



## Design and management of edible shelter

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In 2021, approximately 20,000 shrubs were vegetatively propagated and planted at two research sites; Manunda Merino Stud at Tammin and the UWA farm 'Ridgefield' at Pingelly. Each site consists of three x 6-10 ha paddocks. Within each paddock, there are six subplot treatments (80 x 80 m) that will remain unfenced to allow for the free movement of animals. Shrubs within subplots were planted in September using best commercial practice to rip and scalp the planting lines. Shrubs were planted by hand to ensure accurate spacing.

The six treatments include;

1. Anameka™ saltbush (industry best-practice, relatively palatable) planted at commercial density (double rows, 2 m between shrubs within rows and 18 m wide interrow), perpendicular to the 'killing' wind direction.
2. Anameka™ saltbush in dense plantations (double rows, 2 m between shrubs within rows and 18 m wide interrow), planted perpendicular to the 'killing' wind direction.
3. Rhagodia (similar size to Anameka™ but relatively unpalatable) in dense plantations (double rows, 2 m between shrubs within rows and 18 m wide interrow), planted perpendicular to the 'killing' wind direction.
4. Adjacent rows of Anameka™ and Rhagodia in alternate rows planted in dense plantations (double rows, 2 m between shrubs within rows and 18 m wide interrow), planted perpendicular to the 'killing' wind direction.
5. A blend of Anameka™ and Rhagodia in alternate rows planted in dense plantations (double rows, 2 m between shrubs within rows and 18 m wide interrow), planted parallel to the 'killing' wind direction.
6. A 'control' area of volunteer pasture, which could be sown to other herbaceous options.

In August/September 2022, similar sites were established with 18,000 shrubs in Baandee (Rex Lures) and Cranbrook (Sam Lehmann). The only difference was that industry best-practice treatment was dropped because some shrubs were required for replanting at the Pingelly site. In Baandee, some shrubs have been fitted with tree guards to try to reduce the impact of rabbits.

To date, establishment rates at Tammin for the 2021 planted sites have exceeded 95%. In May, the shrubs were 20-40 cm tall and had less than 50 g per shrub of 'edible' biomass (as expected). Due to the exceptionally wet winter, and the shrubs being behind a creek line, we have not yet returned to measure biomass in the spring and sub-sampling for nutritional analysis.

Establishment rates at the Pingelly site were lower than Tammin. Some blocks had 97% successful establishment while others were as low as 30%. On average, the Rhagodia plots had a 13 to 70% failure rate while the Anameka™ failure ranged from 3 to 27%. Reasons could include subsurface sheet rock resulting in the roots unable to penetrate into subsoil moisture, significant rabbit predation on the edges of the paddock and patches of low soil pH. A large strategic replanting event was conducted in August 2022. In August at the time of replanting, the Anameka plants had 55 g/shrub of edible dry matter (range of 11-190 g/shrub), while the Rhagodia plants averaged 62 g/shrub of edible dry matter (range of 16-164 g/shrub). Nutritional values for the first measurement at Ridgefield are presented in Table 1. Both species had similar digestibility and fibre content. The Anameka™ had more than 5%

higher crude protein. The Rhagodia had higher ash content than anticipated. This will be further explored with a mineral analysis.

Both the Pingelly and Cranbrook sites have featured in significant industry field walks. The new site at Cranbrook has generated a lot of interest after we posted an aerial picture on Twitter. The site was subsequently visited by 35 producers and extension agents as part of the field walk on 11 October 2022.

Table 1. Nutritional values for the saltbush and Rhagodia at Pingelly.

Trait	Units	Saltbush (Anameka)	Rhagodia (clone 40)
Dry matter digestibility	%	61.1	61.4
Organic matter digestibility	%	68.1	68.9
Neutral detergent fibre	%DM	33.3	31.2
Acid detergent fibre	%DM	19.9	19.5
Organic matter	% DM	79.5	81.0
Crude protein	% DM	18.2	12.6



Figure 1. Research team at the planting design at shrub site in Pingelly.



Figures 2 and 3. Planting the Design and Establishment shrub site in Cranbrook in September 2022



Figure 4 and 5. Planting the Design and Establishment shrub site in Baandee in September 2022