UNDERSTANDING THE IMPACTS OF

SHEEP WINTER GRAZING

A Research Overview

This three year research project sought to understand the significance of contaminant losses and the effectiveness of good management practices for sheep winter grazing to enable farmers to make evidence-based land management decisions.

Winter grazing is known to make a significant contribution to total losses of contaminants transported from dairy farms to water. However, very little information is available that documents losses when sheep are used to graze these crops.

THE RESEARCH

The field site was located on a property in Waitahuna, Otago. Two catchments on the property were selected, critical source areas were identified and in-field measuring equipment was installed. Brassica crops were planted and samples captured over each winter/spring period.

KEY RESEARCH OBJECTIVES

- Benchmark losses of phosphorus, sediment, and *E. coli* in overland flow from winter forage crops grazed by sheep.
- Assess the full impacts of leaving critical source areas in grass and ungrazed versus sowing these areas in crop and strategically grazing.

What are the contaminants?	What is good management practice (GMP)?	What is a critical source area (CSA)?
Phosphorous Sediment *E. coli*	On-farm practices to manage farm resources while minimising environmental risk eg: • Grass CSA protection • Grazing direction • Back fencing • Reticulated water	Catchment areas at high risk for generating surface runoff and transporting pollutants (e.g. high soil moisture zones, steep slopes, farm tracks and lanes).

RESEARCH OVERVIEW

The field monitoring began in May 2020 and concluded in December 2022. Surface water samples were taken during each runoff event and analysed. The management treatments for each catchment are detailed in the table below:

	Crop	Catchment A	Catchment B
Year 1 (winter 2020)	Swede	Standard practice (control): CSA sown in crop	Standard practice (control): CSA sown in crop
Year 2 (winter 2021)	Kale	CSA sown in grass	CSA sown in crop
Year 3 (winter 2022)	Kale	CSA sown in crop	CSA sown in grass

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FINDINGS

Critical source areas of each research catchment in June 2021 showing catchment A remaining in grass and catchment B being grazed as conditions allowed.

1. Grazing and treading pressures on the soil were low, allowing most of the rainfall to infiltrate.
2. Contaminant losses reduced considerably compared to standard grazing practice, with phosphorus, sediment and *E.coli* reductions of approximately 50%.
3. These combined effects meant that contaminant losses in surface runoff were low relative to those measured at other (cattle-grazed) sites.

Samples collected after a rain event in July 2021 show the clarity of surface water runoff when the CSA was left in grass and ungrazed (left) versus when the CSA was cropped and grazed (right), demonstrating the benefit of retaining CSAs in grass. These visual clarity observations were confirmed with laboratory analysis.

For further information:

Take Home Message:

Buffers provided by CSAs and un-grazed crop reduce the potential impacts of intensive winter grazing activities on water quality.

ACKNOWLEDGEMENTS

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