Central West catchment management authority

Native fodder shrubs for pasture enhancement

CENTRAL WEST CATCHMENT MANAGEMENT AUTHORITY NATIVE VEGETATION MANAGEMENT

Benefits of native fodder shrubs

What are native fodder shrubs?
In many Australian pastoral landscapes, shrubs are a major source of stock feed, examples include the Saltbush and Bluebush Shrublands found throughout the semi-arid rangelands of Australia (below 450mm annual rainfall). In the Central West Catchment Saltbush Shrublands are commonly found in the north west floodplain country of the Macquarie and Bogan Rivers these include areas of Oldman Saltbush (*Atriplex nummularia*) and Bladder Saltbush (*Atriplex vesicaria*). **(See Photo 1)**

1. Naturally occurring shrublands of Oldman Saltbush are found in the NW region of the Central West.
2. Diamond Firetail Finches use dense shrubs for breeding habitat (Photo Helen Fallow).

Why use native fodder shrubs in your grazing enterprise?
Edible native shrubs provide an enhancement to pastures when planted to complement rather than compete with pastures. The benefits they provide include:

- **Drought tolerance.** Local native plants are well adapted to our local rainfall patterns.
- The **deep roots** of shrubs are able to access moisture and nutrients below the root zones of grasses. This means they can continue to grow long after grasses are haying off, reducing feed gaps. Some shrubs, such as Wattle species, are legumes that will also fix atmospheric nitrogen into the soil. Shrubs also recycle different concentrations of other nutrients to the soil surface.
- **Additional nutrients for animals.** Shrub foliage contains many nutrients and compounds such as tannins, terpenes and oxalates not found in grasses. They are also often high in crude protein and fibre. These nutrients and compounds can be very beneficial for rumen health and animal performance providing a valuable complement to the forage value of grasses. Research into native shrubs has found plant compounds that kill parasitic organisms such as worms. In grazing systems that contain shrubs, grazing animals will self medicate, foraging from trees and shrubs to treat parasites and nutrient deficiencies as needed.
- **Reduce evaporation and transpiration.** When planted as hedges to complement pastures, shrubs can create mini windbreaks across your paddocks (similar to alley farming), reducing wind erosion, soil and plant moisture loss.
- **Encourage good grazing management.** Forage shrubs require careful grazing management to ensure long term viability. This management is based on ensuring adequate photosynthetic leaf material is retained on the plant after grazing and ensuring adequate rest and recovery time is provided prior to follow up grazes. This principle of management is also very beneficial to pasture recovery, complementing your pasture management.
- **Enhance biodiversity.** Many native wildlife, particularly those in decline such as insectivorous birds, require shrubs for habitat. Adding this layer to your paddock will attract these animals back to your property. **(See Photo 2)**

The above benefits can translate into improved productivity, profitability and environment for your farming enterprise. The key to this potential is in the planning and implementation. Choosing the right shrubs for your property, analysing the cost to benefit, designing and managing your investment so it yields for generations are integral parts of the planning and implementation process. These topics are looked at in the remainder of this information sheet, please note this information is not comprehensive and should only be used as a starting point and guide to planning and implementing your pasture enhancement activities.

Native shrub species used to enhance pastures

The following plants are widely used or have potential for use as fodder shrubs. Several species listed are not native to the Central West catchment but have been included as they are widely used elsewhere. The Central West CMA does not recommend the use of non-indigenous species due to weed potential.

Oldman Saltbush (*Atriplex nummularia*)
Size: 4m wide to 2m tall.
Natural climate: 200 to 450 mm annual rainfall. Temperate hot summer, cool winter.
Central West environment: Western Macquarie / Bogan floodplain.
Soil preference: Loams, clay loams & clay soils. Mild acid (>ph5) to alkaline. Very salt tolerant. Intolerant of soil aluminium.
Notes: Has been widely planted as a fodder shrub. Proven track record for establishment and grazing management. Forage test shows good energy (up to 10 MJ / kg dry matter) and crude protein levels (up to 20% CP), with best stock performance when additional feed available to aid digestion. Salt absorbed by the plant is excreted on the leaves, stock which feed exclusively on Oldman Saltbush can quickly exceed recommended salt intake levels. Will outgrow grazing height if not managed. Available in a number of commercially bred cultivars such as 'Eyres Green' and 'De Koch'.

3. Oldman Saltbush grazed by cattle.

River Saltbush (*Atriplex amnicola*)
Size: 3m wide to 2m tall.
Natural climate: 250 to 550 mm annual rainfall. Temperate hot summer, cool winter.
Central West environment: Not native to NSW.
Soil preference: Loams, clay loams & clay soils. Very tolerant of salt and water logging.
Notes: A native of Western Australia. Not widely used as a fodder shrub in eastern Australia. Prefers warm to hot temperature zones and is sensitive to severe frost conditions. Low in energy and high in crude protein. As with all saltbush species ensure adequate additional feed (e.g. grass based pasture) is available so animals do not exceed recommended salt intake levels.

Golden Wreath Wattle (*Acacia saligna*)
Size: 4m wide to 8m tall.
Natural climate: 400 to 700 mm annual rainfall. Temperate hot summer, cool winter.
Central West environment: Not native to NSW.
Soil preference: Sand, sandy loams, loams, clay loams. Prefers moderate acid to alkaline soils (>ph4). Moderate salt tolerance, intolerant of prolonged water logging.
Notes: A native of southwest Western Australia. Leguminous shrub that has been widely planted as a fodder plant in Western Australia, Africa and the Middle East. Not widely used as a fodder shrub in eastern Australia. It has good levels of crude protein and fibre, but low digestibility. Digestibility is greatly increased when additional feed sources are available. Moderate life expectancy 10 to 20 years, regenerates readily from seed and suckers provided seedlings are given grazing respite. Fixes atmospheric nitrogen with Rhizobium root nodules. Will quickly outgrow grazing height if not managed.

Other potential species

Happy Wanderer
(*Hardenbergia violaceae*)
Size: 3m wide to 1m tall.
Natural climate: 450 to 1,000 mm annual rainfall. Temperate hot summer, cold winter.
Central West environment: Native to the central and eastern parts of our catchment.
Soil preference: Shallow gravel, Sand, sandy loams, loams, clay loams. Prefers acid soils (>ph4). Intolerant of water logging.
Notes: Leguminous climbing plant. Is readily grazed by stock in natural landscapes, anecdotal accounts by graziers indicate high palatability and good regeneration response to grazing when provided sufficient rest between grazes. No commercial grazing trials yet undertaken but shows potential in experimental trials. Fixes atmospheric nitrogen with Rhizobium root nodules.

Rhagodia (*Rhagodia spinescens*)
Size: 3m wide to 1.5m tall.
Natural climate: 250 to 500 mm annual rainfall. Temperate hot summer, cool winter.
Central West environment: Native to the western parts of our catchment.
Soil preference: Loams, clay loams & clay soils.
Notes: From the saltbush family (*Chenopodiaceae*), related to Oldman Saltbush. Produces distinctive bright red berry fruits. Not widely used as a fodder shrub it has potential to supplement Oldman Saltbush plantings to increase plant and forage diversity.

Locally occurring wattles

Western Golden Wattle (*Acacia decora*), Deane's Wattle (*Acacia deanei*), Hakea Wattle (*Acacia hakeoides*)
Size: 4-5m wide to 2-8m tall.
Natural climate: 350 to 700 mm annual rainfall. Temperate hot summer, cold winter.
Central West environment: Native to all parts of our catchment.
Soil preference: Shallow gravel, sand, sandy loams, loams, clay loams. Prefers acid soils (>ph4). Intolerant of prolonged water logging.
Notes: Grazed by stock in natural landscapes. Likely to have similar fodder characteristics to *Acacia saligna* (see opposite). Short to moderate life expectancy 5 to 40 years depending on species, regenerates readily from seed providing seedlings are given grazing respite. Fixes atmospheric nitrogen with Rhizobium root nodules. Will quickly outgrow grazing height if not managed. **(See Photo 4)**

Locally occurring tree species

Myall (*Acacia pendula*), Mulga (*Acacia aneura*), Belah (*Casuarina cristata*), Wilga (*Geijera parviflora*) Kurrajong (*Brachychiton populneum*)
There are many tree species that are noted by pastoralists as valuable drought fodder reserves. These trees are frequently browsed to head height when present at moderate density in grazing paddocks. They can be used to enhance diversity in shrub planting to provide shade and forage variety. Plants can also be pruned to encourage low growth.

4. As a scattered shrub in this grazing paddock Deane's Wattle is heavily utilised. Higher densities are needed to meet animals grazing requirements.
5. Wilga overhanging fence lines are frequently grazed. The ground cover on the grazed side of the fence is scalded by stock sheltering near the tree, on the other side of the fence ground covers grow right up to the tree.

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Establishment costs

The following costing is based on planting 1000 Oldman Saltbush seedlings per hectare. Seedling and planting costs will vary according to the quantities, species and planting methods used. Land managers planning to undertake a fodder shrub project should consult suppliers to obtain accurate costings prior to undertaking on-ground preparation works.

Costings for 1000 Oldman Saltbush seedlings planted per hectare

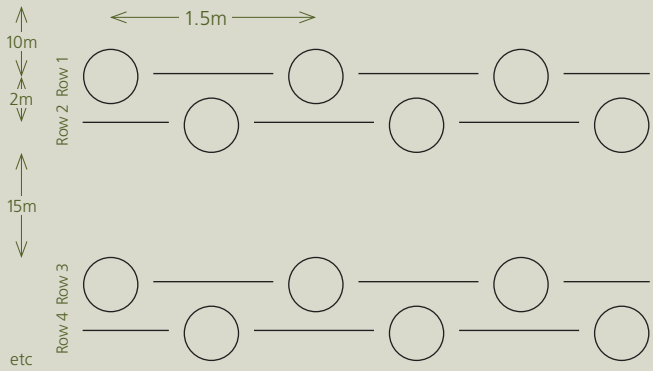
Ground preparation (deep scarifying and weed control)	$200 per ha
1000 seedlings @ 30c (NB other species may cost more)	$300 per ha
Planting costs 1000 seedlings @ 10c (at 1m spacings)	$100 per ha
Reduced carrying capacity for 1yr (until seedlings establish)	$50 per ha
TOTAL COST per ha	**$650 per ha**

6. Oldman Saltbush planting near Narromine.

Farm example – Oldman Saltbush, Narromine

This planting aims to enhance pasture feed value by adding narrow alleys of Oldman Saltbush to existing pastures. The design minimises edge competition with the pasture whilst providing fodder and shelter belts for stock. Hedges made up of 3 rows of Oldman Saltbush (2 metres apart) are planted across the paddock with 20 metre pasture alleys in between. Approximately 900 seedlings per hectare are used. Alley width was calculated using windbreak effectiveness principles of 10 times windbreak height (10 X 2m), with the aim of reducing plant and soil moisture loss in the alleyways. **(See Photo 6)**

Planting design



The above design is a sample layout which can be adapted to suit your planting scenario. Using this layout will help you work through works logistics, ensuring your site is suitably prepared and sufficient plants are advanced ordered.

Design notes: This design is suitable for most small to medium size shrub species. The planting area is 3m wide with pasture alleyways 15m wide, planting density is approximately 900 seedlings per hectare. To improve the windbreak effectiveness decrease the space between seedlings or add an additional row. Alleyway widths can be customised to suit your land use activities (e.g. cropping, native or mixed pastures).

Planting preparation: Spray-fallow a 4 metre wide strip for minimum 6 months. Cultivate the planting zone 3 metres wide to a depth of 250mm or 10 inches using a deep cultivation implement such as a chisel plough. Work soil to depth slowly in several passes to produce a fine friable planting bed.

To further explore ways to use native shrubs to enhance your landscape and grazing enterprise contact the Central West Catchment Management Authority.

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