Barriers and drivers influencing adoption of perennial pastures on the south coast of WA

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Jamie Bowyer and Rebecca Heath

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We would also like to thank the many farmers who willingly gave up their time to be interviewed. Hopefully we have done justice to their contributions, which will be used to help improve delivery of future projects. A big thank you also to community project coordinators Heather Adams, Claudia Hadlow, Leonie McMahon and Jessica van der Waag for providing assistance.

Many thanks must also go to Jenny Crisp who provided invaluable advice and technical guidance in the preparation of this report.
SUMMARY

This evaluation was conducted to provide information to guide the development and design of future projects encouraging adoption of perennial pastures. We wanted to find out what barriers and drivers are influencing adoption of perennials along the south coast of Western Australia. We expected to find that a range of factors are involved.

We interviewed 22 landholders using a semi-structured format across three Strategic Catchments in August and September 2007.

Many factors motivating interviewees to consider adopting perennial pastures were identified. All of the farmers interviewed wanted to restore, maintain or improve the productivity and profitability of their farms. Environmental protection was also a driver but more so from a farm perspective than the off-farm environment. Interviewees often had more than one factor driving them to consider using perennial pastures.

Many barriers were identified, with risk being a key theme. Perennial pastures were considered to be risky and a number of factors contributed to this, including up-front cost, risk of establishment failure, recent dry seasons impacting on financial situations, and lack of knowledge. Other barriers identified were lack of time, incompatibility with current farm practices, cultural influence and lack of need.

Our main conclusion is that a wide range of factors needs to be considered by projects aiming to encourage adoption of perennial pastures. Single methods are unlikely to impact on large numbers of farmers in a target audience or area. Rather, a range of methods will be necessary.
1. INTRODUCTION

1.1 The evaluation

This report documents an interview-based formative evaluation conducted to identify the barriers and drivers to adoption of perennial pastures on the south coast of Western Australia. The purpose of the evaluation was to collect data to inform the development and design of future projects facilitating long-term adoption of perennial pastures.

The following key evaluation question was developed to guide the collection of data:

- What are the drivers and barriers to adoption of perennial pastures in the study area?

This was an external evaluation conducted by the Extension and Communication project team from the Department of Agriculture and Food’s Natural Resource Management Division.

1.2 Background

The clearing of native bush for agriculture has created a range of on-site and off-site natural resource management issues. Federal and state governments have funded a number of programs over many years to address these issues. Programs such as the National Action Plan for Salinity and Water Quality, the Natural Heritage Trust and the National Landcare Program have encouraged landholders to adopt more sustainable practices to mitigate or reverse the impacts of agriculture on the natural resource base. Landholders have also contributed substantial resources to addressing these issues.

From 2002 the Federal Government applied a regional delivery model to deliver environmental objectives. Regional Natural Resource Management (NRM) groups were supported to engage the community and develop regional strategies and investment plans to better target resource allocation. At the time of this report South Coast Natural Resource Management Incorporated (South Coast NRM Inc.) was the group guiding investment and delivery on the south coast of WA.

South Coast NRM Inc. prioritised investment through the selection of Strategic Catchments. These were selected mainly on the basis of catchments that were impacting on high-value assets such as rivers, estuaries, wetlands and waterways. The Strategic Catchments received significant funds to aid the adoption of sustainable land management practices such as biodiversity revegetation, remnant vegetation fencing, stock crossings, riparian revegetation and fencing, earthworks for water control, soil health work and perennial pastures.

1.3 The ‘Profitable perennials’ project

Perennial pastures are often promoted as a management option for addressing land degradation. Many varieties of perennial pastures with attributes that mitigate the environmental effects of agriculture are available. Deep-rooted perennial pastures can use more water, access leached nutrients and provide year-round soil erosion protection. From an environmental perspective there is a strong case for increasing the use of perennials in our farming systems.
South Coast NRM Inc. developed the ‘Profitable perennials’ project to facilitate increased adoption of perennial pastures. The project comprised a number of elements including research, the ‘buying’ of environmental outcomes through a grant, and technical and other support to assist farmers in Strategic Catchments to establish perennial pastures. Oyster Harbour, Bremer River and Lake Warden were the first Strategic Catchments selected, with the project commencing in these areas during 2006. It is important to note that in some of these catchments there had been a considerable body of work already carried out on perennial farming systems. It was hoped that the project would build upon this.

However, little was known about the factors influencing adoption of perennial pastures on the south coast. Because planning had commenced for the second stage of ‘Profitable perennials’, the manager of the project wanted further information to guide the delivery of further work, particularly information on the barriers and drivers to adoption.
2. METHODOLOGY

This evaluation sought to identify the barriers and drivers to adoption of perennial pastures on the south coast of Western Australia—not to quantify the relative importance of each one. As such, barriers or drivers mentioned by only one or two farmers are legitimate findings and have been recorded. To quantify the relative importance of each barrier or driver, further research using a statistically valid quantitative data collection method is needed.

2.1 Data collection method

Semi-structured interviews were used to collect data for the evaluation. The interview method was chosen because an in-depth understanding of barriers and drivers for each interviewee was sought. Interviews were semi-structured to ensure the same basic lines of inquiry were followed with each person and to make data collection more efficient (Patton 2002). An interview guide was developed (Appendix 1) and pilot interviews were conducted with two landholders from the Bremer River catchment in August 2007 to standardise the technique between the two interviewers and refine the questions. The remaining interviews were conducted during August and September 2007. Interviews were recorded digitally and/or via handwritten notes.

2.2 Sampling approach

This evaluation ran concurrently with an impact evaluation of the ‘Profitable perennials’ project conducted by the Department of Agriculture and Food on the south coast (see Bowyer and Heath 2009). To make efficient use of resources, data was collected for both evaluations from the interviewees selected for the impact evaluation. It is acknowledged that a different sampling approach may have been used to gather data on the barriers and drivers to adoption in isolation from the impact evaluation.

A combined ‘purposeful sampling’ technique (Patton 2002) was used to select landholders to be interviewed. Oyster Harbour, Bremer River and Lake Warden Strategic Catchments were selected for the evaluation study area (see Figure 1). These catchments represented a geographical spread across the south coast with Oyster Harbour in the west, Bremer River in the central area and Lake Warden in the east.

Lists of farmer participants were sourced from project coordinators and farmers were randomly chosen from these lists. Farmers were contacted by telephone and asked if they wished to take part, and appointments were made to conduct the interview. A decision was made to interview approximately 20 farmers because time and resources were limited. A number of farmers were unavailable to be interviewed for various reasons.

Twenty-two landholders were interviewed—nine from Oyster Harbour, six from Bremer River and seven from Lake Warden. This included five landholders who did not participate in the ‘Profitable perennials’ project from Oyster Harbour and Bremer River catchments.
2.3 Analysis

All interviews and handwritten notes were transcribed and read independently then re-read by the evaluation team. The data was analysed to identify patterns associated with themes from the initial evaluation focus and any emergent patterns and themes from the interviews (Patton 2002). Transcripts were imported into NVivo 7, a qualitative analysis software program (QSR International 2006), and coded according to themes and patterns. The data was summarised and interpreted by the team.
3. FINDINGS

3.1 Drivers

Many factors motivating interviewees to consider adopting perennial pastures were identified. All of the farmers interviewed wanted to restore, maintain or improve the productivity and profitability of their farms. This was in response to factors that were negatively impacting on production, perceived opportunities to increase production or planned changes to the farm enterprise mix that required increased production. Environmental protection was also a driver but more so from a farm perspective than the off-farm environment. Interviewees often had more than one factor driving them to consider using perennial pastures. Table 1 summarises the drivers on a Strategic Catchment basis and the drivers are then described in greater detail below.

‘Everything becomes dollar-driven—we can pretend, but in reality it is dollar-driven.’

| Table 1 Number of responses in each category of drivers to adoption of perennial pastures across three Strategic Catchments |
|---|---|---|---|---|
| Driver | Oyster Harbour 9 interviewees | Bremer River 6 interviewees | Lake Warden 7 interviewees | Total No. of interviewees who referred to driver |
| 1. Increase/maintain farm productivity and profitability | | | | |
| Factors negatively impacting on productivity | | | | |
| Salinity and related issues | 5 | 3 | 3 | 11 |
| Poor sandy soils | 3 | 3 | 6 | 12 |
| Summer feed gap | 4 | 2 | 0 | 6 |
| Herbicide resistance | 1 | 1 | 1 | 3 |
| Improve year-round production with green feed over summer | 1 | 1 | 0 | 2 |
| Capture summer rainfall and turn into green feed | 1 | 4 | 1 | 6 |
| 2. Environmental protection | | | | |
| Protect estuary | 0 | 1 | 0 | 1 |

Salinity and related issues. Half of the farmers interviewed indicated that managing salinity, or related issues such as recharge and waterlogging, was a driver for using perennial pastures. These farmers wanted to reduce recharge in high recharge areas and get watertables under control; improve production on less productive saline areas or stop the salinity spreading; and/or improve production on areas that were waterlogged. There was a perception that perennial pastures were a profitable option to manage these issues.

‘Well, mainly we have had a few salt problems here. So we are trying to lower the watertable. We have creek lines going salty, that sort of thing, so we are trying to stop that a bit. Just trying to stop the salt, mainly.’

Improve production and manageability on poor sandy soils. Just over half of the interviewees wanted to improve production and/or ease of management on inherently poor sandy soils. These soils grew poor annual pastures and were fragile over the summer/autumn period, meaning they could not be stocked without increasing the erosion risk at this time of the year. Farmers were also getting poor returns trying to crop these soils. In some instances, these soils had become increasingly non-wetting, which impacted on crop
and pasture production. There was a desire to increase stocking rates by improving soil productivity, and perennial pastures were seen as a way of achieving this. Kikuyu was a popular choice, because the lawn-like nature and toughness of this plant allows heavy stocking without increased erosion risk. One farmer was aiming to recapture leached nutrients on these soils using deep-rooted perennial pastures.

'I was looking for a pasture that would tie the paddocks down and would allow paddocks to be stocked in summer. I wanted to safely increase production through increased stocking rates.'

'Just establish it for grazing, just a higher stocking rate on that country. At the moment it's just very limited in stock production. That's my main reason for going into it.'

'Well, I've been cropping it, and there was just no production off the land. That's country just wasted really.'

**Summer feed gap.** Six farmers expressed a desire to reduce the summer feed gap or reduce the amount of supplementary feeding done over summer/autumn by growing summer active perennials. Several perennial pasture options gave them this opportunity.

'We were looking to reduce the amount of supplementary feeding we do over summer and autumn.'

**Improve year-round production by growing summer feed.** Improving year-round production by growing feed over summer was a driver for two of the farmers. These interviewees wanted to intensify their livestock enterprises by having year-round green feed, which would give them the country to put meat lambs onto and/or allow them to increase their stocking rates.

'To increase my grazing … we've gone out of Merino sheep into Dorpers and I'll be lambing more all year round so I want to have country that I can put lambs onto.'

**Capture summer rainfall.** The desire to capture summer rainfall and turn it into a plus for the farm was related to improving year-round pasture production but seen more as an opportunity. Six of the farmers interviewed wanted to use perennial pastures to capture the regular summer rain available on the south coast and thus improve production. They considered not using the rain as a waste.

'To use the out-of-season rainfall. You know it is part of being here on the south coast, the fact that you get that 20–30 per cent of your rainfall out of season in summer. So under just an annual pasture it doesn't do it any good, so if you have some sort of perennial you can make use of it …'

**Manage herbicide resistance.** Three farmers had planted lucerne to address problems with herbicide-resistant weeds in their cropping systems. One used a range of options to overcome herbicide resistance, but would use lucerne in paddocks with watertable problems to address two issues at the same time.

**Environmental protection.** The environment was a consideration, but more from the perspective of maintaining the farm resource base than minimising the off-site environmental impacts of their business. One farmer was keen to showcase a workable perennial pasture system so that other farmers might adopt it. He wanted this to happen to help protect the estuary at the end of the catchment.

'Well I think if I can get that established as a success and then prove to people that I can get one and a half times my grazing off that country, I think that's the thing that will change their minds.'
3.2 Barriers

Many barriers to the adoption of perennial pastures were identified. Table 2 summarises the barriers on a Strategic Catchment basis. The barriers are then described in greater detail below.

Risk, particularly financial risk, was the key underlying theme. Perennial pastures were considered ‘risky’ and this perception often prevented landholders from incorporating perennials on the farm. Coupled with this was the uncertainty of perennials—would the capital and resources invested in perennials pay off? A number of elements contributed to this perception of risk and uncertainty. As with the drivers for adoption, many farmers had more than one barrier to incorporating perennial pastures on their farm. Barriers were often inter-linked, with one influencing another.

Table 2 Number of responses in each category of barriers to adoption of perennial pastures across three Strategic Catchments

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Oyster Harbour 9 interviewees</th>
<th>Bremer River 6 interviewees</th>
<th>Lake Warden 7 interviewees</th>
<th>Total No. of interviewees who referred to barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up-front cost</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Risk of establishment failure</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Recent dry seasons impacting on financial situation</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Lack of time</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Incompatibility with current farm practices</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Cultural influence</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Lack of need</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Up-front cost.** More than half of the interviewees identified the capital outlay required to establish perennial pastures, particularly lucerne, as a barrier preventing adoption. They believed that they could not afford the initial capital outlay, nor could they afford the income lost by taking paddocks out of production while the perennials established. There was a perception that production and subsequent income from perennial paddocks could be lost for up to 18 months.

'We have only been here for five years. Ever since we got here we have wanted to put in perennial pastures but the big factor is taking that paddock out for the year and, you know, you are not getting an income. That's been the main stumbling block …'

**Risk of establishment failure.** The risk of establishment failure was a barrier for just over half of the farmers. There were several aspects associated with this. Often interviewees had witnessed unsuccessful perennial pastures on other properties or had experienced failures on their own farm, and didn’t want to risk the outlay of time and resources on something they couldn’t get to work or hadn’t seen work on other farms. Dry seasons also increased the risk of establishment failure and, at the same time, farmers were not prepared to lose what little feed they had in order to get perennial pastures established. One family considered their lack of skills and experience increased the risk of failure at establishment.
‘We hear a lot of stories of lucerne in places where the lucerne has done really well, but I have seen a lot of failures. I see more failures than what I do successes.’

‘No I didn’t put any in this year. I was going to but it was just too dry. It was just too dry, and to lock up another paddock and take it out of the system was a bit hard this year.’

Recent dry seasons impacting on financial situation. For four farmers, the risky nature and uncertainty of returns from investment in perennial pastures had been exacerbated by the recent dry seasons. Poor seasons leading to reduced returns had impacted on their financial capacity and this prevented them from pursuing something they considered risky. This group of farmers needed immediate ‘safe’ returns on their investments and felt that perennials were too risky at this time.

‘We had a very ordinary year from a cropping perspective last year (due to little rain) in terms of our yields. A substantial net cash deficit for the financial year. I couldn’t afford to be borrowing money to put in something that I consider to be relatively high-risk.’

Lack of knowledge. A general ‘awareness’ was lacking in six of the farmers interviewed and this impacted on decisions to adopt perennial pastures. For example, they were unaware of the perennial options available, the most suitable option for their situation, how profitable perennials could be and/or the benefits of perennials to their farm. Additionally, lack of skills and/or knowledge with respect to establishment and management of the pastures was also seen as a barrier to adoption.

Lack of time. For three of the farmers, the time and effort required to learn about perennial pastures was considered to be too much, as well as the time required to establish the pastures, particularly when prioritised against other farm jobs. One of these had an off-farm job and simply didn’t have time to learn about perennials even though he wanted to.

‘It is a bit of a mind-set really—you just don’t get around to it. It is something you have to plan for. You have to get the paddocks prepared and you have to get organised and do it. The management is a bit different to managing the clover and rye grass annual pasture. You have to work at it a bit.’

‘All the other jobs on the farm seem to be so pressing and that’s the main issue with everything, be it tree planting, planting perennials, erecting fences. It’s time to fit it in with the rest of the program to get it done.’

Incompatibility with current farm practices. Five of the interviewees had not adopted perennial pastures in the past because their business had not included livestock, or their focus was on cropping. These farmers felt they did not need perennials, and therefore weren’t going to plant them, when they could make better money cropping. It is interesting to note that some of these farmers had recently begun putting perennials into their farm enterprise mix to address degradation issues, such as rising watertables, herbicide resistance and non-wetting soils, impacting upon the viability of the cropping business.

‘I’ve just been full crop rotation, had no livestock. I’ve only just introduced livestock over the last two years, so I’ve just been full intensive cropping.’

Cultural influence. One farmer had been strongly influenced by his father in the past, who considered kikuyu unsuitable because he believed the year-round green pick would exacerbate worm problems in a sheep flock.

Lack of need. One farmer believed he had enough perennial pastures on his property and didn’t need any more.
4. KEY LEARNINGS

The purpose of this evaluation was to gather information to guide the development of future projects, ensuring a greater impact on long-term adoption of perennial pastures on the south coast. A number of useful learnings from this evaluation can be applied to similar projects in the future.

Farm productivity is important. The desire to restore, maintain or improve farm productivity appeared to be a strong driver for adoption. Perennial pastures are more likely to be adopted on areas of the farm where they can deliver greater productivity levels than current systems. Targeting areas of low productivity where perennials can deliver the greatest productivity gains is likely to achieve higher adoption levels than areas where little gain is possible. Proponents of projects seeking to achieve environmental objectives should also consider farm productivity implications. If perennial pastures were not going to provide any productivity benefits, then it is unlikely that they would be adopted in the long term. Key extension messages should focus on the benefits perennials can bring to the farm where applicable.

Perennial pastures are considered to be risky. Interviewees considered perennial pastures to be risky and a number of elements contributed to this including high up-front cost, lack of knowledge and skills, seasonal conditions and financial situation. Strategies to reduce risk should be considered when encouraging adoption. For those farmers with little experience with perennial pastures activities that support information exchange and trialling will build knowledge and skills allowing greater confidence to make decisions on adoption of perennials pastures. These could include grants, information networks and technical support. When projects of this nature are rolled out consideration should be made of previous seasonal conditions and the impact this may have had on farmer capacity to get involved. Current seasonal conditions should also be monitored and if not suitable then establishment deferred.

Individual diversity. While not a focus of this evaluation, it was clear that the farmers interviewed were different in many ways. A range of factors influencing adoption were identified and these were the result of a wide range of individual personalities, farming experiences, financial situations, natural resources, enterprise mix and experiences with perennial pastures. It is unlikely that a project designed to increase adoption of perennials will impact on all members of a target audience. Not everyone has a need for perennials and not all barriers can be overcome. Project proponents should be realistic about the level of impact they are likely to have. There is also a need to design project activities to cater for a range of drivers and barriers. Single methods or activities encouraging adoption are unlikely to impact on large numbers of farmers in a target audience or area; a range of approaches will be necessary.

The main conclusion that can be drawn from this work is that a range of factors needs to be considered by projects aiming to encourage adoption of perennial pastures. Single methods used to encourage adoption are unlikely to impact on large numbers of farmers in a target audience or area and a range of methods will be necessary.
5. REFERENCES


APPENDIX 1. Semi-structured interview guide

PROJECT IMPACT

What were the participating farmers’ reactions to project activities, including the value they placed on these?

- What perennials have you planted through the project?
- There have been a number of different activities conducted with farmers through the PP project. I wonder if you could tell me which ones you have been involved in? (May then need to follow through with prompt list—particularly mentioning the grant as an activity.)
  - Planning meetings/workshops
  - Technical support—on farm advice, etc.
  - Financial incentive
  - Establish your site
  - Anything else

- Note the ones involved in and then ask ‘tell me about your experience with the …’

To what extent have participating farmers adopted/not adopted perennial pastures and why?

This is where we find out impact of the project and what in the project made the difference. Need to drill down to see what activities got them over the line if that is the case. May be some overlap with section above.

- What PP have you established or plan to establish since the funded site?
- Which activities do you think were important in helping to make that decision, and why?
- If you plan to do more and haven’t, what is stopping you going forward?
- If you have not planted more and don’t intend to, why not?
- What would you have done in the absence of PP project?
- What other projects/groups working with perennial pastures are you involved in?

Were there any unexpected outcomes?

- Any unexpected outcomes
- Is there anything you would change about the project to improve it?
- Is there anything else you would like to add?

BARRIERS AND DRIVERS

Barriers

- What perennial pastures do you have on the farm now?
- What previous experiences have you had with perennial pastures?
  - Spent time gathering info on
  - Trialled
- Why aren’t/weren’t you using perennial pastures now? (drill down here)
  - Opinions/perceptions of perennials—hard to establish, expensive, etc.
Drivers

- Why did you start using perennial pastures? (drivers—drill down here)
- Where do you generally get information and advice on perennials from?
  - What/who are the influencers?

BACKGROUND INFORMATION

- General background information on farm, enterprise and farmer
- What is your enterprise mix?
- Total farm hectares (area managed/owned/leased)
- Rainfall
- How long have you farmed/had the farm?