

Managing sediment in farm dams

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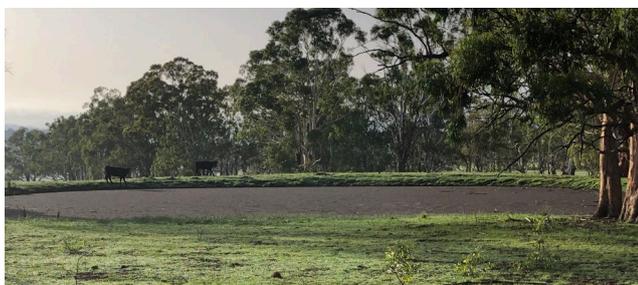
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Introduction

When storms or heavy rainfall occur, sediment runoff and organic pollutants entering dams is a concern. Once these pollutants have entered the dams, bacteria and algae will grow, reducing oxygen levels and causing water spoilage. Spoilt dam water looks dark, with floating scum and a putrid smell.

Polluted dams may make the water temporarily unpalatable to stock, resulting in decreased consumption and the loss of body condition. Young and weak stock are more susceptible. Accumulation of sediment can occur at the edges of the dams increasing the risk of stock becoming bogged.



Management before rain

Maintaining adequate vegetation and groundcover is one of the best ways to prevent runoff and sediment removal. In prolonged droughts this may not be achievable and protective structures may need to be used. Sediment fences can be used to slow the runoff and collect manure, debris and soil, which reduces the amount entering dams. If dams are being constructed sediment ponds should be considered.

When constructing sediment fences, assess the gradient of the slope, existing contours and catchment area. Depending on the individual dam there may be a need to erect more than one sediment fence as depicted in Figure 1.

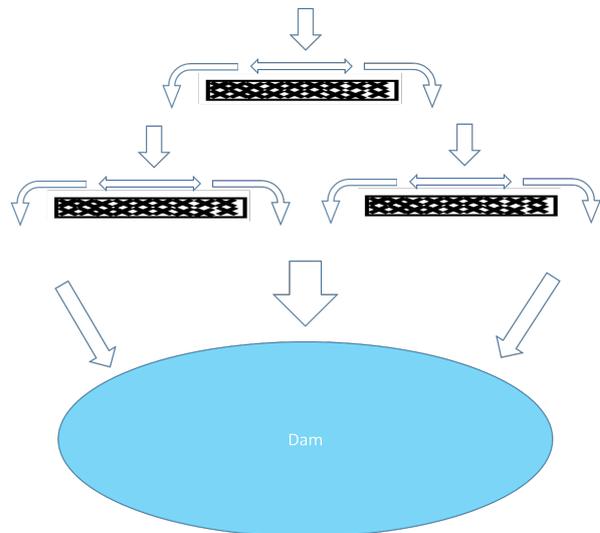


Figure 1

Sediment fences can be made of shade cloth, chicken wire or similar materials. Attach the fence materials to wire strained between steel posts at each end. Intermediate posts should be placed strategically across the barrier to give a gradual curve down the slope to slow the water and direct it around the barrier. Where material with larger holes has been used as a barrier, straw can be placed in front to decrease the particle penetration.



Photo source: <https://www.geckoclan.com.au/project/fire-recovery/>

After the rainfall event

If significant rain has fallen prior to building these structures, some methods to remove the sediment and prevent water fouling are outlined below:

Skimming

Skimming the dam to remove the contamination before it sinks is recommended. This can be a time consuming and labor-intensive exercise, however good results can be achieved.

One system designed by WA farmers is detailed below¹:

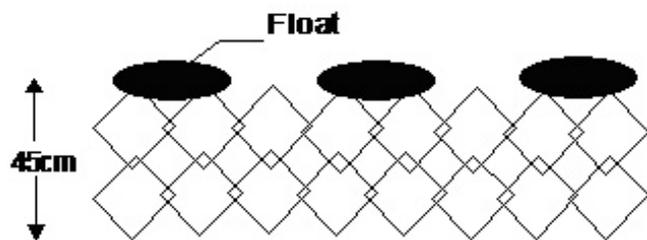


Figure 2: Part of linkmesh boom with floats

A hand-held boom is used to skim the surface. One design is a 10m long by 45-100cm wide piece of linkmesh with floats (e.g. clean 20 L drums) tied to the top. The floats will need to be tied 5cm from the top of the linkmesh and placed close together to ensure the link mesh floats. Ropes (or chain) are then attached to each corner of the link mesh. The end of the rope is tied to the tow bar of a vehicle that is parked at the edge of the dam. The other end of the rope is dragged around the outside of the dam in a windscreen wiper like motion moving the sediment to the edge.



After each skim over the face of the dam, the position of the link mesh will need to be shifted by changing the length of rope to skim another section of the dam. This process will need to be repeated a number of times until the bulk of the sediment is removed.

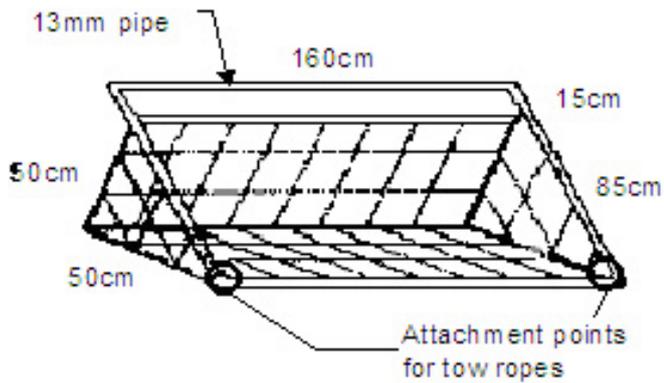


Once the scum has been dragged to the edge, a tractor with a bucket can be used to remove it from the edge of the dam.



Alternatively, a wire cage as depicted in Figure 3, can be pulled by a vehicle to remove the scum. The cage is hooked with a chain (or strong rope) to a vehicle and used to drag the scum out of the dam. This process is repeated until the majority of scum is removed.

¹ <http://agriculture.vic.gov.au/agriculture/farm-management/managing-dams/organic-pollution-in-farm-dams#>



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Figure 3: Cage for dragging materials from dam.

Aeration

After skimming aeration will occur naturally over 2-3 weeks, improving the water quality by putting more oxygen back into the water. This process can be accelerated by some form of water agitation (e.g. pumping the water from the dam up into the air and back into the dam). If the organic material remains it will continue to break down, making the water putrid.

Reticulation

Additional options to improve stock water quality are to fence off the dam, clarify, and pump dam water to a holding tank then reticulate to troughs. Restricting direct stock access avoids bogging and fouling of the dam. Providing water to troughs from a holding tank helps manage the water quality. Pumping provides aeration, and by removing it from the dam any continued breakdown of organic matter does not make that water putrid again.

Calculations are available to ensure that pumps and the reticulation system are capable of providing enough water to meet the daily stock demand. A flocculant, like alum or ultrafine gypsum, is useful to clarify the water before pumping.

A reticulated water supply allows for more flexible management of pastures and feed reserves. Better pasture utilisation is a key driver of overall farm productivity. Livestock also eat more when they have

access to better quality water, further increasing productivity.

Contacts and more information:

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Visit www.droughthub.nsw.gov.au for more information about managing in dry times.

For a complete list of Northern Tablelands Local Land Services Land Facts, please visit our website at www.lls.nsw.gov.au/northerntablelands

Acknowledgements:

Agriculture Victoria - "Building a sediment fence"
(http://agriculture.vic.gov.au/__data/assets/pdf_file/0009/287730/Factsheet-building-a-sediment-fence.pdf)

Agriculture Victoria - "Organic pollution in farm dams"
(<http://agriculture.vic.gov.au/agriculture/farm-management/managing-dams/organic-pollution-in-farm-dams#>)

Gecko CLaN Landcare Network -
<https://www.geckoclan.com.au/project/fire-recovery/>

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