Researchers in the Wine Science Programme at The University of Auckland have developed a complex aroma prediction model that reduces cost and increases the accuracy of achieving specific aromas across multiple vats of blended wines. Utilising this technology, winemakers are able to create a desired blend quickly, more economically and with better consistency, allowing more time to be spent on final tasting and perfection.

The Challenge
To maintain consistency across the vintage, the process of blending wine requires periodic sampling of the wine until the final blend is complete. Sampling is generally completed manually, which takes time, requires significant expertise and can be unpredictable. The consistency of the aroma, and thus taste, of the wine is difficult to maintain. Current technology allows for simple aroma profiling, but cannot assist the blending process with more complex aroma combinations and prediction.

The Solution
With this technology, aroma profiles can be uploaded from wine samples taken from multiple vats and compared against various aroma concentrations that the winemaker wishes to reproduce or develop from. Using the aroma profiles, the model calculates precise quantities and combinations from each vat needed to reproduce the target wine. It also produces aroma descriptors, which can be used to further refine the final product and aids in final manual tasting and mixing. The technology will eventually allow winemakers to design complex wine flavours by using an online tool and widely available profiling test methods. This technology is able to predict final aroma profiles of wine before blending, currently using up to 25 aroma compounds, with the possibility of more, as opposed to 3-5 compounds measured by other methods. Use of the model allows the winemaker to rapidly develop highly consistent base wine blends from multiple vats. Software-based experimentation then assists in creating a final blend, allowing for further experimentation and creativity.

Competitive Advantage
- Quickly and consistently predict wine flavours pre-mix
- Calculate maximum production of a desired blend
- Minimise time consumption of blending process
- Software-based prediction assists in blending decisions and new flavour development

Goldie vineyard on Waiheke Island, owned and operated by The University of Auckland Wine Science programme.
The Wine Science Programme at The University of Auckland

The University of Auckland has established itself as a major centre for advanced Wine Science research and teaching. Research projects include wine aroma analysis, yeast science and red wine astringency and oxidation. In 2004 the Wine Science Programme was awarded a six-year, $9.6 million grant to lead work nationwide into the aroma of New Zealand Sauvignon Blanc. In 2011 the University was gifted the 14ha Goldie vineyard and winery on Waiheke Island for further research and teaching.

Associate Professor Paul Kilmartin is engaged in wine aroma and beverage oxidation research within The University of Auckland Wine Science programme. Paul has been leading research projects in the School of Chemical Sciences and Wine and Food Science programmes since 1997.

The University of Auckland

The University of Auckland is New Zealand’s leading university and is the only one ranked among the world’s top 200 universities by the Times Higher Education World Rankings of Universities. It is also the highest ranked New Zealand university in the QS World University Rankings and the Shanghai Jiao Tong Academic Ranking of World Universities.

The University of Auckland is an international centre of learning and academic excellence. It is New Zealand’s pre-eminent research-led institution and has key linkages with many of the world’s top research intensive universities.

Based in the heart of New Zealand’s largest and most diverse city, The University of Auckland has the most comprehensive range of courses in the country. The University’s mission is to be a research-led, international university, recognised for excellence in teaching, learning, research, creative work and administration.

The University actively seeks to work with government, other universities, research organisations, businesses and commercial consultancies in research, development and education.

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