EIGHTH ANNUAL TECHNOLOGY ISSUE

WINES & VINES

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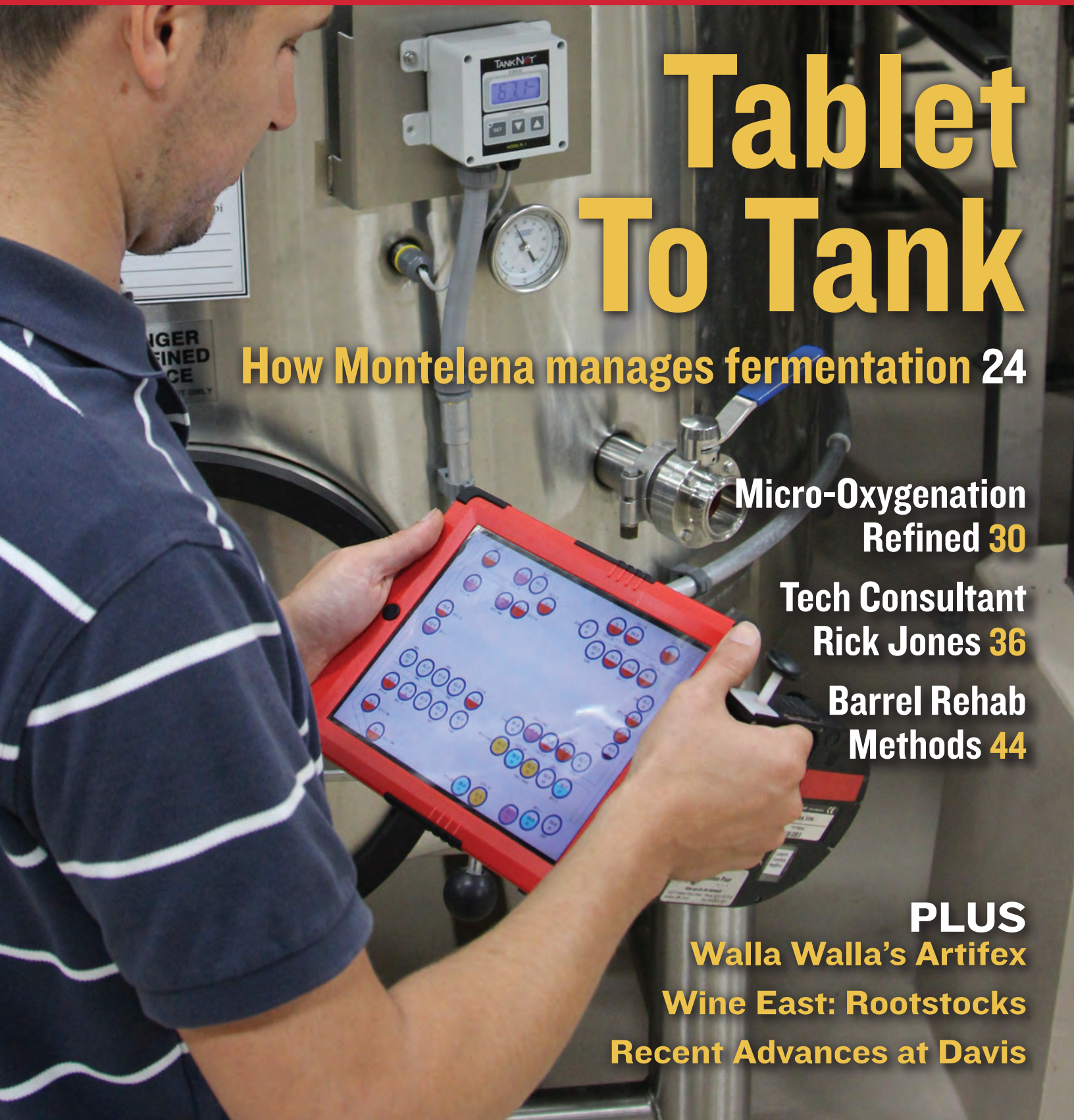


Tablet To Tank

How Montelena manages fermentation 24

Micro-Oxygenation Refined 30

Tech Consultant Rick Jones 36

Barrel Rehab Methods 44

PLUS

Walla Walla's Artifex

Wine East: Rootstocks

Recent Advances at Davis

In This Issue

Thomas Ulrich

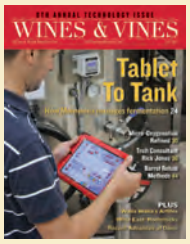
A former technology writer for Hewlett-Packard, Ulrich explains how cellar staffers at Chateau Montelena gave up their clipboards and installed more flexible tank controls and powerful software to better manage and record what happens during fermentation.

Andrew Adams

The air we breathe has been the default source of oxygen for hundreds of years. Then came micro-oxygenation for winemakers who wanted to get really strategic about the process and use pure oxygen. Andrew Adams takes a close look at the latest developments.

Andrew Reynolds

Frequent contributor Andrew Reynolds, professor of viticulture at Brock University in Ontario, shares recent research about how rootstock choices influence wine quality parameters, particularly for Shiraz and Cabernet Sauvignon.



July's Cover

Chateau Montelena assistant winemaker Matthew Crafton uses a TankNET tablet and tank control to track and trigger essential steps in the cellar. The software used incorporates TankNET and VINx2 technologies. Photo by Jamie Thrower of Studio 13 Designs.

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JULY — EIGHTH ANNUAL TECHNOLOGY ISSUE
WINES & VINES

COVER STORY

When Hardware and Software Meet 24

Chateau Montelena combines new cellar technologies to track production wirelessly and do away with hand-written records.

TECHNOLOGY

Using Micro-Oxygenation To Improve Wine Quality 30

Winemakers and suppliers share secrets about using precise levels of pure oxygen for wines.

Winemaker Interview: Rick Jones Talks Tech 36

Early adopter of cellar technology calls himself a "catalyst" for advancing winemaking tools.

TECHNICAL REVIEW

Building a Custom Crush 40

Leading figures in Washington winemaking open custom crush site in Walla Walla.

BARRELS

Methods for Making Old Barrels 'New' Again 44

Winemakers experiment with reconditioning to get new oak flavor while saving money.

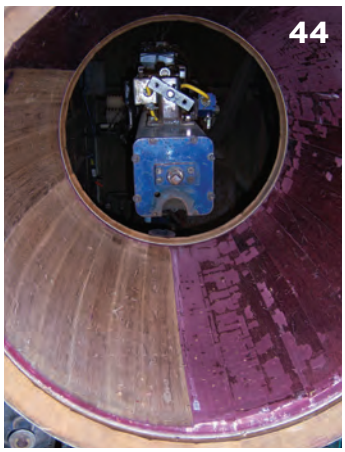
WineEast

States' Wine Histories 61

New books detail the pasts of Maryland and Connecticut as well as Thomas Jefferson's vines.

Rootstocks and Vines 63

Research reports detail how rootstocks affect yield, vine performance and berry composition.



DEPARTMENTS

WINE EAST IN WINES & VINES

ALL PHOTOS: JAMIE THROWER

Winemaker Cameron Parry adjusts the wireless tank thermostat that monitors and drives fermentation at Chateau Montelena in Calistoga, Calif.

When Hardware and Software Converge

Chateau Montelena explores new cellar technologies to keep up with production

By Thomas Ulrich

Winemakers have tracked vintages from standalone computers for decades. They transferred journal entries from notebooks and clipboards—paperwork that Chateau Montelena winemaker Cameron Parry replaced as part of a recent renovation at the 130-year-old winery in Calistoga, Calif.

Parry equipped the production lab and winery with a new generation of electronic tools. They report data more quickly and accurately, and they take the information that he and assistant winemaker Matthew Crafton collect and help shape it into a comprehensive vision for the 2011 vintage.

During the 2010 harvest, a half-dozen clipboards piled up on Parry's desk when they weren't being passed from winemaker to assistant winemaker and back again. "You could see the skid marks between our two desks," Crafton recalls. "We'd often ask one another: 'Who's got the clipboard?'"

Highlights

- Portable computers accelerate the pace of retrieving data and improve the accuracy of laboratory and winery records.
- Powerful software keeps track of production details so that the winemaker can concentrate on improving wine quality.
- Flexible hardware and software make production much more efficient.

The computer monitor hanging above winemaker Cameron Parry's desk provides a comprehensive and up-to-date glance at the current status of the cellar.

And when they finally accessed the aging database, they would often "get in each other's way," Parry says. "I'd be working on a harvest report. Matt would be entering lab work or work-order related information."

Once the electronic ledger was updated with test results and the status of each tank, the pair tracked day-to-day operations with another stand-alone tool—a large, laminated whiteboard. "One step in the winery meant eight steps in the database," Crafton says.

And it showed.

"During harvest, Cameron would say, 'What's in the tank?'" Crafton recalls. "I'd be at least two days behind" reporting the status of the tanks and lab results.

Parry admits that the software he acquired last spring has accelerated the pace of retrieving data and improved the accuracy of laboratory and winery reports. Instead of recording data in several places and waiting as many as 48 hours to review results, he can enter it once and evaluate the information within a few hours.

As it happens

Today, Crafton and Parry watch over the winery from a 32-inch screen that hangs above Parry's desk. It displays a cellar map that records the temperature, value and time of the last Brix measurement, fill-level, set points, status and the lot code of 45 stainless steel fermentation tanks as fast as the cellar crew, wireless thermostats or the electronic probes can report them.

The computer monitor depicts each stainless steel fermentor as an animated icon that shows the status of each tank. Selecting an icon retrieves up-to-date information about its contents.

"A visual representation of the (winemaking) process allows me to take in everything at once," Parry says as a tank icon changes color, signaling that Crafton has inoculated the juice.

Without armloads of notebooks and clipboards, Parry can follow fermentation from the 32-inch laboratory LCD screen. From a tablet computer, he can follow the process all the way to the shipping dock. Armed with software and controllers that drive production, the desktop and portable computers present him with a timely and comprehensive view of the 2011 vintage.

"The harvest is much easier to manage with digital, graphical representations," Parry says. "It's a snapshot, a moment in time. I can see what's already happened and decide what needs to happen next.

Such foresight reflects the convergence of flexible hardware and powerful software—a concept that took hold in U.S. manufacturing more than a quarter-century ago.

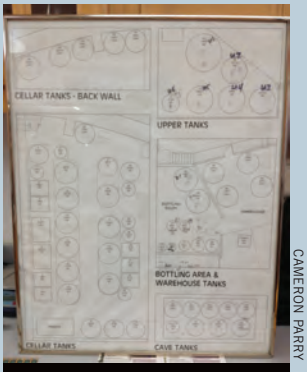
Bye, bye clipboards

Shortly after the 2010 harvest, Matthew Crafton walked into the Chateau Montelena cellar with three clipboards, a densitometer, sample vials and hand-drawn fermentation graphs. "We'd store the information we gathered in several places including a fermentation card and the database."

Clipboards no longer litter winemaker Cameron Parry's desk. In the winery, Crafton and the five-person cellar team enter information into a programmable thermostat attached to each fermentation tank or a tablet computer.

They can specify a temperature range, report a Brix measurement or record a pump over by scrolling down a list that appears on the thermostat screen, selecting the field and entering a value.

Say Parry wants to cool the tank at the end of fermentation. The cellar team gathers a sample. The lab reports the residual sugar has reached 0.08%. Crafton enters the value into the database, which alerts VINx2. The production software signals the control software that the status of the tank has changed. TankNET triggers a controller to open a solenoid. Coolant floods the fermentation tank jacket, lowering the temperature of the fermented fruit to a set value.



CAMERON PARRY

Tank changes and lot status used to be recorded on a white board.

"The project is unique," Parry says, "because VINx2 and TankNET talk to each other."

T.U.

Parry and Crafton are among the first winemakers to integrate TankNET with VINx2. TankNET is a temperature-control system composed of browser-accessible software and wireless tank thermostats that monitor and drive fermentation. VINx2 is production software that captures data and helps guide the process from receiving grapes at the winery to locating cases of finished goods in the warehouse. Together, they track and trigger the essential steps for producing and shipping wine.

TankNET control software and VINx2 production software share data. When Crafton completes a work order, he records the event on his tablet computer. VINx2 uploads information such as when he inoculated the juice, the movement or addition of wine and whether the tank is empty, full or somewhere in between. The TankNET web server updates information displayed on the 32-inch electronic whiteboard hanging from a wall in the production lab.

When Crafton inoculated the tank, for example, he entered the information onto the tablet computer, and the completed assignment became part of the electronic record.

"Once VINx2 alerted TankNET of the change, the LCD informed me that the status of the tanks had changed from an inoculated to a fermenting red," Parry says.

In the production lab or the winery, Crafton, Parry and other members of the cellar team can use tablet computers to add information such as analysis results to the database. Over time the cellar team compiles a history of their wines, one vintage at a time.

Working the cellar

"We take the tablet computer into the cellar, with its water-proof case, where we can update the database by transmitting data wirelessly from the tablet computer to the web server," Crafton says.

Each barrel at Chateau Montelena is given a barcode sticker. When cellar workers finish a job such as racking or filling, the barrels are scanned and their statuses are updated in the main computer system.

Before these rugged computers entered the cellar, workers would stencil serial numbers on each barrel. "Inevitably there would be a problem," Parry says. "We'd send them back to the cellar to re-enter the number."

Now, staffers print a bar code and attach it to the barrel. They can identify the barrel electronically and record information on the tablet computer. And unlike a clipboard that merely stores information, the tablet permits Parry and Crafton to drive production with a few keystrokes.

With software modules that keep tabs on everything from receiving fruit at the winery to tracking inventory in the warehouse, winemakers can tackle broader challenges like elevating the caliber of their wine.

TankNET hardware

TankNET offers two types of temperature controllers ranging from $249 to $399 per tank, according to Paul Egidio at Acrolon Technologies, supplier of TankNET:

1) Tank-mounted thermostats for wineries that prefer a temperature controller on each tank. This is the type Chateau Montelena has (PL-1 thermostats to be precise);

2) Central panel controls for those that do not require controllers for each tank (wineries like Fetzer, Concannon and others use these controls).

Having both options lets wineries choose the best configuration for their aesthetic and functional needs, Egidio says. Typically, the type of system TankNET is replacing dictates which type of controls the winery chooses. All TankNET controllers also operate stand-alone (they do not need software in order to function, be monitored and/or adjusted), regardless of type.

Acrolon offers two versions of its TankNET browser/iPhone/Android control software. Costs range from $1,295 to $3,995. This pricing also includes the web server on which the software is hosted, making TankNET a turnkey solution. Pricing is not subscription-based but rather a one-time license fee.

VINx2 software

The two most popular options of VINx2 software are called Base and

Wine Production Software Suppliers

COMPANY	PHONE	WEBSITE
Acrolon Technologies Inc.	(707) 938-1300	acrolon.com
Foss North America Inc.	(800) 547-6275	foss.us
Logix Controls	(425) 828-4149	logix-controls.com
Modular Information Systems	(866) 647-3757	vintnersadvantage.com
Orion Wine Software (formerly eSkye & Vintage Consultants)	(714) 768-6199	orionwinesoftware.com
Vintegrate, a division of KLH Consulting Inc.	(707) 575-9986	vintegrate.com
VINx2 by JX2 Technology Pty. Ltd.	(888) 240-4860	winery-software.com.au
Wine Management Systems	(800) 656-9521	winemanagementsystems.com
Wine Technology America	(707) 703-1861	vinwizard.com
The Winemaker's Database Inc.	(831) 465-8310	wmdb.com

For more on wine production software suppliers, see Wines & Vines' 2012 Buyer's Guide in print or online at winesandvinesbuyersguide.com.

A color-coded system shows each tank's status, which can include fill level, temperature and the last Brix measurement.

Inventory. VINx2 can be licensed as a subscription service or purchased outright, says Jamie Gilchrist at VINx2. Prices vary depending on the number of modules and users required.

Gilchrist says the sign-on fees for a subscription option can range from $2,000 to $7,000. The Base wine production module has a monthly subscription fee of $300, and the Advanced Inventory module is $200 per month. Outright purchase options start at $15,000 for the Base system plus $7,500 for Advanced Inventory.

Making it better

Before Parry and Crafton launched this new generation of electronic tools at Chateau Montelena, the last vintage and all the vintages that preceded it were distant memories. "We couldn't trace what we did last year," Crafton says.

"We want to capture all this data so that we can make more accurate and timely decisions to improve the quality of our wine," Parry adds.

With hardware and software that keeps track of variables such as temperature, pump overs, lab results and even which batch of fruit stayed on the skins five hours longer than the rest of the lot, winemakers can parse each vintage and learn more from their experiences.

"Let's look at the top 10 lots to see how they are different (from the other wine we make) and reproduce them," Crafton says.

With the 2011 harvest behind them, rethinking the lab and the winery has borne better-than-expected fruit.

"Since last June, we've seen a lot of stuff for the first time," Parry says. "Even after the first harvest, we are much better off than we were before." W&V

Thomas Ulrich wrote a story about mechanical harvesting for the January issue. He teaches journalism at San Jose State University.