DairyNZ

Reducing your environmental footprint

Evidence-based strategies to optimise your farm system, while maintaining productivity and profitability.

DairyNZ

For more information visit **dairynz.co.nz**

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Introduction

Reducing your environmental footprint isn't about isolated practices, it's about how your whole farm system works together. This guide takes a farm systems approach, examining how decisions around land use, stock management, feed, fertiliser, and infrastructure interact to influence your environmental impact. Instead of prescribing a one-size-fits-all solution, we'll help you uncover opportunities in your farm system to improve efficiency, reduce losses, and enhance environmental performance - while maintaining or improving profitability.

The most effective approach for reducing your environmental footprint on-farm combines multiple tactics tailored to your farm system and goals.

Start small, scale up	Begin with low-cost, high-impact practices. Build momentum with early wins before investing in larger changes.
Know your data – monitor and measure	Track your progress with baseline measurements. Use soil tests, fertiliser records, nutrient assessments, and production data to quantify improvements and guide decisions.
Focus on profitability	Prioritise practices that reduce costs while focusing on efficient use of nutrients.
Leverage support	Take advantage of incentives, technical assistance programs, and cost-share opportunities to offset implementation costs.
Continuous improvement	Keep up with the latest research to look for further opportunities to refine your farm system. The benefits often compound over time, driven by improvements in soil health, animal wellbeing, and overall farm efficiency.

Key farm systems actions to reduce your environment footprint are:

Increase more homegrown feed eaten per hectare, from either growing more, improving feed quality, or utilising more of what is grown. Use **imported feed to boost overall farm production** – rather than cause substitution, or add complexity, waste and cost. Doing this will not only improve profitability but also reduce your environmental footprint by increasing on-farm efficiency.

Focus on optimising cow performance through consistent gains in reproduction, calving patterns, genetics, and herd structure – while meeting body condition score (BCS) targets and managing cow health. This approach will boost productivity and likely lower emissions intensity.

Farm system actions and impacts

Key

- Positive impact
- Indeterminant impact
- Likely negative impact

Icons


Profitability


Water quality


Emissions intensity

Total emissions

Farm systems actions that can help reduce your environmental footprint while maintaining productivity and profitability are:

→ Use fertiliser effectively to maintain optimum ranges to drive homegrown feed. Monitor nutrient loss through Overseer or nitrogen risk reporting. See **overseer.org.nz**

→ Reduce your scope 1 and 2 farm emissions, for example: decrease electricity and water use where possible

> Scope 1 emissions occur directly from sources owned or controlled by the farm, scope 2 emissions are from emissions associated with services and products brought onto the farm and used, e.g. electricity.

→ Optimise the genetic potential of each animal through milk production and reproductive performance

→
- Optimise how you use supplementary feed
- Implement a management strategy to prevent soil damage

- Make the most of harvested pasture
- Increase pasture harvested, milk production, reproduction performance and farm system resilience
- Maximise pasture and crop grown
- Improve feed quality

Design your farm system to deliver strong animal wellbeing outcomes

Increase total feed eaten

A focus on profit, people, and animals, not just environmental outcomes

The farm system tactics outlined above offer a strategic framework for optimising your farm system to reduce environmental impact while maintaining profitability. However, successful implementation depends on getting the basics right across the farm system.

Practical farm system actions

The following sections provide practical actions that directly support your chosen farm system approach, whether you're optimising stocking rates, improving feed conversion efficiency, or adapting to seasonal challenges. These management practices work together to form the foundation for sustainable farming systems.

Environmental improvements and operational efficiency are not competing priorities – they're complementary outcomes of well-managed farming systems.

Farm business management and operations

Well-managed business operations reduce waste, improve efficiency, and create the foundation for profitable environmental improvements.

Actions to strengthen the farm business to help reduce your footprint:

- ◯ Set a clear vision and goals for your farm business to guide environmental decision-making
- ◯ Establish and review financial and physical targets that align profitability with sustainability
- ◯ Train staff in best practices to ensure consistent implementation across all farm systems
- ◯ Maximise the consented effluent area and if possible, gain consent for application to areas where silage is cut
- ◯ Align staffing capacity with seasonal demands to maintain operational efficiency
- ◯ Test conserved feeds. Having scales on wagons will minimise under-and over-feeding
- ◯ Create a positive work environment that prevents burnout and maintains performance standards
- ◯ Maintain infrastructure to avoid wastage and unnecessary costs
- ◯ Assess milking, fertiliser and supplement systems for optimal efficiency
- ◯ Explore funding initiatives for farm improvements that reduce environmental impact

Read more at **dairynz.co.nz/business**

Nutrient management

Effective nutrient management is the foundation of environmentally responsible farming that maintains productivity and profitability. The key is applying the right nutrients, in the right amounts, at the right time and place – maximising utilisation and minimising environmental losses.

Actions to strengthen the farm business to help reduce your footprint:

- ◯ Develop an annual nutrient budget using a certified nutrient management advisor
- ◯ Test and adjust soil pH first – this unlocks availability of other nutrients
- ◯ Create a winter management plan to prevent soil damage and runoff
- ◯ Balance animal nutrition with fertiliser decisions
- ◯ Develop a dedicated effluent management plan to ensure effluent is collected, stored, and applied to land responsibly while optimising nutrient uptake

Read more at **dairynz.co.nz/nutrients**

Soil and fertiliser management

Efficient fertiliser and feed management improves pasture and crop growth while minimising nutrient losses to waterways. Implementing actions that reduce nitrogen loss directly lowers total biological greenhouse gas emissions. It also improves efficiency by either reducing total feed consumption or increasing production with the same inputs.

Actions to strengthen the farm business to help reduce your footprint:

- ◯ Undertake regular soil testing to maintain correct fertility levels
- ◯ Monitor soil phosphorus (Olsen P), phosphorus and sulphur levels within optimal ranges for your soil type and crops
- ◯ Monitor soil potassium (K) levels and apply strategically to support pasture production and animal health
- ◯ Apply sulphur fertiliser to support spring pasture growth on sulphur deficient soils or where clover content is important
- ◯ Consider urease-coated fertilisers to improve nitrogen efficiency
- ◯ Apply potassium from October onwards to support clover growth
- ◯ Limit bare soil exposure to prevent soil carbon loss
- ◯ Evaluate minimum tillage options to balance soil health with operational needs
- ◯ Review crop selection to match your soil and climate conditions
- ◯ Store fertiliser in contained systems to minimise environmental losses
- ◯ Calibrate and maintain spreading equipment for accurate application rates

Nitrogen Fertiliser management

Nitrogen fertiliser is a tool for boosting pasture growth, but its environmental impact depends entirely on how strategically it's used. Efficient nitrogen management means applying the right amount, in the right form, at the right time- maximising plant uptake while minimising losses to air and water. Smart nitrogen use supports both pasture performance and environmental outcomes.

Actions to strengthen the farm business to help reduce your footprint:

- ○ Use nitrogen risk assessment tools (like Overseer or farm-specific nutrient budgets) to understand your current nitrogen use and loss risk
- ○ Track total nitrogen applied across the farm to identify opportunities for more targeted use
- ○ Use pasture walks and feed wedge data to apply nitrogen where it will have the greatest effect on pasture growth and dry matter production
- ○ Select the right nitrogen form and rate for your conditions (urea, protected products, split applications)
- ○ Avoid applying nitrogen before heavy rainfall, on waterlogged soils, and in water deficit situations to minimise losses
- ○ Consider protected or slow-release nitrogen products in high-risk areas or seasons
- ○ Review total nitrogen inputs including fertiliser, supplements, and effluent to understand your whole-system nitrogen budget and the effect on purchased nitrogen surplus

Read more at **dairynz.co.nz/nitrogen-use**

Pasture management

Strategic pasture management boosts growth and quality while reducing environmental impact. Timely grazing rotation, good residual management, and the right species mix work together to optimise nutrient cycling and cut nitrogen losses to the environment. Aim to increase homegrown feed eaten per hectare - by growing more, improving feed quality, or using more of what you grow. Use imported feed to boost overall farm production, not to cause substitution, or add complexity, waste and cost.

Actions to strengthen the farm business to help reduce your footprint:

- ◯ Match rotation length to leaf emergence for maximum growth
- ◯ Use feed wedge data to make proactive grazing decisions
- ◯ Apply spring rotation planner to maximise pre and post balance date pasture growth
- ◯ Use feed budgets to determine targeted nitrogen use and impact on feed demand from cropping and new pasture
- ◯ Achieve target residuals and pre-grazing pasture covers for maximum quality and utilisation
- ◯ Maintain average pasture cover targets and rotation lengths throughout the season
- ◯ Incorporate plantain and clover in pasture swards to reduce nitrogen surplus and losses

Read more at **dairynz.co.nz/feed-management**

Strategic supplement use

Strategic supplementation boosts both immediate and deferred milksolids response per kilogram of dry matter fed, improving financial returns and lowering emissions intensity. The key is selecting supplements that provide limiting nutrients efficiently while minimising embedded emissions.

Actions to strengthen the farm business to help reduce your footprint:

- ◯ Use supplements for immediate economic effect and deferred milk solids responses
- ◯ Use our FeedChecker and Supplement Price Calculator tool to plan supplement use effectively. Find the tools at **dairynz.co.nz/feed-checker** and **dairynz.co.nz/supplementcalc**
- ◯ Choose supplements that deliver the most limiting nutrient for maximum response
- ◯ Limit replacing pasture with imported feeds to maximise response and reduce emissions intensity
- ◯ Select supplements with lower embedded emissions (such as maize or grass silage) when feed deficits are expected
- ◯ Maintain average pasture cover targets and rotation lengths throughout the season
- ◯ Incorporate plantain and clover in pasture swards to reduce nitrogen surplus and losses

Read more at **dairynz.co.nz/supplements**

Breeding and reproductive management

Strategic breeding and reproductive management improve herd performance and reduce environmental impact per unit of production. Combining genetic gains with optimal body condition score management delivers long-term efficiency for productivity and sustainability.

Actions to strengthen the farm business to help reduce your footprint:

- ◯ Breed replacement stock from your top-performing cows
- ◯ Ensure selected animals are fit for purpose in your farming system
- ◯ Rear well-grown young stock for better reproduction and productivity
- ◯ Meet body condition score targets and identify at-risk animals in autumn
- ◯ Focus on quality over quantity in replacement stock
- ◯ Use Fertility Focus Reports to identify areas for improving reproductive performance. See more at **dairynz.co.nz/fertility-focus**
- ◯ Match calving spread with feed supply to optimise milksolids production, aligning feed demand with balance date and beyond

Read more at **dairynz.co.nz/breeding**

Animal health and welfare

Proactive animal health management reduces wastage and increases on-farm efficiency while supporting optimal milk production. Preventing health issues and maintaining productive animals creates a more efficient system that reduces environmental impact per unit of production.

Actions to strengthen the farm business to help reduce your footprint:

- ◯ Manage animal health issues proactively and timely
- ◯ Prevent animal stress and minimise avoidable health risks
- ◯ Reduce somatic cell count and mastitis cases to improve production efficiency
- ◯ Identify and cull less productive animals early to reduce seasonal feed demand and prioritise feed supply for more productive cows
- ◯ Prioritise overall herd productivity over maintaining low-performing stock

Read more at **dairynz.co.nz/welfare**

Strategic planting and waterway management

Strategic planting and waterway management can create multiple environmental and economic benefits while improving farm resilience. Well-planned vegetation provides erosion control, waterway protection, biodiversity enhancement, and potential revenue streams through carbon credits, all while supporting livestock welfare and water quality.

Actions to strengthen the farm business to help reduce your footprint:

- ◯ Create a comprehensive planting plan, identifying priority areas across your farm
- ◯ Assess land use change opportunities that could reduce on-farm emissions
- ◯ Contact regional council or catchment groups to explore available support
- ◯ Identify and protect riparian areas along all waterways
- ◯ Plant riparian zones to filter contaminants and provide wildlife habitat
- ◯ Look for opportunities to restore natural wetlands for water quality and biodiversity
- ◯ Plant indigenous and exotic vegetation for erosion control, soil health, and livestock shelter
- ◯ Locate shade and shelter plantings away from critical source areas to prevent nutrient loading
- ◯ Explore carbon credit opportunities through the Emissions Trading Scheme for eligible vegetation

Read more at **dairynz.co.nz/waterways**

Effluent management and application

Effective effluent management transforms waste into a valuable resource that increases pasture production and reduces fertiliser costs. Well-planned storage, testing, and application helps maximise nutrient uptake and minimise environmental impact.

Actions to strengthen the farm business to help reduce your footprint:

- ◯ Develop a comprehensive effluent management plan
- ◯ Test effluent to understand nutrient concentrations and loading when applying to land
- ◯ Store effluent and defer irrigation until application matches plant uptake to mitigate potential loss of nutrients
- ◯ Use appropriate application rates to minimise environmental impact
- ◯ Divert storm water to reduce clean water flow and increase storage capacity
- ◯ Carefully manage effluent from off-paddock housing and standoff pads because of higher volumes of liquid and effluent solids
- ◯ Minimise nutrient loading, ponding, and runoff to waterways through controlled application

Read more at **dairynz.co.nz/effluent-management**

Every farm system is different. There's no single solution for reducing environmental impact. The right combination of practices depends on your land, stock, climate, and goals.

The practices covered in this guide are most effective when they work together as part of your overall farm system. Small, targeted improvements that fit your operation will deliver better long-term results than trying to adopt practices that don't align with your farming business.

Measure your progress and keep refining your approach over time.

Regional considerations

Getting the best results from these management practices means understanding how they interact with your local environment. To get the best results, understand how these practices fit your local conditions. This ensures improvements to your specific farming context are practical and profitable.

Before implementing changes, check with your regional council about regional rules and resource consent requirements. Environmental regulations vary between regions, and your council can provide guidance on what applies to your property.

Upper North Island

The Upper North Island's warm, humid climate and extended growing season create unique opportunities and challenges for sustainable farming. Longer pasture growth periods, heat stress risks, and specific disease pressures require tailored management strategies to maintain productivity while minimising environmental impact.

Specific actions for your region to help reduce your footprint:

- ○ Apply nitrogen before and after summer grass growth, avoiding application to unproductive summer grasses
- ○ Extend rotation length to match slowing leaf emergence (before Christmas in Waikato/Bay of Plenty, early December in Northland)
- ○ Use strategic supplementation to maintain target rotation lengths throughout the season
- ○ Implement proactive heat stress management strategies, particularly in northern areas
- ○ Plan facial eczema prevention from December through April/May
- ○ Manage Theileria (tick-borne disease) risks with appropriate prevention strategies
- ○ Plant shade and shelter within or between paddocks where current protection is insufficient

Lower North Island

The Lower North Island's variable climate and drought-prone areas require careful feed management and strategic planning to maintain productivity during challenging seasonal conditions. Balancing extended dry periods with optimal pasture utilisation helps sustain both animal performance and environmental outcomes.

Specific actions for your region to help reduce your footprint:

- ○ Extend rotation length to match slowing leaf emergence around Christmas, especially in drought-prone areas
- ○ Use strategic supplementation to maintain target rotation lengths during feed-limited periods
- ○ Implement facial eczema prevention from December through April/May
- ○ Plan shade and shelter plantings within or between paddocks where current protection is limited

Upper South Island

The Upper South Island's intensive farming systems and higher stocking rates require careful nutrient management to protect groundwater quality. Winter cropping opportunities and emerging heat stress challenges need strategic management to maintain both productivity and environmental standards.

Specific actions for your region to help reduce your footprint:

- ○ Conduct detailed nutrient budgets accounting for higher stocking rates and their impact on groundwater nitrogen
- ○ Implement careful transition management onto winter crops to minimise nutrient losses
- ○ Manage winter grazing areas to protect aquifer and river water quality
- ○ Match cow liveweight to feed intake capacity to achieve optimal kgMS/kgLWT for your system
- ○ Explore heat stress reduction strategies as impacts may be greater than previously recognized
- ○ Plant strategic wintering shelter to improve animal welfare and pasture production

Lower South Island

The Lower South Island's extensive winter cropping systems and sensitive catchments require comprehensive nutrient and soil management strategies. Focusing on catchment-scale impacts and sediment control helps protect water quality while maintaining productive farming systems in this environmentally sensitive region.

Specific actions for your region to help reduce your footprint:

- ◯ Evaluate catchment-level impacts of all nutrient management practices including wintering, animal waste, and fertiliser applications
- ◯ Implement strategies to reduce environmental risks across the broader catchment
- ◯ Manage critical source areas around winter grazing to minimise nutrient losses
- ◯ Focus on soil management in winter cropping catchments to reduce sediment loss
- ◯ Implement appropriate transition management onto crops to protect soil structure
- ◯ Plan winter shelter plantings to improve both animal welfare and pasture production

Implementing farm system strategies creates a system that works for both your business and the environment. Each action – from nutrient management to regional adaptations – works toward the same goal: maintaining or improving productivity while reducing your environmental footprint. Environmental improvements often align with operational efficiencies, delivering win-win outcomes for profitability and sustainability.

Success comes from taking a systematic approach rather than trying to implement everything at once. Start with the fundamentals that offer the greatest impact for your specific situation, whether that's soil testing, pasture management improvements, or region-specific adaptations. As these practices become embedded in your operation, you'll find that it isn't just about doing the right thing for the environment – it's about building a more resilient, efficient, and profitable farming business that can thrive in a changing world.

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