



Coorong Tatiara

Sustainability, Agriculture & the Environment



Fact Sheet #2 Native forage shrubs – grazing management

It is possible to influence the choice of plants by livestock and therefore the way in which a stand of forage shrubs is grazed. We investigated how to ensure forage shrub plantings were evenly grazed, so ground cover could be maintained and livestock would consume a reasonably balanced diet.

Livestock choices: preference

In a shrub stand, a grazing animal's choices will strongly determine how effectively and efficiently the feed resource will be used. The tastes, nutritive values and physical structures of forage shrub species, particular native ones, differ from one another and, more markedly, from conventional pasture plants. From available plants, grazing or browsing animals will select a diet that provides the best balance of nutrition and energy.

Choosing which forage shrub species to plant and the physical layout of the stand will have long term implications for productivity, nutritive quality and grazing options. So before the first shrub is put in the ground, the species composition and layout of the stand needs to be determined.

Tactical choices: managing livestock preferences

Grazing management manipulates grazing intensity in the stands. Intensity can be changed by:

- the number of animals per unit area
- the length of time during which they graze
- the frequency of grazing
- the length of time between grazing periods
- the amount of feed-on-offer (FOO) when grazing starts and stops
- supplementation.

Changing intensity affects which forage species are grazed, and how much and how quickly they are grazed relative to the other forages present.

Grazing trials

We investigated how to increase shrub intake by livestock, despite unpleasant tastes and anti-nutritive traits, balanced with a reduced alley pasture intake. Grazing would then be more even across the forage types.

To do this we tried to manipulate dietary choices

using long-term and tactical management. We considered three options:

- to diversify the forage mixture by including alternative alleys of perennial lucerne and veldt grass compared to alleys sown to cereal triticale, and planting old man saltbush alone compared to simple mixtures of two shrub species (old man saltbush vs. River saltbush, Rhagodia vs. river saltbush) in a shrub stand,
- to increase grazing intensity (sheep/ha) to *reduce the opportunities for grazing animals to selectively graze* the shrubs and pastures,
- to add supplements to the grazing diets (See Factsheet 3).

We established demonstration trials at 'Booderoo', 'Mount Russell' (Coomandook) and 'Desert Fringe' (Netherton). We wanted to determine if grazing intensity or stand composition could be used to increase an animal's intake of forage shrubs, while the animal still gained weight.

Shrub	Companion species	Grazing Intensity	
		High	Low
Oldman saltbush	Lucerne -Veldt grass	57	146
Oldman saltbush	Triticale	97	155
Oldman & River saltbush	Lucerne -Veldt grass	61	99

Changes in live weights of ewes grazing forage shrub mixtures in autumn 2010 at Booderoo Hills, Coomandook.

Livestock show preferences

We found that grazing stock chose more palatable alley plants and grazed them more heavily than the shrubs. They did not browse the forage shrubs until minimal pasture remained in the alleys. There was a large 'preference gap', producing a disjointed use of the shrubs and alley pastures.

At Booderoo, the switch in grazing from pastures to shrubs occurred when residues in the lucerne alleys

had been grazed to ~250 kg dry matter/ha (DM/ha) and those residues in the veldt grass alleys had reached ~ 400 kg DM/ha. In a late summer grazing trial, sheep preferentially grazed triticale that had been sown the previous autumn and spray-topped in spring. The residual straw was largely left and grazing shifted to the shrubs. The same happened with the lucerne/veldt combinations. In the supplement trials at Mount Russell, sheep began to browse the shrubs most heavily as the residues of the volunteer annual alley pastures fell to approximately 200kg of dry matter/ha.

Maintaining ground cover

The forage shrubs were browsed after the lucerne and the new or green leaf and shoots of the veldt grass had been grazed, leaving lucerne stalks and fibrous, flowering or older stems of veldt grass. Larger residues of veldt grass's spring growth, made up of flowering stems, were left ungrazed.

This tendency for grazing animals to replace less digestible forages (e.g. older veldt grass) with saltier but more digestible ones (e.g. old man saltbush) has been reported in other more rigorous testing.

The fibrous veldt grass, while less nutritious after spring flowering, may be a better companion plant to shrubs for summer grazing as its residual fibrous stems and crowns are less preferred than the shrubs, and so retain greater soil cover.

The 'preference gap' between the shrubs and the alley pastures posed a significant obstacle to fully using the shrubs and keeping erodible soils well covered. The presence of more than one shrub species in a stand, or different pastures (lucerne/veldt grass versus triticale) in the alleys did not substantially change this pattern, particularly when a supplement was available.

Stocking rates increase grazing pressure

In the Booderoo demonstrations in autumn and spring 2010, we used higher stocking rates to increase grazing pressure. Higher stocking rates reduced the amount of feed per sheep making foraging more competitive. It was expected that this would make livestock less discriminating, which would in turn increase the chances of them combining different forages in a more nutritionally balanced diet. Under these greater competitive pres-

ures, livestock might graze more shrubs and understory plants more evenly.

Our work suggests that higher grazing pressures (45-75 ewes/ha vs ~22 ewes/ha) were associated with increased shrub intake. Importantly, in our demonstrations, higher stocking rates were also associated with lower intake (g DM/day/sheep), and slower rates of live weight gain (g/day/ewe). The higher shrub intake was penalised by lower live weight gains as shrubs became a larger part of the diet.

In the single shrub species stands of old man saltbush, intensive grazing produced no significant shift in the livestock preference for the alley pastures over the old man saltbush. There are likely physiological limits to the daily intake of this species imposed by its taste and its anti-nutritive components, particularly salt concentrations.

In our demonstration plots where there was another species in addition to old man saltbush, the sheep appeared to eat more shrubs in total. This observation requires tougher testing. If it is confirmed, *increasing species variety in a shrub stand may be a way of increasing daily shrub intake*. Another strategy that may reduce the 'preference gap' between old man saltbush and pastures is the development of more palatable varieties of old man saltbush. Future Farm Industries CRC is in the final stages of selecting more palatable and nutritious varieties of old man saltbush, which will be released commercially in the near future.

Stopping points for grazing

Our trials highlighted conflict between the goals of:

1. optimising animal production
2. forage shrub and alley plant use and
3. minimising risk of soil erosion.

The relative importance given to each of these goals determines how intensively to graze forage shrub stands, and how much alley pasture and shrub residues to leave after grazing. We found fully using the shrubs intensified grazing pressure, leaving the trial plots exposed, and animals losing weight. When animal condition and soil protection were most important, we stopped trials before the shrubs had been fully used

Key points:

- Choose how you will balance three competing factors: animal nutritional needs, adequate shrub use and retention of adequate soil cover.
- Monitor body condition of stock during grazing to ensure it is at least improving or remains in a range adequate to allow future transition to successful joining, pregnancy and lambing.
- Identify stopping points to grazing: residual alley plant cover (70% ground cover). Be prepared for the last 50% of shrub forage to be eaten quickly when alley pastures have been heavily grazed
- Provide adequate high quality water to meet the likely doubling of the daily requirements
- When supplementing, supply at least 30% of an animal's daily energy requirement (see Fact Sheet 3 for more information on supplements)