Using Trees as Fodder

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Historically, trees such as Mulga and Kurrajong have been used for drought feeding. In our current drought, some producers are using these and other trees as part of a ration or as a full ration. As with any time stock are being fed, it is important to take into account livestock requirements, feed quality and feed quantity.

Before you start cutting trees for fodder, you need to decide if it is going to be an activity that is going to benefit you and your business. Climbing trees with chainsaws is hard and dangerous work. I am regularly hearing of injuries as a result of falling out of trees, cuts from the saw and even felling logs onto waiting stock. You need to decide if it is a job you are willing to do or would rather pay someone else to complete. If you do employ someone, make sure you have suitable insurance.

Stock requirements

Nutritional requirements for stock can be listed by level of importance. Energy being the most important followed by protein then fibre, minerals and vitamins. For cattle on maintenance diets metabolisable energy (ME) levels in feed should be at least 8Mj/kg of dry matter (Mj/kg/DM) and for sheep, ME should be at least 7Mj/kg/DM. Cattle need to be consuming a diet with at least 8% protein while sheep require 7% protein. If a cow is lactating, the energy requirement increases by 60%, meanwhile the energy requirements for a lactating ewe with twins require 3.3 times the maintenance requirements for energy.

The amount of energy and protein stock can access from a feed source is driven by the amount of feed they can process through their digestive system. Feeds with high levels of fibre will move more slowly through the digestive system, compared to feeds with low levels of fibre (i.e. hay vs grain). Stock will generally eat around 3% of their live weight in dry matter (weight of feed when water is removed). If fibre levels are high, feed intake will be reduced. We can estimate potential intake (based on DM) by using the neutral detergent fibre (NDF) value. This is done by using a simple calculation: Body weight x (1.2/NDF).

The NSW DPI publication Managing Drought https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/582531/Managing-drought.pdf explains the nutritional requirements of stock very well and is a great resource if you are feeding.

Feed Quality

There are some significant differences in feed quality of different trees. As part of Central West Local Land Services field days on fodder shrubs, Ag advisory staff collected a number of samples of different trees that we knew producers were lopping for stock feed. As you can see in Table 1, there is a significant difference in feed quality from species to species. There is also differences in feed quality of trees in the same species. This can be due to soil moisture, soil fertility, time of year and age of growth. Therefore, it is important that you get a feed test done to work out the quality of the trees on your farm.

Generally, energy is low and fibre is high. This means that it is difficult for stock to eat enough of the leaves to get the energy they require for maintenance, especially if they are pregnant or lactating. In most cases fodder should be used as a roughage source, supplemented with a feed high in energy, like grain. Molasses can be used to limit impaction (sticks and stems blocking the digestive tract), but should not make up more than 10% of the diet. Urea can also be used to improve the efficiency of the rumen, but great care should be taken as urea is highly toxic if overfed. Protein levels in some species are quite good, particularly in wattles and kurrajong trees.

Table 1: Feed quality of different trees collected in Central West NSW.

Species	Sample type	Location	Dry Matter %	Neutral Detergent Fibre %	Crude Protein %	Metabolisable Energy Mj/kgDM
Black Pine	Leaf and stem	Coonabarabran	58.4	40	6.2	10.8
White Pine	Leaf and stem	Condobolin	64.2	46	6.4	8.8
White Pine	Leaf only	Condobolin	61.9	42	7.4	10.3
Wattle	Leaf and stem	Condobolin	41.4	44	15.1	8.5
Wattle	Leaf only	Condobolin	39.9	44	15.3	8.4
Wilga	Leaf and stem	Condobolin	50.3	31	13.4	9.7
Wilga	Leaf only	Condobolin	50.2	25	13.5	9.5
Rosewood	Leaf and stem	Condobolin	48.9	51	11.4	6.7
Rosewood	Leaf only	Condobolin	47.7	47	12.7	7.3
Kurrajong	Leaf and stem	Coonabarabran	44.1	68	10.4	7.7
Kurrajong	Leaf only	Coonabarabran	43.3	65	14.1	5.8
Kurrajong	Leaf and stem	Condobolin	44.5	60	11.6	7.5
Kurrajong	Leaf only	Condobolin	46.3	64	13.7	8.1
Apple box	Leaf and stem	Coonabarabran	56	47	7.1	5.2
Apple Box	Leaf only	Coonabarabran	52.3	43	9.7	6.0
Belah	Leaf and stem	Condobolin	56	50	10.1	7.7
Belah	Leaf only	Condobolin	55.7	49	9.2	7.5

Feed tests will give a good indication of feed quality, but some species have tannins, are high in lignin or other have anti-nutritional compounds that can affect the ability of stock to make use of proteins in the feed. These will not be picked up in a standard test. Toxins will not be picked up either.

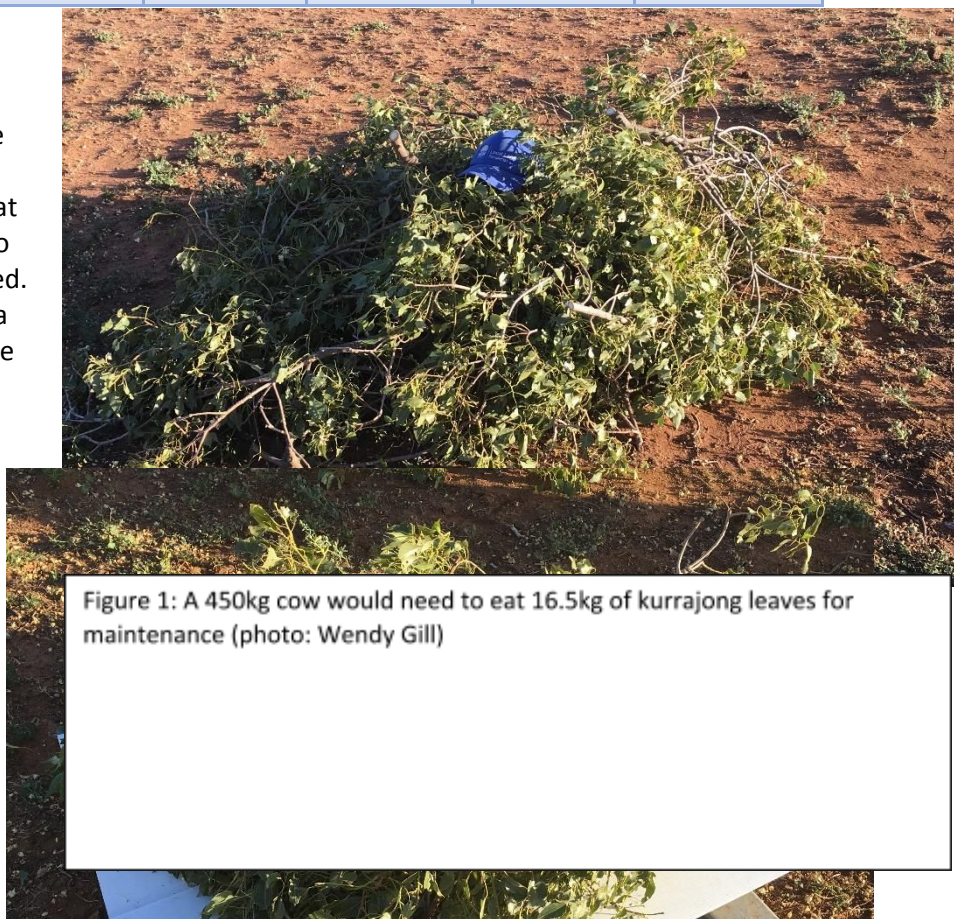

Figure 1: A 450kg cow would need to eat 16.5kg of kurrajong leaves for maintenance (photo: Wendy Gill)

Working out quantity

There are a number of ways to work out feed quantity, but I find the Drought Feed Calculator app to be an easy option. As an example, if you were feeding "Coonabarabran Kurrajong

with leaf and stem" to a 450kg dry cow, you would need to feed 16.5kg of kurrajong per day (as shown in Figure 1) to meet energy requirements. A lactating cow on the same feed would need to eat 26kg to meet its energy requirements. A 60kg dry ewe would need to eat 2.6kg of kurrajong (Figure 2) while the same ewe lactating would need to eat 6.48kg per day.

For each of these scenarios, it would be unlikely that stock would be able to eat enough kurrajong leaves to meet their energy requirements. Therefore, supplementing with high energy feed like cereal grain would be required.

A downside of feeding scrub, is that it is hard to accurately weigh out leaves as we would if we were feeding out grain or hay, but it is important to feed enough and therefore we have to be able to estimate the amount of feed needed for each days feed. It is worth while cutting a proportion of a tree then weighing the sample (Figure 2). If you do this regularly, it will allow you to "get your eye in". Once you know how much fodder you can cut in a given time, you can then work out labour costs per tonne. You could feed this into the Drought Feed Calculator app and compare the cost of feeding trees versus hay or grain.

Figure 2: A 60kg ewe would need to eat 2.6kg of kurrajong leaves for maintenance (photo: Wendy Gill)

Take home message

If you are thinking of feeding trees you should get a feed test done on the trees you plan to use. Once you know the quality of the feed you are using you can then use the Drought Feed Calculator app (https://www.dpi.nsw.gov.au/animals-and-livestock/nutrition/feeding-practices/drought-feed-calculator-app) to calculate the amount of feed your stock need and any supplementary feed you need to include. Finally, get a rough idea of the quantity you are cutting so you can supply your stock with enough feed. If you would like any help completing these steps, speak to one of our Local Land Services Ag advisors.