



FACTSHEET

Science-based advice for **Using farm dairy effluent on free-draining soils**

Science-based advice

On shallow, stony free-draining soils, current regulations and good practice for dairy farms may not mitigate phosphorus (P) losses from farm dairy effluent (FDE) applications.

To minimise or avoid P losses on freely draining, shallow and stony Eyre soils under irrigation:

- Apply less P fertiliser, particularly in a plant available, soluble form.
- Avoid application of P-rich FDE.

Minimising drainage can help reduce the movement of soluble, plant available P. This can be achieved by:

- only irrigating to meet plant moisture requirements;
- using precision application to apply irrigation water to the extent of the soil's available water holding capacity;
- varying the depth of irrigation on a daily basis; and
- adjusting applications according to weather forecasts.

Questions and answers

How was this advice arrived at?

This advice is based on analysis of P in long-term records of leachate and groundwater samples from the Lincoln University Dairy Farm in Canterbury. A shallow stony Eyre silt loam and a deep Templeton soil loam, representative of those used for intensive irrigated dairying in Canterbury, were studied. Despite regulations, industry good practice and guidelines being followed, there were still P losses on the free-draining shallow Eyre soil.

What measures were used to mitigate P loss from FDE application on the farm where P loss was measured?

Phosphorus loss was measured at the Lincoln University Dairy Farm, where:

- FDE was not allowed to pond on soil surface.
- The industry Code of Practice to minimise leaching of FDE was followed.
- Phosphorus was applied to match optimal Olsen P for pasture growth.
- Irrigation depths were varied daily according to soil types and weather forecasts.

Why does this matter?

Additional measures, on top of regulations and industry good practice and guidelines, may be needed to minimise P losses from FDE applied to free-draining soils.

When FDE is applied to soils prone to leaching, P can leach into groundwater or artificial drainage networks and can potentially impact surface waterways. Phosphorus losses are already regulated in many regions, and by 2026 are likely to be regulated across New Zealand.


strengthening good practice, guidelines, and regulations for using FDE on stony free-draining soils with low capacity to retain P (low anion storage capacity). Soils of this type are common in the Canterbury region.

Who's this factsheet for?

This factsheet is for dairy farmers, including those interested in front-footing P loss regulations, and for industry bodies and regional authorities looking at

What's this advice based on?

The information below is sourced from an Our Land and Water research paper:

 *The efficacy of good practice to prevent long-term leaching losses of phosphorus from an irrigated dairy farm*

 doi: [10.1016/j.agee.2018.12.007](https://doi.org/10.1016/j.agee.2018.12.007)



Image: Paul Sutherland Photography