

## Exploring new forage options for the Mallee

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Walpeup Vic., Waikerie SA

### Key messages:

- Trials of potential new fodder shrub species at Walpeup and Waikerie have shown generally strong establishment and early growth.

### Aims:

- Identification of suitable new species for use in mixed forage systems for the Mallee.
- Developing more profitable and sustainable mixed farming systems for the Mallee region

### Background:

There are a many farmers in the Mallee looking for a more resilient crop-livestock system that allows for a highly flexible cropping program whilst maintaining a substantial livestock enterprise. Often this involves finding ways to gain greater grazing value and a more reliable forage base from soils that can be marginal for cropping. This has led to a keen interest in CRC Future Farm Industries research that is aimed at identifying better perennial species than what are currently available in low rainfall areas.

Field trials to evaluate the performance of 16 different forage shrubs have been established at Walpeup and Waikerie as part of a nationally funded project called Enrich - an initiative of the Future Farm Industries CRC with co-funding from MLA. Enrich, led by researchers at SARDI, is exploring a diverse range of perennial shrubs as a feed source for profitable and sustainable grazing systems in the low to medium rainfall areas. The Walpeup site is funded through the Mallee CMA to trial species under conditions specific to the region with the research undertaken by the Victorian Department of Primary Industries (Future Farming Systems Research Division). The Waikerie Enrich site is part of the CRC Future Farm Industries national Evercrop project, led by CSIRO and funded by GRDC, which is working with growers in the low rainfall Mallee of SA and Victoria to evaluate where in the mixed farming landscape, forage options can be most profitable to the whole-farm system. The major aim of the Mallee Enrich sites is identification of potential new species for use in mixed forage systems for the Mallee.

## About the trial:

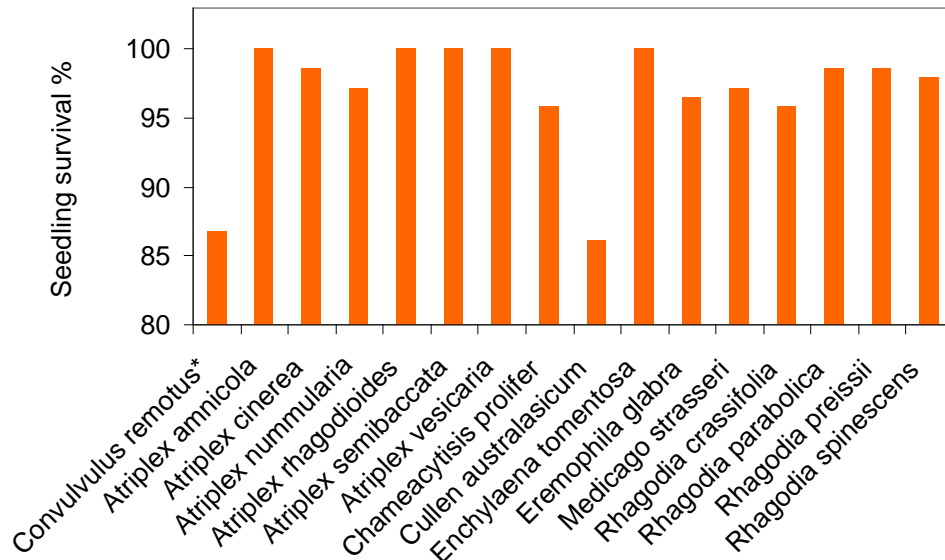
Sixteen species of perennials at Walpeup (see Table 1) were planted as tube stock in July 2008 after the site was deep ripped (30-50 cm deep) and weeds chemically controlled. Fifteen of the 16 species were planted in monoculture while *Convolvulus remotus* (Pink Bindweed) was planted in mixture with *Atriplex nummularia* (Old Man Saltbush). Each species was planted in plots of 36 seedlings, with each species replicated 4 times to account for soil, weed and germplasm variation across the site. The site was not grazed in 2009 to allow the shrubs time to establish. In 2010 after the opening autumn rains, livestock will be introduced to quantify shrub performance under grazing. Ongoing measurements (Figure 1) over the life of the trial will monitor shrub survival and growth. The Waikerie site was established in 2009 using similar methods and includes 15 species (Table 1). The Waikerie site is yet to be grazed.

**Table 1.** Botanical and common names of the forage shrub species planted at the Walpeup and Waikerie Enrich field trials

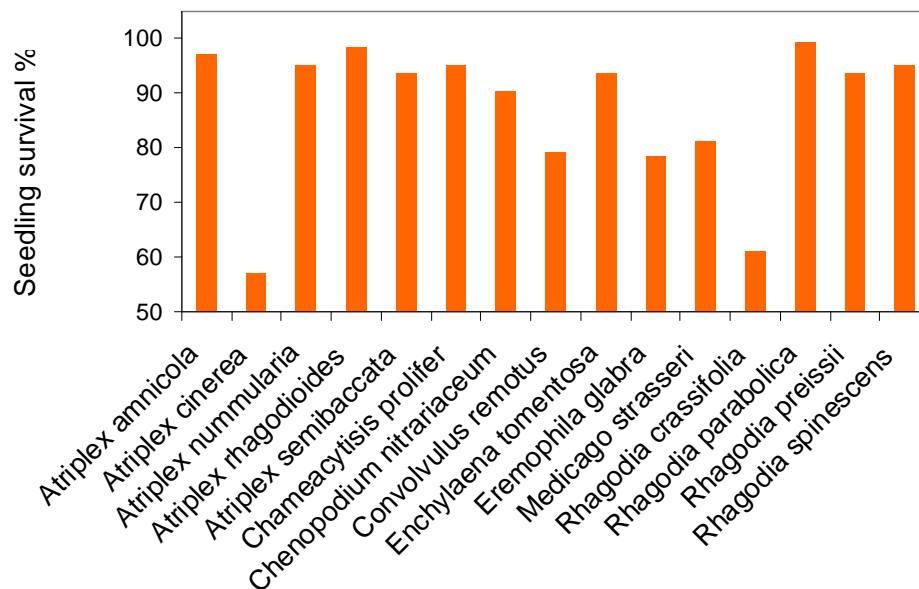
Botanical name	Common name/s	Location
<i>Atriplex vesicaria</i>	Bladder Saltbush	Walpeup
<i>Atriplex amnicola</i>	Swamp Saltbush/River Saltbush	both
<i>Atriplex cinerea</i>	Grey Saltbush/Coastal saltbush	both
<i>Atriplex nummularia</i>	Old Man Saltbush	both
<i>Atriplex nummularia</i> / <i>Convolvulus remotus</i>	Old Man Saltbush + Pink Bindweed	Walpeup
<i>Atriplex rhagodioides</i>	Silver Saltbush	both
<i>Atriplex semibaccata</i>	Creeping Saltbush	both
<i>Chameacytis proliifer</i>	Tree Lucerne	both
<i>Chenopodium nitrariaceum</i>	Nitre goosefoot	Waikerie
<i>Convolvus remotus</i>	Australian Bindweed	Waikerie
<i>Cullen australasicum</i>	Tall Verbine	Walpeup
<i>Enchylaena tomentosa</i>	Ruby Saltbush	both
<i>Eremophila glabra</i>	Emu Bush/Tar Bush	both
<i>Medicago strasseri</i>	Tree Medic	both
<i>Rhagodia crassifolia</i>	Fleshy Saltbush	both
<i>Rhagodia parabolica</i>	Fragrant Saltbush/Mealy	both
<i>Rhagodia preissii</i>	Mallee Saltbush	both
<i>Rhagodia spinescens</i>	Thorny Saltbush	both

**Results:**

At Walpeup seedling survival measured four months after planting was greater than 95% in all species, except the *Convolvulus remotus* growing with the *Atriplex nummularia* and the *Cullen australasicum* (Tall Verbine) species (See Figure 1). Seedling survival was also generally high at Waikerie (Figure 2).

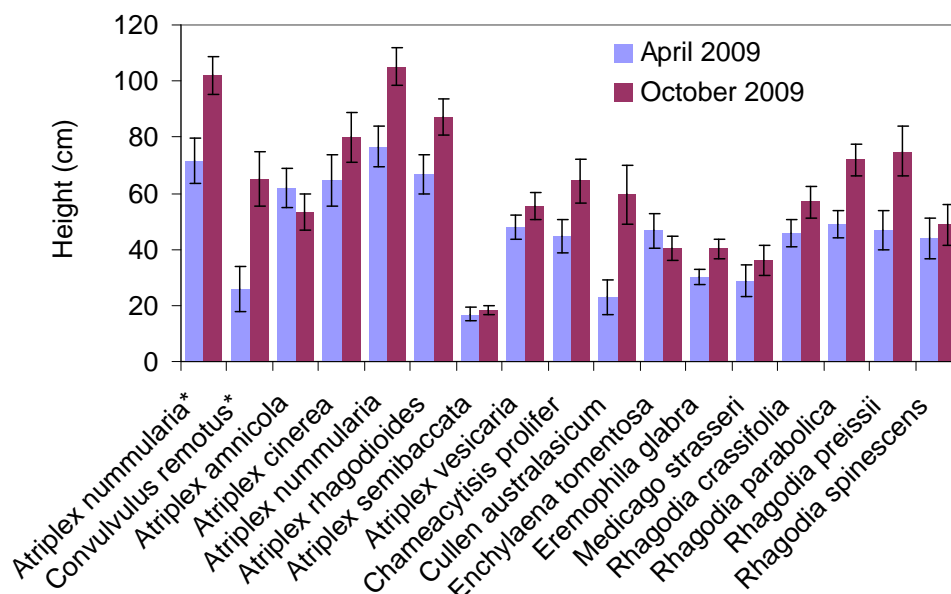


**Figure 1.** Percentage seedling survival planted at the Walpeup Enrich field trial.  
\**Convolvulus remotus* growing with the *Atriplex nummularia*.



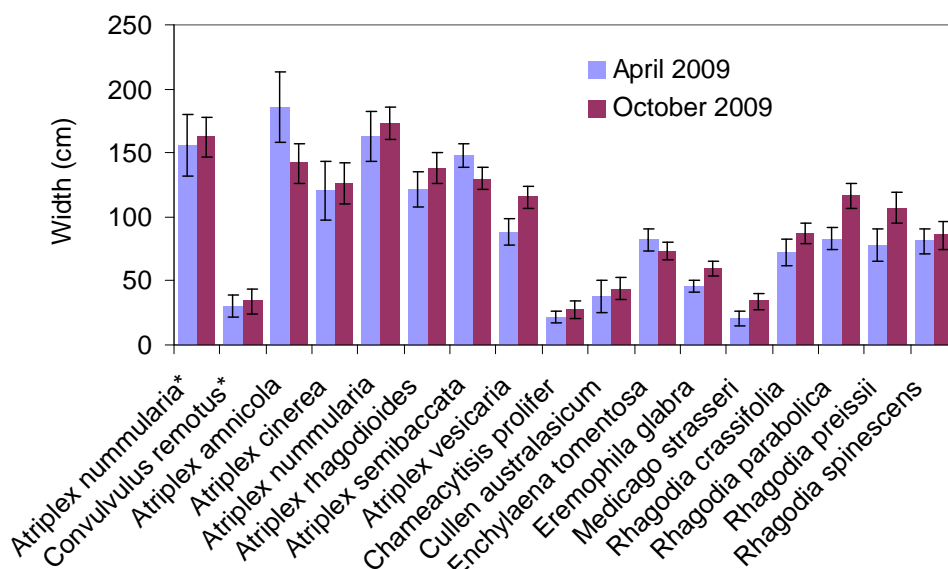
**Figure 2.** Percentage seedling survival planted at the Waikerie Enrich field trial.  
Note poor seedling quality may have contributed to low establishment of *Atriplex cinerea* and *Rhagodia crassifolia* species.

Measurements taken at the Walpeup site have shown that so far *Atriplex nummularia* has been the fastest growing shrub, with heights exceeding 100 cm (see Figure 3). Other high growing shrubs include the *rhagodioides* (Silver Saltbush) and *cinerea* (Grey Saltbush) species in the *Atriplex* genus, and the *preissii* (Mallee Saltbush; Figure 5) and *parabolica* (Fragrant Saltbush) species in the *Rhagodia* genus. According to the preliminary findings, growing *Atriplex nummularia* in mixture with *Convulvulus remotus* has not compromised the growth of the *A. nummularia* 15 months after establishment.



**Figure 3.** Average height of the fodder shrubs planted at the Walpeup Enrich field trial in April and October 2009. \**Convulvulus remotus* growing with the *Atriplex nummularia*. Bars indicate standard deviation.

Shrub performance for the Mallee will not only be determined by height, as some species such as the *Atriplex semibaccata* (Creeping Saltbush) are useful groundcovers that grow laterally along the ground providing excellent soil cover (see Figure 4). Generally species in the *Atriplex* genus exhibited the greatest lateral growth, followed by species in the *Rhagodia* genus and the *Enchylaena tomentosa* (Ruby Saltbush).



**Figure 4.** Average width of the fodder shrubs planted at the Walpeup Enrich field trial in April and October 2009.

\**Convulvulus remotus* growing with the *Atriplex nummularia*. Bars indicate standard deviation.

#### Future Directions:

Measurements of shrub survival and growth will continue next year at Waikerie and at Walpeup where livestock will be introduced to the site and more meaningful data pertaining to shrub performance under grazing will be collected. Relative preferences by sheep for the different shrub species will also be assessed – this is an important consideration since diet selection by animals can tell us about nutritional and ‘extra-nutritional’ effects of plants that we cannot easily measure in the laboratory. Assessments of conventional forage quality will also be conducted and together with the survival and growth data, provide more conclusive information on which to base forage shrub selection for the Mallee environment. Shrub size and its early growth performance are important traits but are not the only criteria to be considered when including new forage species into grazing systems.

#### Acknowledgements:

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**Photo 1.** *Rhagodia preissii* (Mallee Saltbush) one of the fastest growing shrubs in the Walpeup Enrich trial.



**Photo 2 .** *Atriplex semibaccata* (Creeping Saltbush) provides excellent ground cover.



**Photo 3.** Alan Buckley inspecting the forage shrub trial at Waikerie. (photo courtesy of the Stock Journal)

