ECO VINEYARDS
GROWING RESILIENCE NATURALLY

Grower insights

Ground covers

EDEN HALL WINES
ESTATE GROWN • FAMILY OWNED

Dan Falkenberg, Eden Hall Wines

"Viticulture is challenging and to be successful in the future will require vignerons to be innovative in their management practices. The use of native grasses and vegetation are all co-related in building healthy ecosystem services, not only within the soil but above and beyond the view of vines.

Remnant vegetation and native insectary plants are vitally important as natural capital resources or assets to improve agroecology, provide habitat, diversity, and resilience that benefit vineyards and the environment."

September 2023

Mixture of four wallaby grass species, *Rytidosperma* ssp. Barossa, March 2014 (Photo: Mary Retallack)

Grower insights: Dan Falkenberg, Eden Hall Wines

Barossa Valley Wine Region

Pratical insights

What works well?

Wallaby grasses provide valuable habitat for a range of predatory arthropods, (brown lacewings and spiders) which manage light brown apple moth (LBAM) populations below economically damaging thresholds, without the need for chemical intervention.

Perennial native grasses provide many ecological benefits to a vineyard production system.

They improve soil water pathways and infiltration, reducing irrigation requirements, improved soil health and biology, require low maintenance, enhance IPM through improved habitat value for native birds, in particular seed eating and insectivorous species and a significant reduction in undesirable pest plant species.

Pitfalls to avoid?

Native grass requires very little management once established, keep slashing to a bare minimum once per year after flowering (stay off the tractor) and slash 150 to 200 mm high.

Don't slash during flowering of native grasses as you want the seed to mature and drop to the ground. This will help with future recruitment; the seed also harbours many beneficial predatory insects during this period.

Use sheep as a tool for change, but careful management is required.

Careful choice of herbicide and timing of weed wiping is critical to minimise off target damage.

Native grass is a journey and takes time to establish, patience, patience, and more patience!

Background

The transition from annual cereal cropping to the establishment of native perennial wallaby grasses in the mid-row in 2009, was followed by the over sowing of a 20 multi-species mix of grasses and forbs in June 2020 as a part of the EcoVineyards program.

Tips

Weed control

Several weed species were present prior to the establishment of native grasses including salvation jane, *Echium plantagineum*, wireweed, *Polygonum aviculare*, wild oats, *Avena fatua* and evening primrose, *Oenothera stricta*.

It is important when planting native grasses to:

- start with minimal weed pressure, as young seedlings don't compete well with established weeds, and
- be persistent with weed control during establishment. Once wallaby grasses are established, they can outcompete most weed species.

It is important to start weed control in the mid-row twelve to eighteen months prior to the planting of native perennial grasses to provide adequate time to deplete the existing weed seed bank and start with a clean weed free surface.

The site was prepared early in the growing season from spring onwards using contact and systemic herbicide applications. The mid-row was sprayed out each time a germination of weeds appeared in autumn, spring, and summer prior to seeding to knock down weeds and ensure the soil surface was ready for planting the multispecies mix of wallaby grasses and forbs.

A week after seeding herbicide was sprayed over the soil surface to knockdown any weeds that had germinated during the seeding process.

After each herbicide application bio-stimulants were applied to the soil surface to buffer the negative impacts of herbicide.

Preparation, preparation, and preparation is the key to successful outcomes when establishing native grasses.

Clockwise: Andrew Fairney mixing seed with sawdust prior to application and the Native Seeds Inc 'Blue Devil' native grass seeder in action and (Photos: Dan Falkenberg)

Main photo: Native wallaby grasses, *Rytidosperma* ssp. that were sown 9 years previously, October 2018, prior to flowering.

Inset: Checking the rooting depth of wallaby grasses in the vineyard midrow (Photos: Mary Retallack)

Wallaby grasses just starting to develop flower heads in late October 2020 (Photos: Dan Falkenberg)

Clockwise: Wallaby grasses in full flower, December 2018; sparse plant density mimics nature, the tussock grasses grow in tussock formation with gaps in between; natural recruitment in the undervine area (Photos: Dan Falkenberg)

Top and right: Wallaby grasses in full flower with a characteristically fluffy seed head, December 2021, and shedding seed on the ground (Photo: Dan Falkenberg)

Bottom: A mature stand of wallaby grass with spent seed heads (Photo: Dan Falkenberg)

Management

How to sow

We enlisted the services of Andrew Fairney from Seeding Natives Inc who have a specialised purpose-built Blue Devil seeder that was used to sow the native grass mix in the vineyard mid-row in autumn (May 2020), at a rate of 8 kg per sown hectare of pure seed and florets (mid-rows only). It is possible to reduce this rate to 5 kg per sown ha but 8 Kg seems to be a good balance.

Seed is incorporated into the soil at a shallow depth and also on the surface and pressed in with the roller on the back of the seeder to provide seed soil contact to enhance germination.

When to sow

Autumn through to early winter seeding provides most likely the best chance of a successful outcome, seed will be in the soil early while the soil temperature is still warm which will enhance germination.

It is important not to incorporate DAP or other phosphate fertilisers when planting native seeds, as this will reduce the likelihood of success.

Germination

Germination of up to 80% is considered a good result. There may be no observable seed germination for the first three months as native grass is a slow growing perennial, but patience is the key to establishing natives.

Weeds may need to be controlled with a brush or sponge wiper at this stage as native grass doesn't compete well with weeds at early development.

Once wallaby grasses are established, they can provide large volumes of seed pending seasonal conditions that will help regenerate proliferate the sward.

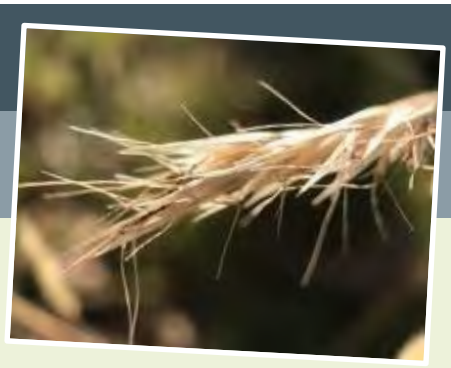
Once the sward is fully established mature plants will drop seed and it will spread into the undervine area.

Sourcing native seed

Seed was sourced commercially from Seeding Natives Incorporated Inc.

A 20 species mix incorporating the following species of wallaby grass was used:

- *Anthosachne scabram,* common wheat grass
- *Arthropodium strictum,* chocolate lily
- *Bothriochloa macra,* red grass
- *Calocephalus citreus,* lemon beauty heads
- *Chloris truncata,* windmill grass
- *Chrysocephalum apiculatum,* common everlasting
- *Convolvulus angustissimus,* Australian bindweed
- *Dichanthium sericeum,* silky blue grass
- *Digitaria brownii,* cotton panic grass
- *Enteropogon acicularis*, curly windmill grass
- *Eryngium ovinum,* blue devil
- *Gonocarpus tetragynus,* raspwort
- *Helichrysum scorpioides,* button everlasting
- *Microlaena stipoides,* weeping grass
- *Rytidosperma caespitosa,* common wallaby grass
- *Rytidosperma fulvum,* copper awned wallaby grass
- *Rytidosperma geniculatum,* kneed wallaby grass
- *Rytidosperma racemosum,* wallaby grass
- *Rytidosperma setaceum,* small-flowered wallaby grass
- *Vittadinia gracilis*, woolly New Holland daisy



Management

How to manage native grasses

Dealing with weeds can be problematic in the first few years of establishment but a simple sponge wiper attached to an ATV can brush herbicide onto the weeds that generally grow faster and above the native grass (native grasses are a slow grower).

Weed removal and weed competition will allow the natives to gain a strong hold and eventually outcompete most weed species.

Roller crimping weeds is also another mechanism for control, it generally is enough to set the weeds back and does not damage the native grass.

During late autumn through to early spring sheep can be used to reduce weeds in the sward and provide soil contact with seed that has dropped to the ground after flowering, further improving the germination of the sward.

Sheep must not be set stocked on the sward they have to be managed on a rotational basis to allow for sward recover, large numbers of sheep for a short time followed by long rest period is preferred.

Native grass requires very little management and over slashing can be detrimental to the longevity of the sward by reducing seed set and natural recruitment.

Typically, slashing once a year is enough. A high mow is preferred 150 to 200 mm high, as low mowing damages the plant's ability to recover.

Allowing native grass to flower and drop seed is crucial to having a self-recruiting system and longevity of sward.

Wallaby grass habit

It is important to have a relatively sparse cover of wallaby grass on the ground as this mirrors its habit in nature.

A perennial or tussock grass will persist for several years and can grow up to 30 cm in diameter. Wallaby grasses have the capacity to regenerate.

A dense groundcover, like other mid-row cover crops is not preferred and doesn't appear to be required for the grass to exclude weed species.

The roots of mature grasses may extend down to 30 cm, and their fibrous root system makes them hardy, and tolerant to drought conditions. Their root system can help to open the soil and improve soil structure and water infiltration.

For more information, check out Dan's EcoVineyards case study https://ecovineyards.com.au/wp-content/uploads/EcoVineyardsCaseStudyFalkenbergVineyard.pdf

Natural wallaby grass recruitment in the undervine area (left) and sterile herbicide area (right) (Photo: Dan Falkenberg)

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The National EcoVineyards Program is funded by Wine Australia with levies from Australia's grape growers and winemakers and matching funds from the Australian Government.

Acknowledgement of country

The EcoVineyards program acknowledges Aboriginal people as the First Peoples and Nations of the lands and waters we live and work upon and we pay our respects to their Elders past, present, and emerging. We acknowledge and respect the deep spiritual connection and the relationship that Aboriginal and Torres Strait Islander people have to Country.

Disclaimer

For more info about the National EcoVineyards Program see https://www.ecovineyards.com.au

Collated by Dr Mary Retallack