The challenge of managing farm dairy effluent in the Manawatu-Wanganui Region.

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Farm dairy effluent has contributed to water quality issues in the Manawatu-Wanganui Region for a long period of time, during which methods of disposal have changed. Initially the contribution of farm dairy effluent to water quality issues was mostly point-sourced via a two-pond treatment system prior to a direct discharge to water. The effects of these discharges on water quality were notable, particularly at low flows when the river systems were already stressed.

Horizons Regional Council are the regulatory authority responsible for the management of natural resources (including managing water quality) within the Manawatu-Wanganui Region. The Manawatu-Wanganui region is a diverse region covering 2.2 million hectares of the central to lower North Island. There are four major and a number of smaller catchments within the Region. Landuse in the Region is predominantly pastoral agriculture with 6.7% (149,230 ha) in dairy farming spread over 937 farms.

In 1993 of all discharges of farm dairy effluent in the Manawatu catchment, 258 were direct discharges to water, and were estimated to be contributing 69 tonnes of soluble inorganic nitrogen (total oxidised nitrogen + ammoniacal nitrogen) per year and 12 tonnes of dissolved reactive phosphorus. By 1997 this had increased to 334 discharges to water and approximately 103.9 tonnes of soluble inorganic nitrogen (total oxidised nitrogen + ammoniacal nitrogen) per year, and 18.9 tonnes of dissolved reactive phosphorus.

Regulatory requirements introduced via a new Regional Plan in the Manawatu catchment in 1997, followed by similar provisions in the Land and Water Regional Plan in 2003, have lead to a shift from the primary consenting method for farm dairy effluent disposal of direct discharge to water to methods requiring discharge to land. This was implemented by issuing a short-term discharge to water consent allowing time for land based disposal infrastructure to be constructed for a land only irrigation system. Direct discharges to water in the Region have been reduced from 439 in 1997 to 2 in 2011. This transition is estimated to have reduced point-sourced SIN loads by approximately 10% and DRP loads by approximately 25% in some sub-catchments. Over a similar period the number of cows milked has increased by 16.7%, the effective land area for dairying has increased by 9.1% and the amount of milk solids produced increased by 28% (Neild and Rhodes, 2009).

The transition from discharges to water to discharges to land has placed greater demands on farmers in terms of financial investment, time to manage the system and required the establishment of a new set of skills. The transition to land based discharges was aimed to manage farm dairy effluent to get the best level of treatment i.e. not just shifting the problem from being a point-sourced to a diffuse sourced issue. Research has shown that one poorly timed effluent application can put as much phosphorus into waterways as a well managed operation would over an entire year (Figure 1; Houlbrooke, 2009).

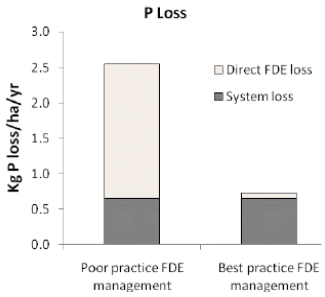

Figure 1: Phosphorous loss (P loss) from poorly managed and best practice Farm dairy effluent (FDE) management. Source Houlbrooke 2009

To address the issue of farm dairy effluent management Horizons Regional Council set about clarifying what best practice management entailed and to communicate this to the farming sector. In collaboration with AgResearch, Horizons produced a report that pulled together information on best practice for effluent management in the region (Houlbrooke, 2008). A key component was the production of decision trees to set out how to achieve best practice in different circumstances. This report concluded that, for most situations, best practice could be achieved by requiring to storage of effluent at some times, then applying the stored effluent to land at times when the nutrients and water in the effluent could be used for plant growth. This practice is referred to as deferred irrigation.

In order to effectively practice deferred irrigation, a customized approach was required to develop recommendations for storage. Horizons developed the Pond Size Calculatorin collaboration with Massey University. The calculator uses farm specific information such as daily climate data, soil type, herd size, milking practices, areas of milking facilities, type of irrigators, irrigation depths, stormwater management and a range of other factors to calculate pond storage requirements. This calculator is now in use by seven regional councils.

Alongside the non-regulatory initiatives Horizons are required to check compliance with consent conditions and address persistent non-compliance. In the 2008 – 2009 dairy season, 628 dairy shed consents were assessed across the region and there were 90 significant non-compliances and 57 technical non-compliances.

In the 2010 – 2011 dairy season Horizons have increased the compliance monitoring effort to check all consents, every year. This approach organizes the farm visits by water management zone with 24 hours notice that an inspection will take place. Horizons have processes in place for assessing non-compliance and significant non-compliance that are consistent with other regional councils and systematic follow up procedures for non-compliant consents. Of the 937 current dairy farms 599 have been visited so far this season and there has been 93 significant non-compliances and 23 technical non-compliances.

Horizons is committed to continuing to work with farmers and the dairy industry to achieve 100% compliance with consent conditions and implementation of best management practices on all farms as a part of a broader programme to improve water quality in the region.

References

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