



ONE YEAR ON...

What have we achieved?

What do we need to keep working on?

SUSTAINABLE DAIRYING –

WATER ACCORD

A commitment to New Zealand
by the dairy sector



Sustainable Dairying: Water Accord

The Sustainable Dairying: Water Accord (the Accord) has been developed under the oversight of the Dairy Environment Leadership Group (DELG). DELG includes representatives from farmers, dairy companies, central government, regional councils and the Federation of Māori Authorities.

Accountable Partners

In accordance with this Accord the following parties have specific responsibilities and are accountable for delivering the commitments and monitoring and reporting as specified. They undertake to carry out those responsibilities in good faith and to the best of their abilities.



John Luxton
Chairman



Dairy for life



John Wilson
Chairman



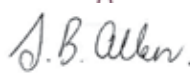
Laurie Margrain
Chairman



Kingi Smiler
Chairman



Graeme Milne
Chairman



Stephen Allen
Chairman



Malcolm Bailey
Chairman

Supporting Partners

Supporting Partners make commitments to the outcomes of this Accord in support of the Accountable Partners.



Friends of the Accord

Friends of the Accord are supportive of the purpose of this Accord and commit to contribute to its success in the spirit of collaboration.

- Westland Milk Products
- Regional/Unitary Councils: Northland Regional Council; Auckland Council; Waikato Regional Council; Bay of Plenty Regional Council; Hawke's Bay Regional Council; Gisborne District Council; Taranaki Regional Council; Horizons Regional Council; Greater Wellington Regional Council; Environment Canterbury; West Coast Regional Council; Marlborough District Council; Tasman District Council; Otago Regional Council; Environment Southland
- The Federation of Māori Authorities
- Ministry for Primary Industries
- Ministry for the Environment

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The Dairy Companies Association of New Zealand (DCANZ) is the umbrella body of companies processing milk in New Zealand.
www.dcanz.com

DairyNZ is the industry organisation representing New Zealand's dairy farmers, funded by farmers through a levy on milksolids.
www.dairynz.co.nz or www.dairyatwork.co.nz

Foreword

This is the first annual progress report for the Sustainable Dairying: Water Accord. While we have made some real and meaningful progress during the 2013/14 dairy season, there is still a lot more work to do.



The dairy industry cares about the health of New Zealand’s freshwater and natural resources. The Water Accord is one way that we are showing our commitment. We are also committed to reporting on how we are doing.

We are learning the lessons from our first year of operation under this new Water Accord. DairyNZ and all the dairy companies are working together to fix issues and address areas that need attention and focus – most notably, nutrient management data collection and how to collate, align and verify dairy company information at an industry level. We have met some, but not all of our targets for this past season.

We certainly recognise and applaud the efforts of farmers, dairy companies, DairyNZ staff and our ‘Supporting Partners’ and ‘Friends’ of the Water Accord for their work and support to date. We are making real strides in key areas such as setting standards for new farm conversions to dairy, stock exclusion from waterways and effluent and nutrient management advice and training. There are still areas where we need to do better and where we need to learn from this first report on how we can lift our performance and ensure we meet our key targets going forward.

We are working closely with regional councils around the country to assist them with implementation of the National Policy Statement for Freshwater Management. We are committed as an industry to farming within environmental limits to maintain and enhance the land and resources that our industry relies upon for its success.



Hon. John Luxton
Chairman
DairyNZ



Malcolm Bailey
Chairman
Dairy Companies Association of New Zealand





The Sustainable Dairying: Water Accord

The Sustainable Dairying: Water Accord was launched in July 2013.

This first annual progress report aims to set out what the Accord has achieved in its first year of operation from June 2013 to May 2014.

This Accord involves a large number of industry players as well as all of New Zealand's dairy companies and has commitments and targets for five key areas:

- Riparian management
- Nutrient management
- Effluent management
- Water use management
- Conversions

The purpose of the Accord is to enhance the overall performance of dairy farming as it affects freshwater by:

- Committing to good management practices expected of all dairy farmers in New Zealand
- Recording pledges by the dairy sector, with the support of others, to assist and encourage dairy farmers to adopt those good management practices and to monitor and report progress

Collating the Accord report

The total number of farms covered by the Accord is approximately 11,400.

This includes farms supplying the dairy companies Fonterra, Miraka, Open Country, Synlait and Tatua, but excludes farms supplying Westland Milk Products. Westland operates its water quality sustainability programme under a Working Together Agreement with the West Coast Regional Council but has also signed on as a Friend of the Accord.

A number of the Accord commitments are defined in terms of percentage of farms achieving a certain standard. In these cases, we have summed the number of farms reported by each dairy company as meeting the standard and have then divided that total by 11,400 to estimate overall national achievements.

'Accountable' and 'Supporting Partners' have developed and are implementing diverse programmes to achieve environmental commitments outlined in the Accord. Despite an overall goal of having consistent systems across all partners, it is clear that there are significant differences in how individual organisations have measured and communicated Accord commitments on-farm. In some cases this has led to a reduced level of confidence when quantifying achievements relative to Accord targets.

Verification of data and figures

An independent audit has been undertaken on the data used in the preparation of this report (see page 32 for Auditor's Statement). On-farm verification by the auditors shows farmers are reporting data correctly to their dairy company. However it is important to note that some of the figures in this report have not been independently verified at the industry level. DCANZ and DairyNZ will work with dairy companies and 'Supporting Partners' (e.g. fertiliser companies) to increase the alignment of data collection between the dairy companies to improve verification systems (see pg 9).

To read the independent audit report, go to www.dairyatwork.co.nz.

Summary and highlights

ONE
YEAR ON

WHAT WE'VE ACHIEVED SO FAR...

- ◆ Every dairy company has an assessment programme in place for new conversions that sets out environmental and other requirements that have to be met before milk supply can start from a new dairy farm.
- ◆ All dairy companies have programmes in place to assess the effluent systems of suppliers on a three-yearly basis, with several companies assessing every farm every year. Three dairy companies have reported 100% of farms assessed in the three year period to 30 May 2014, adding up to 99% of farms being assessed overall in New Zealand.
- ◆ A recent DairyNZ survey of 1,000 dairy farmers shows that 69% of them had either invested in an effluent system upgrade in the last 12 months or were planning to in the next 12 months.
- ◆ Every dairy company has developed programmes to collect nutrient management information from their farmers.
- ◆ For the 2013/14 season, 56% or just over 6,400 farms provided nutrient management data to their dairy companies.
- ◆ Dairy companies report nearly 24,000 kilometres of measured Accord waterways (94%) have been excluded from stock, although this has not yet been fully verified.
- ◆ Fourteen Farm Dairy Effluent Warrant of Fitness assessors have achieved certification.
- ◆ Nearly 250 farm staff attended an effluent management course in 2013/2014.
- ◆ There are now 78 rural professionals across the country certified as Nutrient Management Advisers, able to advise farmers on efficient use of nutrients. Another 56 are in the process of certification.

What we've made the most progress on...



Assessment systems and advice for new farm conversions to dairy



Stock exclusion and crossings and fencing off waterways



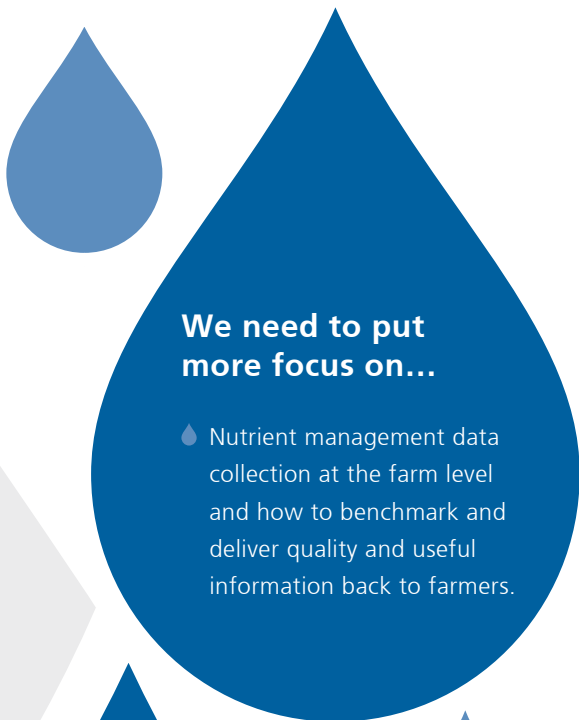
Effluent management system assessments, advice and training



Regional riparian management advice tailored to farmers



Ensuring farmers have accredited experts they can turn to for nutrient management advice



We need to put more focus on...

- ◆ Nutrient management data collection at the farm level and how to benchmark and deliver quality and useful information back to farmers.



We're working on...

- ◆ A three year water use study on over 100 dairy farms across the country is underway. Data from the first 59 farms was collected during the 2013/14 season. Preliminary results will be available in 2015.

While Greater Wellington and Tasman regions achieved zero significant non-compliance for farm dairy effluent, nationally, the rate of significant non-compliance for farm dairy effluent systems and management practices for the 2013/14 season was 7%. We want to keep making progress in every region.

WHAT THE TOUGHEST CHALLENGES ARE...



Collecting nutrient management data and performance benchmarking

The collection of data from individual farms is a major undertaking for dairy companies, as nutrient management information reporting by farmers has not previously been required in the dairy industry. Several companies have included provision of nutrient management data in their conditions of supply for the first time. However, despite significant resources being directed to this commitment, not all farmers were able to provide the required data within the requested timeframes. Dairy companies have also implemented quality control procedures that add further challenges to achieving agreed targets.

This is a challenging target but the industry is determined to achieve it through monitoring and reporting nutrient management performance on-farm. We are driving continual improvements in the quality of data from the farmer and also of information going back to farmers.



Aligning data systems

We have made good progress in using Geographic Information Systems to gather robust on-farm stock exclusion data. However we have learnt from our first audit report that we need to improve our systems and processes for nutrient data and information collection at the dairy company level. We need to ensure it is collected in a way that allows for valid aggregation/collation as an industry.

Dairy sustainability initiatives



DEVELOPING
1,000
FARMING LEADERS

to create positive environmental changes



EnviroReady
FIELDAYS

for farmers to gain the knowledge to ensure responsible farming



CREATING
SUSTAINABLE
MILK
PLANS

for good environmental practice



SUSTAINABLE DAIRYING –
WATER
ACCORD

The dairy industry's commitment to improving water quality



TRAINING &
CERTIFYING
INDUSTRY PROFESSIONALS

to provide better advice to farmers



OVER 50

RESEARCH & DEVELOPMENT PROJECTS

aimed at improving dairying's environmental performance



WATER QUALITY

Working with councils, farmers and the community to create plans that meet a region's **water quality** objectives

One Year On...

How are we doing?

In the following sections, we report back on the key commitments of the Sustainable Dairying: Water Accord and what has been achieved in its first year of operation.

We have achieved some of the targets we set ourselves in our first year, but not all. We have clearly set out where we need to make improvements and pick up the pace of our work.

We have made good progress in using Geographic Information Systems to gather robust on-farm stock exclusion data. However we have learnt from our first audit report that we need to improve our systems and processes for nutrient data and information collection at the dairy company level. We need to ensure it is collected in a way that allows for valid aggregation/collation as an industry.

The systems and practices for data collection at the dairy company level have not stood up to the scrutiny of our auditor and that has affected our target achievements.

We are going to use this feedback to improve our performance going forward. It's vital that we can pull together useful and robust environmental data at an industry level that is directly comparable and easily verifiable.

So what are the next steps for the dairy industry?

1. Review and improve our reporting systems for this Accord. *The Dairy Companies' Association of New Zealand will lead a project to get better and more consistent data collection/aggregation across all companies.*
2. Focus on verifying our data and systems and achieving key 2014/15 targets.
3. Pick up the pace to ensure all our other targets are met on time.

key to target status symbols





Riparian Management

EXPECTATIONS:

- Dairy farms will exclude dairy cattle from significant waterways and significant wetlands
- Riparian planting will occur where it would provide a water quality benefit
- The crossing of waterways by dairy cows will not result in degradation of those waterways

STOCK EXCLUSION & CROSSINGS

Dairy companies have reported between 90 and 100% exclusion of Accord waterways for the 2013/14 season. Dairy companies have reported nearly 24,000 km of measured Accord waterways (94%) have stock exclusion, although this has not yet been fully verified. Therefore, we cannot yet confirm that the target of 90% exclusion by 31 May 2014 has been achieved.

Taranaki Region (~1700 farms) sits outside the riparian management commitments of the Accord due to an existing agreement between Fonterra, Taranaki Regional Council and central government that expires in 2015. Taranaki Regional Council reports 80% of stream banks are fenced and 65% of stream banks are vegetated.

Waterways and drains

90% stock exclusion of the length present on dairy farms by 31 May 2014; 100% by 30 May 2017



AWAITING
VERIFICATION
(94%)

Less than 2% of measured Accord waterway length on-farm is subject to stock exclusion dispensations, with most of these being short-term extensions to allow farmers time to replace temporary fences with permanent ones, or associated with areas where frequent natural flooding precludes the use of permanent fences.

The extent of stock exclusion from significant wetlands is unknown at this stage but is likely to be similar to overall stock exclusion. Identification of significant wetlands (i.e. defined as those identified in an operative regional policy statement or plan) has been problematic, as only some councils had listed significant wetlands in operative regional plans as at 31 May 2012. Others have no such lists and are still working on mapping significant wetlands. In addition it has been difficult to merge property-scale Geographic Information Systems (GIS) files collected by dairy companies with regional council data. DairyNZ and dairy companies have been working with regional councils to resolve this issue, and an agreed wetlands GIS shape file database has now been produced and provided to all dairy companies (24 October 2014).

Wetlands

100% stock exclusion of all wetlands identified by a regional council as at 31 May 2012 by 31 May 2014



NOT YET
ACHIEVED

Dairy companies have identified more than 36,000 stock crossings on dairy farms. Where assessed, dairy companies have determined greater than 90% of regular crossings have bridges or culverts as at 31 May 2014, with one company reporting 100% compliance. However, not all of these crossings have been verified and the national level of compliance (99%) should be treated as indicative only at this stage.

100% of regular stock crossing points are either bridged or culverted by 31 May 2018



AWAITING VERIFICATION (99%)

As reported by dairy companies, dispensations for stock crossings have been granted in a very small number of situations (<0.5%).

RIPARIAN PLANTING

Progress is being made in implementing riparian management plans to enhance water quality on farms. One dairy company has reported 68% of farms with waterways have riparian planting. Formal reporting on implementation of riparian management plans will be included in 2016. In Taranaki, more than 95% of farmers have had riparian management plans produced for them by Taranaki Regional Council.

50% of dairy farms with waterways will have a riparian management plan by 31 May 2016; 100% by 31 May 2020



IN PROGRESS

All of these farms will have completed half of their riparian plan commitments by 31 May 2020; full implementation by 31 May 2030



IN PROGRESS

DairyNZ, in partnership with regional councils, has produced regionally-tailored riparian guidelines for Waikato, Southland and Manawatu-Wanganui regions. The guidelines include information on recommended set-back distances, planting density and appropriate plant species for specific objectives. The guides are available from dairynz.co.nz.

Riparian guidelines completed for three regions by 31 May 2014



ACHIEVED

Riparian guidelines completed for 9 regions by 31 May 2015; all regions by 31 May 2016



IN PROGRESS

CASE STUDY

Brian and Alison Baxter – Manawatu

Brian and Alison Baxter have a windswept dairy farm near the base of the Ruahines. They milk 320 cows on 130 hectares (effective). The creeks which run through their farm are fed by springs with very high water quality. The Baxters have been planting for four years and have put in 2500 plants.



What have they done to manage their riparian zones?

Maintaining the pristine quality of the spring water is important to the Baxters' and a motivating factor for fencing and planting. Their creeks are full of watercress, which the cows love, so as Brian says "if the fence wasn't there, the cows would be getting amongst it within minutes".

The Baxters have planted hardy species to survive blustery conditions. Alison is the designer, laying out where the plants should go; the boys follow after her, digging and planting them. They plant flax, toetoe, cabbage trees and twiggly tree daisy. Flaxes are kept a metre from the high water mark to ensure they won't grow into the channel or fall over in floods.

Brian and Alison chose to not pre-spray before planting because having grass growing up around the plants shelters them from the strong winds. In less windy situations they know that treading down and brush-cutting would ensure plantings have space to grow. The grass growth helps suppress weeds and makes managing their zones less time consuming – but they always keep an eye out for weeds that might need extra effort.

CASE STUDY

Grant Wills – Waikato

Grant Wills milks 650 cows on a 215 ha (effective) property near Walton. The gently rolling land has been in Grant's family for three generations. Five kilometres of different stream branches run through their property and Grant has planted over 7700 trees in the last 10 years.

What has he done to manage the riparian zones?

Grant started fencing on a steep section of river bank which had stock management issues. It was retired and planted in Ovens Cyprus, a forestry crop. Grant sees real value in farmers fencing and planting waterways for farm management benefits and to help meet long-term international market needs.

Early on, Grant mapped his whole farm and the waterways were divided into bite-sized sections for planting. Fencing setbacks vary depending on the terrain and where it would be beneficial for stock management. Grant's attitude to setbacks has changed over time. "You don't really miss the grass and you are better off planting trees in unproductive areas. You get aesthetic benefits and improved stock management."

Over the last ten years he has planted all his waterways. By making planting a family activity, Grant says the process has been manageable. His eldest son was in charge of pruning the first Ovens Cyprus crop and his second son and his friends got paid to plant other areas.





Nutrient Management

EXPECTATIONS:

- Dairy farmers will manage Nitrogen (N) and Phosphorus (P) loss from dairy farming systems, acknowledge the need to manage within nutrient loss limits and pursue continuous improvement in nutrient use efficiency

NUTRIENT MANAGEMENT DATA COLLECTION

Every dairy company has developed programmes to collect nutrient management data from their dairy farmers and model these using agreed protocols (see www.fertiliser.org.nz for latest version of OVERSEER Best Practice Data Input Standards). Data collection and verification systems for 2013/14 season data did vary between companies, influencing the comparability of data. However, for the purposes of generating 2013/14 regional averages, as required by the Accord, we aggregated all the data provided by dairy companies.

Several companies have included provision of nutrient management data in their conditions of supply. However, not all farmers were able to provide the required data within the requested timeframes, and the measure of achievement is the number of farmers from which data has been collected. For the 2013/14 season just over 6400 farms had provided nutrient management data (56%) by 31 October 2014. Across the 15 regions of New Zealand the farmer participation rates ranged from 36% to 100%.

The quality of data supplied by farmers and the quality control procedures used by dairy companies and fertiliser companies to ensure collected data is correctly entered in OVERSEER is critically important. OVERSEER is a predictive model and the quality of the model outputs are directly related to the quality of the input data. Quality control of data is also important so that we can report robust figures back to farmers to assist them in managing nutrients on-farm.

Collection and reporting of nutrient management information is one of the most challenging targets to meet in the Accord. The industry is committed to monitoring and reporting nutrient management performance on-farm and driving continual improvements in the quality of data from the farmer and also of information going back to farmers.

Nutrient management data collected from 85% of dairy farms by 31 May 2014; 100% by 31 May, 2015



NOT YET
ACHIEVED
(56%)

Most dairy companies have reported performance benchmarks back to their suppliers to meet the target of 30 November 2015. It is not known at this stage what percentage of farmers have received individual performance information. This is an area where we need to put a lot more focus to ensure we achieve our targets and commitments going forward.

N loss and N conversion efficiency performance information reported back to 85% of dairy farms by 30 November 2014; 100% by 30 November 2015



NOT YET
ACHIEVED

AVERAGE NITROGEN-LOSS BY REGION

Modelling of collected farm information in OVERSEER was undertaken to provide feedback to farmers on their performance relative to appropriate peer groups. The Accord also requires reporting on average Nitrogen (N) loss per hectare by region (initially for 2013/14 with a progress update every three years using a five-year rolling average once data is available). Over time, the dairy industry will generate a comprehensive and robust dataset on N-loss and nitrogen use efficiency that will be of national significance in managing natural resources. In this first year of the report we have collated data for a single season (2013/14). While valuable for the primary purpose of raising farmer awareness and establishing a baseline, the 2013/14 data is only a starting point. Therefore, caution is urged in interpreting regional average figures.

The OVERSEER Nutrient Budget model is an agricultural management tool which assists farmers and their advisers to examine nutrient use and movements within a farm to optimize production and environmental outcomes. The computer model calculates and estimates the nutrient flows in a productive farming system and identifies risk for environmental impacts through nutrient loss, including run off and leaching, and greenhouse gas emissions. For more information on OVERSEER see www.overseer.org.nz.

For the 2013/14 season, data from approximately 5500 (49%) farms met the quality control criteria established by dairy companies for modelling of farm data in OVERSEER (using established protocols and trained operators).

OVERSEER estimates of regional average N-loss ranged from 23 (Auckland) to 63 kg N/ha/yr (Tasman). In the four major dairy regions (Waikato, Taranaki, Canterbury and Southland), average N-loss ranged from 32 to 48 kg N/ha/yr. The national average, based on 2013/14 data was 35 kg N/ha/yr.

Table 1. Regional average N leaching loss (kg N/ha/yr) and sample size across 13 regions (based on 2013/14 season data).

	Average N-loss (kg N/ha/yr)	Sample size (number of farms)
Northland	24	258
Auckland	23	131
Waikato	32	2101
Bay of Plenty	38	254
Gisborne/Hawke's Bay	34	74
Taranaki	48	765
Manawatu	28	477
Wellington	31	85
Tasman	63	83
Nelson/Marlborough	37	33
Canterbury	34	650
Otago	25	226
Southland	40	399

The observed variance in N-loss between regions is a function of many factors including soil type, drainage characteristics (including rainfall and/or irrigation) and farming practices.

Please note, these values represent data from a single season (2013/14), rather than a long-term average of farm input/output data. In future, we will report a rolling average, rather than single year estimates from OVERSEER.

As a predictive model, OVERSEER outputs are sensitive to variation in input data and analysis protocols. It would be inappropriate to compare these numbers with other values generated for different purposes, as data input and analysis protocols may differ.

MANAGING PHOSPHORUS LOSS RISK

Stock exclusion from waterways, ensuring crossings are bridged/culverted, effective riparian management, and good practice effluent management are all important in mitigating Phosphorus (P) loss risks on farm. These areas are all covered under separate Accord commitments. Other farm practices that can influence P loss risk include management of tracks and races and wintering practices (including cropping).

DairyNZ is investing in several research programmes to improve environmental performance during the critical winter period. For example, the Southern Wintering Systems programme has been intensively monitoring six Southland farms over the last three years to guide farmer decision-making around wintering. DairyNZ is also investing in projects to reduce fertiliser run-off on the West Coast and improve environmental performance associated with winter forage crops in the Waikato.

INVESTMENT IN RESEARCH & DEVELOPMENT TO IMPROVE NUTRIENT MANAGEMENT

In 2013/14, DairyNZ invested \$10 million in environmental initiatives and a further \$18.4 million in research and development. Major environmental initiatives included the rollout of Sustainable Milk Plans to 700 farmers in the Upper Waikato River catchment. Key research programmes relating to improving nutrient management included the 'Forages for Reduced Nitrate Leaching' project (see page 18). Pastoral 21 research on profitable farm systems with a low nutrient footprint is also a major project.

A new guide, *Nutrient Management on Your Dairy Farm*, was published by DairyNZ in 2013. It provides farmers with guidance on improving nutrient use efficiency and increases understanding of nutrient cycling in farm systems. DairyNZ has also produced a good management practice guide to reducing nutrient loss. It can be found on the DairyNZ website www.dairynz.co.nz (see page 19).

NUTRIENT MANAGEMENT ADVISER CERTIFICATION

There are currently (1 December 2014) 78 rural professionals certified under the Nutrient Management Adviser Certification Programme (www.nmacertification.org.nz) with a further 56 advisers in the process of obtaining certification. As at May 31 2014, 50% of nutrient management advisers in fertiliser companies Ravensdown and Ballance had been certified.

The Fertiliser Association of New Zealand is a 'Supporting Partner' under the Accord. It delivers the certification programme for nutrient management advisers. This includes a programme of continuing professional development that ensures that advisors grow their knowledge and skill and keep up to date with nutrient management science and practice.

50% of Fertiliser Association of New Zealand member company nutrient management advisers are certified by 31 May 2014



ACHIEVED



Forage systems to reduce nitrate leaching

Canterbury farmers are participating in a research programme led by DairyNZ to develop profitable solutions that reduce nitrate leaching.

The six-year programme 'Forages for Reduced Nitrate Leaching' aims to reduce nitrate leaching losses by 20 percent by delivering proven, adoptable and profitable pasture and forage crop options.

Dairy, arable (crop) and sheep and beef farms are involved in the cross-sector project which is focusing on three areas – alternative pasture species, crops and farm systems.

Alternative pasture species

Experimental research is underway on crop and pasture species now available to farmers and initial results can be expected within a year.

Alternative pasture species with lower Nitrogen (N) content, cool-season growth or which are deeper rooting (including chicory, plantain, Italian ryegrass and lucerne) are being compared for yield, N uptake and plant characteristics, such as N content.

Crop and pasture management

The effect of management on crop and pasture yield and quality is also being investigated, which includes irrigation, grazing, fertiliser application, crop establishment, crop rotations and effluent management.

The research will look at how management can improve the plant N uptake from the soil and reduce surplus intake of N by grazing animals, ultimately reducing N excretion and nitrate leaching.

Farm systems

Another focus involves co-developing farm systems that incorporate new mitigation options developed through the programme.

Research results will be built into plant, animal and farm system models (such as the DairyNZ whole farm model) to test scenarios and new mitigation options will be demonstrated on-farm.

Farmer participation

A network of monitor farms in Canterbury has been established, with farmers selected through regional field teams within the industry.

The group consists of farmers who are keen to adopt new ideas, have an interest in sustainability and a long-term commitment to their farm.

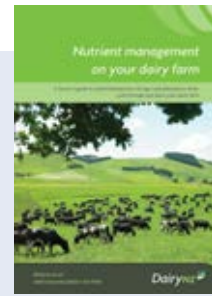


A DairyNZ 'Guide to Responsible Conversions' has been published for farmers. Three regional riparian planting guides have also been produced. Last season farmers requested over 16,000 environment – related resources from their industry body DairyNZ.

Guide to Nutrient Management on your Dairy Farm

Designed to help farmers identify ways to improve nutrient management, the guide covers how Nitrogen (N) and Phosphorus (P) can be lost into water, highlights high-risk areas and provides tools to help measure, manage and improve nutrient use and reduce Nitrogen leaching.

Download or order your copy at dairynz.co.nz/nutrientguide



CASE STUDY

Farmers investing in the environment

Tararua dairy farmer Russell Phillips says farmers are actively working at ways to maintain and improve the environment.

“A benefit of being able to maintain milk production is the added ability to invest capital in good environmental systems,” says Russell.

“Dairy farmers have done a lot to reduce their environmental impact and we are continually looking at ways we can improve our systems. Farmers have fenced waterways to exclude stock, done riparian planting and upgraded effluent systems where needed. These are all big investments in the environment and the sustainability of their farm.

“There are no effluent discharge points in the Horizons region – so we have no effluent running into waterways. Urea usage is being planned more efficiently and farmers are looking at different ways to reduce nitrogen leaching.”

Russell says that farmers are taking advantage of the science that is continually evolving, providing ways to farm smarter.



Effluent Management

EXPECTATIONS:

- Dairy farms will comply with regional council effluent management rules and/or resource consent conditions
- Effluent systems installed on dairy farms will be fit for purpose and able to achieve 365-day compliance with applicable rules

EFFLUENT SYSTEM ASSESSMENT & GUIDANCE

All dairy companies have programmes in place to assess the effluent systems of suppliers on a three-yearly basis, with several companies assessing every farm every year. There is varying data on effluent systems and although we have not been able to fully validate the requested data, we can confidently say that dairy companies have programmes designed to identify risks and drive better performance. Three dairy companies have reported 100% of farms assessed in the three-year period to 31 May 2014, with the aggregate figure across all dairy farms estimated as 99% (unverified).

100% of farms are being assessed for effluent management by 31 May 2014



NOT YET
ACHIEVED
(99%)

DairyNZ, along with industry partners (e.g. the Institution of Professional Engineers NZ – IPENZ) have developed a suite of standards, guides and tools with the aim of increasing capability within the farm dairy effluent (FDE) industry and providing greater certainty and security for farmers investing in effluent system upgrades. These systems include the FDE Design Standard and Code of Practice (published in 2012), IPENZ Practice Note 21: FDE Pond Design and Construction (published 2012) and the Dairy Effluent Storage Calculator (Massey University).

ACCREDITATION OF EFFLUENT SYSTEM DESIGNERS

There are currently 20 companies accredited for effluent system design, four under assessment and a further eight preparing applications. Interest and awareness of the programme is high, with other stakeholders such as dairy companies and regional councils increasingly recommending accredited companies.

The list of accredited companies can be found at www.effluentaccreditation.co.nz. Three companies have applied and failed accreditation but are not listed for commercial reasons. There are also several companies that are now into the second round of accreditation, as the programme has been running for over two years.

Many of the companies accredited have a significant presence in their regions but there are gaps in Northland, Taranaki and Canterbury where more accredited companies are needed.

To gauge the level of uptake by farmers a survey was undertaken with 72 effluent service companies. These include designers, installers and manufacturing/sales supply companies from around the country.

Survey results indicated good support for the FDE code of practice (95% rated the code as either 'extremely relevant' or 'quite relevant'), the training courses and the accreditation programme, with many companies indicating they are preparing their accreditation application. The overall impact of the dairy industry's effluent improvement programmes on farmer motivation to change was considered very positive (80% agreement).

PROFESSIONAL TRAINING PROVIDED

There are a number of training courses on offer to the effluent services industry and other rural professionals (Table 2). As of 31 May 2014, 571 effluent industry professionals had attended training courses provided by several institutions. For example, 189 professionals have attended the New Zealand Water and Environment Training Academy (NZWETA) Pond Design and Construction course since its inception in 2012.

Table 2. Training courses on offer to the effluent services industry and other rural professionals.

Training	Date first offered	No of courses run*	Attendees*
Massey Farm Dairy Effluent Systems Design and Management	2011	7	173
NZWETA Pond Design and Construction	2012	16	189
MPTA FDE Hydraulic Design	2012	14	88
NZWETA Dairy Effluent WOF	2014	3	45
Dairy Effluent Storage Calculator Training (run by DairyNZ)	2012	4	76
Total 31 May 2014			571

*Information provided to DairyNZ from course providers. We have not sought to verify these numbers.

The Primary Industry Training Organisation runs two industry-designed effluent management courses for farm staff (Dealing with Dairy Effluent and Effluent Management Programme). They report 247 course completions in the 2013/14 year.

EFFLUENT WARRANT OF FITNESS

The Dairy Effluent ‘Warrant of Fitness’ (WOF) has been developed by DairyNZ as a voluntary programme to help farms obtain an independent assessment of their effluent system. The Farm Dairy Effluent (FDE) Warrant of Fitness has already been incorporated into some dairy companies’ environmental management systems and is being discussed with some regional councils as a voluntary addition to existing compliance assessments.

A Farm Dairy Effluent Warrant of Fitness scheme is available as a tool for farmers by 31 May 2014



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Details on the Warrant of Fitness can be found at www.effluentwof.co.nz. There are currently 14 certified ‘WOF’ Assessors available to run through the assessment with farmers.

RATES OF SIGNIFICANT NON-COMPLIANCE

Every regional council undertakes annual monitoring of farm dairy effluent systems and management practices in relation to a range of permitted activity rules and consent conditions (see Appendix 1 for monitoring regimes). In the 2013/14 season the rate of significant non-compliance (SNC) on monitored farms at the national scale was estimated at 7%. Rates of SNC do vary widely between regions as shown in Figure 1. Highest rates of SNC were in

Northland (20%). Greater Wellington and Tasman regions had the lowest at zero percent. To some extent this may reflect the different approaches taken by councils in monitoring effluent systems and their definition of SNC.

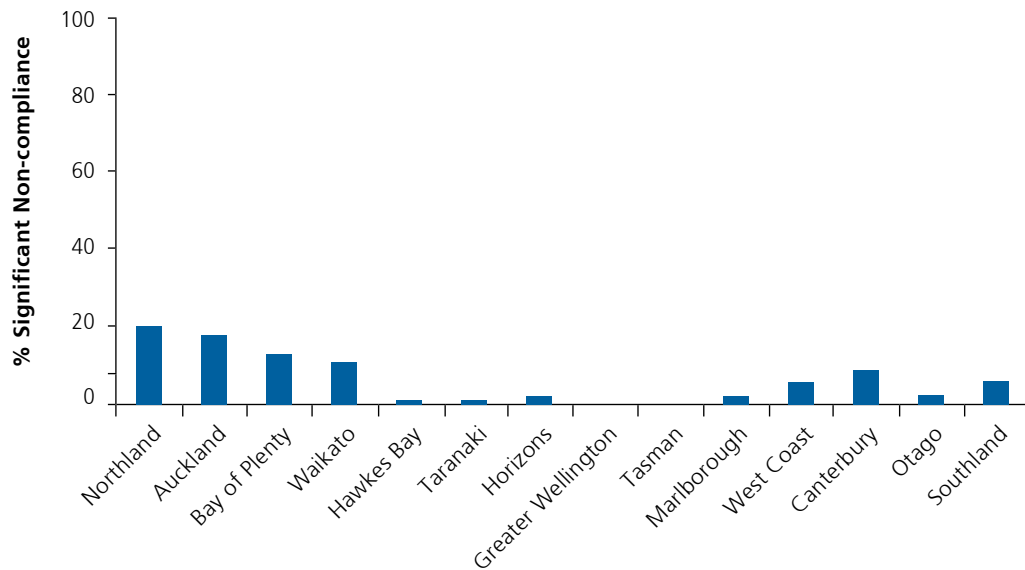


Figure 1. Summary of regional council reported rates of significant non-compliance.

The main reasons given for SNC included inadequate storage facilities (e.g. ponds with insufficient freeboard or over-flowing) and excess irrigations leading to ponding of effluent. Note that SNC relates to the date of inspection. It does not necessarily mean farms are able to comply with rules and consent conditions 365 days of the year. For this reason the dairy industry has implemented effluent system assessments and the Warrant of Fitness to complement the annual monitoring by councils.

Details of the effluent monitoring programmes undertaken by regional councils are given in Appendix 1. These details have been provided by the regional councils and we have not sought to verify any of these numbers.

CASE STUDY

Improving water quality – Northland

In Northland, the community is significantly improving water quality in the Mangere catchment, winning a 2014 NZ Rivers award for most improved river in a region.

Ranked poorest regionally for many water quality indicators in 2006/2007, Northland Regional Council monitored the Mangere River over the next four years.

In the past year, DairyNZ has used the council data to show improving trends in water quality. DairyNZ’s water quality specialist Tom Stephens says now the community is defining its desired water quality.

The 8200ha catchment has 19 dairy farms. Since 2007, many farms have excluded stock from waterways and upgraded effluent systems, which has improved water quality. Median concentrations of E.coli have decreased by 14 percent on average each year since 2007, which is associated with upgrades to 17 of the 19 dairy farm effluent systems in the catchment.

DairyNZ catchment leader Helen Moodie is working with farm consultants implementing Sustainable Milk Plans for dairy farms, with tasks to reduce sediment loss and increase stream oxygen levels.



Riparian planting underway in the wider Mangere catchment.



Water Use Management

EXPECTATIONS:

- Dairy sheds will use no more water for wash down and milk cooling than that necessary to produce hygienic and safe milk
- Irrigation systems will be designed and operated to minimise the amount of water needed to meet production objectives

WATER METERING ON DAIRY FARMS

Reporting on the installation of water meters on farm is not required until the 2014/15 season, but even so, farmers have been proactive on this front and it is worth noting progress made. One dairy company reported that 48% of their farms had water meters installed, although this is unverified at this stage. Another company noted that 30% of suppliers in 2013/14 had water meters installed, and this excluded irrigation water users, whose water metering requirements are covered by regional council rules.

85% of all dairy farms to install water meters by 2020



IN PROGRESS

DairyNZ is funding a three-year water use study on over 100 dairy farms in Canterbury (32 farms), Manawatu (24 farms) and Waikato (52 farms). This study is being done in conjunction with Massey University, with support from Horizons Regional Council. Data from the first 59 farms was collected during the 2013/14 season. Preliminary results of this trial (2014/15 data) will be reported in the 2015 Accord report.

TRAINING, CERTIFICATION AND ACCREDITATION

IrrigationNZ is a 'Supporting Partner' under the Accord. It coordinates training and development activities for irrigators and the irrigation service sector. All irrigated dairy farms have had meters for irrigation installed since 2012, due to 2010 regulations. IrrigationNZ also runs an accreditation programme called 'Blue Tick' that is now widely adopted by regional councils.

169 people attended Irrigation Operator and Manager Training and Irrigation Development Training courses run by IrrigationNZ in 2013/14. A total of nine courses were run throughout New Zealand (Pukekohe to Cromwell).

One Canterbury irrigation company has been accredited for irrigation design and two professionals in the irrigation industry received certification as irrigation designers in 2013/14.

DairyNZ continues to support and promote the 'smart water use on dairy farms' programme. DairyNZ ran 10 MilkSmart events in 2013/14 that incorporated smart water use. There were over 1300 participants at these events.

CASE STUDY



Upper Waikato Sustainable Milk Project

The 700 dairy farmers between Huka Falls and Karapiro Dam are helping improve the Waikato River's water quality by developing Sustainable Milk Plans.

Through the Upper Waikato Sustainable Milk Project, dairy farmers are ticking off more than 4,700 actions which contribute to better water quality.

The project is now being expanded to the 850 farmers of the Waipa River.



Conversions

EXPECTATIONS:

- New dairy farms establish and operate using good practice at the outset to minimise potential negative consequences on water values and interests
- New dairy conversions will comply with all relevant regional plan rules and/or hold all necessary resource consents

Every dairy company has programmes in place to assess new conversions, with a range of requirements to be met before milk supply commences. Usually, this includes a trained company assessor visiting the farm and running through a pre-supply check procedure, and developing an environmental management plan to ensure all requirements are met. In some cases, short-term dispensations may be granted for a transition period.

DairyNZ has developed a *Guide to Responsible Conversions*. Written for farmers and rural professionals working on new conversions, this guidance is available at www.dairynz.co.nz. The guide also links farmers and their advisors to a wide range of other useful tools and resources developed by DairyNZ.

Compliance with standards for conversions from 2013/14 season.

Good practice obligations published by DairyNZ by 31 May 2014.



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CASE STUDY



Farmer action in Southland

In 2011, the Waituna lagoon in Southland made headlines for declining water quality and the need to reduce Nitrogen and Phosphorus loading. Since then, the catchment's 48 dairy farmers have reduced their farms' effects.

DairyNZ water quality specialist David Burger says more recently, the focus has been on science.

"There are still a lot of gaps in our understanding, as it's complicated by differences in soil type, high land use intensity and the water level management," says David.

"This year, we've been looking at 11 key aspects – from understanding nutrient loss processes and modelling nutrient loads, to a wetland study."

A catchment model is quantifying the total nutrient footprint. "This will help us evaluate the collective impact of different mitigation strategies."

The science and economic studies, finishing now, will feed into a catchment-wide plan where water quality meets community expectations, while keeping farm businesses viable.

What farmers think about it

"We have made a few farm changes – a concrete silage pad, a skip for rubbish, disposing properly of silage plastics, bulk fertiliser applications GPS recorded and using a soil moisture probe for effluent management," says Raewyn van Gool, who employs 50:50 sharemilkers on their 145ha, 415 cow farm at Waituna.

"Farmers have really taken ownership of it. They have been supportive of what's happening and often take initiative to do things before they have to. It has been good seeing how the community has come together. There's a really co-operative spirit."



Waituna Lagoon in Southland.

Appendix 1: Effluent significant non-compliance data supplied by regional councils and unitary authorities for the 2013-14 season.

Region	Total farms	No of farms monitored	Description of monitoring programme	Significant non-compliance	Main reasons for non-compliance
Northland	966	966	Non-notified visit to every farm every year. Samples taken of all discharges. All visits done between mid-August and Christmas each year. Follow-up visits to all significant non-compliant farms – by appointment. Approximately 710 consented farms and 260 non-consented farms.	20% (overall) Nb. 16% for consented farms and 29% for non-consented farms	<ol style="list-style-type: none"> Inadequate management (e.g. broken/blocked pipes, sump overflow). Consented farms – water quality results outside consent limits. Untreated effluent discharge to water (entry/exit races, feedpad, underpass). Effluent irrigation – excessive ponding, overland flow or discharging to water. No or inadequate contingency storage.
Auckland	~290	161	Targeted based on high risk farms (i.e. bad compliance history, no pond storage etc) and 50% of all others.	18%	<ol style="list-style-type: none"> Pond is too full or overflowing Effluent is observed at outlet of stormwater diversion Stockpiled effluent (large amounts or with runoff to waterway) Pond observed to be seeping Pond is discharging (via old outlet pipe)
Bay of Plenty	~680	343	Unannounced visits. All sites are inspected between 1 and 3 yearly, depending on previous compliance history and type of disposal system.	13%	<ol style="list-style-type: none"> Pond(s) full- breaching consent free board limit Ponds overflowing Effluent irrigation causing bad ponding and /or runoff to water Effluent observed discharging through the storm water diversion system Feedpad not authorised by consent

Waikato	~4248	812	See below	See below.	11%	See below.
	Permitted Activity only ~4000	636	Targeted based on high risk soils (for irrigation)	1. Over-irrigation causing ponding or runoff. 2. Discharging or overflowing effluent holding ponds.	9%	
	Consented discharge only 278	176	50-75% of consented farms monitored each season and additional targeted monitoring to previously significantly non-compliant farms.	1. Discharge quality standard of 100 g/m3 for BOD5 and SS exceeded. 2. Lack of stormwater diversion from the dairy yard, roof, surrounding catchment of ponds. 3. Failure to desludge effluent treatment ponds on a regular basis.	15%	
Hawkes Bay	80	80	Visit notified in advance (follow up visits of non-compliance notified morning of visit). Annual aerial monitoring.	Discharge to water.	1% (one farm)	
Taranaki	1781	1781	Inspection round starts on 1 July and ends on approximately 31 March. We inspect all farms annually with oxidation pond discharges sampled every second year.	1. Ponding from an irrigator. 2. Oxidation pond discharges (from sampling). 3. Unauthorised discharges to water (overland flow from irrigators, holding pond overflows or first oxidation ponds overflowing).	1%	
Horizons	922	922	All farms monitored	Overflowing storage, ponding issues and solids management.	2%	
Greater Wellington	176	176	All farms monitored. 'Unannounced' visits (no more than 1 hour notice given).	N/A	0	
Tasman	147	147	All farms monitored	N/A	0	
Marlborough	62	62	Pre-inspection letter sent to all farmers prior to milking season. Appointments made with all farmers.	1. No contingency measures in place – little or no storage, ponds full. 2. Poor management of travelling irrigator resulting in ponding of effluent / runoff to water. 3. No notification of discharges, effluent log books not on display. 4. Effluent system design certification not received.	2%	

Region	Total farms	No of farms monitored	Description of Monitoring programme	Significant Non-Compliance	Main reasons for non-compliance
West Coast	391	270 for the 2013-14 Season	<p>All farms with a discharge to water consent (from treatment ponds) must be visited annually.</p> <p>PA (permitted activity) farms are visited according to their compliance rating from the last season. If the farm was non-compliant the year before it will continue to be visited annually (or more often dependant on the issues) until Council is satisfied all the issues that made the farm non-compliant have been addressed.</p> <p>If PA farms are continually compliant then you will only be visited once every 2 years.</p> <p>Some farms will be rated as high risk (usually due to poor infrastructure or management) and will be monitored more frequently.</p>	22 out of 391 = 5.63% SNC	<ol style="list-style-type: none"> 1. Non-compliant sampling results from treatment ponds. 2. Stock underpass issues. 3. Non consented discharges to either ground or water. 4. PA farms storage requirements.
Canterbury	1100	1093 (7 farms were not operational during the season).	<p>All farms that were operational within the season were visited. The visits are made unannounced. Although a phone call is made 15 minutes beforehand to contact the most senior person on site. If a farm is significantly non-compliant they are re-visited until they are compliant.</p>	8.8 %	<p>The causes of non-compliance are in the following order:</p> <ul style="list-style-type: none"> - Ponding of effluent or exceeding the application rate was by far the main cause of non-compliance (over 60% of non-compliant consents). - The number of cows (or volume of undiluted effluent). - Overflow of effluent from storage ponds. - Storage ponds not meeting requirements. - Farms not operating in accordance with management plan. - Discharging of effluent outside of consented area.

Otago	435	435	One annual inspection for every farm, with follow-up inspections conducted for non-compliance until dairy is compliant.	2.3%	Discharge of effluent to land that entered water, and ponding of effluent from irrigator.
Southland	884	884	Farms have a number of inspections allocated to them (normally 2 per farm), some farms have more inspections this can be due to receiving environments, compliance history etc.	6.0%	<ol style="list-style-type: none"> 1. ponded effluent 2. effluent entering waterways 3. mismanagement of effluent systems 4. technical consent non-compliance

Auditor's statement

Telarc SAI Ltd carried out an independent audit of the 2013/14 Sustainable Dairying: Water Accord in accordance with the Telarc SAI Ltd standard operational procedures which comply with the requirements of ISO 17021.

Telarc SAI Ltd was engaged to assess DairyNZ and five dairy companies against two Audit Standards (the Sustainable Dairying: Water Accord Audit Standard Dairy Company Requirements v.7, May 2014 and the Sustainable Dairying: Water Accord Audit Standard DairyNZ Requirements v.5, April 2014). The audit occurred between September and November 2014 and involved site visits with 'Accountable Partners' and farm visits to verify the data that was provided to dairy companies for Accord reporting purposes.

The audit report identified two key recommendations.

Key recommendation 1: It is recommended that the Dairy Environment Leadership Group (DELG) bring forward the first of the five-yearly reviews of the Accord (currently scheduled for 2017) in order to address a variety of Accord interpretation requirements by dairy companies and/or that agreement is sought between the 'Accountable and Supporting Partners' in the interpretation of all aspects of the Accord requirements.

Key recommendation 2: It is recommended that the Audit Standards are reviewed and fully aligned with both the monitoring and reporting requirements of the Accord, as well as the other measures that the Accord requires of DairyNZ and dairy companies.

In addition, the audit report details observations where the current activities of the participants did not meet the requirements of the Audit Standard (DairyNZ requirements) v5, April 2014 or the Audit Standard (dairy company requirements) v7, May 2014. These observations were reported against the individual sections of the audit standards. There are also recommendations in the Audit Report relating to the development of procedures and processes relating to Accord reporting requirements. These observations and recommendations should be read within the context of the whole report.

To read a full copy of the Audit Report for 2013/14, go to www.dairyatwork.co.nz

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