

WINTER 2026

organic matters

THE DIRT FROM ORGANIC WINEGROWERS NEW ZEALAND

Functional vineyards

Lessons from Dr Mary Retallack

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Functional vineyards

Dr Mary Retallack advocates for opening minds and covering soils.

By **Sophie Preece**

Winegrowing needs to move from a monoculture to a polyculture of thought, says a scientist growing ‘interconnected systems’ in viticulture.

Replacing bare-earth philosophies with a range of grasses, forbs, perennials and native species supports beneficial arthropods amid the vines, and earthworms and diverse fungal species in the soil, resulting in more resilient vineyards requiring less intervention, Dr Mary Retallack told attendees at the Organic & Biodynamic Winegrowing Conference last winter.

“I’d much rather see a scruffy vineyard if it’s functional, than a neat one that’s dysfunctional.”

Mary, who is an agroecologist, third-generation viticulturist, namesake of

Retallack Viticulture Pty Ltd and founder and custodian of Australia’s National EcoVineyards Programme, is coming to New Zealand in July for the Organic Winegrowers New Zealand (OWNZ) EcoVineyards Tour, with workshops in Hawke’s Bay on 21 July, Marlborough on 28 July, and Central Otago on 4 August (see page 11).

The workshops will build on Mary’s two information-packed sessions at the Blenheim-based conference last year, with the first outlining the Australian-based EcoVineyards programme, ‘growing resilience naturally’.

The programme, which started in South Australia and went national in 2022 with funding from Wine Australia, works with more than 175 partnering organisations with a common goal of fostering

environmental stewardship.

“We are helping to influence the practices of more than 6,000 winegrowers and 3,000 grape growers, who collectively manage more than 145,000 hectares of winegrapes, plus our international reach as well,” Mary said.

“I’d much rather see a scruffy vineyard if it’s functional, than a neat one that’s dysfunctional.”

The programme’s EcoGrower participants range from organic and biodynamic growers to conventional, minimal input and regenerative, but each are using “ecologically based ideas and principles to create meaningful step change,” Mary said. That includes planting grasses, forbs, annuals and perennial ground covers, including native species, to build health and resilience in vineyards.

“Natives were here before we modified the landscape, and I think they provide tremendous promise to maximise functional biodiversity and the life in your systems, both above and below ground.”

Weeds can also be seen as soil indicators and pioneer species, “rather than just something to get rid of,” she added. “You can read what the soil is telling you, and they can be really a functional part of the landscape, if they’re not noxious.” As an example, marshmallow is an indicator of low organic matter and waterlogged soil, often compacted, with poor drainage.

The EcoVineyards programme offers regional and vineyard-specific solutions, because “one size won’t fit all.” It also offers a wealth of research on its website, Mary said, inviting New Zealand’s industry



Wallaby grass at Skillogalee, Clare Valley SA. Photo: Mary Retallack



Oechalia schellenbergii, predatory shield bug



Celaenia excavate, bird-dropping spider



A native bee on *Vittadinia* sp. New Holland daisy

to leverage the programme's resources to improve natural functionality, including fostering fungally-dominated soils rather than the bacterial dominance of a tidy, bare-earthed block with compacted soils.

"As you gain the confidence to see how they perform you can scale up," she said. "We find this is the quickest way to accelerate meaningful practice change."

"Natives were here before we modified the landscape, and I think they provide tremendous promise to maximise functional biodiversity and the life in your systems, both above and below ground."

The measure of success is whether vineyard practices bring growers closer to the goal of "growing in harmony with nature". There may be several steps back in order to move forwards, "and we totally understand that that's part of dealing with inherited vineyards and climate change challenges," she said.

"We need less sterile, compacted and dead soil systems in the undervine area. We call them the scorched earth or the dead zone. We'd love to reclaim these areas and bring them back to their fully functional capacity."

Functional biodiversity and native insectaries

Mary's second session at the conference was a more detailed exploration of functional biodiversity, including planting insectaries to improve soil health and leverage the predatory power of arthropods, using case studies from across Australia.

As well as insects, spiders and mites in the EcoVineyards arsenal, Australian growers can have insect-devouring microbats in their vineyards. Given New Zealand's two species of microbat are very rare, they're not an ally here, but across the Tasman there are 23 species of the mouse-sized flyers, and the ones in vineyards "really pack a punch," she said.

"They can eat up to half their body weight in insects every night, or nearly the whole body weight if they're lactating." Some vineyard operators she works with have built special bat boxes to tempt them to hang around.

She also loves the work of insectivorous birds in Australia, which she equated with the likes of fantails in New Zealand. "They love eating insects, predominantly, and contribute to biocontrol of insect pests. They're not interested in eating fruit."

Meanwhile, birds of prey play a sentry role, keeping pest birds out of their territory. Some vineyards are putting in high perches where the raptors can get a 360-degree view of the vineyard, "and the pest bird species just scream and scatter whenever they see the predatory bird species come in." Mary invited attendees to check out the bird guide on the EcoVineyards site, which showcases more than 40 species, including insect feeders and

raptors, and the best ways to manage frugivore (fruit-eating) pest species.

Then there are the beneficial insects, spiders and mites.

“It’s really important that we look after all of the ‘mini beasts’ that we have in the vineyard,” she said. “They, of course, can contribute to biocontrol, practically for free if we know how to look after them.” For example, using foliar sulphur rates above 400 grams per 100 litres of water will have a detrimental effect, especially on parasitoid wasps and ladybird beetles.

“It’s important to remember that quite often our actions will have unintended consequences,” she said, noting that grape growers have limited spray options when bunches start to close, but predators can help do the job of biocontrol right up to harvest.

Attracting mini beasts into the vineyard, or offering habitat after releasing them, goes back to diverse plantings, Mary said, referencing the work of the late Professor Steve Wratten, a New Zealand legend of insect ecology, biological pest control and agroecology.

“It is possible to increase the functional diversity of predatory arthropods by more than three times when native evergreen shrubs such as *Leptospermum* species are present.”

The beneficial insects need nectar for “a shot of energy”, pollen as a source of protein, an area of shelter and “a substrate of alternative prey”, she noted, using the acronym of SNAP (shelter, nectar, alternative prey, pollen).

In New Zealand and Australia, growers have used a range of different insectary plants to provide nectar and pollen, but these are often introduced species, such as buckwheat from China and alyssum from Europe, Asia and Northern Africa, and they’ve had limited success in Australia.

“If it works for you, go for it,” Mary said, but noted the risk of replacing one monoculture with another. “So try and dive into a multi-species mix, if you can.”

Her team looks for overlapping flowering periods at key times throughout the season, making natives – many of which are evergreen – a boon, “so we don’t have that same resource bottleneck.”

They look for insectary plants that can outcompete weeds, but not become a weed themselves, and that have low establishment costs. “We want to focus, where we can, on species that are going to last, so locally adapted or native species usually have low ongoing maintenance.”

They also seek plants with low potential to host pests or compete with grapevines. “We’re looking for plants that have an abundance of flowers. Usually white and cream are great for parasitic wasps. But a diversity of different shapes and sizes and colours.” Lots of small flowers are better than big ones, because

European honeybees are likely to ‘raid’ the nectar and pollen in a big flower.

Native plants and a diversity of species are consistently reported as having a low occurrence of pests and a high occurrence of natural enemies, she said, noting the crossover between endemic fauna and flora in New Zealand and Australia. That includes work with wallaby grasses in Australia, akin to the 20 native and 10 naturalised grasses in New Zealand.

She also gave the example of evergreen shrubs like *Leptospermum* (including mānuka in New Zealand), which can be an excellent habitat for parasitoid wasps. In response to a question from the session (see page 9). Mary said it was well reported that stands of native vegetation adjacent to perennial production areas, including vineyards, have been associated with increased biodiversity benefits.

“During my PhD studies, I found that it is possible to increase the functional diversity of predatory arthropods by more than three times when native evergreen shrubs such as *Leptospermum* species are present, versus grapevines only.”

As well as undervine and mid-row diversity, some EcoGrowers are planting ‘bio hedges’ beyond the vines, with a dual role of biodiversity habitat and biosecurity barrier.

“We don’t have phylloxera in South Australia and we don’t want it, so we pick spiky species so that the general public won’t jump the hedge.” Meanwhile, some growers are finding supplementary income amid the plantings, selling seed from established crops, flowers for floristry, or botanicals for gin and vermouth production.

The talk included insights from EcoVineyards participants, including Lulu Lunn from Tintookie Vineyards in McLaren Vale, who has been growing grapes for 35 years. “She’s done our course, and said she’s getting so much more enjoyment out of coming into the vineyard and thinking about what life she can bring in,” Mary said. “Just observing life has given her a whole new satisfaction for growing wine grapes.”

The next chance to access Mary’s wisdom in person is her tour this winter. Growers can also access all the EcoVineyards Australian materials for free on the EcoVineyards website: <https://ecovineyards.com.au>.



Bottlebrush shrub planted adjacent to the strainer post

How to create a biodiverse vineyard ecosystem

Mary Retallack offers detailed replies to OWNZ conference delegates' questions

Mary's talk on functional biodiversity and insectaries was rich with information, and at the end of a full day we ran out of time for questions. So after the conference, OWNZ sent her some of the lingering questions that conference delegates had submitted. Here are her answers:

Question: On biodiversity planting – how do you decide where to site plants?

Insectary plants can be established in a range of locations both within and adjacent to vineyards to achieve 100% functional ground cover and active root growth 100% of the time whenever possible.

For example:

A diversity of low-growing perennial grasses and forbs can be sown in the undervine area using specialised seeding equipment.

Low (< 30 cm) growing grasses, forbs and woody groundcover species can be planted as tube stock, or via the dispersal of seed using specialised hydroseeding equipment like the tailored for use in vineyards Vortec Global VX2000 Agri Hydroviner in the undervine area or on mounds to create beetle banks.

Medium size shrubs (< 2m) can be planted adjacent to strainer posts and as dedicated areas of insectary and/or shelter/wind breaks adjacent to the vineyard.

Is there a relation between the planting density of *Leptospermum* and its proximity to vines, and the population size of predatory species found on grapevines?

It is well reported that stands of native vegetation adjacent to perennial production areas, including vineyards, have been associated with increased biodiversity benefits (Thomson and Hoffmann, 2010).

During my PhD studies, I found that it is possible to increase the functional diversity of predatory arthropods by more than three times when native evergreen shrubs such as *Leptospermum* spp. are present versus grapevines only (Retallack et al., 2019).

It is also reported that the longevity of parasitoid wasps increases up to 3.4 times when they are exposed to flowering shoots of *Leptospermum* spp. when compared to buckwheat (Pandey et al., 2018).

I also found that *Leptospermum continentale*, prickly tea-tree, provides habitat for natural enemies that are attracted to sources of nectar and pollen, such as predatory and parasitoid wasps

(Chalcid, Ichneumonid, Proctotrupoid, Tiphid and Vespoid), lacewings, spiders and other predators.

At least 63 morphospecies (visually distinct species) of predatory arthropods (insects, spiders and mites) were found in association with prickly tea-tree (Retallack 2019). The distance each will move will depend on the foraging preferences of each predatory arthropod.

For example:

It is reported that minute pirate bugs and predatory thrips can disperse up to 36 m from insectary plantings, and parasitoids up to 80 m from buckwheat refuges, while ground beetles move up to 200 m from boundary plantings into adjacent crops.

Spiderlings are well known for their capacity to passively colonise new areas via aerial dispersal techniques, including 'ballooning', which involves moving through the air on silken threads over large distances.

Regarding the placement of insectary plants in proximity to a focal crop (in this case vineyards), there are various recommendations in the literature including:

Plant shrubs adjacent to strainer posts (or set back 1 metre from strainers to allow for the application and removal of bird netting) or at the ends of each row in places where they do not interfere with vineyard practices (Retallack, 2024).

There should be at least 2 x 20 metre rows of hedges per hectare. Hedges constitute biological hotspots, acting as corridors linking up ecological areas (Stefanucci et al., 2018).

The success of a conservation biological control strategy is strongly linked to the availability and quality of ecological infrastructures inside and outside the farm within a radius of 100 to 200 m (Stefanucci et al., 2018).

Extensive research in southeast Australian vineyards also suggests increases in beneficial arthropods will be seen 100 m into the vineyard (Thomson and Hoffmann, 2013) where there are adjacent stands of native vegetation.

In some New Zealand vineyards, the use of flowering buckwheat in one row in 10 (every 25 m) reduces leafroller populations to below economic thresholds (Bernard et al., 2006).

I encourage winegrowers to incorporate a diversity of insectary vegetation (sizes, shapes, overlapping flowering times, flower colours etc.) as close as practical to grapevines and in some cases, growers are replacing missing vines with medium-sized insectary shrubs in the planting row.

Questions about sowing

How do you add wood chip to sow with the seeds? Do both go through the seeder?

When hydroseeding it is common to use wood fibre mulch as the carrier, along with water to disperse the seed via targeted jets onto hard-to-access locations like steep hills, dam banks and the undervine area. For more information, please see the EcoVineyards Vineyard Hydroseeding Q&A.

If sowing native grass and forb seeds using specialised seeding machinery, a range of carriers can be used, including wood shavings (not wood chips) and seeds mixed with an auger. For more information, please see 'Utilising native grassland species in Australian viticulture' and 'Katnook Estate case study' on the EcoVineyards website for examples of seeding equipment and how to prepare the seeds for sowing.

Do you think it would be possible to spread seed with compost?

Yes, this works well if seeds are mixed with a fully mature and good quality compost, they are not buried too deep (< 10 mm), and have sufficient moisture to germinate and establish to maturity.

On establishment and irrigation

Is there need for irrigation during the establishment phase of wallaby grasses?

No, we seed prior to the opening rains in autumn, and when conditions are optimal after the opening rains the native grasses will germinate. You can irrigate but this will also encourage weed seed germination, and native grasses and forbs do not respond well to competition from weeds during establishment.

Once native grasses and forbs are mature, they will out-compete most weed species. They are native and locally adapted species, so they are hardy and will germinate with naturally occurring seasonal rainfall. It may take more than a year for some species of perennial native grasses and forbs to establish to maturity, and they may persist for many decades.

What about water competition for the undervine crops? Are they 'stealing' much water coming from the irrigation system?

We find that native species are hardy and tailored for longevity rather than bred for vigour (like most exotic commercial species) and have low requirement for inputs. Our experience in Australia is that any drawdown in vine vigour in the first growing season is more likely from weed competition. If there is a diversity of species present it is likely there will be a sharing of resources with the focal crop (in this case grapevines) via quorum sensing with many net benefits if assessed over a three-to-five-year period.

Dan Falkenberg from Eden Hall Vineyards in Eden Valley, South Australia recently reported an increase in soil organic matter from 1.2% in 2021 to 5.9% in 2025, an increase of nearly 5% over five years on sandy soil, and increased soil water-holding capacity at depth where mature native grasses and forbs

are present in the undervine area, along with a reduction in soil acidity (0.3 to 0.16 EC1:5) over the same period, and improvements in wine quality.

Are there any shared mycelium networks between the native species and vines? Could there be benefits to this?

Absolutely, the greater diversity of functional species, the greater the likelihood of more mycelium and mycorrhizal fungal networks. Glomalin (soil superglue) is produced by mycorrhizal fungi that live inside plant roots and extend hairlike filaments or hyphae into the surrounding soil to obtain more nutrients. Studies by US researcher Kristine Nicols found that glomalin levels were higher in soils under native grasses and that cultivation and fallowing (bare earth) lowered glomalin levels, because cultivation destroyed the hyphae and fallowing starved them. Glomalin accounts for 27% of the carbon in soil and is a major component of soil organic matter compared to humic acid which contributes only about 8% – a difference of 3.4 times (Wright and Nicolson, 2002).

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For more information please see EcoVineyards best practice management guide on functional biodiversity in Australian vineyards.

Grape growers can access more than 1,800 pages of free practical resources focusing on ecological winegrowing practices by visiting <https://ecovineyards.com.au> or contacting agroecologist/viticulturist Dr Mary Retallack, Retallack Viticulture and Ecology, <https://retallack.com.au>.

Tickets are now on sale for the EcoVineyards New Zealand Tour with Dr Mary Retallack.



OWNZ EcoVineyards Tour

with Dr Mary Retallack

This is a special opportunity to learn from a leader in practical vineyard ecology. Dr Mary Retallack is one of Australasia's true experts on vineyard biodiversity, with decades of scientific and hands-on experience. As the pioneer of the national EcoVineyards program in Australia, she specialises in helping growers find cost-effective solutions to vineyard problems by working with nature.

A captivating presenter, Mary was an audience favourite at our conference last year. Her coming tour is a rare opportunity for a deep dive with her in Aotearoa New Zealand. She will share wisdom on functional biodiversity, cover crops, soil health and much more.

Workshops

Hawke's Bay: Paritua Cellar Door – **21 July**

Marlborough: Yealands Cellar Door – **28 July**

Central Otago: Carrick Winery – **4 August**

If you're outside these main regions, we're going to help you get there. Check out the special ticketing information side box for a discount code.



Tickets available via the website

<https://www.organicwinenz.com/ecovineyards-tour>
or scan the QR code.

SPECIAL TICKETING INFORMATION

OWNZ member, OWNZ non-member,
and student tickets are available.

To help bring people in from outside
of the workshop regions, we have a
limited number of discount codes on
offer to help offset the cost of petrol.

The discount code is: **OUTOFREGION**
and can only be applied for those travelling
from outside of Hawke's Bay, Marlborough or
Central Otago for the day.

We also encourage carpooling,
so reach out to your mates
and share a ride.

2025 CONFERENCE

Ki raro, ki runga, ki te rangi

Under the earth, above the ground, and into the sky:

Reflections on the 2025 conference

By Naomi Galvin

OWNZ Marketing & Events Coordinator

The fourth Organic & Biodynamic Winegrowing Conference was held at the ASB Theatre and Marlborough Events Centre from 16-18 June 2025, drawing growers, winemakers, researchers and thought leaders together for three days of conversation, connection and innovation.

Guided by the conference theme ‘ki raro, ki runga, ki te rangi’ – under the earth, above the ground and into the sky – the programme explored the intricate relationships between soil, vine, water, climate and community. Delegates engaged with vital topics including climate resilience, water ecology, biodiversity, soil health, regenerative viticulture and the future of organic winegrowing in Aotearoa and beyond.

Day one carried a strong regenerative focus, with Nick Paulin serving as MC. Speakers included Clive Dougall, Dr André Leu, Rajat Parr, Nick Gill, Dr Mary Retallack, Dr Sara Loeffen, Olaf Schelezk, Jeremy Hyland, Jim Bowskill and Joseph Brinkley, each bringing fresh perspectives on ecological farming systems, vineyard resilience and the evolving global organic movement.

The trade exhibition proved useful with implements, materials and services helpful for vineyards.

The opening evening welcomed delegates to Nō Aotearoa – Organic Tasting, an opportunity to sample some of New Zealand’s finest organic wines, poured

by the producers. As a special highlight, Oliver de Groot of Monavale Blueberries showcased his blueberry wine – the first non-grape wine featured at the conference.

Day two, MC’d by Anika Willner, flowed with a strong water theme while also venturing into wider philosophical discussions and storytelling. Presenters included Dr Peter Espie, Dr Mark Krasnow, Dr Charles Merfield, Dr Mike Joy, Ian Trousdell, Charlotte Tomlinson and Peter Davidson, Marta Mendonça, Oliver de Groot, Katia Nussbaum, Stephen Wong and Rajat Parr.

That evening, guests gathered to celebrate the Māori New Year with ‘A Touch of Sparkle’ at Te Hākari – Matariki Organic Feast, featuring guest chef Kia Kanuta. The Māori-inspired menu showcased dishes such as ika mata, sourdough, smoked butter, horopito- and harakeke-rubbed lamb shoulder, premium game stew and hāngī potatoes – all enjoyed with background tunes from local DJ George Waterhouse.

Conference proceedings on day three were MC’d by Cassandra Charlick, with a packaging panel discussion anchoring the midday programme. Speakers across the day included Alistair Schorn, Professor Jack Heinemann, Jens Merkle, Lasma Rivers, Sarah McFadden, Joseph Brinkley, Marta Mendonça, Nadine Worley, Stephen Coleman, Angus McDonald, Isaac Pardo, Miguel Godinho, Mike Saunders, Dr Mary Retallack and Katia Nussbaum. Discussions ranged from sustainable packaging innovation to biodiversity and the future direction of organic wine production.

On stage, keynote speakers were gifted beautiful pounamu taonga made by

Nelson hard stone carver Judah Ashton. Each piece was thoughtfully selected for the individual speakers and presented by Ben Trinick, who closed the conference with a karakia. Dr Mary Retallack was particularly touched by the special pounamu gift and said, “The celebration and acknowledgement of Māori culture throughout the conference, the diversity of topics and perspectives covered was in a spirit of generosity.” Katia Nussbaum also loved her white heron and said, “It’s my amulet for opportunity and courage.” Conference delegates got to take home a memento too, this time in the form of a handmade ceramic coffee cup made by SHUP – Sharon Hill Unique Pottery.

The conference concluded with Mai Tawhiti – the International Organic Wine Tasting, which was set beside the river. Guests sampled iconic international organic wines while engaging directly with the speakers and producers pouring them. Light bites and ambient music from local violinist Anna Moore created a fitting close to an event that celebrated not only organic winegrowing, but also the deeper connections between land, people and the living world.

A heartfelt thank you to Horticulture Group and Marlborough District Council for their generous support, and to all our sponsors, partners and trade exhibitors whose contributions helped bring the conference to life.

Photos (right): Winemaker Ben Trinick opens the conference with a mihi whakatau; packaging futures panel discussion; guest chef Kia Kanuta serving up at the Matariki Organic Feast; Lara Campbell sharing Clos Henri wines at the New Zealand Organic Wine Tasting; #DRINKORGANIC plastic-free lanyards, care of Horticulture Group. Conference photos by Lisa Duncan

2025 CONFERENCE

Nature's intelligence

Take-home messages from last year's conference

By **Rebecca Reider**

OWNZ coordinator

Over the course of three days last June, hundreds of us gathered to listen to 28 speakers from all over the world at the Organic & Biodynamic Winegrowing Conference. There's no way I could summarise all of the insights that were spoken into that room. But a year later, leafing through my notebook, here are some of the big picture messages and points of convergence from some of the talks that stayed with me.



Dr Mary Retallack

Retallack Viticulture
Adelaide, Australia

Cultivate a polyculture of thought to find new solutions. Certainty limits thinking.

Cover and nourish your soils; microbes are 'below-ground livestock'. Have functional ground cover and active root growth at all times. Aim for 100% ground cover, including undervine and midrow.

Aim for maximum functional biodiversity. "Scruffy is the new look."

Resilience is the capacity of a system to reorganise after disturbance.

Loss of natural and semi-natural areas contributes to reduced pest biocontrol in crops.

Nutrient-dense crops are more resistant to sap-sucking insects (scale, mealybug, aphids).



Dr Charles Merfield

BHU Future Farming Centre
Christchurch

Soil is the most biodiverse ecosystem on the planet. And we treat it like dirt.

The new paradigm in soil science: Plant exudates feed microbes around roots. These exudates power soil biology. Living plant roots are key to soil health.

Mechanical weed management removes plant roots and thereby reduces soil biodiversity.

Ecological weed management: instead of mechanical weeding, get 'good' plants to out-compete 'bad' plants. Easier said than done to find out what will work. Start small, try different plant species in monoculture and mixes.

Merf's bumper sticker: "Sorry I did not hear your question but the answer is a diversity of living plant roots year round."



Joseph Brinkley

Bonterra
USA

Principles for regenerative viticulture:

- organic inputs only
- cover crops year round
- minimal tillage – "intentional and infrequent"
- grazing to control cover crops and build soil
- labour: fair treatment of farm workers.

Cover cropping: "plants grow soil". Design cover-crop mixes with an understanding that plants are growing the soil. Aim for a long cover-crop flowering season to attract natural predators and parasitoids.

In the market, different stakeholders will have different perceptions around certification. Not all certifications resonate with consumers due to lack of awareness. Know your audience.

Tell fresh stories. Be more interesting. Certification alone isn't enough. Hold onto your story and your truth.