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Days of wine and science

More Oregon vineyards are going high-tech to ensure consistent results

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The dusty interior of Norbert Fiebig's field sprayer doesn't appear to be a likely setting for a technological revolution.

But from the white, smoke detector-sized global positioning system atop the sprayer to the computerized touch screen inside, Fiebig is helping usher high-tech cultivation into Oregon vineyards that, for the most part, have relied on decidedly low-tech methods for decades.

Fiebig, vineyard manager at Van Duzer Vineyards 15 miles northwest of Salem, oversaw implementation this year of a global positioning system that governs everything from spraying and watering to disease and pest control. Neither he nor Van Duzer winemaker Jim Kakacek is aware of any other Oregon winery using similar technology.

"Over the years, we noticed differences in certain areas of the vineyard, which kept all of our grapes from ripening at the same time," Fiebig said. "GPS has allowed us to address those differences and the result, this year, (is that) we're seeing a much more uniform vineyard."

In more than 800 vineyards across Oregon, the 2006 wine-grape harvest is in full swing this week. And increasingly, it's in full swing amid the kind of advanced technology long eschewed by the small mom-and-pop grape growers and winemakers who have defined Oregon's industry.

Premier Pacific Vineyards, based in Napa and financed largely by the California Public Employees Retirement System, is especially interested in bringing technology to bear as it develops extensive vineyard lands in the Northwest. One tool its managers are using is the "pressure bomb," which employs a small pressurized chamber to figure out the precise water content of leaves in the vineyard.

That's important because, especially as harvest approaches, growers want to keep their vines under a certain amount of stress to hasten ripening. Too much water means the grapes will still be green and low on sugar when the harvest-ending autumn rains set in.

At Willamette Valley Vineyards in Turner, another cutting-edge device measures water content in the vines' root balls. It allows vineyard managers to know exactly how much water is in the plants, winery president Jim Bernau

said.

"We want to make sure we don't add any more water than absolutely necessary," Bernau said. "When you do, it goes into the groundwater, carrying positive ions with it. That's how salmon get sick and our rivers and streams get polluted."

Computer-aided fertilizing

Stirling Fox of Newberg-based Oregon Grape Management, which oversees 25 commercial vineyards in and around Yamhill County on a contract basis, said he recently began using a computerized system that links the amount of organic sprays and fertilizers being dispensed to the speed of a tractor.

"Since you're always driving up or down hillsides, you're always changing your speed," said Fox. "Without this system, you'd spray too much when you go slow and not enough when you go faster. This way, we can calibrate the amount of spray per foot, which translates into surprisingly high cost savings."

In Van Duzer's case, the results of the first GPS-guided harvest won't be known for a year or more, when the 2006 vintage is released. Those familiar with the technology, however, are predicting that more of the state's approximately 350 commercial wineries will likely follow suit once they grasp the system's benefits in terms of crop consistency and cost savings.

"The basic assumption that makes precision agriculture so powerful is that there's no such thing as a homogenous piece of land," said Kevin Chambers, co-owner of Oregon Vineyard Supply in McMinnville and chairman of the Oregon Wine Board.

Finding trouble spots

Even within a single large vineyard, Chambers said, it's possible that some areas "are priceless and others are dogs, all based upon the complex geology and topography involved."

The ability to address and correct a vineyard's trouble spots has Chambers thinking he'll likely invest in GPS technology within the next two to three years, since his two-store chain also offers consulting and vineyard-management services.

The system's first step involves aerial multispectrum imaging that's only recently become available in Oregon. Short-wave infrared cameras produce high-resolution images showing the chlorophyll content of leaves -- a key indicator of vine vigor and stress.

The images analyzed this year by Van Duzer showed obvious disparities in vigor in an entire block of grapes. That allowed Fiebig, plugging in his own on-the-ground observations, to use software governing where to dispense more nutrients and organic fertilizers and where to spray less.

That accomplished, the sprayer operator no longer does anything but drive the unit up and down long rows of vines. The GPS, linked to the spray unit, does the rest.

"The goal is to make one end of the row the same as the other end," Kakacek said. "From the results we're seeing so far this year, it's working out nicely."

Technology critics

The increasing prominence of new technology in vineyards here and elsewhere doesn't come without some tension, however.

Some wine critics, for instance, regularly complain about what they see as a move toward a one-flavor-fits-all approach toward winemaking. Many have criticized efforts to create wine that tastes the same vintage after vintage, regardless of growing conditions, arguing that the science of the laboratory should not trump the artistry of the vineyard.

Dick Shea of Oregon's Shea Vineyard and Shea Wine Cellars, for example, said he is moving in precisely the opposite direction.

"Some things that we did mechanically 15 years ago are tasks that we do by hand now," he said. "We want to make sure that every plant is taken care of in a custom fashion, that each one gets its own consideration."

Some wineries have invested as much as $10,000 in high-tech weather stations to help measure, among other things, exactly how rain has fallen at any one time. Shea still uses a bucket to tell him the same thing.

"I'd lose a lot of my customers if I went toward mechanical harvesting or other high-tech applications," he said. "Oregon pinot noir has always been about handcrafting. It's not just our tradition, but our future, as well."

In the long run, the increasing use of technology in vineyard management and winemaking -- in Oregon as elsewhere -- may be inevitable. But for some, no amount of technology will ever replace the time-tested practice of knowing a vineyard's propensities and drawbacks simply by working in it.

"Some of these things might work for an absentee landowner, but we're out on our land every day," said Susan Sokol Blosser, president of Sokol Blosser Winery in Dayton. "Why should I be inside inputting data when I can be outside looking at real plants?"

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