Managing Landslips

Landslips have been occurring since before European settlement. The mass movement of soil is one of the many forces shaping the land in areas that are still geologically active.

Landslips inhibit farm production by:

* loss of accessibility
* exposure of infertile subsoil
* germination of noxious weeds on disturbed soil
* loss of stock and capital items.

# Landslip causes

The loss of forest cover has a destabilising effect on the soil. Extensive root systems that bind the soil have largely gone and excess water formerly used by trees now remains in the soil.

Excess water in the soil profile is considered to be the prime cause of landslips. Their incidence is directly related to rainfall, although geology, soil type, and topography are all contributing factors.

Conditions that contribute to excess water or excess soil water pressure include:

* poor drainage
* badly sited dams
* the removal of deep rooted perennial vegetation.

Landslips can occur on either volcanic or sedimentary soils. They most frequently occur on slopes above 25 degrees, but also occur on much gentler slopes, especially on older existing slips.

# How to manage a landslip

To manage a landslip site, you must manage the water in and around the affected area. Two main methods of managing water are:

* erecting physical works designed to enhance drainage
* increasing water use by increased vegetation cover.

# Physical works

## 1. Drainage works

Where possible use surface or sub-surface drains to redirect water flow away from the slip. You can construct small diversion banks above the slip as one way of diverting water.

Water should be diverted to a well-vegetated, stable site away from the slip area to help minimise further erosion activity.

## 2. Grading

Often the soil surface is severely broken up immediately after a landslip has occurred. Where grading is possible, it will help:

* reduce infiltration
* assist surface drainage
* prevent ponding
* allow for revegetation works.

## 3. Reinforcing

If possible, batter back head escarpments and steep faces that are prone to further slipping. Excess material available from the 'head' after grading could be added to the toe of the slope to provide added support.

Establish a good grass cover over the disturbed area. Support structures at the toe of the slip can be constructed if needed, but engineering advice may be required.

## 4. Streambank stabilisation

Streams may undercut the toe of the slip and remove supporting material. It might be necessary to divert or pipe the stream at this point, or reinforcing the bank with rock or other material.

You should speak to the catchment management authority in your area or contact our Customer Service Centre on 136 186 for advice.

# Vegetation

## 1. Deep-rooted vegetation

Try to use deep-rooted perennial grasses (for example, cocksfoot, tall fescue, phalaris and kangaroo grass) to further reduce excess water.

Plant deep-rooted trees and shrubs on the active slip area and exclude stock. Planting in the catchment above the slip will maximise water use before it reaches the slip.

## 2. Agroforestry

A mixture of trees and pasture ideally suits the area above a slip. Government or private plantation schemes can provide valuable assistance and information for establishing forestry or agroforestry programs.

# How to prevent landslips

It may not be possible to prevent landslips entirely, but with good land management, you can achieve a reduction in their extent and frequency. Although the risk of slips occurring will vary with climate, soil type and topography, some basic guidelines need to be followed.

## Divert water away from slip-prone slopes

Improve drainage by diverting surface water away from landslip-prone slopes using diversion banks or interceptor drains. Ensure safe disposal of excess water to well-vegetated sites to prevent further erosion.

Grassed drains might be sufficient in non-porous soils but in basalt soils, plastic or concrete, drains may be needed.

It is important to drain springs or soaks, which contribute excess water to landslip-prone slopes.

## Land classing

Fence off slip-prone areas so that they can be managed differently to the rest of the farm. You can achieve this by undertaking a land management plan or whole farm plan.

## Water usage

Increase absorption by planting deep-rooted perennial grasses or trees. Take in as much land above the slip-prone area as can be spared rather than restricting works to the landslip-prone area.

## Stability

Avoid structural disturbances. Roads should be constructed along ridges rather than across slopes where destabilisation may be caused as a result of removing supporting material. Excavation may also expose the soil to more infiltration, increasing groundwater problems.

Ensure that runoff from roads doesn't contribute to problems caused by excess water.

## Streambank vegetation

Protect and maintain streamside vegetation since an eroding stream may act to destabilise the toe of a slope.

## Dormant or 'old fossil' slips

Dormant or old fossil slips are to be treated with caution. They are characterised by long uneven hummocky slopes.

Smaller third or fourth generation slips are likely to occur on these slopes after periods of heavy rainfall.

## Cracks and fissures

Cracks and fissures often appear before a landslip occurs. Investigate the underlying cause and where possible smooth over and plant out to prevent excess water entering the subsoil.

## Adopt a 'whole catchment' perspective

The underlying cause of landslips often originates beyond property boundaries. In such cases, you'll need the co-operation of neighbouring landholders or Landcare groups.

## Important points to remember

* Don't construct dams on old slips or slip-prone hillsides as this will increase water pressure in the soil.
* Maintain a well managed pasture and do not overstock.
* Avoid excess cultivation of slip-prone areas as this can adversely affect soil structure and organic matter levels and lead to greater erosion risk and increased infiltration.
* The aim of landslip control is to see a return to stability and productivity of the area. A combination of short term solutions (such as drainage works) and long term remedies (such as planting deep rooted trees/pastures) might be the best approach.
* For effective landslip control the cost of the works, their likely success rate and off-site benefits must all be evaluated.

# Soil creep

Soil creep or terracing (often mistaken for stock tracks across a hill face) is another form of mass movement. Although soil creep is hardly noticeable, it still represents a loss of soil from the farm, creates management problems and needs to be addressed.

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