EnviromooS

environment SOUTHLAND
Te Taiao Tonga

NEWS AND INFORMATION FOR DAIRY FARMERS FROM ENVIRONMENT SOUTHLAND

Issue 7 April 2010

Working together for a better outcome

Environment Southland has been working collaboratively with the dairy industry on reviewing our approach to farm dairy effluent. Our aim is to have a practical regime based on sound science that addresses environmental effects but doesn't unnecessarily constrain dairy farmers' freedom to operate.

The public notification of updated rules for farm dairy effluent in July will be a significant step for us all. Workshops for dairy farmers will be held in June about the new approach.

This issue of EnviromooS updates you on some scientific research on the application of effluent when soil moisture levels are very high, but still less than the soil water deficit, when the application of very small amounts of effluent in "pulses" is still possible using a low rate irrigation system.

The article also has good advice on what to do if you are in the unfortunate situation of having a full effluent pond and soils are at or above field capacity (the red zone!)

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Inside this issue:

By using pulsed irrigation, low rate irrigation systems such as Larall and K-Line can continue to be used to apply effluent when soil moisture content is approaching field capacity.

What's the story with pulsed irrigation?

Effluent needs to be applied in a way that keeps valuable nutrients in the root zone so they can be taken up by plants, instead of being lost into groundwater or surface waterways.

Scientific research shows that in general, as the level of soil moisture increases (and the soil water deficit decreases), less effluent can be applied without nutrients being lost. This is the case with most soil types in Southland.

On such soil types, low rate irrigation systems such as Larall and K-line can continue to be used to apply effluent when soil moisture levels are starting to increase and high rate systems such as the older style travelling irrigators shouldn't be used because they will lose nutrients out of the root zone. In fact by using pulsed irrigation, low rate irrigation systems can still be used even when the soil moisture content is approaching field capacity.

Environment Southland's new approach to farm dairy effluent being discussed in June is based on this scientific research and matches effluent management practices to different soil/landscape types.

Pulsed irrigation is an important tool for managing effluent when soil moisture levels are very high (see the soil moisture network on www.es.govt.nz under 'farming'). It can also be used when soils are very dry and cracked to avoid losing nutrients to waterways or groundwater.

Photo shows a Larall system being tested for application depth.

What's the correct amount of storage in an effluent system?

Environment Southland's current consent requirements are based on a minimum of 3m^3 of storage per cow for low rate irrigation systems and a minimum of 4.5 m^3 of storage per cow for high rate systems.

Storage requirements within consents are set for soil moisture management and not for the purpose of managing workload during peak periods. If you wish to use effluent storage to manage your workload at busy times, you need to consider having additional storage available above that required by the consent.

Other factors that should be considered include:

- the catchment area; some dairy sheds have additional concreted areas, eg races, feed pads, underpasses, silage bunkers etc that need to be allowed for;
- the length of time cows are on concrete. Additional effluent can be generated if cows are fed supplement at the dairy shed;
- the presence or absence of rainwater diversions for roof water and storm water on concrete;
- seepage from groundwater at underpasses or lower areas at the dairy shed;
- the type of shed and water management at the shed;
- local variation in climatic conditions and the effect that unusually wet years can have on storage requirements and the volume of stormwater that runs off from the catchment area;
- the difference between storage capacity and total capacity. Storage capacity is the volume of water between the 500mm free board and the minimum depth below which no more effluent can be removed. Depending on pond design, there may be up to 800mm of effluent at the bottom of the pond that cannot be pumped out – this does not count as storage.

What's pulsed irrigation?

The term "pulsed irrigation" describes the application of very small amounts of effluent in 'pulses' using a low rate irrigation system such as Larall (pictured at left) or K-Line.

The latest advice from AgResearch recommends that each pulse should be an irrigation period of up to 20 minutes, followed by a spell of at least 40 minutes without effluent irrigation on that area. The pulse cycle can then be repeated up to a maximum application depth of 4mm.

This means that if you have a low rate system with an application rate of 4mm/h and pulsed for 20 minutes on, 40 minutes off as recommended, you could do three pulse cycles over a three hour period.

What if the soil moisture network shows red and my pond is full?

This should only occur in very wet years. If it happens more often it's a sign that there is either insufficient storage or the pond is not being managed correctly.

If the worst does happen and your pond is full when soil moisture levels are at or above field capacity (the red zone on the soil moisture network), contact Environment Southland straight away.

If your farm has areas of well drained soils on flat land, you may be able to continue applying effluent to these areas safely even when soil moisture levels are high.

On other soil types, in emergencies we may allow farmers to apply effluent using pulsed irrigation with a low rate irrigation system when soils are at or above field capacity, provided the application doesn't result in surface runoff or green drainage water in tile/mole drains.

Be aware that if it happened on the same property repeatedly, our staff would investigate storage capacity and pond management.

Effective pond management is critical to ensure effluent is only applied when soil conditions are suitable. Managing pond levels and reducing the amount of water entering the pond are the keys to effective pond management.

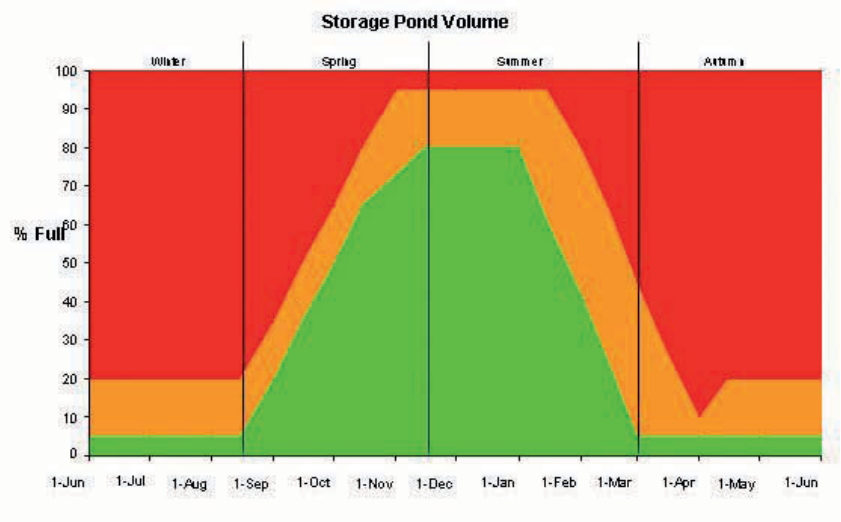
Pond levels through the year

An empty pond will give a buffer during wet or busy periods.

A full pond may leak or cause odour problems and may result in financial loss as you lose control of effluent and the capital investment tied up in the pond.

The diagram at right shows acceptable effluent volumes for different times of the year. In a typical year the volume of effluent stored should be maintained within the green zone. A few wet weeks at any time of year may result in storage levels moving into the orange zone.

If the storage levels are frequently moving into the red zone then this indicates more storage is required.



General targets for management of effluent storage are:

Winter: ideally the pond should be empty

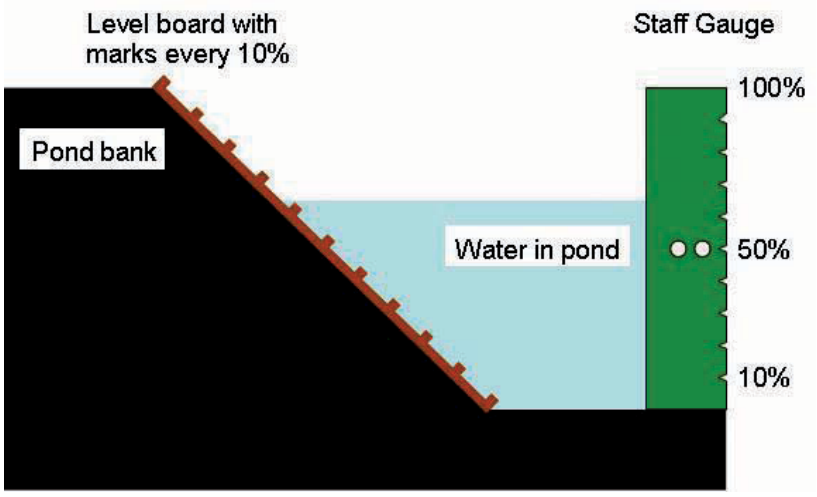
Spring: pond is filling with effluent. Small volumes of effluent can be irrigated as soil water deficits allow

Summer: pond should be emptied

Autumn: ideally the pond should be maintained at a low level through autumn and winter. Some effluent may be stored and carried through the winter.

A storage level graph could be placed on the wall of the dairy shed and a level reading taken every two weeks and recorded on the chart.

The diagram at left shows some ideas for creating level gauges to simplify measuring the water level in the pond.



Hints to reduce water use around the dairy shed

Aim to use less than 50 litres per cow per day at the dairy shed. Modifications such as yard scrapers can reduce water use.

- less waste equals less cost (pumping, storage, irrigating)
- less water reduces the amount of storage required and the "irrigation season" is shorter
- less effluent in the pond equals less environmental risk.

Minimise washdown water

- don't wash down more than necessary
- use high volume, low press washdown to better move solids
- ensure that hoses, troughs and water pipes within the yard area don't leak
- use a scraper to remove solids before hosing down pre-wet the yard before milking. This speeds up the hosing down

High volume, low pressure hoses are excellent for yard washdown.

Low volume, high pressure hoses are poor for yard washdown

Exclude rainwater

- install or repair guttering on the roof of the dairy shed to pipe rainwater to storage tanks or a drain
- use stormwater diversion over the winter (diverting water that runs off the yard to a drain)
- install kerbs to prevent inflow of stormwater from outside to the yard area
- in high rainfall areas, consider roofing the dairy yard to exclude all rainwater

Draft Annual Plan proposes new annual charge on water use consents

Environment Southland proposes to introduce an Annual Research and Monitoring Charge for consented water users.

The proposal is set out in the Council's Draft Annual Plan. It would mean a typical 600-cow dairy farm would pay $100 a year based on a consent to take groundwater and $210 based on a consent to take surface water.

The proposed charge would recover 80% of the cost of the Council's groundwater monitoring and resource investigations, and 40% of the cost of monitoring and investigating the region's surface water, including quantity and quality.

Altogether, Environment Southland will spend $1.72 million on ground and surface water monitoring and investigations this year. Until now, the whole cost of those activities has been funded from the General Rate.

The new proposal would impose a minimum $100 charge on all consents to use water, based on the daily amount that the consent holder is authorised to take, with a cap of $5,000 on groundwater takes and $50,000 on those from surface water.

The charge is calculated at $1 per cubic metre for groundwater takes and $2.50 per cubic metres for surface water takes.

This would raise $885,384 and ensure that those who benefit from the guaranteed and exclusive right to take and use water make a direct contribution towards the cost of its management. Charges will not apply to permitted activities, including reasonable individual needs for domestic and stock drinking water.

General rates paid by all ratepayers will decrease by $885,384 if the proposal is confirmed. This reduction will offset the research and monitoring charge.

Typical annual charges would be:

- 600 cow dairy farm: $100 for groundwater or $210 for surface water
- Large irrigator: $5000 for groundwater or $50,000 for surface water
- Invercargill City Council for the city's water supply: $50,000
- Southland District Council for the Winton water supply: $1500
- Meridian Energy: $50,000
- Alliance Lorneville: $50,000
- Princhester rural water supply: $500
- Kaiwera stockwater supply: $500

You're invited to make a submission

A summary of the Draft Annual Plan is on our website www.es.govt.nz and was delivered to each home in the region on 15-16 April, in The Southland Express and The Ensign. You can read the full Draft Annual Plan on www.es.govt.nz, collect a copy from Environment Southland's office or phone 0800 76 88 45 and we will post you a copy.

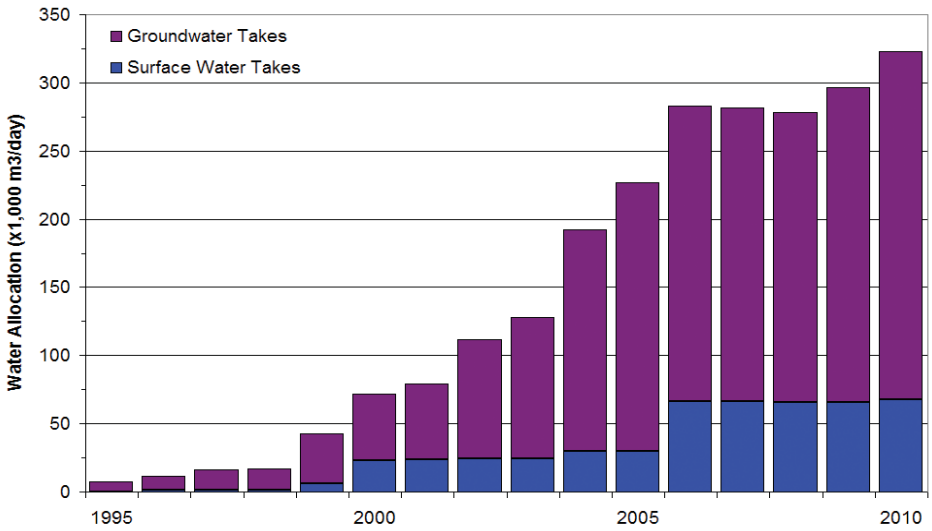
You can make a submission on any part of the Draft Annual Plan. We must receive your submission by 4.30pm on Monday 3 May 2010.

Dairy differential rate to reduce

If the Draft Annual Plan is adopted as proposed, there will be a reduction of $3000 in the amount collected from the dairy differential rate.

This is because there has been a drop in the costs of the projects part-funded by the dairy differential rate.

Water allocation in the Mataura catchment in the last 15 years



Demand for water in the Mataura catchment has increased 40-fold over the past 15 years. Most of the growth has occurred as a result of development of pasture irrigation in Northern Southland since 2000. Irrigation in Southland has expanded in response to general intensification of agricultural production (mostly dairying) and a changing climate. Today, 80% of water allocated in the Mataura catchment is from groundwater with 61% of water used for irrigation.

Are you on our list?

This newsletter is produced by Environment Southland, Private Bag 90116 Invercargill. It is written with dairy farmers in mind.

We send a copy to all dairy consent holders. If you would like us to add your sharemilkers, farm managers or anyone else to the mailing list, phone 0800 76 88 45 or e-mail michele.poole@es.govt.nz