

DAIRY SECTOR: IMPROVING WATER MANAGEMENT PRACTICES AND BEHAVIOURS

Executive Summary

Introduction

Managing water use is both a challenge and an opportunity for the dairy sector.

The sector understands it needs to do better in managing its impact on water quality.

The Dairying and Clean Streams Accord is a long standing and successful example of an audited self management approach to the achievement of sustainable water management.

The focus will now move to managing nutrient losses from pasture. Management of nutrient losses will require behavioural change, strong support from systematic, long term programmes and an ongoing commitment to capturing innovation opportunities.

Providing Leadership

The sector is stepping up. The sector's "Strategy for New Zealand Dairy Farming" exemplifies this new commitment. Sustainability is a key agenda item at all meetings of all dairy leadership organisations. Local leadership is apparent, that applied in the Aorere catchment in Golden Bay. Collaboration with other stakeholders is important. The dairy sector is active in the "Land and Water Forum," has strong relationships with Regional Councils and is building its relationship with iwi such as Tainui Waikato.

Enabling Behaviour Change

A number of programmes have been developed or are in development: Farm Dairy Effluent Code of Practice; AgITO; Smart Water on Dairy Farms Kit; Irrigation Efficiency Project; Farm Enviro Walk; Overseer development; and on-going research to confirm the regional efficacy of Nitrification Inhibitors.

Promoting Effective Practices

A key new initiative is the "Every Farm Every Year" independent appraisal of effluent infrastructure. Partner programmes include: Warrant of Fitness; Nutrient Efficiency Benchmarking; the advice provided by Fonterra's eleven Sustainable Dairy Specialists; and the "profitability, sustainability, competitiveness" resources and programmes put in place by DairyNZ.

Driving Adoption

New measures to assist dairy farmers to achieve environmentally sustainable practice include: a stepped up approach to achieve 100% stock exclusion from streams; the planting of iconic riparian margins through a programme called "Catchment Care" and; the "Effluent Improvement Programme" that combines advice and pay-out deductions.

Future Proofing

Industry research includes: \$6.3m annual expenditure through DairyNZ; new expenditure under a proposed Mk11 Pastoral 21; and the sustainability initiatives included in the recently funded "Primary Growth Partnership." The sector's total investment in research to future proof sustainable dairying is about \$20 million per annum.

Dairy Sector: Improving Water Management Practices and Behaviours – Further Details

Managing water is both a challenge and an opportunity for the dairy sector.

The sector knows that if it can be smarter in its management of water use it can unlock wealth-generating potential for the nation and capitalise on one of New Zealand's few natural competitive advantages.

Smarter implies storing and allocating water more efficiently but also using water more responsibly. The dairy sector understands, for example, that it needs to do better in managing its impact on water quality.

The key to delivery of smarter water will be the sector adopting and promoting a culture of continuous improvement across all aspects of sustainable water use and management.

The sector stands ready to enhance its contribution to tackling the water management challenges New Zealand faces through:

- i. Continuing to embed enhanced water management as a priority in strategic frameworks
- ii. Adopting aggressive targets to address issues such as effluent compliance and contaminant losses
- iii. Enabling dairy farmers to meet targets by defining good management practice, developing tools and generating programmes to build sector capacity
- iv. Promoting universal use of good practices and behavioural change through communication, extension and demonstration
- v. Supporting dairy farmer uptake, when the above methods are insufficient, primarily through the use of incentives, tools and advice but with a willingness to use sanctions when required
- vi. Actively engaging and collaborating with communities and stakeholders to define preferred objectives and to develop frameworks to deliver on the desired change, at an agreed pace and price.

Research in targeted dairy catchments has shown that farmer, science and industry driven definitions of good management practice, with clear targets, appropriate audit and support, are capable of delivering very real improvements in water quality even in intensively farmed catchments¹.

The dairy sector is committed to adopting an audited self management approach, to achieve sustainable water management. The *Dairying and Clean Streams Accord* (see appendix one for details) is a long established example of this approach.

Behavioural and system change requires a systematic, long-term programme of action and inter-related measures that progressively build on existing impetus, awareness, culture and the latent capacity to make preferred sustainable water management the norm.

Underpinning behavioural and system change is a continuous commitment to capture innovation opportunities - from a sector that has consistently demonstrated on-going practice improvement, technology development and uptake over past decades. Many of the technologies and practices that are common on-farm today, and which are now producing significant sustainability gains, were not on the radar 10 years ago. Supporting and encouraging this form of "bottom up" innovation, and rewarding success, will remain a key part of the dairy response.

¹ This has been demonstrated through the industry's Best Practice Dairy Catchment (BPDC) project.

The basic model adopted by the sector involves four steps (see figure one).

1. Providing *leadership* and embedding the preferred strategic direction into industry organisations.
2. *Enabling* behavioural change to occur by distributing the results of research and by developing and building human and technical capacity.
3. *Promoting* behaviours and practices that are known to be effective through extension, demonstration and reporting of monitoring results.
4. *Driving* compliance with desired behaviours, if earlier steps are not sufficiently effective, through carefully designed incentives and sanctions.

Leadership

The sustainability and water management message is clearly embedded within the 2009 *Strategy for NZ Dairy Farming*. The sector has developed annual milestones and multi-year targets to ensure this Strategy succeeds².

Environmental sustainability is a key agenda item on Fonterra, DairyNZ, Dairy Companies of New Zealand (DCANZ) and Federated Farmers Board meetings. Driving industry environmental sustainability is a central objective of each organisation.

A Dairy and Environment Leadership Group (made up of representatives from Fonterra, DairyNZ, DCANZ, Government, Maori, Federated Farmers, Regional Councils and others) meets three times a year to influence dairy industry sustainability priorities and monitor progress.

DCANZ has committed to extend its current pre-competitive collaborative approach to sustainability objective setting and issue resolution. The aim of this work is to seek agreement on pan-company environmental targets and performance benchmarks.

Dairy farmers are also providing direct leadership in response to local and regional issues. The collaborative “system improvement” response of dairy farmers in the Aorere Valley of Golden Bay, to concern about the effects of contaminants on adjacent aquaculture ventures, is a good example. The “catchment club” approach adopted by Rotorua dairy farmers is a second example.

Recognition of the exemplary performance of leaders through programmes such as the Balance Farm Award has been a highly successful means of identifying and promoting expected behaviour. Fonterra is stepping up its support of these programmes.

In recognition of the concern about nutrient levels in the nation’s lowland waters, sector leaders are collaborating with stakeholders and proactively negotiating specific targets for action in particular catchments. Focus is being given to locations with sensitive receiving waters and where partnership commitments with Regional Councils and the fertilizer industry are already underway (e.g. Horizons, Canterbury, Waikato, Bay of Plenty and Southland).

Enabling behavioural change

DairyNZ, supported by others in the industry, has completed a Farm Dairy Effluent (FDE) Design Code of Practice and Design Standards. This supports effluent good management practice by ensuring effluent management systems, and the advice provided by equipment sales firms and rural professionals, are fit-for-purpose.

² The industry has set aggressive targets to drive reductions in contaminant losses. The targets established under the *Strategy for New Zealand Dairy Farming* are that by the end of 2011, 50% of dairy farms have, and are implementing through an auditable process, Nutrient Management Plans that reduce their nutrient footprint either to established benchmarks of high resource use efficiency or agreed partnership targets; 90% of farms are doing so by end of 2012

An AgITO effluent management module is now into its second year of operation. This will assist to ensure dairy farm trainees are provided with proper instruction as to the use of effluent systems and adopt good management practice for effluent application.

Dairy NZ and Fonterra are committed to a “*Smart Water on Dairy Farms*” project. This will initially involve the roll out of tools and resources (“*Short Form Action Plan*” and a “*Smart Water Use Kit*” - with assessment workbook checklist) to assist farmers to appraise their water systems and operations, identify opportunities for improvement and make desired changes. After trialling the programme in the Waikato, it is proposed to roll out the *Smart Water Use* programme nationally.

A separate irrigation efficiency project is also in place. This is being led by Irrigation NZ, DairyNZ and others, to deliver on the target set by the Primary Sector Water Partnership to have 80% of water used by the dairy sector meet industry good practice benchmarks by 2016. An irrigation scheme self management approach is envisaged. This will provide the tools to enable farmers to optimise water application and better match water needs to water availability and preferred application rates.

Fonterra delivered the “*Farm-Enviro-Walk*” (FEW) effluent triage tool, developed by DairyNZ, to over 3000 suppliers during the 2010 season. 10% of these resulted in a referral being made to Fonterra’s team of Sustainable Dairy Specialists for advice on what to include in an “*Effluent Improvement Plan*”. Other dairy companies are using FEW or similar programmes to similarly encourage good management practice.

The *Dairying and Clean Streams Accord* means virtually all farmers already have nutrient budgets to inform fertiliser use. The next step on the good management practice ladder is for these to become ‘whole farm nutrient management plans’ – with clearly understood and agreed community targets for good nutrient management practice. The development of templates for these plans, and aggressive targets for their uptake by dairy farmers, are already in place.

The Ministry of Agriculture and Forestry, AgResearch and Fertilizer Research, with support from the dairy sector, continue to invest in improving the value and efficacy of the Overseer nutrient management modelling tool. The Massey University nutrient management course continues to generate an increasing number of persons capable of assisting dairy farmers to make use of the Overseer tool.

Research into novel technologies for on-farm effluent treatment systems is being supported by the sector. These technologies will generate approaches for use on farms in areas where irrigation of effluent to land is problematic - due to the risk of run-off and leaching to groundwater e.g. in hilly country and on tile / mole drained land.

The sector has committed nearly \$2 million toward a \$10 million, three year programme to confirm the regional efficacy of nitrification inhibitors and to accelerate development of second-generation nitrogen loss inhibitors.

Promoting behavioural change

Fonterra introduced the “*Every Farm Every Year*” independent appraisal of Fonterra suppliers’ effluent infrastructure on 1 August 2010. Where change is needed, farmers will be referred to Fonterra’s expanded team of Sustainable Dairy Specialists and an Effluent Improvement Plan (EIP) will be prepared. There will be sanctions (including non pick up of milk) for failure to comply with an EIP.

Industry partners will also engage with regional councils in key dairying regions to establish a ‘*warrant-of-fitness*’ approach to effluent management systems. This will focus on the design specifications of the effluent management infrastructure that are likely to satisfy regional council requirements in each location.

The sector is supporting the concept of “*N Efficiency*” as a key metric for farm management and sustainability, building on approaches adopted in Europe and elsewhere. In more particular terms, the dairy sector is working with the fertilizer industry to now develop an N-loss benchmarking and reporting framework at various scales. This will enable targets to be set and progress to be monitored over time.

Fonterra estimates its current annual spend on on-farm sustainability initiatives tops five million dollars. It has now doubled its team of Sustainable Dairy Specialists / Advisors to a total of eleven with leadership and support from a Field Team Manager and an Environment Programme Manager. Other support is provided by a Sustainable Dairying Strategy Manager and a Sustainable Dairying Policy Manager. Non Fonterra dairy companies are similarly providing resources and working with suppliers to drive improvements in sustainability practice.

DairyNZ has repositioned its programmes and expenditure to place greater emphasis on sustainability and, in particular:

- Has increased its number of field Consulting Officers to 36, with sustainable dairying a regular part of field days and a priority feature of farmer contact
- Is rolling out its Whole Farm Assessment approach to focus on causes of problems rather than symptoms
- Is placing new emphasis on ensuring there are adequate numbers of rural professionals to advise farmers on good management practice for water quality issues, including through the ‘Train-The-Trainer’ programme under the Primary Growth Partnership investment.

Driving behavioural change

As awareness of the risk posed by diffuse discharges has increased (in both absolute and relative terms), dairy farmers are moving to adopt techniques and systems recognised as being part of good agricultural management practice.

The sector has already achieved very high levels of compliance with *Dairying and Clean Streams Accord* targets related to the exclusion of stock from water ways³. The industry will adopt new communications efforts to drive achievement of the Clean Stream Accord target of 90 percent stock exclusion from waterways by 2012. Post that date, industry will work with stakeholders such as Regional councils to continue to prioritise universal stock exclusion including, if appropriate, investigating regulatory instruments. Industry and government research is also underway to develop and better understand the value of tailored riparian restoration and planting programmes as an important tool to target water quality issues in appropriate catchments.

The dairy sector will continue to advocate for the expansion of the “Taranaki model” of encouraging riparian planting, to other dairy regions. This concept involves the regional council preparing riparian management plans for dairy farms and providing native plants, at cost price, to implement the plan. It also arranges contractors for major planting projects.

Fonterra has established a \$1.5 million dollar “*Catchment Care*” programme, in partnership with “*Conservation Volunteers*,” to lead the planting of the riparian margins of iconic water ways throughout New Zealand. The Company is also sponsoring riparian planting awards in regions such as Taranaki.

³ The 2008/09 report on progress in meeting Accord targets recorded 80% exclusion of stock from water ways on dairy farms supplying Fonterra

Good management practice on effluent is encouraged by Fonterra's "*Effluent Improvement Programme*" with milk pay-out deductions of \$1500 / \$3000 during the 2010 seasons and the provision of one-one-one advice to any supplier requiring it.

Future-proofing

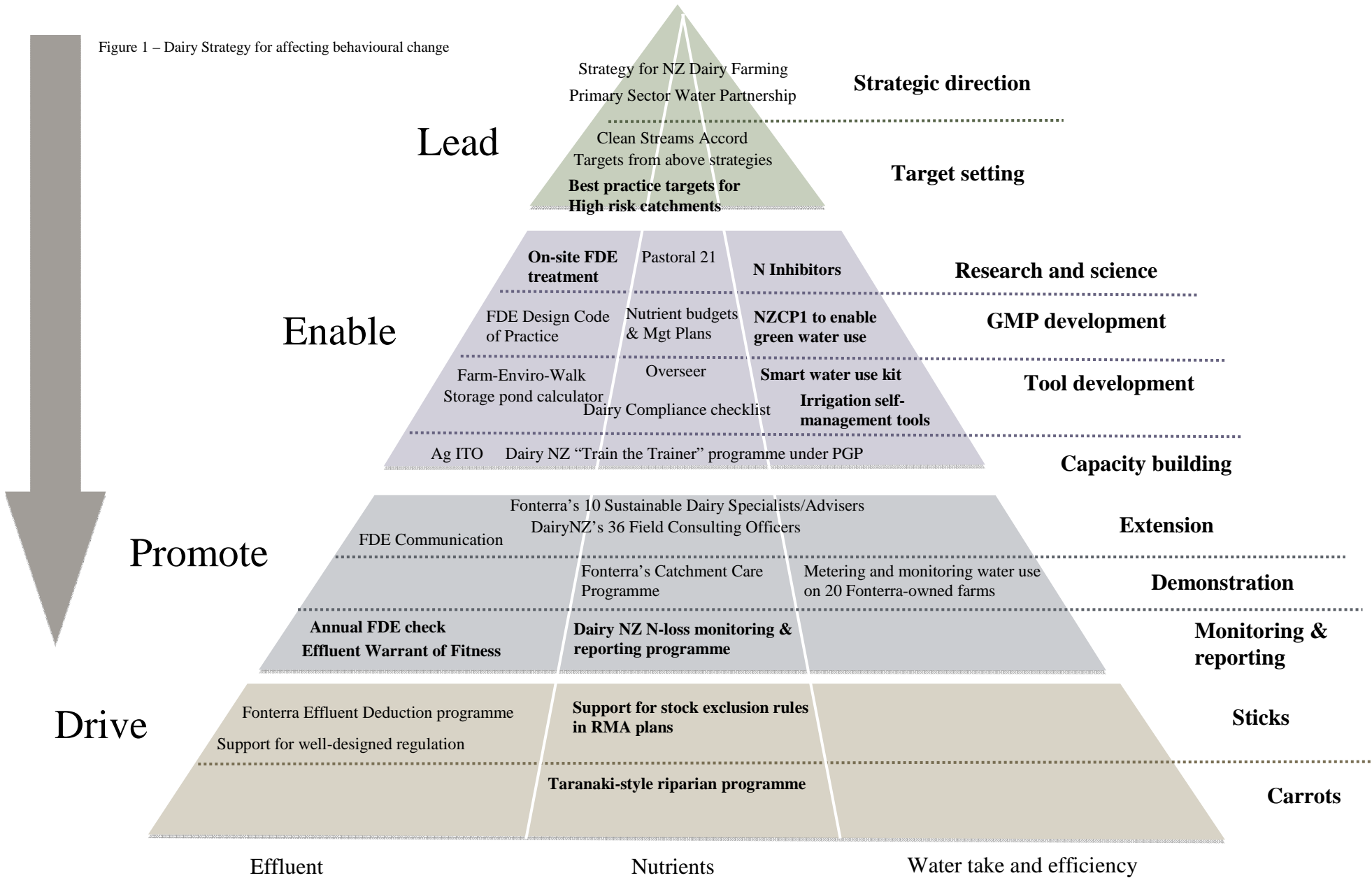
Alongside all these initiatives, the dairy sector is keeping a keen eye on emerging challenges. Expectations of on-going improvements in environmental performance are high. Considerable effort is going into ensuring there will be solutions for the future that allow dairy production to grow in response to demand without a commensurate increase in environmental footprint.

Dairy farmers already contribute \$6.3 million per year on environmental research solutions. Farmers also contribute to a wider industry good research budget of over \$50 million from which whole farm system improvements are delivered.

Future proofing is reflected, in particular, in two initiatives:

- Pastoral 21 – This is a collection of industry good bodies established to co-fund, in partnership with government, research into environmental mitigation technologies and knowledge transfer to farmers – a second phase of programs is currently under development
- The dairy sector's Primary Growth Partnership (PGP) project – This has been developed to position the dairy sector to respond to the full range of sustainability challenges that lie ahead, with the overall aim of reducing the industry's total environmental footprint.

Figure 1 – Dairy Strategy for affecting behavioural change



Appendix 1– Existing Dairy Sector Commitments

Dairying and Clean Streams Accord

The 2003 Dairying and Clean Streams Accord (DCSA), signed by Fonterra, MfE, MAF and Local Government NZ, provided an important set of initial targets:

- Dairy cattle to be excluded from 50 percent of streams, rivers and lakes by 2007, rising to 90 percent by 2012;
- Fifty percent of regular crossing points to have bridges or culverts by 2007, and 90 percent by 2012;
- All dairy farm effluent discharge to comply with resource consents and regional plans immediately;
- All dairy farms to have in place systems to manage nutrient inputs and outputs by 2007;
- Fifty percent of regionally significant wetlands to be fenced by 2005, rising to 90 percent by 2007.

The industry has pursued these targets by providing information and advice through extension services and by carrying out an independent annual on-farm assessment of progress. Although progress against four out of five targets has generally been very good, in the case of effluent compliance, the industry has fallen short⁴.

⁴ This is for a range of reasons but the primary one is that the initial target was an aggressive one which failed to take into account the complexity of the issue, the lack of good practice knowledge, systems and measures and the evolving expectations and inspection practices of regional councils