

# PROGRESS WITH DEVELOPING NEW FARM SYSTEMS FOR THE LAKE TAUPO CATCHMENT

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Environment Waikato has recently released a proposed variation to the Waikato Regional Plan for managing land use in the Lake Taupo catchment. This plan aims to reduce nitrogen (N) losses from pastoral and urban land in order to protect lake water quality. Pastoral farmers need new management options in order to achieve reductions in N leaching and minimise the costs that N leaching restrictions will place on future farm development.

Based on our understanding of N cycling, the options being tested in this programme aim to remove or reduce the number of urine patches being deposited to the soil, particularly in the high-risk seasons. These options include field studies into a shift to growing forages and changing winter management and modelling studies that examined the use of altered stocking regime, nitrification inhibitors, wintering-off and integration of forestry with intensification of pastoral farming

Field trial results showed that highly fertilised, annual, cut & carry cropping systems can contribute very high nitrate losses to ground water on free-draining pumice soils in a high rainfall environment. Losses from perennial crops lucerne and pasture are substantially less due to their lower requirement for fertiliser N. De-stocking cattle over winter greatly reduced annual nitrate leaching losses, although losses were higher in a season with substantial summer drainage unusually high February rainfall.

Modeling exercises showed potential to improve profitability under N leaching restrictions through

- Integration of forestry into pastoral farming. Using the annuity approach to assist with farm cashflow might overcome some of the feasibility issues. Intensification of land use on the remaining pasture land may erode the N leaching benefits of forestry unless this can be done without increasing N output.
- Increasing sheep:cattle ratio and sheep performance. The current high returns from sheep relative to cattle have a large impact on this option.
- Use of nitrification inhibitors. This policy was effective on dairy farms, but not cost-effective as a blanket approach on sheep and beef farms under the assumptions used.
- Wintering-off offered options for existing dairy farmers to reduce N leaching while maintaining profitability.

Comparison between the most efficient dairy and sheep:beef systems suggest that the current dairy options are not attractive conversion options in the Lake Taupo context