Vinehealth CEO Inca Pearce with a Boundary Rider vineyard sign at a pilot vineyard in the Barossa.

Grapes & Geofences

Protecting South Australia's billion-dollar wine industry

VINEHEALTH AUSTRALIA

A cutting-edge vineyard cyber monitoring system, designed to keep South Australia's $1.78 billion wine industry free of devastating pests and diseases such as phylloxera, is currently being trialled in vineyards.

Project Boundary Rider creates a virtual boundary – or geofence – around vineyards and uses smartphone app technology to monitor the movement of people entering properties. Vineyard owners are alerted when anyone crosses their boundary line.

The Boundary Rider pilot project, initiated by Vinehealth Australia, is being trialled by 30 winegrowers in McLaren Vale and Barossa. The system is a first in biosecurity for the wine industry nationally.

"It's an exciting project," says Vinehealth CEO Inca Pearce. "Initiating biosecurity practices is often a responsive action to a threat, but this technology allows us to proactively track the movement of people in and out of vineyards, and potentially stop the spread of a harmful pest or disease between vineyards or regions."

Forewarning an outbreak

The geofence concept has been successfully implemented in industries such as fleet management, human resource management, asset management (such as marine parks), marketing and law enforcement.

Its adoption in agriculture has been relatively limited to date, but usage by Canadian Pork Producers assisted in containing the spread of Porcine Epidemic Diarrhea virus (PEDv) in 2014.

When searching for commercially available geofencing offerings, Vinehealth Australia discovered Canadian company Be Seen Be Safe.

"The poultry industry of Canada is successfully using Be Seen Be Safe's geofencing technology to track movements of people in and out of poultry farms and then using these visitor records to conduct trace-backs in the event of a disease outbreak," said Brendan Tully, Vinehealth Australia's spatial information services administrator.

"We decided to partner with Be Seen Be Safe for our vineyard biosecurity pilot program because of their system capabilities," he said. "The results to date are promising."

Vinehealth Australia's geofencing pilot – Project Boundary Rider – uses the Be Seen Be Safe system modified for plant-based requirements, and utilises the ESRI ArcGIS platform, incorporating ArcGIS GeoEvent Processor for Server, an extension to ArcGIS for Server.

A customised phone app by Be Seen Be Safe, which Vinehealth Australia has named 'BRider', integrates with the platform and acts as a passport, recording crossings of the vineyard's geofences (in and out) as all visitors move from vineyard to vineyard. The vineyard owner receives instant notification of the visitor's arrival, and all records are GPS time-stamped to give temporal and spatial data which is recorded in a database.

Visitors who have the BRider App also receive a notification on their device when they cross the geofence. Notifications to visitors can be customised, for example, 'Welcome to Winery Estate. Please respect the health of our vines and report to the vineyard office. Do not enter our vine rows without permission.'

In the event of a pest or disease outbreak, officials can quickly communicate updates and alerts, and put in measures to contain the disease spread.

"The ability to analyse and process real time data makes this a powerful tool in biosecurity management, in the event of an incursion," says Tully.

"When looking at a disease outbreak and why often the devastation is so immense, the answer lies in our inability to predict where it is likely to 'break' next. Current trace forward and trace back methods take weeks, even months.

During a disease outbreak we need answers quickly so we can forewarn those in the path of a disease, or those already affected so they can take action to mitigate impact."

Protecting a most valuable resource

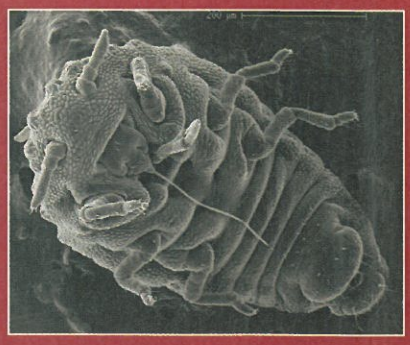
The benefits for the wine industry of utilising geofencing for a biosecurity purpose are potentially far-reaching.

"In the case of an outbreak, the system would erect and monitor exclusionary zone boundaries," said Inca Pearce, Vinehealth's CEO. "When paired with the stopping of all movement, such rapid response would mean far more effective containment, resulting in less impact for the industry,"

"The improved trace back through the use of real-time information technology applications will result in direct savings in time and resources. And it will mean improved management of quarantine zones, resulting in improved risk mitigation and reduced concern to the industry and the general public."

For vineyard owners, the technology means peace of mind in their efforts to cresource – their grapevines.

PHYLLOXERA IN FOCUS



Grape phylloxera (Daktulsphaira vitifoliae) is a devastating pest of grapevines worldwide. Phylloxera is a tiny yellow insect that destroys grapevines by killing their roots. When a vineyard is infested, the only way to remove phylloxera is to remove all vines.

Phylloxera is native to eastern and southern USA, and is in every wine producing country in the world except Chile. In Australia, phylloxera is only found in small areas of central, eastern and north eastern Victoria and the south east of New South Wales.

Through quarantine measures, implementation of farm-gate hygiene practices and continued vigilance, the states of South Australia, Western Australia and Tasmania have not become infested with phylloxera; alongside large parts of Victoria and New South Wales. Queensland is thought to be free of Phylloxera.

Vine pests such as phylloxera can be accidentally spread on clothing, footwear and vineyard machinery.

Ben Zander, a pilot program participant from Wroxton Partners in Eden Valley, is a strong advocate of the initiative.

"I believe the wine industry needs to be constantly evaluating and embracing new technologies for the potential benefit of the industry as a whole," Ben says.

"I would hope the pilot allows me a more streamlined and easy manner to electronically record visitor movements both on and off property. I think this is a good initiative by Vinehealth Australia – we need our peak industry bodies to be aware of current, next year and five year technologies to determine where they might fit within the viticultural industry.

"As individuals we don't always have access to this information or what technology can truly do for us, and it's encouraging that Vinehealth Australia is looking to the future and protecting our valuable assets."

Vinehealth Australia (formerly the Phylloxera and Grape Industry Board of SA) is committed to minimising the risk of pests and diseases (in particular phylloxera) in South Australian vineyards and providing effective pest and disease management policies, information on best practice biosecurity measures and current research. ■