WA LANDCARE network

Salinity Management
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Landholder Todd Gray hosts groups looking to learn more about the drainage system.

Deep drains for salinity management

'Mayfield, Dumbleyung'

By Ella Maesepp, Katanning Landcare

"The payback period on my farm, if I'd had to pay for it all myself, is about 10 - 20 years, although it's hard to be exact. But that time is getting close to passed, and really, when you've already been here a hundred years and plan on staying here for another hundred, what's 20 years?" Todd Gray, Mayfield.

Todd Gray is one of fourteen landholders in the central part of the Shire of Dumbleyung who form the Fence Road Arterial Drainage Scheme – an enormous 52 km interconnected system of deep drains.

Constructed over the summer of 2007-08, following years of planning, assessment and a Pilot Project site slightly further west at Beynon Rd, the Fence Road scheme was partially funded by the WA State Government through the Department of Water, and the landholders themselves.

Todds farm "Mayfield" is located at the top of the scheme, and he also owns the property at the bottom – with thirteen neighbours in between. Water from the drainage system discharges into the natural watercourse which eventually flows to Lake Dumbleyung, but Todd observes that the water rarely makes it that far, evaporating in the drainage lines first.

Todd's farm has been in his family for one hundred years. When he returned from school in 1991, salt had begun appearing in the farm at the top of the catchment, which he and his aunt tackled straight away by planting trees. "We planted them in December, because the ground was wet!" explained Todd.

However, the salinity – and particularly the waterlogging – continued to worsen. Even moderate rainfall events of 7–8 mm would render some parts of paddocks untrafficable.

Seen from the air, the bus shows the scale of the drainage corridors.

The Drains

The Fence Road Arterial Drainage Scheme not only covers 14 landholders and 52km but includes ten road crossings, 35 farm crossings and varies in depth and width as it progresses.

Deep drains work by intercepting groundwater held within the clay layer, allowing it to flow freely out of the soil profile and be moved away. This inhibits the rise of groundwater towards the lands natural surface, causing salinity and waterlogging issues, by dewatering the ground on either side of the drain channel.

52km of drains stretch across the Dumbleyung landscape in the Fence Road Arterial Drainage Scheme.

At Todds upper-catchment farm, the drains are 2m deep and are designed as 'closed' drains – meaning that there are batters on both sides of the drainage ditch, excluding all surface water except for direct rainfall.

Breeches occurred in some sections along the drainage scheme soon after construction and these needed to be repaired. As a result, the batters were built higher in subsequent and repaired drains, to further protect the channel.

Todd has fenced off his drains and planted native vegetation in only some places along it. Over time, self-sown plants including samphire, bluebush and creeping saltbush have also established themselves – stabilising the batter mounds and using more water too.

The drains ran water continuously for the first nine years after installation. Todd noticed a reduction in waterlogging issues almost immediately. "We got the drain put in and it didn't take long at all for the waterlogging to stop. It was amazing how quick it was. It's made a huge difference," said Todd.

There are some piezometers (groundwater monitoring bores) located nearby, and Todd also noticed that the groundwater levels in them stabilised. The water now sits at between 70cm and 120cm below the surface.

Todd credits the drains with saving around 100ha on his property alone and has given him more options in both cropping and pasture. He has also changed his paddock layout to better work with the drain positions – once working paddocks of approximately 40ha each, he now has 65-90ha paddocks. Todd has added an additional 4km of deep drains to his property above and beyond those originally installed as part of the program.

Management and Maintenance

The Fence Road Arterial Drainage Scheme was constructed as a Pilot Drainage Project and a governance document was developed to steer the scheme forward clearly. The document details a range of requirements for longevity of the project, including responsibilities of all stakeholders.

In 2008, a Land Drainage Advisory Committee (LDAC) was established to assist with the management of the Fence Road Drainage Scheme. It was recognised early on that such a large piece of infrastructure, which crossed multiple private and public tenures, needed to have a central coordinating body. It consisted of 6 landholders and 3 Shire of Dumbleyung Councillors and was responsible for inspecting the drains, recommending maintenance schedules and dispute resolution.

The LDAC ceased operating in 2013 and a new Committee reformed in September 2018. This current Committee has the responsibility to liaise between the landholders involved in the Fence Road Pilot Drainage Project and the Shire, and consists of 3 landholders from within the Scheme, two Shire Councillors, the Shire CEO and the Landcare Manager.

The drainage corridors feature an excavated central channel, batters set back from the channel, with a buffer zone of naturally regenerated vegetation, and then fenced off from the paddock.

Each landholder within the scheme pays an annual service charge which reviewed regularly, to cover the costs required to maintain the drain at an operational standard. The 2019/20 annual service charge was $400/km, increasing to this level due to major damage done to sections of the drain in the February 2017 flood. Landholders also pay an annual administration fee of $200 and a fee of $50/km/year for any additional drains they install themselves plus a $50 once off payment to link into the scheme.

This annual service charge is an ongoing contribution to maintenance fund and will vary according to conditions which can affect the maintenance and operation of the drain i.e. unexpected high summer rainfall or flood events.

Impacts

Todd can see that the drains have had a positive impact on his farming operation, but the cost of construction and maintenance of the drains is never far from the surface of the conversation. Todd acknowledges that at $7000/km to construct, the $1.4 million of government financial support received was a critical factor in bringing the whole scheme to life.

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PROPERTY OVERVIEW

***Property**: Todd Gray "Mayfield"*
***Property Size:** 2400 ha*
***Rainfall Average:** 325 mm*
***Enterprise:** Sheep and grain cropping*

Fence Road Arterial Drainage Scheme Key Facts

- *52km of drains*
- *14 landholders*
- *Constructed 2007-2008*
- *$1.4 million cost*
- *Management through an integrated committee*

Monitoring by the Department of Water for the first three years after installation showed that the volumes and salinity of the water released from the drains was consistent with predictions, but the pH was significantly lower, coupled with a high level of iron in the water. There was also found to be less macroinvertebrate diversity in creeklines closer to the discharge points from the drainage scheme.

Dumbleyung Landcare Officer, Claudia Hadlow, has been involved in the Fence Road Arterial Drainage Scheme since its inception, and shares the benefit of her experience. She cautions that despite the success in lowering groundwater, large scale schemes using a contentious issue such as deep drainage and involving many different landholders, is fraught with challenges.

"Despite best intentions and careful planning, the drainage scheme has polarised part of the community. There's been unintended impacts, differing levels of commitment, and as we see ownership of land begin to change hands – as invariably it will – there is uncertainty about how well this scheme will function into the future."

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