Erosion control on fences and fire breaks

Fences and fire breaks – also referred to as fire-lines – are often susceptible to damage by soil erosion. This is because they concentrate runoff, resulting in the formation of rills and gullies. In time, this can damage fences and cause fire breaks to be inaccessible and difficult to maintain.

Roads and tracks on farms and grazing properties can also serve as fire breaks and are often located alongside fences. More information about road and tracks is available from science notes *L239* and *L240*.

This science note outlines how to control erosion around fences and fire breaks.

Planning fences

Most fences follow a geometric pattern regardless of the local landscape. Fences and nearby roads can divert the natural flow of runoff. This is accentuated if one side of the fence is more heavily grazed than the other.

Figure 1 (below) shows three different ways in which fences might be aligned to the natural contours of the land.

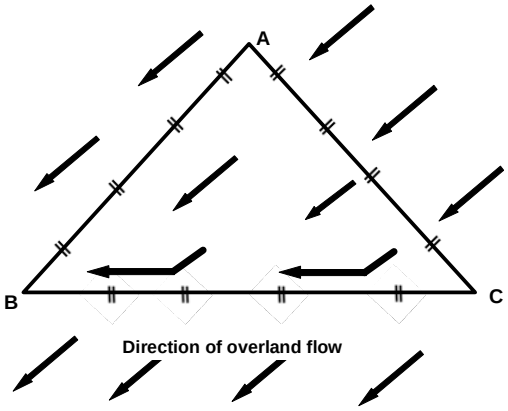

Figure 1 – Variations in how fences may be orientated to the direction of overland flow.

- Section A-C is on the contour and, provided there were no obstructions to flow, runoff would flow safely across the fence line.
- Section A-B is directly up and down the slope with runoff parallel to the fence. If the slope is steep, any roads or cattle pads along the fence would require whoa-boys or diversion banks to divert runoff from the fence line. Ridge lines run directly up and down the slope and are ideal locations for fences.
- Section B-C has the greatest potential to intercept and concentrate overland flows. The erosion risk becomes greater if there are roads or cattle pads. Wire netting fences attract a build up of soil and are especially at risk of diverting runoff.

Where fences divert overland flows (B-C in Figure 1) it may be necessary to implement measures that allow runoff to pass under them at regular intervals. If the fence is on a property boundary, the matter should be discussed with neighbours. Landholders have an obligation to receive from neighbouring properties any runoff they would receive under natural conditions.

Before carrying out any clearing for a fence line, requirements under the *Vegetation Management Act 1999 and the Vegetation Management Framework Amendment Bill 2013* must be followed.

Erosion control on fence lines

Preparation is important. Erosion control measures on a fence line are much easier to apply before the fence is built. Fences built on a dozed line that is below ground level or where there are windrows parallel to the fence line will have a high erosion risk.

If the fence line is orientated to the direction A-B or B-C in Figure 1, then whoa-boys (also referred to as water bars, cross banks, humps or diversion banks), may be required. For specifications for whoa-boys check the science note *L240.*

Fences crossing whoa-boys must be easily opened to allow for maintenance of the whoa-boy (Figure 2).

Grass under fences will restrict water flows. If this is likely, the section of a whoa-boy built through a fence should have extra fall:

- 150mm over 30m for slopes <5 per cent
- 300mm in 30m for slopes >5 per cent.

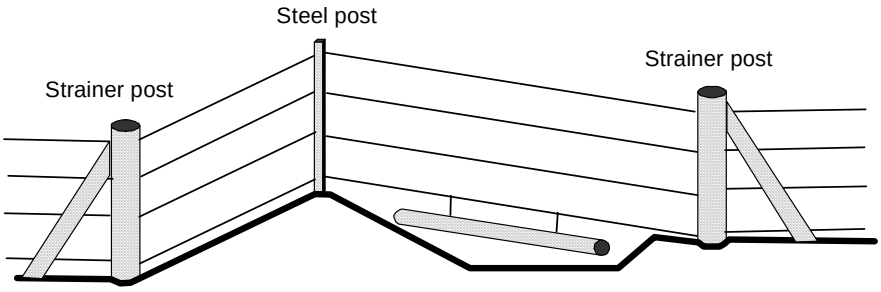

Figure 2 – Fences built over banks or whoa-boys need a method of opening them up to allow for maintenance.

Sometimes attempts are made to ‘repair’ holes in netting fences by grading soil up to either side of the fence. This creates a bank which concentrates runoff and causes erosion, especially where there are highly erodible sodosol soils. Such soils often have a high salt content, which will contribute to rusting of the fence.

Planning fire breaks

Existing tracks, roads and fences are ideal locations for fire breaks. Fire breaks on boundary fences should be discussed with neighbours. A joint fire break on both sides of the fence allows access for fence maintenance and may protect the fence from fire damage.

When constructing a fire break to contain an approaching wildfire, there is often little time to worry about erosion control, however, it is important to implement erosion control measures after the fire threat has passed.

Erosion control on fire breaks

Most fire breaks are built with graders, bulldozers, disc harrows or fire ploughs. The aim should be to create a flat profile with minimal soil disturbance.

Windrows, as shown in Figure 3, or channels should be avoided. If the fire break is in a direction such as A–B or B–C in Figure 1, whoa-boys at regular intervals may be required.

Figure 3 – Windrows created during firebreak construction may concentrate and divert runoff.

If a plough or grader has created a windrow, it may be possible to remove it by ploughing or grading in the opposite direction when the break is next maintained.

If ploughing a fire break, Figures 4 and 5 show how runoff may be spread depending on the direction of travel and the direction of the land slope.

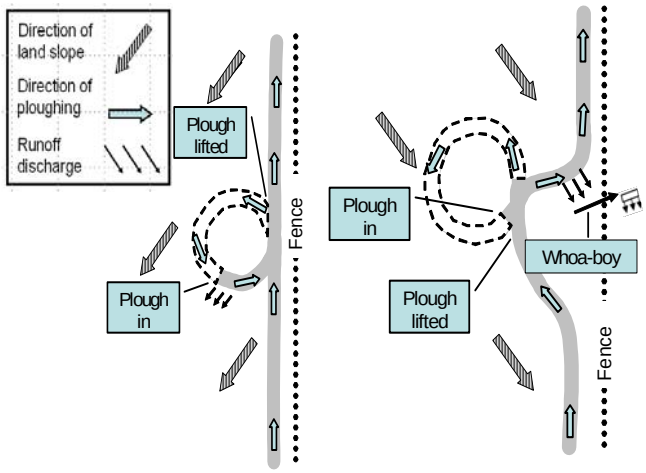

Figure 4 – Methods of dispersing runoff from furrows and windrows when ploughing uphill.

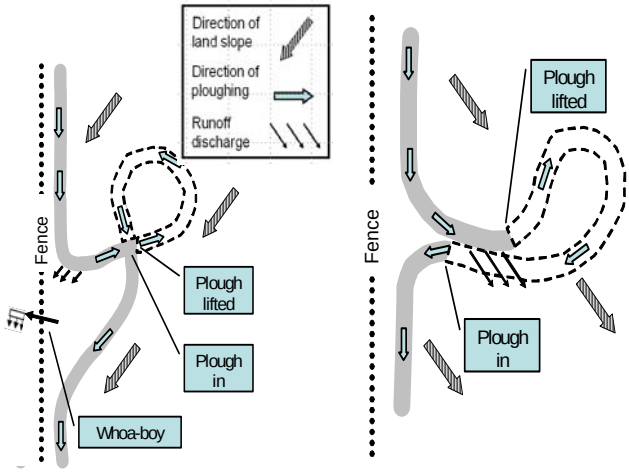

Figure 5 – Methods of dispersing runoff from furrows and windrows when ploughing downhill.

When building fire breaks to control an approaching fire, any windrows should be away from the fire. This is because logs in the windrow can continue to smoulder for days. A strong gust of wind could spread sparks across the windrow and cause the fire to reignite.

Alternative types of firebreaks

Consider using natural features that cannot support fire or will inhibit the passage of a fire. They include watercourses, moist vegetation types such as rainforests and rocky outcrops, including cliff faces.

Fire breaks can be created by using a non-residual herbicide such as glyphosate when plant growth is active. The treated strip can be burnt off before adjacent areas have cured sufficiently to carry a fire. Once a fire break has been installed by a grader and is protected by banks, a herbicide treatment avoids the need for annual grading.

Slashing as low as possible to the ground can slow the fire spread or allow fire fighting resources to get access, however, on a hot windy day a slashed fire break is unlikely to contain a fast running grassfire.

Further information

This and other science notes are available from the Queensland Government website www.qld.gov.au – search 'science notes' or for further information about this science notes series phone **13 QGOV** (13 74 68) – Ask for science notes – Land series 241. Other science notes related to this topic include:

- L239 Erosion control on property roads and tracks—cross-sections and locations
- L240 Erosion control on property roads and track— managing runoff.

For general information about fire management check the Rural Fires Services website www.ruralfire.qld.gov.au.

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