



How Mitchell grass pasture composition influences sheep productivity

Mitchell grass pastures change significantly throughout the year and between seasons, [read here](#). Species composition of Mitchell grass pastures influences sheep productivity and has implications for management.

Sheep grazing Mitchell grass pastures: diet composition and diet quality

Pasture composition: the mix of species in a pasture, i.e. the diversity and abundance of different pasture species.

Diet composition: species diversity and proportions in the diet, i.e. what the sheep are eating from the pasture.

Diet quality: nutritive value of the diet, including protein, energy, other nutrients and digestibility.

Diet composition and diet quality vary more in relation to seasonal rainfall than between paddocks, especially for sheep. Sheep's split, moveable lips and narrow muzzle enables them to nibble and bite off parts of a plant giving them the ability to **selectively graze pastures**. Given sheep can capitalise on the availability of forbs, they typically have **higher diet quality** than the average quality of all plants in the pasture. **Taste, sight, smell, touch, palatability and nutritional status influence forage selection.**

The figure below depicts the progression of forage selection by sheep grazing Mitchell grass pastures. The speed of progression from one feed type to the next is a **factor of initial availability and stocking rate**. **Lighter stocking rates allows sheep to progress more slowly** from herbage and annuals to seed heads, for example, which **extends diet quality** further into the season.



When available, forbs form a significant component of sheep diets. On Mulga/Mitchell grass country, the **nutrient content of the green forbs and grass was similar** whereas on Mitchell grass country the **nutrient content of green forbs is higher than the green leaf of grasses**.

Whilst they are not the most palatable species available, Mitchell grasses are valued for their **tolerance to grazing and persistence throughout dry spells**, providing **invaluable dry standing feed** when most other plants have disappeared in the dry season.





Forbs in pastures

- When sheep are **lightly stocked** and forbs are present in the pasture, **forbs form a greater proportion** of the diet than grasses. At higher stocking rates and under the same pasture conditions, **grasses form a greater component of the diet** with a subsequent impact on **diet quality**.
- While forbs are crucial for animal production, **managing for forbs is not recommended** as the higher **utilisation rate** required to increase their presence **sacrifices the resilience and longevity** of the pasture. **Forbs are best treated as the cherry on top**.
- Protein and energy are likely to be lacking in the diet when there is reduced availability of preferred forbs, annuals, seed heads and pods. High-quality supplements should be given in these situations.

The impact of seasonal rainfall on diet quality and sheep production

Rainfall	Pasture	Implications for sheep and/or management
Early start to the season	Perennial grass dominant pasture.	Sheep might require supplementation earlier if pasture quality is reduced due to lower availability of herbage.
Late start to the season	Forb dominant pasture, pasture quality will be sustained for a bit longer but there may be a reduced bulk of grass going into the dry season.	Evaluate available forage and stocking rate at the end of the growing season.
Wet summer, dry winter/spring	Increased perennial grass yield.	Watch out for a decline in diet quality. It could be worthwhile considering supplementation, to: <ul style="list-style-type: none"> - avoid a decline in marking rates for spring-born lambs - ensure spring-joined ewes are on a rising plane of nutrition.
Average summer, wet winter/spring	Winter/spring rainfall promoting the growth of high-quality forbs in addition to standing dry pasture.	Diet quality maintained throughout the year due to winter forb and herbage growth.
A series of good seasons	Further shift towards perennial grasses. There is likely to be fewer forbs and a bigger stand of lower quality dry pasture.	The country probably looks fantastic! Take some photos of the pastures for future reference. If you have a big stand of pasture, stocking rate could be increased for a period to capitalise on the feed and give inter-tussock species a chance to grow? Perennial dominated pastures may lack protein and energy, insufficient for maintenance. Earlier supplementation may prevent reductions in wool production, reproduction rates and lamb marking rates.
Dry period then consecutive years of above average rainfall	Increased chance of a protein drought, particularly if the winter growing period is prolonged (i.e. significant herbage and forb growth in winter).	Left unaddressed, protein droughts can reduce lambing rates and growth rates. Earlier supplementation may be required, even around autumn lambing.

Are your ewes in lambing and lactating when pastures are nutritionally optimal?

The benefit of autumn vs spring lambing will differ depending on location. **North-west pastures** are typically at their maximum nutritional value in autumn whereas **south-west production areas** can expect winter rainfall in 35% of years, which improves feed quality leading into spring.

High diet quality at lambing can improve:

- ewe milk yield
- lamb growth rates
- lamb survival

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