Perennial pasture demonstration site at Winterbrook Farm (November 2015)

A Lesson in Perennial Pastures: Case Study from Winterbrook Farm

Manjimup landholder Kim Skoss says that farmers shouldn't rush into planting perennial pastures, but instead should prepare at least one year in advance of seeding. Kim has just completed a 3-year perennial pasture demonstration supported by South West Catchments Council. If he could have his time again, he would have spent the first year preparing the paddock to ensure a clean seed-bed with good soil fertility.

Kim's demonstration took place in a shallow valley with gravel-loam soils that had poor pasture growth with blackberry canes.

Kim Skoss with phalaris seedheads in January 2017

Soil testing in January 2014 found that phosphorus levels were very low, and also that the soil's phosphorus buffering index (PBI) was extremely high. The average PBI from three soil samples was 1588, which suggested that phosphorus would limit production. Soil pH was 5-5.5 in $CaCl_2$.

Work commenced in April 2014 to prepare the paddock.

"We worked up the paddock with a Caltros cultivator in two directions to level the paddock, applied glyphosate after weed germination and rolled the paddock to firm the seedbed."

Kim selected a species mix that would be active in winter and resilient. This included phalaris (Holdfast GT), cocksfoot (Grassly summer active), sub clover (Antas), arrow leaf clover (Zulu) and Lucerne (Sardi 7). All species were planted at 4.5kg per hectare with an Atkinson drill in June 2014.

"The contractor knew what he was doing and that really helped. Getting the seed as shallow as possible (5-10 mm) but getting enough contact with the soil. Its an economy to use them given their cost and the cost of the seed."

Fertiliser was broadcast post germination (Ecogrowth NPK at 150 kg per hectare). Kim found it difficult to justify significant expenditure on fertiliser for such a small grazing enterprise.

Germination was generally good with perennial grasses evident in the drill lines. However, very few lucerne plants were detected in the first year. Growth was slow over the spring and the paddock had one light graze to knock down the volume of annual grasses going into summer. The main pest issue in Year 1 was kangaroo grazing (no point in the paddock is further than 150 metres from native vegetation).

In May 2015 Kim recorded a total ground cover of 66%,which increased to 84% by October 2016. This was attributed to tillering

of the perennial grasses and an increase in annual grass cover.

Kim split the paddock into three 2ha paddocks and applied Australian Mineral Fertiliser Grazing P at 330 kg per hectare. But growth during spring was still "unremarkable" (Table 1).

In 2016, soil tests revealed that phosphorus levels were still low, so Kim applied Pro P (Hi Tech Ag) at 150 kg per hectare.

As the demonstration neared its completion, Kim hosted 14 farmers at a field day, half of whom had never sown perennials. Kim said that it was a mistake to sow perennials without properly controlling weeds and addressing fertility issues.

"I should have seeded a grass legume mix in the first year with a capital application of phosphorus. Then in 2015 I could have grazed the residue and direct seeded following the application of a knockdown herbicide. But I expect the paddock should become more productive with time due to the pulse grazing."

Kim also felt that he wasn't resting his paddocks for long enough post-grazing.

"A thirty day recovery period in winter is too short. I'm hoping to take that out to 50-60 days in 2017. I'm also hoping to have some better kangaroo control measures."

Longer rests in winter are in line with research which suggests that phalaris should be rested until four fully expanded leaves have developed on each tiller, while other research suggests 4-5 leaf stage for both phalaris and cocksfoot. Grazing should stop at a height of around 3-5 cm and avoid damaging the high crown of upright cocksfoot varieties.

The field day was used to gather experiences from farmers who have sown perennials, including some members of the Manjimup Pasture Group, and also from Kim's agronomist and seed supplier (see Box). Margaret River farmer Paul O'Reilly, who was planning to sow perennials for the first time in 2017, said the feedback from farmers was invaluable.

"Theory is good, but practical applications are most beneficial."

Paul is now focused on balancing nutrient levels before sowing.

Kim hopes that production will increase with time, and was encouraged by widespread seed-set of phalaris and regrowth from rains in January 2017. But for now he is content with the lessons provided to other farmers about the importance of good preparation and management for perennial pastures.

TIPS TO ESTABLISH AND MANAGE PERENNIAL PASTURE (collected from experienced farmers with some input from an agronomist and seed supplier)

- Speak to a good agronomist
- Commence preparations at least one year out from planting. Preparations should include:
  - ◊ Soil test to identify pH and fertility issues;
  - ◊ Effective weed management, with at least a double knock.
- Concerns with using glyphosate may be allayed by combining it with additives such as fulvic acid.
- Sowing seed shallow (5-10mm) is critical. This can be done by direct drilling, or broadcasting and rolling to ensure contact with soil.
- Applying fertiliser down the shoot with the seed is seen as beneficial for small seeded perennials that may have slow root development.
- Sowing at above (e.g. double) recommended rates was recommended by farmers to ensure a good outcome from investment.
- Consider insect management (Note: Red Legged Earth Mite damage was detected at the field day).
  - ◊ At seedling stage chemicals may be required but are relatively cheap.
  - ◊ Once plants have established, nutritional sprays may be effective by converting nitrates, which attract insects, to other N forms.
- Be aware of any potential kangaroo grazing that may affect establishment.
- Don't count on any feed for 12 months, and any grazing in that period should be minimal and aimed at promoting plant growth.
- Grazing management is vital for persistence. Ensure the paddock is given suitable recovery periods.
- Phalaris, cocksfoot and fescue don't like being grazed over summer.

Table 1. *Changes in percent ground cover.*

Sample time	Perennial grass	Legume	Annual grass	Broad-leaf	Total cover
May 2015	12.8%	21.9%	19.8%	11.5%	66 %
Oct 2016	16.5%	28.0%	32.8%	6.7%	84%

Table 2. *Cow grazing days per hectare (average cow 400 kg).*

Year	Paddock 1	Paddock 2	Paddock 3	Control
2015	192	103	132	338
2016	231	176	187	286

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