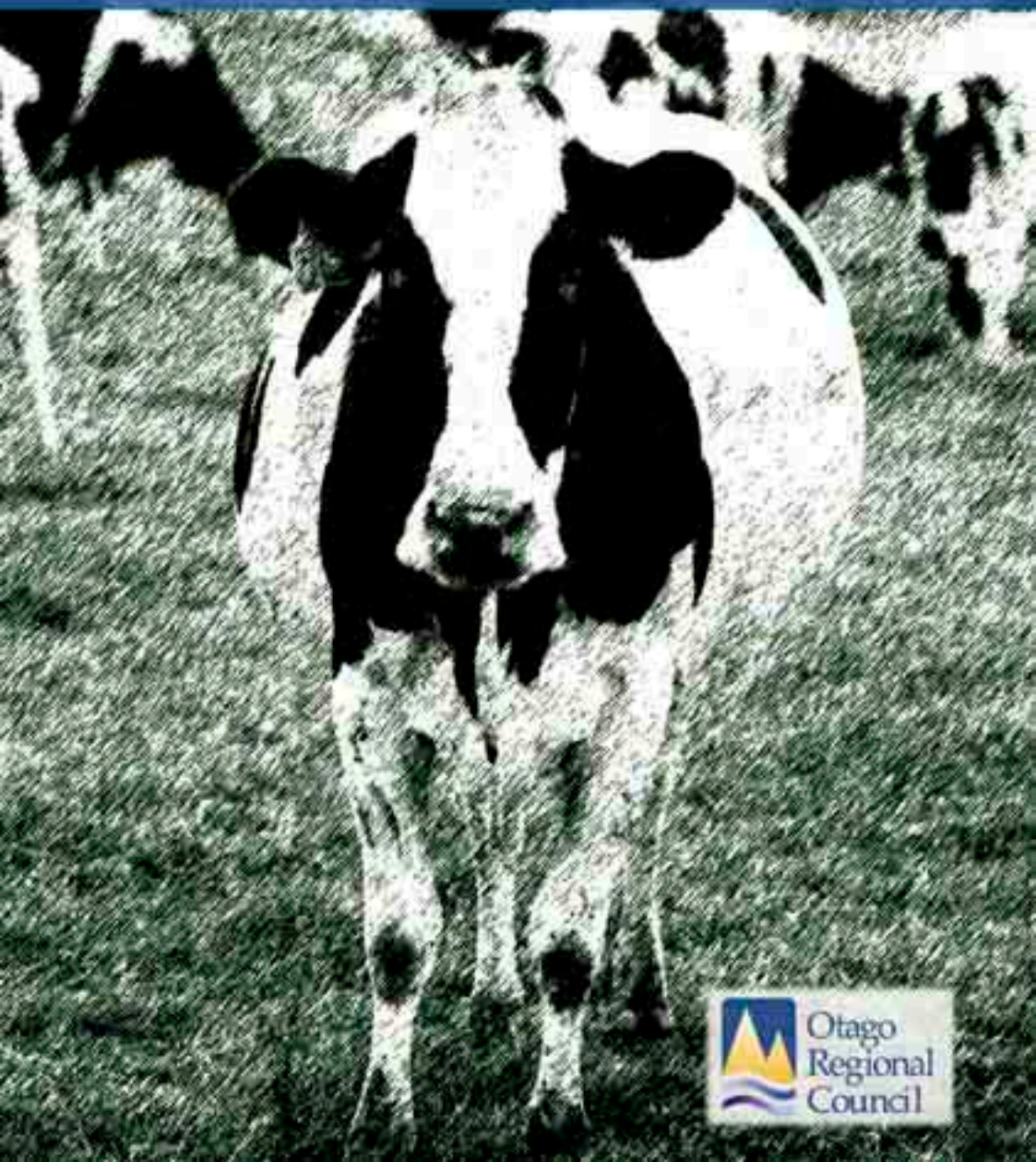


# ENVIRONMENTAL CONSIDERATIONS

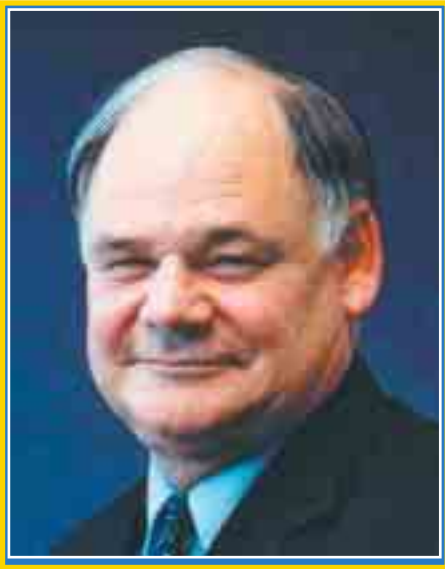
## FOR DAIRY FARMING IN OTAGO



# ENVIRONMENTAL CONSIDERATIONS for dairy farming in Otago

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## Foreword

The Otago Regional Council wants to promote sustainable and environmentally safe farming. The intensification and expansion of dairying in Otago is an important contribution to our region's economy and change to our rural environment. The Otago Regional Council has published this booklet to help farmers and the wider community get the many social and economic benefits of a successful dairy industry while also protecting and enhancing our region's land and water resources.

In support of the issues covered in this booklet, the Otago Regional Council provides an integrated package of information and regulatory services. This package includes:

- One to one advice for those considering making a dairying conversion or expansion.
- Information sharing via dairy industry, landcare and community group meetings and field days.
- Resource information on water, soils, climate and natural hazards.
- Resource consents for water use and waste discharge.

Consent compliance inspections and enforcement.

I am pleased to acknowledge the active support of dairy farmers, the dairy processing industry, community groups, environmental agencies and research groups in sharing information that has made this booklet such a comprehensive and practical reference. That this is its second edition, with some updated information, reflects its usefulness.

I urge dairy farmers and sharemilkers to promote and protect their investments and industry by following the suggestions given in this booklet.

Duncan Butcher  
Chairperson

# Introduction

Dairying is a significant land use in Otago, and as with any type of agriculture there are environmental impacts that are important to consider when managing your dairy farm.

This booklet aims to provide a convenient summary of environmental issues that may affect dairy farms. It can be part of a systematic approach for addressing environmental issues on your property. Each section looks at a potential environmental issue, management options and a summary of the rules that may affect your farming operation in Otago.

This booklet is not designed as a comprehensive manual on environmental management, but rather as a starting point to ensure environmental issues are taken into consideration when managing your operation. You can get further information from a variety of sources, including private consultants, dairy consulting officers, other dairy farmers, dairy companies, Crown Research Institutes and the Otago Regional Council.

The booklet provides a summary of rules that may apply to your farming situation, but is intended as a guideline only. You can find the complete wording for all rules in the appropriate plans available from the Otago Regional Council. Contact the Consents Administration section at the Otago Regional Council.

Some activities may require a resource consent, however many are permitted activities. Permitted activity means you are allowed to carry out the activity without the need to obtain a resource consent, provided you meet all of the conditions associated with the permitted activity. If you are going to do anything classed as a permitted activity you should check the permitted activity rules.

This booklet does not cover issues that are affected by plans produced by your City or District Council.



# Managing environmental risks

Planning is the key to managing environmental risks on the farm. Environmental management should not be thought of as something else to do after other aspects of your farm management have been completed. You can apply basic management procedures to environmental issues just as you would do to financial management.

Work through the issues in a logical manner and develop a written plan for environmental management on your farm. This could be a plan written up in your farm diary or one of the complete environmental management systems that are now available for farmers. The basic steps will be the same.



Beetlebanks, creating good habitat for beneficial insects

## Steps to develop a plan for your property:

1. Identify what the important issues are on your farm. Talk to the Regional Council, consultants, or other farmers to help with this.
2. Develop a plan for how you are going to manage each issue.
3. Set realistic timeframes to achieve your goals and objectives.
4. Estimate the cost involved.
5. Put your plan into action.
6. Check that you are meeting the objectives.
7. Change your plan if it is not meeting your objectives or if you want to update your objectives.

# Biodiversity

Biodiversity is a word we are going to hear a lot more about in the near future. Protecting

New Zealand's biodiversity is about making sure that the range of native plants and animals continues to survive. Maintaining biodiversity is a national issue, however small steps by many landowners will go a long way in assisting the national objective.

Many steps suggested in this booklet contribute to maintaining or enhancing biodiversity. For example, protecting waterways improves aquatic habitat. Protecting existing wetlands is a high priority for maintaining biodiversity. Creating new wetland areas can assist in removing nitrate from shallow groundwater, while at the same time providing habitat for wildlife.

- ? Are there any high priority wildlife habitats, for example wetlands or native bush, on the farm
- ? Can unproductive areas of the farm provide habitat for native species  
Consider planting these areas in trees.
- ✓ Fencing and planting around waterways or steep gullies can provide suitable areas for wildlife habitat.
- ✓ Adopt all practical steps to protect remaining wildlife habitats.
- ✓ Talk to the Otago Regional Council about the possibility of funding for biodiversity enhancement projects.

## Rules affecting biodiversity

There are no rules directly affecting biodiversity in plans produced by the Regional Council. Check District or City Council Plans for your area.

## Sources of further information

- Talk to the Department of Conservation about important native species that may be in your area.
- Queen Elizabeth II Trust.
- Riparian management manual, Otago Regional Council.

# Effluent management

Effluent management is a high priority on a dairy farm. There are a number of options to consider. Advice from a suitably qualified consultant will assist your planning and choice of system, and make sure that your system can handle any increased load if you have increased your herd size.

## Land based systems

Land application of dairy effluent is the preferred method of treating it provided the application is correctly managed. The two most common options are using a travelling irrigator or an effluent tanker.

Correctly managing a land based system prevents effluent getting into ground or surface water and affecting water quality. At the same time you can ensure the most benefit from applying the nutrients back onto the land. To do this a number of aspects need to be considered.

### ? Your management systems

Are your staff fully trained in the use and operation of the effluent irrigation equipment

Are your staff adequately supervised when operating the effluent system

Does your plant and machinery maintenance schedule include the effluent system

### ? The system set up

Is your reticulation and storage system suitable for your terrain

Is there sufficient storage capacity to cover wet periods

Is there sufficient area available to spread the effluent

### ? The options for waste minimisation

- Have you considered all options for reducing water use?
- Can rainwater be diverted?
- Is covering the yards an option?

### ? The options for waste treatment

- Do you have options for treating and re-using your wastewater?
- Is wetland treatment an option?

### Management tools

- Have you considered the concept of a simple effluent management plan?
- Do you undertake nutrient budgeting?

### ? Stocking rates

- Is your farm really capable of carrying the stock numbers that you propose, or are you better to concentrate on gaining better production per cow rather than going up in cow numbers?

## Sites for effluent application

Plan ahead and consider any future herd expansion. The larger the herd the greater the land area you need to irrigate and the bigger the capacity of the pump required.

✓ Have sufficient area for effluent disposal to keep nutrient application below recommended levels. A guideline is 8ha/100 cows.

✓ Know the soil type and application rates that are suitable for that soil type. Freely draining soils with a deep water table are ideal.

✓ Avoid areas with tile and mole drains if possible. Discharging effluent to land that is tile and/or mole drained increases the risk of effluent getting into streams. Consider other treatment and discharge methods.

✓ Avoid areas that are close to waterways or have shallow groundwater.

✓ Check with the Otago Regional Council to see if your farm is in a groundwater protection zone. This may affect maximum application rates for effluent and/or require a resource consent.

## Storage ponds

Your system will require flexibility for storage. There will be times of the year when it is not suitable to apply effluent to land because soil conditions will increase the risk of effluent getting into water. These times will vary from area to area, and within seasons. Over these wet periods you will need to store the effluent until soil conditions are suitable to apply effluent.

- ✓ You will need information about rainfall and soil types for your location to determine how long soil conditions are suitable for effluent application.
- ✓ Storage ponds must be sealed to prevent effluent leakage and should have a storage capacity of at least 50 litres/cow/day plus an estimate of direct rainfall into the storage pond over the wetter months of the year.
- ? What steps can you take to minimise the volume of effluent produced?
  - Provide some diversion for storm water to prevent it filling up your storage pond.
  - Put guttering on the shed to stop water falling straight into the yard.
  - Use a scraper to reduce water use.
  - Use high volume (3.5 – 4.5 l/sec) low – pressure (100-150 kPa) nozzles on your wash down hoses. These use less water in the long run by reducing washing time.
  - Consider covering your yards. As well as reducing the amount of water that you have to dispose of through the effluent system it will also improve the environment for your cows.
- ? Do you have a contingency plan in place? What provision have you made if your pump breaks down or if there is an extended period when the ground is too wet to apply effluent?

## Managing effluent application to land

The three issues to consider when applying effluent are:

1. The amount of nutrients being applied in the effluent.
  2. The volume of effluent being applied in relation to soil moisture conditions.
  3. The impacts that it may have on soil condition especially when combined with grazing.
- ✗ Don't apply effluent when the ground is saturated. You will need sufficient storage to cover these periods.
  - ✓ Rotate effluent application over all the area you have available. Mark out your runs on a farm map; record when they are used and how long the irrigator spent on the run.
  - ✓ If effluent application over tile drains is unavoidable, the amount of effluent applied must be low enough to prevent it travelling straight through the drains and into waterways. Effluent should not be applied to tiled land when the soil is wet. Ensure you have sufficient storage capacity to cover these periods.
  - ✓ Know how much effluent you are applying. Application depth will be affected by the travelling speed and diameter coverage of your irrigator. Factors that may affect the travel speed of your applicator include:
    - length of grass;
    - hose drag;
    - terrain to be traversed;
    - pump capacity,
    - nozzle size.
  - ✓ Know what nutrients you are applying. Nutrient content of effluent will vary depending on dilution rate and how long it is stored for. 20 mm of effluent will "typically" provide 80 kg N per hectare and 70 kg K per hectare.
  - ✓ Regularly check effluent area soils for signs of soil compaction and treat accordingly.
  - ✓ Preferentially treat effluent paddocks when high risk of soil compaction exists.

# Pond systems

Pond systems are designed to reduce the organic content of effluent. If effluent is discharged to water you will need a resource consent. However, because ponds don't function effectively in cooler climates, the pond process doesn't normally reduce the nutrient content of the effluent sufficiently to prevent impacts on the environment. Pond systems may be used as an initial treatment before land application or before additional treatment through other secondary treatments such as mechanical aeration or constructed wetlands.

## Management of pond systems

- ✓ Monitor the discharge to make sure the pond is working effectively and that any discharges to water are within your consent conditions.
- ✓ Ponds must be maintained. This includes desludging, controlling weeds, and repairing pipes and structures.
- ✓ If you divert your feed pad effluent to your effluent pond you need to consider additional ponds, since ponds are generally designed to treat farm dairy effluent.

## Rules affecting effluent management

### Land Application Rules

Under the Water and Air Plans, land application of dairy effluent is a **permitted activity** only when:

- the discharge is more than 50 metres from any water body, bore or the coast;
- effluent does not directly enter any drain, water race, or ground water;
- effluent does not pond or run off to any other person's property;
- the soil is not saturated;
- you apply less than 150 kg N/ha/yr. If you are in the Waitaki Plains Zone A ground water protection area, N application needs to be less than 75kg N/ha/yr. If you are in any other Zone A ground water protection area you need a resource consent to discharge effluent. Check with the Otago Regional Council where these zones are.
- odours are not noxious, dangerous, or objectionable beyond the boundary of the property;
- any new land application area is sited well away from houses, roads or public places;
- the discharge does not exceed the application rates in the following table for particular soil types.



Effluent irrigator



## Animal waste application for various soil types under pasture cover

Soil type	Maximum application depth at any one time	Maximum application rate	Minimum return period
Sand and loamy sand	25 mm	32 mm/hr	15 days
Sandy loam and fine sandy loam	25 mm	20 mm/hr	15 days
Silt and sandy silt loam	25 mm	17 mm/hr	20 days
Clay and clay loam	25 mm	10 mm/hr	20 days
Peat			15 days

### NOTE:

1. If soil moisture content is greater than 50% saturation or slopes are greater than 8 degrees you will need to reduce application depths and rates to avoid breaching other rule conditions.
2. The ideal application rate for all soil types is 10mm/hr or less.

If you cannot meet all the permitted activity conditions you will need a **resource consent** to discharge effluent to land.

### Rules for storage ponds

Under the Water and Air Plans, storage ponds are a **permitted activity** only when:

- any odours are not noxious, dangerous, offensive or objectionable beyond the boundary of the property;
- any new storage pond is sited well away from houses, roads or public places;
- the ponds are sealed and there is no leakage.

If you can not meet all the permitted activity conditions you will need a **resource consent** to discharge effluent to land.

### Rules for discharges to water

- You will need a **resource consent** to discharge treated effluent to water from a pond system or constructed wetland.

### Sources of further information

- "Dairying and the environment. Managing Farm Dairy Effluent." Published by Dairying and the Environment Committee.



Scraper

# Feed pads and stand-off pads

Feed pads and stand off pads are options for protecting soil physical structure over wet periods (see page 20).

## Considerations during planning

Obtain good information about the characteristics of the soils on your property. You need to understand the soils so you know the risks associated with them. You can then decide whether feed pads or stand off pads are necessary to protect your soil. Are the soils on your property prone to pugging? Silt loams and clays are most susceptible.

- ✓ When building your pad consider solid and liquid waste management. If the feed pad is close to the farm dairy, design it so that the contaminants run into your effluent collection system for the farm dairy.
- ✓ Locate the feed pad or stand off pad well away from any waterways.
- ✓ Consider building the pad at the opposite end of the farm to your farm dairy. This will provide two areas for on/off grazing, but will require a separate system for waste disposal as you will not be able to use your farm dairy effluent system.

Whilst these pads are good in terms of minimising soil compaction during wet weather or winter conditions, if not managed properly they can cause severe impacts on water quality. Within a month period a feed pad can generate two and a half times more nitrogenous waste than is generated in the farm dairy in the entire milking season.

## Rules for feed pads or stand-off pads

Under the Water Plan, the discharge from any feed pad, stand off pad or sacrifice paddock onto land is a **permitted activity** only when:

- the feed pad or stand off pad is not within 50 metres of any surface water body; and
- the discharge is more than 50 metres from any surface water way or bore; and
- no discharge directly enters water in any drain, water race or groundwater; and
- effluent from the discharge does not run off to any other person's property.

If you cannot meet all the permitted activity conditions you will need a **resource consent**.

If there is a storage pond for the feed pad or stand off pad, check the effluent rules (page 6).

If you discharge your feed pad effluent to pasture you need a larger area. The rule of thumb is approximately 50 grams of nitrogen is excreted per cow, per day in a feed pad.

## Sources of further information

- "Dairying and the environment. Farm management issues." Published by Dairying and the Environment Committee.



Feed pad

# Silage

The big environmental issues with silage are what happens with the silage leachate and silage wrap.

## Silage leachate

Leachate from silage stacks is likely to cause severe de-oxygenation in waterways, resulting in major effects on water quality, fish, plants and other stream organisms. On average it is 200 times stronger than raw sewage, 40 times stronger than farm dairy wastewater and eight times stronger than piggery waste. The leachate is very acidic, contains high levels of nutrients, and has levels of ammonia likely to be toxic to fish.

- ✓ Site silage pits away from any water or places where groundwater can get into the pit. If old pits are sited close to waterways you must prevent leachate from getting into water.

## Silage wrap

Silage wrap floating around a farm is a sure way to detract from the dairy industry's clean, green farming image. A suggested way to manage silage wrap and pit covers is to adopt appropriate measures from the 5 R's of waste management (see page 16).

### Reduce

Minimise the amount of plastic used. Pit silage uses less plastic than tube wrapping, which uses less plastic than individually wrapped bales.

### Re-use

Re-use old silage wrap where possible. Laying it under gateways before putting gravel on is one possibility. Old silage covers have been used as pond liners.

### Residual management

Your final option for getting rid of any silage wrap is taking it to a landfill.

- ✓ Collect silage wrap and covers and take them to the nearest landfill or dispose of them in the farm dump. Bale up the plastic in an old wool pack to make transportation easier.



Silage pit

Some people believe burning silage wrap is the best option for disposal. Silage wrap is made of polyethylene and needs to be burnt in a hot fire to prevent the release of toxic chemicals into the air. It can, however, still produce lots of black smoke.

### *Rules affecting silage*

Under the Waste Plan silage pits are a **permitted activity** only when:

- there is no groundwater seepage into the pit;
- the silage stack or pit is more than 100 metres from any well used for domestic purposes or drinking water for livestock;
- leachate from the silage stack or pit does not enter any water body;
- the silage stack or pit is more than 50 metres from any waterbody;
- silage production is undertaken on production land;
- the silage stack or pit is more than 50 metres from a property boundary, excluding road boundaries;
- the silage stack or pit is not noxious, dangerous, offensive or objectionable beyond the boundaries of the property.

If you don't meet the permitted activity conditions a **resource consent** is needed. Check with the Otago Regional Council about rules concerning burning silage wrap.

### *Sources of further information*

- "Dairying and the environment. Farm management issues." Published by Dairying and the Environment Committee.
- Otago Regional Council Fact Sheet.



Loading silage for feed out

# Stock access to waterways

Cattle like to spend time in creeks and rivers. They can cause major impacts on water quality through faecal materials, nutrients and sediment entering water. Streambed and bank damage also impact on creeks, rivers and wetlands.

**Riparian management** is a term that is often used when talking about managing the zones around rivers and lakes. It includes options like fencing off these areas, controlling grazing, planting vegetation and leaving buffer strips when cultivating.

- ✓ Intensively grazed cattle should be excluded from all waterways including drains. In many cases fencing costs can be kept to a minimum by using electric fences. The Otago Regional Council's target is to have all cattle excluded from waterways by December 2005.

The buffer zone may need to be only one metre wide if surface run-off is not an issue and there is no riparian vegetation to protect. Steeper country will require strips of at least 5 metres in width, so that the grass can provide an effective filter strip to reduce sediment and nutrient run off.

Where possible, open drains should also be fenced.



Buffer zone, to keep stock from water



Permanent fencing along waterway

## Reducing stock access to waterways

- ? What areas can be fenced off using electric fencing and what areas would be more appropriate to permanently fence? If you want to plant around creeks in the future, permanent fences may be more appropriate.
- ✓ Planting key areas around water will help stabilise banks, provide shelter for stock and habitat for birds, and help improve water quality.
- ✓ Provide reticulated stock watering facility (i.e. water troughs). This will minimise the need for stock access to waterways.
- ✓ If you are using green feed crops and plan to strip graze them, either choose paddocks away from water, or avoid cultivating close to any water. When it comes to grazing these paddocks keep stock back from water by using electric fencing.
- ✓ Repair fences after flood damage.

## Rules affecting stock access to waterways

Under the Water Plan stock grazing in or around water is a **permitted activity** only when:

- no water take is affected; and
- the stock do not cause slumping, pugging or erosion on the bank, or a conspicuous change in the colour or clarity of the lake or river; and
- the nutrients *E Coli* from the animal excreta do not result in harm to aquatic life, or smell, or the water becoming unfit for animals to drink, and
- no wetland identified in the Water Plan is affected; and
- stock do not disturb indigenous vegetation or the habitat of indigenous fauna, trout or salmon.

If your situation does not meet all the permitted activity conditions you will need a **resource consent**, to allow your stock to access waterways.

## Sources of further information

- "Dairying and the environment. Farm management issues." Published by Dairying and the Environment Committee.
- Riparian Management Manual Otago Regional Council.

## Soil Management

Protecting the soils on your property is vital to maintain productivity. Physical condition and structure of soils is as important as soil fertility.

### Soil physical condition

Soil compaction is the compression or squeezing of a soil, reducing the number and volume of large soil pores, and increasing soil density. It occurs when forces acting upon the soil (e.g. cattle treading) are greater than the soil's strength, causing closer packing of aggregates and particles. The wetter a soil is the greater its susceptibility to compaction. Root penetration and aeration are restricted in a compacted soil, so plant productivity may be significantly reduced.

? Do you have good soil information for the property? Some soils are particularly prone to soil compaction or erosion. Identifying these soils can help you manage them more effectively.

### Management

- ✓ Conduct an annual visual check of susceptible paddocks during November. If paddocks are still showing signs of compaction you may need to consider aerating to fix the problem and changing management practices to prevent it occurring in the future.
- ✓ If you have soils that are susceptible to compaction consider feed pads, stand-off pads, (**see page 8**) on/off grazing, back-fencing when strip grazing, and/or drainage as ways to minimise soil compaction.

## Soil cultivation

Care also needs to be taken when cultivating soils. Cultivating close to waterways can have impacts either at cultivation time or when greenfeed crops are grazed.

- ✓ If you are re-grassing paddocks or cultivating for a greenfeed crop, leave a buffer area to act as a filter strip between the cultivated area and any water. The width will depend on the topography of the paddock but on sloping land should be at least 5 metres. This will reduce the likelihood of soil entering the water after heavy rain and will also keep stock back from the waterbody when the crop is fed.
- ✓ Care should be taken when first grazing re-grassed cultivated paddocks, as there is a risk to stock of nitrate poisoning.

## Soil nutrients

Fertiliser is a major expense on dairy farms. Applying the "correct" amount has two important benefits.

1. You aren't spending money on fertiliser that is not needed.
2. You reduce the risk of adverse impacts on the environment.

The best way to do this is nutrient budgeting.



Understanding your soil

## Nutrient budgeting

Nutrient budgeting looks at nutrient inputs and outputs from all sources in the farming system. It takes account of factors like soil losses, soil reserves, animal transfer, fertiliser inputs, and any feed brought into or taken off the farm. A nutrient budget will identify if too much or too little fertiliser is being used.

AgResearch has developed a nutrient budget computer package called "Overseer" to help farmers. A free copy of the package is available from MAF Policy. Alternatively, fertiliser reps and farm consultants should have access to the package.

Nitrogen is one of the key nutrients in any nutrient budget and is important from an environmental perspective because nitrate (a form of nitrogen) is easily leached to water. The major source of nitrate leaching in dairy farms comes from urine patches. However, two other potential sources of nitrate leaching are the use of nitrogen fertiliser and dairy effluent (see page 5).

## Factors to consider

- ✗ Do not overstock. You should know the carrying capacity of your soils. High stocking rates will result in excessive nitrate leaching and soil damage.
- ✓ Make sure your fertiliser rep is using nutrient budgeting when calculating your fertiliser requirements.
- ✓ Complete a separate nutrient budget for your effluent area. Applying effluent adds significant amounts of nutrients, particularly  $\text{N}$  and  $\text{P}$ , and you should adjust your fertiliser to compensate for this.
- ✓ Make sure your fertiliser spreader keeps enough distance to prevent fertiliser getting into water.
- ✓ Make sure your fertiliser spreader is calibrated. This will avoid uneven application of fertiliser.
- ✓ Promote clover growth. Nitrogen fertiliser should only be used as a strategic supplement, not as a substitute to clover. Excessive nitrogen application will reduce clover performance.
- ✗ Avoid excessive irrigation. Excessive irrigation can cause nutrient leaching. Assess soil moisture to use water efficiently.

## Nitrogen fertiliser use

Correctly managing nitrogen fertiliser use is an important consideration on your dairy farm.

The key management strategies to reduce the risk of nitrate leaching are:

- Apply fertiliser at a rate that the plant can use it.
- Keep applications from nitrogen fertiliser below  $100 \text{ kg N/ha/yr}$ .
- Use split dressings to apply fertiliser between  $0$  and  $5 \text{ kg N/ha}$  at a time.
- Avoid winter applications.
- On permanent hay or silage paddocks rates of up to  $200 \text{ kg N/ha/year}$  can be used.

## Rules affecting soil management

- There are no rules affecting soils management in plans produced by the Otago Regional Council.

## Rules affecting fertiliser use

Under the Water Plan fertiliser application to land is a **permitted activity** only when:

- measures are taken to avoid fertiliser getting into surface water; and
- fertiliser is used in accordance with the manufacturer's directions.

## Sources of further information

- Code of Practice for Fertiliser Use is available from your fertiliser rep.
- Your farm consultant or Dairy Consulting Officer.
- Soil structural breakdown and compaction in new ealand soils, MAF Policy technical paper 5/5. Available from MAF.



The right hand fence protects the waterway running alongside the race.



# Tracks and stream crossings

Correct design and construction of tracks is important for good cow flow and minimising lameness problems. There are also environmental considerations to take into account. Run-off from tracks can contribute significant amounts of sediment, nutrients and faecal material to water. Crossings need to be carefully planned.

## Track management

- ✓ Make sure tracks are constructed to prevent build up of effluent and mud, which may then be washed into water. Install frequent cut-offs on sloping land to divert run-off away from any waterways.
- ✓ Bridges should be used for all stream crossings and should have wooden or concrete verges to prevent animal waste from getting into water.
- ✓ Establish adequate buffer strips to prevent effluent and sediment being washed off into water. These should be fenced off. Consider planting these areas.
- ✓ Annual track maintenance will keep tracks in good condition and minimise lameness problems. Repair or redesign any areas that cause the build up of mud close to any waterways.
- ✗ Track and race layout that involves regularly walking cattle through water should be avoided. This practice is now strongly discouraged by the industry.
- ✓ Avoid fords and convert existing fords to culverts with overflow provision during winter.

## Rules affecting tracks and stream crossings

### Bridges and culverts

Under the Water Plan, constructing a bridge or culvert is a **permitted activity** only when:

- the catchment upstream is less than 50ha;
- the structure does not cause flooding or erosion of the bank or riverbed during or after construction.

If you cannot meet all the permitted activity conditions you will need a **resource consent** to construct a bridge or culvert.

### Stock crossing streams and rivers

Under the Water Plan, stock crossing streams and rivers is a **permitted activity** only when:

- no water take is affected, and
- the stock do not cause slumping, pugging or erosion on the bank, or a major change in the colour or clarity of the lake or river; and
- no wetland identified in the Water Plan is affected; and
- stock do not disturb indigenous vegetation or the habitat of indigenous fauna, trout or salmon.

If you can not meet all the permitted activity conditions you will need a **resource consent**.

# Waste management

Waste management is more than thinking, "How do I get rid of any rubbish"? A total waste management policy for your farm should be based around the five "R's" of waste management.

- *Reduce*
- *Recycle*
- *Residual management*
- *Re-use*
- *Recover*

## The five "R's" of waste management

### Reduce

This should be the number one option in your waste management process. What steps can be taken to reduce the amount of waste produced?

- ✓ Get together with neighbours and buy bulk materials.
- ✓ Use concentrated products to reduce packaging.
- ✓ Maintain healthy stock.

### Re-use

- ✓ Find out which chemical containers can be refilled or sent back to the manufacturer.
- ✓ Some containers may be able to be re-used if they have been triple rinsed. For example old drench containers could be used to drip-water plants in shelter belts.

# 5 "R's"

### Recycle

Recycling schemes are not available at the moment in New Zealand for farm products. However, recycling is being used successfully overseas and could be a viable option for material like chemical containers.

### Recover

Recovery is getting any other products from your waste. There are probably not many options available at the moment on an individual basis. However, in the future it may be possible to work with groups of other farmers on these types of projects.

An example would be when dead stock are picked up by a licensed operator, skinned and then rendered down.

### Residual management

Residual management is how you deal with any material left after other steps have been taken to minimise the amount of waste material. Options available are removing to commercial landfills, or using farm landfills. Check the obligations regarding farm landfills.

For some chemicals the only option is to store in a secure place until alternative disposal methods become available.

## Disposal of dead stock

Poor carcass disposal practices can result in surface or groundwater contamination.

- ✓ Dispose of dead stock as soon as possible.
- ✗ Do not dispose of dead stock in water or on flood prone land.
- ✓ Move carcasses from the roadside to avoid complaints.
- ✓ Bury animals in a shallow grave.
  - Select an area in clay to prevent contamination of groundwater.
  - Make sure the carcass is well covered so dogs and other scavengers can't uncover it.
- ✓ Use dead cow removal schemes if they are operating in your area.
- ✓ Dig the pit where there will be no ground water contamination.

## Farm landfills

If you have a landfill on your farm, particular care needs to be taken to avoid contamination of ground and surface water. Leachate from the landfill must be prevented from entering any water body.

- ✗ Do not dispose of unwanted chemicals or other hazardous material in the landfill.
- ✓ Site the landfill away from boundaries, particularly road boundaries. Plant trees around the landfill to shield it from neighbours.
- ✓ Site the landfill in clay soils if you have these on your property. This will reduce the risk of contaminating groundwater.

## Stock truck effluent disposal

Stock truck effluent on roads is unsightly and may cause a road hazard. Stock truck effluent disposal sites have been established at strategic locations on State Highway 1 throughout Otago to help combat this problem.

- ✓ Encourage your trucking operator to make use of truck effluent disposal sites.
- ✓ Ensure stock standing periods are adhered to before loading on trucks.

## Rules affecting waste management

Under the Waste Plan offfal pits are a **permitted activity** only when:

- the pit is at least 100 metres from any well used for domestic or livestock supply, and at least 50 metres from any river, lake, stream, pond, wetland, coast or property boundary;
- there is no groundwater seepage into the pit;
- leachate from the pit does not enter groundwater or surface water;
- only dead animal matter and perishable household wastes are disposed of in the offfal pit, and the offfal pit contains no hazardous waste, toxic matter, sewage, animal effluent or dead animal material from an industrial or trade premises;
- run-off or smell from the offfal pit is not noxious, dangerous, offensive or objectionable beyond the boundaries of the property.

If you don't meet all the permitted activity conditions a **resource consent** is needed.

Under the Waste Plan a landfill is a **permitted activity** only when:

- the Otago Regional Council is told where the landfill is;
- the landfill is at least 100 metres from any well used for domestic or livestock supply, and at least 50 metres from any river, lake, stream, pond, wetland, coast or any property boundary;
- there is no groundwater seepage into the landfill, and leachate from the landfill does not enter groundwater or surface water;
- the landfill is only used for waste from the farm, and contains no hazardous waste, toxic matter, sewage, offfal or animal effluent;
- the landfill does not cause a nuisance beyond the boundaries of the property;
- no waste is burnt in the landfill.

If you don't meet all the permitted activity conditions a **resource consent** is needed.

# Water use

Water availability is vital for your dairy operation. It is important to think about efficient water use in and around the farm dairy and during irrigation.

## Water use around the farm dairy

- ? What happens to your milk cooling water? Is it recycled or discharged?
- ✓ Minimise the amount of water used for washing down your farm dairy. This will reduce the amount of effluent you need to get rid of.

## Irrigation

Irrigation can substantially increase production in areas where sufficient water is available. Making efficient use of available water is the main consideration for a good irrigation system. You also need to avoid applying water in a manner that will cause water logging or excessive leaching of nutrients.

- ✓ Understand the soil types on your property. Different soils will have different irrigation requirements. By understanding the soils on your property you can make sure you are applying the correct amount of water.

- ✓ Work with your local irrigation committee and comply with your resource consent conditions. Adopt a policy of "give and take". Water has many uses, not just restricted to pasture irrigation.
- ✓ Where possible have a flexible water supply. Efficient application of water means adjusting application depths and frequencies depending on the conditions. To operate this kind of system you need to be able to take different rates of water from the source.
- ✓ Where possible install a water meter to assist efficient water use.

## Rules affecting taking of water

Under the Water Plan, taking reasonable quantities of water for stock drinking is a **permitted activity**.

It is also a **permitted activity** to take up to 25,000 litres of surface water per day only when:

- the take doesn't exceed the following flow rates; 0.5 litres/sec in the North Otago, Maniototo and Central Otago sub regions, 1.0 litres/sec elsewhere;
- measures are taken to prevent fish from entering the intake;
- other lawful water takes are not affected; and
- the right to take surface water is not suspended.



Stock water

It is also a **permitted activity** to take up 1,000,000 litres of surface water per day from the main stem of the Clutha and Kawarau rivers, or from Lakes Wanaka, Hawea, Wakatipu, Dunstan and Roxburgh only when:

- the take doesn't exceed 100 litres/sec;
- measures are taken to prevent fish from entering the intake; and
- other lawful water takes are not affected.

Check with the Otago Regional Council for full details of the permitted activity conditions. If you cannot meet all the permitted activity conditions you will need a **resource consent**.

You will require a **resource consent** for other water takes.

You will need a **resource consent** to construct a bore.

You may require a **resource consent** to take groundwater. Check with the Otago Regional Council for the conditions for your area.

### Sources of further information

- Otago Regional Council Consents Administration section.
- Dairy consulting officers
- Water companies
- Irrigation consultants

## Weeds and Pests

### Weeds

Weeds can become a major problem if not controlled. Some weeds are already well established in Otago. Other plants have the potential to become problems on farm land if brought in from outside the region, or if they spread from gardens. Control is easiest when the weed population is small. If you use agrichemicals to control weeds, see the Agrichemical use section (**page 21**).

### Animal pests

Animal pests also need to be controlled. Possums and ferrets can spread Tb, and eat native plants and animals. Rabbits can contribute to increased erosion as well as eating pasture. Rooks are a pest in a few areas of Otago.

- Aim for a concentrated effort to reduce pests to manageable levels. Once pest numbers are reduced it is easier to follow-up with regular control and keep the populations low, rather than letting them build up.
- Keep rabbit levels below the requirement for your area. See the Otago Regional Council's Pest Management Strategy.
- If you see rooks, contact the Otago Regional Council for professional help in controlling them.

### Rules affecting weeds and pests

The Pest Management Strategy for Otago covers rules in relation to weed control.

The main obligation for landholders is to maintain a boundary area free from weeds if your neighbour's property is mainly free of the weed concerned. The width of the boundary control area depends on the species.

Weed	Width of Boundary
Ragwort	50m
Gorse	10m
Broom	10m
Nodding thistle	100m

There are also some gorse and broom free areas where all gorse and broom needs to be controlled. These areas are generally outside dairying areas, however you should check with the Otago Regional Council to see if your property is in one of these areas.



Ragwort

### Sources of further information

- Pest Management Strategy for Otago

# Wintering of dairy stock

With the expansion of dairying in Otago there is now an option for wintering dairy cattle on many sheep and beef farms. This can provide an excellent source of income but it pays to be aware of potential environmental impacts that many heavy cattle can have on soils and waterways (**see feed pad section**).

Obtain good information about the characteristics of the soils on your property. You need to understand the soils so you know the risks associated with them. You can then decide whether feed pads or stand-off pads are necessary to protect your soil. Wet soils are particularly prone to soil compaction. Silt loams and clays are most susceptible.

Small streams that lead into the larger rivers are often important fish spawning areas. The grazing of large herds of cows can have a particularly detrimental affect on these streams.

- ✓ Keep cattle out of all waterways. A one-wire electric fence is a cheap and effective way to achieve this.
- ✓ Planting key areas around the waterways will help stabilise banks, provide shelter for stock and habitat for birds, and help improve water quality. You will need permanent fencing to achieve this.
- ✓ If you are using green feed crops and plan to strip graze them, either choose paddocks away from, or avoid cultivating close to any waterways. When it comes to grazing these paddocks keep stock back from waterways by using electric fencing.
- ✗ Do not feed out supplementary feeds in areas where run-off water may reach the waterbody. If possible avoid feeding out in these paddocks altogether.
- ✓ Repair fences after flood damage.

## Feed pads and stand-off pads

Feed pads and stand-off pads are options for protecting soil physical structure and reduce run-off over wet periods.

- ✓ When building your pad allow for solid and liquid waste disposal. Prevent run-off and scrapings getting into waterways.

- ✓ Locate the feed pad or stand-off pad well away from any waterway.
- ✓ If you are applying effluent from feed pads or stand-off pads onto pasture, you need to know how much you can apply without contaminating ground and surface water. Consult an expert when you design the system.

Whilst these pads are good in terms of minimising soil compaction during winter conditions, if not managed properly they can cause severe impacts on water quality. Within a two-month period a feed pad can generate two and a half times more nitrogenous waste than is generated in the farm dairy in the entire milking season.



Break feeding of green food crop

## Rules for wintering dairy stock

### Stock grazing next to waterways

Under the Water Plan, stock grazing in or around waterways is a **permitted activity** only when:

- no water take is affected; and
- the stock do not cause slumping, pugging or erosion on the bank, or a conspicuous change in the colour or clarity of the lake or river; and
- no wetland identified in the Water Plan is affected; and
- stock do not disturb indigenous vegetation or the habitat of indigenous fauna, trout or salmon.

If you cannot meet all the permitted activity conditions you will need a **resource consent**.

## Feed pads or stand-off pads

Under the Water Plan, the discharge from any feed pad, stand-off pad or sacrifice paddock onto land is a permitted activity only when:

- the feed pad or stand-off pad is not within 50 metres of any surface waterway; and
- the discharge is more than 50 metres from any surface waterway or bore; and
- no discharge directly enters any waterway; and
- effluent from the discharge does not run off to any other person's property.

If you can not meet all the permitted activity conditions you will need a **resource consent**.

## Sources of further information

- "Dairying and the environment. Farm management issues". Published by Dairying and the Environment Committee.

## Contingency planning

Situations that require an emergency response may arise on the farm from time to time.

Think ahead and have a contingency plan in place to deal with these unusual but foreseeable problems. Circumstances might include emergency milk disposal, fuel and agrichemical spillage or effluent pumps breaking down.

## Agrichemical and fuel storage

Agrichemical and fuel storage areas are potential sources of contamination due to accidental spills or leaks.

- ✓ Consider creating a concreted area with a raised lip on which to locate fuel tanks. The concrete area will contain any spills or leaks.
- ✓ Chemicals should be stored in a locked shed away from the farm dairy and bores. When mixing agrichemicals mix on a concrete pad with a raised lip to contain any spills.
- ✓ Keep a bag of sawdust or other absorbent material close by in case of emergency spills.



Chemical storage shed

## Emergency milk disposal

Occasionally there will be situations when milk cannot be picked up. In these cases you need to have an emergency plan for how you are going to deal with the milk.

If milk enters water it can have significant effects on aquatic life by depleting oxygen levels.

## ! Disposal methods must prevent milk getting into water

- ✓ Feed milk to livestock. If you have any doubts about suitable ways to do it consult a vet.
- ✓ Irrigate on to pasture
  - Dilute at least 1:1 possibly up to 1:10 to avoid odour problems.
  - Do not apply more than 50,000 litres per hectares. (5 litres per m<sup>2</sup>).
- ✗ Do not spray over areas that:
  - are tile or mole drained;
  - have slopes that run towards waterways or wetlands;
  - are frozen;
  - are likely to pond or flood after application.

# Check list

- Have you evaluated the environmental risks associated with your farming operation? These will be based on your soil types, topography, surface and groundwater in the area, and practices that you are undertaking.
- Do you have a system in place to manage environmental issues on your property? You can follow the process of Plan, Do, Check, Act, and operate a system just like you do for financial management.
- Have you talked with appropriately qualified people to make sure your effluent application system is capable of disposing of effluent without having negative impacts on the environment?
- Have you talked to the Otago Regional Council about any resource consents you need?
- Do you understand the conditions attached to any permitted activity rules? If the activity does not meet all the conditions you will require a resource consent.
- Have you checked with your District or City Council about District Plans and implications for your farm?



For resource consent information, and the full wording for permitted activities contact the Consent Administration team at the Otago Regional Council.

Contact an Otago Regional Council Land Resource Officer to arrange a free farm visit to discuss these issues and options in more detail:

Otago Regional Council  
Private Bag 1954  
Dunedin  
Phone 03 474 0827  
Freephone: 0800 474 082  
Fax: (03) 479 0015  
Email: [info@orc.govt.nz](mailto:info@orc.govt.nz)

Visit the Otago Regional Council web site:  
[www.orc.govt.nz](http://www.orc.govt.nz)

Published May 2001  
Revised March 2003