

Managing your farm's water resources

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Abstract

Although it is difficult to 'drought proof' a property, good planning in advance can ensure that water for stock and other on-farm uses is available, except in the very worst years. This paper outlines the key questions that landholders need to consider in ensuring adequate supplies, and provides a summary of the pros and cons of various possible water sources. Management issues are discussed, possible incentives described, and further sources of information outlined.

Key words

Farm water, dams, bores, rivers, Harvestable Right.

Introduction

The critical need to develop and manage farm water resources in the best way possible has been highlighted by the recent exceptional drought conditions experienced across NSW. This is an often overlooked area of farm management which resurfaces each drought, by which time it is too late to implement the necessary changes and upgrades to infrastructure and management.

Key Farm Water Resources Questions

The key questions which need to be considered in the development and management of farm water are:

How much water do I need?

The amount of water needed to satisfy general farm water requirements is often underestimated. These requirements typically include stock needs, domestic uses, house garden, fire fighting, washing down and crop spraying. If the proposed supply is from groundwater or a permanent creek or river, there is usually no need to allow for evaporation or other losses. If the source is a dam, the total storage capacity should include the calculated water requirements plus the evaporation losses for the period between dam replenishments. In most parts of the state, this means a significant increase in dam capacity to meet the annual water needs.

How much water can I have?

The amount of water which a property can access under the current legislation governing access to water resources in NSW depends on where the property is located, what water sources are being accessed, and for what purpose this water is being

used. The two pieces of legislation that cover access and use of water resources in NSW are the Water Act 1912 and the Water Management Act (2000). For further information on water licensing, contact NSW Department of Water and Energy.

In summary:

- A licence is required for ALL bores (stock, domestic, irrigation)
- A license is required for ALL dams which are not considered Harvestable Right dams, or are defined as exempt structures under the Farm Dams Policy
- A license is required to extract and use ANY water from creeks and rivers for a purpose other than stock and domestic use where a property adjoins a river/creek (i.e. has a riparian right)

What are my best options for accessing water?

There are three main options for supplying water for non-potable farm uses. These are groundwater, rivers/streams and farm dams. Selecting the best option for your particular purpose is critical to the long-term viability of your property.

a) Groundwater

All forms of groundwater extraction, whether for stock, domestic, irrigation or industrial use require licensing. Some areas of NSW currently have embargoes on the issuing of new groundwater irrigation or industrial licenses.

Advantages

- good yields in some areas
- good quality in some areas
- reliable supply during drought

- no evaporation loss
- flexibility of location when part of reticulated system

Disadvantages

- not available in sufficient amount or quality in all locations
- high installation costs
- ongoing operational costs (i.e. pumping)

b) Rivers/streams

If your property borders a river then you may have a “Riparian Right” to extract stock and domestic water supply from this source. If you wish to extract river water for irrigation, industrial or other commercial purpose, a license will be required. This also applies to the construction of dams on rivers.

Advantages

- Reliable supply
- Easy to access
- Riparian right
- Relatively inexpensive
- Flexible management via location of stock watering points

Disadvantages

- May be inadequate flow during drought conditions
- Not an option for many properties
- Additional infrastructure requirements (i.e. pumps, tanks, pipes, troughs, etc)
- Maintenance of infrastructure due to floods and sedimentation in rivers/creeks
- Ongoing operational costs (pumping)
- Direct stock access can result in environmental damage

c) Farm Dams

The NSW Farm Dams Policy (1999) allows dams to be constructed in certain locations, (minor non-permanent watercourses, gullies and hillside locations), and the water from these Harvestable Right dams can be used for any purpose without requiring a license, provided the Maximum Harvestable Right Dam Capacity (MHRDC) for that particular property is not exceeded

Advantages

- Often the only option for farm water supply
- Minimal operating costs
- Minimal maintenance/ management required
- Reliable supply when properly located, sized and

constructed

- Water quality adequate for stock water
- Can have dual role of erosion control and stock/ domestic water

Disadvantages

- Not suitable for all areas/landscapes
- High initial cost to construct
- Inflexible location once constructed
- High losses due to evaporation
- Can suffer water quality problems if poorly managed
- Poor design and construction can result in expensive failures

How can I manage this water resource to maximise water quality and quantity?

All farm water resources can benefit from ongoing management to ensure water quality and quantity issues are adequately considered. This is particularly relevant for both farm dam and river/creek water sources.

Poorly located, designed and maintained farm dams can suffer poor quality as a result of capturing contaminated runoff from yards or other stock camps, or accessing saline groundwater in areas of high water tables and salinity. Water quantity can also be adversely affected by poor design incorporating large surface areas of shallow water or very exposed locations resulting in high evaporative loss. Mitigating measures can be implemented to reduce impacts such as the establishment of vegetative buffer/filter strips upstream and/or upwind of dam storages

Stock watering points on rivers and creeks can also result in poor water quality, particularly for downstream watering points. This is generally the result of high turbidity from stock damage and erosion of stream banks at stock access points, as well as high nutrient loads entering directly into watercourses. Mitigating measures include well located stock access points at stable gently sloping stream bank locations, or fencing off riparian areas and pumping of river water to service off-river watering points via a reticulated system.

The design of reticulation systems to support the use of groundwater as a farm water resource can also impact on water quality and quantity. Poorly located and installed stock troughs can create erosion problems due to stock tracking and/or the pugging

of soils. Poorly installed and designed systems can also result in frequent breakages and leakage which contribute to inefficient use of water resource, as well as excessive maintenance and resultant cost.

How does this management fit in with other farm management activities?

Farm water resources should be considered in the context of the overall farming system and not in isolation. For example, the fencing of rivers and creeks may be an opportunity to stabilise eroding stream banks and also to establish good riparian vegetation corridors for biodiversity outcomes. At the same time this activity will necessitate the need to establish off-river watering points for paddocks adjacent to the river.

The establishment of a reticulated watering system to support these off-river watering points may then provide the flexibility to change stock management to a rotational grazing regime on the remainder of the property, by utilising the same system to provide the numerous watering points required for smaller paddocks.

Revegetation activities may also provide the opportunity for shading, sheltering and nutrient filtering to protect and enhance the water quantity and quality in existing farm dam storages.

Incentives

The Murrumbidgee Catchment Management Authority currently offers a comprehensive range of incentives which directly and indirectly can assist landholders in enhancing and better managing their water resources. For example, there are incentives available for the fencing, protection and revegetation of rivers and creeks across the Murrumbidgee catchment. Where this activity results in the need for off-river watering points, the Murrumbidgee CMA may provide incentives for this activity. Other

incentives are available for improving grazing management of perennial pasture paddocks to reduce groundwater recharge, and therefore contribute to salinity management. These incentives are provided to landholders to enable them to subdivide large paddocks into smaller paddocks and use the funding provided to contribute to the cost of the fencing and additional water supplies which may be required to support this activity.

Conclusions

The concept that properties can be 'drought proofed' is to a large extent unrealistic. The amount of water resource required to do this would generally be both prohibitively expensive to develop, and very difficult to access. What landholders should concentrate on is improving the drought preparedness of their properties. This involves developing adequate water resources to meet their needs in the vast majority of years. In the Australian environment, this is generally agreed to be the water resources required to service the farm's annual water requirement in 8 out of 10 years, or 80% reliability.

Importantly, these water resources, once developed, need to be maintained and managed in a way that will ensure the best sustainable farm water quality and quantity outcomes. Information in this paper and from sources mentioned here will assist landholders in considering their own situations, and what best management of farm water resources means on their properties.

Further reading

Department of Land & Water Conservation (1999) 'Rural Production and Water Sharing.'

ISBN 0 7347 5064 1. (Department of Land & Water Conservation: Sydney, NSW)

Soil Conservation Service of NSW (1989) 'Farm Water Supplies Manual'. (Soil Conservation Service of NSW: Sydney, NSW).