



Vineyard Trial:

Burgundy Adopts Drones to Detect Disease

Drones are being used to detect a leafhopper-spread grapevine yellows disease in the region's vineyards.

Christy Canterbury, MW

Christy Canterbury MW was short-listed for the 2014 Louis Roederer Online Wine Communicator of the Year Award. She also writes for *Decanter*, *TimAtkin.com* and *Beverage Media*, among others. She speaks regularly at conferences such as ProWein, VinExpo and the Hong Kong International Wine & Spirits Fair. Canterbury previously directed the global beverage programs for Culinary Concepts by Jean-Georges Vongerichten and Smith & Wollensky Restaurant Group.

BURGUNDY'S BUREAU INTERPROFESSIONEL DES Vins de Bourgogne (BIVB) is adopting a new program to use drones in its vineyards. As **Dominique Lafon** of **Domaine des Comtes Lafon** said to me in November: "It sounds a bit like Star Wars, but the implications are fascinating."

The primary aim is to detect the vine menace *Flavescence Dorée*, a leafhopper-spread grapevine yellows disease that can kill vines or render their production uneconomical. The organizations that are collaborating on the initiative believe they will be able to adapt the technology to spot other diseases in the near future. *Esca* (a fungal killer that rots vine wood) would be the next target, followed by *Peronospora*, AKA downy mildew, which can be either a seasonal or on-going problem, depending on winter temperatures.

For all of these diseases early detection is vital, and that depends on humans. Burgundian estates tend to be parceled and tended by small family domains. Much of the vineyard supervision can fall on the shoulders of one person. However, there are also larger estates and *négociants* whose plots dot the 75 miles of vineyards stretching north to south from Marsannay to Mâcon. Long distances, coupled with limited eyeballs and ticking clocks, can create a furious race against diseases.

Today, these diseases are treated with chemicals. Burgundy, like other conscientious wine-growing regions, is keen to reduce its use of manufactured chemical sprays as well as its use of organic compounds like sulphur and copper. These have negative, long-term implications for human and environmental health as well as cash flow. Burgundians anticipate that

drones will allow more timely disease identification along with more precisely targeted treatments, thereby reducing the number and quantity of treatments required.

How the Idea Developed in Burgundy

Franck Brossaud, associate director of the Technical & Quality Department at the BIVB, said the idea to use drones to combat *Flavescence Dorée* came about because of when the disease can be spotted: harvest. But during that time, winemakers have more than enough to pay attention to, from grape maturity and processing to weather and personnel, so observing vine health can easily be put on the back burner.

Additionally, winemakers and vineyard managers aren't necessarily looking at every vine at that time of year, and many harvesters—especially temporary workers—don't know how to detect or report *Flavescence Dorée*. Furthermore, spotting *Flavescence Dorée* is easier with an aerial view rather than a lateral view from the ground. Vineyard workers can spot *Flavescence Dorée* more easily from tractor seats than when standing because more vines can be seen at once, allowing for a better comparison of other vines rather than just a few in the 360° circle around a worker. However, tractors cannot be used on all of Burgundy's slopes—they move slowly, and they compact the soil at a time of year that is often rainy. Hence, the call for drones.

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Moving Forward

Burgundy's initial drone trials began in 2013 and covered the Côte d'Or and the Mâconnais. The three-year project formally launched in January 2015. The region has dedicated approximately \$2.2 million to the initiative, roughly \$733,000 per year. The national government will assist with financing and research. **Novadem**, an aerial robotics company whose research is supported by France's national research ministry, will provide the drones. Each costs approximately \$62,500, and two are expected to be used in the prototype phase.



The coordination of the government agencies and the local Burgundy winegrowers' office is key as, unlike in other countries where there are large tracts of private land a grower can survey, Burgundian vineyards have many different owners. This prevents potential issues with air rights and the unapproved surveillance of other growers' vines. For example, a drone could be used to broadcast photos of what another winegrower is doing, potentially disproving a grower's claim about its viticultural practices, yields, etc.

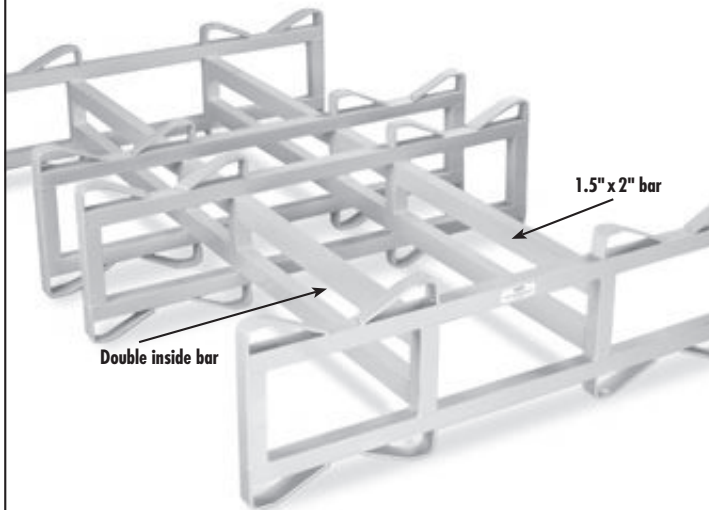
Brossaud said the first year largely will be dedicated to training technicians, refining the drones' sensors and microprocessors and fine-tuning resolution of the images. While there are lateral findings that can be applied from work done in Bordeaux, Burgundy's landscape is quite different, with its higher and steeper vineyards, and the process needs to be adapted for that. As the project advances to tackle other diseases, different image resolutions and altitudes may be required to accurately identify problems.

A full rollout will begin in 2016. By 2017, Brossaud expects the system will not only be in place but working well enough to be wholly accepted by the vigneron. When properly used, Brossaud said the system "should work like vitamins for the vine...or, better yet, vaccinations for healthy vines." Suffering vines can be treated, and healthy vines can be protected from ailing neighbors, especially by uprooting vines where needed.

As with any new program, it will be critical that winemakers, domaine owners and the government believe additional investment, after the three-year trial phase, is merited. Otherwise, a potentially promising program may never be fully realized. While Brossaud optimistically said this program specifically was chosen because its partners believed it could be rapidly implemented, most projects in viticulture and technology take time to provide consistent and positive results.

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Potential Concerns

While the efficiency of this project sounds remarkable, there could be caveats. For example, could the use of drones disassociate vignerons from their vines? Could drones not only reduce chemical but also human input? Brossaud thinks not. He sees the drones as a new source of information to assist, not replace, the vineyard owner.

While the investment in this project is substantial, it is not the only major project in the works at the BIVB. Considering how Burgundy (especially the Côte de Beaune) has tremendously suffered from hail loss in the last four years, it would be less than clever to work on saving vines whose production is consistently decimated by hail. Brossaud noted that the investment in hail prevention is far more substantial than the current investment in drones. This should resonate well with landowners struggling to produce reasonably sized crops while doubting this futuristic undertaking. Losing the faith of a constituency in one aspect can lead to the blanket loss of confidence in all others.

Drone Research Already In the Works

Drones were already being trialed in Bordeaux on the properties of magnate **Bernard Magrez**, who intends to roll out drone use to his other French properties, which extend from Provence to the Spanish border. Magrez's teams have been working with **Airbus** and French government agencies (including food, flight and environmental groups) to swiftly and efficiently study not only vine disease but also water stress, vine vigor, grape maturity, topsoil composition and land contours via images produced by drones.

Wheat, soybean and corn farmers, whose tracts can be enormous and are much more densely planted, have been investing in drones for years to save time and money while minimizing sprays on healthy plants and reducing environmentally unfriendly run-off.

Depending on the model, fully remote-controlled drones can hover just over the ground or rise to 850 feet. Most fly for at least 30 minutes at speeds of up to 40 miles per hour. Their photo sensors are also very precise.

Global Information System (GIS) mapping enables accurate pinpointing of ailing vines. This is particularly important in Burgundy, where half a dozen growers can own vines within a few rows of each other. Growers can be accurately and quickly informed of issues among their vines.

The BIVB now is determining how to inform growers of issues. One of the next interesting questions to resolve is how quickly those growers will be required to do something about problematic vines.

Conclusion

For all its fame and glory, Burgundy remains a sleepy wine region. For every winemaker that is forward-thinking and environmentally proactive, there are several more who are not. This sophisticated venture should help the former protect themselves from the practices of the latter.

If these drone trials prove to be effective, the BIVB may break down doors for other experimental projects like IRIS+, which uses algae-based extracts to promote the natural defense systems of vines through organic means. The question for other wine-growing regions will be how to unite—likely with the help of their regional and/or national governments—to defend their vines against disease. **WBM**

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