



Above: Di Haggerty inspecting a shrub belt along a fence line after sheep have been put in for grazing, March 2012



Project Snapshot

Name	Dianne and Ian Haggerty
Farm name	Prospect Pastoral Co
Location	Wyalkatchem
Catchment group	Yeelanna
Rainfall	200mm (ave past 5 years)
Farm size	20000 acres (including lease and sharefarms)
Enterprise mix	60% cropping, 40% sheep
Soil types	Wodjil sands, Morrel clay/loam, conglomerate gravels
Species grown	Oil mallees (<i>Eucalyptus loxophleba</i>) Saltbush (<i>Atriplex</i> spp.) Rhagodia preissii Wattle (<i>Acacia</i> spp.)

Key Messages

- **Saltbush and Rhagodia shrubs fit in well with the existing farming system, as they are drought-tolerant and adapted to a wide range of soil types**
- **Grazing management is critical to ensure good shrub establishment and persistence**
- **Mix of shrub species has increased the diversity of native animal species within the paddock**



Above: block planting of shrubs on a gravelly hill in March 2012

Background of perennial shrubs for grazing

The north-eastern Wheatbelt is characterised by vulnerable soils such as Wodjil sands, which can sometimes result in wind erosion. The strategic planting of perennial shrubs in high-risk areas has been used to help stabilise fragile sands; either using block plantings, at the exclusion of future cropping opportunities, or more recently widely-spaced shrub belts, which function to slow wind speeds across the paddocks, while allowing normal cropping and pasture rotations in the alleys between.

The main species used in these systems include oil mallees, saltbush and acacia species. Shrub species differ in their palatability and nutritional value as livestock fodder, with oil mallees being largely unpalatable. These species also vary in their range of applications; saltbush plays an important role in the management of dryland salinity, acacias are commonly used as hosts for sandalwood plantations, and oil mallees have the potential to be used as a biofuel source.

The Enrich project, lead by Dean Revell of the Future Farm Industry CRC, assessed around 100 fodder shrubs for their value as a feed source for livestock. The project identified the top performing species over a range of plant and animal production traits, including biomass production, palatability, nutritional value and shelter/wind break potential. One of the top performers was *Rhagodia preissii*, a native shrub. Saltbush species also performed particularly well across a range of production traits.

The Haggerty's way

“Our property is located adjacent to Lake Wallambin, a large salt lake. The soil is consequently characterised largely by Morrel soils, as well as Wodjil sands, both of which are susceptible to wind erosion, and can be unproductive when it comes to pastures for livestock production” mentioned Di. Some of the worst salty Morrel paddocks have been excluded entirely from cropping, and have been planted with saltbush alleys to protect them from erosion.

The Haggertys have been growing saltbush in saline areas of their farm for the last 10 years, and Di describes “over time we have planted at least 50,000 seedlings. We first planted *Rhagodia* in 2008, after hearing about it associated with the Enrich project. This was only a small planting to see if *Rhagodia* would establish and persist, the results were promising.

As part of the Wheatbelt Natural Resource Management funded project, the Haggerty's planted a 10 hectare block planting along with an alley configuration of fodder shrubs across a 100 ha paddock; the alleys totalled 15 hectares. The block planting was on a gravelly conglomerate hill which is usually quite bare, and is affected by both wind and water erosion; the alleys were planted across a Wodjil sand-dominant paddock, with some good clay/loam areas. “My two primary aims were to reduce the incidence of wind and water erosion across the paddocks, and to increase productivity through providing summer grazing options” stated Di.

As well as saltbush and *rhagodia*, the Haggerty's planted acacia species and oil mallees. The oil mallees were

Well established shrub belt with oil mallees (left), saltbush (centre) and rhagodia (right) in March 2012 (18 months after planting)



planted on the northern and western sides of the block planting and the alleys, to provide frontline protection from the most damaging winds.

The 2010 planting was followed by an uncharacteristically dry spring. With the exception of the wattles, the survival rates of the shrubs were very good despite the dry season. The estimated survival rates of the oil mallee, saltbush and rhagodia seedlings were 80%, 85% and 95% respectively. “We had a bad season, yet got a good result,” concluded Di. In 2011 four wattle species were later planted into the gaps left where shrubs had died.

Major changes to the farming system

The trial paddock was cropped both in the shrub establishment year 2010, and the following year; this was to keep livestock out of the paddock until the shrubs were big enough for grazing, and has been the only change to their normal cropping rotation. “I don’t anticipate any changes to our cropping rotation from having the shrub alleys in the paddock, as they can be easily cropped around, and are not affected by the normal weed control practices”, describes Di.

The shrubs are still too small to see if they have had any positive effects on managing wind erosion in the paddock. Having been in crop for the last two years, and without summer grazing in between, the paddock has a large amount of dry matter protecting the ground from wind erosion. “We try to maintain good ground cover anyway,” Di said.

The three shrub alleys join onto remnant bushland,

effectively creating wildlife corridors across the paddock. Di has noticed this has resulted in an increased diversity of birds and insects in the paddock. “The insect and bird life in those alleys is phenomenal,” Di said. “In particular, the rhagodia shrubs have abundant flowers and bright red berries in summer which attract this activity”.

Costs associated

The trial paddock was cropped around the fodder shrub block planting and between the alleys; herbicide and seed costs were the same as per the usual cropping program. Additional costs included the hire of the Chatfield’s tree planter and the purchase of fencing materials to fence off the block planting from the rest of the paddock.

The main cost of establishing the fodder shrub belts was the purchase of seedlings:

- **Rhagodia** – 6,000 seedlings, approximate cost \$0.40 each. Total \$2,400.
- **Oil mallees** – 5,000 seedlings, approximate cost \$0.45 each. Total \$2,250.
- **Saltbush** – 6,000 seedlings, approximate cost \$0.40 each. Total \$2,400.
- **Wattles** – 6,000 seedlings, approximate cost \$0.45 each. Total \$2,700.

Dos and don'ts when establishing shrubs

Di believes grazing management is critical when establishing shrubs, in particular to make sure shrubs are not overgrazed or grazed too early. "They can be grazed first at about 15 months, if they are big enough," she suggested. This would be in the spring of the year following planting. The Haggertys' shrubs are only now just being grazed for the first time, about 20 months after planting. The leaves are quite dry, and Di highlights that if left too long before grazing, the foliage will lose its freshness and become less palatable to stock. "There is plenty of ground cover available, so it is likely the sheep won't target the shrubs for a while yet."

The Haggertys used a Chatfield's planter to propagate the shrub seedlings. The shrubs were spaced approximately 1.5-2m apart; Di suggests this is a good distance to allow for grazing between the shrubs. A July time of planting was selected for two key reasons; soil moisture at this time would be high for good seedling survival and establishment, and the shrubs would have enough time to establish deep roots before the end of the rainfall season.

Prediction for the future value of this system

Though the shrubs are still very small, and only now just receiving their first grazing, Di can see the potential benefits of incorporating them into their farming system; not just in terms of providing a windbreak, but also to increase plant and animal diversity in the paddocks. The Haggerty's plan to gradually expand this fodder alley system across most of their farm; Di suggests a rate of one paddock a year would be realistically achievable.

The fodder shrub alleys have been planted along roads, fences or contours within paddocks to minimise potential conflict with their cropping program. They can still manoeuvre machinery around as before, and the amount of cropping area sacrificed is minimal. Di believes this is important, as "people are more likely to adopt this system if there's less interference with the cropping program".



Above: Saltbush well established and ready for grazing in March 2012



Above: Rhagodia in late March after flowering

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