

Impact Varietal Aroma Compounds in Sauvignon Blanc: Effect of Cryogenic Pre-Treatment Technologies During Winemaking

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Abstract

Varietal aromas, amongst others “green” (vegetative, grassy, herbaceous, asparagus, green pepper, capsicum, tomato leaf) and/or “tropical” (gooseberry, grapefruit and passion fruit) are synonymous with sought-after Sauvignon blanc wines. The aforementioned aromas can be attributed to the grape-derived impact varietal aroma compounds i.e., methoxypyrazines (“green”) and volatile thiols (“tropical”), respectively. It is noteworthy that viticultural and oenological practices as well as climate can influence the levels of these impact varietal aroma compounds. Subsequently, wine producers are continuously striving to improve wine quality by deploying different methodologies, amongst others, cryogenic treatments to grape juice before winemaking. Therefore, this study aimed to investigate the novel approach of applying cryogenic pre-treatment technologies to whole grapes, macerated grapes, turbid must and clear juice, directly after harvesting (0 months) as well as for a 4 month storage period and its effect on the impact varietal aroma compounds in Sauvignon Blanc originating from Stellenbosch and Durbanville (Coastal region), and Napier (Overberg region), respectively. Multiple Factor Analysis (MFA) of sensory evaluation data of the 0 and 4 month wines following small-scale wine production (20 L) showed that stage of production as well as cryogenic treatments positively impacted wine aroma and flavour attributes, as these wines were perceived to have enhanced tropical fruit (3SHA), citrus (3SH) and vegetative fresh notes. Methoxypyrazine and volatile thiol levels complemented the sensory evaluation data, as a positive correlation was observed between “green” and “tropical” and methoxypyrazine and volatile thiol compounds, respectively. It can, therefore, be concluded that cryogenic pre-treatment is a novel, yet advantageous technology during winemaking to increase the levels of impact varietal aroma compounds in Sauvignon blanc.

PRESENTER BIOGRAPHY: VALMARY VAN BREDA

As a Senior Research Technician (Ph.D. candidate) at the ARC Infruitec-Nietvoorbij Valmary has more than 15 years of experience in the fields of Microbiology, Fermentation Technology, and Sensory Evaluation within the Wine Industry. Valmary has published scientific articles and been a co-author of numerous articles; both locally and internationally as well as presented at Local and International conferences. In addition, she has been a team member of various projects funded by the ARC, Winetech, The Department of Agriculture Forestry and Fisheries (DAFF), and the National Research Foundation (NRF). Projects involved; The use of *Torulaspora delbrueckii* for wine production, Fermentation trials on grapes treated with new fungicides, Production of Fruit wines, and Improved Quality of Method Cap Classic (MCC). Moreover, Valmary manages the AGRI-Food Analytics Laboratory of the ARC Infruitec-Nietvoorbij which provides analytical services to ARC Researchers as well as to external clients within the Wine and Agro-Processing Industries.