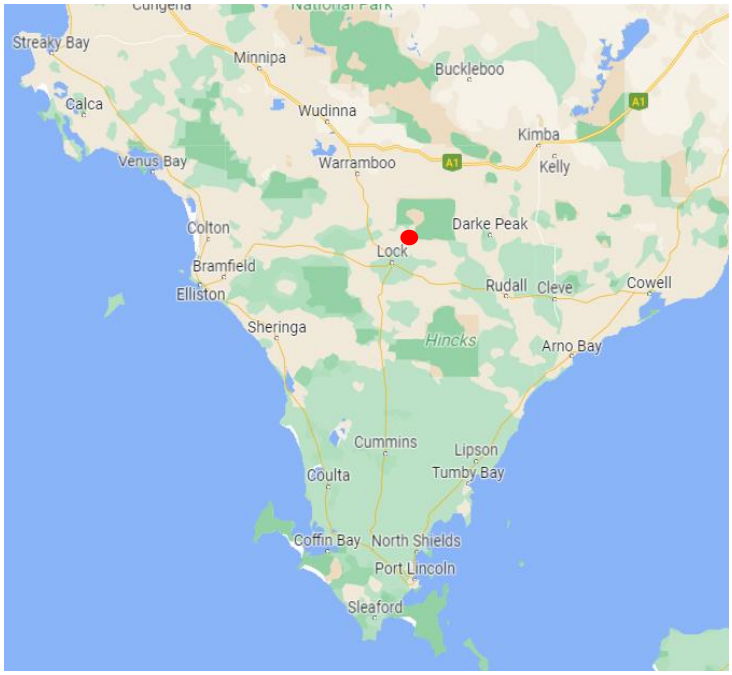
Regenerative Agriculture Program Mallee seeps case study: Glover, Lock

Key messages

1. Try and identify the areas early and manage them to reduce future impact.
2. Keeping perennial ground cover is critical.
3. Use water before it discharges into the swales and causes scalds.



Background

Kerran (Gus) Glover farms with his family on a property between Lock and Darke Peak. The farm totals 6,500 ha arable with another 1,500 ha of scrub. The farms include some share and contract farming. The share farming land involves about 50% cropping.

With an average annual rainfall of 350 mm, 4,000 ha is cropped annually in rotation with wheat, barley and canola. Around 1,600 ha is pasture, being mostly self-regenerating medic. 3,000-4,000 ha is sown to a mix of vetch, barley, tillage radish and canola for grazing or hay annually.

Sheep are an important component of their farming system. Gus runs 1,500 self-replacing merino ewes.

The farm is a mix of dune swale, sandy loam and sand over clay. There are also patches of limestone. The sand ridges extend through the farm, making them a challenge to manage productively and maintain cover at all times, finding a balance between not over-grazing but also not under-utilising the better areas of a paddock.

How it began

The Glovers had been identifying areas that in recent years were beginning to show signs of salinity, where bare patches started to grow.

In discussions with Landscape Board staff, they recognised these patches as Mallee seeps. The clearing of sand dunes and rises, combined with restrictive clay in the sub surface, meant water was not utilised, then running down the slopes, evaporating and creating saline patches in the low-lying areas. These areas seemed to be exacerbated with summer weed control.

The areas of bare patches or scald, started in 2016 after a wet winter and high production year.

What did they do?

The Glovers have been undertaking a multi-pronged approach as part of the EP Landscape Board's Mallee seeps project. Some of the non-productive sand hills have been fenced and replanted with native vegetation to utilise excess water. Other areas have been fenced off to allow regeneration of native vegetation, also allowing for better grazing management of the at-risk areas.

Lucerne has been planted on other sand hills to utilise moisture, where the areas are inherently low in productivity and are non-wetting anyway. Deep ripping has been undertaken on the tops of hills with some success, particularly prior to sowing lucerne.

Lucerne has been planted over the growing seep areas to utilise excess moisture, before it becomes saline. A 10 cm deep layer of sand was spread across the scalds to protect the lucerne during germination and allow it time to grow through the saline soil surface.

Perennial veldt grass has also been planted and established in some areas.

Puccinellia was another potential species to establish but as the areas are small and only just developing, Gus is planning to continue to crop through the lucerne in future.

Saline scald before lucerne establishment

Scald area covered in Lucerne

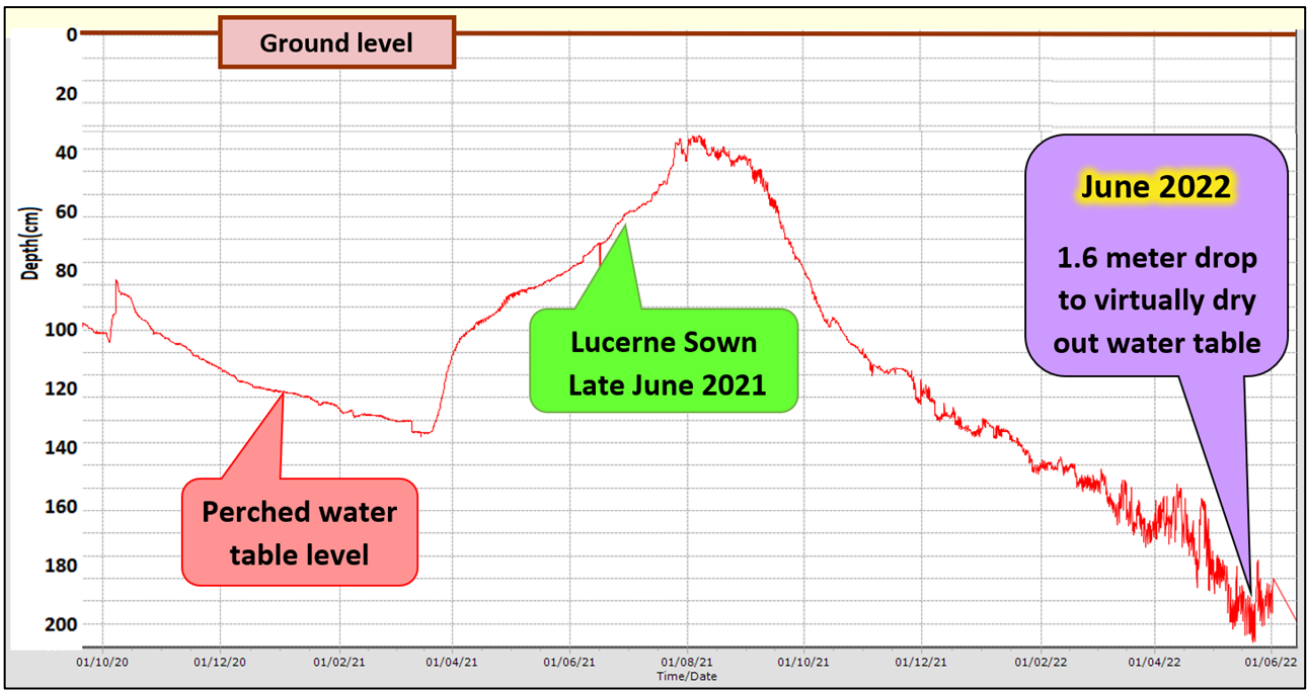
What worked?

The areas of scalding have been reduced since the start of the program. Dealing with the scald early on before they became unmanageable has been important to success.

The graph below provides a clear measure of the positive effect the lucerne has had on the water table. Of note, a significant rainfall event in January 2022 had no impact on the water table reduction.

Establishing lucerne over the scalded area provided immediate impact on the perched water table, drinking it down. As long as the lucerne is maintained, Gus hopes it will continue to keep the areas dried out and hence maintain productivity.

Identifying new areas early has been the key to being able to establish lucerne during winter to stop the problem from developing further.



Water table levels prior to and after establishment of lucerne.

What didn't work?

The multi-pronged approach has been very successful for Gus and at this stage there has been little failure.

The main learning came with poor establishment of lucerne on a second sandhill. Conditions were excellent for lucerne, but only the lucerne lower down the slope has successfully established. Gus believes the young plants on top of the sandhill were beaten by insects. The lesson being, keep an eye on it.

What would they do differently of they were to do it over again?

Satellite imagery has identified more potential areas that may scald if not managed into the future.

There is potential for other crops to be sown. With summer rainfall, sorghum could be established. Veldt grass has been planted in some areas as well and there is potential for more to be established.

Deep ripping may not be required on all areas prior to planting lucerne or other perennial species. Overall management is site specific and will depend on a range of criteria, particularly a good understanding of the soil at each location.

Other species may have the same positive results. In future, tillage radish and more perennial veldt could be utilised.

What have they seen or read that they would be excited to try?

Gus is very happy with the results and the techniques currently being employed. At this stage, he is not seeking any new alternatives.

What do they think the role of regenerative agriculture is in EP environments?

In the future, Gus believes management of variable soils, rainfall and changing climate will mean changing farming systems to match it. To be sustainable in the long term, new things will be required. Perennial pasture and vegetation will be critical to keeping soil cover and improving production.

Acknowledgements

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More information

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