Keep it Low

Good effluent management reduces emissions

This fact sheet is part of the Profitable Dairying series - *Good business management reduces greenhouse gas emissions.*

The Australian dairy industry has committed to reducing greenhouse gas emissions intensity (emissions per L milk produced) by 30% by 2020.

Fert$mart is a key component of the Profitable Dairying project, aimed at reducing greenhouse gas emissions intensity and improving the profitability of dairy farmers.

Effluent and manure management accounts for around 20% farm greenhouse emissions.

Greenhouse gases from effluent ponds

Three-quarters of Australian dairy farms store effluent in ponds prior to reuse with typical storage periods ranging from weeks to months.

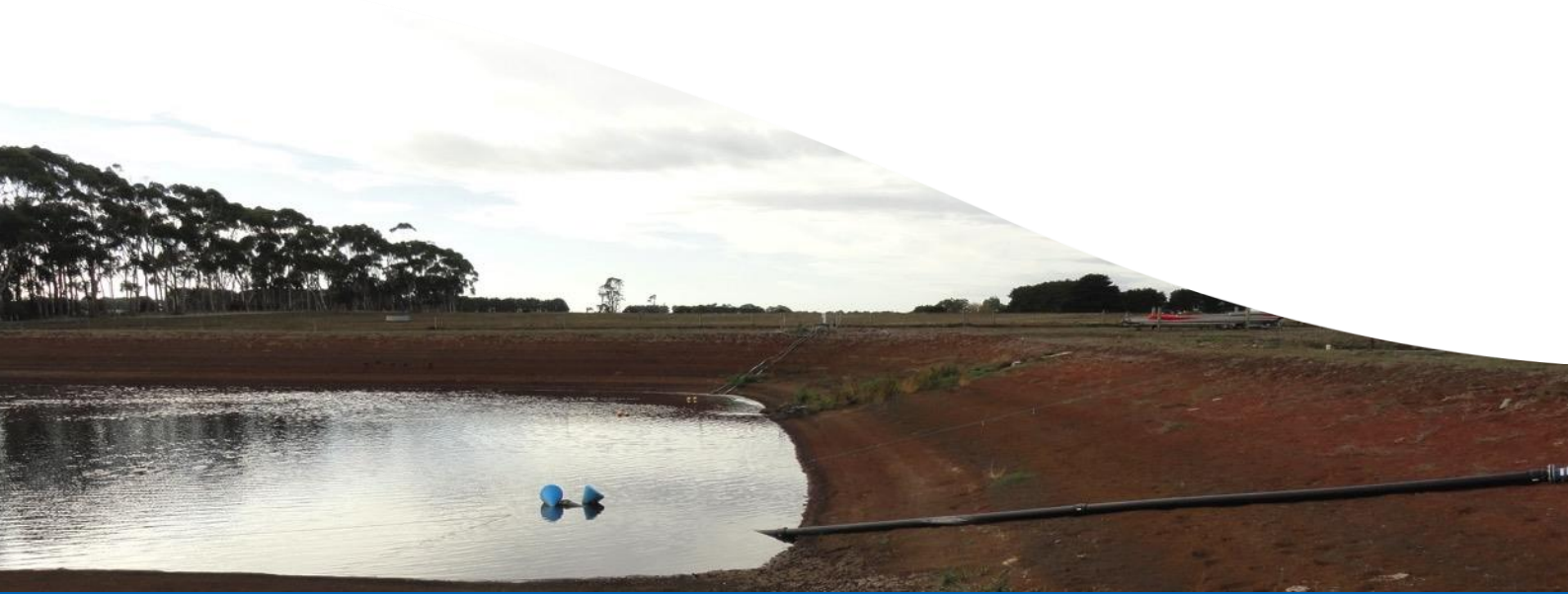
Volatile solids settle out of the effluent forming sludge at the bottom. Those solids often remain in the pond for some years before being removed and spread.

The volatile solids in effluent and sludge decompose under anaerobic (without oxygen) conditions releasing methane and carbon dioxide. The longer the time spent in the pond, the greater is the conversion of those degradable solids into methane.

Methane is responsible for 50-75% of the greenhouse gas emissions from a typical dairy farm. Methane emissions are largely from enteric fermentation in the gut of cows; microbes breaking down carbohydrates, but also from the effluent pond.

Typical 'manure management' practices result in methane generation of over 400 kg CO_2e per cow per annum which represents over 7% of the total GHG estimate for grazing farms. The potential for reducing emissions across all emission sources is being investigated.

Covering effluent ponds and capturing biogas is possible but not currently economically viable for Australian grazing based dairy farms. Click here for Dairy Australia biogas information

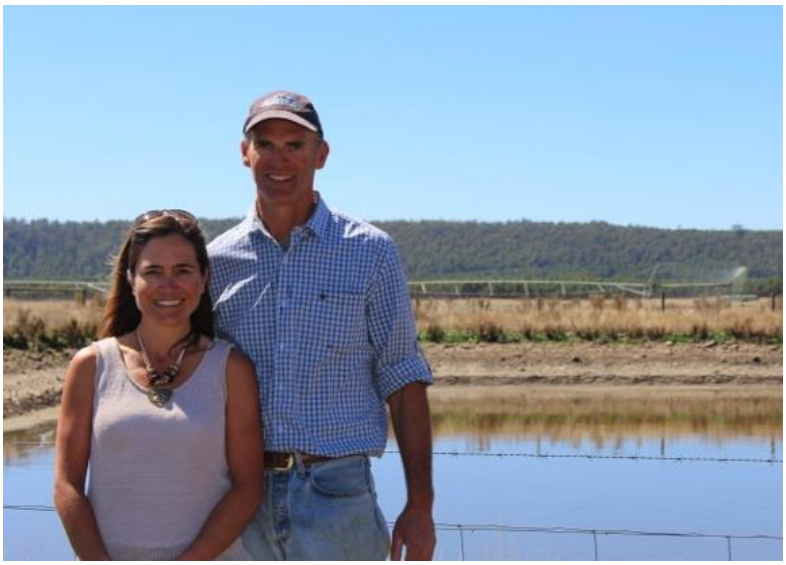


"READY TO GO, KEEP IT LOW"

This simple message for effluent management has multiple benefits. Keep the effluent pond as empty as possible, especially coming into winter, so nutrients go out onto the paddock growing grass and there is maximum storage capacity for winter storage and in event of breakdowns. Volatile organic compounds are not in the system for as long and there is less potential for methane and nitrous oxide greenhouse gas emissions.

"We aim to have our two pond system as empty as possible by the end of autumn. Coming into winter, we want peace of mind that we've got plenty of storage to get through the wetter months. Putting effluent over 100 ha through effluent irrigation (including through two pivots) has meant we've been able to cut back on fertilisers but still maximizing pasture growth"

Brian and Michele Lawrence, Meander, Tas.



De-sludging ponds on a regular basis means less build up of volatile organic compounds in the effluent system. There is less feedstock for the methanogenic bacteria living in effluent systems and less methane production. Anaerobic conditions in effluent ponds also lead to nitrous oxide volatilisation. Maintaining first and second ponds as empty as possible means less nitrous oxide greenhouse gases and more N for pasture growth.

Nutrients left in ponds and piles is a wasted resource

Full effluent ponds that haven't been emptied for years (above left) and wet piles of effluent solids (above right) are a source of greenhouse gas emissions. Ponds should be regularly emptied so the organic compounds are a source of nutrients for pasture, and production of methane and nitrous oxide greenhouse gases is minimised. Manure piles should be spread as soon as dry enough for spreading and leachate from piles contained to minimise risk of runoff.

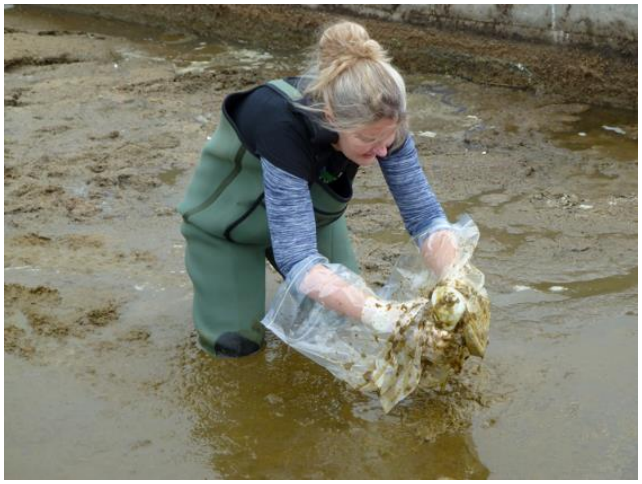
Short term effluent retention research

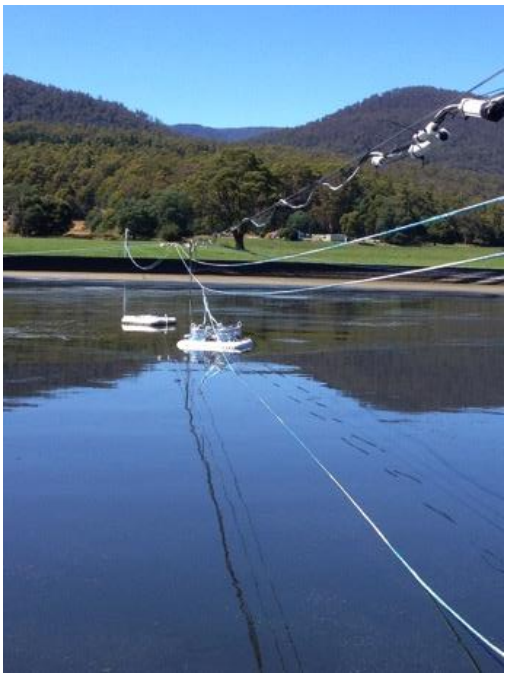
Research is currently being conducted by Tasmanian Institute of Agriculture at Meander, Tasmania to demonstrate a short retention time effluent management strategy. Effluent will be distributed weekly to fortnightly whenever the soil moisture deficit allows. During each distribution event, any settled solids or sludge will be agitated and removed from the tank minimising the residence time for volatile solids.

Greenhouse gas emissions from the surface of the storage tank are being measured via automatic sampling chambers and analysed at Tasmanian Institute of Agriculture's Burnie laboratory.

With reduced time in storage, methane (CH_4) production and nitrogen (N) loss by volatilisation of ammonia are expected to be reduced. The project will provide more data around greenhouse gas emissions from dairy effluent systems and potential strategies for mitigation.

Research in the pork industry has demonstrated over 80% reduction in greenhouse gas emissions with short term effluent retention management. Click here for more information.





Further resources:

Effluent videos and information sheets
Fert$mart effluent information
Effluent and Manure Database (technical resource)
Short retention time research project (above ground storage tank)
Emissions management for dairy farmers

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