Excerpt from:

Precision Viticulture
Technology highlighted at CSUF Grape Day

Story and Photos by Ted Rieger

NIR SPECTROSCOPY IN GRAPE QUALITY ASSESSMENT

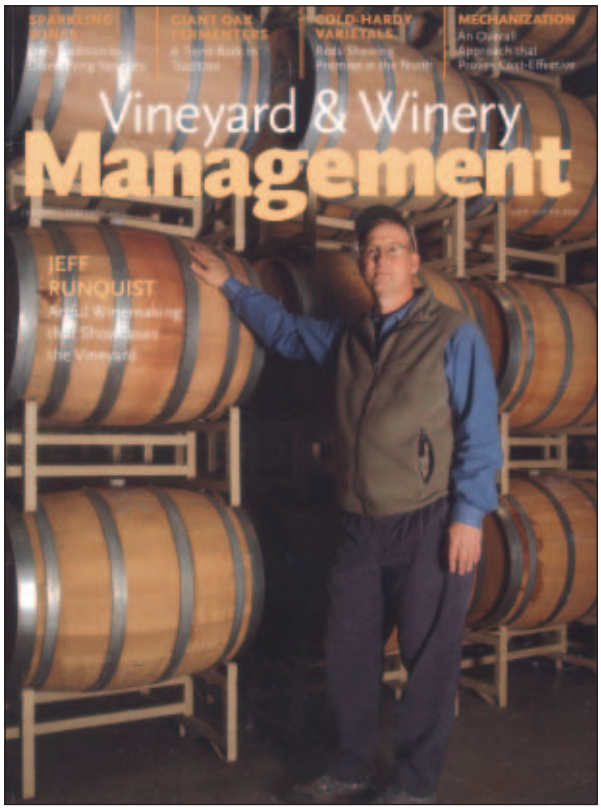
VERC student research assistant Oren Kaye demonstrated fruit quality evaluation technology being tested in the cabernet sauvignon block of the Fresno State vineyard. The technology uses light in the near infrared (NIR) zone to scan inside a grape on the vine without having to pick the grape, using a Brimrose Luminar 5030 NIR hand-held analyzer that is a portable battery-powered device used in the vineyard. The device can take measurements for Brix, pH, titratable acidity (TA), malic acid, anthocyanin in relation to color quality, and other phenolic measurements, just by holding the scanner against the outside skin of any grape in the vineyard. The data can be taken into the vineyard, or it can be transferred to a remote computer using a wireless connection.

Kaye listed several advantages of NIR spectroscopy for analyzing fruit and wine quality:

- It allows non-destructive sampling.
- It enables larger sample sets to provide a better indication of vineyard status.
- It can perform many analyses simultaneously.
- It can be used to identify flavor attributes not yet recognized.
- NIR analyzers are also available as submersible liquid probes that can be used to monitor wine samples during processing in tanks or barrels.

Kaye said the VERC project began in 2003 and is in the data-collection stage, with more than 6,000 grape scans completed over two seasons. The scans are being done simultaneously with picking the same berries to perform standard lab testing as a way to compare results. This will enable calibrating the Brimrose NIR analyzer to provide the most accurate results in the future. He said, "The equipment is readily available, but you can't just buy it and begin running it." Kaye further explained: "We're developing calibrations for vineyard use with the idea that Brimrose can use the data to perhaps develop general software for the grape industry. Some wineries with the expertise will probably want to do their own calibrations and develop their own software, while others may want to buy a package off the shelf if it's available." Kaye said so far there has been a very strong correlation between the grape scan data and the berry lab analyses data, but there are some variables. He said, "We're seeing some different results and calibrations between thinner and thicker skinned grape varieties, so we are working on making the calibrations more variety specific."

The VERC project plans to eventually link the mobile equipment to a GPS to allow each data point to be associated with a specific location in the vineyard. This will permit selective harvesting if desired, and will provide a long-term database in order to adjust management practices to improve uniformity and quality in the vineyard.



Vineyard & Winery Management
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Precision Viticulture: Technology highlighted at CSUF Grape Day; pages 107 - 115.

*VERC research assistant **Oren Kaye** demonstrates a Brimrose NIR spectroscopy hand-held unit that can take readings for Brix, pH, TA, etc. from any grape in the vineyard without removing it from the vine.*