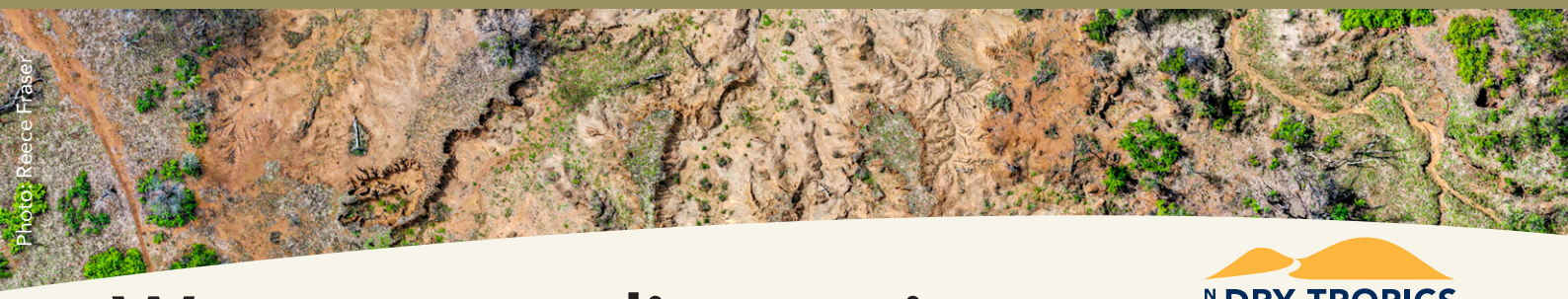

Water spreading to improve degraded native pastures

Water spreading banks aim to maximise the use of surface runoff, by redistributing it and increasing the chance of runoff infiltrating into the soil. This increases soil moisture availability, helping to improve plant growth. Water spreading banks suit land with less than 2 per cent slope. The success of water spreading banks depends on location and design capacity, land use and regular maintenance.

Criteria for a suitable site:

- The volume of water being spread and the topography of the spreading site must be taken into account when designing systems to reduce potential problems of structural failure and erosion.
- Construction must not obstruct major water courses,waterways or flood plains and must meet relevant legal and local planning requirements. If a water spreading scheme affects water flows to public utilities, neighbouring properties, roads, railways or other landowners, consultation and agreement is needed before a scheme is implemented. Written agreements may be needed.
- Sites should have slopes generally less than 2 per cent. Areas with a flat microrelief and low overall slope are desirable to maximise the economic effect, and reduce the potential for spread water to re-concentrate and cause sheet, rill or gully erosion.
- Water spreading schemes are mainly used to rehabilitate or enhance degraded native pastures where productivity is generally low. This makes it essential that there is a large area watered per unit length of construction.
- Steeper areas should only be considered where there are special needs, where catchment runoff is small enough to be diverted safely, and where spreading is physically and economically practical at small horizontal intervals to reduce the risk of erosion.
- Water must be able to be safely diverted from its original flow path.
- The point of re-entry of spread water into watercourses must be stable.
- Spreader bank channel depth should not exceed 150mm to allow for easier spreading of runoff (not ponding in the channel).

Design hints

- The maximum grade for the diversion bank out to the spreading area is 0.2 per cent (1:500). This grade will allow water to move freely along the channel if it becomes grassed and reduces risk of scouring if the channel is bare. In some instances the grade may need to vary for specific sites. If the land slope is very low or the channel is expected to be bare, the gradient in the channel may need to be kept below 0.2 per cent. In other cases the gradient may need to be above 0.2 per cent for a short distance from where the flow is being diverted in order to prevent sudden changes in flow velocity.
- When the diversion bank reaches the spreading area, it changes to a gapped spreader bank. The soil from the channel is pushed to the upslope side of the channel, as well as the downslope side in a sequence, as shown in Figure 1. For the diversion channel, the soil is pushed to the downslope side.
- Take into account the catchment area, expected runoff, local knowledge of flows, etc and design accordingly. Diverting too large a volume may cause problems with bank failure and erosive flows.
- Leave gaps in the spreader bank to allow overland flow into the scheme from land upslope of the bank.

For more information, contact
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Bank construction hints

The gapped spreader bank highest up the slope should be built first.

If further spreader banks are required down the slope, these should be built as the second stage. The diversion bank should only be constructed after all necessary spreader banks have been built.

Maintenance is important to keep the spreader bank working satisfactorily.

The channel capacity should be maintained by removing silt and obstructions. Breakages need to be repaired as soon as possible or concentrations of water may cause sheet, rill or gully erosion.

Image 1: Water spreading banks.

Design Layout Options

There are several different design layout options when installing water spreading banks and channels. Each site needs to be assessed to work out what is best suited for that area. Some example layouts are shown here.

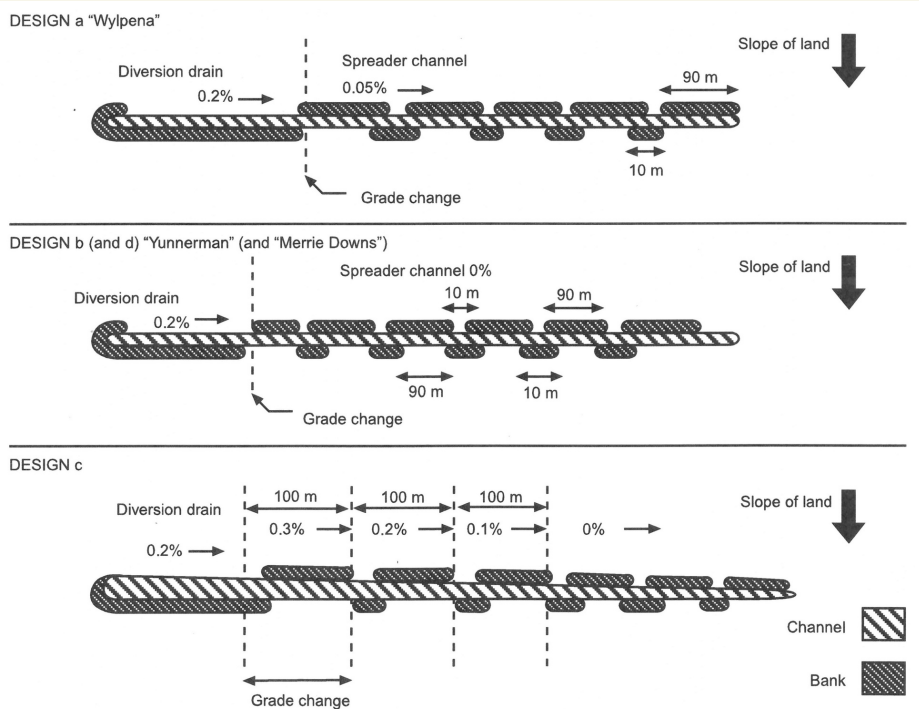

Figure 1: Different design layout options for water spreading banks and channels (Source: Koch et al. 1994).

Reference: Koch AJ, Bryant WJ, Herbert JG, Muller AD and Gray HJ (1994). *Guidelines for the Rehabilitation of Degraded Native Pastures using Shallow Ponds and Water Spreading Techniques.* Queensland Department of Primary Industries, Brisbane.

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