ECO VINEYARDS
GROWING RESILIENCE NATURALLY

CASE STUDY

ESTABLISHING NATIVE SHRUBS ADJACENT TO STRAINER POSTS, COMPOSTING, HYROSEEDING AND SAP TESTING AT JUNIPER ESTATE, MARGARET RIVER, WA

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Wine Australia

retallack viticulture

NEW ECOVINEYARDS PROJECTS

Background

Juniper Estate is approximately 14 hectares in size and is located at 98 Tom Culity Drive, Wilyabrup. The first vines were planted by the Wright family in 1973. Today there is a total 9 ha planted to Chardonnay, Cabernet Sauvignon, Shiraz, Malbec, Semillon, Merlot, Cabernet Franc, and Petit Verdot.

> ***"I have loved the grower community aspect of being part of the EcoVineyards program. The demonstration site allowed us to learn from and share our practical successes and failures. The workshops often challenged conventional wisdom with an awesome range of expert presenters, often from outside the industry."***
>
> **Ianto Ward, Juniper Estate**

Project description

Our case study involved:

- Planting native species at the ends of rows to increase insect abundance and diversity
- Making compost to use as an extract to apply as a soil drench over the mid rows to increase soil biodiversity
- A hydroseeding trial of native ground covers to assess suitability for establishing in the vineyard
- Trialling the use of leaf sap testing as a method to measure and treat vine health and nutrition.

Figure 1: EcoGrowers Caroline (Caz) Smirk and Ianto Ward, Juniper Estate [Photo: Mary Retallack].

What did you do and when?

October 2023

- We planted *Eutaxia myrtifolia, Scaevola crassifolia, Conostylis aculeata, Hakea sulcata, Hibbertia serrata, Verticordia plumosa, Kennedia prostrata,* and *Themeda triandra* adjacent to the strainer posts.

July 2024

- We set up an aerobic compost round and a Johnson Su bioreactor round. The compost from the aerobic compost round was used to make the compost extract which was applied to the mid rows through the block. A mix of compost extract (4 kg), seaweed (0.2 kg), fish hydrolysate (1 L) and molasses (0.5 L) was mixed with 400 litres of water and applied over a hectare on three occasions across the 2024 growing season.

August 2024

- We planted *Hakea trifurcata, Astartea scoparia, Melaleuca incana, Hakea undulata*, and *Anigozanthos flavidus* and replaced the plants that had not survived the initial planting adjacent to strainer posts.

Figure 2: Native plants at row ends surrounded by wood chip mulch [Photo: Ianto Ward].

Figure 3: Flowering *Scaevola crassifolia,* cushion fanflower on the end-row for native insectary planting [Photo: Ianto Ward].

Figure 4: Filling the 'tea bag' ready to make another batch of compost extract [Photo: Ianto Ward].

Figure 5: Caroline Smirk, Ianto Ward, Juniper Estate and Dr Mary Retallack, National Ecovineyards program manager inspecting the quality of the compost round (October 2023) [Photo: Kate Tarrant].

May 2024

- In preparation for hydroseeding, the under vine area and adjacent paddock patch were sprayed with Slasher organic herbicide to knock down weed growth.
- The paddock area was rotary hoed, the under vine area mowed close to the ground, with the resulting thatch then raked off by hand. Native seed was applied by hand, followed by a covering of hydromulch. Species planted are listed in the table below.

Figure 6: Watering in native seed [Photo: Ianto Ward].

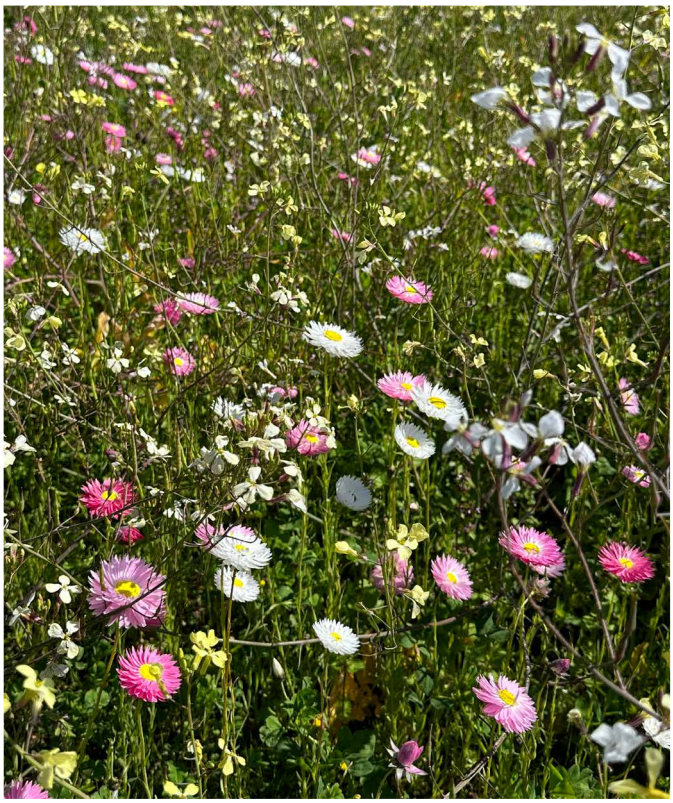

Figure 7: Everlastings in the native insectary [Photo: Ianto Ward].

Figure 8: Hydroseeding over the native seed, the undervine strip(May 2024) [Photo: Rebecca Archer].

Figure 9: Trial row for undervine hydroseeding of native seed (May 2024) [Photo: Rebecca Archer].

Figure 10: Hydroseeding over the native seed, the undervine strip(May 2024) [Photo: Mary Retallack].

Figure 11: Trial row for undervine hydroseeding of native seed (May 2024) [Photo: Mary Retallack].

January 2025

- Old and new leaves (petioles removed) were sampled from three blocks to send for sap testing. The leaves were sampled before 9am to ensure full leaf tension. Both young and old leaves were separated and taken when they were dry. Twenty leaves of an average size provided enough weight. Samples were sealed in in zip lock bags and were wrapped in paper towel and placed in an esky with an ice block.
- Samples were sent via Mark Tupman from Productive Ecology to a Netherlands laboratory, Nova Crop Control on the 14 January 2025. Results were received on the 23 January, a short 10-day turnaround.
- The lab reported on sugar levels, pH, EC and a range of nutrients. The results were compared to the target ranges suggested by John Kempf (Figure 13 below). The John Kempf values are generally higher than the target range listed for trees in the Nova report. A foliar fertiliser mix was designed and applied to the vine canopy to address the nutrients that were deficient.
- To find out more please see the Nutrient-dense plants are more resistant to pests and diseases fact sheet.

Figure 12: Collecting the 'young' leaf sample for sap testing [Photo: Ianto Ward].

Sap analysis target ranges (grapes)			
Total sugars	4	Sulphur (S)	400 to 450
pH	4.5	Phosphorus (P)	650 to 750
EC	10	Silica (Si)	100 to 120
Potassium (K)	2,300 to 2,500	Iron (Fe)	25 to 30
Calcium (Ca)	1,500 to 1,800	Manganese (Mn)	30 to 40
Magnesium (Mg)	750 to 900	Zinc (Zn)	15 to 25
Sodium (Na)	125 to 200	Boron (B)	15 to 17
Ammonium (NH_4)	0	Copper (Cu)	1.5 to 2
Nitrate (NO_3)	0	Molybdenum (Mo)	0.5 to 0.75
Total nitrogen (N)	450 to 500	Aluminium (Al)	10
Chloride (Cl)	500 to 700		

Figure 13: Sap analysis reference levels published by John Kempf and AEA (supplied by Mark Tupman).

If you changed your project, what was the reason for the change?

- We didn't apply compost extract as a foliar application to the vine canopy, as we didn't have the time.
- The sap testing was included after we learned about this new service at the Ecovineyards workshop, and we were interested in testing a new tool to measure vine health throughout the growing season.

What worked well?

Native plants which survived and grew well:

- *Anigozanthos flavidus*, tall kangaroo paw
- *Astartea scoparia*, common astartea
- *Conostylis aculeata*, prickly conostylis
- *Eutaxia myrifolia*, egg and bacon plant
- *Hakea trifurcata*, two-leafed hakea
- *Melaleuca incana*, grey honey myrtle
- *Themeda triandra*, kangaroo grass

Any pitfalls to avoid?

- Beware of paper wasps potentailly building their nests in tree guards!
- Those plants which did not survive the summer and we would avoid using in the future:
  - *Apium prostratum,* sea celery
  - *Hakea sulcata,* furrowed hakea
  - *Hakea undulata*, waxy-leafed hakea
  - *Hibbertia serrata*, serrate-leaved guinea flower
  - *Kennedia prostrata*, running postman
  - *Kunzea recurva*, purple kunzea
  - *Verticordia plumosa*, plumed feather flower

Figure 14: Paper wasps nest inside corflute tree guard [Photo: Mary Retallack].

- Weed control was critical before attempting to establish native plants from seed. We planned to spray out the weeds once we saw germination with the opening rains in Autumn 2024. However, our region experienced one of the driest autumns on record; there was no recorded rain before the hydroseeding demonstration. The subsequent weed growth appears to have smothered out much of the native species to date.
- We plan to use leaf blade sap testing again next season and will include a follow-up sample after applying corrective sprays to assess their impact on sugar and nutrient levels.

Highlights and insights

We have microbats in the vineyard that help with free insect control. Microbat calls were collected using a Chorus (Titley Scientific) bat detector placed on the edge of the vineyard near the cellar door over several nights.

The three species identified on our Wilyabrup site were:

- *Chalinolobus morio*, chocolate wattled bat
- *Falsistrellus mackenziei*, western false pipistrelle
- *Vespadelus regulus*, southern forest bat

"I've gained new knowledge about microbats, deepened my understanding of composting practices for the vineyard, and broadened my existing knowledge of local native plant species."

Ianto Ward, Juniper Estate

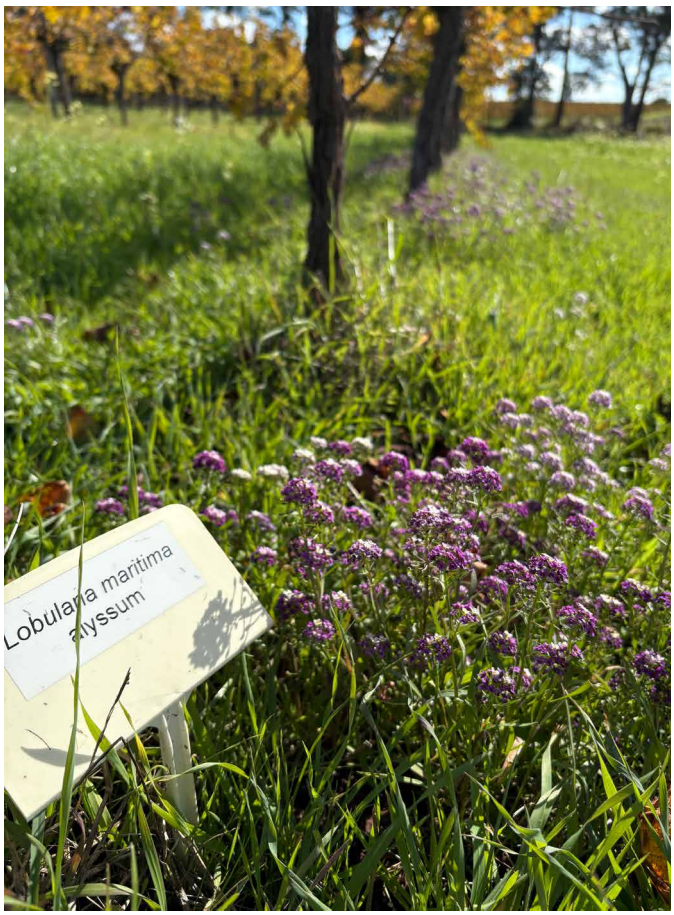

Figure 15: *Lobularia maritima*, alyssum hydroseeding trial [Photo: Ianto Ward].

Figure 16: Planting of native species in Area A [Photo: Ianto Ward].

Figure 17: Ianto Ward and kangaroo grass planted adjacent to the strainer post [Photo: Caz Smirk].

Figure 18: A pair of ibis utilising the bird perch installed in the vineyard [Photo: Ianto Ward].

Where to from here?

We will continue to:

- Produce our own compost and utilise it to apply compost teas throughout the vineyard.
- Monitor the under-vine strip trial to observe if any of the native species begin to establish themselves over time.
- Monitor the native plants at the end rows as they continue to establish themselves and mature to a flowering stage to observe the insect life they attract to the vineyard.

Are there any outstanding knowledge gaps you would like filled?

- Over time, I would like to monitor the abundance and diversity of insect species on the native shrubs to assess our success in increasing the biodiversity of the vineyard.

Plant lists (native species planted on end rows)

#	Scientific name	Common name	# planted	# survived	% survival
Planted 1 October 2023					
1	*Apium prostratum*	sea celery	5	0	0%
2	*Austrostipa elegantissima*	tall feather grass	5	5	100%
3	*Austrostipa flavescens*	spear grass	5	5	100%
4	*Conostylis aculeata*	prickly conostylis	5	*3*	60%
5	*Eutaxia myrtifolia*	egg and bacon plant	5	5	100%
4	*Hakea sulcata*	furrowed hakea	5	3	60%
5	*Hibbertia serrata*	serrate-leaved guinea flower	5	0	0%
6	*Kennedia prostrata*	running postman	5	0	0%
7	*Scaevola crassifolia*	thick-leaved fan flower	5	2	40%
8	*Themeda triandra*	kangaroo frass	5	5	100%
9	*Verticordia plumosa*	plumed feather flower	5	1	20%
Planted 20 August 2024					
10	*Anigozanthos flavidus*	tall kangaroo paw	15	10	67%
11	*Astartea scoparia*	common astartea	15	10	67%
12	*Conostylis aculeata*	prickly conostylis	15	12	80%
13	*Hakea trifurcata*	two-leafed hakea	15	14	93%
14	*Hakea undulata*	waxy-leafed hakea	15	5	33%
15	*Kunzea recurva*	purple kunzea	15	0	0%
16	*Melaleuca incana*	grey honey myrtle	15	15	100%
		Total	**160**	**95**	**59%**

Plant lists (native seed species used in the under-vine hydroseeding trial)

#	Scientific name	Common name
1	*Brachyscome iberidifolia*	Swan River daisy
2	*Brachyscome iberidifolia*	Swan River daisy (mixed splendour)
3	*Carpobrotus virescens*	coastal pigface
4	*Chrysocephalum apiculatum*	common everlasting
5	*Conostylis candicans*	cottonheads
4	*Disphyma crassifolium*	pig face
5	*Kennedia prostrata*	running postman
6	*Lobularia maritima*	alyssum
7	*Microlaena stipoides*	weeping grass
8	*Rytidosperma geniculatum*	kneed wallaby grass
9	*Trachymene pilosa*	native parsnip
10	*Trifolium subterraneum*	subterranean clover

Costs

Date	Item	Number of plants	EcoVineyards costs (ex GST)	Co-contribution (landholder contribution)	In-kind time
6/07/2023	Introductory meeting onsite				2.0 hrs
18/08/2023	Peg out trial area, spray weeds, photo point				2.0 hrs
26/08/2023	Order plants from GLCN	55	$188		0.5 hrs
4/09/2023	Take soil samples and post to Agpath Lab				1.5 hrs
8/09/2023	Mulch dead weeds in Area A down to ground level				0.5 hrs
3/10/2023	Light disc of area A				0.5 hrs
4/10/2023	Pickup and plant seedlings at end of rows				4.0 hrs
4/10/2023	Spread native grass, water in with seaweed and hydrofish				1.0 hrs
4/11/2023	Install grow guards on seedlings				1.0 hrs
summer 23/24	Hand water seedlings - with seaweed Dec, Jan, Feb, Mar, April - 45min per time				4.0 hrs
8/05/2024	Spray area A and outside row CAS03 with Slasher				1.0 hrs
14/05/2024	Deep rip and cultivate area A				0.8 hrs
21/05/2024	Mow outside row CAS03 and rotary hoe				0.8 hrs
23/05/2024	Rake off thatch in CAS03 and Mary spread seed				1.0 hrs
11/06/2024	Seed remaining section of Area A		$366		0.5 hrs
24/07/2024	Plant seedlings from Boyanup Botanical to fill in missing at ends of rows SHI06 and new rows CAS03 and CHA05	105	$226		4.0 hrs
24/07/2024	Install growguards and stakes on seedlings.		$215		1.5 hrs
12/09/2024	Apply compost extract to midrows				1.0 hrs
12/09/2024	Impact Ecology - microbat call analysis and report		$124		
24/10/2024	Mow weeds in hydroseeding area and area A				1.5 hrs
25/10/2024	Apply compost extract to midrows				1.0 hrs
4/12/2024	Apply compost extract to midrows				1.0 hrs
9/12/2024	Microbat recorder setup and drop off to Stormflower				1.5 hrs
28/01/2025	SAP leaf sampling and drop off		$300		1.5 hrs
	EcoGrower contribution			$3,000	
	Total	**284**	**$1,418**	**$3,000**	**34 hrs**

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ACKNOWLEDGEMENT OF COUNTRY

EcoVineyards proudly acknowledges the Aboriginal and Torres Strait Islander Peoples, and their ongoing cultural and spiritual connection to this ancient land on which we work and live.

As the Traditional Custodians of this land, we recognise their wealth of ecological knowledge and the importance of caring for Country.

We pay our respects to elders past and present and extend this respect to all Aboriginal and Torres Strait Islander Peoples.


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