



Drought reserve dams

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This Landcare Note outlines a method of improving the utility of an earth dam based water supply system

"Drought proofing" is a set of strategies and works for enabling a property cope with extended dry periods. These include vegetation protection, stocking strategies, use of stock containment areas, fodder reserves and water reserves.

It is the water reserve that is of interest here.

Rainfall figures for Victoria show quite a variation from year to year. In the drier parts of the State it is possible to have no significant runoff for up to 2.5 years. Water supplies need to be designed with this in mind.

Check with your Rural Water Authority to find out their requirements and guidelines for the construction of drought reserve dams.

Surveys conducted during droughts over the last 20 years indicated that those properties which did not run out of water (for stock and domestic use) could attribute this to at least one large deep dam located on the property.

A strategically located large dam can be a valuable investment. It allows a wider range of management options during periods of low rainfall and runoff.

Of course the cost to benefit ratio of providing such a water reserve may not be acceptable on some properties. Stock removal and/or carting water may be better options. The technical assessment and economic evaluation are necessary to aid in coming to the best decision

Function

A drought reserve dam can supply

- Domestic supplies and stock water requirements
- Reserve stock and domestic supply to augment other less resilient supplies
- Fire fighting reserve
- Reliably-available body of water for wildlife use.

Location and design

To have a satisfactory drought reserve a dam needs to be:

- large
- deep
- strategically located
- structurally reliable

- protected from strong winds
- fenced-out.

A drought reserve dam

- will provide the required water for stock and domestic use for the expected duration of a drought (up to 30 months)
- supplies water of suitable quality for the expected duration of a drought.
- is one you can use if smaller paddock storages fail. The idea is to provide a large deep storage serving several paddocks.
- may well be a large house and garden storage that can be used to supply stock in drought conditions.

Siting and development

The following points need to be considered:

The best storage to excavation ratio.

That is the ratio of the volume of water which will be stored to the volume of soil moved to get that storage. Topography of the land plays a key role in getting a good storage to excavation ratio

Strategic location.

Ideal placement is where water can be readily reticulated to a number of paddocks

Soil suitability.

Test holes should be dug to see if the subsoils will provide suitable material for the embankment and excavation and storage.

Suitability for a deep storage.

Evaporation losses can be over 1200mm per year in northern parts of Victoria. Deep dams loose relatively less of their stored water to evaporation. The Avoca River Drought Survey of 1979 recommended a minimum water depth of 5m.

Check for salt.

There is no point in building a large dam for reserve purposes which will accumulate saline water.



Catchment runoff

Catchment runoff must be able to fill the storage in most years. Dams that persisted during the dry periods of 1976/'77/'78 , 1982/'83 and 1994/'95 generally had large catchments with a high-runoff.

Can a stable spillway be provided?

It will have to be large enough to carry and dispose of floodwaters safely, without damaging the bank or causing erosion.

Safeguarding against siltation and contamination.

Erosion in the catchment will lead to siltation of the storage if it is not controlled. Heavy stock concentrations (especially cattle) around the dam followed by a storm can

result in significant water contamination. A silt dam or a grass filter strip immediately upstream, of the dam to trap dung and silt before it enters the storage is desirable.

Fencing out and reticulating

Maximum benefit will be gained by fencing out the dam and reticulating water to adjoining paddocks.

Construction quality.

A dam of this depth and size will be relatively expensive. Good construction practices associated with soil moisture content, rates of compaction, core trenching, topsoiling of the embankment, etc are critical to protect the investment.

Protection from evaporation.

Consider strategic location of trees and shrubs provide some shade, and to reduce wind effects.

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