Value of saltbush questioned

Brian Casson
Tess Casson
Ed Barrett-Lennard
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Over the last 20 years the Department of Agriculture has focused on finding plant species that can grow on saltland to produce sheep feed, and on techniques for establishing plantations of saltbushes. Some research has been in response to farmer reports of success in using revegetated saltland to provide autumn forage, while other work has resulted from the apparent importance of saltbushes in rangeland areas.

Objective measurements of wool production have been taken only recently. Three years research at Katanning indicates that while saltbush material is selected and eaten by sheep, its value for wool production is not high. It appears that saltbush cannot act as a genuine supplement to dry pastures, as BRIAN WARREN, TESS CASSON and ED BARRETT-LENNARD explain.
The useful sheep feed from river saltbush, the leaf, seed and very fine stems at 240 g (A), is a small portion of the total bush compared with the thicker stems 465 g (B) and the branches 1591 g (C). This analysis is typical.

Forage production
One of the main constraints to sheep production on any pasture is the amount of forage actually available to the animals. With saltbushes this is leaf and very fine stem material less than 2 mm in diameter.

In experiments between 1992 and 1994 on a 20-hectare saltland grazing site at Katanning, edible dry matter (DM) production from four commonly grown saltbush species was consistently low. Each year on average, leaf and fine stem yielded less than 0.5 tonnes of dry matter per hectare (tDM/ha).

Forage production from understorey grasses (mainly barley grass, with small amounts of other species such as puccinellia and ryegrass) remained relatively constant (see Figure 1). It was about three to four times that from the saltbushes and our work shows that even though this material is of poor quality, it is equally important to grazing animals.

To put production from saltbush pasture (saltbushes plus understorey) in perspective, a dry, mixed annual pasture in early summer, or stubble from a 1.5 tonne wheat crop, will provide about 3–4 tDM/ha.

At drier sites, yields of saltbush leaf have been similar to that from Katanning, but lower rainfall areas produce less understorey, so that the contribution from the saltbush becomes more important.

Saltbush composition
In general, adult sheep require forage with a digestibility greater than 50 to 55 per cent and nitrogen content of 1 to 1.5 per cent to optimise intake and maintain weight. The higher the fibre and salt content, the lower the digestibility. The more salt in the feed, the less the sheep will eat.

Very little information on the nutritive value of saltbushes was available when this work began. We measured digestibility, which is an indicator of the energy available from the forage, of both DM and organic matter (dry matter corrected for the ash content), the nitrogen content, and the salt and fibre content of saltbush samples from all over Western Australia and some from the eastern States.
Our tests have shown that there is very little difference in the chemical composition (and nutritive value) of saltbush species wherever they are grown. Even when saltbushes grow on mildly saline soil they accumulate salt in their leaves and we have found from 15 to 20 per cent of the DM is salt. Fibre levels of saltbush (40 to 45 per cent) are similar to those found in most mature green forages (see Figure 2).

The real digestibility of saltbush leaf and small stem is frequently below 50 per cent, about the same as dry grass, but the nitrogen content is 2 to 2.5 per cent. While the leaf and fine stem are digested poorly by sheep, the nitrogen content should be more than enough to support weight gain in adult animals. The high salt content reduces the digestibility of saltbush by increasing the flow of nutrients from the rumen.

Grazing studies

Liveweight and condition scores of sheep grazing saltbush pastures (10/ha) were measured over summer and autumn in three successive years. While only the 1992 data are shown (see Figure 3) the pattern of liveweight change and body condition score was very similar each year.

In 1992 the mean liveweight of sheep grazing all saltbush pastures apparently remained constant for about seven to eight weeks and then dropped sharply as the bushes were defoliated. The weight of sheep on the control area (dry pasture without saltbush) declined after entering the plots and they were removed after about seven weeks grazing.

Sheep on all four saltbush varieties and the dry pasture had the same body condition score through the whole grazing period. When the sheep were removed from the control plots because of excessive weight loss, they had a slightly higher condition score than those on the saltbush pastures.

Increased water consumption is an important consideration when grazing sheep on saltbush pastures. Because of the very high salt content of their diet, the animals require a low-salt water supply and even then consumption is increased two or three times, up to 7 litres per day, compared with sheep grazing dry, low-salt pasture.

This difference in liveweight but similarity in condition score is because animals eating saltbush, with up to 20 per cent salt in the diet, retain additional water in body tissues and the intestinal tract, which does not contribute to production, giving a false impression of their condition. The additional water retention has been shown clearly from analysis of body composition. The saltbush sheep had about 10 to 15 per cent more water in their bodies than the controls, which equals 3 to 5 kg more weight.

Measuring faecal output of sheep grazing different saltbush pastures using special nappies helps provide researchers with important information about sheep diets and differences between saltbush species and individual sheep.

Figure 3. The average liveweight and condition score of wethers grazing saltbush and dry annual pasture, at Katanning over summer and autumn 1992.
Saltbush pastures may use some groundwater and change the environment in which they are planted, but the value of this to the farmer differs from their value as a forage.

Many producers consider revegetated saltland a valuable autumn forage reserve. The next phase of our project is to work with farmers who are currently managing their saltbush pastures in this way in order to determine possible benefits to a whole-farm system. It will then be appropriate to re-examine the economic significance of saltbush.

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Further reading

Conclusion
Although this work has taken place in the South-West of Western Australia, our analyses of samples from other areas and interstate suggest that these results will apply to forage from many other salt-affected areas.

There appears to be no doubt that the high salt content of the feed is the main problem with grazing sheep on saltbushes.

While we have not been able to show any real benefits to sheep from grazing saltbush compared with dry pasture, we have also not found it to be harmful. It appears that saltbush does not act as a genuine supplement to dry feed.

Brian Warren and Tess Casson are Research Officers, Sheep Industries Branch. Ed Barrett-Lennard is a Senior Research Officer, Pastures and Revegetation Branch, South Perth.

Brian can be contacted at the Albany District Office on (098) 420 500

The role of saltbush
- Low capacity sub-soil water pump
- Coloniser of severely degraded saltland sites
- Modifier of the micro-environment to allow re-establishment of other species (especially after water table draw-down)
- Provider of shelter for domestic livestock and native wildlife
- Nitrogen source when (very rarely) energy is not the first limiting 'nutrient'

What saltbush is not
- High producer of dry matter on severely degraded sites
- Producer of high quality forage
- Suitable feedstuff for young, pregnant or milking animals

This is not a problem if plenty of good quality water (less than 500 ms/m for young sheep) is available but needs to be addressed before allowing sheep to graze saltbush.

Wool production
Grazing saltbush had no effect on wool growth or quality over the whole year.
Even when we looked at wool production for the relatively short periods when sheep were grazing saltbush pastures, no differences were caused by the saltbush species or the saltbush alone. However, the wool was tender for each group, less than 30 N/k tex, and the position of break was during the early period of grazing saltbush.