

Recordkeeping helps increase farmer confidence to change practices

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Abstract. Supporting more targeted comparative recordkeeping in decision making is proposed as a means to increase farmer confidence to change practices. A qualitative social research project found beef and sheep farmers in southern Australia who engaged in some form of comparative recordkeeping activity, either benchmarking with other enterprises or targeted recordkeeping within their enterprise, were more open to change. Benchmarking or other comparative recordkeeping provided farmers with confidence to assess future opportunities and make decisions that improve farm performance. In contrast, farmers who were not keeping and interpreting written or electronic records were more likely to approach change in a reactive or cautious manner. Formal benchmarking is not accessible or appropriate for all farmers but given the positive relationship between benchmarking and recordkeeping and confident decision making about future practices, providing more accessible forms of comparative recordkeeping through facilitative extension approaches could engage a wider range of farmers in successful change.

Keywords: adoption, benchmarking, boundaries to change, decision making, extension, practice change

Introduction

Agricultural extension activities often engage farmers who are pro-active knowledge seekers and utilise opportunities to network with and learn from industry advisors and other farmers. Formal benchmarking is an extension activity promoted by some extension providers and researchers that requires intensive participation and consistent commitment from farmers. Formal benchmarking between farms is a detailed process of recording different aspects of farm business to calculate and compare measures of productivity and profitability. Benchmarking in farming (previously known as comparative analysis (Fleming et al. (2006)) has been variously defined (Wilson, Charry & Kemp 2005; Kahan 2013). Following Wilson, Charry & Kemp (2005, p. 46), we define benchmarking as a:

comparison of a performance indicator derived for one business with the same performance indicator derived for one or more other businesses... [it] incorporates a focus on the production (physical and technical husbandry), ecosystem resources management, human resources and business management practices / processes ...

In a formal benchmarking system, a farmer shares data related to key variables influencing productivity and profitability within a group who have similar enterprises – allowing for comparisons and open discussion around opportunities to change or improve practices with the aim of further increasing profitability.

Turner, Wilkinson & Kilpatrick (2017) identified that farmers participating in formal benchmarking display the Extensive Networking learning style identified by Kilpatrick & Johns (2003), and the strong economic and business orientation of the Progressive farming style identified by Howden et al. (1998). Some fitted the description of the Innovators categorised by Rogers (2003) and Howden et al. (1998): farmers who are at the forefront of change and enjoy the process of trialling new practices. When farmers network with other participants in group learning activities, they gather further information from both experts and other farmers, and compare practices, values and data. Kilpatrick (2000) reports that these collective experiences increase the likelihood of farmers successfully implementing practice change. Indeed, all farmers who participated in formal benchmarking activities in Turner, Wilkinson & Kilpatrick (2017) could be classified as Early Adopters; implementing new practices successfully and viewed with respect by their industry peers (Rogers 2003).

A large proportion of farmers do not engage in formal benchmarking activities. Over the last 10 years in the Tasmanian dairy industry for example, at least 90% of farms have not engaged in freely available formal benchmarking (Tasmanian Institute of Agriculture 2017). This may be due to the complexity of the process, or the group nature of benchmarking processes (Shrapnel & Davie 2001). Fleming et al. (2006) describe other broad criticisms of formal benchmarking that may deter some farmers from committing the time and other resources required to engage in benchmarking. These include its potential failure to incorporate sound economic principles in its application, limitations in establishing the underlying relationships between the key variables and

farming practices, and the lack of information around potential risk associated with subsequent practice change. In addition, appropriate benchmarking groups are not geographically accessible for a large proportion of farmers.

While the intensity and commitment required for participation in formal benchmarking is a barrier to engagement for many farmers, and others recognise its inadequacies, there are a range of less formal benchmarking and comparative recordkeeping opportunities that can support farmers in their decision making around change. For example, farmers may focus on a smaller selection of key variables and take the less formal approach of either comparing their records with those from other farms that are publicly available, or comparing their own records from year to year (within-farm recordkeeping). There are also a range of agricultural physical measures (e.g. animal weights) that can form the basis of comparing farm outcomes, as an alternative to business or financial measures. We use recordkeeping to refer to these less comprehensive or more informal data recording and comparison activities based on farm production, other business records or self-determined targets. Ronan and Cleary (2000) argue that the conclusive test of the value of the various forms of benchmarking and comparative recordkeeping is if they facilitate changes in management that result in improved farm productivity and profitability.

Change is a complex process that Turner, Wilkinson & Kilpatrick (2017) explored among beef and sheep farmers in southern Australia. Farmers were found to have individual combinations of firm and flexible 'Boundaries to Change' that determine the extent of change they are able or willing to make, with boundary flexibility influenced by their motivating values and information seeking patterns. To help facilitate practice change and improved farm productivity and profitability, extension providers were encouraged to identify and respect farmer values, work within existing boundaries and support farmers' moving from firmer to more flexible boundaries. This paper builds on Turner, Wilkinson & Kilpatrick (2017) to further explore the role of comparative recordkeeping in the process of change. It has been established that formal between-farm benchmarking activities typically engage farmers who are progressive and innovative, or Early Adopters. While benchmarking has been widely endorsed by some extension providers and researchers, but there is limited understanding of the detail of how farmers establish and monitor their 'strategic' plans (Stanford-Billington & Cannon 2010). The study reported here expanded the gaze to include other forms of comparative recordkeeping. It explored how benchmarking and other forms of comparative recordkeeping contribute to farmer decision making with respect to their approach to change. This paper also discusses the potential benefit of a broader range of comparative recordkeeping activities to engage a greater proportion of farmers in building an evidence base to support decision making and change and provides suggestions of how to engage traditionally non-participating farmers.

Materials and methods

The exploratory study investigated the research question: How does benchmarking and recordkeeping influence the decision making and approach to change of medium-large scale beef and sheep farmers in southern Australia? A qualitative approach was chosen to provide opportunities to hear the *how*, and to allow ideas to be built from farmers' descriptions of change. Semi-structured, in-depth interviews collected qualitative data from 24 farm owners in two Australian states, Victoria and Tasmania (Table 1). The sample was divided equally between the two states (12 for each) and then again between sheep and beef farmers (6 for each enterprise per state). Beef farmers in north-west Tasmania and south-west Victoria, and sheep farmers in the northern Midlands of Tasmania and in south-west Victoria were recruited with the assistance of meat industry extension providers. Only one farmer in the sample farmed both sheep and beef, and data collected focussed on the main enterprise. All farmers who were selected managed medium-to-large scale farms (gross farm income between AUD \$200,000 and \$500,000 per year). In order to observe variation in approaches to change, the sample was further divided into two sub samples of roughly equal size representing farmers who were identified by Research and Development Corporation (RDC) extension providers as participants in group extension programs, and farmers who were thought to have not participated in these publicly funded programs. The selection of potential participants aligned with the requirements and interests of the RDC funder, Meat and Livestock Australia.

Table 1. Number of beef and sheep farmers engaged in formal between-farm benchmarking (FB), recordkeeping between farms (RBF), recordkeeping within farms (RWF), recordkeeping based on production (RP) and minimum recordkeeping (MR), interviewed in Tasmania and south-west Victoria*

	Bench- marking	Other comparative recordkeeping				Total farmers
	FB	RBF	RWF	RP	MR	
<i>Beef</i>						
Tasmania	1	0	0	2	3	6
SW Vic	1	2	1	1	1	6
<i>Sheep</i>						
Tasmania	3	0	2	0	1	6
SW Vic	1	1	0	2	2	6
Total	6	3	3	5	7	24

*When farmers spoke of engaging in more than one type of benchmarking/recordkeeping activity, the most advanced level was tabulated, with levels becoming less advanced from left to right.

The interviews averaged 40 minutes each and were carried out on the farmers' properties between August and December, 2013. The interviews focused on the process of on-farm change and benchmarking, and questions were developed with reference to farmer adoption literature, particularly that relating to social context, the step-by-step nature of adoption and engagement in learning activities (Kilpatrick & Johns 2003; Pannell et al. 2006; Wilkinson 2011). Questions were open-ended with a number of prompts to elicit fuller responses from participants, and covered changes made with the stated goal of improving the farm business, motivations for change, information sources, engagement in learning, benchmarking, limitations to change and future plans. The scope of the study was limited to how farmers approach change and therefore interviews did not explore the impact of the changes made on the farms. Interviews were digitally recorded for subsequent transcription and thematic analysis.

Interview transcripts were entered into NVivo10© qualitative data analysis software and coded. Categories or themes were generated from the data, consistent with an inductive analytic approach (Lincoln & Guba 1985; Ryan & Bernard 2000), with categories shaped by the research questions guiding the study and by the literature (Huberman & Miles 1994; Ryan & Bernard 2000). During analysis of the data, codes were added to and revised, with new themes emerging from participants' responses to the open-ended interview questions. Data could be searched and retrieved using the NVivo10© software during the iterative process of refining the resulting insights into the role of benchmarking and comparative recordkeeping in the adoption process. In the reporting of findings, farmers are represented by a number (1-24) and a code that specifies their location in Victoria (V) or Tasmania (T), involvement in Sheep (S) or Beef (B) industries and as a Participant (P) or Non-participant (NP) in RDC-led extension programs.

Findings

Participation in formal benchmarking

Farmers who displayed a more confident, proactive approach to change tended to be those who prioritised benchmarking and recordkeeping in their farm management. As well as making changes to solve problems on their farms, these farmers were proactive in seeking continual improvement to their management and maximised production efficiencies. They were also likely to have greater flexibility around what they would change in order to achieve these efficiencies; more likely to have flexible 'boundaries to change'.

Six of the twenty-four farmers in this project had participated in formal between-farm benchmarking, predominantly through programs run by private consultancies. One of these farmers explained that it was when he commenced benchmarking activities that 'a lot of changes started to happen' (TSP5), and another agreed that benchmarking 'changed the way we were thinking' (TSP4). At the time of the interviews, two farmers were continuing to benchmark in a formal manner and one, the manager of a multi-generational Tasmanian Merino and mixed-cropping enterprise, described how he successfully moved to fattening prime lambs and growing larger areas of a smaller number of profitable crops as a result of benchmarking. The changes from a wool and mixed cropping operation to fattening prime lambs and more intensive cropping, were not only in response to the market, but guided by extensive recordkeeping that directed decision making and changes towards more profitable enterprises and practices (TSP5):

Benchmarking certainly helped that (process of change) by putting in black and white what's profitable and what's not ... you've got it all in black and white in front of you what's making the money and what's not, so it's pretty easy to put a line through...

He now undertakes between-farm and within-farm benchmarking to continue maximising efficiencies, and the process continues to stimulate inquiry:

...It's really just fine tuning now for the benchmarking, seeing why this year our costs are greater than they have been for the last three or four years, and identifying why that is. And saying, "Oh well look that was a seasonal thing, we couldn't control that." Or "Have we made a management decision somewhere that's blown some costs out somewhere?"

The second farmer who has continued formal benchmarking, stated that benchmarking provided him with clear performance goals. At the time of the interview this Tasmanian beef farmer had recently reached his optimum number of breeding cattle and was working towards his stated goal of performing in the top performance quartile of his benchmarking group. He described the initial benefits when he commenced between-farm benchmarking (TBP11):

When I first started I didn't know what other people were doing, so you don't know, well okay how far behind am I? Where am I at compared to the bigger circus? And so I found that very helpful...It showed up...our weaknesses.

The farmers who had previously participated in formal benchmarking provided reasons for discontinuing that included the belief that between-farm benchmarking did not accurately capture the cattle trading enterprise and a dissatisfaction with the lack of transparency of underlying calculations (and therefore lack of confidence in the resulting measures). Other farmers who implemented a less formal style of benchmarking echoed these reasons for not undertaking between-farm benchmarking, in particular the sentiment that formal benchmarking could not accurately represent their enterprise or that their enterprise combination could not be compared with another in a meaningful way (e.g. cattle breeding and cropping enterprise).

Participation in alternative forms of comparative recordkeeping

The less formal approaches to comparative recordkeeping ranged from the extensive use of spreadsheets to assess future management changes, to using physical production measures based on animal weights or pasture growth. Three farmers maintained extensive farm business data, but self-analysed their farm's performance compared with published benchmarking data, while another three farmers reviewed their farm's data between years, rather than comparing it with that of other farms. Farmers relying on recordkeeping in some form displayed a more direct and confident approach to change than farmers who were not keeping any records. This more direct process of change was exhibited by a Victorian beef farmer (VBP22), who confidently changed his operation from one breed and calving system to another over a two-year period to maximise profitability, guided by his records and budgets. He described his process of running multiple spreadsheets to theoretically test the financial implications of a new management idea, combined with comparing his farm's performance with that of what he stated to be trusted published benchmarking data. While he had not undertaken formal between-farm benchmarking he had learned how to maintain and use extensive within-farm records; another effective strategy to improve performance.

Some farmers exhibited a commitment to extensive recordkeeping and understanding the underlying mechanics of management practices but considered particular aspects of their business off-limits in regard to change. One Tasmanian sheep farmer for example (TSP6), had participated in group extension activities and pursued best practice management around prime lamb production with the guidance of measuring and monitoring. However, this has taken place within some firm boundaries of maintaining a single labour unit, keeping his existing self-replacing Merino flock, and not increasing his minimal irrigation infrastructure. His approach to adoption had been flexible in regard to fine-tuning management practices, but change had been limited by labour, enterprise and infrastructure-related boundaries. These firm boundaries related to his aversion to increasing production costs, but the confidence provided by his between- and within-farm benchmarking experiences had enabled him to maximise efficiency within these boundaries.

Physical production measures of performance like monitoring lamb weights were identified as a common and accessible form of within-farm recordkeeping, that provide evidence for decision making (TSP6):

When you're having a bad day, or you're worried, all you see are the skinny lambs, and when you're having a good day, all you see are the fat lambs. Weighing them takes the emotion out of it and you see things just the way they really are.

Another farmer bought scales and implemented a system of tracking animal weights as a result of participation in a publicly funded extension program. After entering animal and pasture

performance measurements into a simple computer program, the resulting data patterns were used to guide decisions about how to further improve poor performing pastures (VSP16). Similarly, improving the herd genetics by keeping and comparing records of calf weights was an alternative form of benchmarking (VBP19), as was ewe pregnancy scanning and the associated recordkeeping (VSP14). While seasonal differences sometimes make between-year comparisons difficult, five farmers could see the benefit of a 'simplified form of benchmarking' physical aspects of production (VBP19):

Benchmarking to me would be less financial and more probably improvement of your cattle...just a basic thing would be probably looking at a ten year average of the weight on the calves. That would be a simple benchmark for me.

Two Tasmanian beef farmers sought out information independently and set goals around their farm production and business performance. Their stories suggested that they approached change in an informed and confident manner but resisted engaging in group learning activities and participating in between-farm benchmarking because they did not want to share business details of their operations with any other farmers (TBN7; TBN12). In general, however, participating in extension activities was an important source of information about how to measure and monitor farm performance for farmers in this study. The comparisons did not usually take place within a group activity, but participation in extension helped build farmer capacity to keep and interpret meaningful records themselves. A consistent message emerging from the data was voiced by a Victorian beef farmer and frequent participant in extension activities: 'If you haven't got some kind of benchmarking happening ... you can't really measure your improvement, can you?' (VBP19).

Non-participation in benchmarking and group learning activities

Participants in group extension programs were found to value recordkeeping to some extent, compared with less consistent use of recordkeeping by non-participants. Furthermore, among those most heavily involved in extension activities were the farmers who used measuring and monitoring to both initiate and guide the process of change. In contrast, a 'trial and error' process of change was described by the farmers who undertook minimal recordkeeping and were non-participants in group extension activities. Motivators for change in such situations were largely reaction-based, in response to market pressure or solving an immediate problem that has arisen. Farmers who employed minimal recordkeeping were generally more hesitant to initiate future change due to uncertainty about the best course of action or the potential returns on further investment.

Seven farmers engaged in minimal recordkeeping, and a common explanation was a preference for on-farm activity over office-based work, aligned with a disinterest in figures and strategy. A prime lamb farmer based in south-west Victoria said she 'prefers common sense' (VSN15) over recordkeeping. She did however refer to mentally noting trends in the average performance of ewes tagged into different mobs. For this farmer, maximising the survival, health and well-being of her lambs was the first priority, and while it was a positive goal, it also acted as a 'boundary to change' as it limited her interest in further increasing production efficiency. A beef farmer whose priority was to maintain healthy soil and contented cattle through a more holistic approach to farming has similarly avoided benchmarking as he was not interested in having profit-based comparisons influencing or pressuring his decision making (TBP10). These and other farmers had developed practical on-farm systems (e.g. tags to keep track of ewe/lamb weight groups and crosses for ease of management; TSN1) but were not interested in progressing the system to include monitoring or recordkeeping, and the subsequent informed changes to management.

Whether involved in group extension activities or not, farmers in this study developed a network of local and/or expert contacts who they targeted when seeking to resolve an issue or improve a farm practice. For the non-participants, this network was generally preferred as an information source over structured meetings and the value of talking to other farmers who were either more experienced or at a similar stage of farming was emphasised. Owners and managers of neighbouring farms were a particularly useful resource as they work with similar environmental variables. One farmer spoke of her belief that the 'best information is from people who are doing it well and have success in your local area' (VSN13). This concept of 'looking over the fence' was an important source of information and also a motivator for change. A medium-scale prime lamb farmer in Victoria (VSN15) explained that she prefers to talk to other farmers who she trusts, have good lambs, have great ideas and are doing well, over going to organised group events and being 'talked at'.

Discussion

The importance of prioritising benchmarking and/or comparative recordkeeping to guide decisions about change was consistently emphasised by farmers who sought improved farm performance. Recordkeeping guided the process of change for many farmers by providing either the financial or physical basis for decisions, rather than a reactive, instinct or emotion-based reason. Farmers spoke of the power of recordkeeping to 'take the emotion' out of decision making, and to allow them to measure performance in 'black and white'. While farmers who chose to participate in formal benchmarking may have already displayed the characteristics of innovative and progressive Early Adopters (Howden et al. 1998; Rogers 2003) and Extensive Networkers (Kilpatrick and Johns 2003), the results of this study suggest that the process of recordkeeping has further increased their openness to change and directed their decision making around farm practices and management. This positive relationship between recordkeeping and change was also observed among farmers who were not undertaking between-farm benchmarking but participating in alternative forms of benchmarking and comparative recordkeeping.

Farmers who participate in formal benchmarking tend to actively engage in knowledge seeking, are experienced networkers, and proactive about the change process (Turner, Wilkinson & Kilpatrick 2017). Kilpatrick (2000) revealed a strong relationship between farmers' levels of education and the extent of their practice change. The human and social capital of farmers who successfully benchmark is therefore likely to be high, and these farmers are well equipped to participate in and understand the complexities of formal benchmarking activities. As learning is a step by step process, with knowledge building on existing knowledge (Weick 1979, 1995), they are building on an existing framework of detailed knowledge about farm management, business financials, and underlying principles. Farmers participating in formal benchmarking in this study spoke about the positive influence of intensive recordkeeping and monitoring in directing major changes to farm enterprises, to increasing the scale of production, and in goal setting. However, to suggest that every farmer could participate in and benefit from formal benchmarking does not take into account the incremental learning process and the fact that access to benchmarking numbers alone does not facilitate change (Ronan & Cleary 2000). A comprehensive knowledge about the farming system provides the foundation for sound interpretation of benchmarking data and ensures appropriate decisions around change are subsequently made.

Formal benchmarking is not accessible to or appropriate for all farmers (Fleming et al. 2006). Some farmers in this study who appeared to have the capacity to participate in benchmarking gave reasons for non-participation or discontinuing after initially participating. Disincentives included the fact that different enterprises were not necessarily comparable, the system was not always a good fit for an operation (e.g. cattle trading, mixed enterprises), and farmer unwillingness to disclose business processes and financial details to other producers – which is an essential part of the formal benchmarking process. Ronan & Cleary (2000) emphasise the importance of the quality of benchmarking data collected, the credibility and transparency of the derived calculations, and the meaning of the numbers to farmers if benchmarking is to support practice change and improved farm productivity and performance. The data collected and economic principles underlying calculations must reflect the interactive nature of farm inputs and outputs and provide a consistent ranking across many farmers (Fleming et al. 2006). When benchmarking is relied on for decision making without a comprehensive understanding about how its derived data relates to the whole farming system, subsequent practice change may not lead to the desired increase in farm profitability and may involve unforeseen risk. Malcolm (2004, p. 413) warned that,

It is overly simplistic to reduce farm decision analysis to analyses of 'once and for all options'. Making the decision is just the first step. The next steps are to apply the decision and respond as the farming world changes...

While formal benchmarking is not accessible or appealing to all farmers, this study suggests that the benefits of alternative forms of comparative recordkeeping can play an important role in increasing confidence, guiding decisions and supporting goal setting. The process of recordkeeping, whether it be in the form of keeping and comparing spreadsheets of farm business data, or independently maintaining and drawing on records of physical measurements such as animal weights, helped farmers become more proactive in their decision making around change.

Measuring and comparing all of the variables involved in some formal benchmarking systems is not necessarily meaningful for farmers (Mauldon & Schapper 1970), whereas a suite of simplified, targeted benchmarking and comparative recordkeeping alternatives could increase accessibility and usability. Extension providers could develop a set of variables based on key best practices and physical measures that lead to improved farm performance, then provide the essential support required for farmers as they learn how to apply the data in decision making for their own

farm contexts. A facilitative approach by extension providers has been found to help farmers learn; to understand the data and associated new knowledge sufficiently so that they can apply and adapt it (Ko, Kirsch & King 2005; Turner & Irvine 2017). Farmers who are willing to engage in group learning activities could discuss within-farm performance in groups, focusing on key physical measures for each farm. According to Sewell et al. (2014) the opportunity for farmers to learn to incorporate key evidence into managing their own farming systems is one of the keys to supporting adoption of management recommendations. The experience of the group would be utilised as knowledge is shared and use of best practices and practice change would be accelerated (Kilpatrick 2000; Hansen 2015) as participants learn how to use or increase their use of recorded physical measures in decision making.

This study also explored the stories of change of farmers who are traditionally not interested in attending group learning sessions and found that non-participation in both extension activities and recordkeeping was generally related to a less confident, and 'trial and error' approach to change. The reasons why these farmers choose not to engage in group activities align with the findings of social network research carried out by Wood et al. (2014), showing that many farmers prefer to learn about practices directly applicable to their individual farm and are less interested in engaging in knowledge exchange about generalised best practices. In the study reported in this paper some farmers were not primarily motivated by increasing farm profits but could benefit from benchmarking or recordkeeping using variables that relate to their motivating values, such as maintaining the well-being of their animals or the health of their soil. The 'Boundaries to Change' concept developed by Turner, Wilkinson & Kilpatrick (2017) provides guidance around recognising non-financial motivating values (Rodriguez et al. 2009; Sattler & Nagel 2010) and identifying the limited areas where these farmers' boundaries are flexible. Extension providers could then include a focus on these motivators in their program design where possible.

Interviews with farmers who traditionally do not engage in benchmarking, comparative recordkeeping or extension activities, indicate that they are interested in hearing and learning from the journey of fellow farmers to improve performance. Owners and managers of neighbouring farms were identified as a particularly useful information source, with 'looking over the fence' established as an important part of the process of change for these farmers. Telling the stories of farmers through less formal avenues could be a way of increasing the number of available neighbouring fences to 'look over' (Tarnoczi & Berkes 2010). Rather than being physically limited to the expertise of farmers in the local area, this approach could increase opportunities to learn in a non-threatening way from a fellow farmer. In developing the content of the farmers' stories, referring to the farmers' boundaries to change could provide a source of common ground for a reader to connect with (e.g. the need to limit labour units, or prioritising animal welfare). Extension providers often present farmers who have their whole system operating at a 'best' practice level - the typical farmer champion. However, the findings of this study suggest that presenting the stories of farmers who have been able to achieve change in a particular management area but have some areas they are not (possibly yet) able or willing to change may be a more effective approach to improve farmer engagement. This approach acknowledges the reality of many farmers who operate with firm adoption boundaries in place (Turner, Wilkinson & Kilpatrick 2017) and therefore will not consider changing some aspects of their operations. This approach would aim to ignite interest in recommended practice management areas and their associated measurement variables, and also to encourage more farmers to investigate participating in a group of farmers who have a similar framework of reference with regard to existing knowledge and motivating values.

Conclusion

Supporting the use of targeted comparative recordkeeping in decision making is proposed as a means to increase farmer confidence to change practices. Evidence presented here suggests that benchmarking and comparative recordkeeping help to provide confidence and direction for decision making around change and therefore increase the likelihood of farmers adopting best practice recommendations. Farmers who proactively sought out information and engaged readily in extension activities were more likely to commit to the demands of data collection and analysis required by formal benchmarking. This study suggests a wider range of farmers may experience benefits if comparative recordkeeping opportunities incorporating variables aligned with motivating values are provided in an easily implemented way. For practice change and improved farm productivity and performance to proceed, extension delivery would need to facilitate the learning required for farmers to interpret and apply data in decision making around change. There are many farmers who choose not to engage in group learning activities or seek out general best practice information. Strategies to engage these traditional non-participants in alternative forms of comparative recordkeeping activities could include telling the change stories of farmers outside the innovative and progressive Early Adopter segment. Some farmers will retain firm boundaries

around areas including debt, enterprises and infrastructure, and could relate to and potentially be motivated by stories about similar farmers benefiting from comparative recordkeeping and subsequently making changes or adopting practices within these boundaries.

Acknowledgements

The authors thank the Victorian and Tasmanian farmers who participated in this study, and Mary Graham and Mya Gaby for their assistance in conducting farmer interviews in Victoria.

Funding: This work was supported by Meat and Livestock Australia under Grant [number B.COM.0346]

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