

## Improving water use efficiency at the dairy

The Department of Water, Land & Biodiversity Conservation (DWLBC) is currently updating South Australian water licensing from area based to volumetric. Dairy farmers in the South East were granted an industrial volumetric licence with a condition endorsed. The condition required them to install a water meter to measure their water use at the dairy. Some farms may have installed the meter at the dairy and this will allow them to accurately assess their freshwater consumption. However, some meters installed at the bore will also be recording stock consumption.

Rural Solutions SA consultant Michael O'Keefe has visited over 130 dairy farms in the Southeast and Mt Lofty Ranges regions in the past 18 months. As part of the on-farm visits Michael asked each farm if they knew how much freshwater their dairy used on a daily or annual basis. Usage included the plate cooler system, machine rinse, platform and yard wash down. He reported that approximately eighty-five percent of the farms did not know how much water they consumed. Most farms provided estimations, however once Michael had assisted the farms in calculating the contribution from the individual usage components many of the farms were surprised. Many had significantly understated their usage.

To prevent exceeding your farms industrial water allocation for the dairy, and in light of the current water shortages there are several conservation measures that farms can implement or install to reduce their freshwater usage. They include:

- ensuring the plate cooler flow rate is operating at 2.5 – 3.0 litres of freshwater to every litre of milk. This ratio will ensure adequate pre-chilling whilst conserving freshwater usage.
- divert stormwater falling on the dairy shed roof into tanks. This can be used for dairy wash down, or supplement the hot water system. Avoid diverting the stormwater into the effluent system.
- reducing cup and platform spray flow rates to prevent manure and feed dust from sticking to the milking machines and platform. Then during the last rotation the flow rate can be increased to allow the sprays to wash the fore mentioned items. Reducing the cup spray flow rate from 30 to 10 litres per minute over six hours of milking is equivalent to reducing usage from 10,800 to 3,600 litres per day. Annually this would conserve 2,600,000 litres of freshwater.
- installing a solenoid on the platform to govern the platform and cup sprays, so they only operate when the platform is rotating.
- collecting the platform wash down water and machine rinse, then pumping it into the yard wash tanks. This could supplement freshwater, or recycled effluent from a pond or mechanical solids separation device.
- matching the floodwash volume to the yard dimensions and slope. If the dairy yard is floodwashed using freshwater (even if recycled from the plate cooler) calculate the minimum required volume to effectively wash the yard. Four – five thousand gallon tanks (17,500 – 22,000 litres of effective volume) are the most common tank installed, however some farms are using more water than is required. Michael's visits showed that approximately seventy – eighty percent of the water consumed at the dairy on a daily basis was used for yard washing.
- Recycling effluent from a pond system to the yard wash tanks. If the effluent management system achieves effective solids separation, effluent from a single or multiple pond system can be recycled to the yard wash tank for yard hosing, hydrant or floodwashing. This option also allows the possibility of recycling the plate cooler water in a closed loop system ie. refrigerated or evaporative cooling tower. Many farms currently transfer the used plate cooler water to their yard wash tanks, therefore there is a huge potential to reduce freshwater usage through a closed loop pre-chilling system. A 500 cow herd producing 12,000 litres of milk per day (plate cooler : freshwater ratio of 2.5 : 1.0) could save approximately 10,500,000 litres of freshwater annually.
- Only washing the dairy yard once per day if freshwater is used (subject to hygiene).

For further information regarding water and effluent re-use initiatives, or assistance with dairy effluent management contact Michael O'Keefe from Rural Solutions SA. The Statewide Dairy Effluent project called '*Resource – Not Waste*' is currently providing free technical advice and design services to South Australian dairy farms. Ph 08 8842 6222