

Using perennials to lower the water table



Farm info.

Grower: Graydn Wilcox

Location: West Woodanilling

Soil type: Sandy gravel, duplex

Arable area: 1200 ha (50%), large areas salt effected

Ave annual rainfall: 400 mm

Enterprise mix for 2013: Mixed cropping and livestock (50:50).



Article by Paul Omodei, agVivo

With significant areas of mild to severe salt-affected land surrounding and within his farm, mixed farmer Graydn Wilcox decided it was time to do something about it. He has always been keen to try new species of perennials and his interest is driven by the passion to have a low (or nil) supplementary feeding merino wool livestock system.

Graydn and his wife Jenny run 2,000 merino ewes and 1,000 wethers in a 50:50 crop livestock system with a long term lambing percentage of 86%, which he would like to increase significantly. He aims to get weaners to a minimum of 20 kgs live weight before the summer period, which is a key to weaner survival over this period. With a lambing time of mid-July the growth rate of lambs through the spring on good annual legume pastures is critical to meeting these targets for weaners.

Density and composition in annual pastures is therefore of high importance to achieve target FOO and lamb weight gain. Deferment of annual pastures at the break is a key strategy Graydn must implement, while also getting stuck into a cropping program that is a key driver of farm profit. He could see the fit of perennials as a deferment option for annual pastures while assisting in significant saline land issues.

What initially started out as a way to improve the carrying capacity and

productivity of saline land now has taken on a more strategic role to reduce supplementary feed costs while increasing cropping percentages on more suitable paddocks. This will have a substantial impact on his bottom line in future years as the areas of both these strategies increase.

Graydn has had a long involvement with the Department of Agriculture and Food (DAFWA) and Wagin Woodanilling Landcare Zone evaluating pasture options and profitability outcomes for saline land. Graydn is also chairman of the Beaufort Flats Pasture Improvement Group. A DAFWA technical report was recently released on a saltland project conducted from 2007–2009 on a new farm purchase. Previous owners had run 400 wethers for a period of a couple of months on 120ha of slight to severe salt-affected flats or effectively 1 DSE/ha annually. The project measured both pasture and livestock production from two treatments: (1) saltbush only (on severely affected land), and (2) direct

seeded saltbush and understorey (on slightly saline affected land). The establishment costs (including fencing and water infrastructure) were \$522/ha for the 'direct seeded saltbush and understorey' and \$307/ha for the 'saltbush only' treatment. An analysis using a 'discounted cashflow investment framework' revealed that the establishment costs on the 'direct seeded saltbush and understorey' would be recovered after 12 years compared to six years for the 'saltbush only'. This analysis ignored the other benefits such as protein, minerals, vitamin E, reduced supplementary feeding and deferment of annual pastures. The integration of saltbush and other perennials into the farming operation has gradually been fine-tuned and is an ongoing process across 'Miripin'.

Species selection

'Miripin's Hall Paddock' is marginal for crop because of salinity. Sowing perennial pastures will reduce the impact of salinity through water table draw down, salt scald recovery and permanent soil cover reducing evaporation. Tall wheat grass (TWG) and kikuyu were chosen as the perennial species because Graydn believes they



ABOVE: A mixture of tall wheat grass and lucerne

LEFT: Excellent establishment of perennial pastures

are more likely to persist. Pegasus lucerne was added because the neighbours had a good stand growing on some moderately saline grey clay and Graydn is always looking to add legumes for nitrogen and feed quality. Balansa clover was added because it is a cheap annual clover which has good waterlogging tolerance and is a good indicator of how well you went with regard to seeding depth and insects (i.e. no balansa means the seed was too deep or insects got it all!). The selection of species also provides great flexibility for Graydn to lamb his ewes into the stand, with the expectation of increased

lamb survival. Lambing in July normally provides Graydn with enough feed on offer (FOO) for lambing ewes without supplementary feeding, although the break of season still remains a tough time of the year for management as the cropping operation gets into full swing.

First grazing

After completing a Lifetime Ewe Management (LTEM) course in 2012, Graydn now has a much greater focus on monitoring his ewes for condition score at key times throughout the year to increase weaning rates and ewe survival. For his ewe flock during April and May, the requirement of energy per head is 8.5–9.5 MJ per day because the ewes are still in early-mid pregnancy with a lambing date of early July. The LTEM tools show that a ewe needs only 300 kg/ha of FOO to sustain this energy requirement for that period of the reproductive cycle. In late May 2013 the FOO of the Hall Paddock was measured at 3,800 kg/ha of FOO, as a result of traditional integrated summer feed strategies of crop stubbles and supplementary grain allowing the perennial paddock to be deferred for break of season grazing. So far in 2013, the paddock has been grazed twice with dry sheep (empty ewes, wether and ewe hoggets, remaining older wethers) for a total of 913 DSE grazing days per hectare. Prior to perennials this would be the total carrying capacity of this paddock for the whole year.

The Hall Paddock is part of a planned grazing rotation which includes 120 ha of

saltbush and 130 ha of perennial pastures for deferment of annual pastures and savings in supplementary feeding. Graydn is seeing the benefits of this plan and he says, "It works really well as long as you have enough crop residues to carry the sheep through the summer." The overall plan of increasing the cropping area to boost income, as well as provide summer feed for stock, is a critical part of the farm plan.

Costs and returns

The cost of establishing perennials is commonly one of the greatest barriers to adoption. Graydn's approach to a more 'shotgun' mix provides him with a lower risk of failure particularly with kikuyu as part of the mix. Good preparation in terms of annual grass weed management is a key focus for him which has provided excellent success with establishment (see Table 1).

Return on investment

The total annual stocking rate across the property hasn't changed, but with more paddocks cropped, the winter grazed stocking rate is up by 1–1.5 DSE/ha. This means that the same amount of stock are run on less pasture grazing area during the winter and more hectares are cropped to help increase farm profits. While these results appear small, the cumulative benefits over a period of time are quite significant. A ten year Discounted Cash Flow (DCF) analysis on these recent changes to Graydn's whole farm enterprise show that the benefits of sowing the perennial pastures (and marginal increase in cropping percentage from 52% to 57%) are in the vicinity of \$25/ha. This is not taking into account any savings from reduced supplementary feed which is one of the main drivers of Graydn's passion for perennials.

Future plans

Graydn has used these species again in recent plantings of perennials. He has also used the acid tolerant (AT) and grazing tolerant (GT) phalaris varieties Advanced AT and Holdfast GT simply because they appear to be a more productive grass relative to TWG, with improved persistence and resilience. Both these phalaris types have improved winter production and while Graydn is still well aware of the management issues relating to alkaloid toxicity in animals from grazing phalaris, he knows he has access to experienced graziers and industry people which will assist him in its management. ✓

TABLE 1. Establishment costs

Activity	\$/ha
Seed	\$104
Chemical	\$30
Fertiliser	\$0
Operations (contract seeding/spraying)	\$67
Total cost	\$201
Breakdown of costs	
Seed	TWG 2kg @ \$13/kg = \$26
	Lucerne — Pegasus 2kg @ \$10.40/kg = \$20.80
	Kikuyu — Whittet 1.25kg @ \$45/kg = \$56.25
	Balansa — Paradana 0.4kg @ \$4.40kg = \$1.76
Operations	3 sprays @ \$9.00/ha each = \$27
	Seeding @ \$40/ha = \$40
Chemical	1st Knockdown — Glyphosate @ 2L/ha = \$12
	2nd Knockdown — Sprayseed @ 1L/ha = \$10
	Post seeding-pre emergent — Chlorpyrifos @ 0.3L/ha + Bifenthrin @ 0.2L/ha = \$8