South East Dairy Effluent Guidelines

Irrigation Management Plans

Guideline No 12

If you intend to irrigate dairy effluent during the time of the year when average rainfall exceeds average evaporation, it is advisable that you develop an Irrigation Management Plan.

An Irrigation Management Plan aims to prevent nutrients, particularly Nitrogen, from leaching past the root zone of crops and pastures and entering the groundwater system.

You may also wish to consider monitoring effluent impacts on groundwater, surface water and soil so as to determine the sustainability of your irrigation effluent practice.

An Irrigation Management Plan does not need to be developed if you will be storing your effluent during that part of the year when average rainfall exceeds average evaporation.

If, however, you intend to spread effluent during that period you should check the feasibility by developing an Irrigation Management Plan (IMP). The IMP should describe how the effluent will be spread and demonstrate that the nutrients applied in the effluent will be taken up by pastures or crops.

The objective of the Irrigation Management Plan is to prevent nutrients, particularly nitrogen, from leaching below the root zone of the pasture or crops and being carried down into groundwater resources.

The Irrigation Management Plan should be developed by a person skilled in irrigation and plant nutrition and provide sufficient details to enable other persons to verify the sustainable operation of the irrigation system. See Guideline 23 for possible contacts to develop an IMP.

What information should be included in an Irrigation Management Plan?

The dairy effluent Irrigation Management Plan should include sufficient information to demonstrate that the pasture or crop is capable of assimilating the nutrients applied, particularly nitrogen.

The minimum level of information to include in a dairy effluent Irrigation Management Plan is:-

- Volume and nutrient composition of the dairy shed effluent
- Depth and quality of groundwater beneath the irrigation area
- How the effluent will be applied
- The water balance for the irrigation area
- The hydraulic loading rate of the irrigation system
- The amount of nutrients which will be applied at each irrigation
- Approximate frequency of irrigations
- Evapotranspiration rates of the crop or pasture
- Average daily growth rates for the crops or pastures for each month of the year
- Types of crop or pasture and their ultimate use
- The nutrient balance for the irrigation area
- A sampling and monitoring program of soils, vegetation and groundwater to monitor the fate of the nutrients applied during irrigation.

DairySA · National Foods · Dairy Farmers · Landcare South Australia · Warrnambool Cheese & Butter · SENRCC South East Natural Resource Consultative Committee · Government of South Australia Primary Industries and Resources SA · Rural Solutions SA · Australian Government Department of Agriculture, Fisheries and Forestry · EPA South Australia · South East Catchment Water Management Board

Minimum Monitoring Requirements

Sampling and monitoring will be important considerations in verifying the sustainability of the irrigation system.

Groundwater

A typical groundwater monitoring program could include:

- recording groundwater levels and collecting samples from monitoring bores installed at suitable depths and locations to provide representative water level and water quality data for all aquifers likely to be affected
- take samples at least twice yearly and have them analysed at least for nitrate and salinity. See Guideline 23 for laboratories which can analyse groundwater samples.

Surface water

Take representative samples of runoff from the irrigation area when runoff may impact on surface waters of high environmental value or those used for potable water. Take samples upstream and downstream of the affected area to monitor the impact of the irrigation. Frequency of sampling should be at least twice during the period when average rainfall exceeds evaporation.

Analyse surface water for oxidised nitrogen and total Kjeldahl nitrogen to give an indication of the runoff of effluent.

Soil

The maintenance of soil quality is essential for long-term sustainability of irrigation schemes. The IMP should provide for soil sampling and analysis on a regular basis to ensure that no harm is being done to the soil structure and chemistry. Recommended parameters, at a minimum frequency of every three years, for soil sampling are:

- Conductivity
- pH
- Phosphorous
- Nitrogen (total)