Selection of yeast strains for optimal development of regional characters of Verdelho

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INTRODUCTION

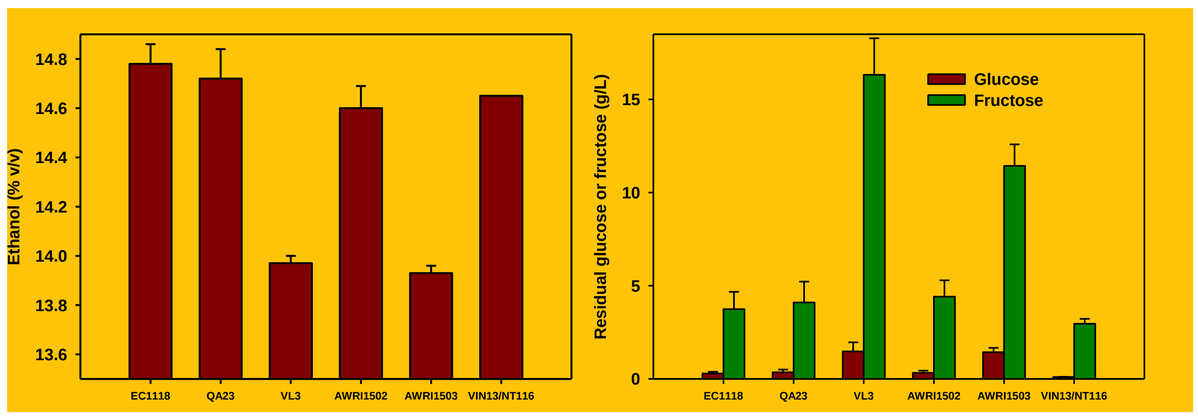
Verdelho is a variety for which Queensland is becoming well known. While in Australia Verdelho is the 9th most common white grape variety at 2.5% of total vines bearing at harvest in 2008, In Queensland it is the 2nd most common white variety, representing about 7% of total plantings. The objective of this pilot research project was to trial commercially available yeasts to optimise development of regional character of Queensland Verdelho wines. Three commonly used white wine yeasts, two new hybrids and a two-yeast mix were used to prepare small experimental batches of wine from Granite Belt Verdelho grapes. Vinification was conducted using local fruit to ensure results were applicable immediately and not subject to regional transferability issues.

METHODS

Verdelho grapes were harvested during the 2007 vintage, and 60 L of grape juice was prepared and stored at 0°C with 200 ppm SO_2. Prior to inoculation, SO_2 was reduced to 34.4 ppm total (8 ppm free) with H_2O_2 by the AWRI Method TN06. The juice (13.6° Baumé, 0.58 g/L malic acid) was acidified with tartaric acid to TA 6.3 (pH 2.91) and 200 mg/L DAP was added.

Experimental wines were produced in the latter half of 2007 by standard small-lot winemaking protocols. Wines were made in 2 L batches, each with three replicates. Ferments were inoculated with the yeasts at 20 g/hL. Yeasts were made up with a similar quantity of Go-Ferm (Lallemand). Ferments were conducted over 29 days. At completion the wines were brought to 40 ppm SO_2 and stored cold to settle, with racking twice.

The wines were bottled in December 2007, and presented for sensory analysis and judging according to standard wine show criteria to the Queensland Winemakers Cluster in December 2007, and to judges at the RASQ Wine Show in Toowoomba in May 2008.



YEASTS

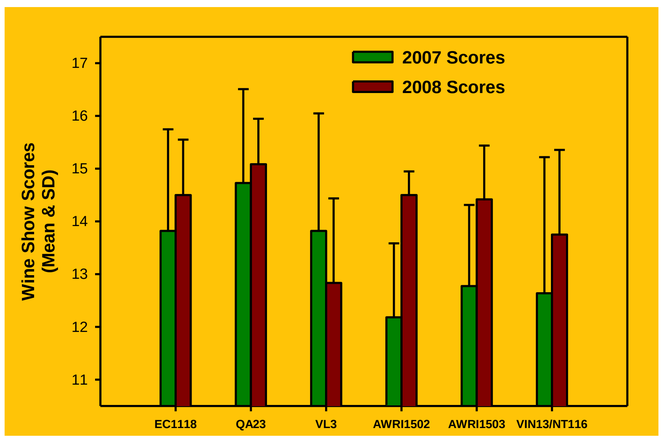
Saccharomyces strains were selected in consultation with Queensland winemakers who were interested in trialling certain yeasts with Verdelho (2 and 3 below). We also sought novel hybrids and a coferment , each of which has great potential. The strains included

1. Lalvin EC1118 (Lallemand), *S. bayanus*, selected as a control, "neutral" yeast with minimal sensory contribution
2. Enoferm QA23 (Lallemand), *S. bayanus*, recommended for enhancing floral aromas (β-glucosidase activity) and passionfruit / gooseberry / guava characters (strong volatile thiol converter)
3. Zymaflore VL3 (Laffort Oenologie), *S. cerevisiae*, recommended for enhancing varietal and box tree / passionfruit / gooseberry / guava characters (strong volatile thiol releaser)
4. AWRI 1502 (Mauri Yeast Australia), hybrid of *S. cerevisiae* x *S. cariocanus*, selected for enhancing varietal fruit aromatics and contributing to mouth-feel and palate length
5. AWRI 1503 (Mauri Yeast Australia), hybrid of *S. cerevisiae* x *S. kudriavzevii*, similar properties to AWRI 1502
6. A co-inoculation of *S. cerevisiae* strains VIN13 and NT116 (Anchor Yeast), both individually recommended for production of aromatic wines, VIN13 (strong volatile thiol releaser) and NT116 (strong volatile thiol converter).

RESULTS AND DISCUSSION

Most of the ferments progressed well, with residual sugar of 3 to 4.5 g/L. However VL3 and AWRI 1503 ferments seemed to become stuck at 17.8 and 12.9 g/L respectively. This led to production of around 0.6% less ethanol and seems to reflect fructose assimilation problems. Whether this is related to the small fermentation volumes remains to be determined.

When the wines were presented to winemakers and judges for sensory evaluation, feedback on all wines was positive. Some sensory differences were noted anecdotally. The scores from the 20 point scoring system were statistically similar. Wines were also evaluated 6 months later, and seem to have improved in bottle.



CONCLUSIONS

While some sensory differences were noted, the standard show judging criteria did not help to differentiate the wines. Further trials will be undertaken with larger ferment volumes, enabling sufficient wine to be produced for trained panel sensory evaluation for further discrimination of sensory profiles. It appears that the newly developed hybrids are being used effectively with varieties such as Chardonnay, Semillon and Chenin Blanc and may be more suitable for reserve grade or aged Verdelho, rather than wines designed for consumption within 12 months. Thus future work will include both aged and early-drinking styles.

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