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SQUEEZING MORE WATER OUT OF A FARM DAM

When Gippsland beef farmers, Greg and Fiona O'Brien, bought their property in 1996, they had no idea that one day they would be reliant on ground water to run their business. Nor did they realise that they would need to take a series of steps to reduce evaporation and seepage from their dams to secure a more reliable water supply.

"It was the end of a very wet season when we bought the property, and the dams were all full," recalls Greg, who is currently running 200 head of Belgian Blue stud and vealer stock on 112 hectares.

"In fact, our main concern at that time was the quality of the water, rather than the quantity."

Greg and Fiona immediately set about installing troughs in every paddock, and fencing off the dams, to ensure that the stock had clean water and to minimise damage to the dam banks. The reticulation system was set up to gravity feed from the large dam located at the top of the property.

The reticulation system made rotational grazing very simple, but the couple ran into problems when conditions suddenly became dry. The feeder dam became very low, and while there was water in the smaller dams located along the creek, reticulating back up the hill was not feasible.

Then there was relatively little run-off the following winter and spring, and they realised they needed to find ways to capture more water.

Greg and Fiona decided to put in a bore, and to build three small dams in areas they thought would provide good run-off. At the same time, they had a close look at the existing dams to see whether they were holding water as well as they should be. They discovered that yabbies had undermined a wall of the largest dam resulting in large water losses. They were also losing a significant amount of water from every dam through evaporation.

A bore was installed at a cost of around \$12,000, and required a bore construction licence (because it was for stock and domestic purposes, no other permit was required). Information obtained from consultants about bores in the area indicated that most were around 60 metres deep, and that the location would have little influence on the chances of finding water.

They decided for ease of monitoring, proximity to power, and ability to gravity feed to most paddocks, to locate the bore near to the house. The bore ultimately ended up being 68 metres deep.

According to Greg, the bore provides "pretty good water – it's low salinity, not too high in iron, and the cattle can drink it straight."

The pump delivers around 2,500 litres per hour, and uses solar power with a 240 volt battery bank, and a diesel backup. However, the downside of this set-up is that the pump needs to be

operated manually. Greg and Fiona are contemplating switching to an independent solar pump that will operate even if they are away for an extended period.

The bore is now an essential part of Greg and Fiona's operation, particularly in summer.

"We couldn't maintain our stocking rate without it," says Greg. "Last year's run-off was the worst ever – I'd say we used it for 80 per cent of our water over summer."

The dams still play an important role, particularly in the cooler months, and Greg says there's been a real benefit in minimising losses from seepage and evaporation. He had the damaged wall re-built at a cost of around \$2,000, and while there is still some seepage due to soil type, he believes that the water savings have been well worth it.

Greg and Fiona also lined the dam with silage-pit plastic. Unfortunately, they did not have the equipment to cover the liner with a protective cover of dirt; as a result, it was ruined by kangaroos.

"We took the short cut and paid the price," Greg says. "The lesson here is: do it well and do it once!"

To reduce evaporation, Greg and Fiona deepened the two main dams, and ensured the new dams were sufficiently deep to reduce the proportion of surface area exposed to the air.

"The dams are around 10 metres wide and five metres deep, which works well."

Greg and Fiona also like to have a good cover of vegetation around the dams. This helps to reduce evaporation in a number of ways: by lowering the ambient temperature (this decreases the amount of latent heat available to convert the water to a gaseous state); by maintaining humidity (evaporation is highest when the air immediately above the water is dry); and protecting the surface area from wind (wind removes the insulating layer of moist air, replacing it with dry air, which then encourages evaporation).

For more information, contact the Department of Primary Industries (DPI) Customer Service Centre on 136 186 or visit the DPI website on www.dpi.vic.gov.au (insert 'Farm Dams' into keyword search at top of page).

EDITORIAL NOTE: A supporting graphic of a farm dam is available – see Media Contact details below.