

Stocking rate management in the Fitzroy Woodlands

Matching pasture supply to animal demand

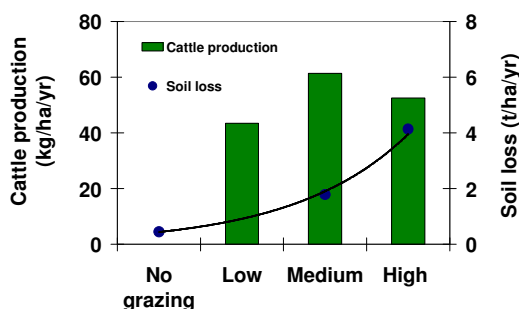
Why is it important?

Stocking rate management is vital for land condition, animal performance and therefore overall business profitability and resilience.

When land is in A or B condition it is very stable and capable of withstanding unplanned disturbances such as fire or drought. Managing stocking rate is critical for maintaining good land condition or to improve poor land condition. As a general rule, land condition declines when pasture utilisation rates exceed 30%.

As stocking rates increase animal production/head declines, whilst animal production/ha initially increases it declines after reaching a maximum point. In the long run, maximising profit, animal performance per hectare and per head are complimentary.

Cattle production and soil loss per year



“Stocking to LTCC keeps you safe from making poor trading decisions.”



Influence of Stocking Rate on Weight Gains at Rubyvale (1994-2001)

Grazing Pressure	Stocking Rate * (ha/AE)	Weight Gain	
		kg/hd	kg/ha
LOW	5.0	150	43
MEDIUM	3.2	136	61
HIGH	3.2*	116	53

*Average Stocking Rate over 7 years to achieve desired grazing pressure

“If you look after your land, you will always look after your cattle.”

Getting the language right

Stocking rate: The number of animals per hectare for a given time period, say the dry season, to achieve desired utilisation level and animal performance.

Long-term carrying capacity (LTCC): The average number of animals a paddock can carry over a planning horizon (more than 10 years) without degrading land condition. It takes into account the different land types that may be present, their condition, tree cover and how evenly the cattle use the paddock. Generally around 30% of the annual pasture growth is utilised on more productive land types and less as land productivity or condition declines.

Land condition: The capacity of land to respond to rain and produce useful forage. There are four categories with A representing good condition and D representing degraded condition. (See Land Condition fact sheets of the Fitzroy Woodlands)

Utilisation: The proportion of annual pasture growth that is consumed by herbivores (eg. cattle, horses, kangaroos, rabbits). Not all pasture growth is available to cattle enterprises. Some growth needs to be left so the plant can survive and contribute to a healthy ecosystem.

Setting your stocking rate

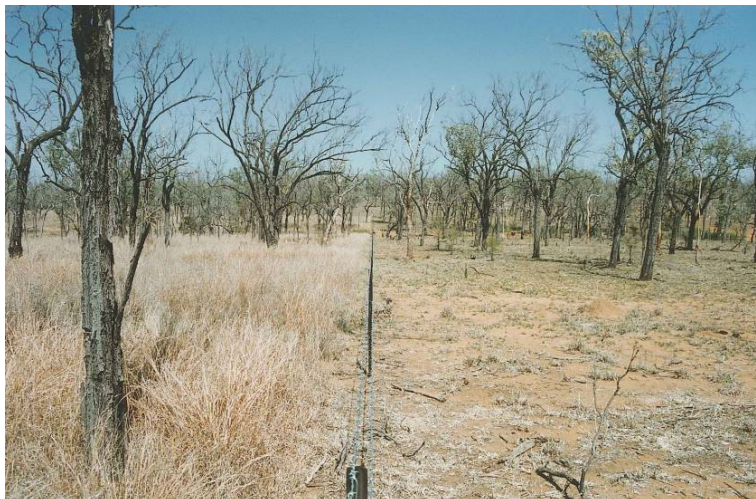
Not all the feed produced is available for animal production ... the plant requires a certain amount to remain healthy and make a positive contribution to keeping the ecosystem healthy (land condition). The goal is to use surplus feed or *available feed* for animal production, the only trick is we don't know when the *available feed* reserve is going to be replenished. Therefore your stocking rate needs to vary with the amount of *available feed* grown. The most critical time to review your stocking rate is towards the end of the wet season, when the chance of additional pasture growth is low. The earlier this assessment can be made the better. Reviewing this decision in the early wet using animal performance, pasture availability and seasonal forecasts is prudent. Minimising the frequency of forage imbalances helps to ensure the maintenance of long-term carrying capacity.

Long term carrying capacity and stocking rate

As long term carrying capacity is looking for the average number of animals for a long time period it needs to take into account that there will be poor pasture growth years. Therefore this level of stocking will not greatly harm land condition; it is a risk-adverse approach to managing stocking rates. So while you will get through the dry times relatively well, the downside is that you will miss the opportunity to capitalise on the good times.

By using your long term carrying capacity as a base (particularly for financial budgeting) and then making adjustments to stock numbers at the end of the growing

season you can optimise business performance without risking land condition. An opportunity to adjust cattle numbers is a positive occasion to strengthen your business. In good years, spell or burn paddocks, entertain short term trades or agistment and in bad years to remove unproductive animals.



Light and heavy utilisation

Gross margins (\$/ha) for grazing strategies at Wambiana.

	Years 1-4	Years 5-10	Years 11-12	Years 1-12
Annual Rainfall	776	434	1073	654
Heavy SR	35	-17	20	6
Moderate SR	21	11	15	15
Variable SR	30	4	16	14

It is better to err on the side of caution than be tempted by short term financial gain and risk ecosystem damage. The data from the Wambiana grazing trial (left) shows that moderate stocking rates were the most profitable overall and minimised low income years. The heavy and variable stocking rates were more profitable in good rain fall years; however there is a high financial and ecological risk in the transition from good to poor years. Bio-economic modelling conducted on a representative property based at Duaringa recommended that annual increases in stock numbers from the conservative stocking rate need to be tempered with relatively greater drops in stock

numbers to minimise pasture degradation in poor growing seasons.

Pasture growth and ecosystem requirements

Grass tussocks require both **rest** and **grazing** to remain healthy and productive. Paddocks with good land condition should be spelled one year in four, while paddocks in poorer condition require spelling more frequently to improve land condition. Wet season spelling allows the tussock to replenish root reserves and increase crown cover which aids soil surface condition, pasture health and vigour. Residual plant material and good ground cover is necessary for healthy and vigorous plant growth with the onset of the growing season.

Other things to consider when setting stocking rate

Grazing pressure from other herbivores, such as horses, kangaroos or rabbits must be taken into account when setting stocking rate. Also consider if there is any area in a paddock that may have limited use due to terrain, distance to water or patch grazing. Deductions may also be necessary for tree competition and areas of poor land condition.

Reviewing your stocking rate

To see if your stocking rate is in the optimal range look at the following indicators.

Ground cover

Any material covering the ground up to 50cm high that will intercept a falling rain drop is considered ground cover. Plants living or dead, bark, leaves, sticks, logs, pebbles, rock and dung are common examples of ground cover. 30% ground cover has been identified as the absolute minimum and is to be avoided at all costs. Ideally ground cover greater than 50% minimises runoff, loss of nutrients and soil whilst promoting pasture growth.



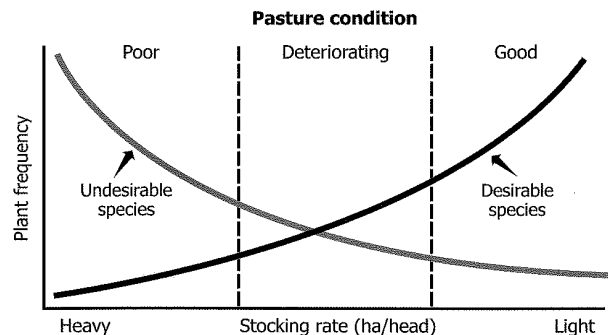
Left. Low ground cover 15-30%



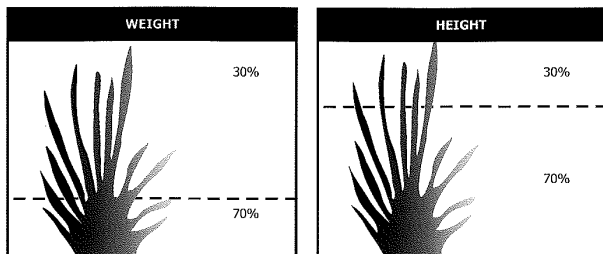
Right. Moderate to High ground cover 50-90%

Pasture composition

The desirable 3P (perennial, productive and palatable) grasses decline when stocking rate increases making way for undesirable grasses and weeds to increase in the ecosystem. 3P grasses include desert bluegrass, black spear and buffel grass. Undesirable grasses include wire grasses and annuals. A good coverage of 3P grasses for that particular landtype indicates that stocking rate is in the optimal window.



What does 30% utilisation look like?



30% use (utilisation) by weight (correct), compared with 30% use by height (incorrect).

Utilisation levels

Utilisation level is measured by plant weight not height as seen in the diagram to the left. So although a 25-30% utilisation rate may sound small, the bulk of the plant weight is towards the base of the plant which allows the plant to be grazed down considerably without detriment.

Higher utilisation levels on productive land can be achieved if the pasture is regularly wet season spelled. Lower levels of utilisation should be used on landtypes of lower productivity.

Residual plant material

Generally 800-1000 kg/ha of plant material and 40-70% ground cover is necessary at the beginning of the wet season for the plant to function well with the onset of the growing season.



Left. 1050 kg/ha pasture material on brigalow country.

Right. 950 kg/ha pasture material on ironbark country.



Adjusting cattle numbers

Adjusting cattle numbers can be physically and emotionally challenging, particularly for breeding enterprises. The earlier animal numbers can be adjusted the greater the opportunities available either through agistment or selling. As the saying goes *if you look after your land ... you will always look after your cattle*.

The class of cattle traded or put on agistment needs to be carefully considered. There maybe opportunities in the market to sell older animals and keep younger animals who are not putting as much pressure on the ecosystem and should have superior genetics.

In years with low pasture growth animal numbers need to be reduced quickly to protect ecosystem health and allow for pastures to recover with the onset of rain. Rebuilding cattle numbers needs to occur slowly with higher pasture growth years to allow pasture plants to recover their reserves.

Producer case study – their experience in managing stocking rates

Bon Accord is located 10 kilometres west of Anakie with predominantly brigalow/blackbutt land types. About 75% of the property is cleared with buffel pastures and regrowth controlled by blade ploughing or Graslan herbicide. The majority of the property has very good land condition. The herd is self replacing and turnoff from the property is mainly EU steers and cull heifers, with some cows and steers going to local markets. Paddock sizes are 300 to 400 hectares and stock are usually concentrated on about half of the property at any one time.



Richard Hawkins on coolibah flats

Stocking rate management

The overall stocking rate is conservative, and usually only varies by around ten per cent. During dry conditions the stock numbers are reduced significantly, and built up gradually after a drought. Good distribution of water points assist with an even grazing distribution.

Total stock numbers are kept fairly constant at long term carrying capacity. However, if conditions become dry in winter, then the older steers, heifers and saleable animals are sold. If conditions remain dry, cull cows are sold in January based on a pregnancy test and cull for age. Further dry conditions will entail further sales of stores, weaner steers and cull heifers until a nucleus breeder herd is remaining.

Summary

Well established infrastructure, together with a conservative stocking rate and a policy of reducing numbers during dry periods allows for a flexible rotational grazing system and the maintenance of good land condition.

Places to go for more information

StockTake: Balancing supply and demand workshop, developed to provide grazing land managers with a practical, systematic way to assess land condition, long-term carrying capacity and calculate short-term forage budgets. Contact Jane Hamilton (via DEEDI Business Information Centre) 13 25 23 or jane.hamilton@deedi.qld.gov.au

MLA EDGENetwork:

Grazing Land Management: Provides land managers with a practical and planned approach to improve land productivity and sustainability Contact Jane Hamilton (via DEEDI Business Information Centre) 13 25 23 or jane.hamilton@deedi.qld.gov.au

Nutrition: Covers all areas of animal nutrition, including how nutrition affects animal growth rates, financial returns and market access. Contact Desiree Jackson (via DEEDI Business Information Centre) 13 25 23 or desiree.jackson@deedi.qld.gov.au