LAND MANAGEMENT

SUSTAINABLE LAND MANAGEMENT
Protecting your farm from storm damage

Main points

- The most effective measures are pole planting to protect tracks, crossings, fencelines and dam catchments.
- Pole planting is ideal for protecting gullies and medium hill country pasture.
- Very steep or highly erosion prone-land may be more productive in forestry.

Background

In Northern Hawke's Bay, a hill country farmer can expect an erosion event every five years and a severe erosion event every 10 years.

After a severe storm, access tracks, water supplies and fencelines need immediate and costly repair work. On a typical hill country farm with few prevention measures, damage can be expensive after a storm, eg the average cost to Wairoa District farmers after a storm similar to Cyclone Bola would be about $35,000.

The following methods have been successfully used by farmers in Hawke's Bay to prevent damage to hill country properties. There are seven main areas on a farm susceptible to damage.

Farm tracks

Damage to tracks is caused mainly by dropouts, and from debris from slips above. Surface scouring along tracks is a problem on lighter soils.

Dropouts are difficult and expensive to repair so prevention is best. Plant two to three rows of poles immediately below the track at spacings of 5-10m, with the first row about 2m out from the track. Plant all the fill material below the track.

Poplar poles used to stabilise slopes above and below a farm track.

It's difficult to use trees to control debris from slips higher up hillsides blocking tracks after a rain event. The most practical solution is to sweep the debris off the track with a blade. Obvious slump areas above the track should be planted.

Scouring caused by running water can be minimised by having plenty of culverts or cutoffs. These should be well maintained so that water always flows away from the track – not down it. A good farm track is a valuable asset.

Water supplies

Dam catchments: Protect dams from becoming silted up. Identify the slopes susceptible to slipping and plant these. Also pair plant channels as these often scour, producing large amounts of debris. Very unstable or steep slopes should be forested. Poplars and willows should not be planted on the headwall of the dam because trees disturb the compacted material necessary for an effective head wall. Root channels create leaks in the long term and wind thrown trees can cause damage as well.

Following Cyclone Bola in 1988, a study showed planting poles at 10 m x 10 m spacings to stabilise the average dam catchment would cost only as much as cleaning out a completely silted up dam once.

Dam spillways: Eroding spillways have been the cause of many farm dams failing. Dams with steep or large catchments have high volumes of overflow which can scour spillway channels.

Spillways should be built into hard material, be of a low angle, be large enough to contain normal floods, and have a good grass cover. Willow poles can be planted on the down-hill side of the spillway to protect from drop-outs, but they need to be away from the headwall. They must also be planted a metre or more out of the spillway.

A well sited dam. Note: the well grassed spillway in the foreground.

Farm dam protected from soil erosion.

Gully crossings

The protection of crossings and culverts is essential to maintain access to the farm after a flood. For each crossing plant a minimum of one pair of willows upstream and one downstream for protection. Where the crossing passes over an eroding gully, more intensive block or spaced planting will be needed, both up and downstream.

Fencelines

Fences are damaged during storms, both by slip debris and by drop-outs. Experience indicates that slip debris usually causes complete destruction of fences, but it is relatively easy to rebuild the fence over the debris. However, damage from drop-outs is difficult to repair without realigning the fence.

To protect fencelines, plant poles where drop outs are likely to occur. Trees should be planted on both sides of the fence at 8-10m spacings. It is often not practical to plant all the way up a slope to control all slipping, but obvious unstable areas should be planted. It may be better to relocate some fences.

Gullies

Watercourses are normally severely affected by heavy rain storms. This erosion affects access and begins a cycle of more erosion from the over-steepened sides by undermining adjacent hillsides which then collapse.

Control can be cost effective and simple. Willows are normally planted in pairs as close as 5m between pairs on steep country and 10-20m spacings on easier ground. Poles can be staggered down the water course where erosion is less severe.

Poles should be planted just out of the normal flood level on good soil, but away from the top edge of high, vertically eroded gully sides. See also the Environment Topic on *controlling gully erosion with debris dams.* Debris dams build up and stabilise the gully floor and when combined with willow planting will stop the gully degrading and stabilises the slope.

Streams and rivers

Stream bank erosion is more difficult to control than gully erosion. Preventative work such as planting poles on the outside

Erodible hill slope protected from slipping with Matsudana Willows. These have also been used for fodder.

of bends and shrub willow planting in areas which are beginning to erode should be undertaken. Major work such as groyne construction should be done only with the advice of a river engineer.

Protecting hill country pasture

Although slips grass over quickly, pasture growth only reaches 70-80% of the uneroded production after 30 years. Most of this recovery is within the first 10 years. Trials in Gisborne showed poplars planted 11 x 11 metres apart reduced the risk of slipping by more than 80%.

Pasture can be protected from storm damage by planting poles at 10-15m spacings and greater, depending on the site. Timber production from these trees is also a possibility. Sites needing protective planting can often be identified from old slip scars. These and surrounding areas need planting.

For further information

For information on sustainable land management, ask for the other titles in this series, or contact Land Management staff at Hawke's Bay Regional Council for advice.

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