Perennial Pastures in SW WA: A Review

Author: Peter Clifton

South West NRM

In early 2025, livestock producers in the high rainfall region of South West WA were surveyed to understand their confidence in perennial pastures, and how high key management actions are prioritised. Of the 64 respondents, 73% ran a beef enterprise, 42% ran sheep, 5% ran a dairy enterprise and 8% had another livestock enterprise. Respondents manage a combined area of 16,685 hectares.

As expected, confidence levels are relatively low, while the importance of weed and grazing management was relatively high.

This review looks at why confidence levels are low and uses feedback from local agronomists and farmers experienced in perennials to better understand the key management considerations.

Table 1: Survey results: Farmer confidence and management prioritisation for perennial pasture establishment in SW WA (n=64).

Question	Average	Std Dev
Qu1 How confident are you that you could establish and maintain perennial pastures in the sward?	**4.7/10**	**2.1**
Qu2 How important do you consider grazing management for the persistence of perennial pastures?	**8.4/10**	**1.9**
Qu3 How important do you consider weed management for helping perennial pastures to establish?	**7.8/10**	**2.2**
Qu4 How confident are you that you could select suitable perennial pastures for your requirements?	**5.2/10**	**2.7**

Why is confidence low for establishing and maintaining perennials in the sward?

Moore *et al.* (2006) outlines the challenges in establishing and maintaining perennial pastures in WA. Compared to annual pastures, perennial seeds are small and seedlings are slow growing, which makes them prone to competition from other plants such as broadleaved weeds and annual pastures, particularly annual ryegrass.

> **Jake Ryan** (Manjimup farmer): Perennials are a weak plant when you establish them.

The challenge of establishing and maintaining perennials in WA is not new. Moore *et al*. (2021) describe how research commenced in the 1930's.

> "Even though substantial areas had been sown …. perennial pastures were uncommon. Dunne (1938) observed that although many performed well in their first season, few persisted."

Poor persistence is often the result of competition from weeds and other plants, or grazing management, both of which are discussed below. However, other barriers exist that may limit confidence. This includes the ability to sow seeds at the correct depth. Small perennial seeds require shallow sowing (e.g. 5-15 mm, Barenbrug 2024).

> **Jake Ryan** (Manjimup farmer): Sowing too deep is a disaster. If you've had some tillage, you can easily sow too deep. You want to be able to see the seed tops on the ground, if not most of it on top of the ground.

If establishment is successful, they then need to survive summer and autumn when our Mediterranean climate means conditions are hot and dry. Climate impact was evident in 2024 when WA had a particularly harsh summer with little rain from September 2023 to May 2024.

> **Nathan Tognela** (agronomist): We planted red clover, white clover, plantain, chicory, perennial ryegrass, hybrid ryegrass, Italian ryegrass, cocksfoot, tall fescue, phalaris and lucerne," he said. "The trial was going amazingly for three years. Unfortunately the summer of 2024 was brutal and it killed every species, we had not one surviving plant. So, can we grow perennial species in WA? Yes, in the great southern. It's a lot cooler, they get summer rainfall there. Their summers aren't as harsh as our (West Coast) summers.

Another topic that complicates establishment is when to sow perennials, autumn/winter or spring. Annuals are typically sown in autumn, but pasture growth slows down in winter, and this is particularly the case for slow growing perennials. A late break to the season e.g. June means it is cold when seedlings emerge, resulting in little growth until spring. So, the alternative is to wait until spring to sow as temperatures increase and allowing more time for weed control. However, this runs the risk of a dry finish and insufficient development of plant roots going into summer.

> **Sam Taylor** (agronomist): The common principle with all plant growth is if there's moisture and warmth they'll grow quickly, so trying to maximise that opportunity when you can.

> **Brooke Anderson** (agronomist): You're throwing the dice with the weather. If you can get the perennials established on a rising soil temperature they'll get going so much quicker and

> establish some roots. If you get 5 weeks or so of moisture, they will have a much higher chance of survival through the first summer.
>
> **Jake Ryan** (Manjimup farmer): Because we've got irrigation in the paddock, we can establish in March/April. (Without irrigation) I wouldn't be establishing perennials until September when it warms up, otherwise it's just too cold (in winter). Establishing without irrigation in April is quite difficult because it's hard to get a knock first on your weeds as they germinate. You need two knocks then seed it. "If you end up seeding in May/June and it's cold then they're extremely slow, sub clover and ryegrass are going to dominate it.
>
> **Tim O'Dea** (seed supplier): With a spring plant growers need to be really careful with all the bugs around as they can wipe out stands of germinating clover and herbs (lucerne flea, aphids and mites etc).

Finally, pests such as black beetle and red legged earth mite can impact establishment, in some cases wiping out areas. Black beetle should always be considered where kikuyu has been growing.

Moore *et al* (2021) emphasis that for perennials to be commercially successful, they must have "a robust and resilient management package" and a strong relative advantage over annuals. It is debatable if either of these currently exist.

> "Perennial pastures generally cost more to establish than annual pastures. The cost of establishment, extra grazing infrastructure (discussed below), higher risk of failure and additional cost to re-establish, along with (slow growth and) the longer establishment time (i.e. less grazing time), mean it can be several years before the investment breaks even."

Taking short cuts only increases risk of failure, which is the most expensive outcome.

> **Brooke Anderson** (agronomist): It depends what you're growing, but I find because you're spending so much more money on perennial seed, you don't want to back off on the nutrients. You need to get everything right, ground prep, weed control and fertiliser, give it every chance you can to establish well.

Do producers rate the importance of weed management high enough?

> **Tim O'Dea** (seed supplier): Background Wimmera (annual ryegrass) pastures are hard to deal with (establish perennials) because the Wimmera is very persistent. The east coast doesn't have this problem.

Given that slow growing perennials are prone to competition in their first year, good control of faster growing annual weeds is critical (Moore *et al* 2006). But what exactly is "good weed control" when it comes to perennials? This question is important because there is a suggestion that most producers tend to approach weed control prior for a perennial pasture much like they would for an annual. But slow growing perennials need a more strategic and longer-term

approach. The lack of consideration of weed control was evident in Expressions of Interest from farmers to host a demonstration site. Many EoIs were rejected due to a lack of sufficient weed control (e.g. one chemical spray if required). It suggests a lack of understanding of how important it is to overcome competition from annual plants, and that perhaps the confidence score should be more like 9 out of 10 rather than 7.8. It may be that the importance of weed control for annual pastures is also 7.8.

Farmers and advisors who spoke at the "Perennial Question" events in April 2025 support a more strategic and thought-out approach:

> **Sam Taylor** (agronomist): I think there are some general principles no matter what species you identify as being suitable for your property. The first one is clean the paddock up two years before you're planning on seeding because typically a lot of the perennial seedlings hate competition. Controlling weeds for two years doesn't mean two years of fallow, but instead, having an integrated plan over that time to make sure weed species don't get a chance to set more seed. If you're not prepared to do the basic steps (weed and grazing management), stick with the annuals, you won't get success out of the investment.
>
> **Adam Chapman** (agronomist): Don't come up with the idea that you're going to grow perennials on a whim. Correct your pasture for pH and make sure your weed management is right. One of the biggest "weeds" for a perennial pasture is annual ryegrass.
>
> **Tim O'Dea** (seed supplier): It's definitely worth having a 2-3 year plan if you're going to establish perennials. Sorghum or millet in year 1 can work after a knockdown on an existing pasture in spring, or spray topping in spring if not planting a summer crop. (In year 2), use a double knock and then sow oats or even a brassica. Then do a spring sowing that year, or wait until the following year autumn and do another a double knockdown before sowing perennials.
>
> **Jake Ryan** (Manjimup farmer): Weed management is "very, very, very important"! We generally follow a vegetable rotation because the paddock has low weed pressure.
>
> **Garry Haddon** (Busselton farmer): (Weed management is) 100 per cent where it's at. We're taking it on with a mouldboard plough to bury the seed and the kikuyu. We've done it at our Warner Glen property where we've inherited a doublegee issue and it's 99 per cent gone. That took 2-3 years.
>
> **Mark Tupman** (consultant): Weed control is probably number one priority and the state of the soil is number two in terms of just establishing perennials and getting them to grow well through that first season.
>
> **Warren Pensini** (Boyup Brook farmer): (Perennials) just do not compete with annuals, particularly grasses. We've established them in an organic situation where we were ploughing, and it was ok but not as good as now. A double knock is a minimum, even in the year before sowing. So the paddock we're sowing this year we cut hay off that for two years running, then we then sprayed it out last year and planted sorghum (in spring). We'll still do another double knock (two knock-down sprays) this year before we seed.

So, despite a relatively high level of importance being placed on weed control, it could be higher.

Is the importance of grazing management high enough?

> **Sam Taylor** (agronomist): (Perennials) are not a 'set and forget' type proposition (with the exception of kikuyu). They need rotational grazing, short, intense harvest period, long rest period.

Moore *et al*. (2006) state that successful farmers have used rotational grazing to provide rest periods from grazing. Rest is required so plants can replenish carbohydrate reserves:

> "Perennial plants store carbohydrate in their crown, tap-root, stolons and/or rhizomes and use this energy for the initial regrowth following grazing (or defoliation), to persist through periods of stress (e.g. drought, cold) and for regrowth in autumn for summer-dormant species. If the carbohydrate reserves are continually exhausted and not fully replenished, then the stand density will gradually decline.

This requires more intensive animal management through regular moves (e.g. ideally every 1-3 days) and smaller paddocks or the ability to split paddocks with electric wires. Therefore, this may require a significant change in farming practice, more time and labour allocated to monitoring grazing and shifting animals, and increased infrastructure and maintenance.

There may also need to be an adequate recovery period at the break of season when energy reserves are likely to be low after summer, and grazing too early after the first autumn rain may reduce survival. Time of grazing should follow recommendations for different species based on the number of leaves per tiller (shown later in this document).

Farmers who have successfully adopted perennial pastures have all adopted a relatively high level of rotational grazing, and are particularly rigorous in the first year:

> **Jake Ryan** (Manjimup farmer): If it's a big mob, then we graze one day, and if it's a smaller mob we'll split the paddock with hot wires and do one day on one half and one day the other half then get them out.
>
> Especially in that first year of establishment, otherwise, they'll knock them too much, annuals take over again and you lose the perennials, so grazing management is critical.
>
> **Tim O'Dea** (seed supplier): If you're a small farmer and are limited with your potential grazing over summer don't grow a perennial would be my suggestion. Just grow annuals and rely on silage and hay. If you can't pull your stock off when the plant goes dormant, you'll damage the crown and kill it, whatever perennial it is, besides kikuyu and couch.

> **Sam Taylor** (agronomist)**:** You have to be prepared not to graze that country for probably at least 6 months (after sowing) to really let those plants establish and get themselves a crown so that when they're grazed, they have a carbohydrate reserve and are able to recover.

> **Warren Pensini** (Boyup Brook farmer): If you're going to set-stock, you may as well forget about it. That's particularly vital in the first year. If you get one graze out of it in the first year you're doing well. But once your grasses are established, like the phalaris we have, I actually did set stock it for nearly a month after it established. It's not the best for production but it won't kill it.

Why is there low confidence in selecting species?

The lack of confidence in selecting perennial pasture species is closely related to the general lack of confidence in the ability of perennials to establish and persist in SW WA. There is no stand-out species that are "no-brainers". Each species has failed in certain situations while some also come with animal health concerns, even though new varieties have reduced risks. There is also a large amount of information and options open to growers, but a lack of demonstrated success.

The history of perennial pastures in WA, now almost 100 years long, shows that only a few can be considered a commercial success (Moore *et al*. 2021). Most of the temperate grasses and clovers suitable to the south west are considered niche species (i.e. >5000 ha and >50 000 ha at peak adoption – Moore *et al* 2021). Only kikuyu and lucerne have been adopted at a larger scale, although the area of lucerne has reduced since the 2000's.

Grasses

According to Moore *et al* 2021, the perennial pasture with the most straightforward and low risk management package is kikuyu. However, it has a reputation as a low nutrition pasture that outcompetes preferred species, an environmental weed, and is associated with black beetle. It also typically requires heavy grazing and high stocking rates for effective management. However, it is seen as one of the best options by agronomist Sam Taylor:

> "The species which is by far and away the most consistent is Kikuyu and it's probably also the most loathed. I struggle to understand why people don't like it because if it's well managed it can be good quality. On most farms there's a bit of a low part of the landscape and you're likely to find kikuyu across most properties in the South West region. Things like Kikuyu are more tolerant of less fertile land if you're not prepared to make the investment on fertility."

Other C4 sub tropical grasses such as Rhodes and Panic grass, while common north of Perth, are not commonly grown in the SW which is more prone to frost, while the cold soils reduce winter and early spring production.

The grasses more commonly sown are the niche species of perennial ryegrass, cocksfoot, tall fescue and phalaris.

Ryegrass appears to be the quickest of these four grasses to establish, the most productive and palatable with higher nutritional value, but is also the most shallow-rooted and therefore least resilient to hot dry summers. It suits most soil types.

Ryegrasses are also available as hybrids (part perennial - part annual ryegrass), persisting for 3-5 years with stronger growth rates. Ryegrasses may also contain endophytes that offer protection from insects such as black beetle and freedom from ryegrass staggers.

Phalaris, tall fescue and cocksfoot appear lower in palatability but deeper rooted, to below 1.5 m for phalaris, 1 m for fescue and 0.8 m for cocksfoot (Barenbrug 2024).

Varieties of different species can be summer active of winter active. It is generally considered that with harsh summers in the south west, it is very difficult for summer actives (or continentals) to grow in summer, and their lack of dormancy may exhaust energy reserves and reduce their persistence. Winter actives or "Mediterranean" varieties that shut down in summer and conserve energy reserves, tend to be considered more appropriate and also more productive in winter.

For salty areas, tall fescue is tolerant, followed by phalaris (moderate), cocksfoot (some) and ryegrass which has low tolerance. This trend is similar for waterlogging, with tall fescue and then phalaris most tolerant, but ryegrass having some tolerance and cocksfoot less tolerance (Barenbrug 2024).

In terms of soil type, phalaris is suited to heavier soil types but will produce on a range of soils. Cocksfoot is more suited to lighter, less fertile well drained soils, including deep sands, while fescue suits most soil types. All species have varieties that are acid- tolerant, particularly cocksfoot and phalaris (Barenbrug 2024).

Finally, grazing is recommended for ryegrass and fescue when tillers have grown three leaves, and phalaris and cocksfoot at the four-leaf growth stage.

> **Jake Ryan** (Manjimup farmer): We've gone from a high diversity mix (including clovers and herbs) down to a grass-based perennial pasture. We now grow 4Front ryegrass, Holdfast phalaris and Kanui cocksfoot. That way we can go out with our herbicides and control (broadleaved) weed species – doublegee, capeweed, thistle etc
>
> **Nathan Tognela** (agronomist): The perennial ryegrasses were by far the most productive and the fastest species to establish. Cocksfoot, phalaris and fescue were the slowest to establish. The first species to die was perennial ryegrass because it's so shallow rooted. The cocksfoot, phalaris and fescues were also the last thing that animals grazed every time they went

into the paddock, especially the phalaris, so the cocksfoot and tall fescue were two species that showed real promise but then that summer (of 2024) just nailed them.

Brooke Anderson (agronomist): On trials I've run in the past we didn't really see the phalaris or cocksfoot in the first year. They came through in the second season however they were very slow growing and the least palatable to stock. The highest producers and fastest to recover from grazing were the perennial ryegrasses.

Tim O'Dea (seed supplier): Ryegrass is a proven system, it's easy to manage and it's got some great data around it. Multispecies is a lot harder, you'll graze species out, so it's finnicky and hard to manage. Cocksfoot and Phalaris are fairly adaptable to lower pH, but for me, if you're going to go for a perennial I'd pick better country. You'll increase production in those paddocks and during the shoulders getting that vegetative growth later in the season when all your annuals have run to head. There are beautiful soils in general in Manjimup, you can grow just about anything, but going into the lighter soil types things like phalaris and cocksfoot can adapt beautifully to those environments and perform really well.

Adam Chapman (agronomist): Phalaris, fescue and ryegrass, were the most commonly seen to do well. Bealy Ryegrass (now 4Front) is really good. Cocksfoot goes alright but not always that successful in its establishment, it's a bit weaker. Phalaris goes really well, and has good persistence. There used to be animal health issues with the Original Australian Phalaris and it used to clump up, but new varieties are a lot more prostrate. The feed value, although not as good as ryegrass, is really strong.

Jake Ryan: We have Phalaris that is now five years old and you can't kill it.

Sam Taylor (agronomist): Once we move to the alternatives (from kikuyu), a winter active tall fescue has a really strong fit. I haven't seen as much success out of things like cocksfoot or phalaris but certainly know that phalaris is highly persistent.

Warren Pensini (Boyup Brook farmer)**:** It used to be that you could only plant phalaris in the wet areas and in the heavier type soils. We've got phalaris growing on top of our gravelly ridges now, partly due to better varieties. The big issue with phalaris was the staggers, but the newer varieties are a lot safer. It's my number one go to, the first thing I put in the mix, because it grows on the spit of a rain. Last year, when we came through that horrible dry summer in March 2024 we had it shooting on dew. Cocksfoot, we've had mixed results with. Fescue is another one that's been a bit tricky, I've got one paddock of fescue that I planted 15 years ago. Unfortunately it's an older variety that's not particularly palatable."

Legumes

Legumes are a desirable component of the system, but can complicate management. They appear to have less success than grasses, and are sometimes not considered necessary because a persistent subclover seed bank means annual clovers are often present, especially when less

nitrogen is used. Due to complications with weed control, legumes may be less suitable where broad-leaved weeds are a problem.

In terms of tolerances, lucerne has low tolerance of water logging, while white and red clover have some tolerance and strawberry clover is considered tolerant. Strawberry clover is also tolerant of salt. The clovers suit a wide range of soils, while lucerne prefers deep well drained soils. These legumes prefer a soil pH between 5.4 and 8.0 (Barenbrug 2024), so have less tolerance of acidic soils compared to other options.

> **Jake Ryan** (Manjimup farmer): I don't think perennial clovers did that well, they're not good at competing with subclovers. Subclover is out of control at our place. Lucerne persistence is useless in that system too, it was there as long as you did rotational grazing, as in day in day out style holistic plan grazing, but as soon as you go for more set stock it doesn't really persist.
>
> **Nathan Tognela** (agronomist): The red and white clovers were so slow, swamped by weeds, didn't flower, died at the end of the first spring. The lucerne was an absolute failure and we knew that would happen.
>
> **Brooke Anderson** (agronomist): Lucerne is definitely not something we've had much success with down here mainly because of the acid soils, being too wet, and the pests.
>
> **Warren Pensini** (Boyup Brook farmer)**:** Lucerne, I have a love hate relationship with. I love it, the cattle love it, but so do the bugs. I think the perennials help the sub clover that emerges from the seedbank. I think the subs just get better with the perennials."

Herbs (Chicory, Plantain)

Herbs such as chicory and plantain are a valuable, high quality component, but again restrict weed control so should be avoided where broad-leaved weeds are a problem. Both plants are considered deep rooted and drought resilient, but not generally sown as monocultures. They are suitable on most soils with a soil pH between 4.5 and 7.5 (Barenbrug 2024).

> **Jake Ryan** (Manjimup farmer): Chicory and plantain were quite handy but some of the chemicals we use on the veggies persists in the soil which hindered their germination. Having chicory and plantain also limits weed control options for the following year. Because we are in vegetable production, we need to make sure that we've got some of the nasty weeds under control.
>
> **Adam Chapman** (agronomist): The challenge is the herbicide options. They're very good nutritional values, good grazing but softer to get going, probably tougher than lucerne, weaker than ryegrass. They are a little bit more difficult to establish with hungry sheep on there because they are pretty palatable.
>
> If you're going to put chicory and plantain in, I'd almost treat it like a lucerne establishment, I'd almost say you'd be at about 25% stocking rate for the first 12-15 months and you're doing a few very light short grazes.

Nathan Tognela (agronomist): If you've got chicory in your paddock and a cape weed problem, it's really hard to control.

Warren Pensini (Boyup Brook farmer)**:** I've had some success sowing lucerne, chicory and plantain by themselves and using a grass-selective herbicide to control annual ryegrass. Then sowing perennial grasses over the forbes the following year.

Col Bowey (agronomist): Chicory is a good one because, you might not have rain, but as soon as the humid nights come in, it just sucks the moisture out of the air and takes off.

So is it worth establishing perennials?

Despite the challenges, there appears to be a high level of interest in grazing perennial pastures. This was evident from the fact that 83 farmers attended the four "Perennial Question" events.

The motivation for most farmers is to extend the growing season, save money on supplementary feed and also to improve soil health and soil carbon.

Jake Ryan (Manjimup farmer): They're great early feed options. All you have to do is break dormancy, they don't have to germinate, establish and then grow. When they break dormancy, they shoot 10-20 new leaves and then 2-3 weeks later you've got a fully grown plant, compared to an annual which takes 6 weeks to establish a good pasture. Then on the other end of the season you're getting that green feed about two weeks longer than annual pastures, good feed options for finishing lambs or cows.

Other benefits are they have a big root system going deep, so you'll grow your soil in depth.

Warren Pensini (Boyup Brook farmer): We want to extend our growing season so our cows are on grass for longer, which is also cheaper. That's where perennials are really important to us.

Adam Chapman (agronomist): We can make silage really well (in Manjimup) but our hay harvests around here, especially if we get rain, are pretty mediocre. Perennials can be beneficial instead of running a whole annual system where you've got a load of really good feed, but can't utilise it at that time.

Perennials can be a really good opportunity to remediate the soils if you've got compacted soils or shallow soils. You see some really good recovery of compacted topsoils with phalaris and fescues that do a really good job of exploring the soil.

While the relative advantage of perennials over annuals in terms of yield and total energy provision to animals is debatable, perennials also need to be compared to hay and silage which is what they will reduce.

Daniel Real (Researcher): It's not 'is perennial better than Italian (annual) ryegrass?' That's not the point, they are different. But the comparison of perennials versus more supplementary feeding or other types of feeding in autumn might be a better comparison.

Other advantages outlined by Moore *et al* (2006) include:

- Summer rain – rain after annual pastures have senesced reduces feed quality and quantity of dry standing annuals. In comparison, perennial pastures start actively grow.
- False breaks in early autumn – annuals often germinate and die, reducing the seed bank, while perennials survive.

And Moore *et al* (2006) place a higher value on the provision of feed in drier months compared to wet months.

> "Total dry matter production from well-managed annual and perennial pastures is usually comparable but perennial pastures have a more even seasonal distribution. Spring production from annual pastures is often higher than for many perennial pastures but perennial pastures are more productive in summer, autumn, and/or winter (depending on species and period of active growth) – when feed is often limiting. Consequently, each unit of production is more valuable than the same production in spring when there is a surplus of feed resulting in poor pasture utilisation."

In conclusion, there are many barriers to adoption and successful establishment of perennials in SW WA. Emphasizing the importance of weed and grazing management, particularly the "special needs" of perennials compared to annuals and the benefits of 2-3 year weed management plans is a key requirement for adoption.

Grazing management is a topic on its own, but courses have been supported by South West NRM (Grazing Matcher) and other groups in South West WA for the past eight years, so many more growers are now aware of how to successfully apply rotation grazing. These courses have built up useful information and case studies to improve grazing management.

Finally, simplifying the options and providing concise information on species selection can also help to reduce confusion and the tendency to stick with the status quo of annual pastures.

Data Sources and Method

Data synthesised in this document comes from a Skills and Knowledge Survey, which consisted of an online survey, and an in-person survey conducted before the commencement of four "Perennial Question" field day events in April 2025. Qualitative data was also collected at these events and documented in an edited form here:

- The Perennial Question (Manjimup)
- Answers to the Perennial Question (Busselton)
- The Perennial Question (Warner Glen)
- Pensini's proof that perennials are possible (Boyup Brook)

Additional information was sourced from:

- Perennial Pastures for Western Australia – Moore *et al.* 2006
- The challenges of developing resilient perennial pastures for a Mediterranean environment – a review for Western Australia – Moore *et al.* 2021
- Perennial Pasture Guide - Temperate Extensive Systems Ed 3.0 – Barenbrug 2024