14	0.71	0.23	0.34	*0.68*	<0.0001
Box Hedge	0.38	0.61	0.21	0.16	0.16	*0.31*	0.078
Cooked Vegetable	1.46	0.91	1.17	1.25	1.39	-	0.798
Sweaty	0.20	1.39	0.83	1.92	1.21	*0.81*	0.021
Yeasty	1.11	1.03	1.32	1.48	2.04	*0.63*	0.071
Pungent	2.3	2.35	2.56	2.22	2.07	-	0.400
Nail Polish Remover	0.99	1.03	0.99	0.71	0.73	-	0.550

From Table 2 and Figures 1 and 2 it can be seen that clone F4V6 was significantly higher in *green capsicum* and *fresh green* attributes than the other strains, and lowest in the *sweaty* attribute. Strain Q97/20C was rated highest in *sweaty* and low in *green capsicum*, *fresh green* and *box hedge* attributes. F7V7 was rated highest in *box hedge* and was moderate in *fresh green* aroma. H5V10 was rated moderately in all attributes, while 5385 was highest in *yeasty* aroma.

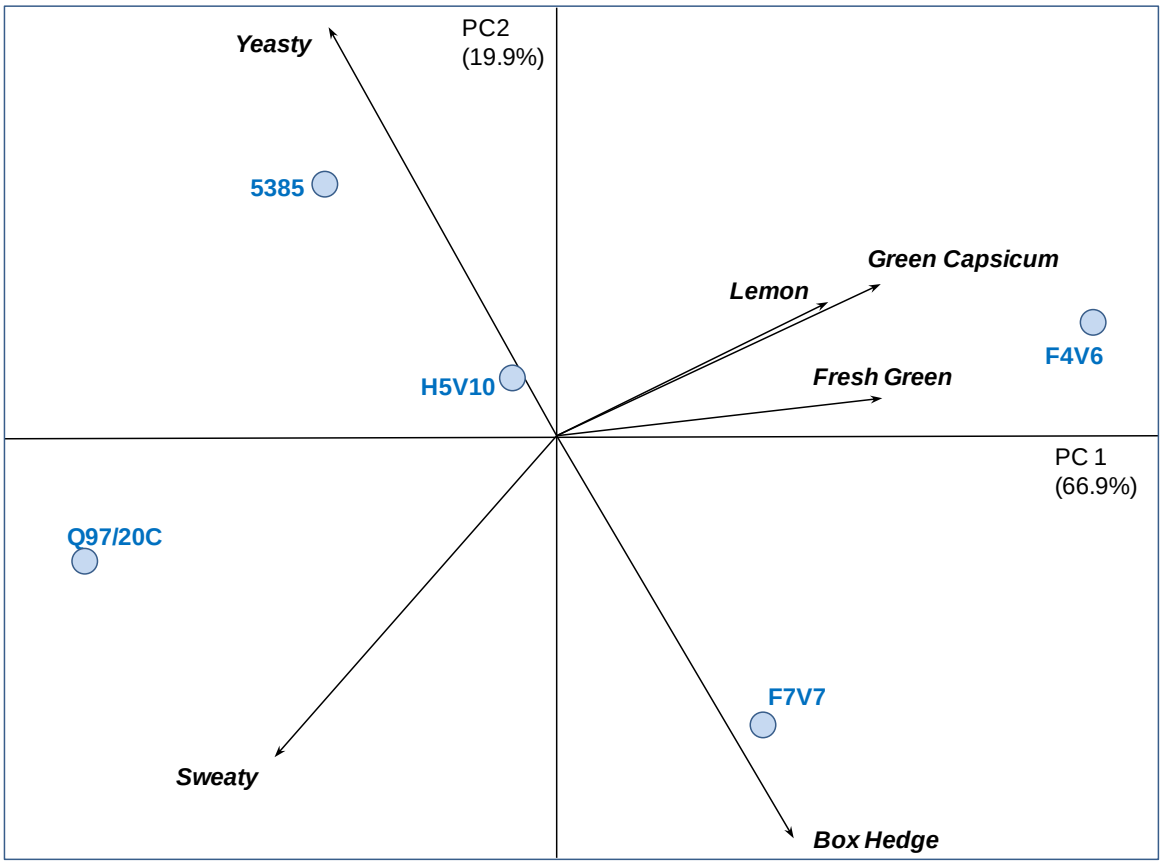

Figure 1: Principal component scores and attribute loadings for Sauvignon Blanc wines made from the different clones.

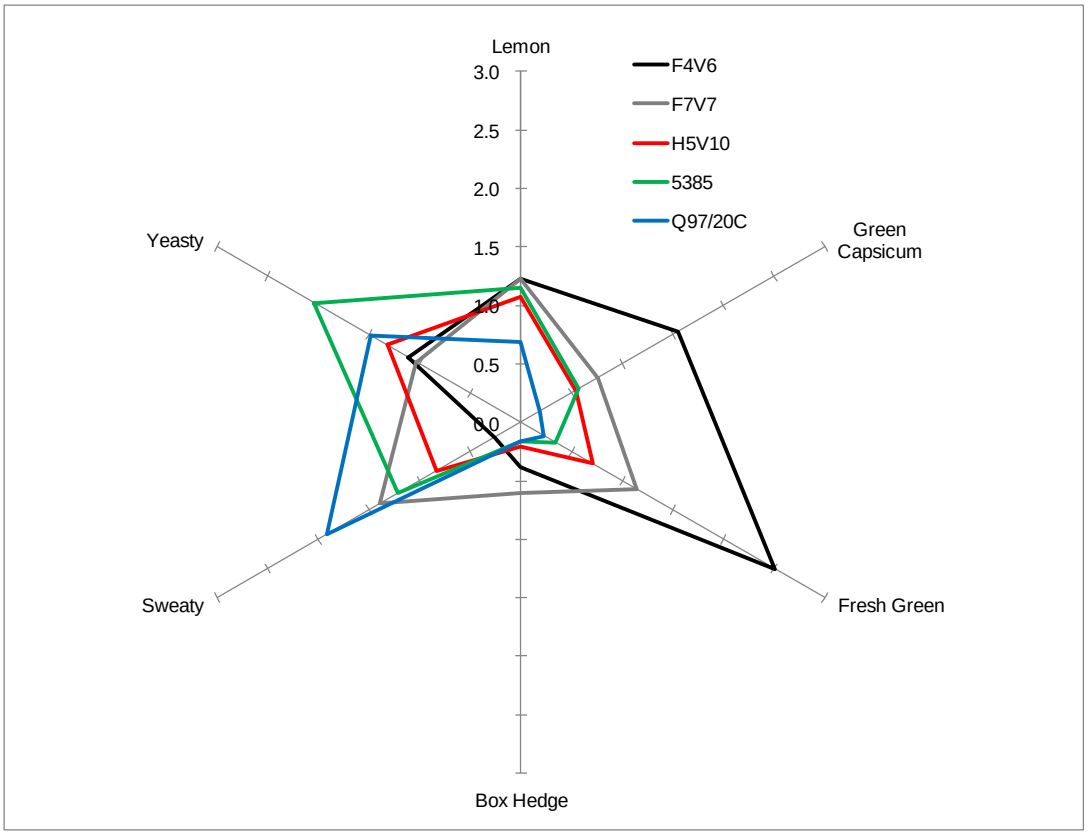

Figure 2: Radar plot of mean scores for the significant aroma attributes rated for wines made from the five clones.

Conclusion

The wines made from the different clones had moderately different aroma properties, with the differences in ‘green’ aroma being of greatest importance. The attributes yeasty and sweaty are likely associated with fermentation related aromas, while ‘box hedge’ is a term related to tropical thiols, with F7V7 having the highest rating of this attribute.

Considering the wines were made from a single grape lot fermented in a single fermentation replicate in small scale winemaking conditions, further studies are warranted to confirm that the sensory differences in the wines was due to the clone effect and not to variability in the vineyard or the winemaking.