

# ENVIRONMENTAL CONSIDERATIONS

for intensive sheep, beef  
and arable farms in Otago



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# Introduction

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Sheep, beef, and arable farming are important land uses in Otago. Minimising potential impacts on the environment is an important consideration when managing your farm. In this booklet the Otago Regional Council aims to provide a convenient summary of environmental issues that may affect intensive sheep, beef, and arable farms. It can be part of a systematic approach for addressing environmental issues on your property.

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, other farmers, Crown Research Institutes and the Otago Regional Council.

Included in this booklet is a summary of rules (legal requirements) that may apply to your farming situation, intended as a guideline only. You can find the complete wording for all rules in the appropriate plans available from the Otago Regional Council. Issues affected by plans produced by your City or District Council are not covered here.

Some activities may require a resource consent, however many activities are permitted activities. A permitted activity is a specific legal term. It means that you are allowed to carry out the activity without the need to obtain a resource consent, provided you meet specific conditions. If you are going to do anything classed as a permitted activity you should check the exact wording of the applicable rules.



# Managing Environmental Risks

Planning is the key to managing environmental risks on the farm. Minimising environmental risks should be done in conjunction with other aspects of your farm management. You can apply basic management procedures to environmental issues just like you would do to financial issues. Work through the issues in a logical manner and develop a written plan for environmental management on your farm.



## *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. Set goals and objectives for each issue.
- 3 **Estimate** the costs involved.
- 4 **Set** realistic timeframes to complete your goals and objectives.
- 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.



# Agrichemicals

## Agrichemical storage, handling and use

When using agrichemicals, think about environmental issues while mixing and storing chemicals, as well as when using them. Potential sources of contamination are due to accidental spills or leaks. Most agrichemicals now break down in the soil. However, decomposition rates will depend on the rate of biological activity, which in turn depends on climatic and soil factors. The impact of agrichemicals in water will depend on the chemical and aquatic life present.

- ✓ Follow Growsafe guidelines when using chemicals. This will include providing staff training on handling of chemicals and making sure labels are carefully read before use.
- ✓ Chemicals should be stored in a locked shed.
- ✓ If possible mix all agrichemicals on a concrete pad with a raised lip to contain any spills.
- ✓ Keep a bag of sawdust or other absorbant material close by in case of spills.
- ✗ Avoid using pump sheds to store agrichemicals.
- ✓ Store and mix chemicals away from any water ways.
- ✓ Minimise the likelihood of damage from spray drift. Spray only in calm conditions and ensure close neighbours are advised when spraying adjacent to boundaries.



Beetlebanks, creating good habitat for beneficial insects

## Sources of further information

- Otago Regional Council Fact Sheets
- Growsafe course notes.

## Minimising agrichemical use

Perhaps the biggest impact from chemicals is on beneficial organisms. By removing these from the system, crops and pasture are at risk of attack from undesirable organisms eg grass grub, porina.

- ✓ Minimise use of agrichemicals. Look for alternatives where possible.
- Provide habitat for beneficial insects and reduce the need for spraying harmful organisms by:
  - Leaving the strip along the fenceline unsprayed. While a little unsightly, these strips provide good habitat for beneficial insects.
  - Set out "beetlebanks" within cultivated paddocks. These also provide good habitat for beneficial insects.
  - Sow cover crops on crop margins.

## Agrichemical disposal

Farm chemicals are a necessary part of many farming operations but can be toxic to the environment. Left over chemicals and empty containers must be carefully disposed of to make sure they do not contaminate soil or waterbodies.

- ✓ Make sure staff understand the importance of correct disposal.
- ✓ Store surplus chemicals carefully or return to the manufacturer/seller if possible.
- ✓ Triple rinse empty containers before disposal, i.e. rinse with water and pour the water and chemical into the spray

## Rules affecting agrichemical use

Under the Otago Regional Council's Regional Plan:Water, using an agrichemical when it may enter water is a permitted activity only when:

- all reasonable measures are taken to minimise agrichemicals getting into surface water; and
- the agrichemical is used in accordance with the manufacturer's directions.

Under the Otago Regional Council's Regional Plan: Air, agrichemical application is a permitted activity only when there is no noxious or dangerous effect at, or beyond, the property boundary resulting from the application.

# Biodiversity

## What is 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 continue to survive. Maintaining and enhancing biodiversity is a national issue, however small steps by many landowners can make a difference.

Many steps suggested in this booklet will contribute to maintaining biodiversity. For example, protecting waterbodies improves aquatic habitat. Protecting existing wetlands is a high priority for maintaining biodiversity. Creating new wetland areas can help in removing nitrate from shallow ground water, 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?
- ✓ Fencing and planting around creeks and waterbodies or steep gullies can provide suitable areas for wildlife habitat.
- ✓ Adopt all practical steps to protect remaining wildlife habitats.
- ✓ Fence areas of remnant native bush.
- ✓ Talk to the Otago Regional Council about the possibility of funding for biodiversity.



Enhancing biodiversity through fencing and planting

## 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.
- Riparian Management Manual, Otago Regional Council.
- Queen Elizabeth II Trust.
- Strategies to enhance biodiversity on mixed cropping farms - Ministry for Environment, video.

# Cultivation

## Conventional cultivation

When cultivating you need to think about potential impacts on the soil and surrounding waterbodies. The main impacts on soil are potentially increased erosion and loss of soil structure. Cultivating close to waterbodies can have impacts either at cultivation time or when greenfeed crops are grazed.

Soil organic matter helps maintain soil structure and biological activity. Soil structure will affect the storage and movement of water and the susceptibility to erosion. Frequent cultivation can decrease organic matter levels and increase the chance of wind and rill erosion. Soils with low organic matter levels have poor water and nutrient holding capacity.

- ✓ Maintain high levels of soil organic matter in your soils.

Maintaining soil organic matter levels is particularly important when you are doing a lot of cultivation. The best way to increase soil organic matter is to re-sow the paddock in pasture when organic matter levels are getting low. Alternatively, plant cover crops during fallow season and plough prior to cropping. This will maintain a continuous vegetative cover and will provide organic matter to the soil.

- ✓ Prevent erosion by using direct drilling rather than cultivating.

If you need to cultivate:

- ✗ Don't cultivate high risk paddocks with a slope greater than 15 degrees.
- ✓ Work paddocks on the contour rather than straight up and down the slope.
- ✓ Maintain a coarse seedbed.

Frequent cultivation to the same depth can lead to the formation of plough pans. These pans form layers in the soil that restrict root growth and impede drainage.

- ✓ Vary the depth and direction of cultivation to avoid the creation of plough pans.
- ✓ If you are cultivating near a creek or river prevent soil from entering the creek. A buffer area will act as a filter strip and reduce the likelihood of soil entering the waterway after heavy rain. The width needed for a buffer strip will depend on the topography of the paddock. On sloping land you should leave at least a 5-10 metre buffer strip whereas on flat land a one metre strip may be sufficient.

Long fallow periods over winter will cause a breakdown of organic matter and could lead to leaching of nitrogen in free draining soils.

- ✓ Use a short fallow period to reduce nitrate leaching.
- ✓ Sow cover crops to improve soil structure.



Direct drilling

## Minimum tillage and direct drilling

Minimum tillage and direct drilling will reduce soil erosion compared to conventional cultivation. Using the double spray and fallow technique will retain soil moisture and give better results particularly in dry areas.

Direct drilling will however increase the use of agrichemicals. See the agrichemical section for best management practices when storing, mixing and using agrichemicals.

## Rules affecting cultivation

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



Cultivating leaving a buffer strip along a waterway

## Sources of further information

- North Otago Sustainable Land Management Manual - available from North Otago Sustainable Land Management group (NOSLaM) or Otago Regional Council.
- Riparian Management Manual, Otago Regional Council.
- Otago Regional Council Fact Sheets.
- Soil structural breakdown and compaction in New Zealand soils, MAF Policy technical paper 95/5. Available from MAF.

# Farm dams, tracks, stream works and crossings

## Farm dams

Constructing dams by blocking waterbodies can have major impacts on aquatic life in streams and creeks. It is particularly important to make sure that the dam is constructed so that fish can move upstream. Activities involving earthmoving equipment can also have major impacts on instream habitat, particularly by adding significant quantities of sediment to the waterway.

There is also a potential flooding risk for people and land below a dam, especially if the dam has walls over three metres high.

- ✓ Check to see whether you need a resource consent before building the dam.
- ✓ If the dam is across a stream, design it so fish can move upstream.
- ✓ In some areas you may be able to plant trees or wetland plants around the edge of dams. This will provide habitat for wildlife.
- ✓ If possible fence off the dam to prevent stock access and provide a water trough for stock water.

## Tracks

Correct design and construction of tracks is important. Run-off from tracks can contribute significant amounts of sediment, nutrients and faecal material to creeks and waterbodies.

- ✓ Identify and avoid, where possible, unstable areas.
- ✓ Keep road spill from waterbodies.
- ✓ Revegetate unstable batters and fill slopes.
- ✓ Install adequate water control features such as culverts, water tables and cutoffs.
- ✓ Annual track maintenance will keep tracks in good condition and will help minimise stock lameness problems. Repair or redesign any areas that cause the build up of mud close to any waterbodies.

## Stream works and crossings

In-stream works may involve the disturbance or alteration of the streambed causing a permanent or temporary change to its natural state. It may involve the construction of bridges, culverts, ford crossing, stabilization works and channel reshaping. These works will often require heavy machinery such as diggers, dozers or trucks working within the water itself or along the riparian margin adjacent to the waterway. Forward planning and consultation with interested parties is essential.

- ✓ Use the most appropriate machinery for the job and use experienced operators.
- ✓ Minimise sediment input by working from the bank rather than in the waterway.
- ✗ Do not work in or near water during spawning periods. Damaging fish spawning areas is an offence under the Conservation Act.
- ✓ Allow for replanting where necessary.

River crossings need to be carefully planned. Particular care needs to be taken during construction of any stream crossings. Establishing structures in waterbodies requires careful attention to containment of construction and waste materials.

- ✗ Do not release concrete or wash water into the waterway as concrete waste is toxic to fish.
- ✓ Make suitable provision for diversion of main water flow away from construction zone during construction period.
- ✓ Bridges should have wooden or concrete verges to prevent animal waste from getting into waterbodies.
- ✓ Avoid fords and convert existing fords to culverts with adequate overflow provision.

## Rules affecting farm dams, tracks, stream works and crossings

### Farm dam

Under the Otago Regional Council Regional Plan: Water, constructing a farm dam is a permitted activity in all areas, except parts of Clutha District, only when:

- the dam wall is less than 3 metres high at centre,

- the catchment is less than 50 ha, and
- the dam doesn't cause flooding on other properties.
- If you can not meet all the permitted activity conditions you will need a resource consent to construct a farm dam.

### Tracks

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

### Stream works

The Water Plan controls activities that disturb the bed of a stream, river, pond or lake, or involve a structure in such places. Even if the bed is dry, there is a limit to the amount of disturbance that can be done as a permitted activity. The activities include such things as fencing, laying pipes, damming, placing structures including intakes, altering or demolishing existing structures, clearing debris, extracting gravel, reclaiming or depositing material, putting in stopbanks or reinstating banks. Anything not specifically permitted may well require a resource consent from the Otago Regional Council. The permitted activity rules have conditions relating to such things as keeping floodways clear, controlling erosion and sediment release into water, retaining the natural shape and affecting others downstream. In some cases the Otago Regional Council must be notified before work commences.

### Crossings

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 can not meet all the permitted activity conditions you will need a resource consent from the Otago Regional Council to undertake stream works or construct a bridge or culvert.

# Fertiliser use

## Fertiliser use near waterbodies

Fertiliser is a necessary part of farming. However, you should minimise the amount of fertiliser getting into waterbodies. This will make sure you get the most benefit from your fertiliser as well as preventing excessive algal growth in lakes and streams.

Two important factors to think about are:

- 1) The amount of fertiliser you use.
- 2) How fertiliser is spread.

- ✓ Follow recommendations in the Fertiliser Code of Practice for fertiliser handling, storage and use.
- ✓ Use ground based spreading if you have an option, because you have more control over placement of fertiliser.
- ✓ Make sure your fertiliser spreader is calibrated and keeps enough distance to prevent fertiliser getting into waterbodies.

## Nutrient budgeting

Fertiliser is a major expense on farms. Applying the “correct” amount means you aren’t spending money on fertiliser that is not needed, while at the same time reducing the risk of adverse impacts on the environment.

The best way to do this is 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 onto 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. Fertiliser reps and farm consultants should have access to the package. Alternatively, a copy can be obtained from MAF Policy.

- ✓ Make sure your fertiliser rep is using nutrient budgeting to calculate your fertiliser requirements.

## Nitrogen fertiliser use

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. Whilst the major source of nitrate leaching comes from cattle urine patches in pasture soils, in cropping soils long fallow periods and nitrogen fertiliser can contribute to nitrate leaching.

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

- ✓ Apply N fertiliser at a rate that the plant can use it. If soil temperatures are low, plant uptake of nitrogen will be low.
- ✓ For intensive grazed pastures keep annual N applications below 150 kg N/ha/yr.
- ✓ Use split dressings to apply N fertiliser between 30 and 45 kg N/ha at a time for grazed pasture.
- ✓ For cropping soils test for potentially available nitrogen and apply N fertiliser to suit crop needs.
- ✓ Provide cover crops during fallow periods.



Ground spreader

## Rules affecting fertiliser use

Under the Water Plan using fertiliser when it may enter water is a permitted activity only when:

- all reasonable measures are taken to minimise 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. Available from your fertiliser rep.

Otago Regional Council Fact sheets.

# Fuel Storage

Fuel and oil storage on farms can cause damage to the environment if not managed properly. Petroleum products are toxic to animals and plants, and can have serious effects on groundwater; small amounts can contaminate large quantities of water resulting in unsafe drinking water for people and stock. Contaminated water used for irrigation may result in loss of productivity.

- ✓ Locate storage areas away from other stored chemicals and any potential source of ignition e.g. grain dryers.
- ✓ Consider creating a concreted area with a raised lip on which to locate fuel tanks. The concrete area will contain any spills or leaks.
- ✓ Have a load of sand, sawdust or another absorbent material beside the storage area to soak up any spills. Install an appropriate fire extinguisher nearby.

## Rules affecting fuel storage

Unless you have a resource consent you are not permitted to allow any fuel to get to water. Storage, however, is not covered by the Water Plan, but may be covered in your district plan.

The Otago Regional Council policy is to require, through district plans, that all practical alternative locations for fuel storage near any stream, river, pond or lake are considered before siting there, or, that contingencies are in place to ensure the environment is safeguarded. This will mean, in the event that there is no alternative site for storage, that effective spill containment and recovery plans are in place.

# Silage

Issues to think about when using silage on your farm include: what happens with silage leachate, silage wrap and where you feed out silage.

## Silage leachate

Leachate from silage stacks is likely to cause severe de-oxygenation in waterbodies, having major adverse 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 also very acidic, contains high levels of nutrients, and has levels of ammonia likely to be toxic to fish.

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

## Silage wrap

Silage wrap floating around a farm is messy and untidy. A suggested way to manage silage wrap and pit covers is to adopt appropriate measures from the 5 R's of waste management.

(See waste management section)

## 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.

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.



Silage pit

## Rules affecting silage

Under the Otago Regional Council's Regional Plan: Waste, 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;
- run-off or smell from the silage stack or pit is not noxious, dangerous, offensive or objectionable beyond the boundaries of the property.

If you can not meet all 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

Otago Regional Council Fact Sheet.

# Stock Grazing

There are three potential impacts to consider if you are grazing stock on your farm.

- 1 Impacts on waterbodies.
- 2 Soil compaction.
- 3 Erosion if grazing unstable hill country.

All can be minimised by appropriate management techniques.

## *Stock access to waterbodies* *Intensive cattle grazing*

Intensively grazed cattle can have a major impact on waterbodies. The extent of the impact is determined by factors including soil types in the riparian margin, waterbody type, size and stability, and the management skills of the landholder.

Faecal contamination, nutrients and sediment entering waterbodies, and stream bank damage are some of the impacts that cattle can have on creeks and rivers.

- ✓ If you are using green feed crops and plan to strip graze them, either choose paddocks away from, or avoid cultivating close to any waterbodies. When it comes to grazing these paddocks keep stock back from waterbodies by using electric fencing.



Fenced waterway

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 are more appropriate.

- ✓ Intensively grazed cattle should be excluded from all water bodies. Where surface runoff or damage to riparian vegetation are not an issue then the width of the exclusion zone may be no more than one metre. On sloping land where there is a lot of run-off a riparian zone of up to 10 metres may be required.
- ✓ In many cases fencing costs can be kept to a minimum by using electric fences. Electric fences allow easy access for annual grazing to remove vegetation and help keep weeds under control. Where possible, open drains should also be fenced.
- ✓ Planting key areas around waterbodies will help stabilise banks, provide shelter for stock and habitat for birds, and help improve water quality.
- ✓ Providing the right environment for stock will help minimise management impacts.

Factors to consider include:

- shade and shelter away from the riparian margin,
- alternative reticulated water supply,
- salt blocks away from riparian margin.

## Stock access to waterbodies

### Intensive sheep grazing

Intensive sheep grazing can be expected to have less of a direct impact on waterbodies than intensive cattle grazing, because sheep generally cause less physical damage than cattle and also have a lower affinity for the stream environment. Impacts are most pronounced where sheep are held at very high grazing intensities during wet periods, on riparian margin areas and where stock camps occur.

Mob stocking and strip grazing in the riparian margin can lead to high nutrient and pathogen levels entering the water via animal excreta.

- ✓ Avoid mob stocking or strip grazing riparian areas, particularly in wet periods. Develop grazing management options that will allow you flexibility to shift stock away from the riparian margin during wet periods.
- ✓ Attention to the stock environment will reduce the likelihood of stock congregating in riparian areas. Factors to consider include:
  - Avoid situations where the only shade and shelter is located within the riparian margin. If the only tree in the paddock is on the riparian margin stock will camp there on a hot day;
- ✓ Locate salt blocks and the like away from the riparian margin; and
- ✓ Ensure paddock designs don't channel stock towards the riparian margin.
- ✓ For highly sensitive areas develop stock grazing regimes that allow you to reduce stocking pressures.
- ✓ Fence off or change management practices to reduce stocking rates in areas where there are already problems.
- ✓ If you are using green feed crops and plan to strip graze them, either choose paddocks away from water-bodies or avoid cultivating close to them. When it comes to grazing these paddocks keep stock back from water-bodies with electric fences.

## Soil compaction

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, heavy machinery use or mob stocking sheep) are greater than the soil's strength. The wetter a soil is, the more susceptible it is to compaction.

Root penetration and aeration are restricted in a compacted soil, and plant productivity may be significantly reduced.

- ✓ If you have soils that are susceptible to compaction consider: back-fencing when strip grazing, grazing less susceptible soils when wet and/or drainage as ways to minimise soil compaction.
- ✓ If you have many cattle, consider feed pads or stand off pads (see Wintering dairy stock section).
- ✓ Conduct an annual visual check of susceptible paddocks during November. If paddocks are still showing signs of compaction, consider aerating to fix the problem and changing management practices to prevent it occurring in the future.

Break feeding greenfeed crops over winter means heavy concentrations of stock during a time when soils are very susceptible to compaction.



Tree plantings for erosion control.



## Sources of further information

Riparian Management Manual Otago Regional Council.

Otago Regional Council Fact Sheets.

Soil structural breakdown and compaction in New Zealand soils, MAF Policy technical paper 95/5. Available from MAF.

## Grazing unstable hill country

Some hill country (particularly around coastal Otago) is geologically unstable. The risk of erosion is increased if the only vegetation on this type of country is pasture. Grazing cattle can also increase the risk of erosion by pugging the soils.

- ✓ Plant trees on country that shows signs of slipping and slumping. Poplars are very suitable for erosion control.
- ✓ Maintain pasture length in winter to prevent soil particles being washed off in heavy rain.
- ✓ In the event of serious instability use de-watering techniques to remove water from hillsides.
- ✓ Where there is severe erosion consider total retirement of the block and planting in trees.

## Rules affecting stock grazing

### Stock grazing next to waterbodies

Under the Water Plan stock grazing in or around waterbodies 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.

### Soil compaction

There are no rules affecting stock grazing and soil compaction in plans produced by the Otago Regional Council.

### Grazing unstable hillcountry

There are no rules affecting stock grazing of unstable hill country in plans produced by the Otago Regional Council.

## Waste management

Waste management is more than thinking, "How do I get rid of my rubbish"? A total waste management policy for your farm should be based around "The five Rs 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.
- ✓ Minimise the number of dead stock on-farm.

### 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.

### 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 materials 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 below 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 ground or surface water contamination.

- ✓ Dispose of dead stock as soon as possible.
- ✓ Do not dump dead stock in waterbodies.
- ✓ Bury dead 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 offal pit where there will be no groundwater 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 ground water.

## Sheep dip disposal

Dip chemicals are toxic to soil organisms and aquatic life. It is important to minimise the risks of soil and water contamination from dip waste.

- ✓ Follow dipping code of practice, using an accredited operator.
- ✓ Mix chemicals and dispose of surplus chemicals well away from watercourses.
- ✓ Allow stock to dry before letting out. Don't run wet or dripping stock across creeks.
- ✓ Dispose of sheep dip in a way that prevents excessive build up of residue in the soil, or contamination of waterbodies. See sheep dip disposal rules on page 16 for options.

## Stock truck effluent disposal

Stock truck effluent on roads is unsightly and may cause a road hazard. Truck stop effluent 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 sites.
- ✓ Ensure stock standing periods are adhered to before loading on trucks.

## Rules affecting waste management

### Offal pits

Under the Otago Regional Council Regional Plan: Waste, offal 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 offal pit, and the offal pit contains no hazardous waste, toxic matter, sewage, animal effluent or dead animal material from an industrial or trade premise;
- the offal pit is not noxious, dangerous, offensive or objectionable beyond the boundaries of the property.

If you cannot meet all the permitted activity conditions a resource consent is needed.

## Farm landfills

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, offal 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 cannot meet all the permitted activity conditions a resource consent is needed.

## Sheep dip disposal

The Water Plan allows animal dip material to be disposed of on production land only when:

- it occurs more than 50 metres from water bodies, and more than 100 metres from a bore;
- no more than 5000 litres per hectare is disposed;
- the land has continuous growing pasture, and is not used if it has been used for such disposal within the previous eight months;
- the manufacturer's directions for disposal are followed;
- none of the material directly enters water in any drain or race, or groundwater, or runs off to or damages any other property.

If you can't meet all the permitted activity conditions a resource consent is required.

## Sources of further information

Otago Regional Council Fact Sheets.

## Water use

### Irrigation efficiency

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 need to apply water in amounts that will avoid waterlogging or excessive leaching of nutrients, and prevent a build up of salinity.

- ✓ 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.
- ✓ Develop ways to accurately record water use and meet conditions of your resource consent.
- ✓ Irrigate at night to minimise evaporation losses

### Taking water

Taking water for irrigation is controlled by resource consents to ensure sufficient water is maintained in rivers and groundwater systems.

- ✓ Work with your local irrigation committee and comply with resource consent conditions. Adopt a policy of give and take. Water has many uses, not just irrigation.

### Using poor quality groundwater

Using poor quality groundwater for irrigation can impact on the soil. Water that is high in sodium or iron and with low pH, may contribute to soil structural breakdown, and drainage or sodic acidity problems.

If you suspect a problem, visually inspect your soil for crusting and drainage problems and conduct annual soil conductivity and pH tests.

- ✓ Test your water for the Sodium Adsorption Ratio (SAR) and make sure you stay within your resource consent requirements.



Spray irrigation system

## Rules affecting water use

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

It is a permitted activity to take up to 25 cubic metres of surface water per day only when the take doesn't exceed the following flow rates;

- 0.5 litres/sec in North Otago, Maniototo and Central Otago sub regions,
- 1.0 litres/sec elsewhere.

And if certain conditions are met. For example:

- the rate of take;
- that fish are prevented from entering the intake; and
- that other lawful water takes are not affected.

It is also a permitted activity to take up to 1,000 cubic metres 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 entering the intake; and
- other lawful takes are not affected

You may take groundwater as a permitted activity, up to 10 cubic metres per landholding per day (more from certain aquifers - details are available from Otago Regional Council or in the Water Plan), but only when:

- the take is for a rate no greater than 1.5 litres/second (more from certain aquifers);
- no back-flow of any contaminated water occurs to the aquifer;
- 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 (including irrigation).
- 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.



Small stream

### Sources of further information.

Otago Regional Council Consents Administration section.  
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.

## 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.



Possum caught in Timms trap.

## Rules affecting weeds and pests

The Pest Management Strategy for Otago covers rules relating to weed and animal pest 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. See Table 1.

**Table 1:** Width of weed-free boundary strip

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

Some weeds need complete control. See Table 2

**Table 2.** Control of other weeds

Weed	Control needed
Old Mans Beard	Complete control of all localised patches, and infestations must be prevented from spreading
Nassella Tussock	Complete control required

There are also some gorse and broom free areas where all gorse and broom needs to be controlled. Check with the Otago Regional Council to see if your property is in these areas. Under the Pest Management Strategy there are rules covering rabbits, hares, chinchillas and rooks. Maximum allowable levels which vary depending on location are set for rabbits.

No person can import or keep a chinchilla unless all breeding age male chinchillas are neutered. It is an offence to poison, capture or trap a rook without authorisation, to shoot at one, or, in the months September to November (inclusive), to operate a bird-scaring device or discharge a firearm within 500 metres of any tree containing a rook nest, or interfere with any nest.

## 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 waterbodies. (See stock grazing 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 mobs of cows can have a particularly detrimental affect on these streams.

## Stock grazing near waterbodies

- ✓ Keep cattle out of waterbodies. A one-wire electric fence is a cheap and effective way to achieve this.
- ✓ Planting key areas around waterbodies 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 waterbodies. When it comes to grazing these paddocks keep stock back from waterbodies 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.

## Sources of further information

“Dairying and the environment. Farm management issues.”

Published by Dairying and the Environment Committee.

## Feed pads and stand-off pads

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

- ✓ When building your pad allow for solid and liquid waste disposal. Prevent run off and scrapings from getting into water ways.
- ✓ Locate the feed pad or stand-off pad well away from any waterbodies.
- ✓ 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.

## Rules for wintering dairy stock

### Stock grazing next to waterbodies

Under the Water Plan, stock grazing in or around waterbodies 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 water body; and
- the discharge is more than 50 metres from any surface water body 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.

# 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 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.

For further information on any other matters relating to environmental issues on your property contact the

Otago Regional Council  
Private Bag  
Dunedin  
Phone 03 474 0527  
Freephone: 0508 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)

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