



Resilient plants to entice hens outdoors on free range farms- Case study farms

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May 2020

Farm 5 - Planting saltbush on the range

Introduction

Trees and shrubs on the range are highly beneficial as they;

- Provide shade and shelter for hens.
- Encourage hens to go outside and explore.
- Add to the aesthetics of the range.
- Buffer odour, dust and noise emissions.

Even though the case study describes planting saltbush, the information presented is applicable for planting most tree or shrub species and includes the pitfalls we encountered in the project ("Resilient plants to entice hens outdoors on free range farms"). Oldman saltbush (*Atriplex nummularia*) was chosen because it is well adapted to the region where the case study farm is located. Free range farms in high rainfall areas with acidic soils could consider other fast growing species such as Tagasaste (*Chamaecytisus palmensis*) and wattles (*Acacia* species).

Farm description

Climate & soils

The case study farm is in the Temperate – Mediterranean climatic zone. Average annual rainfall for the farm is around 360 mm, with cool wet winters and hot dry summers. Rainfall during 2017 was close to average (355 mm) but during 2018 the area had only received 170 mm and 2019 received 221 mm rainfall. Soils are moderate to highly calcareous gradational clay loams with moderate fertility. Soil pH measured in CaCl₂ is 6.6 – 7.0 (0 – 15 cm) and alkalinity increases with depth with 7.1 – 7.5 (15 – 60 cm) and 7.6 - 8.0 (60 – 100 cm). Boron toxicity issues can be found at depths 50 – 100 cm which cause foliage to brown in susceptible plant species and varieties.

Shed and range description

Individual flock sizes on the farm are 30,000 hens stocked at 10,000 birds/ha. Sheds (16.5 x 132 m) are orientated East - West with pop holes down both long sides of the shed. The corresponding range area is 4 hectares also orientated East – West in a rectangular shape with the shed located centrally at the Eastern end. The farm was established from 2015 to 2017 and most trees and shrubs had been planted within 50 m from the sheds. The range area 50 m beyond the shed on the western side had very few trees, although there are scatterings of native small leaf bluebush (*Maireana brevifolia*) (Figure 1). Range areas are relatively flat.



Figure 1. Small leaf bluebush (*Maireana brevifolia*) on the range of the case study farm 5.

Saltbush planting

Why Oldman saltbush?

Oldman saltbush is very well adapted to the area with a plantation block for sheep production situated only 1 km from the farm. Oldman saltbush grows relatively fast under favourable conditions and can reach a height of 1 m by 12 months of age. Seedlings are relatively cheap at 40 cents each for an order of 1,000 seedlings. The saltbush nursery had already exposed the seedlings to outdoor conditions which is an essential step before planting. Therefore it is important to ask the nursery, are the seedlings ready to plant and hardened to climatic elements? Once Oldman saltbush is established it will be tolerant to dry conditions including drought and another bonus it is a fire retardant. In summer when annual pastures have dried-off, saltbush will provide green forage on the range.

Preparation and planting

Two range areas of two separate flocks were selected for planting saltbush. Areas to be planted were sprayed on 7/09/2017 with Roundup Powermax® (Glyphosate at 3L/ha) and planting rows were deep ripped on 11/09/2017. This was done well before the hens commenced ranging. Deep rip lines had worked well on one range area but the other area had created large clods of soil. Saltbush planting was too soon after ripping as the range with clods had caused problems with physically planting seedlings between soil clods and then watering. Water would disappear between soil clods beyond the root zone of the newly planted saltbush. In 2017 saltbush was planted during the driest month of that year (September total = 3.2 mm) and soil conditions were dry on the planting days 27 to 28/09/2017. Another planting of saltbush was made in 2018 (24/08/2018 and 7/09/2018) to fill in some of the gaps due to poor survival from the 2017 planting.

The Oldman saltbush variety “De Kock” came in seedling trays holding 150 seedlings. Just prior to planting, seedlings were popped out from the tray and placed into a 9L bucket with a mixture of 3L water and Seasol®. The bucket could hold at least 50 seedlings. Planting was done using a PottiPutki (Figure 2) which is an ergonomically designed manual tree planter. Planted seedlings were protected with green corflute 40 cm high triangular guards (Figure 3) and watered after planting.



Figure 2. Left; PottiPutki planter in action. Middle; planter with beak mechanism in closed position ready for inserting into soil and Right; beak mechanism open ready for planting. The seedling is dropped down the hollow tube section of the planter and then the planter lifted up out of the way. Soil around the seedling is compacted by the operator's feet.

Four twin rows of saltbush were planted per range 16 m apart. Rows started at least 50 m from the western end of the shed and were 250 m long. Twin rows of saltbush were 4 m apart and within a row saltbush was spaced at 4 m (Figure 4). This gave the option to thin out if necessary in later years. The plan was to also sow new pastures between the saltbush rows; this did not eventuate as conditions were far too dry.



Figure 3. Saltbush seedling in corflute guard.



Figure 4. Oldman saltbush rows in late summer on the case study farm 5, 6 months after planting, the dark green low growing shrubs on the range are small leaf bluebush.

Saltbush survival rates

In 2017 a total of 1,000 seedlings were planted (500 per range) and a further 500 (250 per range) in 2018 to fill in the gaps due to seedling deaths in 2017. In hindsight this was too many seedlings to look after, given conditions at planting were so dry and it meant a lot of follow-up watering. Despite the dry conditions the survival was 41% and 51% for the two range areas in October 2019. This level of survival was only possible through strong commitment from farm staff watering the saltbush every fortnight.

Hen interactions with saltbush

Research has shown hens are attracted to saltbush and will eat up to 5% saltbush in their diet (de Koning *et al.* 2019). Some of the saltbush plants from the 2017 planting have grown to at least 1 m tall and it was observed hens are using the saltbush to rest and dustbathe under (Figures 5 & 6). Similarly, small leaf bluebush that naturally occurs on one range area was also attracting hens for dustbathing and sheltering. Wildlife cameras were placed near the saltbush to see how frequently the hens used the area. Interestingly, similar numbers of hens visited the saltbush areas closest to the shed (at least 70 m from shed) as those saltbush areas further away from the shed (at least 120 m from shed). Although, those cameras 70 m from the shed were triggered 3 to 5 times more often by hen activity than the more distant cameras at 120 m.



Figure 5. Hens foraging and dustbathing around Oldman saltbush on the case study farm 5 during winter 2019.



Figure 6. Mid spring in 2019 the inter row annual pasture species have died off and hens are using the saltbush for shade.

Key messages

- Choose tree/shrub species adapted to your area, consult your local nursery and agronomist.
- Plant into damp soil, not dry.
- If deep ripping, allow deep rip lines to settle before planting, particularly if large clods are formed from ripping.
- Look at the long term weather forecast. If prolonged dry conditions are predicted, ask yourself is it worthwhile to plant? Alternatively delay planting and/or reduce the number of trees planted.
- Look after your seedlings immediately after planting by watering well and protect with guards.
- Water regularly (weekly or fortnightly) throughout the first summer or prolonged dry periods.

Reference

De Koning, C., Barekatin, R., Singh, M. and Drake, K. (2019) Saltbush (*Atriplex nummularia* and *A. amnicola*) as potential plants for free-range layer farms: consequences for layer performance, egg sensory qualities, and excreta moisture. *Poultry Science*, 98(10); 4555 – 4564.