

Establishing and managing blocks of diverse forage shrubs in the Mallee

Many farms in the Mallee contain soils that do not grow productive crops or pastures. With investment in shrubs and fencing, and a preparedness to rotationally graze, block plantings of diverse shrubs can be successfully established and used.



Mature diverse shrubs in a block planting

Components of a diverse shrub system

The nutritional needs of grazing livestock vary significantly over time, both within the year and between years. Providing livestock with a forage mix comprised of different shrubs, each with their own unique combination of nutrients and minerals, increases the chance of fulfilling nutritional requirements and potentially reduces the need for supplements. Total feed intake usually increases with additional plant species on offer — when an animal consumes its limit of one species, it may still consume another species with a different balance of nutrients. Growing a mix of shrub species also decreases the chance of losses through specific pests and diseases.

In addition to improving the feedbase, a diverse shrub planting, even if smaller in scale, can offer the co-benefits of using ground water, slowing wind speeds, and providing ground cover during dry months. Soils may also rehabilitate over time, so that desirable pasture species can re-appear or establish.



Diverse shrubs planted in a block on soil without inter-row pasture

Historically, few forage shrub species have been grown on a commercial scale in Australia other than Old Man Saltbush. However, recent research from the Enrich project has revealed a number of species which, when used together, can be productive and persistent in low-rainfall zones of southern Australia. Correct selection of shrub species depends primarily on soil factors such as salinity, waterlogging and texture. The species making up the mix do not necessarily need to be evenly proportioned. The benefits of including a mix are most often seen when all species are represented as at least 10% of biomass.

Planting blocks of diverse shrubs

Unproductive areas where pastures or crops do not currently grow are often distributed in small pockets across the farm. For such areas, the best design is typically a block planting, in which shrubs are planted at small intervals, usually with equal distances between rows. Ideal shrub density for block planting without pasture in-between shrubs is between 400–1100 plants/ha. Shrub spacing can be altered between and along the rows, but gaps should be 3 m or more. Planting too densely is likely to result in reduced shrub productivity due to competition between shrubs after only a few years. Mustering stock in dense shrub stands can also be a problem.

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Examples of shrub spacing in a low-moderate density block configuration

Spacing between rows	Spacing between shrubs within each row	Shrub density
5m	5m	400 plants/ha
5m	4m	500 plants/ha
6m	4m	625 plants/ha
4m	3m	833 plants/ha



Seedling planting checklist

- ✓ Select paddock the year before planting.
- ✓ If possible control undesirable species while promoting any pasture seedbank that may exist.
- ✓ Choose the desired planting layout and calculate the number of shrubs needed.
- ✓ Order shrubs with the supplier by November the year before planting.
- ✓ By March the year of planting, deep rip the rows to be planted.
- ✓ Before the break of season organise a contract planter or the use of a planting machine.
- ✓ Carry out scalping or mounding along the shrub rows after the break to minimise the erosion risk.
- ✓ Use a non-selective herbicide along the rows after weed germination.
- ✓ Ensure seedlings are strong with a well-developed root system.
- ✓ Soak seedlings immediately before planting.
- ✓ Plant seedlings into moist soil achieving good contact between roots and soil

Establishment

Careful paddock preparation is most important when establishing forage shrubs – the benefits of thorough planning and preparation are significant and long lasting. The most common method for establishing mixed species forage shrubs is by planting seedlings (see checklist). The various steps include weed control the previous spring and in autumn the year of planting, ordering shrubs by November the year before, deep ripping two months before planting, and scalping or mounding the rows before planting.

Although direct seeding is more cost effective than planting established seedlings, it is less reliable and not suitable for all shrub species. Direct seeding of forage shrub species including Old Man Saltbush, Rhagodia, Ruby Saltbush and Thorny Saltbush has been successful in some situations, but results can be inconsistent (spring and summer rains are needed). Assessing the viability of seed with a germination test before seeding is essential.

Grazing management

Following the establishment year, shrubs should not be grazed for at least 12 to 18 months. First grazing should be short and sharp, and carefully monitored to ensure plants are not being pulled up by livestock.

Grazing different plants in diverse shrub plantings has often been considered difficult to manage, with the most palatable species commonly being over-grazed. However, by considering the nutritional experiences of livestock and their potential to 'learn' about novel feeds, it has been repeatedly shown that grazing diverse shrub mixes is not only possible, but also productive. Recent research has shown that young sheep can grow up to 200g/head/day without grain supplementation during autumn in a diverse shrub-pasture paddock.

For more detail see "Establishing forage shrubs" and "Grazing management to get the best out forage shrubs".



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