CHAPTER 3
Pasture management during drought periods

This chapter looks at methods of assessing pastures to determine how much feed is available and also at management considerations to get the best from the pasture system during tough times.

Key Messages:

- **Availability of pasture needs to be assessed in kg DM/ha for use in feed budgets.**
- **Defer grazing after the drought breaks. Grazing too early further damages the grasses and will affect their persistence.**
- **Weed management is important in the first few months after the drought breaks, otherwise they may significantly reduce future pasture production.**
- **Assess perennial pastures after the drought breaks for the percentage of perennial grass, annual grass, broadleaf weeds and bare ground. This will give an indication of whether pastures need resowing.**
- **If sowing into pasture, apply a small amount of phosphorus fertiliser, 10-20 kg/ha phosphorus, the equivalent of 114-227 kg super/ha.**

The need for supplementary feeding and the quantity required will depend on the availability and quality of the pasture. The following section provides a simple guide to help you estimate pasture quantity and quality to determine the contribution of the pasture as part of a ration.

Assessing pasture availability

The quantity of pasture in a paddock is measured in kilograms of dry matter per hectare (kg DM/ha). It is the weight of pasture from a hectare if it was cut to ground level and completely dried to remove all moisture.

Pasture quantity is determined by measuring the average height of the pasture in centimetres (using a stick or ruler) and calibrating the height to kg DM/ha using Figure 3.1 as a guide. When using this method, the first 0.5 cm should be excluded from the measurement.

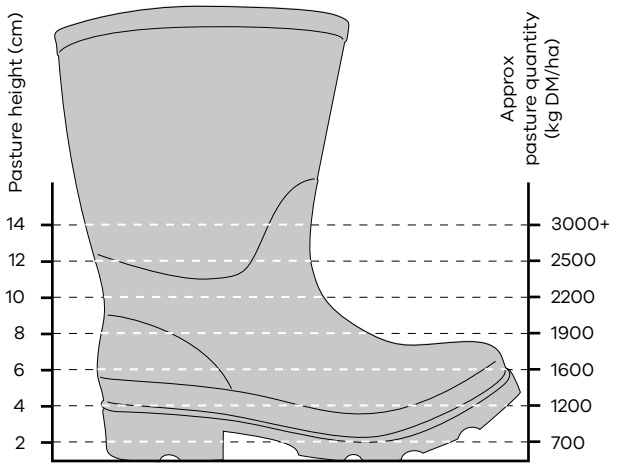

Figure 3.1: The relationship between green pasture height and pasture availability.

The pasture quantity figure can then be used in feed budgets. Feed budgets allow you to use the energy content (or quality) of the pasture to help determine if enough feed is available to meet production targets (maintenance or growth or lactation, etc).

Another way to assess pasture quantity is the 'cut and dry' method. This will give the most accurate estimate of quantity.

- make a square 33 x 33 cm (you could use wire or PVC pipe or small gauge poly pipe using corner joiners)
- take 10, 33 x 33 cm pasture cuts (to the ground) from the paddock
- dry each sample in a paper bag in the microwave – place a glass of water in the microwave during the drying process to stop bag/sample from burning
- dry sample for 1 minute, remove and weigh
- dry for another minute, remove and weigh
- continue drying and weighing until there is no change in weight
- multiply the average weight (g) of the sample by 100 to get the kg DM/ha.

Pasture quality

Pasture quality is determined by the digestibility of the green and dead herbage, clover content and the proportion of dead herbage.

Digestibility is the proportion of the pasture eaten that is retained by the grazing animal. For example, if green pasture has a digestibility of 70%, it means 70% of the pasture eaten will be used by the cattle and 30% will pass out as faeces, so if the cattle eat 10 kg of pasture, 7 kg will be utilised and 3 kg excreted. A highly digestible feed will be digested faster, allowing for greater intake and greater animal production.

Protein content of the pasture is also important. If it is too low it can limit the performance of some classes of stock. The protein level of dry pasture will range from 5% to 8% of dry matter. The protein level of green pasture ranges from 12% to 30% of dry matter (depending on the stage of growth and the amount of clover present).

Pastures with high digestibility will also be high in energy (see Table 3.1). Other factors that influence quality of pasture include:

- proportions of dead and green herbage of the same species (quality gradually declines as pasture ages from the vegetative to reproductive state
- differences between pasture species.

There is often little difference between annual and perennial grasses early in the growing season. Towards the end of the growing season, however, annuals such as silver grass and barley grass quickly decline in quality when they produce seed heads and die. Perennial grasses maintain higher quality longer and usually have some green material present.

Legumes are particularly high in protein and usually have roughly the same energy value as perennial grasses. Animals gain weight faster when grazing legume pastures compared to a grass pasture with the same pasture availability.

Figure 3.2: 1,700 kg dry matter, 55% digestibility.

Figure 3.3: 1,000 kg dry matter, 60% digestibility.

Table 3.1: Metabolisable energy (MJ ME/kgDM) supplied by different pasture qualities.

Pasture Description	Digestibility	Energy (MJ ME/kgDM)
Dry stalks	50%	6.5
Dry grass and leaf	55%	7.5
Late flowering	60%	8
Mid flowering, green and dead	65%	9
Late vegetative	70%	10
Active green growth	75%	10.5

Stock and pasture management at the end of a drought

In previous droughts, some of the worst stock losses have occurred immediately after the drought has broken. It is important that the feeding management of sheep and cattle is carefully planned and supervised over the weeks following the end of the drought.

Stock will spend a lot of energy roaming around paddocks chasing the short 'green pick' that quickly appears. Although this green pick is highly nutritious, the quantity that stock can eat soon after germination is not great and may be far less than their maintenance requirements.

Stock need time to adapt from grain feeding to eating pasture. It takes 2-3 weeks for the population of digestive organisms in the rumen of cattle to adjust to digesting pasture rather than grain. Sudden changes from high grain rations to green pasture can cause digestive disturbances.

There may be stock problems if the pasture is dominated by particular weeds. Nitrate poisoning is common in pastures dominated by capeweed and clover early in the season. Do not allow hungry stock free access to these types of pastures. Strip graze the paddock where practical and ensure stock have ad lib access to hay.

The arrival of drought-breaking rains can also be accompanied by cold and windy weather. These conditions place added stress on stock that are already suffering from a lengthy drought.

Feeding management

Feeding should be continued for 2-3 weeks beyond the end of the drought. Stock should be restricted to small areas for that time to allow a wedge of feed to grow ahead of them.

Wean stock off grain over 2-3 weeks and give them access to some green pick to enable their digestive systems to readjust to the green feed.

Cold and windy conditions associated with drought-breaking rains may increase the maintenance requirements of the stock. The rations fed over the 2-3 week period should be increased by about 20% above drought rations.

Pasture recovery

The effect of drought on a pasture will depend on the management and grazing pressure to which it is subjected relative to the rainfall. There are significant differences between species in their ability to withstand the combined effects of heavy grazing pressure and reduced rainfall.

The extent to which pastures recover after a drought depends largely on when the drought-breaking rains are received. If the drought breaks with a 'normal' autumn break, the pasture should recover quickly – providing there are adequate numbers of viable seeds to germinate or there are drought-tolerant perennial species present. Sufficient follow-up rains are needed to keep pastures growing vigorously. A delayed break, or lower-than-average rainfall in the autumn, will impair the pasture recovery rate. The effect of drought on irrigated pastures will depend on the availability and frequency of watering.

Annual species

Annual grasses, such as annual ryegrass, will have reduced seed set during a drought, resulting in lower density in pastures the following year.

Lack of competition from favourable species may allow undesirable annual grasses such as silver grass and barley grass to come back strongly, even if there is less seed available for germination.

Spray programs later in the year may be required to control undesirable annual grasses.

Sub clover or medic should have sufficient residual hard seed in the soil to produce a good sward after drought, unless the clover or medic content has been poor for some years before. Bare soil conditions and an early break will favour their germination and it is not uncommon for these annual legumes to return to a similar or greater percentage of the sward than before the drought.

Annual weeds such as capeweed, erodium, Patterson's curse and thistles will be more prominent after a drought. These broadleaf weeds tend to grow bigger with less competition. If capeweed is dominant, there is a possibility of nitrate poisoning of stock. This can be prevented by not introducing hungry stock to capeweed-dominant pastures.

These species are favoured by bare ground at germination and reduced competition from other species. They also cope better with 'false' breaks than more favourable species.

Perennial species

Perennial grass species are likely to suffer considerable reductions in plant numbers during a drought. The longer the dry conditions last, the more severe the effect.

Perennial ryegrass is the least tolerant of drought, followed by cocksfoot, tall fescue and phalaris. A dormant bud in the phalaris plant is its mechanism for survival, supplying the plant with water and nutrients throughout the dry period. By allowing phalaris to set seed in spring, the dormant bud can be fully developed, enhancing the chances of survival.

Take care when grazing phalaris pastures soon after the autumn break. Short phalaris pastures can produce a toxin that causes phalaris staggers and death. The risk can be minimised by allowing plants to establish three leaves before grazing,

and feeding the animals hay before they are introduced to phalaris.

Paspalum is relatively drought tolerant and will increase its dominance in under-irrigated pastures.

Lucerne has a deep taproot and can survive drought, provided it is given regular spells from grazing to allow it to recover.

White clover survival is likely to be severely affected, particularly in marginal areas (which includes 'irrigated' areas where the watering has been stopped).

Opportunity to improve pastures

Pasture productivity will not necessarily fall drastically after a drought, even though some species will have declined. A 'wait and see policy' for up to two years after the drought can allow sufficient time to gauge the actual effects and allow some species, for example perennial ryegrass, to thicken up from seed produced in the post-drought year.

For the best result, a good weed control program should precede all pasture establishment work. Broadleaf weeds, for example, are likely to be a problem in newly germinated pastures unless they are controlled.

Opportunity to control weeds

For any weed control program to be successful, it must include a method for replacing the weeds with more desirable species. Methods may include chemical control followed by re-sowing and/or grazing management programs. Grazing management combined with chemical control can be successful if the desirable species makes up 50% or more of the pasture composition.

The following spray programs may be considered. Always read the product label and follow all directions. Product labels contain helpful information and critical precautions for the safe and responsible use of these techniques.

- Spray grazing for broadleaf weeds. Conducted in autumn or early winter after the break. Spray with a broadleaf herbicide such as MCPA, wait two weeks and graze off the pasture.
- Winter cleaning for annual grasses (particularly silver grass). Conducted in late winter. Spray with simazine, which prevents the annual grasses from seeding.
- Spray-topping for annual grasses such as barley grass. Conducted in mid-spring (when plants are in the 'milky dough' stage). Spray with sub-lethal dose of glyphosate and graze off the pasture.
- Pre-sowing knock down spray. Spray with a lethal dose of glyphosate before sowing a new pasture or fodder crop.

Need for fertiliser

There may be a larger-than-usual residual effect from fertiliser applied at the start of the drought as a consequence of reduced leaching of nutrients because of the dry conditions and reduced pasture growth.

Areas that have been used for intensive feeding will have increased in fertility due to the nutrients supplied by the feed and recycled through the animal. Soil testing post-drought is the key to ensuring the correct nutrient applications.

In circumstances of reduced stock numbers and restricted finances, it may be necessary to defer or reduce fertilisers for the year.

Nitrogen fertilisers can be used early after the autumn break to boost autumn/winter feed availability. Nitrogen fertiliser is best used on improved plant species and may be wasted if pasture composition has been seriously compromised by the drought.

Fodder crops

In some circumstances, it is useful to grow a winter fodder crop to boost feed supplies after the drought. In most cases there is no need to do so, particularly if there is a good early break and stock numbers are down, or if water is available to irrigate pasture.

Fodder crops can help control weeds prior to re-sowing pasture in the following year and can provide feed more rapidly than a newly sown pasture.

Estimated pasture survival

It is important to assess what recovery might be expected when rain falls so early action can be taken.

A simple procedure is to water (with a watering can) a square metre in several places within the paddock and see what grows. In previous droughts, the results of this procedure have shown a close relationship to what subsequently germinates.

If stock are in the paddock, it may be necessary to use a fence to protect the watered areas.

Assessing the need for resowing a perennial pasture

Resowing does not always mean a total renovation of the pasture. If there is still a reasonable amount of desirable species present, but it needs to be thickened up, direct drilling into the existing pasture is generally the best method.

Ryegrass seed, for example, is generally drilled in at lower rates, such as 15 kg/ha for an oversow, while a full resow generally has sowing rates of 20-25 kg/ha. Other seed types will have different recommended rates.

Assessing composition of the perennial pasture can be completed using the stick method. Walk across the paddock in a diagonal transect. Randomly throw a pen or stick in front as you walk. Note what the end of the stick is touching and record. Complete this 50 times along the transect. Record whether it touches a perennial grass, annual grass, weed or bare ground. If 50 records are collected, simply multiply the number in each category by two to get a percentage composition for the paddock.

If desirable perennial grass species are above 70%, the pasture will still be productive. If the desirable grass species are below 50%, reseeding will increase yields, increase the feed value on offer to stock and increase the response that pasture will have to applications of nitrogen should you choose to use it.

When assessing perennial pastures before the break has arrived, a significant amount of bare ground may be encountered. If this bare ground is 30% or lower, this will not significantly affect pasture production across the year. Clover will germinate and fill some of the bare ground areas, but weed control may be needed to control capeweed growth early in the season (generally about six weeks after the break).

If reseeding, it is a good idea to apply a small amount of phosphorus-based fertiliser to ensure new emerging pasture can readily access phosphorus from the soil. Phosphorus is important for healthy, strong root formation, giving the pasture a kick start to life.

Rates of 10-20 kg/ha of phosphorus will be adequate (114-227 kg super/ha). The phosphorus can either be drilled in with the seed (best response) or broadcast around the time of sowing.