

Managing for drought in grazing lands

Rainfall variability is a key feature of the Queensland climate, with the rainfall decreasing and becoming more variable from the coast to the inland.

It is normal for seasons to be well below or above the average as shown in Figure 1. This data applies to Jericho in central Queensland, but the data for all inland grazing areas shows similar fluctuations.

Rainfall averages are misleading because they seem to imply what is normal and what can be expected. Figure 1 shows that there are more years with below average rainfall than there are with above average rainfall. The median is a more useful value because it ignores the extremes. The median is the middle point that has half the recorded values higher than it and half below it. The average is generally higher than the median, because it is skewed upwards by occasional high recordings.

The total amount of rainfall received in any year does not necessarily give an indication of how good or bad that year may have been. A high proportion of the rainfall may have occurred in just a few days or there may have been many small falls which would be lost by evaporation.

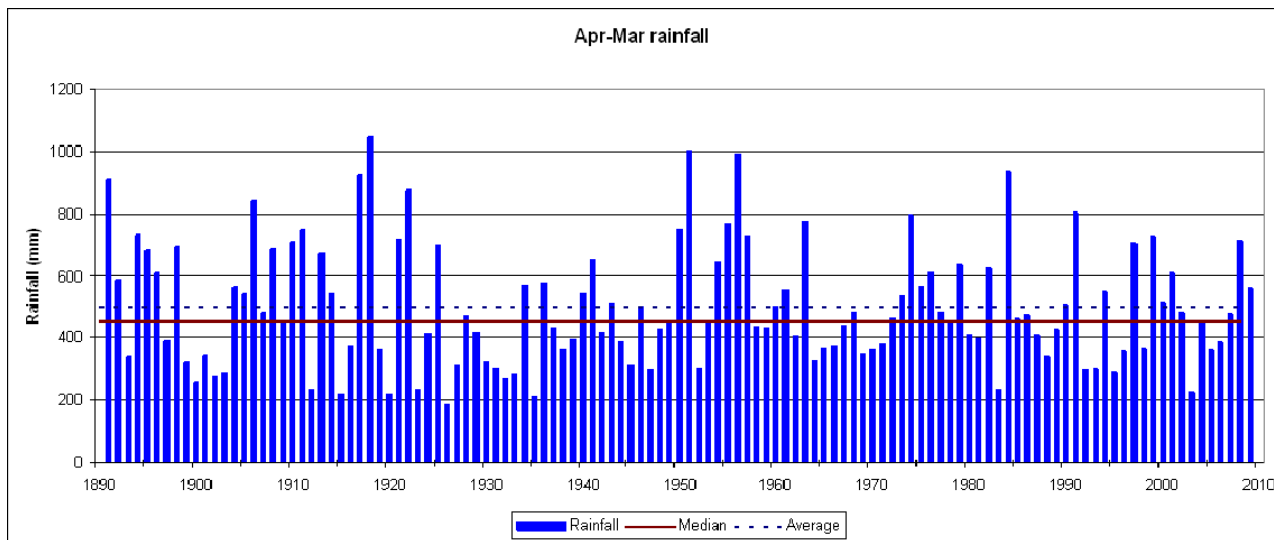


Figure 1 – Annual rainfall for Jericho in central Queensland from 1890 – 2009. The data is based on an April to March year to coincide with the summer growing season for pastures.

Sustainable stocking rates

Pasture growth is dependent on a range of factors including the land type and seasonal conditions. Pasture grasses in Queensland produce most of their growth in the summer months.

The amount of annual pasture growth (July of one year to June in the next year) that is consumed by grazing animals is referred to as the 'utilisation rate'. The safe utilisation rate usually varies from 15 per cent to 30 per cent depending on land type and climate. In very arid environments safe utilisation rates may be less than 5 per cent.

High rates of utilisation may seem more profitable in the short term, but they will degrade pastures. Heavy grazing can have the following impacts:

- Tussock size is reduced – fewer tillers are produced, the root system contracts and less seed is set – meaning the plant may die out. These effects are most severe on the pasture species that stock prefer.

- If ground cover is poor, drought breaking rainfall may be lost as run-off, which could erode the soil and delay the recovery from drought.
- Weeds (herbaceous and woody) invade.

Low utilisation rates may appear to 'waste' feed but they allow the pasture to recover following periods of stress, to remain vigorous and to seed and help maintain soil health.

Once land condition deteriorates its ability to grow useful pasture declines and it becomes more susceptible to future droughts. Table 1 provides an example for the Box Sandalwood land type in the Maranoa region. Land in very good condition (Condition A) produces more pasture and has a higher safe carrying capacity than land that has been subjected to significant degradation (Condition C).

Table 1 – Land condition affects safe carrying capacities

Data applicable to the Box Sandalwood land type in the Maranoa region	Condition A	Condition C
Average dry matter production kg/ha/yr (as predicted by the GRASP Model)	3000	1350
Amount of feed available assuming a 20% utilisation rate (kg)	600	270
Feed consumed by a 450kg steer in one year (kg)	3650	3650
Number of hectares required for one 450 kg steer	6.1	13.5
Long term safe carrying capacity for a 500 ha paddock (450 kg steers)	82	37

Forage budgets are used to match feed supply with feed demand. The amount of feed available for grazing can be determined by assessing the total amount of pasture in the paddock and subtracting what will be lost from trampling and leaf fall and how much residual pasture it is desired to have at the end of the grazing period.

A good time to assess the amount of feed and to adjust rates is in March–April, at the end of the growing season. The aim should be to have at least 40 per cent ground cover and 1000 kilograms per hectare of grass at the beginning of the next summer storm period.

Managing for drought

Because droughts are a recurring fact of life in Queensland, it is essential to plan for them. Seasons of 'below average' rainfall are not unusual and should not have disastrous consequences. If properties are managed for drier-than-average years, better seasons become a bonus for both production and the landscape.

Monitoring the Southern Oscillation Index (SOI) and seasonal forecasts can help predict future seasonal conditions (e.g. a strongly negative SOI indicates a significant chance of drought). As a drought develops, it is important to adopt a strategy while there are still options available. Stocking rates should be managed according to the pasture available and the condition of that pasture. Stock should be sold or agisted early in the dry season while they are still in good condition and fit to travel.

When assessing stocking rates, the effects of native animals such as kangaroos and pests such as rabbits need to be considered. Sheep, goats and horses graze closer to the base of plants than cattle do, and in dry periods can put more pressure on pastures.

If browse species such as mulga are taking up a significant portion of the diet, this is usually an indication that the pastures have been subjected to prolonged dry periods or heavy grazing pressure. Ideally, stock numbers should be reduced before this situation arises. Browse species, especially mulga, combined with mineral supplements may keep stock alive in a drought but any grasses that grow after rainfall may be subject to very high grazing pressure and land condition may decline.

Hay and supplements such as urea, molasses and cotton seed need to be used with care. They should only be used to maintain or improve the condition of the animals that remain after numbers have been adjusted for the amount of feed available. Incorrect use of supplements can contribute to high grazing pressures during a drought and after rainfall.

Most damage from grazing occurs when grass is sprouting from its reserves after a dormant period – in spring or after a drought or fire. Overgrazing at this time allows undesirable grasses and weeds to gain a foothold in the pasture. It is important to spell overgrazed pastures after drought-breaking rain until there is sufficient growth to support around one-third of the normal stocking rate.

Monitoring pastures

Gradual changes in rangeland condition and deterioration of native pastures often go undetected unless there is a structured monitoring system in place. If changes are noticed early, grazing management can be modified to stop the decline and improve pasture and land condition.

Monitoring includes taking a photo and inspecting selected parts of the paddock to check pasture composition, condition and yield each year. Memories are short; a documented record allows comparison with previous seasons and provides a record for others to gauge changes.

Further information

Further information about managing for drought in grazing lands can be found on the Department of Agriculture, Fisheries and Forestry website (www.daff.qld.gov.au). The website also includes information about grazing land management and enhancing native pastures.

The Rainman Streamflow 4.3 computer program is available on the Department of Agriculture, Fisheries and Forestry website <http://www.daff.qld.gov.au/plants/field-crops-and-pastures/broadacre-field-crops/cropping-efficiency/rainman> or by calling 132523. Rainman Streamflow 4.3 contains long-term historical rainfall data for some 3800 locations throughout Australia and monthly rainfall data can be updated via the Internet each month for free. Landholders can also enter and analyse their own rainfall data.

The Long Paddock website (www.longpaddock.qld.gov.au), includes information about current drought declared areas in Queensland, maps showing how recent rainfall compares with long term averages, data from pasture growth models and seasonal conditions outlook for areas throughout Queensland.

This and other science notes are available from the Queensland Government website www.qld.gov.au – search 'science notes' or for further information about this science notes series phone **13 QGOV** (13 74 68) – Ask for Science notes – Land Series 90. Other science notes related to this topic include:

- L91 Erosion Control in Grazing Lands

July 2013
L90