

# Under-sowing perennials to reduce establishment costs

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For Tim and Steph Stevenson, moving from Perth to Kojonup some nine years ago brought with it a change in scenery, soil type, paddock sizes and more rainfall.

## Farm info.

**Grower:** Tim and Steph Stevenson

**Location:** 'Kaula Dale', Jingalup,

**Arable area:** 800 ha

**Ave annual rainfall:** 500 mm

**Soil type:** Duplex granite sand over clay

**Enterprise mix:** Cropping, stud rams: 510 ha crop, 290 ha pasture

Like most farms in the Kojonup district, soil types vary significantly within paddocks and in average winter rainfall years many become winter waterlogged. With a passion for breeding rams (of a number of breeds) the pasture enterprise is at the forefront of productivity gains for the Stevenson's. The challenge on their farm is to get the best pasture species performing on every soil type including a strong mix of annuals and perennials.

Tim and Steph currently run around 1500 stud ewes and aim to achieve 130% lambing from them. Using perennials has allowed mating of ewe lambs to occur a month earlier if the season permits and reduces the use of supplement feeding.

### Paddock preparation

When I first visited Tim he had a simple brief for this 'wetter country', "I would like to have persistent perennials in all parts of the landscape with a mix of good winter production and green feed at the shoulders of the season that I can crop over if I want to." From that moment on Tim and I started on a fact finding mission, basically 'right plant, right place' kind of stuff that we hear a lot about with perennials. In the meantime though, the focus was on paddock preparation to get control of unwanted grass weeds such as silver, brome and barley grass. Cropping with canola and hay were used to clean up

these unwanted weeds and crops were also sown over the existing lucerne.

In 2011, Tim agreed to be involved in a *Grain & Graze 2* pasture cropping large scale demonstration trial. This trial was conducted in the adjacent paddock to his focus paddock. Various perennials were established in September 2011 — kikuyu, chicory, lucerne, tall fescue, phalaris and tall wheat grass. In the surrounding area of the trial Tim sowed a mix of 2 kg/ha of phalaris and 1 kg/ha of chicory so that the whole 10 ha could be managed as one during the trial. He was also keen to see how these species would perform with spring sowing in this duplex granite sand. The plan was to then sow grazing barley over the established perennials the next autumn of 2012. However, the performance of the phalaris and chicory both in the trial and Tim's paddock was quite outstanding. While we were cautious that the late rain in 2011 had assisted this very good establishment, both the phalaris and chicory produced rapid, solid crowns and appeared very robust.

### Establishment under crop

Based on this result, Tim decided he wanted to trial autumn establishment of a similar mix under a grazing barley hay crop as an alternative method to avoid the 'lost productivity during establishment'. This establishment method under a 'cover crop' is not common practice these days and is not viewed by experienced perennial

farmers and specialists as good management. Historically though, cover crops for perennials have been sown with cereals that are allowed to grow tall with limited grazing (i.e. aim to protect young perennial seedlings but effectively shades them out instead) and this has resulted in a spindly perennial plant with poor energy reserves going into the hot summer. However, with newer winter grazing cereals such as Urambie barley and Revenue wheat now available, the option now is to sow these cereals (that are bred for grazing multiple times) as the cover crop. This allows good grazing capacity from the paddock during establishment while keeping the canopy open for the young perennial seedlings.

The paddock wasn't ideally prepared with no spray topping of barley and brome grass in the spring of 2011 but heavy grazing by ewes kept seed set relatively low. It was sown relatively early in the season on the 10th of May after 30 mm rain in the first week of the month with 60 kgs/ha Urambie barley, 1 kg/ha Advanced AT phalaris, 1 kg/ha Resolute tall fescue and 1 kg/ha Puna chicory. The paddock had a simple knockdown with 1.2 L/ha Glyphosate but no residual grass herbicides. The barley and perennials jumped out of the ground even though the rest of May became very dry and the next significant rainfall event wasn't until June. The barley was grazed in early June to reduce the leaf area and transpiration

from the plant as things were starting to get a bit dry. Just after grazing the rain came and the season looked to be back on track. The paddock was grazed again on the 10th of July with ewes and lambs and again on the 14th of August to give the perennials one last growth spurt before cutting for hay in mid-October. The time of cutting hay was bought forward from the planned end of October as the finish to the season was looking dry (only 8 mm) after a very good 90 mm in September. This early cutting proved to be good management for the perennials (hay yielded about 4 t/ha) especially the phalaris and chicory which responded to stored moisture. The tall fescue was less pleasing and we suspect that the pH of 4.8 in this paddock may be marginal for the persistence of fescue.

### Stocking the pastures

The breeding of stud rams requires Tim to start lambing in April, so early season feed is critical. Perennials such as phalaris and chicory that produce early season green feed ideally fit into Tim's system. As he says, "The benefits to me of not supplementary feeding early lambing ewes with the feed cart is significant." Tim is not concerned with animal health issues associated with phalaris staggers as he sees this as a management issue of the animal before grazing. "If you're putting lambs or ewes onto pellets or grain you ensure they're prepared for the change in diet so why is it any different for phalaris? I know what the consequences are so I make sure the stock have full stomachs and ad lib hay or straw.

In these early years of establishment it is difficult to quantify an increase in stocking rate with the perennials Tim

has established. In fact, he is more interested that his stocking capacity doesn't decrease while establishing them! A decrease in stocking capacity is a productivity loss he can't afford on what is a relatively small farm. So far the perennials are holding their own through the winter grazing period. Grazing his cash crops is also a critical component in allowing high winter grazed stocking rates of 16 DSE/ha although he doesn't get hung up on DSE's too much. He wants more lambs per hectare at the cheapest cost which means less grain feeding of either the ewe or the lamb.

### Grazing records, below House Dam Paddock (30 ha)

**2nd June** — 180 lactating ewes for 3 days  
 $(180 \times 2.5 \times 3 \div 30 \text{ ha} = 45 \text{ DSE days/ha})$

**10th July** — 300 lactating ewes for 14 days  
 $(300 \times 2.5 \times 14 \div 30 \text{ ha} = 350 \text{ DSE days/ha})$

**14th August** — 500 lactating ewes for 5 days  
 $(500 \times 2.5 \times 5 \div 30 \text{ ha} = 208 \text{ DSE days/ha})$

A total of 603 DSE grazing days per hectare for the winter months or about half the grazing days compared to Tim set stocking six lactating ewes per hectare during lambing from June to August.

### Establishment costs

In Tim's situation, he believes his establishment costs are for the seed only. By sowing the perennials under the barley crop which was grazed and made into hay the costs of fertiliser, chemicals and operations are not attributed to the perennials alone. In Tim's case, hay was the end product but this could also be grain for cash income.

### Financial benefits

Tim believes the perennials in his farming system will improve productivity of winter waterlogged soils that maintain desirable species and not just unwanted winter and summer weeds. He also hopes that the consistent water use by perennials will one day enable profitable grain cash crops to be grown in these areas. Tim and I estimate on the last five years cropping results that these paddocks currently produce less than 5 kg grain per millimetre growing season rainfall (kg/mm GSR) due to winter waterlogging. The aim is to get this to at least 10 kg/mm GSR by using a combination of perennials and early sown grazing crops that can be grazed from autumn through to early August while maintaining average winter stocking rates. This is a tough aim but one believed to be achievable and required to produce sufficient returns on the value of the land.

### Future plans

Tim has again established another 35 ha of phalaris and chicory under barley in 2013 on similar country. This paddock was sown in June to allow for a double knock prior to sowing. The concerns in this paddock were ryegrass and while the double knock has done an excellent job, late germinations may still hinder the persistence of the perennials. Tim is not afraid though to graze hard in the spring and then spray top the ryegrass to control seed set. He has seen that by keeping the grazing, of phalaris in particular, hard in the spring it will remain vegetative and therefore not be affected significantly by a spray top later in the season. The alternative is to use an earlier spray top option with Gramoxone which in Paul's experience won't have a long term effect on the phalaris and chicory due to their strong crowns at this time of the year.

Scope (IT) barley is also seen as a potential cover crop option so that IT chemistry can be used to remove barley grass and brome grass in crop. However, there is little known about the tolerance of perennials to this chemistry so this is definitely a work in progress.

Harvesting his own phalaris seed is a future aim of Tim's, but with the continuing success of under-sowing low rates of phalaris with barley, the seed cost is not a significant one while he maintains his winter grazed stocking pressure. ✓



Attendees at a Southern DIRT Field Day inspecting a pasture cropping trial site on 'Kaula Dale'.