Leading the way
in nitrogen reduction

How Nigel Harwood is reducing nitrogen losses while maintaining a productive dairy system.

Farming above the Tākaka Marble Aquifer comes with a responsibility to protect New Zealand's largest cold-water springs, Te Waikoropupū. Nigel Harwood and his family have taken a proactive approach for many years, investing in practical on-farm improvements and working with Farmers Across the Marble Aquifer catchment group (FAMA) to reduce nitrogen losses while maintaining a productive and profitable dairy system.



Farm snapshot

Location:

Tākaka Marble Aquifer, Golden Bay, South Island

Total farm area in aquifer recharge zone:

506 hectares

Herd size:

885 crossbreed cows

Dairy operation land size:

319 hectares, with an additional 187 hectares of support land for youngstock grazing and supplementary feed

The Harwood farm also integrates sheep, beef, deer and forestry alongside renewable energy.

Key results

Since the monitored base year in 2016/17, the Harwoods have achieved:

13%

Reduction in modelled nitrogen leaching*

63 kg N/ha → 55 kg N/ha

*Calculated using Overseer modelling - a nutrient management tool used to estimate nutrient use, transfers and losses within a farm system.

14%

Increase in milk production, while maintaining similar cow numbers

337,000 kg MS → 386,000 kg MS

25%

Potential total reduction in nitrate leaching*

***if planned improvements are implemented**

17.4%

Projected reduction in nitrogen surplus**

Already reduced from 132 kg N/ha in the base period to 126 kg N/ha in 2024/25, with a projected reduction to 109 kg N/ha following planned effluent system improvements.

**Calculated using the DairyNZ nitrogen surplus method on the milking platform only. Does not include replacement stock grazed on support land.

Strategies driving nitrogen reductions

ONE | Targeting high-risk areas with soil mapping

Completed high-resolution soil mapping through Landscape DNA and Land and Water Science, using funding through Fonterra and involvement with FAMA

Identified areas most vulnerable to nitrate leaching or run-off risk, enabling tailored management strategies for each area

Managed each block for maximum productivity, while minimising environmental impact

TWO | Improving nutrient and effluent management

Regular soil testing to guide fertiliser application

No fertiliser applied to effluent blocks

Expansion of effluent application area underway to improve nutrient distribution and utilisation

THREE | Adjusting feed to reduce nitrogen losses

Incorporating low-protein feed supplements such as barley and fodder beet to reduce surplus nitrogen in the herd's diet

Fodder beet is harvested and fed out rather than grazed in situ to support reduced dietary nitrogen intake while maintaining energy supply

FOUR | Investing in waterway and wetland protection

Removed an old tile drainage system that was ineffective at reducing pugging. Replaced with a shallow 1.5-metre open drain system to capture and remove surplus water

Drains planted with grasses, ferns and carex to trap sediment and nutrients

Leaky weirs installed to slow water movement and support wetland formation

Learn more

To read the full Harwood family story and learn how FAMA supports farmers across the Marble Aquifer, visit: fama.org.nz