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2017 Equipment Survey Report *plus* Innovative Fermentation Technology



INNOVATION+QUALITY

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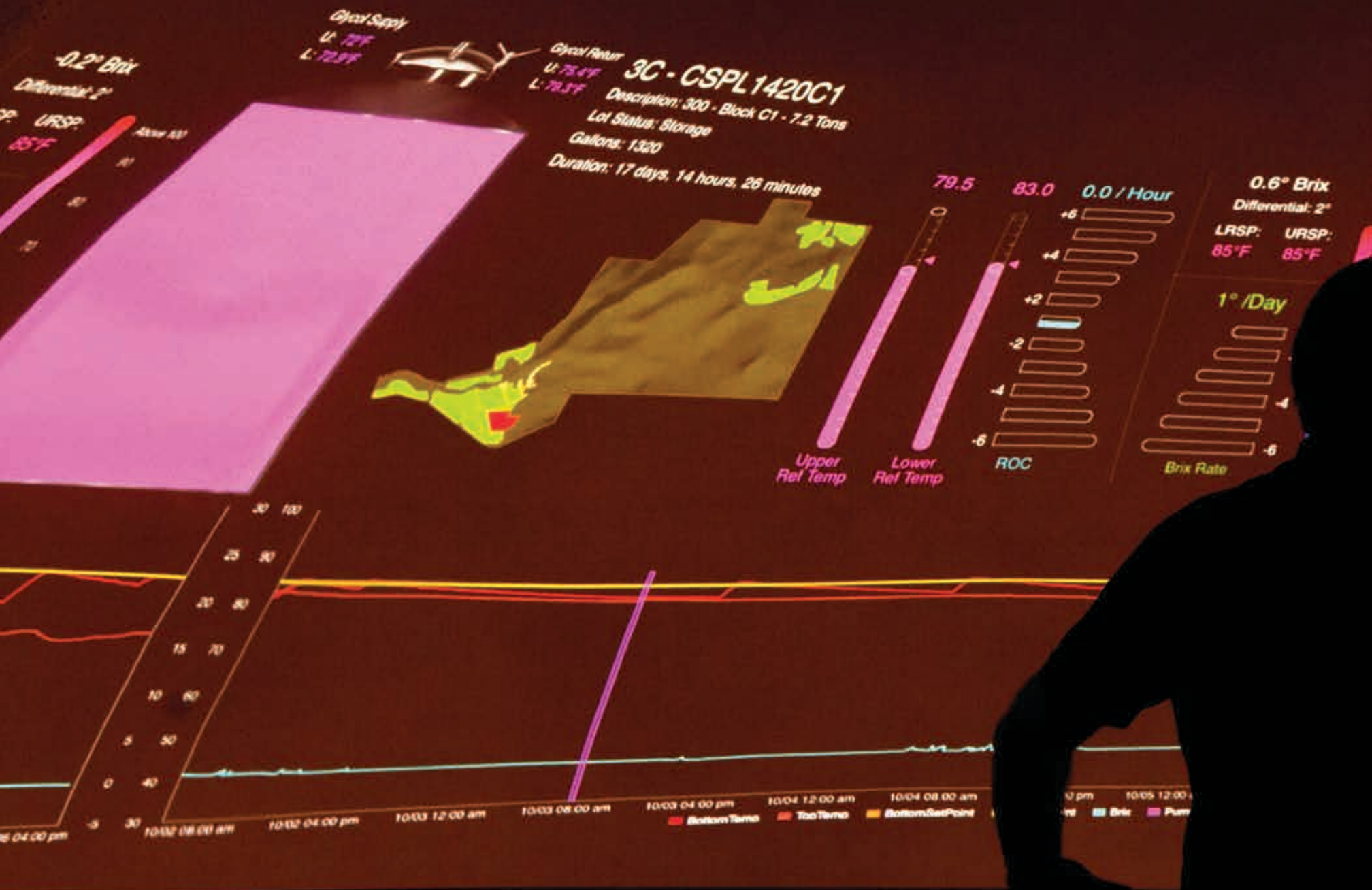
March 2, 2017

Announcing Innovation+Quality 2017 **Award Winners** See page 18.

Innovative Fermentation Technology at Palmaz Vineyards

The winery adds crown to remarkable facility—comprehensive fermentation monitoring displayed on cavern wall

Paul Franson



Glycol Supply
U: 67.6°F
L: 67.6°F



Glycol Return
U: 75.4°F
L: 77.4°F

4C - CSPL1421D

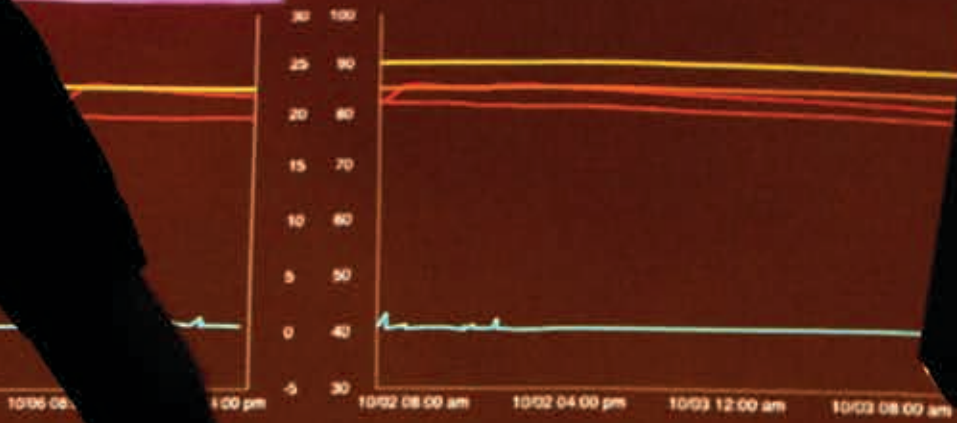
Description: 300-Block D 7.1 Tons
Lot Status: Storage
Gallons: 1320
Duration: 16 days, 13 hours, 19 minutes

Glycol Supply
U: 83.7°F
L: 67.6°F

0.2" Brix
Differential: 2"
LRSP: 85°F
URSP: 90°F

77.5 83.5 0.0 / Hour

0.1" / Day



Innovative Fermentation Technology at Palmaz Vineyards

THERE AREN'T MANY WINERIES that are as impressive as **Palmaz Vineyards**, especially if you're a technology junkie. Since its early days, the winery has been at the forefront of innovative vineyard and winery technology, and is continuing to upgrade and improve its processes. The east Napa facility consists of numerous tunnels and rooms dug into the side of Mount George and stretches horizontally the equivalent of 18 stories.

The caves themselves are notable but equally so is what's in them: fermentation tanks that rotate on a carousel in a giant domed cavern so that sorted grapes can drop by gravity into fermentation vats. A sophisticated system of pipes allows must to further flow by gravity to barrels stored in caves branching out in spokes below.

The winery has its own bottling line, which sparges the bottles with argon then inserts the corks under negative pressure in the headspace.

Then there's a plant for wastewater treatment—which is so large it could treat enough water for a small municipality's use. The treatment plant cleans all water used in the winery and stores 1.2 million gallons of water in sealed tunnel arms for use in the vineyards.

But the winery's newest wonder is a sophisticated Fermentation Intelligence Logic Control System, FILCS (pronounced Felix), for monitoring conditions in each of its 24 fermentation tanks, which projects data on the domed cavern wall above, making it easy for the winemaking crew to know exactly what is happening in each tank. The same information can also be displayed on an iPad so winemaker **Tina Mitchell** can monitor status in her office or even at home, and change temperatures or initiate pump-overs if needed.

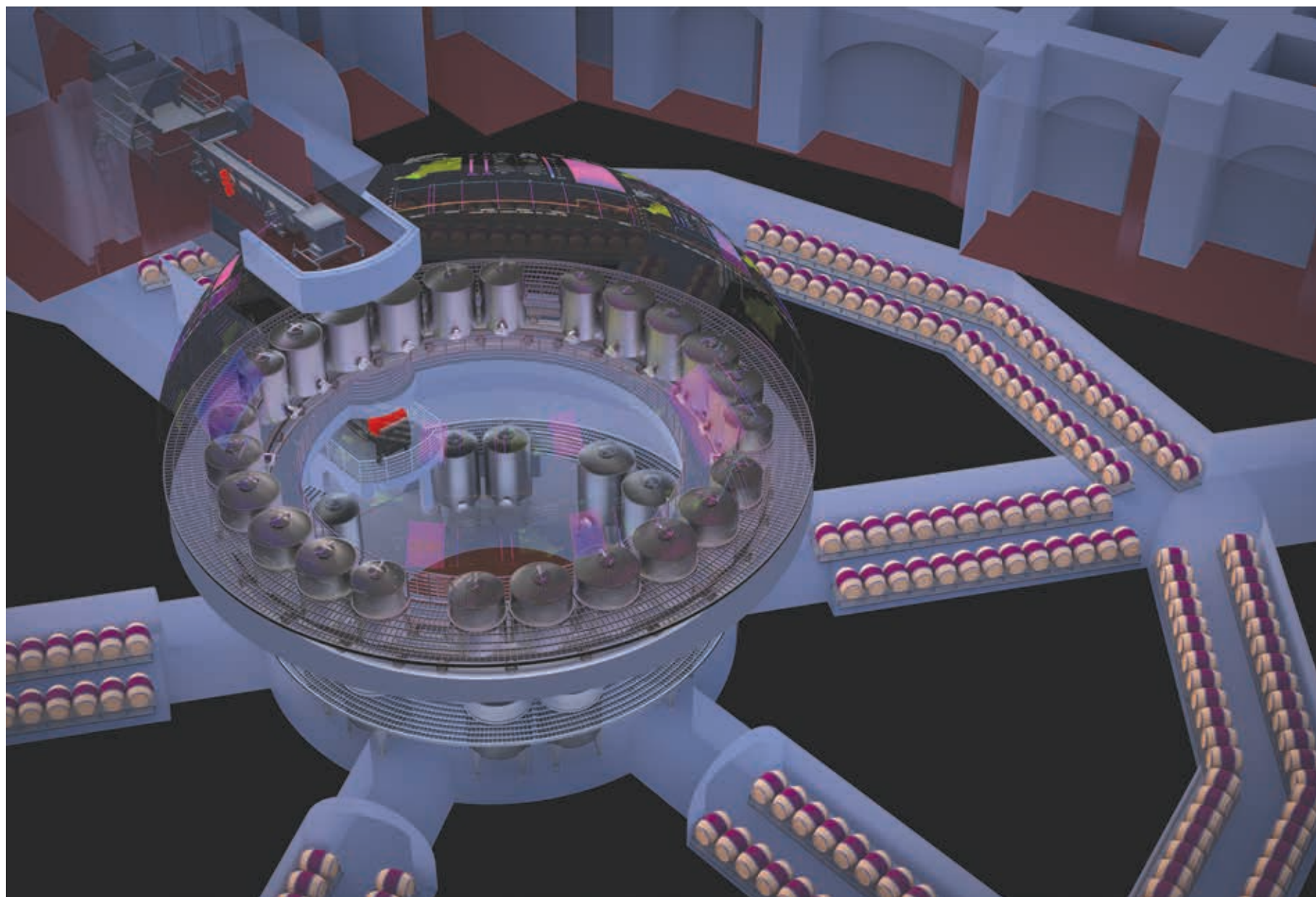


Christian Palmaz



Florencia Palmaz

The tank information system is the work of **Christian Palmaz**, the president of the winery, who studied computer science and geoscience while earning his bachelor's degree in business at **Trinity University** in San Antonio, Texas, as part of a collaboration with **Acrolon's TankNet** system. "When developing the system, it didn't make sense to reinvent the wheel on the automation side, so we turned to TankNet for the nuts and bolts, the end to end solution, and we built the analytics of FILCS on top of that. [Acrolon founder] Paul Egidio enabled us to do that," said Palmaz.



ALL PHOTOS COURTESY PALMAZ VINEYARDS



An Acrolon PM-4000 controller at each tank provides local control and link to TankNET web-server for projected visualizations, remote management and advanced data-mining by FELICS.

Palmaz also implemented a comprehensive geographical information system (GIS) for the winery's diverse vineyards, though his father has an intense interest in systems, too. Palmaz is the son of Dr. **Julio Palmaz**, a physician who invented the Palmaz Coronary Stent, and **Amalia Palmaz**, who has a master's degree in economics from the **Catholic University of La Plata**, Argentina. Both were born in Argentina. Before she came to the United States, Amalia was president of **Cristamine S.A.**, her family's mining company. She also co-founded **GoodHeart Brand Specialty Foods Co.** in San Antonio and now serves as the winery's CEO.

Daughter **Florencia Palmaz** is cofounder of Palmaz Vineyards and president of GoodHeart Brand Specialty Foods Co. and **Haute at Home**, a national catalog company that offers gourmet foods for in-home dining, both founded with her mother. She collaborates with the winemaking team to direct the style of the wines produced and oversees the culinary program at Palmaz, as well as being involved in marketing.

A Vacation Home That Got Out of Hand

Julio and Amalia started their winery venture in 1996 when they bought the East Napa mountainside property for a small vacation home after enjoying visits to the area as tourists. The 600-acre property had once been **Cedar Knolls Vineyard**, which was founded in 1881, and was later abandoned and housed a brothel during Prohibition from 1916 to 1934.



It took 10 years for the Palmaz family to complete the ambitious winery project and plant 64 acres of vineyards, which lie in front of the winery, at an elevation of 300 to 400 feet, and at sites on top of a ridge above, at 1,200 and 1,400 feet. The winery was completed in 2003, and relatively few changes have occurred since then. “It takes a long time to dig the caves,” noted Florencia Palmaz. “That gives you a chance to think everything through.”

Once the winery was complete and operating well, the family shifted its focus on the vineyards, replanting 40 percent of the vines after monitoring each vine’s performance. “We monitor the vines for six or seven years; and if they’re not performing, we replace them,” she said.

The family has also installed an extensive mobile data collection system to monitor irrigation and the vines. “We want to minimize time spent collecting data and maximize time acting on it,” she said, explaining that the same philosophy extends to the winery. They want the winemaker to spend her time tasting the wines and evaluating them, not spending time reading and recording measurements.

Winemaker Tina Mitchell joined the winery in 2003 after time spent at **Louis M. Martini, Inglenook and William Hill Estate Winery**. She works with noted consultant **Mia Klein**.

The Fermentation Information System

One of Christian Palmaz’s first tasks was to improve the tank monitoring system to provide an incredibly detailed overview of wine status; its information displays are like a scene out of a science-fiction movie. The presentation includes a visualization of exactly what’s happening in each tank, showing temperature from top to bottom and information about each lot, including size, time in tank, vineyard source (location, shown in map form), glycol temperature entering and leaving, and Brix. Equally impressive are charts that plot Brix, top and bottom temperature and desired temperature over time, showing any interventions directly above the tank.

“We chose to display the information where the winemaker would see it easily,” said Florencia Palmaz.

In its earliest days, the information gathered was displayed on a monitor



TankNET software projected onto dome ceiling above fermentation tanks

Innovative Fermentation Technology at Palmaz Vineyards

overlooking the tanks, but that wasn't very convenient. The earliest version also didn't display temperature profiles—or a visualization of the tank.

When Christian Palmaz graduated and joined the winery in 2007, he implemented the information system on iPads, but even that wasn't ideal, for the winemaking staff had to keep looking at the tablet, which might be left at another site. That meant that the winemaking staff wasn't really fully utilizing all the data being collected.

The projection on the dome changed that. Now six projectors can display all the tank data at once, though it's more useful to drill down to one. The system even detects when a winemaker or worker approaches a tank, and switches to that tank—projecting it on an opposite wall as they might not be able to see the projection above the tank if they're standing on the lower level.

Both sets of sensors consist of eight temperature sensors attached to a rod. One is hanging vertically halfway between the center of the tank and the outside of the tank. The other is in the center of the tank. This allows them to create a visualization of the whole tank with the expected red reading for warm and blue for cool, helping determine when pump-overs are needed.

Pump-overs are controlled remotely, too; and since the temperature display is in real-time, the operator can tell when the tank has had enough. Each tank has four cooling jackets for flexibility.

The system initially used hydrometers to measure Brix, but they kept clogging, so Palmaz replaced them with sonodensimeters, which are used by submarines. They can measure density to 1/100th of a degree, tracking the changes in Brix as fermentation proceeds. “They learn not to overcorrect or worry since they can see the impact of any temperature change,” said Florencia.

One thing the winemaking team has learned is that quite a bit of fermentation by native yeasts occurs at the low temperatures maintained during fermentation. “We're learning to embrace this non-saccharomyces yeast,” she said.

She says they've studied the impact; seeing the activity at different temperatures helped identify the yeasts, she says, since they prefer different temperatures.

Unlike at a university, however, rather than just gaining broad winemaking knowledge, they're concerned about making better wines. “We hope to be able to predict impacts from experiences,” Florencia said.



Honoring Tradition, Too

Though they're aggressively embracing new technology, Palmaz also honors tradition, such as the gravity-fed flow. Decisions about blends are made by winemaker Mitchell, consultant Klein and Florencia—not technology, though they can do it very accurately with micrometer flow meters.

Palmaz Vineyards produces 5,000 to 7,000 cases of red wine each year, primarily Cabernet Sauvignon and other Bordeaux varieties, plus Chardonnay, Riesling and Muscat from its vineyards, purchasing 40 percent of the Chardonnay it processes from **Hyde Vineyards**. Its wines sell for \$65 to \$220.

The vineyard, winery and its contents are remarkable, and it's unlikely that many vintners could surpass them. Nevertheless, it suggests ways for other wineries to improve their operations, if not the whole scope. Florencia Palmaz admitted, “It takes a lot of cash to do all this.”

But we're glad they did. [WBM](#)