

CHAPTER 1

# SUSTAINABLE DAIRYING



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## 1.0 SUSTAINABLE DAIRYING

Sustainable dairying occurs when there is a balance between social, economic and environmental goals. New Zealand dairy farmers are innovators in applying environmentally friendly practices and pursuing new technologies as their businesses and ultimately their livelihood depend on their dairying practices being sustainable. Dairy farming will not be sustainable if natural resources are degraded to boost farm income; nor is dairy farming sustained if economic and environmental pressures make it unfeasible to farm profitably.

Agricultural exports are a substantial contributor to New Zealand's GDP, sixty five cents of every dollar earned overseas is from agricultural produce. The dairy sector contributes 20% of New Zealand's exports and 7% of GDP. A feat made more remarkable by the fact that farmers represent fewer than 4% of the population.

Environmental degradation impacts on plants and animals living in waterways and on the land. It can have health impacts on people and restrict their recreational activity, food gathering and aesthetic pleasure in the landscape. Polluting land and water can also compromise Maori cultural and spiritual values. All of these factors may bring society's pressure to bear on the dairy industry and other land users.

The dairy industry has shown leadership in developing the Dairy Industry Strategy for Sustainable Environmental Management, with its vision of "enjoyable, profitable dairy farming that looks after the environment for future generations of farmers and the wider New Zealand public. Dairy farming is an attractive and respected land use in pastoral environment."

Visual images seen by the public are important for the reputation of dairy farming. Cows in waterways, cows in mud and dead cows have all been identified as 'negative' sights for visitors, while 'positive' sights include well fed cows, green grass and clean rivers. These positive images are the backdrop for successful product marketing campaigns and it is in the interests of all farmers to continue to project a positive image. As stated in the Dairy Industry Environmental and Animal Welfare Policies: "Leveraging New Zealand's positive environmental image adds value to our products and therefore puts dollars in farmers' pockets. But the more successful the strategy is, the greater the risk of it being undermined by bad environmental or welfare practice." Domestic pressure can be a more significant influence than international market demands.

This calls dairy farmers to maintain high standards for:

- food safety (e.g. uncontaminated soils and high water quality for stock health and dairy hygiene and milk fit for purpose),
- animal welfare (e.g. shade and shelter) and
- responsibility and care for the environment (e.g. dairying landscapes with healthy rivers flowing through them and habitat provided for native species).

In New Zealand, the Resource Management Act (1991) is the main piece of legislation seeking to address the effects on the environment of economic activity, including farming.

Under the RMA, councils manage the effects of activities on natural resources, including pollution or discharges, and depletion or deterioration of natural resources.

Pollution or discharges can occur from a 'point source' such as an effluent pond discharge or feed pad. Examples of point source pollution on a dairy farm include:

- concentrated effluent reaching a waterway and releasing toxic ammonia and organic matter that needs to be broken down by micro-organisms, taking oxygen out of the water and impacting on stream life
- leakage or spills of fuel oil or pesticides near a bore or well causing contamination of the groundwater aquifer.

Point source pollution is more easily addressed by regulatory approaches such as dairy effluent discharge rules.

'Non-point source' pollution is diffuse and does not originate from a single identifiable source or event. In the case of dairy farming, this may be:

- runoff from paddocks, carrying faeces, urine, soil, fertiliser, or pesticide residues into surface waterways or through the soil to groundwater
- contaminants that arise from farm inputs such as fertilisers, pesticides and animal remedies building up in the soil over time
- discharges to the air of greenhouse gases from stock or soil that can have a cumulative effect on the global climate.

Non-point source pollution can be difficult to regulate as it is not often visible or measurable, and generally is a cumulative impact of everyday farm activity. However, by following best management practices as outlined in this manual, this type of effect can be minimised.

Depletion or deterioration of natural resources can also result from farm activity. For example:

- soil quality may deteriorate under intensive stock and machinery pressure
- topsoil may erode and be lost from productive use
- wetlands that are drained or bush cleared, can affect habitat values and catchment protection processes such as flood mitigation
- energy use can deplete reserves of non-renewable resources such as fossil fuels and fertilisers.

Any intensive use of land, such as dairy farming, will have some impact on water, air, soil and natural habitats. Finding the balance between successful dairy production and the degree of impact that may be acceptable to society is the key to achieving sustainable dairying.

Sustainable dairying will minimise the contamination of water, air and soil, preserve and enhance natural habitat and make wise use of scarce resources. The official definition of sustainable agriculture adopted by the Ministry of Agriculture and Forestry is: "... the use of farming practices which maintain or improve the natural resource base of agriculture, and any parts of the environment influenced by agriculture. Sustainability also requires that agriculture is profitable; that the quality and safety of the food, fibre and other agricultural products are maintained; and that people and communities are able to provide for their social and cultural well-being."

There are many positive spin-offs for farmers in implementing sound environmental management, including:

- efficiencies in nutrient, energy and water use, saving money on big-ticket farm expense areas
- continued productivity when soil quality is maintained
- stock safety and ease of shifting stock when waterways, swamps, bush and steep gullies are fenced out
- greater returns through inputs being focused on easier land when more marginal areas are fenced and planted
- less ongoing maintenance and fix-up costs when earthworks and structures are designed and built well from the start
- personal satisfaction and a more pleasant working landscape resulting from environmental improvements.

These benefits underscore the importance of sound environmental management to farmers and farm staff, farm families and rural communities.

Dairy farmers are much more conscious of current environmental issues and best management practices than in the past, compared with many other industries.

Farmers will find their own best practice solutions and design systems to meet their financial, economic, and family goals. The practices and information in this manual provide a set of up-to-date guidelines to support this.

## 1.1 TRENDS IN DAIRYING AND THE ENVIRONMENT

Dairy farming has been expanding nationally in recent years. The amount of land used for dairy farming in New Zealand increased by 12% between 1994 and 2002. The number of cows in the country increased over the same period by 34%, and the average stocking rate (dairy cows per ha) by 19%. Milk solids production volume grew an impressive 50% in the same period, with per hectare production rising 34%.

Part of this increase was undoubtedly due to a rapid rise in N-fertiliser use, with urea use per hectare up 162% between 1996 and 2002.

At the same time, land under irrigation has been steadily increasing.

Energy use increased by 30% in the farming sector between 1992 and 2002, even without considering the increase in energy-intensive N fertiliser use.

These figures indicate that dairy farming has become more intensive. But research has shown that high-input farms are not always high-profit farms and as the intensity of farming increases, environmental pressures also become more critical. High-input systems consistently have greater environmental emissions of N and greenhouse gases, and the greatest energy consumption (both on a per hectare basis and on a per kg of production basis). High-input systems are also most vulnerable to increases in energy, feed or fertiliser costs.

The expansion of dairying brings in important overseas earnings (19% of our merchandise exports in 2002) and creates employment both on-farm and in the processing industry. It can also have many positive flow-on effects as it boosts economic and social activity for local communities in dairying areas.

However, with increasingly intensive land use, soil and water health can deteriorate, and as dairying expands into non-traditional locations, there may be risks of:

- damage to soils, especially when dairying expands onto less robust soil types,
- drainage of remnant wetland habitat, and
- competition for scarce water resources.

There are environmental indicators that are cause for concern including:

- nutrient levels in waterways causing algal growth and reduced water clarity
- surface water bodies reaching 'fully allocated' status
- ground water quantity and quality
- faecal contamination of lowland waterways and estuaries
- soil quality affected by compaction under intensive land use
- traces of cadmium from phosphate fertiliser building up in soils
- wetland and lowland forest loss
- greenhouse gas emissions

Dairying is by no means the the only contributor to these effects, but where dairying is a significant land use, widespread adoption of best management practices can help to address these issues.

This means that it is important that the industry takes action to address environmental impacts, to protect soil and water that form the basis of production, and to assure the New Zealand public and overseas markets that dairy farming is environmentally responsible. Some impacts (such as groundwater pollution or climate change) have a time lag effect, meaning that action is needed now to prevent further decline in the future.

## 1.2 INDUSTRY, COMMUNITY AND GOVERNMENT RESPONSES

The dairy industry has recognised the importance of managing the farm environment. A Dairy Industry Strategy for Sustainable Environmental Management has been prepared, with targets for progress to be made on three fronts: Leadership and Engagement, Research and Action. The strategy identified key issues for the dairy industry in relation to the environment. The aim of the strategy is to see voluntary adoption of best practice by farmers, allowing on-farm flexibility in addressing environmental issues. The priority areas in the strategy are:

- nutrient losses of nitrogen and phosphate to water
- microbial contamination of surface water
- availability of water for dairying
- continued contribution to the Pastoral Greenhouse Gases Consortium.

This Strategy incorporates the targets from the Dairying and Clean Streams Accord, an agreement signed in 2003 between Fonterra, Regional Councils, the Ministry for the Environment and the Ministry of Agriculture and Forestry. The Accord identified key issues and defined targets for implementing best management practices on farms. The performance targets specified in the Accord are:

- exclude dairy cattle from 50% of streams, rivers and lakes and their banks by 2007, and 90% by 2012. (A stream is defined as deeper than a 'Redband', wider than a stride and permanently flowing)
- 50% of all regular crossing points to have bridges or culverts by 2007, 90% by 2012
- all farm dairy effluent discharges to comply with resource consents and regional plans
- all dairy farms to have systems to manage nutrient inputs and outputs in place by 2007
- 50% of regionally significant wetlands to be fenced by 2005, 90% by 2007.

Some Regional Councils have introduced related rules through their Regional Plans. For example, from 2006 Environment Waikato requires a nutrient management plan (basically a nutrient budget) to be used to plan fertiliser application where nitrogen fertiliser is being applied at rates greater than 60 kgN/ha/yr.

Regional Councils have also focused attention on key catchments (such as Taupo and Rotorua lakes) or over critical aquifers (e.g. the 'red' zones in Canterbury) to respond to specific issues of water quality or availability.

The effect on these sensitive areas of certain land uses or activities has focused policy attention on how such activities can be controlled and fuelled debate around the scientific basis for such policy decisions.

In addition to regulatory mechanisms, Regional Councils offer advice and promote best environmental practice. Many also provide incentives for specific environmental protection activities such as riparian fencing.

National working groups have been convened to address critical issues (such as cadmium contamination). The government and the Parliamentary Commissioner for the Environment also undertake research to highlight issues and options. Grants are available (e.g. through the Sustainable Farming Fund and Sustainable Management Fund) for projects that promote good environmental management.

In response to the increasing focus on environmental issues, community groups have arisen among farmers and other interested parties such as Landcare groups or catchment groups. These groups can identify key local issues and take on action projects, or support landowners to take action (e.g. by growing trees for erosion control or riparian plantings).

Networks such as the New Zealand Farm Environment Award Trust are also highlighting and promoting good farm practice as developed by farmers themselves.

Quality assurance systems have emerged from the agricultural sector, including the Market Focused approach of the dairy industry. Related industry groups have developed best practice guidelines and quality assurance frameworks such as the Fertiliser Manufacturers' Research Association Code of Practice for Fertiliser Use, Fertmark and Spreadmark.

All of this forms a solid backing for dairy farmers to proactively find on-farm solutions and ensure sustainable dairying into the future.

## 1.3 ROLES AND RESPONSIBILITIES

Regional Councils have the delegated responsibility to ensure soil, water and other natural resources are sustainably managed. They will often seek to do this through voluntary mechanisms first, but may consider regulation in certain circumstances.

With all regulation, for farmers a key concern is to retain flexibility and options within the regulatory framework. Many other developed countries have defined practices and limits on aspects of farming (e.g. maximum rates of fertiliser). However, the focus of the Resource Management Act is to manage effects, not activities themselves. The focus of the industry strategy is on voluntary adoption of best management practice.

This puts the onus on farmers to be proactive in environmental management, to understand the links between land use activities and environmental effects, and to work constructively with regulatory agencies so that a positive outcome can result.

The industry has an overall duty to protect the image of dairy farming as a sustainable form of land use, and to support farmer suppliers in achieving this.

Farmers can also carry out new developments on the farm with the community and the environment in mind. There is increasing recognition of public use of natural resources and of Maori cultural values and practices. When planning to undertake an activity, the community and local iwi may need to be consulted on the proposal.

Natural areas of special interest to iwi include:

- water quality and quantity
- fish, seafood and other food sources
- the coastal environment
- river and lake beds
- traditional and ancestral sites, including burial sites
- marae and Maori land
- cultural resources (e.g. materials for weaving and carving).

The wider community will often have a general interest in water quality and quantity, recreational use, and aesthetic or landscape values as well as any effects from odours and dust.

### 1.3.1 Local Authorities

The level of government with the major responsibility for natural resource management under the Resource Management Act (1991) is the Local Authority. In most cases the Local Authority is the Regional Council. However, when the District Council or City Council is a Unitary Authority it will carry out Regional Council functions relating to the Resource Management Act (1991) in addition to its city or district functions. The Unitary Authorities that combine these functions are Nelson, Marlborough, Gisborne and Tasman.

Regional Councils are also closely involved with District and City Councils, health authorities, Maori and community groups.

District Councils and City Councils may have specific rules regarding practices undertaken on dairy farms such as setback distances for certain activities. Therefore, farmers should contact the District Council or the City Council before proceeding with new activities or structures. They will also advise on the requirements for consultation with neighbours, iwi, local community or other affected parties.

Councils issue 'resource consents' for particular activities undertaken in their area. A resource consent is permission to undertake a specified activity. A Permitted Activity can be carried out without a resource consent from the Regional Council. Regional Plans normally reserve the Permitted Activity status for those activities that are relatively common, with minor effects. Permitted Activities are often subject to conditions. Failure to comply with these conditions means the activity then requires a resource consent.

Figure 1.3-1 shows the Regional Council boundaries and Table 1.3-2 gives the addresses and contact numbers of the various Regional Councils.

**REGIONAL COUNCIL BOUNDARIES**

**— Regional Council Boundaries**  
**Except for the following Unitary Authorities:**

- Gisborne District Council
- Tasman District Council
- Nelson City Council
- Marlborough District Council

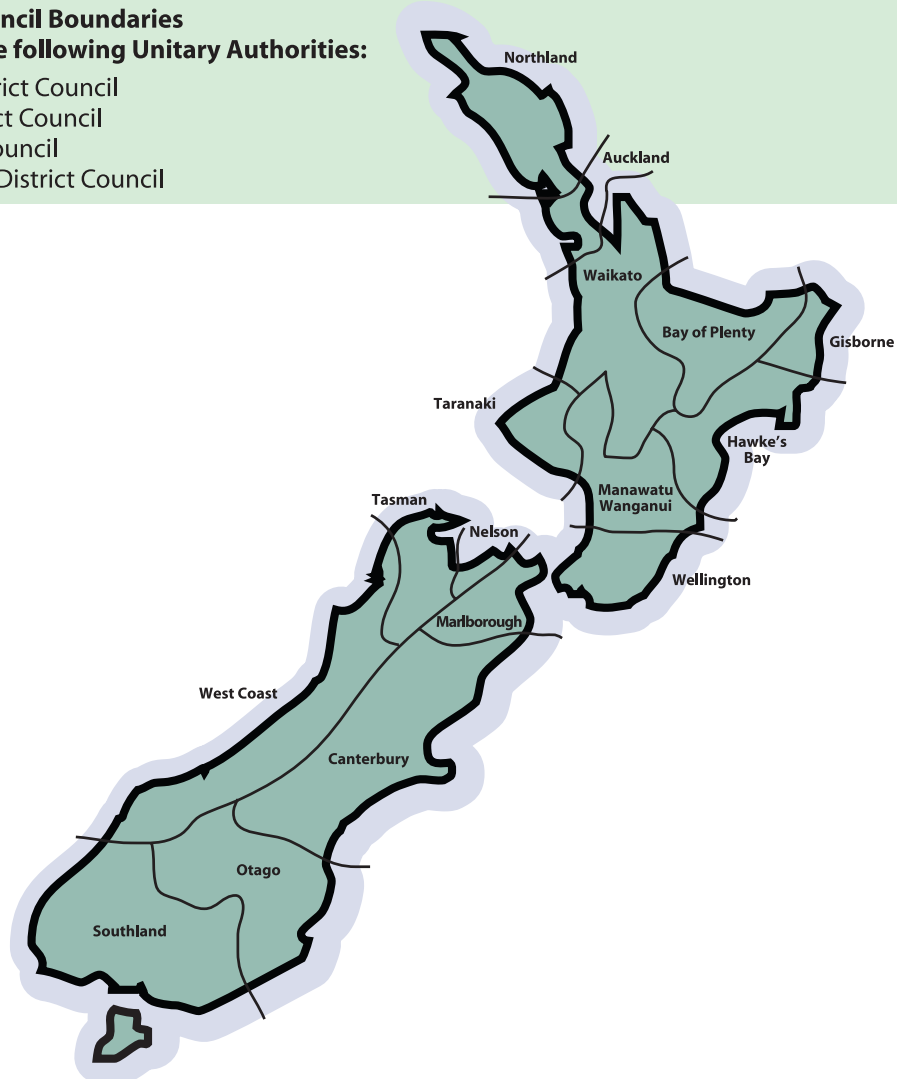


TABLE 1.3-1

## REGIONAL COUNCIL CONTACT INFORMATION

|  |  |  |
|--|--|--|
| Northland Regional Council                       | 38 Water St<br>Private Bag 9021, Whangarei 0140  | Freephone: 0800 002 004<br>www.nrc.govt.nz   |
| Auckland Regional Council                        | 21 Pitt Street, Private Bag 92912<br>Auckland 1643   | Phone: 09 366 2000<br>www.arc.govt.nz  |
| Environment Waikato                              | 401 Grey Street<br>PO Box 4010, Hamilton East 3247   | Freephone: 0800 800 401<br>www.ew.govt.nz  |
| Environment BOP                                  | Quay Street<br>PO Box 364, Whakatane 3158  | Freephone: 0800 368 267<br>www.envbop.govt.nz  |
| Gisborne District Council                        | Fitzherbert Street<br>PO Box 747, Gisborne 4040  | Phone: 06 8672049<br>www.gdc.govt.nz   |
| Hawke's Bay Regional Council                     | 159 Dalton Street<br>Private Bag 6006, Napier 4142   | Freephone: 0800 108 838<br>www.hbrc.govt.nz  |
| Taranaki Regional Council                        | 47 Cloton Road<br>Private Bag 713, Stratford 4352  | Freephone: 0800 736 222<br>www.trc.govt.nz   |
| Horizons Regional Council<br>(Manawatu-Wanganui) | 11-15 Victoria Avenue, Private Bag 11025,<br>Palmerston North 4442   | Freephone: 0508 446 749<br>www.horizons.govt.nz  |
| Wellington Regional Council                      | 34 Chapel Street,<br>PO Box 41, Masterton 5840, Wairarapa<br><br>142-146 Wakefield Street, Wellington<br>PO Box 11646, Wellington 6142 | Freephone: 0800 496 734<br>www.gw.govt.nz<br><br>Freephone: 0800 496 734<br>www.gw.govt.nz |
| Marlborough District Council                     | 15-21 Seymour Square<br>PO Box 443, Blenheim 7240  | Phone: 03 5785249<br>www.marlborough.govt.nz   |
| Tasman District Council                          | 189 Queen Street<br>Private Bag 4, Richmond 7050   | Phone: 03 5438400<br>www.tdc.govt.nz   |
| Nelson City Council                              | 110 Trafalgar Street<br>PO Box 645, Nelson 7040  | Phone: 03 5460200<br>www.ncc.govt.nz   |
| Environment Canterbury                           | 58 Kilmore Street<br>PO Box 345, Christchurch 8140   | Phone: 03 3653828<br>www.ecan.govt.nz  |
| West Coast Regional Council                      | 388 Main South Road<br>PO Box 66, Greymouth 7840   | Phone: 03 7680466<br>www.wcrc.govt.nz  |
| Otago Regional Council                           | 70 Stafford Street<br>Private Bag 1954, Dunedin 9054   | Freephone: 0800 474 082<br>www.orc.govt.nz   |
| Environment Southland                            | Cnr North Road/Price Street<br>Private Bag 90116, Invercargill 9840  | Phone: (03) 211 5115 or<br>0800 76 88 45 (Southland only)<br>www.es.govt.nz                |

## 1.4 USING THIS MANUAL TO ADDRESS ENVIRONMENTAL ISSUES ON FARM

The information in this manual can be used by dairy farmers to respond to the challenges that the current trends present and to manage environmental risks proactively.

To this end, it is wise to develop a plan for the farm property addressing aspects of sustainable dairying. The plan could follow a recording system such as the 'Market Focused' approach. It should cover the following steps:

1. Identify the important environmental issues on your farm. Use the information in this manual and talk to the Regional Council, advisors and community members with environmental expertise, and to other local farmers.
2. Develop a plan for how you are going to manage each issue. Again, actively seek information about best practice from farmers, industry extension staff researchers and community sources and decide what will work best on your property.
3. Estimate the cost involved and set realistic timeframes to achieve your goals and objectives.
4. Put your plan into action.
5. Check that you are meeting your objectives.
6. Change your plan if you are not meeting your objectives or you want to update your objectives.

Particular chapters of the manual can also be used when planning or designing specific on-farm developments (eg. riparian planting or new silage bunkers).

In addition to proactive planning for sustainable dairying, day-to-day activity should be carried out safely and all precautions followed. All farm workers and contractors should be aware of procedures for preventing or limiting environmental damage and pollution, and should be aware that everyone on the farm can be held responsible for any breaches of rules.

Advice on any of these matters should be sought from industry extension staff or independent advisors - see [www.envirodirect.co.nz](http://www.envirodirect.co.nz) for more information.

## 1.5 FURTHER READING

Dairy Environment Review Group, 2006. "Dairy Industry Strategy for Sustainable Environmental Management."

Dairying and the Environment Committee and EQUAL. "Market Focused. An Environmental Management System for New Zealand Dairy Farmers."

Fonterra Co-operative Group. "Dairy Industry Environmental and Animal Welfare Policies."

Fonterra Co-operative Group, Local Government New Zealand, Ministry for the Environment, and Ministry of Agriculture and Forestry, 2003. "Dairying and Clean Streams Accord."

New Zealand Farm Environment Award Trust, 2005. "Whole Farm Sustainability. A Guide to Sustainable Farm Management." NZFEA Trust, Hamilton.

Otago Regional Council, 2003. "Environmental Considerations for Dairy Farming in Otago". Otago Regional Council, Dunedin.

Parliamentary Commissioner for the Environment, 2004. "Growing for Good. Intensive Farming, Sustainability and New Zealand's Environment." PCE, Wellington.