

Establishing and managing diverse shrub-pasture plantings in the Mallee

Where farmers are primarily interested in improving the resilience of the livestock feedbase, and are prepared to rotate stock through shrub-pasture plantings, they should consider establishing mixtures of diverse shrubs and pasture. These plantings can not only improve farm productivity and drought resilience, but also improve salinity, erosion and biodiversity outcomes.

Advantages of a diverse shrub–pasture system

The nutritional needs of grazing livestock vary significantly over time, both within the year and between years. Providing livestock with a mix of different shrubs and pasture, each with their own unique combination of nutrients and minerals, increases the chance of meeting the requirements of animals 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 can offer the co-benefits of restoring the water balance, slowing wind speeds, providing ground cover during dry months, and increasing biodiversity.

Historically few forage shrub species have been grown on a commercial scale in Australia besides 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 the 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, and there is no single correct method. The benefits of including a mix are most often seen when all species are represented as at least 10% of biomass.

Planting diverse shrubs in an alley design

Where the area to be planted is substantial and good pasture growth can occur, there is the opportunity to plant the forage shrubs in an alley design. Alley planting comprises rows or belts of shrubs alternated with wider spacings where pasture or crops can be grown. The shrub belts in an alley planting are usually made up of double rows, but three to four rows can be used. Using multiple rows in alley plantings increases the chance of shrub cover along the entire belt in case some shrubs fail to establish.

Even in an alley belt a significant gap (e.g., 3 m to 5 m), is needed between shrub rows. Pasture will still grow in this area, and annual legumes in particular will be productive. When considering the width of the alley it is important to consider machinery access, total paddock size, the shrubs' effect on wind speed, the proportion of shrub forage in the total paddock feed, and the way the planting will be used.

For shrubs to provide the bulk of an autumn diet, enough shrub forage needs to be available to make a difference to the overall feed budget. Insufficient shrub forage leads to poor-quality autumn pasture making up the greatest proportion of the diet and the complementary benefits of a shrub–pasture mix are lost. For example, if double rows of shrubs are separated by alleys 25m wide to accommodate machinery, it can result in a feed base comprising 85% pasture and only 15% shrubs. In this case, high stocking densities would be needed to ensure stock eat useful levels of shrub.

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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 planting, deep ripping two months before, and scalping or mounding the rows before planting.

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

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, monitoring plants to ensure none are being pulled up by livestock.

Grazing different plants in diverse shrub and pasture mixes 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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