

# THE WALL STREET JOURNAL.

## Blending Science With Wine

*A Tech Executive Who Stomps His Own Grapes Refines the Discipline of Viniculture*

At a 12,000-square-foot research winery here at University of California, Davis, Silicon Valley wizardry is meeting centuries-old tradition—all in order to figure out how to make better wine.

The mission is being carried out courtesy of T. J. Rodgers, chief executive of [Cypress Semiconductor Corp.](#) in San Jose who also operates his own vineyards and winemaking operation. He donated 152 stainless-steel fermentation tanks that are equipped with high-tech equipment designed by Cypress's engineers. Among other things, the 55-gallon tanks monitor sugar levels, control temperature and transmit data wirelessly to the winery's computers.

Not only does this automate tasks that winemakers typically spend hours doing each day, but for the first time, it provides a level of control over the grapes' fermentation process that will allow UC Davis to create identical barrels of wine. By eliminating variables such as the alcohol level at different points during the fermentation process, UC Davis researchers hope to pinpoint the impact of different winemaking techniques.

"I wanted to showcase how technology could transform winemaking," says Mr. Rodgers. The 62-year-old CEO has spent years burnishing his winemaking expertise by bringing fresh scientific insight to the ancient process. But he insists on maintaining some age-old practices, such as crushing grapes for most of his vineyard's production with his own feet in the belief that it produces a better-tasting vintage.

The experiments that Mr. Rodgers's donation to UC Davis have made possible won't begin yielding results until next year. Winemakers caution that each vineyard and vintage is different, so while the Davis winery may be able to pinpoint, say, the optimal time to add yeast to a particular batch of wine, it isn't clear how broadly applicable the results will be. "A lot of information is great, but the great thing about wine is that there is no recipe," says John Conover, general manager for **PlumpJack** and **Cade** wineries in Napa.

Still, many winemakers say they welcome any scientific advances that can help them improve their products. Bill Murphy, chief executive of Clos LaChance Wines in San Martin and an adviser to the winemaking program at UC Davis, says he uses state-of-the-art commercial equipment to test things like how many vines to plant per acre. But there are too many things he can't control or reproduce, such as what time of day fermenting red wine juice is pumped back over the grape skins. As a result, he calls the research winery's moves potentially "revolutionary."

UC Davis, which runs a highly regarded program on viticulture and winemaking, first approached Mr. Rodgers in March seeking a \$1 million donation. Instead, the CEO—who sells about 1,000 cases a year of his own Pinot Noir and has designed his own hydraulic-powered fermenter—invited a pair of professors to visit his winery in Redwood City. In April, he showed them the fermenters he had designed and offered to develop a new generation for the university.

Roger Boulton, a professor of viticulture and enology, and Andrew Waterhouse, the department's chair, were immediately struck by the potential time savings presented by the hydraulic-aided presses. Mr. Waterhouse says he thought to himself, "This could work."

Mr. Rodgers then decided to go further.

Having tried and failed three times on his own to construct a programmable version of a device called a brix meter, which measures the sugar level in fermenting wine, Mr. Rodgers turned to some Cypress engineers and asked them to build prototype brix sensor using the company's chips and other technology. He turned to another team to figure out how to relay the measurements wirelessly. Within a week, the teams had prototypes.

In May, Mr. Rodgers, who sometimes sketches out designs while working on a floating styrofoam desk in a hot tub, drew schematics for the new brix sensors and tanks. Over the next few months, he periodically sent 20-plus page PDF files to the UC Davis professors detailing the progress, including reports on successful and failed tests. In mid-August, he delivered the first units to the research winery.

One day recently, about 40 of the fermenters were hooked up at the research winery, some of which were already filled with grape juice. Plastic tubes running up to the ceiling and through the building's walls vented out carbon dioxide and pulled in water to cool and heat the tanks.

Mr. Rodgers, who says he will have spent precisely \$1.003 million to develop the fermenters, plus additional time from Cypress engineers, is already hard at work on his next winemaking project: a spectrophotometer that uses light to measure the presence of different compounds in wine.

Currently, winemakers have to send samples of their wine to labs to run expensive tests to get these results. Mr. Rodgers is working with students to develop a spectrophotometer that can sit in wine, take real-time readings and transmit the results wirelessly.

If he succeeds, he already has the wine industry interested in the possibilities. Mr. Conover of **PlumpJack** wants to stick the devices inside bottles of its 2009 Cabernet, which it will bottle in June. The winery uses some screw caps and some corks on its bottles, and wants to see whether there are long-term differences in how the wines with the different tops age, he says.

"We respect tradition, but we believe in innovation as well," says Mr. Conover.