Managing stock water

GUIDELINES FOR GRAZING IN THE GWYDIR WETLANDS AND MACQUARIE MARSHES

SECTION FIVE

Contents

Introduction

Graziers in the Gwydir Wetlands and Macquarie Marshes use a variety of stock water sources as part of grazing management and it is expected that this will continue. However, alternative water is increasingly important, especially ground water. Alternative watering points are places where animals obtain water other than from flooded semi-permanent or permanent wetlands. As a consequence of using alternate water points:

- stock can access water when wetlands are dry; and
- stock do not need to move into inundated wetlands for water.

Water sources for grazing cattle

Graziers recognise that there is a need to provide water for stock across entire properties, so that businesses are not reliant on flood water in wetlands. Most graziers in the semi-arid Gwydir Wetlands and Macquarie Marshes can access water for their stock from three sources:

- surface water (e.g. river flows);
- groundwater (e.g. bores); and
- rainfall.

Alternative watering points enable different management objectives to be met:

- Stock can be temporarily or permanently excluded from different wetland areas.
- Pasture utilisation can be managed to increase the range of plant species.
- Grazing is not dependent on the availability of inundated wetlands.
- Stock access clean water and this influences productivity.
- Reduced soil compaction and pugging occurs in wetlands.

There are a number of different ways of providing alternate stock water:

- bore drains;
- dams and ground tanks; or
- pipe and trough systems.

In a Canadian trial, heifers supplied with clean water from a trough gained weight up to 23% faster than those with free access to other water types (Willms *et al.* 2002).

Bore drains

The supply of ground water is generally reliable, although extended periods of water extraction across large areas is meaning that the supply is declining.

There are two types of groundwater:

- Artesian water flows to the surface under pressure (often called a flowing bore) and is usually associated with deep extraction bores.
- Sub-artesian water must be pumped to the surface. This water is usually associated with shallow extraction bores and can be directly influenced by short-term climatic conditions such as rainfall events and water tables.

Bore drains were one of the earliest ways of distributing ground water for stock and consisted of long open drains flowing for long distances across multiple properties. However, evaporation and other losses of water from bore drains has resulted in the introduction of 'cap and pipe' programs which distribute water to a network of watering points typically using polypipe and troughs.

Surface Water

Dams and ground tanks

Ground tanks and dams are excavated man-made water holes that store water below the level of the surrounding landscape. These storages can be filled by:

- rainfall;
- wetland flooding;
- open bore drains; and
- stock and domestic water flows.

Relatively common throughout the Gwydir Wetlands and Macquarie Marshes, dams and ground tanks are usually:

- relatively easy and cheap to construct;
- low maintenance (e.g. infrequent removal of sediment); and
- permanent.

However, water stored in dams and ground tanks can:

- be poor quality (e.g. turbid); and
- evaporate rapidly.

Pipe and trough systems

Pipe and trough systems allow for the exclusion of livestock from inundated wetlands, rivers, channels and dams (including ground tanks). These systems can be used to move water small to large distances and have several advantages including:

- water transmission losses are very limited;
- water quality generally remains high;
- water can be directed to livestock;
- water access is less limiting to livestock production; and
- can help to control total grazing pressure.

However, there are two key management issues to consider with a pipe and trough system:

- installation expense; and
- maintenance requirements.

Water quality

In considering whether a water source is suitable for livestock, it is essential to test pH, salinity and chloride (Olson 2007). Water for domestic and stock use should have a **pH** range of between 6.5 and 8.5.

Salinity is the salt content of water. It is the sum of all mineral salts including sodium, calcium, magnesium, chloride, sulphate and carbonate. The impact of salinity on stock health and productivity depends on:

- species, breed and age of the animals;
- status of stock (e.g. pregnant or lactating);
- water and mineral content of available feed;
- climatic temperature and water temperature; and
- salt composition of water.

A good measure of water salinity is the electrical conductivity (EC). EC (µS/cm) describes the total salt content.

Chloride has a number of functions in the body including the regulation of osmotic pressure, balancing pH and influencing digestion.

However, excess chloride causes toxicity. In ruminants, excessive chloride:

- increases osmotic rumen pressure;
- causes a decrease in rumen microbial populations and metabolic activity; and
- reduces nutrient uptake.

Excess sodium chloride in livestock can, if not caught early, result in dehydration, kidney failure, nervous system dysfunction and death.

Shallow wetland pond (NSW DPI)

Salinity (EC in µS/cm) Effects/cautions for livestock
Less than 1600 Low level of salinity. Should not present any serious burden to any livestock.
1600 to 4700 Should be satisfactory but may cause temporary and mild diarrhoea in unaccustomed livestock. Should have no other effects on health or performance.
4700 to 7800 Should be satisfactory but may be refused, at first, by animals unaccustomed to it. May cause temporary diarrhoea. Unacceptable for poultry.
7800 to 10,900 Can be used with reasonable safety for dairy and beef cattle, sheep, pigs and horses. For pregnant or lactating animals, or horses in work, avoid using water with salinity at the higher levels in this range. Unacceptable for poultry.
10,900 to 15,600 Considerable risk in using this water for pregnant or lactating stock, young animals, or any animals subjected to heavy heat stress or water loss. Unacceptable for poultry. Unsuitable for pigs and horses. In general, should be avoided for use by livestock, although older livestock may subsist on these waters in conditions of low stress.
15,600 to 23,400 Risky. Cannot use for stock other than adult, dry sheep.
around 30,000 Toxic: effects will vary depending on the types of salts present.

(Olson 2007).

Managing water in the Macquarie Marshes

A grazier in the Macquarie Marshes has recently undertaken some property development to meet the challenge of a diminishing water supply on his property. Previously, as the wetlands dried, cattle had to walk up to 5 km for water. To better manage this situation, the grazier installed over 50 troughs. Now cattle have to walk a maximum of 1 km before finding water.

When placing the water tanks and troughs, this grazier gave thought to reducing costs, while providing a positive grazing benefit. In this case, the grazier placed watering points in the corner of paddocks which meant that several paddocks could be supplied from one water tank to reduce piping costs. Water points were placed in more than one corner of most paddocks to reduce the pressure of stock access to a single watering point.

Other changes to grazing management on this property have included the breaking up of a number of larger paddocks into smaller blocks, often connected by a laneway. The use of laneways in particular has significantly reduced the amount of time and effort needed to move cattle in between paddocks and the stock yards.

Bore drain in Gwydir Wetlands (NSW DPI)

Ground tank (NSW DPI)

Water management in semi-arid environments

Stock water management is critical for grazing management in the semi-arid areas of Australia. The WaterSmart Pastoral Production™ (Desert Knowledge CRC) project combines the best of what is known about grazing management with the best technologies in stock water storage and delivery on pastoral properties in these drier areas.

Key ideas from the WaterSmart program that will apply to graziers in the Gwydir Wetlands and Macquarie Marshes include:

- When placing troughs or locating ground tanks, consider the proximity of shade. Preferably troughs should be located at least 250 m away from shade to reduce the potential for camping and erosion around the troughs.
- Protect country by not placing watering points or stock camps in valuable pastoral country.
- More watering points means that there is less stock congregation and pugging.
- Turn watering points on/off to allow good areas to regenerate and to aid grazing efficiency.

Recommendations

When designing/re-developing a watering scheme, graziers should consider the following recommendations.

- Water security is a major issue and graziers need to establish alternative options for stock water storage (e.g. harvesting rainwater or accessing ground water).
- Graziers that have access to ground water should investigate pipe and trough systems to secure stock water.
- Graziers cannot move from semi-permanent and permanent stocking toward a more flexible grazing system without adequate water availability.
- Graziers generally have very large grazing paddocks in wetland areas and if the sizes of these paddocks are reduced then additional water may need to be supplied.
- Troughs are preferable to dams or wetland access as they help in maintaining:
  - water quality;
  - management control; and
  - production potential.
- Wetlands provide water when inundated but stock entering drying wetlands cause significant disturbance.

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