Researcher helps longtime grape growers embrace new technology

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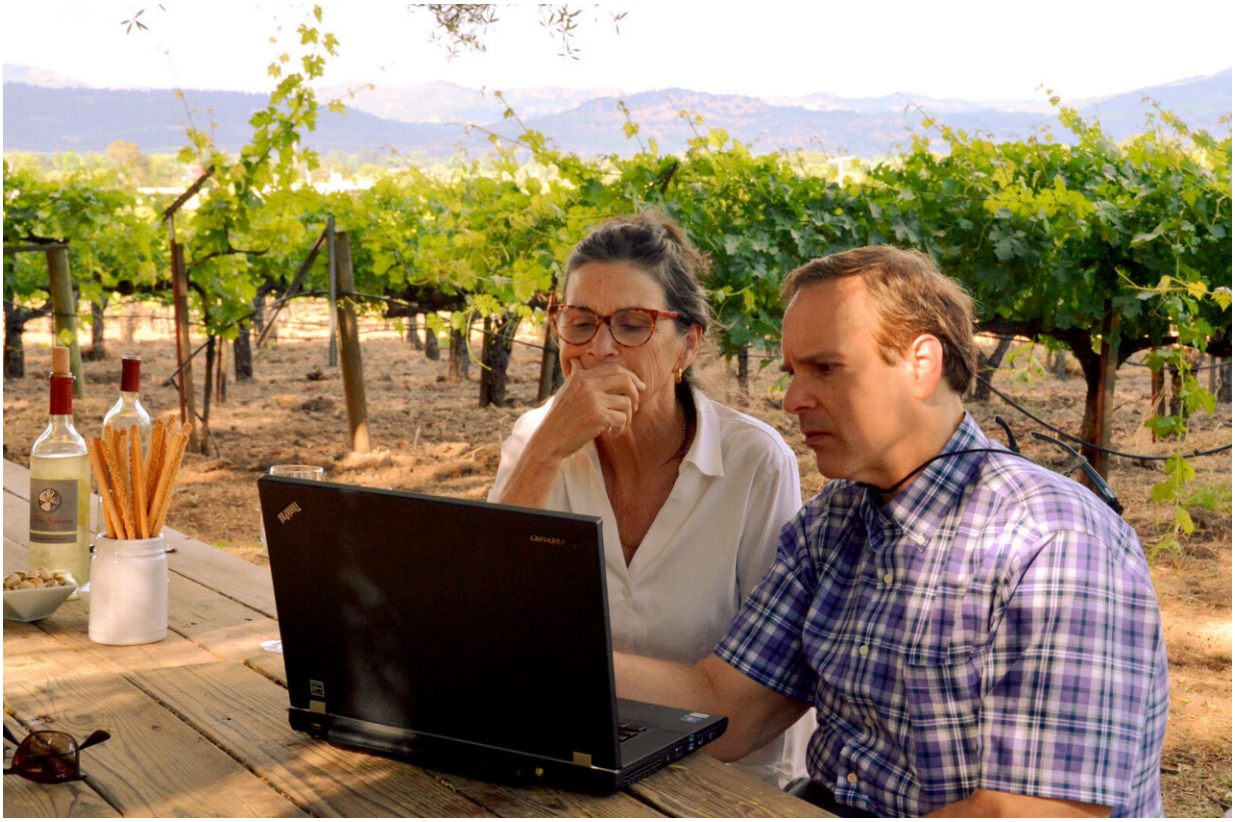

David Ebert, Purdue's Silicon Valley Professor of Electrical and Computer Engineering, shows data to Julie Johnson of the Tres Sabores Estate vineyard in St. Helena, California. Ebert and other Purdue colleagues are trying to help vineyard owners in California utilize new, efficient technology for their operations. Credit: Purdue University

California vineyard owners are carefully watching grapes mature on the vine this summer, just one in a list of responsibilities that determines their chances at a successful season.

Years of experience working the land have been the main tool for these growers, but environmental restrictions and requirements are making the job increasingly complicated.

David Ebert of Purdue University's College of Engineering is focused on helping the wine industry through Discovery Park's Big Ideas program. Ebert along with Christian Butzke, a food science professor and enologist, and other Purdue colleagues are trying to help growers in California transition to utilizing new, efficient technology for their operations without being caught in a data overload.

"We've basically been looking at factors in how the growers can harness technology that allows them to become more effective and more efficient in their operations and decision making," said Ebert, Purdue's Silicon Valley Professor of Electrical and Computer Engineering.

There are long-running farm owners who are only now beginning to consider the new technologies available to them.

"Since it hasn't been made intuitive to use and they haven't grown up using it, they are uncomfortable blindly trusting what a computer is telling them to do, and they shouldn't have to be," Ebert said. "They need tools to make data understandable and useful to them in their operations."

Because grapes are a perennial crop, some decisions by growers can have a 20- to 25-year impact on their operations and their profitability. Ebert's work is intended to help growers understand how to make effective decisions in adopting new technology to increase their economic and

ecological sustainability. The technology is intended to improve both day-to-day and long-term operations as well as help their overall investment.

Ebert said growers today are facing new local community constraints in addition to uncertain growing season conditions. A number of counties in California have decided vineyards need to be certified sustainably farmed and many ground water districts are setting new guidelines to preserve water resources and make sure that water is used effectively.

"Trying to bring all of those factors together is a complex process," Ebert said. "We're working to bring all these limitations and data together in a understandable system so people have the policy constraints, economics, science basis, data analytics and their operations models combined into a simple dashboard to make better decisions."

When the project began in 2014, Ebert discovered that the rules of thumb many growers used to judge crop conditions no longer worked. Data collected from the technology can help forecast and understand multi-year impacts on the crop, including complex weather.

"There's an increasing trend for growers wanting these new tools, seeing real value in it and realizing that they need to move in this direction to be sustainable economically and environmentally," Ebert said.

However, the technology and data must be targeted to each crop and regional conditions to be trustworthy and effective. Ebert said technology that works for wheat farms in Kansas can't be directly translated to work for a vineyard crop that has been growing for 20 years.

"Some vineyards we work with were planted in the early 1900s," he said. "These vines are adaptable, but the growers need the right information in these unprecedented growing conditions.

"This is what our Purdue science-based, data-driven and grower-driven approach enables: Understandable, trustable information from all these new sensors and data sources to enable them to adapt and sustain their operations."

Provided by Purdue University