



New Zealand's National Vine Collection

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GENETIC DIVERSITY AND BIOSECURITY - NEW ZEALAND'S NATIONAL VINE COLLECTION

In August, I visited Dr Darrell Lizamore, Principal Research Scientist for Grapevine Improvement at Bragato Research Institute, Lincoln University, to learn more about the National Vine Collection, his team manages. I had heard about this collection and its potential for grapevine improvement and biosecurity through my work with the Technical Reference Group for the Grafted Grapevine Standard, so I was keen to visit and hear more about the vineyard. Darrell explained that this collection has roots going back nearly a century to the government-operated viticulture research station at Te Kauwhata in Waikato. This station trialled numerous grape varieties and shared promising ones with other regions. When the centre closed, the vines were initially relocated to Marlborough, and then, thanks to a proposal by Lincoln viticulturist Glen Creasy, they were moved to Canterbury. Glen recommended this area due to the lack of phylloxera in Canterbury at the time. Lincoln University became the new custodian of the vines, managing them under contract with New Zealand Winegrowers (NZW).

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On arrival, the vines were divided by health status: those free of disease became the ‘high health’ collection, while those showing potential viral symptoms formed the ‘low health’ collection. The low health vines are

located at the far end of the property and in a separate vineyard to prevent cross-contamination.

Today, the collection boasts about 600 unique grapevine accessions, offering genetic diversity for the New Zealand viticulture industry. Some vines are the only ones of their kind in the country, invaluable for research and breeding. Unfortunately, many low health vines suffer from visible viral infections, which complicates management. To address this, Lincoln researchers, led by Darrell, are conducting trials to remove viruses from select vines. Virus removal is challenging due to the specific ways viral infections influence clonal traits, which may even be desirable. Different methods work better for different varieties, so research is needed to refine techniques and determine which viruses should be retained or eliminated for the health of the collection. Alongside virus elimination, Darrell’s team is re-mapping and re-labelling vines to clarify genetic identities. After DNA testing, some vines initially labelled as just “old vines” turned out to be duplicates of other clones already recorded in the collection.

This finding has highlighted the need for strategic management, conserving unique and valuable vines while removing redundancies.

A visit by expert French ampelographers underscored the collection’s value, recommending that redundant genotypes be removed to make room for replications of unique vines. They proposed establishing a dedicated facility similar to those in France, complete with secure access, trained staff, and funding independent of commercial pressures. While maintaining this collection is relatively

low cost in relation to New Zealand’s \$2 billion wine industry, opinions vary. Some within the industry advocate for keeping only commercially viable varieties, while others, including Darrell, argue that maintaining genetic diversity is vital for industry resilience and long-term sustainability. This diversity could prove essential if new threats or environmental challenges arise. As Darrell explained, the collection serves as a buffer against potential issues, with its possible range of unique traits leading to disease resistant varieties or characteristics such as varying bud-burst timings. As New Zealand has restricted access to international grapevine genetics, this collection could be invaluable, especially with climate shifts creating demand for varieties suited to warmer climates and spring frost sensitivity. It enables industry researchers to explore traits like disease resilience and adaptability in real-world conditions.

One significant future objective for the collection is introducing economically relevant genetic traits that aren’t yet present in New Zealand. Darrell cited the example of Pierce’s disease (*Xylella xastidiosa*) resistant vines, developed by United States researchers through crossbreeding with *Vitis arizonica*. While currently absent in New Zealand, this resistant vine would add a powerful biosecurity asset to the collection, providing an essential safeguard against a future biosecurity threat of Pierce’s disease.

The Lincoln collection thus represents far more than a genetic archive - it’s a vital resource for the future of New Zealand viticulture. This small but diverse vineyard may one day shape the industry’s response to evolving conditions, securing its resilience through the power of genetic diversity.