



Performance through collaboration

FINAL REPORT

SURVEYING ON-FARM PRACTICES: DRIVERS OF FARMER DECISION- MAKING

PROJECT 1.2.004

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Please note that a significant amount of the content in this report has been drawn from previously published project documents, including the following:

Curtis, A. & Luke, H. (2019). *Social Benchmarking for Natural Resource Management*: 2019 North Central Victoria. Southern Cross University, NSW, 2480. ISBN 978-1-64826-349-1.

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PEER REVIEW STATEMENT

The Soil CRC recognises the value of knowledge exchange and the importance of objective peer review. It is committed to encouraging and supporting its research teams in this regard.

The author(s) confirm(s) that this document has been reviewed and approved by the project's steering committee and by its program leader. These reviewers evaluated its:

- originality
- methodology
- rigour
- compliance with ethical guidelines
- conclusions against results
- conformity with the principles of the [Australian Code for the Responsible Conduct of Research](#) (NHMRC 2007), and provided constructive feedback which was considered and addressed by the author(s).

PROJECT PARTICIPANTS

Southern Cross University, Charles Sturt University, Agricultural Innovation and Research Eyre Peninsula (AIR EP), West Midlands Group, Western Australian No-Tillage Farmers (WANTFA), North Central CMA, NSW Department of Primary Industries (DPI) and Central West Farming Systems, South Australian Primary Industries and Regional Development (PIRSA).

Additional (third party) regional partners: Eyre Peninsula Landscape Board, Liebe Group, Wheatbelt NRM, Local Land Services Central West.

The Local Shire Councils of:

North Central Victoria: Loddon, Macedon, Ranges, Gannawarra, Greater Bendigo, Hepburn, Mount Alexander, Northern Grampians, Buloke, Campaspe, Central Goldfields, Pyrenees and Swan Hill.

Northern Wheatbelt of Western Australia: Dandaragan, Moora, Coorow, Dalwallinu and Wangan-Ballidu.

Central West New South Wales: Parkes, Lachlan, Cowra, Bland, Blayney, Cabonne and Forbes.

PROJECT PARTICIPANTS



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EXECUTIVE SUMMARY

This project aimed to gain a broad understanding of the factors driving farmer decision-making across Australia by implementing social benchmarking surveys for landholders within selected regions across four states.

The surveys were developed using an established method of survey design and implementation. This method has been used by Professor Allan Curtis for several decades. The method requires a high level of stakeholder engagement and input into the questionnaire design, with topics and questions developed and refined via a series of workshops. The survey findings were presented to and discussed with regional partners via interactive presentations, information sheets and a full report for each region. These are available on the Soil CRC website.

The first survey was undertaken in the North Central area of Victoria, and the findings were immediately accessible by the North Central CMA to use in their strategic planning and practice. Subsequent surveys were run on the Eyre Peninsula of South Australia, the West-Midlands region of Western Australia, and in the Central West region of New South Wales. The procedural lessons learned during the survey implementation across these regions informed the continual improvement of the survey tool and process. The original survey method has been modified by Dr Hanabeth Luke, and the postal Soil CRC social benchmarking surveys are now complemented by an online version, with links and QR codes sent out with an advance notice. The survey instrument now also includes additional open questions that enable deeper insight into some key areas. A clear procedure has been documented and submitted to the Soil CRC to support the implementation of subsequent and repeat farmer practice surveys to enable further evaluation of practice change.

A key finding of the project is heterogeneity across regions. There is great variety in terms of demographics, proportion of landholder types, information sources used, knowledge levels and implementation of a range of practices for farmers across farming systems and regions. A full and detailed report on survey findings is available in the regional reports. Farmer perceptions of climate change emerged as an interesting theme, where in two of the three regions surveyed, less than half of farmers viewed climate change as anthropogenically-induced. Analysing differences by age using established definitions of generations, found that younger farmers use different information sources, but feel generally less well supported than their older counterparts in their agricultural activities. Across all regions, the ability to *pass on a healthier environment for future generations* was the most important value landholders attached to their property.

OBJECTIVES

Overall Purpose: Six surveys of farmers' current and intended practice are required to be completed early in the span of the Soil CRC. This project was to develop, administer, analyse and report on the first three surveys and implement the fourth. It was also to articulate a clear process and plan for completing the remaining surveys.

Objective 1: To develop, administer and analyse the first Soil CRC farmer practice survey in the North Central district of Victoria.

Objective 2:	To develop and document a guide for undertaking the survey and collaborative development process.
Objective 3:	To collaborate with Soil CRC partners AIR EP, WANTFA, West Midlands Group, Eyre Peninsula Landscape Board, and Central West Farming Systems to customise the survey for their needs and regional relevance.
Objective 4:	To implement and report on surveys in South Australia and Western Australia.
Objective 5:	To develop and implement a survey in New South Wales.
Objective 6:	To articulate a clear plan for undertaking the remaining surveys.

RESULTS

Objective 1:	The first Soil CRC farmer practice survey was designed and implemented in the North Central district of Victoria. A full report was provided to the North Central CMA, and an academic paper has been submitted to the international journal <i>Agriculture and Human Values</i> .
Objective 2:	A guide for undertaking the survey and collaborative development process was developed and documented in the 'Guide for undertaking the survey and collaborative development process'.
Objective 3:	A high level of collaboration took place with Soil CRC partners AIR EP, WANTFA, West Midlands Group, Eyre Peninsula Landscape Board and Central West Farming Systems to customise the survey for their needs and regional relevance, as well as via the survey feedback process.
Objective 4:	The second survey in South Australia and the third survey in Western Australia were implemented and reports completed. Feedback was provided to regional partners via a range of means, including providing a results infographic for each region.
Objective 5:	A survey has now been implemented in Central West New South Wales.
Objective 6:	A clear plan for undertaking the remaining surveys is in place, supported by the 'Guide for undertaking the survey and collaborative development process'.

NEXT STEPS

TIMING

A new project has been approved to complete the write-up of the NSW survey and implement the remaining two surveys.

Commencing immediately after this project finishes.

Complete the analysis and write-up of the New South Wales survey.	October 2021.
Implement the fifth and sixth Soil CRC social benchmarking surveys, likely partnering with Southern Farming Systems and the Wimmera CMA.	To be advised by partner organisations as to the most appropriate time of year for implementation. The overall plan is to complete both by September 2022.
Use the findings of this project to inform the activities of another newly approved Soil CRC project, <i>Knowledge-Sharing for Improved Soil Stewardship</i> . This project has a key aim to inform the ongoing engagement activities of the Soil CRC and its partner organisations.	September 2021 to September 2023.

INTRODUCTION

The Soil CRC national survey project, Surveying On-Farm Practices, was initiated in 2019 in partnership with local farming organisations. The project goes partway towards achieving the Soil CRC's goal of surveying six regions, twice, over its 10-year time frame. Four regions have been surveyed, each representing a range of different farming systems, landscapes, and Soil CRC partner organisations. The findings from the first three of these surveys are outlined in this final project report.

A central aim of this project was to gain a broad understanding of the factors driving farmer decision-making across Australia by implementing social benchmarking surveys for landholders within selected regions, across four states. The data arising from these surveys can inform decision-making and strategic planning for local farming groups, natural resource management (NRM) organisations and the Soil CRC.

This Soil CRC project is led by Hanabeth Luke of Southern Cross University (SCU). Principally funded by the Soil CRC, funds for regional surveys were also contributed by the North Central CMA, Ag Innovation and Research Eyre Peninsula (AIR EP), the West Midlands Group, and the Eyre Peninsula Landscape Board. Insight gathered not only provides relevant regional insights, it also contributes to the wider Soil CRC research portfolio. For example, Soil CRC researchers now have improved understanding of farmer knowledge of soil health and management; the impact of farmer participation in soil health groups; and the implementation of best practice soil management by farmers.

The project research team includes social scientists from Southern Cross University and Charles Sturt University. The research draws on a widely accepted approach to social benchmarking for regional NRM developed by Allan Curtis (see Curtis, Byron, and MacKay, 2005; Curtis et al. 2008). This survey-based methodology has been applied across Australia, including as part of the Australian Government's National Action Plan for Salinity and Water Quality, with case studies in Victoria, New South Wales and Queensland.

Surveys are developed using an established method of questionnaire design and implementation that follows the method developed and used by Professor Allan Curtis over several decades. The method requires a high level of stakeholder engagement and input into the survey design, with questionnaire topics and questions developed and refined via a series of workshops. Survey findings are provided to regional partners via interactive presentations, information sheets and a full report for each region, available on the [Soil CRC website](#). Full technical reports for each Social Benchmarking Survey are available on the Soil CRC website at <https://soilcrc.com.au/technical-reports/>.

Groups associated with the Soil CRC and willing to partner with the survey team were identified to co-develop the survey and support its implementation in their region. The project was presented at the inaugural Soil CRC conference in 2019, and many relationships with participants across Australia were formed there. The survey is designed to gain an understanding of the drivers of on-farm decision making, and in particular, explores farmer knowledge of soil health and management and the implementation of best-practice soil management. Over the longer term, Soil CRC social surveying will collate a dataset of national significance, showing both breadth and depth of information on factors involved in on-farm decision-making for Australian farmers.

The first region surveyed was North Central Victoria because the North Central CMA:

- had existing relationships with the survey team

- had run a similar survey in the past
- provided the opportunity to gain a longitudinal data set.

Subsequent surveys were developed for the Eyre Peninsula of South Australia, West Midlands region of Western Australia, and the Central West region of New South Wales. The procedural lessons learned during the survey implementation across these regions have informed the continual improvement of the survey tool and process.

The established survey method has been modified by Dr Hanabeth Luke. The postal Soil CRC social benchmarking surveys are complemented by an online survey, with links and QR codes sent out with an advance notice. The survey now also includes several open questions that enable deeper insight into some key areas. A clear method has been documented and submitted to the Soil CRC to support the implementation of subsequent and repeat farmer practice surveys that can continue to evaluate practice change.

This report summarises the data presented in the individual reports from the first three regions surveyed: North Central Victoria, the Eyre Peninsula in South Australia, and West Australian Wheatbelt. A milestone of this project was also to develop and implement the fourth survey, which has been conducted in Central West New South Wales. The resulting data will be reported in the follow-on project, Surveying On-Farm Practices Across Australia.

PREVIOUS RESEARCH & LITERATURE

A search of the literature indicates that ongoing research is important for understanding the evolving motivations that drive current farm and soil management practices (e.g. Allan et al., 2018; Stimpson, Luke and Lloyd, 2019). A range of farm management decisions will influence soil health in several ways, with different decisions leading to pathways that can result in, for example either soil stabilisation or soil erosion, or increased or decreased soil organic matter. Over time, these choices can lead to farming enterprises that are either building or reducing their long-term resilience to economic, social and environmental shocks. For agricultural and NRM organisations to encourage the best decision-making for healthy soils and resilient farming systems, understanding the landholder and the array of influences that underpin their decision-making is essential (Abadi et al., 2020). With this knowledge NRM and other organisations can encourage positive behaviours and adoption of innovations and best practices.

Changing human behaviour can be difficult, and engaging rural property owners in practice change is no exception. There is a large set of possible factors influencing decisions and these vary according to each technology, property owner, social context, intervention and over time.

Unless there are strong economic drivers supporting implementation, effecting change is often problematic because the private benefits of action by rural property owners to address environmental degradation are often uncertain. There is often limited commitment by governments to legislate and/or enforce compliance. And, with some issues, the way forward is uncertain, in part because every landscape has been modified (i.e. we are uncertain about where we are headed and how to get there).

Further complicating the task for those implementing research, development and extension across rural areas is the scope and pace of social change in many regional areas. As conceptualised by the Multifunctional Rural Transition (Holmes 2006), many rural areas are shaped by a mix of production (e.g. agriculture), consumption (e.g. recreation) and

conservation values (Barr 2005). Agriculture may remain the dominant land use, but primary production may not be the principal focus of many landowners.

Where practitioners are confident about the appropriateness of the outcomes they are seeking and the science that links proposed interventions and desired outcomes, they can apply best practice recommendations. For example, with riparian management there are widely accepted best practices that include fencing to manage stock access, providing off-stream watering points for stock, eradicating pest plants and planting trees and shrubs. Under these circumstances, those setting out to achieve change need to make an assessment of the adoptability of those best practices and respond appropriately (Pannell, 2011). For instance, if awareness, knowledge or management skills are important constraints, then activities that address those topics are appropriate. If the issue is that the change involves considerable expense and appears to offer limited financial returns to landowners, then some form of cost-sharing between government and private landowners might be appropriate.

Curtis and Lefroy (2010) made the additional point that NRM occurs in modified environments where there is often uncertainty about the way forward and the desired condition to aim for. They argued that under these circumstances it is important to engage property owners (and other stakeholders) in dialogue, learning and action which typically involves engaging and building human (i.e. knowledge and skills) and social capital (i.e. positive social norms, relationships built on trust and reciprocity, networks as platforms). For example, there is considerable uncertainty about how to maintain soil health under cropping regimes. Experience suggests that farmers will lack confidence in practices that have not been trialled in their local area.

In Australia, farmers justifiably consider themselves responsible stewards of the land, and while production is important there is a growing interest in other key areas such as aesthetics, conservation, recreation, and restoration (Mendham, Gosnell, and Curtis, 2010). Therefore, this research contributes ongoing knowledge about Australia's changing on-farm practices, priorities, beliefs, and challenges, and offers a snapshot of values, beliefs, and farmer attitudes. Importantly, the management practices, values, and land use by rural property owners are important aspects that characterise the multifunctional rural landscapes of Australia, as important elements of farmer identity (Groth et al. 2017). These aspects will be discussed in detail in the following section of the report.

Before this study, the most recent social benchmarking survey was completed in the Wimmera region of Victoria (Curtis and Mendham 2017). With similar surveys in 2002, 2007 and 2011, analysis of Wimmera survey data has provided important insights for NRM practitioners, including trends in social structure (i.e. property size, occupational identity, length of residence, the extent of absentee ownership, enterprise mix); and for researchers (e.g. extent of stability and change in values, beliefs and attitudes) (Toman, Curtis and Mendham 2019).

CONCEPTUAL FRAMEWORK

This section outlines the conceptual framework underpinning this research. We begin with a lay definition of the concepts used throughout the report.

Lay definitions of key concepts

Values: guiding principles/what is important to people.

Beliefs: what we think is true.

Norms: how we/others think we ought to behave. These can be personal norms or social norms.

Attitudes: what we think should happen in relation to a specific social issue.

Knowledge: grasp of facts, understanding of process.

Skills: ability to implement or perform a task.

Trust: willingness of those who are vulnerable to rely on others, which in part depends on the trustworthiness of those seeking to be trusted. Trustworthiness is based on assessments by others of our ability, benevolence and integrity.

Values and beliefs: difficult to change but important for effective engagement

Researchers typically distinguish between 'assigned values' and 'held values'. Assigned values are those that individuals attach to specific physical goods, activities or services (Lockwood, 1999). 'Held' values are ideas or principles that people hold as important to them (Lockwood, 1999) and are generally highly abstract, generic and conceptual, but guide personal action (McIntyre, Moore, and Yuan, 2008).

Value orientations are the position a person takes when a particular set of held values are more important to them than other held values (Axelrod, 1994). Individuals can hold more than one value orientation simultaneously (Lockwood, 1999; Stern, 2000). This is an important point and one confirmed by the results of social benchmarking surveys across Victoria. Indeed, across all regions, almost all survey respondents give a high rating to items measuring social, economic and environmental held and assigned values (Curtis and Curtis 2018).

A number of theoretical approaches have been developed and applied to explain the relationship between values and behaviour. Values-Belief-Norm Theory (VBN) explains an individual's motivation for environmental behaviour. It is an important theory that underpins much contemporary social research, including the Soil CRC social benchmarking surveys.

VBN theory suggests that individual behaviour is derived from core elements of personality and belief structures. These inform people's specific beliefs about human-environmental interactions, consequences, and an individual's responsibility for taking action. VBN theory proposes a chain of elements, with one component influencing the next. The elements of VBN theory include values, beliefs (awareness of consequences or does the condition of the asset affect yourself, others or the environment; ascribed responsibility beliefs; and general environmental concern), personal norms and behaviour (Stern 2000).

VBN theory hypothesises that environmental behaviour is more likely if the individual believes that there may be adverse consequences for something that they value highly (Stern, Dietz, and Kalof 1993). To explore the influence of held values (guiding principles), the survey employs seven to 10 items based on the scale developed by de Groot and Steg (2007) and adapted from Schwartz's value typology that distinguishes between biospheric, egoistic and altruistic values (Schwartz 1992, 1994).

Items included in the survey topics also explored 16 attached values focussed on the importance of the farm business, relationships with the family and wider community and the local environment. Those items drew on previous research (e.g. Seymour et al. 2010; Stedman, 2002).

Some beliefs and attitudes related to private property rights appear to be important for some property owners who are likely to be difficult to engage in NRM. For example, results from the 2014 North Central survey suggest about one in four landowners are concerned about protecting private property rights and their beliefs appear to impede their engagement in government programs (Curtis and Mendham 2015).

VBN and related theories arising from the Theory of Planned Behaviour do not account for the larger set of factors, including seasonal conditions and markets that influence land use and management decisions by rural property owners (Pannell et al. 2006). While it is possible that values, beliefs and personal norms may mediate or moderate some of these other factors, it is difficult to change these deep-seated personal attributes in the short or medium term. Nevertheless, it is essential to understand the values and beliefs of landowners if they are to be effectively engaged.

An increasing proportion of rural property owners in parts of rural Australia are identifying as non-farmers by occupation (Curtis and Curtis 2018) and farmer identity is an important influence on their knowledge and management skills and the adoption of best practices for sustainable farming and biodiversity conservation (Curtis and Mendham 2015; Groth et al. 2014).

An associated trend is for considerable change in rural property ownership. For example, in Victoria, it is estimated at 4% to 5% per annum across the State, including the regions surrounding Melbourne and Bendigo (Mendham and Curtis 2010). The rate of change suggests 40-50% of rural properties will change ownership in a decade. New and longer-term property owners are different and those differences present both a challenge and opportunity for agricultural and NRM practitioners. New owners are typically less experienced, thus less knowledgeable about many farming and land management practices, while less connected to existing farming and NRM networks. At the same time, new, non-farming or hobby farming landowners are typically more committed to environmental values, less reliant on on-property income and are often seeking advice about ways to better manage their properties. Items in the Soil CRC Social Benchmarking surveys explored these topics.

One of the responses of social researchers tasked with advising agricultural practitioners on effective engagement is to develop typologies that distinguish groups/types based on key attributes. Those attributes might include the main industry (e.g. forestry or farming), enterprise type (e.g. dairy, beef, sheep, horticulture), land class (e.g. floodplains or hills), management approaches (irrigation or dryland, adoption of conservation practices), property types (large or small), and/or personal characteristics such as values or attitudes.

Typologies appeal as a useful aid for agricultural and NRM practitioners if they include all rural property owners (e.g. not just farmers by occupation); are soundly based (i.e. grounded in relevant theory); and are constructed using reliable methods (e.g. not based purely on the intuition of researchers). Unfortunately, there are few examples where those criteria have been met. It is also important that typologies enable NRM practitioners to readily identify different cohorts when they set out to engage rural property owners.

Groth included a series of items in the 2014 North Central survey to measure the extent to which respondents held a farmer identity. Groth's Farmer Collective Identity Construct scale (FCIC) has 12 items across seven dimensions – self-categorisation; behavioural involvement; evaluation; importance; social embeddedness; attachment and sense of independence (Groth et al. 2016). The technical report (Curtis and Mendham 2015) and five journal papers provide a comprehensive explanation of how the FCIC scale was developed; the items included; the results of tests of scale reliability and validity; the approach to typology development using the scale; the characteristics of the four types of landowners (Full-time farmers (FTF), Part-time farmers (PTF), Hobby farmers (HF), Non-farmers (NF)); and implications of farmer identity for NRM.

The key points are that:

1. Farmer identity is an important influence on land use and management.

2. PTF are an important cohort, distinct from HF and closer to FTF in that they typically have a strong business focus.
3. Groth's typology provides a useful guide (heuristic) for agricultural and NRM practitioners setting out to engage rural property owners because practitioners can readily classify property owners when meeting them.

Given the limitations of space in the Soil CRC social benchmarking surveys, and with results indicating a strong positive relationship between respondent's scores on Groth's FCIC scale and their self-identification as FTF, PTF, HF or NF, the Soil CRC surveys did not include the FCIC scale. Instead, respondents were asked to self-select from the four categories listed above; and in a later section, to write in their current occupation (e.g. farmer, teacher, retiree).

LEVERS FOR CHANGE

Researchers have identified what can be considered 'levers' to effect change (e.g. improving knowledge and management skills); and processes or platforms that are effective for engaging rural property owners in learning, dialogue and action (e.g. Landcare and commodity groups). Government programs that engage property owners, including through cost-sharing where there are public benefits from work on private property, can also have a positive influence on the adoption of best agricultural practice and land management.

Social norms are an important but often neglected aspect of a community's social capital. Social norms can have both positive and negative influences on agricultural practice and land management (Minato et al. 2010). Indeed, a key outcome of Landcare participation has been the establishment of positive social norms about what sustainable farming involves in a local context (Curtis et al. 2014). Social norms are best identified through qualitative research within a community where there are 'ties that bind'. However, it is possible to explore personal norms through surveys and these may reflect social norms. The Soil CRC surveys include two items exploring personal norms related to soil management.

Trust is an important element of the social capital of organisations, whether they be government agencies, private businesses or volunteer organisations. Where trust in an organisation is high, partners will be more likely to accept advice, enter partnerships to develop and implement plans, forgive mistakes and provide positive recommendations to others (Sharp and Curtis 2014).

A key point from the limited number of studies examining landowner trust in agricultural and NRM organisations is that many rural property owners are not predisposed to trust others (e.g. Curtis and Mendham 2017). Judgements about the trustworthiness of individuals and organisations also influence landowner willingness to trust. Trustworthiness involves assessments of three key elements: capability; benevolence; and integrity (Sharp and Curtis 2014; Mayer, Davis and Schoorman 1995).

METHODOLOGY

The Soil CRC social benchmarking surveys are based on a well-established methodology, with a similar survey undertaken in 2014 (Curtis and Mendham 2015). The administrative process of the survey ultimately derives from Dillman (1978), and is a well-tested format (see for example Curtis, Byron and McKay, 2005). Four case study regions were selected – North

Central Victoria, the Eyre Peninsula of South Australia, the Northern Wheatbelt of West Australia, and Central West New South Wales.

CASE STUDY SELECTION

Case study regions were selected based on criteria that included the following:

- involvement of at least one Soil CRC partner
- willingness of regional Soil CRC partner organisation(s) to participate, with sufficient resources, time and capacity
- existence of other Soil CRC projects in the region, particularly from programs 2-4
- regional variations that enable cross-regional analysis
- representation of different types of organisations across regions, including both NRM organisations and local farmer research and development groups
- geography of the region, including soil type and climate
- capacity to access landholder data for survey mail-out
- relevant jurisdictions of use to partner groups will influence the boundaries of the regions surveyed.
- jurisdictional boundaries of relevance to Soil CRC partner groups

SURVEY STRUCTURE

The survey instrument incorporates several core questions (Figure 1) which are based on previous research. They focus on the key factors influencing landholders' decisions that lead to different agricultural and land management outcomes on their properties. These include sections on the 'held' and 'attached' values of landholders (McIntyre, Moore, and Yuan, 2008; Seymour et al. 2010; Stedman, 2002). They also include a number of questions relating to the practicalities of property management over time, such as who is involved in the management of the farm, whether the farm is turning a profit, whether the land tenure is being expanded or reduced in size over time, and whether there are any significant plans to change the land-use currently in place. Questions on future plans for the property are posed, including future plans to sell or to hand on the property/farm onto the next generation, and the extent to which succession plans are in place.

The Soil CRC surveys include items exploring engagement through various locally relevant platforms (e.g. Landcare, soil health groups, and commodity groups) and processes (e.g. training, field days and government programs). The surveys also include measures of the respondent's predisposition to trust (Leahy and Anderson 2008; Smith et al. 2013), judgements of the trustworthiness of local agricultural and NRM organisations, and trust in them. Core items also explore landholder predisposition to accept risk (Meertens and Lion 2008).

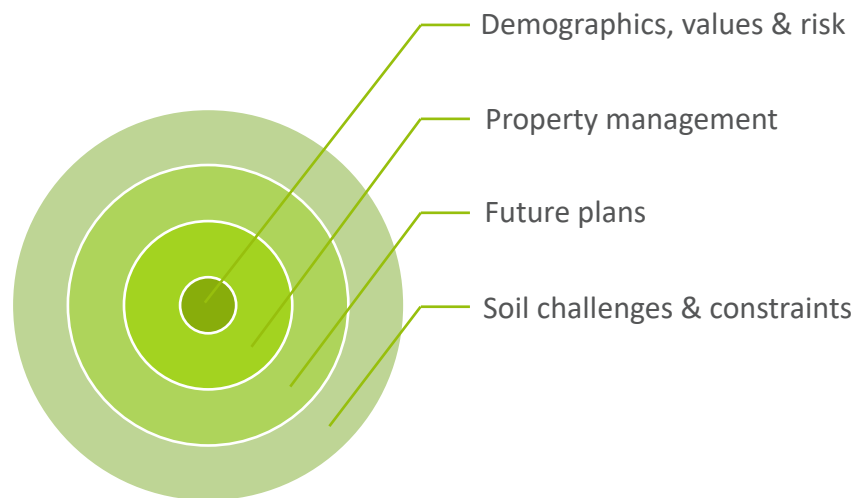


Figure 1: The survey instrument contains a number of core questions which remain constant across regions, though some will vary slightly, such as regional soil issues deemed important for some soil types but not others.

An integral part of the Soil CRC surveys are questions that relate to influences on soil health and fertility, though some of these vary across regions due to some soil issues being more salient in some regions than others. There are up to 12 items that relate directly to soil issues, 21 farm practice items that relate to soil health and fertility and up to 18 knowledge items that relate to soil-friendly management practices.

SURVEY CO-DESIGN PROCESS

The survey co-design process is essential for building into the survey a number of key topics into the survey. We ran identified by regional partners on which they can gain insight into landholder experiences and practices. This requires running a workshop with local partners to discuss and mind-map regional challenges and existing focus of those local groups. These mind-maps were then distilled into three to four key focus areas for that region, which were then woven throughout the survey. Focus areas included:

- relevant current and intended practices being implemented
- self-assessment of knowledge on various topics
- beliefs, personal norms and confidence in implementing best practice for these topics
- regional issues, with one item on declining soil health/and or productivity, which helps contextualise the overall importance of the items on soil-related issues

Figure 2 shows an example of the priority topics raised in each of the regional workshops.

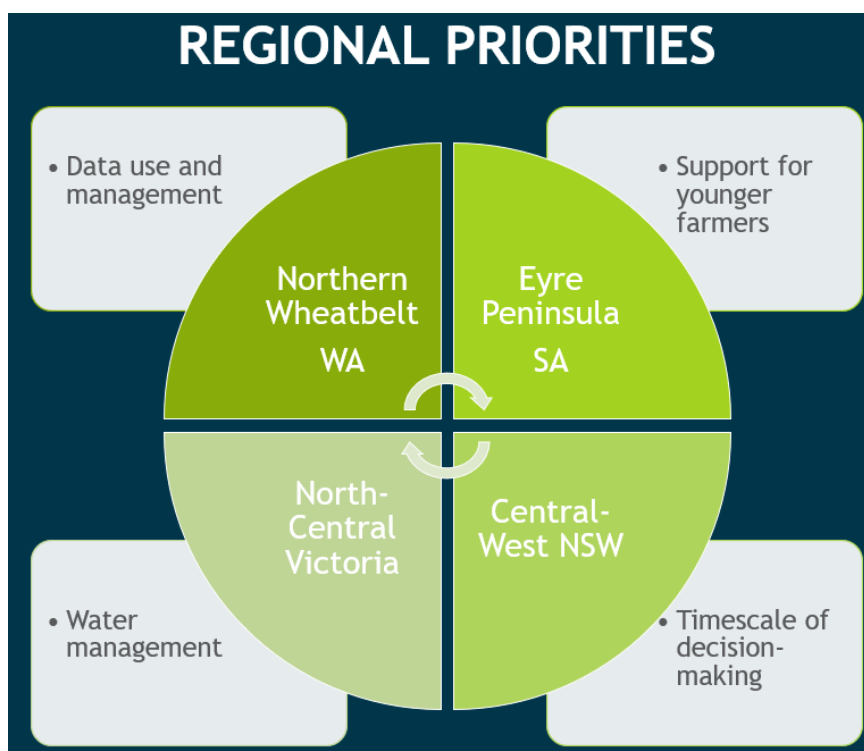


Figure 2: One of the topics driving survey customisation is displayed for each of the survey regions.

SURVEY AIMS AND FOCUS ACROSS REGIONS

A key strength of this project is that the general survey approach is customised through collaboration with regional partners to ensure regional relevance. While a core set of questions remains to enable cross survey comparisons and to develop a national dataset, each region has different priorities which are built into the survey. In this way, each survey report can directly inform strategic planning and decisions around present and future directions, while providing clear pathways toward better engagement between the Soil CRC partners' regional farmer base in their activities.

For the North Central CMA, the survey process was expected to:

- describe the social/farming structure (property size, property subdivision/amalgamation, occupational identity of landholders and extent of absentee ownership) for the region and for each LGA
- gather data to be used by the North Central CMA to assess progress in the achievement of Regional Catchment Strategy and specific NRM objectives
- inform understanding of landholder adoption of best practice NRM
- inform the North Central CMA Board and staff engagement with rural property owners (e.g. cohorts based on farmer occupational identity).

For Eyre Peninsula farmers, a broad range of topics was discussed and distilled into four main areas of focus:

1. A profile of farming on the Eyre Peninsula, including farm management structures and who plays a role in decision-making, to inform engagement with rural property owners.

2. Landholder expectations around the formation of AIR EP.
3. Factors leading to the present and future resilience of Eyre Peninsula farms, including uptake of best practice.
4. The future of farming, including support for young farmers and emerging leaders.

For the Northern Wheatbelt, a list of priorities was developed and distilled into four main areas:

1. Profile of farming in the Northern Wheatbelt, including farmer engagement.
2. Data management and use.
3. Farm management practices, risk and resilience.
4. The future of farming in the Northern Wheatbelt.

The areas of priority for the Central West will be detailed in the upcoming report, 'Agriculture in Central West New South Wales Soil CRC Social Benchmarking Report'.

SURVEY IMPLEMENTATION

The first Soil CRC survey was implemented in 2019, with North Central CMA and Soil CRC staff working together to review, revise and update the 2014 survey that had been implemented in the region. A draft 2019 survey was subsequently pre-tested, with a small group of rural property owners.

The 2019 survey was posted to a randomly selected sample of rural property owners (properties of 10 hectares (ha) and above) identified using local government ratepayer lists. The North Central CMA region includes a substantial part of 14 Shire or City local government areas (LGA). As in 2014, the intention was to survey approximately 2000 rural property owners from across the region. The research team worked with Council staff to select a random sample of property owners, with the number in each LGA sample reflecting that LGA's proportion of the estimated total number of rural properties in the region. The mailout process occurred over a period of eight weeks, with an initial mailout (including a cover letter, survey booklet and return envelope) followed by three reminder/thank you cards; then a second mailout package to non-respondents followed by two reminder/thank you cards. Mount Alexander LGA was the only exception and Council staff undertook the mailout process for this Shire.

In June 2019, surveys were posted to 2040 property owners. After removing return-to-sender, duplicate ownerships, properties that had been sold, owners who were ill or overseas and other acceptable reasons for a non-response, there were 1862 possible respondents. With 663 returned and completed surveys, the response rate for 2019 was 36 %. The response rate in 2014 was 48 % (794 completed surveys returned from an adjusted sample of 1646).

A similar process was undertaken on the Eyre Peninsula, working with the two local grower groups Eyre Peninsula Agricultural Research Foundation (EPARF) and Lower Eyre Ag Development Association (LEADA), who, during the course of the project, merged to form AIR EP. The Eyre Peninsula Landscape Board also joined the project as a local partner, with PIRSA supporting the project. There were a limited number of landholders in the identified region, thus a census of all properties over 10 ha was conducted, with landholder mailing data identified from the ratepayer lists of the Eyre Peninsula Landscape Board. A total of 1966 surveys were sent to Eyre Peninsula landholders, with 478 responses and an adjusted total of 1484 leading to a final response rate of 32 %.

In the Northern Wheatbelt, a draft survey was pre-tested with a small group of rural landholders. A copy of the final 16-page survey booklet is included in Appendix B. The survey was posted to all rural property owners (properties of 10 ha and above) identified using spatially referenced landholder contact lists for the Northern Wheatbelt region provided by the local governments of Dandaragan, Moora, Coorow, Wongan-Ballidu and Dalwallinu. Surveys were posted to 980 property owners. After removing return-to-sender, duplicate ownerships, properties that had been sold, owners who were ill or overseas and others who took the option to opt-out of the survey, there were 734 possible respondents. A total of 174 surveys were completed. 42 were completed online and 31 were linked to the spatial property identifier, which enables these responses to be included in the total. A 24 % response rate was recorded (Table A). It is also useful to note that the median number of landholdings per respondent was two. Thus, we estimate that our sample represents about half of the landholdings in the region.

RESPONSE RATES

Table A: Response rates across regions, worked out with the adjusted sample/possible responses return to sender/duplicates/opt-outs removed from the sample.

Survey	Mailed out	Removals	Possible respondents	Actual responses	Response rate (%)
North Central	2040	178	1862	663	36
Eyre Peninsula	1966	482	1484	478	32
WA Wheatbelt	980	246	734	174	24

There is a trend to lower response rates for surveys of property owners in Australia and overseas (Stedman 2016), particularly for surveys that are not directed to a specific audience (e.g. horse owners; cattle producers). This trend may reflect 'survey fatigue' across societies, concerns about privacy that have been heightened by the recent exposure of 'data mining' by Facebook and Google, and lessening of ties with and trust in universities and governments. Contemporary trends of increased absentee ownership of rural properties, including by 'land bankers' close to Melbourne, and more rural property owners identifying as NF by occupation also appear to be contributing to lower survey response rates in Victoria.

Non-respondents may be different to respondents and social researchers are often asked about the impact of non-responses on the reliability of survey data (i.e. ability to generalise from the respondents to the larger population). The research team's experience is that non-respondents are not a homogenous group (i.e. there are many reasons for non-responses) and that with a response rate of ~50 % it is unlikely that the cohort of non-respondents will be sufficiently different to change results significantly. In the past we have taken steps to compare respondents and non-respondents, including by using available data for property size (based on LGA lists for both cohorts); and age of farmers (using ABS data for the non-respondent cohort and survey data for respondents). Those comparisons have suggested that respondents and non-respondents to the social benchmarking surveys in Victoria are not significantly different.

For each of the surveys a comparison was made between the mean property size of respondents and non-respondents to ensure that there was not a significant difference in property size. When reflecting on the reliability of survey data, social researchers can also draw upon established theory (e.g. are results consistent with contemporary social theory

about the stability of values, or the differences between cohorts based on farmer identity), and explore the extent to which the results are consistent with those of previous studies (e.g. 2019 vs 2014 North Central surveys). Those assessments suggest the survey data are reliable.

DATA ANALYSIS

Data from the first three surveys have been analysed. Descriptive statistics such as frequencies, means and medians were used to summarise responses to all survey items ('not applicable' and missing responses were removed from the analysis of means). For items that asked respondents to specify an amount (e.g. days of paid off-property work in past 12 months) zeros were excluded in the calculation of means and medians (hence, these were treated as a 'No' response). In these situations, the means and medians were treated as the mean or median of those who had undertaken the practice.

Further analyses included examination of data for statistically significant differences between different groups (e.g. FTF, PFT, HF, NF). Because the normality of the data cannot be assumed, non-parametric approaches were used (e.g. Elliot and Woodward, 2007).

Kruskal Wallis Rank Sum Tests were used to test for differences on a continuous variable or a Likert scale variable (e.g. age or agreement with an issue) based on a grouping variable (e.g. farmer identity cohorts). Chi-squared tests were used to examine the dependence between two grouping variables. Similarly, Pearson's Chi-squared test with simulated values was used to test for differences on a Yes/No (i.e. nominal data as for Landcare participant) based on a grouping variable (e.g. the farmer identity cohorts).

To explore relationships between variables in the survey, pairwise comparisons were conducted between each item and all other items in the survey. Kruskal Wallis Rank Sum Tests were used to test for relationships between Likert-type response and a grouping variable (e.g. FTF, PFT, HF, NF) (results in an H value). Chi-squared tests were used to examine dependence between two categorical (or grouping) variables (e.g. between Yes/No for management action implemented and Landcare member/Landcare non-membership).

Pairwise comparisons tested for relationships (positive and negative) between variables expected to influence adoption (i.e. independent variables) of best practices (i.e. the dependent variables). Those practices covered both environmental management and sustainable agriculture. Most practices were thought to be relevant to most property contexts. However, respondents were allowed to choose Don't know/Not applicable. As might be expected, the proportion selecting this option varied across the best practice items. Those data are reported in the summary tables.

Survey recipients were asked to provide information about implementing best practice NRM for both the full period of their management and for the past five years. In North Central Victoria there were issues with the wording of the question, thus best practice was calculated for the full period of management.

Logistic regression modelling was used to explore the extent a small number of independent variables contribute to the presence or absence (as most were assessed using Yes/No) of best practice land management implementation. Experience with previous reports suggest that a model with a guided input of up to 20 variables provides useful guidance for Agricultural and NRM practitioners.

Regression modelling also addresses the thorny question of multicollinearity between independent variables (i.e. where two variables essentially have the same impact). However, experiences with social benchmarking data suggest that those efforts may lead to important

variables being excluded from models. For example, pairwise comparisons may reveal a significant relationship between implementation of a best practice and both participation in a soil health group and property size. If participation in a soil health group and property size are also correlated, regression modelling may exclude one of these variables. There are sophisticated statistical techniques that can help to further tease out causality but these are beyond the scope of this research project.

Interpretation of the results of the pairwise comparisons (e.g. to eliminate significant relationships that were irrelevant/nonsense) allowed the research team to identify a small number (<25) of independent variables to include in the modelling for each best practice. Some variables were included in most models. The selected variables were then entered by Simon McDonald in a stepwise modelling process using the Akaike information criterion (AIC) as the step criteria.

For logistic regression modelling, the proportion of all responses for the dependent correctly predicted by the model indicates the value of the model. A model is considered useful if it correctly predicts at least 70 % of responses to the dependent variable (i.e. each best practice).

In all analyses, the *p* statistic represents the significance level where a value below 0.05 is considered statistically significant. A *p*-value < 0.05 means that it is unlikely (probability of less than five per cent) that the observed relationship or difference has occurred purely by chance. All statistical analyses were performed using R Studio software and Microsoft Excel.

RESULTS

PROFILE OF FARMING ACROSS REGIONS

Key attributes of the survey sample are summarised in Table B. These key attributes are important for contextualising and interpreting the factors influencing farming knowledge, values, and practices. Please note that this report only includes the results for the first three surveys.

Table B: Key attributes summary table.

Key attributes (mean unless indicated)	North Central Victoria (2019)	The Eyre Peninsula, South Australia (2020)	Northern Wheatbelt, Western Australia (2020)
Property size (area owned)	118 ha (median 228 ha)	2885 ha (median 1500 ha)	4712 ha (median 3227 ha)
Bought additional land in region in past 20 years	45 %	51 %	56 %
Subdivided or sold part of property in past 20 years	15 %	16 %	27 %
Property leased, share farmed or agisted by others	45 ha	359 ha	27.5 ha

Key attributes (mean unless indicated)	North Central Victoria (2019)	The Eyre Peninsula, South Australia (2020)	Northern Wheatbelt, Western Australia (2020)
Property leased, share farmed or agisted from others	225 ha	669 ha	1305 ha
Age of respondent (median)	62 years	57 years	70 years
Proportion of full-time farmer (FTF) survey responses	49 % (own 80 % of the land surveyed)	62 %	72 %
Gender of respondent	22 % Female	10 % Female	8 % Female
Resident on property	73 %	76 %	83 %
Median length of family ownership	46 years (mean 59 years)	50 years (mean 67 years)	55 years (mean 90 years)
Other family members working on property	30 %	59 %	73 %
Paid off-property work last 12 months (mean number of days)	65 days -	87 days (median 10 days)	20 days (median 47 days)
Hours work on-property per week	35 hours	42 hours	46 hours
Income from agriculture in relevant region 2018/19	69 %	78 %	89 %
Net profit from agriculture in relevant region (full-time farmers 2018/19)	65 %	76 %	70 %
Received net off-property income 2018/19	70 % primary respondent	34 % primary respondent	2 % primary respondent
	30 % spouse	23 % spouse	34 % spouse
	-% both	-% both	23% both
% all survey respondents net income from off-property >\$50k	31 %	43 %	42 %
Completed short course related to property management in past 5 years	19 % (respondent only)	89 % respondent or partner	22 % respondent or partner
Attended a field day in the last 12 months	32 %	53 %	53 %
Property management or whole farm plan	28 % (34 % FTF)	44 % (53 % FTF)	45% (53 % FTF)

LAND USE

The most common land use for the West Australian Wheatbelt region and the Eyre Peninsula region of South Australia was cereal cropping, with the most common land use in North Central Victoria being pasture (Figure 3).

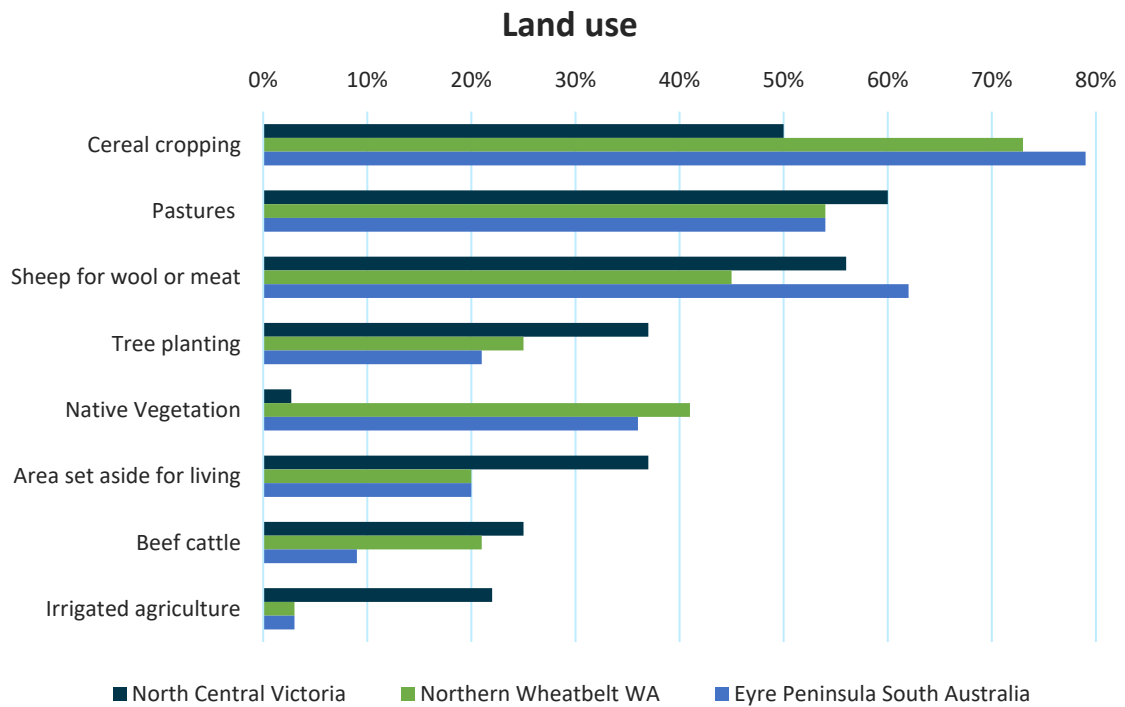


Figure 3: Land uses for each region.

FARMER OCCUPATIONAL IDENTITY

Survey participants self-identified into one of four groups based on their engagement with farming (Figure 4). Full-time farmers represented the largest percentage of respondents. North Central Victoria had the highest response rate to the survey and the highest proportion of female respondents (Figure 5).

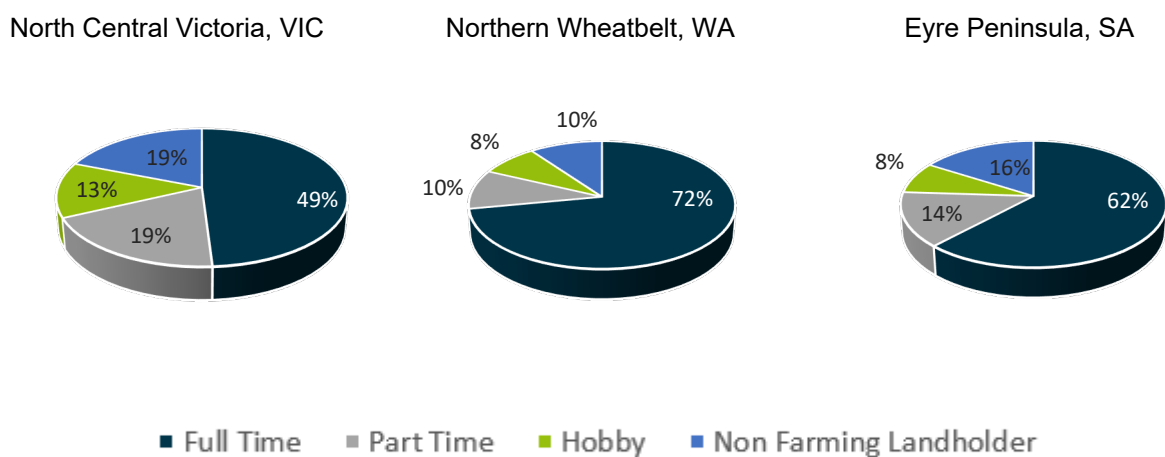


Figure 4: shows the overall survey regional response rate and response rates by gender, for each of the landholder types.

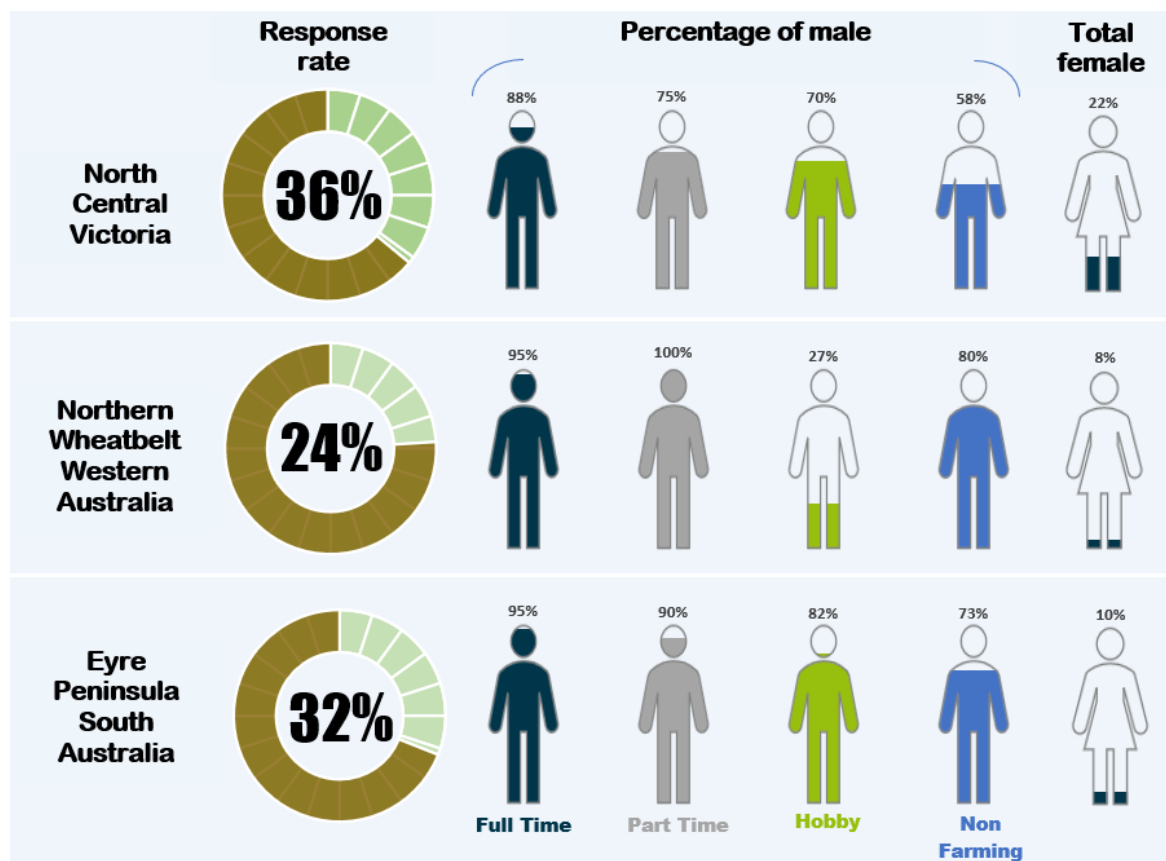


Figure 5: Response rate and composition of Male to Female respondents for each region.

WHAT IS IMPORTANT TO LANDHOLDERS?

Values

What is important to landholders, and farmers in particular? Respondents were asked to assess the importance of a range of values to them. Some were those which they associated or attached to their property, and the others were their personal, intrinsic, or held values, labelled *'The principles that guide your life'*.

The values people attached to their property were, understandably, variable across each region (Figure 6), with the top value across all three regions recorded as the *'ability to pass on a healthier environment to future generations'*. In terms of principles that guide the respondent's life, the top two principles across all three regions were clearly indicated, with *'looking after family'* and *'preventing pollution and protecting natural resources'* being the two most important principles for landholders across regions (Figure 7). Notably, the results relating to the question *'Creating wealth and striving for a financially profitable business'*, appeared to be less important in North Central Victoria. However, this was diluted by the 'non-farmers', group with the percentages of full-time (86 %) and part-time farmers (68 %) represented in much higher proportion.

Top 10 values attached to properties

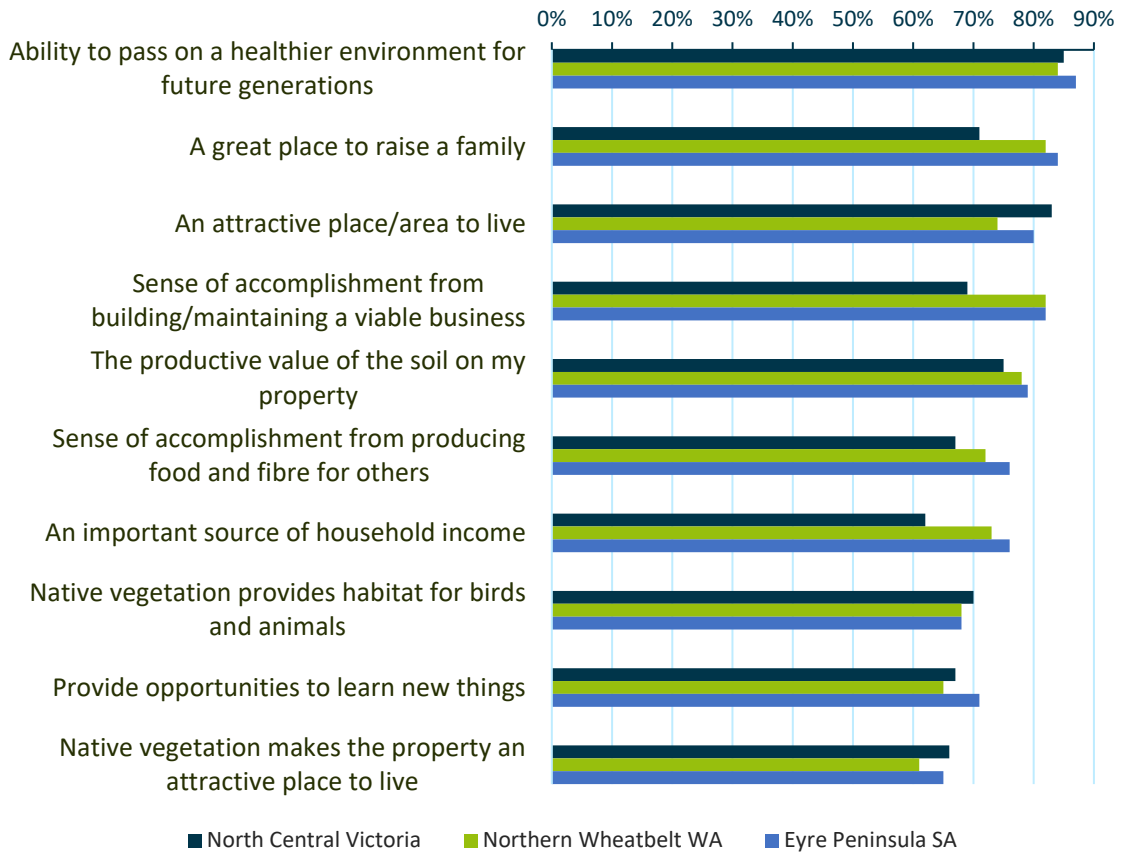


Figure 6: Values attached to property.

Top landholder 'held' values

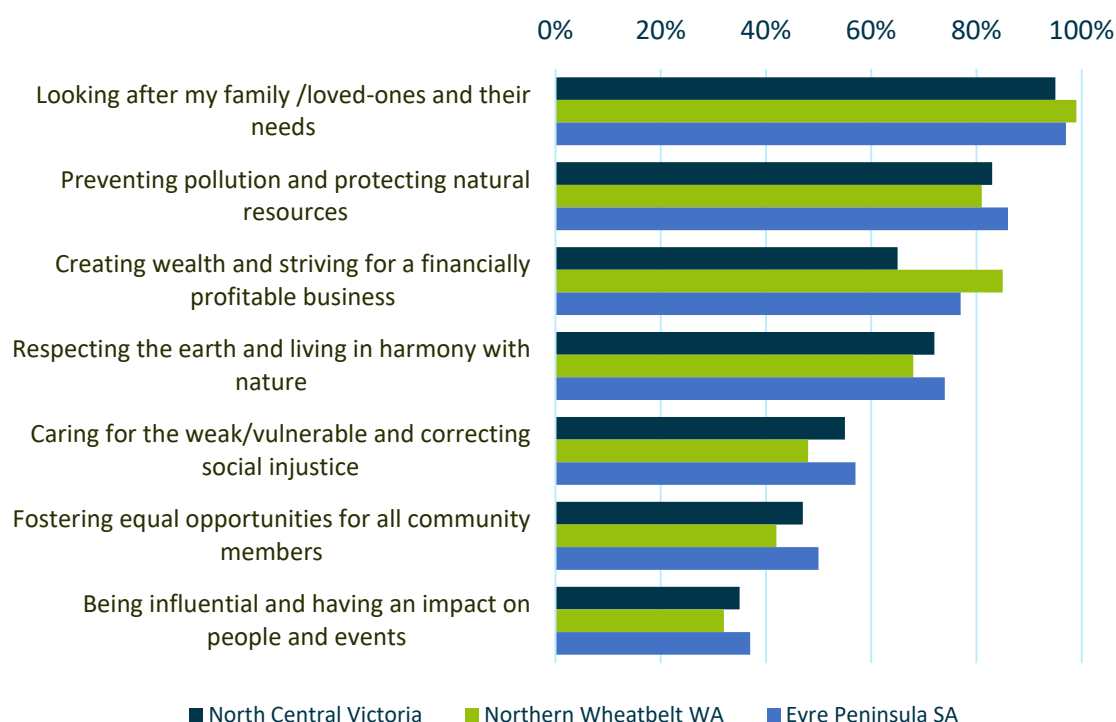


Figure 7: The top 'held' values of landholders, responding to the survey section 'The principles that guide your life'.

Risk and openness to change

In both the Northern Wheatbelt, WA, and Eyre Peninsula, SA, respondents indicated a very high degree of openness toward new ideas about farming. Ninety-one per cent of full-time farmers in the Wheatbelt, and 90 % of Eyre Peninsula farmers agree or strongly agree with that statement (Table C). In the North Central Victorian survey, 33 % indicated that they were usually an early adopter of new agricultural technologies and practices; this was 44 % for WA and 41 % for SA respondents. Our research found that those identifying as early adopters are significantly more likely to be engaged in soil health groups and commodity groups. They are significantly more likely to adopt best practices and change their on-property operations to achieve both agricultural and ecological goals. They are more likely to take on cutting-edge innovations and respond to climate change by changing on-property operations to capture carbon and reduce carbon emissions.

Table C: Risk and openness to change, with results presented representing the mean score out of five, and the overall per cent agreement.

STATEMENT	North Central Victoria	Eyre Peninsula, SA	Northern Wheatbelt, WA
I am usually an early adopter of new agricultural practices and technologies	3.3 33 %	3.2 41 %	3.3 44%

STATEMENT	North Central Victoria	Eyre Peninsula, SA	Northern Wheatbelt, WA
I prefer to avoid risks	3.4 48 %	3.4 58 %	3.0 33 %
I usually view risks as a challenge to embrace	3.4 47 %	3.5 57 %	3.5 51 %
You can't be too careful when dealing with people	3.8 61 %	3.4 55 %	3.5 50 %
People are almost always interested only in their own welfare	3.3 44 %	3.3 48 %	3.1 34 %
Financially, I can afford to take a few risks and experiment with new ideas*	-	3.2 44 %	3.3 45 %
I am open to new ideas about farming*	-	4.2 90 %	4.2 91 %
This may not be the best farm around but there is no real need to change*	-	2.7 26 %	2.7 15 %
I don't have enough time to consider changing my practices*	-	2.6 17 %	3.1 38 %

* SA & WA surveys only

REGIONAL AND ON-FARM CHALLENGES

Water security was selected as the most important issue on the Eyre Peninsula SA (81 %) and in the West Australian Wheatbelt (78 %). In Victoria, this question was focused on the importance of water quality in dams during drought (66 %) and the movement of irrigation water away from their region (48 %) which ranked as the third and eleventh most important issues respectively. However, these findings clearly indicate that water security is an important factor across all three regions, but more so for the comparatively drier regions of the Eyre Peninsula and the WA Wheatbelt. The top ten most important issues across the three regions are shown in Figure 8 and the most important property-level issues in Figure 9.

Most important regional-scale issues

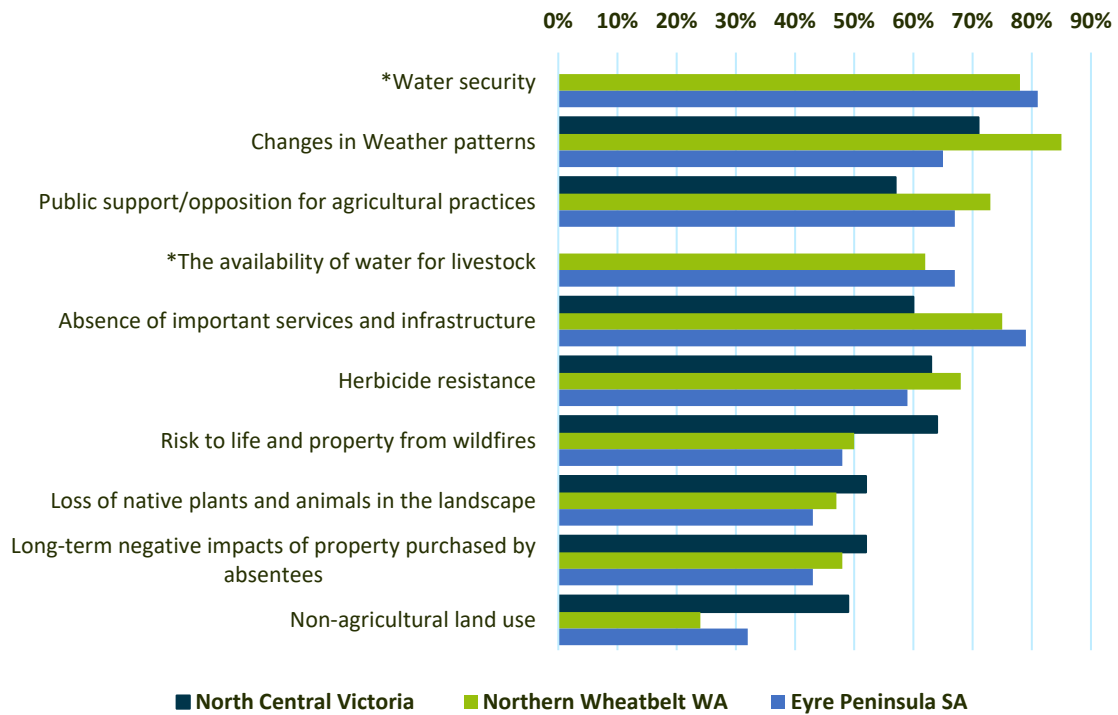


Figure 8: The top ten most important issues across the three regions. * issue not included in all surveys.

Figure 9 shows the most important property-scale issues identified by landholders across regions were soil erosion (72 % in Victoria), as well as soils having low biological activity, declining nutrient status and low organic carbon. Uncertain or low returns was the most important issue experienced by farmers in the Northern WA Wheatbelt, which may relate to the extent to which they appear to be experiencing temperature extremes and other impacts associated with climate change (Figure 10 below). Indeed, 70 % of WA farmers who responded to the survey considered climate change a risk to the region.

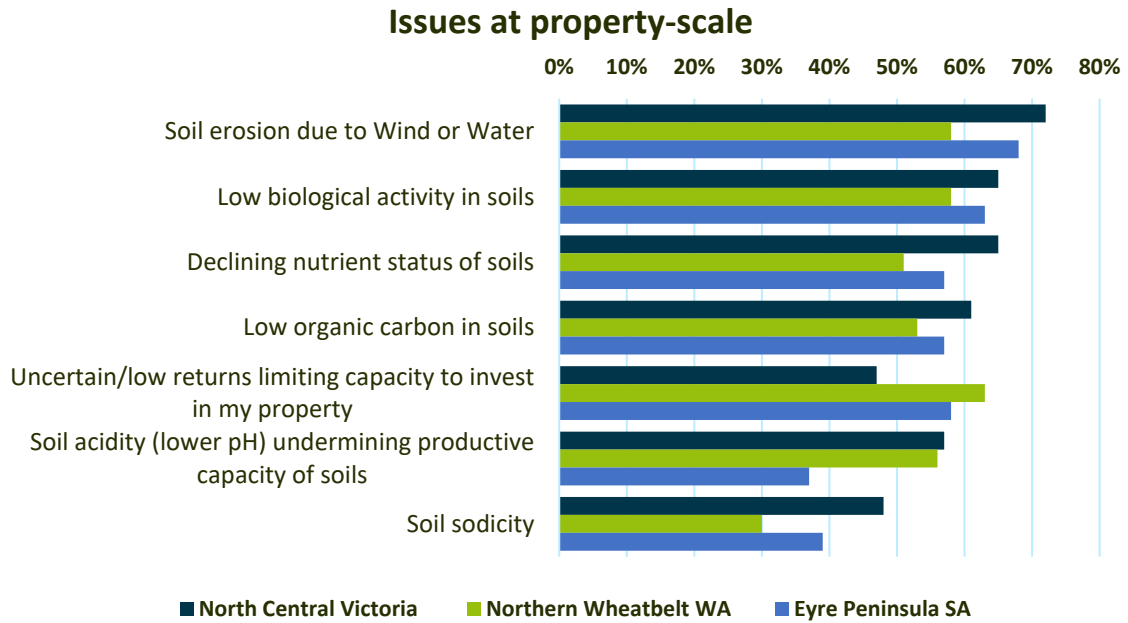


Figure 9: The importance of property-scale productivity and soil issues across regions.

BELIEFS ABOUT CLIMATE CHANGE

In this section we considered the level of concern related to the impacts of accelerated climate change. Sixty-five to 80 % of farmers across the regions considered ‘changes in weather patterns’ to be a major regional issue, even when responses to climate change items were quite low, suggesting a potential resistance to use the term ‘climate change’, specifically (Figure 11).

There were some substantial differences across regions about beliefs on climate change. In the variable climate of the northern Wheatbelt in WA, 70 % of respondents believed that climate change posed a risk to their region, compared to just 43 % of respondents on the Eyre Peninsula. Importantly, there was fairly consistent confidence across regions that landholders can adapt to expected changes in weather patterns (Figure 10).

Farmer climate change related beliefs across regions

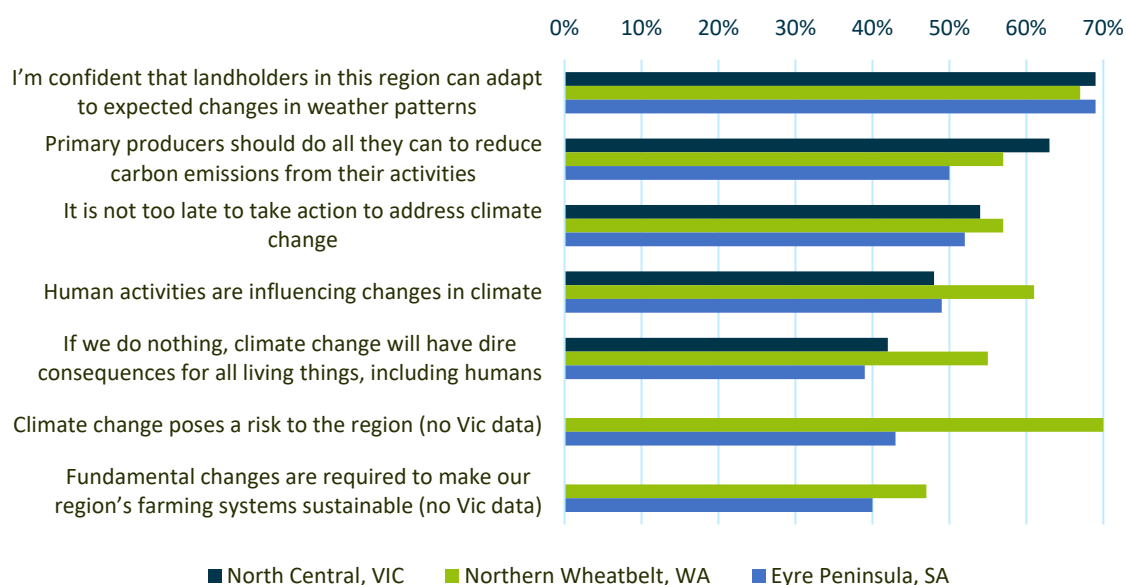


Figure 10: Farmer climate change related beliefs across regions.

Issues related to climate change across regions

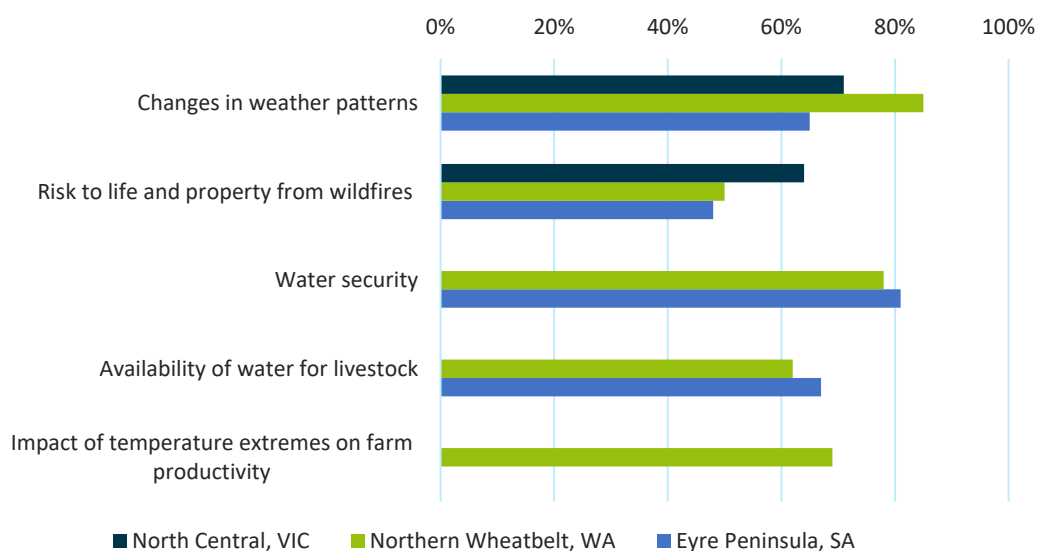


Figure 11: Issues related to climate change across regions. Some questions were introduced only in the 2020 SA & WA surveys.

FARMER PRACTICES

Reported soil testing varied widely across regions, with four-fifths of the WA farmers testing their soils, while less than half of Eyre Peninsula farmers were testing their soils (Table D). Almost three-quarters of the Victorian farmers were conducting soil testing where they had applied ameliorants in the past. Local partners suggest that necessity leads to testing in areas prone to acidic soils.

Across the SA and WA survey, chemical use was reported to have risen for over one-third of farmers (35 % & 36 %), while a smaller, but still substantial proportion of farmers reported that they had decreased chemical use in recent times (21 % & 28 %). Statistical modelling with the SA survey data identified that farmers who felt ‘adequately supported to conduct farming and land management activities’ on their property were also more likely to have the financial capacity to be experimenting with new ideas.

Table D: Practices implemented in the last five years, across regions, for full-time (FT) and part-time (PT) farmers. For North Central Victoria, data presented is for the full period of management.

MANAGEMENT PRACTICE	North Central Victoria		Eyre Peninsula, SA		Northern Wheatbelt, WA	
	FT	PT	FT	PT	FT	PT**
Lethal control of pest animals	80 %	72 %	64 %	51 %	67 %	45 %
Use of no- (or minimum) tillage techniques to establish crops or pastures #	75 %	53 %	58 %	44 %	62 %	27 %
Planting legumes or pulses*	-	-	52 %	42 %	70 %	82 %
Planting of trees and shrubs	70 %	68 %	31 %	22 %	50 %	55 %
Testing of soils for nutrient status #	73 %	55 %	49 %	48 %	82 %	64 %
Application of soil ameliorants other than fertiliser and lime	67 %	40 %	31 %	31 %	64 %	20 %
Sowing perennial pastures ##	58 %	41 %	24 %	31 %	24 %	36 %
Use of precision farming techniques	47 %	26 %	50 %	39 %	66 %	10 %
At least one lime application to arable land	51 %	44 %	19 %	22 %	75 %	45 %
Preparation of a nutrient budget for all/most of the property	32 %	13 %	26 %	22 %	41 %	9 %
Fencing of native bush/grasslands to manage stock	47 %	47 %	26 %	20 %	39 %	18 %
Use of time controlled, cell or rotational grazing #	42 %	45 %	25 %	29 %	21 %	20 %
Deep ripping of arable land	26 %	17 %	33 %	17 %	58 %	20 %
Farming activities that you consider to be regenerative*	-	-	14 %	14 %	17 %	1 %
Increase in chemical use*	-	-	35 %	17 %	36 %	10 %
Reduction of chemical use*	-	-	21 %	27 %	28 %	50 %
Organic farming*	-	-	3 %	9 %	3 %	0 %

*SA & WA surveys only. **small sample size. # Slightly modified question across surveys ## Lucerne only for VIC.

Farmer knowledge in relation to practices

Farmer knowledge on a range of items is displayed in Table E below. The results across regions showed consistent trends that knowledge of best practices often correlated with increased uptake of the associated practices. Due to the low proportion of full-time farmers in the overall landholder survey response, the response for full-time farmers only has been included for the North Central region of VIC, but not SA or WA.

Table E: Self-assessed knowledge of land and soil management and practices for the three study regions. Mean is out of five. Percentage results are for those landholders rating their knowledge as 'Sound' or 'Very Sound'. For North Central Victoria, as full-time farmers made up about half of the respondents, data for full-time farmers only is provided in brackets.

KNOWLEDGE TOPIC	North Central Victoria (with full-time farmer data)	Eyre Peninsula, SA	Northern Wheatbelt, WA
Strategies to maintain ground cover to minimize erosion in this area	3.8 91 % (FT 97 %)	3.9 95 %	4.1 97 %
Preparing a farm/property plan allocating land use according to land class	3.4 76 % (FT 90 %)	3.5 84 %	4 96 %
The extent and type of biological activity in soils on your property	3.0 70 % (FT 82 %)	2.9 67 %	2.8 61 %
The production benefits of applying biological soil supplements (e.g. compost, microbial inoculants)	3.4 82 % (FT 90 %)	3.2 76 %	3.3 80 %
How to identify the main constraints to soil productivity	3.4 78 % (FT 97 %)	3.4 83 %	3.7 89 %
The processes leading to soil structure decline	3.2 76 % (FT 90 %)	3.3 81 %	3.5 82 %
How to use soil testing to prepare a nutrient budget that will increase soil productivity #	3.0 63 % (FT 81 %)	3.1 70 %	3.7 83 %
How to establish perennial pastures in this area	3.6 75 % (FT 92 %)	3.2 76 %	3.2 71 %
Time controlled, cell or rotational grazing strategies*	-	2.9 69 %	2.8 56 %
How to build soil organic matter/soil carbon	-	3.4 85 %	3.4 84 %
Regenerative agriculture and holistic farm management*	-	2.7 57 %	2.7 53 %
How to support the persistence of native grasses in this area	-	2.6 56 %	2.4 41 %
How land in your district was used and managed before European settlement	2.4 45 % (FT 48 %)	2.5 47 %	2.4 43 %

The Aboriginal groups/s connected to the area where your property is located	2.5 48 % (FT 43 %)	2.33 43 %	2.2 37 %
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* SA & WA surveys only. # Victoria survey includes additional words "...without the risk of high levels of nutrient run-off".

FARMER ENGAGEMENT

Survey respondents were asked what their top sources of information were regarding topics related to the management of their property. While the mode of information varied across farmer cohorts within each region, overall North Central Victoria's top three modes of information were magazines (58 %), television (47 %), and newspapers (53 %). For the Northern Wheatbelt region in WA the top mode of information was field days (59 %), magazines (59 %) and websites (49 %). Similarly, the Eyre Peninsula in South Australia has field days as their number one mode of information (56 %), followed by websites (54 %), and newspapers (53 %) (Figure 12).

The top source of information in the Northern Wheatbelt region in WA and Eyre Peninsula in South Australia was 'other farmers' (76 % and 77 % respectively). As this question was added later to reflect the input from partners it is excluded from Table F below.

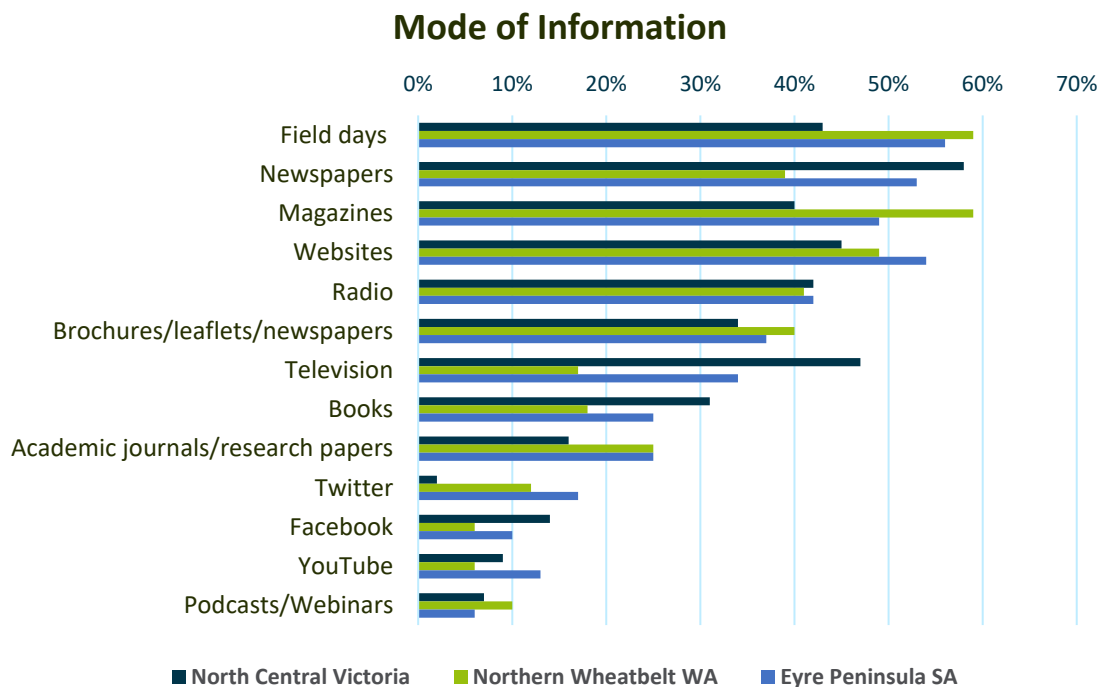
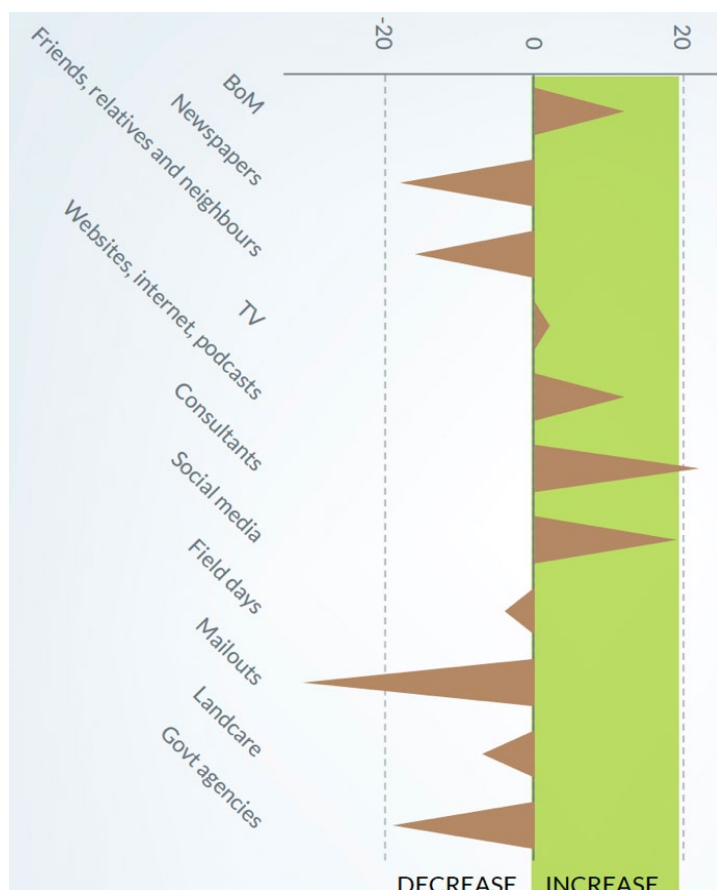


Figure 12: Modes of information.

Table F: Sources of information about agricultural practice and land management used across regions

Source of Knowledge	North Central Victoria	Eyre Peninsula SA	Northern Wheatbelt WA
Other farmers	-	77 %	76 %
Friends/neighbours/relatives	55 %	67 %	47 %
Bureau of Meteorology	64 %	59 %	51 %
Independent agricultural consultants, agronomists or stock agents	45 %	55 %	60 %
Commercial agricultural consultants, agronomists or stock agents	45 %	40 %	48 %
Rural R&D organisations/corporations (e.g. GRDC)	20 %	30 %	25 %
Local farming groups (AIR EP, WMG)	-	44 %	24 %
Regional NRM group or CMA	27 %	33 %	13 %
Universities/CSIRO	-	7 %	12 %
Direct contact with researchers/extension officers	8 %	14 %	7 %
Commodity groups	8 %	12 %	7 %
Soil CRC	6 %	5 %	3 %
Local Council	18 %	13 %	2 %
Environmental organisations, e.g. Greening Australia, Landcare	32 %	14 %	2 %
Government agencies & departments (DPIRD, PIRSA/SARDI)	24 %	50 %	25 %
Academic journals/research papers	15 %	25 %	22 %



Information use over time was explored in North Central Victoria, with survey results from 2014 and 2019 brought together in Figure 13, showing that in recent times the use of traditional information sources declined, such as newspapers and mailouts, as well as friends, relatives and neighbours.

There was an expected increase in social media and other online modes of communication. There was also a notable percentage increase in the use of private consultants, alongside a similar decline in the use of government agencies as a key information source.

Figure 13: Percentage change in use of various information sources over time, using data from the 2014 & 2019 North Central CMA surveys

VIEWS ON GROWER OR FARMING SYSTEM GROUPS

Landholders were asked to share their views on the role of local grower or farming system groups, shown in Table G, with fairly consistent results across regions.

Table G: Views on organisational relationships across regions.

VIEW STATEMENT	North Central VIC	Eyre Peninsula, SA	Northern Wheatbelt, WA
I feel a personal responsibility to be part of a local grower group (WA) research and development group (SA) or soil health group (VIC)	3.0 41 %	3.4 40 %	3.2 38 %
Grower groups are the best way to drive and direct local research, development and extension	-	3.9 66 %	3.6 54 %
I feel adequately supported to conduct farming and land management activities on my property*	-	3.7 59 %	3.4 52 %

* SA & WA surveys only.

FARM MANAGEMENT AND DATA

Data use and management was raised as a particular area of interest in the development of the South Australian and West Australian surveys. As such several new questions were built in addition to some of the original core survey questions.

Northern Wheatbelt Western Australia

The findings suggest that data is an important part of farm management, yet almost half of the West Australian farmers surveyed (49 %) reported internet connectivity as a barrier to using on-farm data. Sixty-six per cent of WA respondents agreed that decision-making needs to be strongly influenced by data and 62 % agreed that they already have good systems in place to manage farm data. Soil testing was perceived as an integral element of data gathering, with 91 % of full-time farmers agreeing that it is an essential step in understanding soil condition. However, this still translated to only 82 % of farmers having conducted a soil test in the previous five years.

On-farm management was largely collaborative, as 79 % of farmers include another person or people in their management decisions. Most often, this was a spouse/partner, family, or an advisor such as an agronomist. Seventy-three per cent reported that they had other family members working full-time on their property.

Eyre Peninsula South Australia

Respondents indicated that 61 % of farmers have good systems in place to manage farm data, yet the absence or poor quality of important services and infrastructure (e.g. health, schools, internet) was the most important issue for farmers in this region (79 %). Soil testing was perceived as an integral element of data gathering, with 83 % of farmers agreeing that it is an essential step in understanding soil condition. However, only 49 % of full-time farmers on the Eyre Peninsula had conducted a soil test in the previous five years of management. While

there were no specific survey questions on the importance of data in decision-making, 53 % of farmers agreed that they have good systems in place to manage farm data.

On-farm management was largely collaborative, as 75 % of farmers include another person or people in their management decisions. Fifty-nine per cent reported that they had other family members working full-time on their property.

North Central Victoria

The data collected in this regard was limited. However, 80 % of respondents agreed that there is an absence or poor quality of services and infrastructure (e.g. health, schools, internet). Eighty-nine per cent of full-time farmers agreed that soil testing is an essential step in understanding soil condition, translating to 73 % of full-time farmers having ever tested their soils in paddocks they had applied ameliorants to. While they were not directly asked whether someone else was included in their decision-making, 30 % reported that they had other family members working full-time on their property.

THE FUTURE OF FARMING

Long-term plans

Landholders were asked to share their views on the long-term plans for their property, outlined in Table H, below.

Table H: Long term plans across regions.

LONG TERM PLANS	North Central VIC	Eyre Peninsula, SA	Northern Wheatbelt, WA
Ownership of the property will stay within the family	66 %	79 %	72 %
Additional land will be purchased	26 %	32 %	33 %
I will move off the property around/soon after reaching retirement age	15 %	30 %	29 %
Additional land will be leased or share farmed	17 %	23 %	19 %
All or most of the property will be leased or share farmed	18 %	21 %	17 %
The enterprise mix will be changed to diversify income sources	23 %	18 %	22 %
A family member will seek additional off-property work to support the farm	21 %	17 %	12 %
The property will be sold	18 %	14 %	16 %
The property will be subdivided and a large part of the property sold	7 %	6 %	4 %
Have a well-advanced succession plan	27 %	37 %	41 %

Differences by age

Data was analysed by dividing up the respondent data from full-time and part-time farmers into three age categories, as determined by established definitions of generations (Dimock 2019):

- Generation Y (born 1981-1996)
- Generation X (born 1965-1980)
- Baby Boomer and older (born before 1965, referred to as Baby Boomer+).

The baby boomer generation was the largest cohort of farmers in each region, and only the SA data had sufficient responses from Gen Y farmers to include this data separately. For the two other regions, Gen X and Gen Y data were reported together.

The younger farmers across regions had consistently (and significantly) higher self-reported knowledge levels on a range of farming best practices, which often translated into increased uptake of best practices in comparison with the older groups. In North Central Victoria, the older group were found more likely to be associated with Landcare had better knowledge of a number of NRM practices than younger farmers.

On the Eyre Peninsula, Gen Y were significantly more open to risk than the older groups. All Gen Y respondents said they were open to new ideas about farming, and this age group were more interested than the older groups in taking up some sort of study/activity to improve their farm management skills. Gen Y were more likely to have completed a property management or whole farm plan. They were also found to be the most time-poor group, and less likely to participate in the wider agricultural community than older farmers. However, they were more likely to include others in their farm management decisions.

Gen Y were the only group for which every respondent had completed at least Year 10. They had the highest rates of both tertiary education (24 %) and other post-secondary education (24 %), and were significantly more confident with managing data and farm accounts. In comparison, 12 % of Generation X and 8 % of the Baby Boomer+ generation had tertiary qualifications.

As a group, the younger **Northern Wheatbelt** cohort (56 years and under) were more likely to have been increasing their land tenure and owned, on average, more than twice the land than older survey respondents. This age group were more likely to view 'internet connectivity' as a barrier to the effective use of on-farm data.

In North Central VIC values around wealth generation emerged as significantly more important for younger farmers (56 years and under), whereas environmental values were stronger for the older farmers.

Younger Victorian farmers were more likely to use information sources such as the internet and Twitter, compared to older farmers preferring newspapers, radio and television.

Across regions, a great deal of variation was found in terms of farmer age profiles, though it was generally more likely that the person responding to the survey for each property was an older male. A greater proportion of younger respondents were found on the Eyre Peninsula in comparison with the other two regions.

DISCUSSION

Understanding farmer on-farm practices, priorities, beliefs and challenges can provide input into strategic planning, innovation and capacity building for our regional partners, for the Soil CRC and for agricultural practice across Australia (Bennett and Cattle, 2013). In broad terms, each of our regional partner groups has different areas of focus, which form key elements of strategic planning cycles that usually take place over about five years. For example, in Victoria, each NRM region develops a Regional Catchment Strategy every five years, which identifies regional NRM priorities and describes strategies to achieve those objectives. For the North Central CMA, the most recent was the 2020-2026 Regional Catchment Strategy, which was informed heavily by the results of the North Central CMA Social Benchmarking Report, an outcome of this project. Key environmental assets identified in this region are soils, waterways, wetlands and native vegetation.

Regional agricultural organisations typically have limited ability (agency) to accomplish their goals without the support of other stakeholders (e.g. Australian and state governments, Non-Government Organisations), and especially rural property owners who own most rural land in the region and directly influence the condition of soil, waterways, wetlands and native vegetation. In turn, the condition of those environmental assets influences their livelihoods, well-being and wealth (including property values). Farmer decisions strongly influence soil health and productivity, with land and farm management being a complex activity. Landholder decisions are driven by a range of environmental, economic and social factors. This project has explored a range of social elements influencing landholder perspectives on a range of issues, and those factors influence the acceptability of several best practices, new technologies and innovations.

In Australia, while primary production is not the focus of all landholders, clearly agriculture is still considered to be the primary focus of land use (Groth and Curtis 2017). This is unsurprisingly reflected in the WA Wheatbelt and the Eyre Peninsula of SA where the highest land use was cereal cropping, with the most common land use in North Central VIC being pasture (Figure 3). Additionally, less traditional land uses such as farm forestry and farm-based tourism did not feature as prominently in the results. In relation to non-forestry tree planting, there was a notable difference across regions, with 37 % of North Central landholders planting trees, compared to only 21 % of Eyre Peninsula landholders and 25% of Wheatbelt landholders.

VALUES

This research considers farmer values across a range of different regions in Australia. Farmer values attached to their property were, understandably, variable across each region (Figure 6), with the top value across all three regions recorded as the 'ability to pass on a healthier environment to future generations'. Driving this focus on a healthier environment is likely not a new approach, because traditional farmers see themselves as responsible stewards of the land (Mendham, Gosnell, and Curtis, 2010).

Farmers highly value their properties as a place to raise and support their families, as well as a place to look after, while striving for a profitable business. Many significant differences emerged by age group, including values, knowledge and best practice implementation, indicating a clear avenue for further investigation.

PARTICIPATION

In terms of risk and openness to change, our research found that those identifying as early adopters are significantly more likely to be engaged in soil health groups and commodity groups. They are significantly more likely to adopt best practices and change their on-property operations to achieve both agricultural and ecological goals. They are more likely to take on cutting-edge innovations and respond to climate change by changing on-property operations to capture carbon and reduce carbon emissions. This drive towards innovation is typical in Australia where the need to remain productive and profitable is pushed forward by low and variable rainfall, and highly weathered infertile soils (Bellotti and Rochecouste, 2014).

CHALLENGES

For on-farm challenges, water security was the most important issue on the Eyre Peninsula SA (81 %) and the WA Wheatbelt (78 %). In Victoria, this question was focused on the importance of the quality of water in dams during drought (66 %) and the movement of irrigation water away from their region (48 %) which ranked as the third and eleventh most important issues respectively. It is well known that Australia is highly vulnerable to water scarcity and has challenges with water-saving and water use efficiency (Maraseni, Mushtaq, and Reardon-Smith, 2012). The findings clearly indicate that water security is an important factor across all three regions, but more so for the comparatively drier regions of Eyre Peninsula SA and the WA Wheatbelt.

Soil challenges were fairly consistent across regions, with soil erosion a top issue, followed closely by the interrelated trifactor of low biological activity, declining nutrient status and low organic carbon. A notable interest in improving these elements is evident, with many farmers working to improve these soil issues. Regional data shows opportunities and levers for increased uptake of practices related to addressing these soil challenges, in relation to boosting knowledge associated with those practices, and improving confidence in the effectiveness of their implementation.

Additionally, beliefs around climate change varied across regions, with more widespread agreement that climate change is due to human activity, and that it is more of a risk to the Northern Wheatbelt in VIC compared to the other regions. Regardless of these beliefs, changing weather patterns emerged as the most important regional challenge across Australian farming systems, indicating a possible lack of willingness to associate changing weather patterns with climate change, as has been identified in previous studies (Mazur et al., 2013).

THE FUTURE OF FARMING

Our results show that age matters when seeking to engage farmers, with significant differences found for a number of survey items by age, including values, knowledge and likely implementation of best practice. However, our results also indicate that younger farmers are needing more support than they are currently receiving, which could relate to knowledge, financial, or social support. While succession planning is underway across the regions studied, there lies another opportunity for further support and engagement to ensure those plans become more fully developed.

The results from the Victorian study in particular (given that it had a longitudinal element) show that a trend towards a multifunctional, rather than a purely production-based farming landscape is occurring. Our results indicate a strong desire to keep the farm in the family rather than sell. This contrasts with the findings of Mendham, Gosnell and Curtis (2010). Indeed, one

of the most important long-term plans indicated by property owners in this study was that the property would stay within the family.

CONCLUSION

This project is contributing ongoing knowledge about Australia's changing farming practices, priorities, beliefs, and challenges, and offering a snapshot of values and farmer attitudes. Follow-up surveys in future years can build on this data to show what changes may be occurring across the three regions.

A key finding of this project is heterogeneity across regions. There is great variety in terms of demographics, the proportion of landholder types, information sources used, knowledge levels and implementation of a range of practices for farmers across farming systems and regions. One common theme is that having the ability to pass on a healthier environment to future generations is extremely important for landholders across the regions. A full and detailed report on survey findings is available in the [regional reports](#), and a webinar that summarises the results is available via: <https://soilcrc.com.au/webinars/>

Decision-making processes continue to be complex, with different issues salient across regions. However, we can make some conclusions as to how the many influencing factors relate to each other, as shown in the schematic presented in Figure 14, adapted from Curtis and Luke (2019).

Drivers of Landholder Decision-Making

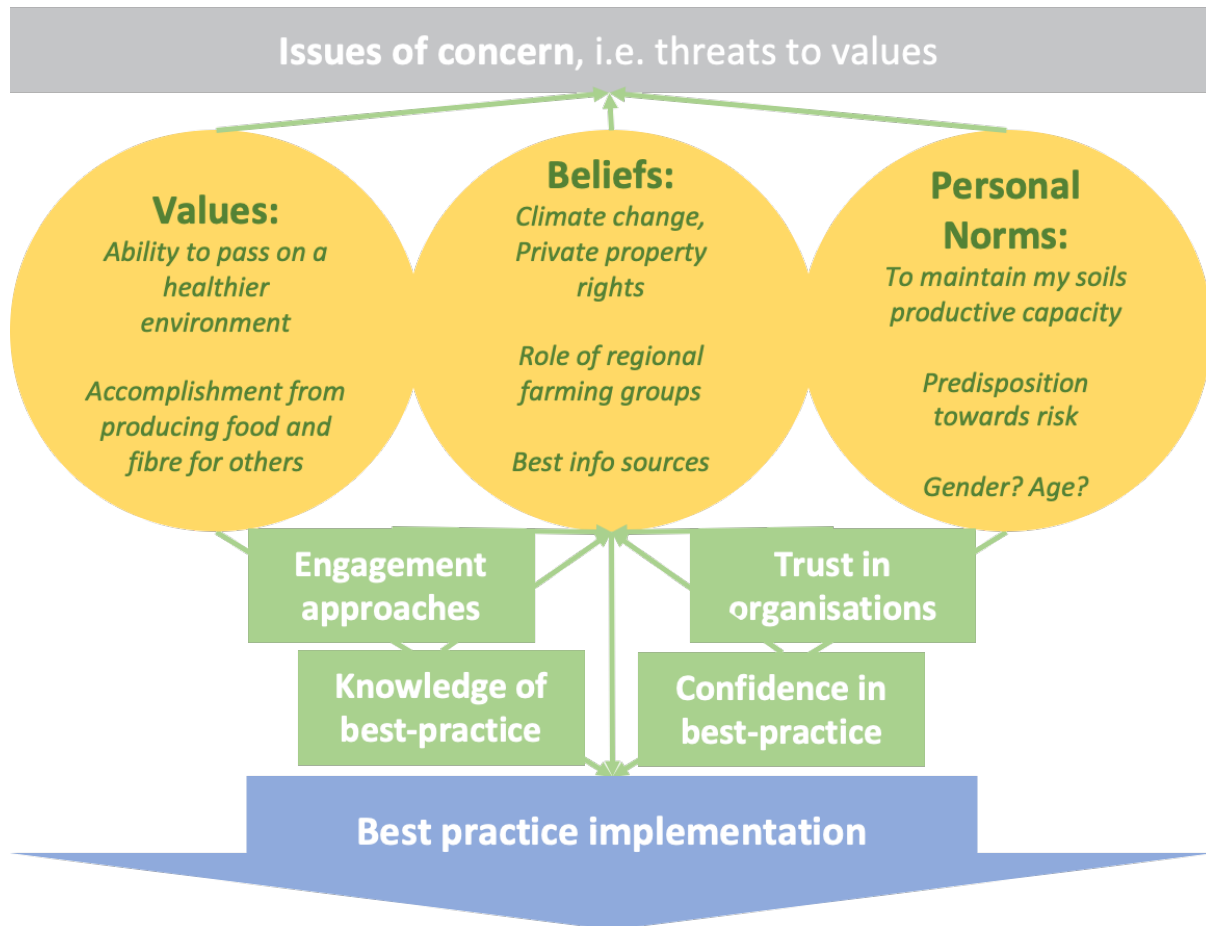


Figure 14: A schematic showing some of the key drivers of decision-making, building on values-beliefs-norms theory but demonstrating the complexity of relationships between values, trust, engagement approaches and knowledge.

The Soil CRC Social Benchmarking surveys have provided important and useful information on a broad range of topics. They have reinforced the importance of landholder values, beliefs and normative influences, and highlighted the importance of trust and engagement approaches of information providers, whether they be agricultural organisations, local grower groups, NRM organisations, or government.

The surveys are helping us better understand farmer decision-making on relevant local topics. We are also beginning to draw together some national patterns of understanding on the challenges, aspirations and influences on decision-making for landholders across Australia.

Our work can provide Australian farmers with a clearer picture of what other farmers are doing in different farming systems, while giving Soil CRC researchers and regional groups an evidence-based direction for enhanced farming research and farmer support.

RECOMMENDATIONS

We recommended these surveys be repeated to provide a longitudinal view of general changes over time. This will help to improve understanding of the values, beliefs, attitudes, and knowledge among rural landholders, and how they are influencing decisions regarding soil management.

ACKNOWLEDGEMENTS

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Finally, we thank every landholder who has filled in one of our surveys. You are absolutely integral to this project and we hope to hear from you again soon.

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APPENDIX A – NORTH CENTRAL VICTORIA SURVEY



SURVEY NO.

Supporting landholders in the north central victoria region

RURAL LANDHOLDER SURVEY 2019



SUPPORTING LANDHOLDERS IN THE NORTH CENTRAL VICTORIA REGION

This survey is a vital part of efforts to understand the important social and economic factors shaping landholder decision making. Information you provide will guide implementation of the North Central Catchment Management Authority's (CMA) 2020-2026 Regional Catchment Strategy that supports landholders working to establish viable futures in the North Central CMA region.

Information provided will also inform the research activities of the Australian Government and industry funded Soil Cooperative Research Centre (Soil CRC), of which North Central CMA is a partner.

Surveys have been sent to a random selection of landholders covering small and large properties. There is no other way to obtain this property level information. This survey follows up a similar survey in 2014 and will provide insights into trends overtime.

We are seeking the views of the persons primarily responsible for managing the property. If you are not involved in the management of the property please forward the survey to the property manager or return the survey in the return envelope. We ask that you only provide information for property/s within the North Central CMA region.

It should take you about 25 minutes to complete the survey. There are no right or wrong answers and there is no need to think at great length about your responses. If you have any questions about the survey, please phone Dr Hanabeth Luke on 1800 317 503 or by email at Hanabeth.Luke@scu.edu.au

You are assured of complete confidentiality. Your name will never be placed on the survey or used in any of the reports. No group outside the research team will have access to the survey data. Information is published at the regional scale and individual data are never published.

Thank you for your assistance,



Professor Allan Curtis



Dr. Hanabeth Luke

1. WHY YOUR PROPERTY IS IMPORTANT TO YOU

The next set of statements seeks information about the reasons your property is important to you. *Examine each statement in the table and place the number for your response in each space provided for 'Your View'.*

RESPONSE OPTIONS:

NOT IMPOR TANT	MINIMAL IMPORTANCE	SOME IMPORTANCE	IMPORTANT	VERY IMPOR TANT	NOT APPLICABLE
1	2	3	4	5	6

WHY YOUR PROPERTY IS IMPORTANT TO YOU	YOUR VIEW
Sense of accomplishment from producing food and fibre for others	
Ability to pass on a healthier environment for future generations	
Sense of accomplishment from building/maintaining a viable business	
Opportunity to learn new things	
A place or base for recreation	
Working on the property is a welcome break from my normal occupation	
An asset that will fund my retirement	
A great place to raise a family	
A place where I can escape the pressures of life	
Native vegetation provides habitat for birds and animals	
An important source of household income	
An attractive place/area to live	
Provides a sense of belonging to a community	
The productive value of the soil on my property	
Native vegetation makes the property an attractive place to live	
An asset that is an important part of family wealth	

2. LONG-TERM PLANS FOR YOUR PROPERTY

Please indicate the possibility that your long-term plans for your property in the next 10 years will involve each of the choices in the table below. *Examine the response options underneath this paragraph. For each choice in the table, place the number of your response option in the 'Your view' column.*

RESPONSE OPTIONS:

HIGHLY UNLIKELY	UNLIKELY	UNSURE	LIKELY	HIGHLY LIKELY	NOT APPLICABLE
1	2	3	4	5	6

LIKELIHOOD YOUR LONG-TERM PLANS WILL INVOLVE	YOUR VIEW
Ownership of the property will stay within the family	
The property will be sold	
The property will be subdivided and a large part of the property sold	
I will move off the property around/soon after reaching age 65 years	
All or most of the property will be leased or share farmed	
Additional land will be purchased	
Additional land will be leased or share farmed	
The enterprise mix will be changed to diversify income sources	
The enterprise mix will be changed to more intensive enterprises	
The enterprise mix will be changed to less intensive enterprises	
Me or my spouse will seek additional off-property work	
Some part of property will be placed under a conservation covenant	

Do you have family members interested in taking on your property in the future? *Please tick your answer.*

Yes No Unsure/too early to know

If Yes, has your family agreed to a succession plan? *Please circle your answer.*

Not started Early stages Halfway Well advanced Completed/Ongoing

3. YOUR ASSESSMENT OF ISSUES

This set of statements seeks your opinion about the importance of a range of issues that may be affecting your property and your local district. *Examine each statement in the table, then place the number of your response option in each space provided for 'Your view'.*

RESPONSE OPTIONS:

NOT IMPORTANT	MINIMAL IMPORTANCE	SOME IMPORTANCE	IMPORTANT	VERY IMPORTANT	NOT APPLICABLE / DON'T KNOW
1	2	3	4	5	6

IMPORTANCE OF ISSUES AFFECTING YOUR LOCAL DISTRICT	YOUR VIEW
Absence or poor quality of important services and infrastructure (e.g. health, schools, internet)	
The impact of pest plants and animals on native plants and animals	
Uncertain/low returns limiting capacity to invest in my property	
Less water being made available to support recreation on rivers and lakes	
Movement of irrigation water away from this region	
Dryland salinity undermining long-term productive capacity	
Irrigation salinity undermining long-term productive capacity	
Loss of native plants and animals in the landscape	
Nutrient run-off from rural properties affecting water quality	
Stock damage to native vegetation along waterways and in wetlands	
Risk to life and property from wildfires	
The effect of ground water extraction on stream flows during drought	
Non-agricultural land use (e.g. residential, solar, mining) encroaching on farming land	
Changes in weather patterns	
Dams on rural properties reducing run-off to natural waterways	
Modernisation of the irrigation system as part of water reform	
Crop weed resistance to herbicide	
Long-term negative impacts of property purchased by absentees	
Quality of water in farm dams during drought	
Public support for agricultural activities/practices, e.g. pesticide use, bare paddocks, mulesing	

IMPORTANCE OF SOIL RELATED ISSUES ON YOUR PROPERTY	YOUR VIEW
Soil erosion (e.g. by wind or water)	
Low permeability of sub soil	
Declining nutrient status of soils	
Soil acidity (lower pH) undermining productive capacity of soils	
Soil sodicity	
Low organic carbon in soils	
Low biological activity in soils	

4. THE PRINCIPLES THAT GUIDE YOUR LIFE

The next set of statements seeks information about the principles that guide your life. *Examine each statement in the table and place the number for your response in each space provided for 'Your View'.*

RESPONSE OPTIONS:

NOT IMPORTANT	MINIMAL IMPORTANCE	SOME IMPORTANCE	IMPORTANT	VERY IMPORTANT	NOT APPLICABLE
1	2	3	4	5	6

THE PRINCIPLES THAT GUIDE YOUR LIFE	YOUR VIEW
Looking after my family and their needs	
Working for the welfare of others	
Protecting the environment and preserving nature	
Being influential and having an impact on other people and events	
Fostering equal opportunities for all community members	
Preventing pollution and protecting natural resources	
Having power and being able to lead others	
Respecting the earth and living in harmony with other species	
Caring for the weak and correcting social injustice	
Creating wealth and striving for a financially profitable business	

5. YOUR KNOWLEDGE OF DIFFERENT TOPICS

In this section we would like you to provide an assessment of your knowledge for a number of different topics. Examine the response options. For each choice in the table, place the number of your response in the 'Your view' column.

RESPONSE OPTIONS:

NO KNOWLEDGE	VERY LITTLE KNOWLEDGE	SOME KNOWLEDGE	SOUND KNOWLEDGE (sufficient to act)	VERY SOUND KNOWLEDGE (can give a detailed explanation)	NOT APPLICABLE
1	2	3	4	5	6

YOUR KNOWLEDGE OF DIFFERENT TOPICS	YOUR VIEW
Preparing a farm/property plan allocating land use according to land class	
Which Aboriginal group is connected to the area where your property is located	
The role of understorey plants in maintaining native birds	
The role of logs & river-side vegetation in supporting native fish	
The extent and type of biological activity in soils on your property	
Strategies to maintain ground cover to minimise erosion in this area	
How to establish introduced perennial pastures (e.g. lucerne) in this area	
How to identify the main constraints to soil productivity on your property	
The production benefits of applying biological soil amendments and supplements (e.g. compost, manure, microbial inoculants)	
The processes leading to soil structure decline in this area	
The role of soil carbon in maintaining soil health	
The extent of native vegetation cover in the North Central region before European settlement	
How land in your district was used and managed before European settlement	
How to use soil testing to prepare a nutrient budget that will increase soil productivity without the risk of high levels of nutrient run-off	
The effect of fertiliser application on the persistence of native grasses in this area	

6. YOUR VIEWS

We would like to know how closely the statements presented below reflect your views. *Examine each statement in the table, then place the number for your response in the space provided for 'Your view'.*

RESPONSE OPTIONS:

STRONGLY DISAGREE	DISAGREE	UNSURE	AGREE	STRONGLY AGREE	NOT APPLICABLE / DON'T KNOW
1	2	3	4	5	6

STATEMENTS	YOUR VIEW
The increased allocation of water for the environment under the Murray-Darling Basin Plan will improve the health of waterways & wetlands	
Aboriginal people should be able to negotiate access with landholders to visit cultural sites	
The public should be able to access crown land managed by private landholders (e.g. unused roads)	
If landholders are informed in advance, it would be acceptable to cause minor floods for environmental purposes	
Landholders should be able to harvest rainfall on their property, even if that action impacts on others	
Primary producers should do all they can to reduce carbon emissions from their activities	
The cost of deep-tillage and subsoil modification are justified by increased production	
The benefits of stubble retention outweigh problems arising from the practice	
The costs of applying lime to address soil acidity are justified by increased production	
The costs of applying gypsum to address soil sodicity are justified by increased production	
The costs of establishing perennial pasture are justified by the returns	
The cost of willow removal is justified by improvements in the condition of river banks & river health	
Soil testing is an essential first step in understanding soil condition	
Intensive grazing for short periods is usually better for the health of native vegetation along waterways and wetlands than set stocking	
Fencing to manage stock access is necessary to protect the health of waterways & wetlands	
Improvements in bank stability & vegetation condition justify the costs of watering stock off-stream	
I feel a personal responsibility to be part of a soil health group	
I feel a personal responsibility to maintain my soil's productive capacity	
Biological activity is an important indicator of the productive capacity of soils	
I'm confident landholders in this region can adapt to expected changes in rainfall patterns	

7. PREFERRED SOURCES OF INFORMATION

In the past 12 months what have been your sources of information about topics related to the management of your property in the North Central Catchment? Please place a tick besides any relevant sources of information in the table below.

SOURCE OF INFORMATION		SOURCE OF INFORMATION	
Television	<input type="radio"/>	Facebook	<input type="radio"/>
Books	<input type="radio"/>	YouTube	<input type="radio"/>
Academic Journals	<input type="radio"/>	Twitter	<input type="radio"/>
Magazines	<input type="radio"/>	Instagram	<input type="radio"/>
North Central CMA	<input type="radio"/>	Internet	<input type="radio"/>
Victorian Farmers Federation	<input type="radio"/>	Landcare group/network	<input type="radio"/>
Bureau of Meteorology	<input type="radio"/>	Local Council	<input type="radio"/>
Water Authorities (e.g GMW, Coliban Water)	<input type="radio"/>	Mailed brochures/leaflets/community newsletters	<input type="radio"/>
Government agencies/departments	<input type="radio"/>	Rural R&D corporations (e.g. MLA, GRDC)	<input type="radio"/>
Soil Cooperative Research Centre (CRC)	<input type="radio"/>	Extension officers	<input type="radio"/>
Newspapers	<input type="radio"/>	Environmental organisations	<input type="radio"/>
Field days	<input type="radio"/>	Commodity groups	<input type="radio"/>
Radio	<input type="radio"/>	Friends/neighbours/relatives	<input type="radio"/>
Podcasts/Webinars	<input type="radio"/>	Agricultural consultants, agronomists and stock agents	<input type="radio"/>
Banks	<input type="radio"/>	Other – please specify	

For your selection/s above, please indicate the title/name of your preferred top source (e.g. radio station, paper or website)? _____

8. YOUR VIEWS ABOUT RISK, TRUST AND CLIMATE

In this section we would like to explore your views about the taking risks, trusting others, climate change and the North Central CMA. For each statement in the table, place the number of your response in the 'Your view' column.

RESPONSE OPTIONS:

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE	NOT APPLICABLE / DON'T KNOW
1	2	3	4	5	6

STATEMENTS	YOUR VIEW
You can't be too careful when dealing with people	
People are almost always interested only in their own welfare	
One has to be alert or someone is likely to take advantage of you	
I am an early adopter of new agricultural practices and technologies	
I prefer to avoid risks	
I really dislike not knowing what is going to happen	
I usually view risks as a challenge to embrace	
Human activities are influencing changes in climate	
It is not too late to take action to address climate change	
If we do nothing, climate change will have dire consequences for all living things, including humans	

Are you aware of the existence of the North Central CMA? Yes No

If Yes, please answer the next items. If no, please move to the next section.

STATEMENTS	YOUR VIEW
The North Central CMA keeps landholders' interests in mind when making decisions about waterways and wetlands management	
Sound principles guide North Central CMA decisions about waterways & wetlands management	
The North Central CMA is very knowledgeable about waterways & wetlands management	
I can rely on the North Central CMA to provide useful advice about waterways & wetlands management	
I can rely on the North Central CMA to provide appropriate financial assistance for waterways & wetlands management	

9. ENTERPRISE/ LAND USE MIX

This topic is seeking information about your current land use/enterprise mix. *Please place a tick besides any correct response in the 'Situation Now' column. Please answer with the land you own and manage within the NC CMA region in mind.*

ENTERPRISES / LAND USE ON YOUR PROPERTY IN 2019	SITUATION NOW	ENTERPRISES / LAND USE ON YOUR PROPERTY IN 2019	SITUATION NOW
Cropping	<input type="radio"/>	Irrigated agriculture	<input type="radio"/>
Pasture	<input type="radio"/>	Area of remnant native vegetation (e.g. trees, grasslands, wetlands)	<input type="radio"/>
Dairying	<input type="radio"/>	Farm forestry	<input type="radio"/>
Beef cattle	<input type="radio"/>	Other tree planting (e.g. shelter, habitat, erosion or recharge control, carbon)	<input type="radio"/>
Sheep for wool or meat	<input type="radio"/>	Farm-based tourism (e.g. farm stays, B&B)	<input type="radio"/>
Other commercial livestock enterprises (e.g. goats, pigs, deer, horse studs, poultry, alpaca, dogs)	<input type="radio"/>	Conservation covenant attached to property title (e.g. Trust For Nature)	<input type="radio"/>
Viticulture	<input type="radio"/>	Area set aside for living/recreation (e.g. gardens, pets, water bodies, vehicles)	<input type="radio"/>
Vegetation offsets	<input type="radio"/>	Carbon farming	<input type="radio"/>
Horticulture	<input type="radio"/>	Hay production for sale	<input type="radio"/>

10. OCCUPATIONAL IDENTITY

Please circle the descriptor/term that best describes your occupational identity:

Full-time farmer

Part-time farmer

Hobby farmer

Non-farmer

11. MANAGEMENT PRACTICES ON YOUR PROPERTY

This section asks about practices undertaken on your main or 'home' property in the North Central region during the full period of your management; and the past 3 years.

Some actions may not be relevant to your situation. Please ignore those topics.

If you have owned your property for less than 12 months, please leave this topic and go to the next page.

We also want to know if the activities listed have been supported by resources from outside groups (e.g. North Central CMA, DEWLP, Greening Australia, Trust for Nature, Landcare). Please place a tick where that is the correct response in the three columns.

PRACTICES IMPLEMENTED ON YOUR MAIN OR "HOME" PROPERTY IN THE NORTH CENTRAL REGION	AT SOME TIME DURING PERIOD OF MANAGEMENT	PAST 3 YEARS (2017-2019)	RESOURCES PROVIDED BY OTHERS
Planted trees and shrubs (incl. direct seeding)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fenced native bush/grasslands to manage stock access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fenced waterways & wetlands to manage stock access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Established permanent grassed waterways in drainage lines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Established off-stream watering points	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Established an irrigation tailwater reuse system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used time controlled or rotational grazing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sown lucerne	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sown perennial pastures other than lucerne	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used minimum or no tillage techniques to establish crops or pastures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used precision farming techniques for cropping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Applied at least one lime application to arable land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deep ripped arable land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Applied soil ameliorants other than fertiliser and lime (e.g. gypsum, organic manure)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tested soils for nutrient status in paddocks where have applied fertiliser/soil conditioners in the past	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prepared a nutrient budget for all/most of the property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prepared a habitat assessment for native plants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Each year have worked to control pest animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Each year have worked to control non-crop weeds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. BACKGROUND INFORMATION

BACKGROUND INFORMATION	PLEASE TICK OR FILL IN YOUR RESPONSE
What is the total area of rural land you own within the NC CMA region? (excluding land you manage but do not own)	_____ total Ha owned
Is this property your principal place of residence?	<input type="radio"/> Yes <input type="radio"/> No
What area of additional land do you manage (lease/sharefarm/agist from others) within the NC CMA region (additional to the figure you provided above)?	_____ additional Ha managed
What is the longest period of time you or your family have owned or managed all/some part of your property?	_____ yrs
What area of your property is leased, share farmed or agisted by others?	_____ Ha
How many rural properties do you own? (including those within and outside of the NC CMA)?	_____ No. of properties
How many of these properties are within the NC CMA region?	_____ No. of properties

13. YOUR PROPERTY

This topic seeks information about you and your main or 'home' property.

BACKGROUND INFORMATION	PLEASE TICK OR FILL IN YOUR RESPONSE
Did you attend field days/farm walks/demonstrations focused on soil health in the past 12 months	<input type="radio"/> Yes <input type="radio"/> No
Has this enterprise bought additional land to increase a landholding in this region in the past 20 years?	<input type="radio"/> Yes <input type="radio"/> No
Have you subdivided or sold part of your existing property in this region in the past 20 years?	<input type="radio"/> Yes <input type="radio"/> No
Are other family members working full time on your property?	_____
Are you male or female?	<input type="radio"/> M <input type="radio"/> F
What is your age?	_____ yrs
What is your main occupation? (e.g. farmer, teacher, accountant, investor, retiree)	_____
In the past 5 years have you completed a short course relevant to property management? (e.g. financial planning, integrated pest management)	<input type="radio"/> Yes <input type="radio"/> No
Estimate the average number of hours per week that you worked on farming/property related activities over the past 12 months.	_____ hr/wk
Estimate the number of days that you were involved in paid off-property work in the past 12 months	_____

Did you attend field days/farm walks/demonstrations focused on native plants & animals in the past 12 months	<input type="radio"/> Yes <input type="radio"/> No
Are you a member or involved with a local Landcare group?	<input type="radio"/> Yes <input type="radio"/> No
Are you a member or involved with a local commodity group? (e.g. Better Beef, Best Wool, Birchip Cropping Group)	<input type="radio"/> Yes <input type="radio"/> No
Are you a member or involved with a local soil health group?	<input type="radio"/> Yes <input type="radio"/> No
In the past 12 months have you changed your financial or on-property operations as a result of considering climate change?	<input checked="" type="radio"/> Yes <input type="radio"/> No
In the past 12 months have you changed your on-property operations as a result of considering opportunities to capture carbon (e.g. by revegetation, soil management)?	<input type="radio"/> Yes <input type="radio"/> No
In the past 12 months have you changed your on-property operations as a result of considering opportunities to reduce carbon emissions (e.g. solar, wind, gravity systems)?	<input type="radio"/> Yes <input type="radio"/> No
Have you prepared/are you preparing a property management or whole farm plan that involves a map or other documents that address the existing property situation and include future management and development plans?	<input type="radio"/> Yes <input type="radio"/> No
Did you irrigate in the 2018/19 season?	<input type="radio"/> Yes <input type="radio"/> No
If yes:	
Was surface water used	<input type="radio"/> Yes <input type="radio"/> No
Was ground water was used	<input type="radio"/> Yes <input type="radio"/> No
Did you earn income from agriculture on your property in the North Central region during 2018/19 financial year?	<input type="radio"/> Yes <input type="radio"/> No
If yes, did your property return a net profit from agriculture (income exceeded all paid expenses before tax) in 2018/19?	<input type="radio"/> Yes <input type="radio"/> No
If yes, was the net profit from agriculture in 2018/19 above \$50,000?	<input type="radio"/> Yes <input type="radio"/> No

Did you or your spouse receive a net off-property income (after expenses and before tax) last financial year (2018/2019)?

Yes, me Yes, my spouse No

If yes, was the total off-property income (before tax) for you and your partner last financial year (2018/2019) above \$50,000?

Yes No

OTHER COMMENTS AND THANK YOU FOR YOUR TIME

Do you have any other comments about any of the topics covered in the survey, or other aspects of land and water management in the North Central CMA region? Please use the space provided to write your comments or attach additional sheets. Your comments will be recorded by the research team.

We appreciate the time you have spent answering the questions. Please return the completed survey in the envelope provided that is addressed to Professor Curtis.

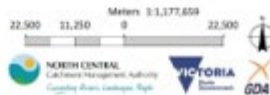
If you need assistance with the survey, or wish to make specific comments about it, please 1800 317 503 to contact Dr Hanabeth Luke.

NORTH CENTRAL CMA REGION



Legend

- Main Watercourse
 - Main Waterbodies
 - Freeway; Highway
 - Arterial
 - Main Towns
 - North Central CMA
- North Central Basins**
- Avoca River
 - Avon River
 - Campaspe River
 - Loddon River



The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person relying on making some such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



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APPENDIX B – NORTHERN WHEATBELT WA SURVEY



SURVEY NO.

SUPPORTING LANDHOLDERS IN THE WEST AUSTRALIAN WHEATBELT

RURAL LANDHOLDER SURVEY 2020



SUPPORTING LANDHOLDERS IN THE WHEATBELT REGION

This comprehensive survey is a vital part of efforts to understand the important social and economic factors shaping landholder decision making. Information you provide will guide decision-making and strategic planning by WANTFA, the West Midlands Group, the Liebe Group and Wheatbelt NRM, all organisations working to support landholders to enable viable futures in the Wheatbelt region. Information will also be used to inform the activities of the Australian Soil Cooperative Research Centre.

Surveys are being sent to landholders with properties in the Wheatbelt, identified via ratepayer lists. Each survey has a serial number that links to the property, enabling us to spatially reference our survey results with soil and weather data. There is no other way to obtain this property level information. Our plans are to follow up this survey in about five years, to provide insights into trends over time.

We recognise that you may not be involved in decision making for this property. We are seeking the views of the person/s primarily responsible for managing the property. If you are not involved in the management of the property, please forward the survey to the property manager or return the survey in the postage-paid return envelope. We ask that you only provide information for property/s within the Wheatbelt region.

This voluntary survey should take approximately 25-40 minutes to complete. There are no right or wrong answers and there is no need to think at great length about your responses. If you have any questions about the survey, please contact Dr Hanabeth Luke on 1800 317 503 or by email at Hanabeth.Luke@scu.edu.au

You are assured of complete confidentiality. Your name will never be placed on the survey or used in any of the reports. No group outside the research team will have access to the survey data. Information is published at the regional scale and individual data is never published.

Thank you for your assistance,



Dr. Hanabeth Luke

1. OCCUPATIONAL IDENTITY

Please **circle** the descriptor/term that best describes your **occupational identity**:

Full-time farmer

Part-time farmer

Hobby farmer

Non-farmer

Please circle the **Rainfall zone** most relevant to your main/home property:

Low (Under 325mm) Medium (325-450mm) High (Over 450mm)

What is your local government area? _____

2. ENTERPRISE/ LAND USE MIX

This topic is seeking **information about your current land use/enterprise mix**. Please place a tick besides any correct response in the **'Situation Now'** column. Please answer with the land you own and manage within the WA Wheatbelt region in mind.

ENTERPRISES / LAND USE ON YOUR PROPERTY IN 2020	SITUATION NOW	ENTERPRISES / LAND USE ON YOUR PROPERTY IN 2020	SITUATION NOW
Cereal	<input type="radio"/>	Horticulture	<input type="radio"/>
Legumes/Pulses	<input type="radio"/>	Irrigated agriculture	<input type="radio"/>
Oil seeds	<input type="radio"/>	Area of remnant native vegetation (e.g. trees, grasslands, wetlands)	<input type="radio"/>
Pasture	<input type="radio"/>	Farm forestry	<input type="radio"/>
Dairying	<input type="radio"/>	Other tree planting (e.g. shelter, habitat, erosion or recharge control, carbon)	<input type="radio"/>
Beef cattle	<input type="radio"/>	Farm-based tourism (e.g. farm stays, B&B)	<input type="radio"/>
Sheep for wool	<input type="radio"/>	Heritage agreement/covenant	<input type="radio"/>
Sheep for meat	<input type="radio"/>	Area set aside for living/recreation (e.g. gardens, pets, ocean access, vehicles)	<input type="radio"/>
Other commercial livestock enterprises (e.g. goats, pigs, deer, horse studs, poultry, alpaca, dogs)	<input type="radio"/>	Other (please specify):	<input type="radio"/>
Viticulture	<input type="radio"/>		

3. YOUR ASSESSMENT OF ISSUES

This set of statements seeks your opinion about the importance of a **range of issues that may be affecting your property and your local district**. Examine each statement in the table, then place the number of your response option in each space provided for **'Your view'**.

RESPONSE OPTIONS:

NOT IMPORTANT	MINIMAL IMPORTANCE	SOME IMPORTANCE	IMPORTANT	VERY IMPORTANT
1	2	3	4	5

IMPORTANCE OF ISSUES AFFECTING YOUR LOCAL REGION	YOUR VIEW
Absence of important services and infrastructure (e.g. health, schools, internet, phone coverage). For example:	
Risk to life and property from wildfires	
Availability of water for livestock	
Dry, salinised land undermining long-term productive capacity	
Long-term negative impacts of property purchased by absentees or corporate farms	
The impact of pest plants and/or animals on native plants and animals	
Loss of native plants and animals in the landscape	
Water security	
Changes in weather patterns	
Public support/opposition for agricultural practices (e.g. GMs, animal welfare, pesticide use)	
Herbicide resistance	
Non-agricultural land use (e.g. residential, wind farms, mining) encroaching on farming land Please specify:	
Declining soil health and/or soil productivity	

IMPORTANCE OF ISSUES AFFECTING YOUR PROPERTY	YOUR VIEW
Uncertain/low returns limiting capacity to invest in my property	
Impact of temperature extremes on farm productivity (e.g. frost, heat damage)	
The impact of weeds or feral animals or over-abundant native species on productivity Please indicate the most important:	
Secondary impacts of previous amelioration strategies If important, please indicate amelioration strategy:	

3. YOUR ASSESSMENT OF ISSUES (CONT.)

IMPORTANCE OF SOIL RELATED ISSUES ON YOUR PROPERTY	YOUR VIEW
Soil erosion (e.g. due to wind or water)	
Non-wetting soils	
Declining nutrient status of soils	
Salinity undermining productive capacity of soils	
Soil acidity (lower pH) undermining productive capacity of soils	
Soil sodicity	
Low organic carbon in soils	
Low biological activity in soils	
Soil-borne diseases	
Chemical residue in soils	
Effects of pesticide use on soil biota	
Soil (re)compaction	
Gravels and duplex soil amelioration	

4. THE PRINCIPLES THAT GUIDE YOUR LIFE

The next set of statements seeks information about the **principles that guide your life**. Please number each.

RESPONSE OPTIONS:

NOT IMPORTANT	MINIMAL IMPORTANCE	SOME IMPORTANCE	IMPORTANT	VERY IMPORTANT
1	2	3	4	5

THE PRINCIPLES THAT GUIDE YOUR LIFE	YOUR VIEW
Looking after my family/loved-ones and their needs	
Preventing pollution and protecting natural resources	
Being influential and having an impact on people and events	
Fostering equal opportunities for all community members	
Respecting the earth and living in harmony with nature	
Caring for the weak/vulnerable and correcting social injustice	
Creating wealth and striving for a financially profitable business	

5. WHY YOUR PROPERTY IS IMPORTANT TO YOU

The next set of statements seeks information about the **reasons your property is important to you**. Examine each statement in the table and place the number for your response in the space provided for **'Your View'**.

RESPONSE OPTIONS:

NOT IMPORTANT	MINIMAL IMPORTANCE	SOME IMPORTANCE	IMPORTANT	VERY IMPORTANT
1	2	3	4	5

WHY YOUR PROPERTY IS IMPORTANT TO YOU	YOUR VIEW
Sense of accomplishment from producing food and fibre for others	
Ability to pass on a healthier environment for future generations	
Sense of accomplishment from building/maintaining a viable business	
Provides opportunities to learn new things	
A place or base for recreation	
An asset that will fund my retirement	
A great place to raise a family	
Its native vegetation provides habitat for birds and animals	
An important source of household income	
An attractive place/area to live	
Provides a sense of belonging to a community	
Provides a sense of belonging to a place	
My property is an important part of who I am	
The productive value of the soil on my property	
Native plants and animals make the property an attractive place to live	
An asset that is an important part of family wealth	
Other? Please specify:	

6. YOUR KNOWLEDGE OF DIFFERENT TOPICS

In this section we would like you to provide **an assessment of your knowledge** for a number of different topics. Examine the response options. For each choice in the table, place the number of your response in the **'Your view'** column.

RESPONSE OPTIONS:

NO KNOWLEDGE	VERY LITTLE KNOWLEDGE	SOME KNOWLEDGE	SOUND KNOWLEDGE (sufficient to act)	VERY SOUND KNOWLEDGE (can give a detailed explanation)	NOT APPLICABLE
1	2	3	4	5	6
YOUR KNOWLEDGE OF DIFFERENT TOPICS					YOUR VIEW
Preparing a farm/property plan allocating land use according to land/soil characteristics					
The Aboriginal group/s connected to the area where your property is located					
The role of remnant vegetation in supporting the natural ecosystem					
Strategies to maintain ground cover to minimise erosion in this area					
Options and strategies to (re)establish perennial pastures (e.g. Lucerne/native grasses) in this area					
How to identify the main constraints to soil productivity on your property					
The production benefits of applying biological soil supplements (e.g. compost, manure, microbial inoculants)					
The processes leading to soil structure decline in this area					
The role of soil carbon in maintaining soil health					
How to build soil organic matter/soil carbon					
How land in your district was used and managed before European settlement					
How to use soil testing to prepare a nutrient budget that will increase soil productivity					
Regenerative agriculture and/or holistic farm management					
How to support the persistence of native grasses in this area					
Farming practices that can lead to more nutrient-dense food					
How to (re)introduce more legumes/pulses into your enterprise mix					
Time controlled, holistic or cell grazing strategies					
The role of on-farm biodiversity for supporting soil and landscape health					
Existing data analysis tools to support on-farm decision-making					
The extent and type of biological activity in soils on your property					

7. YOUR VIEWS & EXPERIENCE

We would like to know **how closely the statements presented below reflect your views**. Examine each statement in the table, then place the number for your response in the space provided for **'Your view'**.

RESPONSE OPTIONS:

STRONGLY DISAGREE	DISAGREE	UNSURE/ DON'T KNOW	AGREE	STRONGLY AGREE
1	2	3	4	5

STATEMENTS	YOUR VIEW
The benefits of stubble retention outweigh problems arising from the practice If relevant, how do you manage your stubble?	
The costs of applying lime to balance soil acidity is justified by increased production	
The costs of establishing perennial pasture are justified by the returns	
Soil testing is an essential step in understanding soil condition	
Biological activity is an important indicator of the productive capacity of soils	
Fencing to manage stock access is an essential element of protecting waterways and native vegetation	
I feel a personal responsibility to be part of a local grower group	
I feel a personal responsibility to maintain the productive capacity of my soil	
There is adequate compensation or support provided for conservation activities on my farm	
Pathway to market for my produce is clear	
I usually include another person or people in my on-farm management decisions If yes, please indicate who (i.e. spouse, agronomist):	
I have good systems in place to manage my farm data	
Decision-making needs to be strongly influenced by data	
Internet connectivity is a barrier to my using on-farm data more effectively	
I feel confident working with numbers and managing my farm accounts	
Most years I'm satisfied with my farm's productivity given the seasonal conditions experienced	
I am coping well with the associated stresses and challenges of managing my farm	
Grower groups are the best way to drive and direct local research, development and extension	
I am interested in learning more about regenerative/holistic farming approaches	
Adopting regenerative/holistic farming practices is justified by the returns	

7. YOUR VIEWS & EXPERIENCE (CONT.)

STATEMENTS	YOUR VIEW
I'm confident that landholders in this region can adapt to expected changes in rainfall patterns	
Primary producers should do all they can to reduce carbon emissions from their activities	
Fundamental changes are required to make farming systems more resilient in our region	
I feel adequately supported to conduct farming and land management activities on my property	
I would like to use less chemicals on my farm but it is too difficult in practice	
I have a preferred decision-making tool that I regularly use If yes, please indicate the name of tool:	

OPEN QUESTIONS

What is your main source of support for your agricultural and land management activities (e.g. grower groups, friends)?

What sort of support would enhance your agricultural and land management activities?

Which group/organisation/department do you think would be the most appropriate to provide this support?

Is there a particular technology/tool/innovation that would support your farm management goals?

- Are you a member of WANTFA? No Yes I was a member
- Are you a member of/associated with your regional NRM group? No Yes I was previously
- Are you a member of the West Midlands group? No Yes I was a member
- Are you a member of the Liebe group? No Yes I was a member

STRONGLY DISAGREE	DISAGREE	UNSURE/ DON'T KNOW	AGREE	STRONGLY AGREE
1	2	3	4	5

STATEMENTS (please indicate the extent to which you agree with the following, for the corresponding groups)	WANTFA	Regional NRM group	Local grower group (eg. West Midlands Group, Liebe)
Provides valuable information about soil, agronomy, farm management and/or natural resource management			
Can be relied on to keep landholders' interests in mind when making decisions about research priorities			
Should play an advocacy role/lobby on behalf of my community's needs in regards to research, development & extension (R,D & E)			

What would you most like to see from these groups?

Local Grower Group:

WANTFA:

Regional NRM group:

8. TOP SOURCES OF INFORMATION

In the past 12 months, what have been your **top** sources of **information about topics related to the management of your property in the WA Wheatbelt region?** Please place a tick besides relevant sources in the table below.

MODE OF INFORMATION		ORGANISATION/PERSONS	
Television	<input type="radio"/>	Other farmers	<input type="radio"/>
Books	<input type="radio"/>	West Midlands Group	<input type="radio"/>
Magazines	<input type="radio"/>	Liebe Group	<input type="radio"/>
Newspapers	<input type="radio"/>	WANTFA	<input type="radio"/>
Email(s)	<input type="radio"/>	Regional NRM group (eg. Wheatbelt NRM, NACC)	<input type="radio"/>
Radio	<input type="radio"/>	Local Council	<input type="radio"/>
Field days	<input type="radio"/>	Department of Primary Industries and Regional Development (DPIRD)	<input type="radio"/>
Websites	<input type="radio"/>	Soil CRC	<input type="radio"/>
Instagram	<input type="radio"/>	Rural R&D corporations (e.g. GRDC)	<input type="radio"/>
Twitter	<input type="radio"/>	Extension officers	<input type="radio"/>
Brochures/leaflets/newsletters	<input type="radio"/>	Environmental organisations (e.g. Greening Australia)	<input type="radio"/>
YouTube	<input type="radio"/>	Commodity groups	<input type="radio"/>
Podcasts	<input type="radio"/>	Friends/neighbours/relatives	<input type="radio"/>
Academic journals/research papers	<input type="radio"/>	Universities/CSIRO	<input type="radio"/>
Facebook	<input type="radio"/>	Bureau of Meteorology	<input type="radio"/>
Whatsapp or Messenger groups	<input type="radio"/>	Independent agricultural consultants, agronomists or stock agents	<input type="radio"/>
Other	<input type="radio"/>	Commercial agricultural consultants, agronomists or stock agents	<input type="radio"/>

For your selection/s above, please indicate the title of your preferred top source: (e.g. name of newspaper or website)

9. YOUR VIEWS ABOUT RISK, TRUST AND CLIMATE

In this section we would like to explore your **views about the taking risks, trusting others, and climate change**. For each statement in the table, place the number of your response in the **'Your view'** column.

RESPONSE OPTIONS:

STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
1	2	3	4	5

STATEMENTS	YOUR VIEW
You can't be too careful when dealing with people	
I am usually an early adopter of new agricultural practices and technologies	
People are almost always interested only in their own welfare	
My farm is doing ok the way the things are, I see no reason to change	
I prefer to avoid risks	
I am open to new ideas about farming and land management	
I usually view risks as a challenge to embrace	
Financially, I can afford to take a few risks and experiment with new ideas	
I have sufficient time available to consider changing my practices	
Climate change poses a risk to the region	
Human activities are influencing changes in climate	
It is not too late to take action to address climate change	
If we do nothing, climate change will have dire consequences for all living things, including humans	

10. MANAGEMENT PRACTICES ON YOUR PROPERTY

This section asks about **practices undertaken** on your main or 'home' property in the WA Wheatbelt region during the full period of your management; and the past 5 years. **Tick all relevant:** Some actions may not be relevant to your situation; please ignore those topics.

PRACTICES IMPLEMENTED ON YOUR MAIN OR "HOME" PROPERTY IN THE WHEATBELT REGION	AT SOME POINT (prior to 2015)	PAST 5 YEARS (2015-present)	INTEND TO IMPLEMENT IN NEXT 5 YEARS
Planting of trees and shrubs (incl. direct seeding)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fencing of native bush/grasslands to manage stock access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of time-controlled, cell, or holistic grazing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sowing perennial pastures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of no-tillage techniques to establish crops or pastures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of precision farming techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At least one lime application to arable land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deep ripping of arable land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Application of soil ameliorants other than fertiliser and lime (e.g. gypsum, organic manure)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Testing of soils for nutrient status	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preparation of a nutrient budget for all/most of the property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lethal control of pest animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduction of chemical use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase in chemical use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plant legumes/pulses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic farming. List certification scheme, if applicable:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farming practices you consider to be regenerative Example/s:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What is the most important influence on your soil health?

11. YOUR PROPERTY AND YOU

BACKGROUND INFORMATION	PLEASE TICK OR FILL IN YOUR RESPONSE
What is the total area of land you own in the WA Wheatbelt region? (excluding land you manage but do not own)	_____ total Ha owned
Is this Wheatbelt property your principal place of residence?	<input type="radio"/> No <input type="radio"/> Yes
What area of additional land do you manage (lease/sharefarm/agist from others) in the WA Wheatbelt region (additional to the figure you provided above)?	_____ Additional Ha managed
How long have you or your family owned or managed all/some part of your property?	_____ yrs
How many rural properties do you own within the WA Wheatbelt?	_____ No. of properties
What area of your property is leased, share farmed or agisted by others?	_____ Ha
INFORMATION ABOUT YOU AND YOUR MAIN OR 'HOME' PROPERTY	PLEASE TICK OR FILL IN YOUR RESPONSE
Has this enterprise bought additional land in this region in the past 20 years?	<input type="radio"/> No <input type="radio"/> Yes
Have you subdivided or sold part of your property in this region over the past 20 years?	<input type="radio"/> No <input type="radio"/> Yes
Estimate the number of hours per week that you worked on farming/property related activities (average over the past 12 months).	_____ hrs/week
What is your age ?	_____ years
What is your gender? <input type="radio"/> Male <input type="radio"/> Female <input type="radio"/> Non-Binary	
What is your main occupation (e.g., farmer, teacher, investor, retiree)? _____	
What is the highest level of formal education you have completed? <input type="radio"/> Trained in life but no formal quals <input type="radio"/> Year 10 <input type="radio"/> Year 12 <input type="radio"/> Vocational Certificate <input type="radio"/> Tertiary/Uni	
Are other family members working on your property on a daily or weekly basis ? If yes , please indicate who they are: <input type="radio"/> Spouse/partner <input type="radio"/> Children <input type="radio"/> Parent/s <input type="radio"/> Sibling/s <input type="radio"/> Other/s	<input type="radio"/> No <input type="radio"/> Yes
Have you prepared/are you preparing a property management or whole farm plan that involves a map or other documents that address the existing property situation and include future management and development plans?	<input type="radio"/> No <input type="radio"/> Yes
Is any proportion of your land presently lost to production due to soil problems? If yes, how many hectares have been lost due to soil _____Ha	<input type="radio"/> No <input type="radio"/> Yes
Please specify the issue:	

11. YOUR PROPERTY AND YOU (CONT.)

INFORMATION ABOUT YOU AND YOUR MAIN OR 'HOME' PROPERTY	PLEASE TICK OR FILL IN YOUR RESPONSE
In the past 12 months have you changed your financial or on-property operations as a result of seasonal changes in weather patterns?	<input type="radio"/> No <input type="radio"/> Yes
In the past 12 months have you changed your operations to increase the soil carbon on your property (e.g. by revegetation, soil management)	<input type="radio"/> No <input type="radio"/> Yes
In the past 12 months have you changed your on-property operations as a result of considering opportunities to reduce carbon emissions (e.g. generating wind power, improved practices)	<input type="radio"/> No <input type="radio"/> Yes
Did you earn income from agriculture on your Wheatbelt property during 2018/2019 financial year?	<input type="radio"/> No <input type="radio"/> Yes
Did your Wheatbelt property return a net profit during the 2018/2019 financial year?	<input type="radio"/> No <input type="radio"/> Yes
If yes, was your net 2018/2019 agricultural income above \$50,000?	<input type="radio"/> No <input type="radio"/> Yes
Did you or your spouse/partner receive a net off-property income (after expenses and before tax) in the financial year (2018/2019)?	<input type="radio"/> No <input type="radio"/> Yes, me <input type="radio"/> Yes, my partner
If yes, was the total off-property income for you and/or your spouse above \$50,000?	<input type="radio"/> No <input type="radio"/> Yes
In the 2018/2019 financial year, what percentage of you (and your spouse's) income was earned off farm? (eg from shares, rental income, employment, other business)	_____ %
Estimate the number of days you were involved in paid off-property work in the past 12 months	_____ days per year
Has your WA Wheatbelt property returned a net profit over the last 10 years? (i.e. income exceeded all expenses before tax, on balance, over the 10 year period)	<input type="radio"/> No <input type="radio"/> Yes
In the past 5 years have you or your partner completed a short course/workshop relevant to property management? (e.g. financial planning, integrated pest management)	<input type="radio"/> No <input type="radio"/> Yes, me <input type="radio"/> Yes, my partner
In the last 12 months, did you attend field days, farm walks and demonstrations focused on soil health and productivity?	<input type="radio"/> No <input type="radio"/> Yes
If you ticked no to attending field days/farm walks/demonstrations, what may have prevented you?	
In the last 12 months , what was the most important influence on your profitability?	
What has been the top influence on your profitability over the last ten years ?	
Over the last 10 years, if there is a particular practice change that has played a major role in your farm's profitability, please describe:	
In the next 10 years , what would you see as likely being your biggest challenge and/or opportunity?	

12. LONG TERM PLAN OPTIONS

Please indicate the possibility that your **long-term plans** for your property in the **next 10 years** will involve each of the choices in the table below. *Examine the response options underneath this paragraph. For each choice in the table, place the number of your response option in the 'Your view' column.*

RESPONSE OPTIONS:

HIGHLY UNLIKELY	UNLIKELY	UNSURE	LIKELY	HIGHLY LIKELY
1	2	3	4	5

LIKELIHOOD YOUR LONG-TERM PLANS WILL INVOLVE	YOUR VIEW
Ownership of the property will stay within the family	
The property will be sold	
The property will be subdivided and a large part of the property sold	
I will move off the property around/soon after reaching retirement age	
All or most of the property will be leased or share farmed	
Additional land will be purchased	
Additional land will be leased or share farmed	
The enterprise mix will be changed to diversify income sources	
The enterprise mix will be changed to more intensive enterprises	
The enterprise mix will be changed to less intensive enterprises	
A family member will seek additional off-property work to support the farm	
Some part of my property will be set aside for conservation purposes	
Buying property outside of my current area to mitigate increased seasonal variability	

Do you have **family members interested in taking on your property in the future**? Please tick your answer.

Yes No Unsure/too early to know

If **Yes**, has your family agreed to a **succession plan**? Please circle your answer.

Not started Early stages Halfway Well advanced Completed/Ongoing

OTHER COMMENTS AND THANK YOU FOR YOUR TIME

Do you have any other comments about any of the topics covered in the survey, or other aspects of land and water management in the WA Wheatbelt region? Please use the space provided to write your comments or attach additional sheets. Your comments will be recorded by the research team.

We appreciate the time you have spent answering the questions. **Please return the completed survey in the postage-paid envelope provided**

If you need assistance with the survey, or wish to make specific comments about it, please contact Dr Hanabeth Luke via **1800 317 503**.



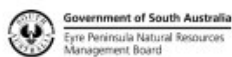
APPENDIX C – EYRE PENINSULA SURVEY



SURVEY NO.

AGRICULTURE ON THE EYRE PENINSULA

RURAL LANDHOLDER SURVEY 2020



SUPPORTING LANDHOLDERS ON THE EYRE PENINSULA

This regional survey is a vital part of efforts by local farming groups to understand the important social and economic factors shaping landholder decision making. Information you provide will guide decision-making by Agricultural Innovation & Research EP (AIR EP, which is the new entity driving farmer-driven research, development and extension on the Eyre Peninsula, formed from a merger of EPARF & LEADA (Eyre Peninsula Agricultural Research Foundation and Lower Eyre Agricultural Association) and Eyre Peninsula Natural Resource Management Board. Aggregated information arising from this survey will be used to inform the research activities of the Australian Government and industry funded Soil CRC, of which AIR EP is a partner.

There is no other way to obtain this property level information. We plan to follow up this survey in five years, to provide insights into trends over time.

We recognise that you may not be involved in decision making for this property. We are seeking the views of the persons primarily responsible for managing the property. If you are not involved in the management of the property, please forward the survey to the property manager or return the survey in the stamped return envelope. We ask that you only provide information for property/s within the Eyre Peninsula region.

Survey forms have been sent to all landholders on the Eyre Peninsula (with properties bigger than 10Ha). It should take approximately 25-40 minutes to complete. There are no right or wrong answers and you do not have to answer every question. If you have any questions about the survey, please phone Dr Hanabeth Luke on **1800 317 503** or by email at Hanabeth.Luke@scu.edu.au

You are assured of complete confidentiality. Your name will never be placed on the survey form or used in any of the reports. No group outside the research team will have access to the survey data. Information is published at the regional scale and individual data is never published.

Thank you for your assistance,



Dr. Hanabeth Luke

1. OCCUPATIONAL IDENTITY

Please **circle** the descriptor/term that best describes your **occupational identity**:

Full-time farmer

Part-time farmer

Hobby farmer

Non-farmer

2. ENTERPRISE/ LAND USE MIX

This topic is seeking information about your current land use/enterprise mix on the land you own and manage within the Eyre Peninsula region. Please **tick** any correct response in the 'Situation Now' column.

ENTERPRISES / LAND USE ON YOUR PROPERTY IN 2020	SITUATION NOW	ENTERPRISES / LAND USE ON YOUR PROPERTY IN 2020	SITUATION NOW
Cropping	<input type="radio"/>	Irrigated agriculture	<input type="radio"/>
Pasture	<input type="radio"/>	Remnant native vegetation (e.g. trees, grasslands, wetlands)	<input type="radio"/>
Dairying	<input type="radio"/>	Farm forestry	<input type="radio"/>
Beef cattle	<input type="radio"/>	Other tree planting (e.g. shelter, habitat, erosion or recharge control, carbon)	<input type="radio"/>
Sheep for wool	<input type="radio"/>	Farm-based tourism (e.g. farm stays, B&B)	<input type="radio"/>
Sheep for meat	<input type="radio"/>	Heritage agreement/covenant	<input type="radio"/>
Other commercial livestock enterprises (e.g. goats, pigs, deer, horse studs, poultry, alpaca, dogs)	<input type="radio"/>	Area set aside for living/recreation (e.g. gardens, pets, ocean access)	<input type="radio"/>
Viticulture	<input type="radio"/>	Other - please specify	<input type="radio"/>
Horticulture	<input type="radio"/>		

Please indicate your rainfall zone:

Low

Medium

High

3. YOUR ASSESSMENT OF ISSUES

This set of statements seeks your opinion about the importance of a range of issues that may be affecting your property and your local district. *Examine each statement in the table, then place the number of your response option in each space provided for 'Your view'.*

RESPONSE OPTIONS:

NOT IMPORTANT	MINIMAL IMPORTANCE	SOME IMPORTANCE	IMPORTANT	VERY IMPORTANT	NOT APPLICABLE
1	2	3	4	5	6

IMPORTANCE OF ISSUES AFFECTING YOUR LOCAL REGION	YOUR VIEW
Absence of important services and infrastructure (e.g. health, schools, internet, phone coverage)	
Support for new and young farmers	
Uncertain/low returns limiting capacity to invest in my property	
Herbicide resistance	
Risk to life and property from wildfires	
The availability of water for livestock	
Dry salinised land (magnesia patches) undermining long-term productive capacity	
Long-term negative impacts of properties being owned by absentees or corporate farms	
The impact of pest plants and/or animals on native plants and animals	
Loss of native plants and animals in the landscape	
Water security	
Changes in weather patterns	
Public support/opposition to agricultural practices (e.g. pesticide use, soil loss, mulesing)	
The impact of weeds or over-abundant native plant species on productivity Please indicate the most important species:	
The impact of feral animals or over-abundant native animal species on productivity Please indicate the most important:	
Non-agricultural land use (e.g. residential, solar, wind farms, mining) encroaching on farming land Please specify:	

3. YOUR ASSESSMENT OF ISSUES (CONT.)

IMPORTANCE OF SOIL RELATED ISSUES ON YOUR PROPERTY	YOUR VIEW
Soil erosion due to wind or water (circle either if one is more important)	
Low permeability of subsoil	
Declining nutrient status of soils	
Soil acidity (lower pH) undermining productive capacity of soils	
Soil sodicity	
Low organic carbon in soils	
Low biological activity in soils	
Soil borne-diseases	
Phosphorus availability in calcareous soils	
Chemical residue in soils	
Effects of pesticide use on soil biota	
Secondary impacts of previous amelioration strategies If important, please indicate amelioration strategy:	

4. THE PRINCIPLES THAT GUIDE YOUR LIFE

The next set of statements seeks information about the **principles that guide your life**. Please number.

RESPONSE OPTIONS:

NOT IMPORTANT	MINIMAL IMPORTANCE	SOME IMPORTANCE	IMPORTANT	VERY IMPORTANT
1	2	3	4	5

THE PRINCIPLES THAT GUIDE YOUR LIFE	YOUR VIEW
Looking after my family/loved-ones and their needs	
Preventing pollution and protecting natural resources	
Being influential and having an impact on people and events	
Fostering equal opportunities for all community members	
Respecting the earth and living in harmony with nature	
Caring for the weak/vulnerable and correcting social injustice	
Creating wealth and striving for a financially profitable business	

5. WHY YOUR PROPERTY IS IMPORTANT TO YOU

The next set of statements seeks information about the reasons your property is important to you. *Examine each statement in the table and place the number for your response in the space provided for 'Your View'.*

RESPONSE OPTIONS:

NOT IMPORTANT	MINIMAL IMPORTANCE	SOME IMPORTANCE	IMPORTANT	VERY IMPORTANT
1	2	3	4	5

WHY YOUR PROPERTY IS IMPORTANT TO YOU	YOUR VIEW
Sense of accomplishment from producing food and fibre for others	
Ability to pass on a healthier and more sustainable farm for future generations	
Sense of accomplishment from building/maintaining a viable business	
Opportunity to learn new things	
A place or base for recreation	
An asset that will fund my retirement	
A great place to raise a family	
A place where I can escape the pressures of life	
The native vegetation on the property provides habitat for birds and animals	
An important source of household income	
An attractive place/area to live	
Provides a sense of belonging to a community	
The productive value of the soil on my property	
Native vegetation makes the property an attractive place to live	
An asset that is an important part of family wealth	
Other? Please specify:	

6. YOUR KNOWLEDGE OF DIFFERENT TOPICS

In this section we would like you to provide **an assessment of your knowledge** for a number of different topics. Examine the response options. For each choice in the table, place the number of your response in the **'Your view'** column.

RESPONSE OPTIONS:

NO KNOWLEDGE	VERY LITTLE KNOWLEDGE	SOME KNOWLEDGE	SOUND KNOWLEDGE (sufficient to act)	VERY SOUND KNOWLEDGE (can give a detailed explanation)
1	2	3	4	5

YOUR KNOWLEDGE OF DIFFERENT TOPICS	YOUR VIEW
Preparing a farm/property plan allocating land use according to land class	
Which Aboriginal group is connected to the area where your property is located	
The role of understorey plants in supporting the natural ecosystem	
The extent and type of biological activity in soils on your property	
Strategies to maintain ground cover to minimise erosion in this area	
How to establish perennial pastures (e.g. Lucerne or native grasses) in this area	
How to identify the main constraints to soil productivity on your property	
The production benefits of applying biological soil supplements (e.g. compost, manure, microbial inoculants)	
The processes leading to soil structure decline in this area	
How to build soil organic matter/soil carbon	
The extent of native vegetation cover in the Eyre Peninsula region before European settlement	
How land in your district was used and managed before European settlement	
How to use soil testing to prepare a nutrient budget that will increase soil productivity	
Regenerative agriculture and holistic farm management	
How to support the persistence of native grasses in this area	
Potential applications of 'virtual fencing'	
The EP Soil moisture probe network	
Farming practices that can lead to more nutrient-dense food	
Time controlled, cell or rotational grazing strategies	

7. YOUR VIEWS & EXPERIENCE

We would like to know **how closely the statements presented below reflect your views**. *Examine each statement in the table, then place the number for your response in the space provided for 'Your view'.*

RESPONSE OPTIONS:

STRONGLY DISAGREE	DISAGREE	UNSURE	AGREE	STRONGLY AGREE	DON'T KNOW	NOT APPLICABLE
1	2	3	4	5	6	7

STATEMENTS	YOUR VIEW
The cost of deep-tillage and subsoil modification are justified by increased production	
The benefits of stubble retention outweigh problems arising from the practice	
The costs of applying lime to address soil acidity are justified by increased production	
The costs of applying gypsum to address soil sodicity are justified by increased production	
The costs of establishing perennial pasture are justified by the returns	
Soil testing is an essential first step in understanding soil condition	
I'm confident that landholders in this region can adapt to expected changes in weather patterns	
Fencing to manage stock access is an essential part of the work required to protect the health of waterways and native vegetation	
Biological activity is an important indicator of the productive capacity of soils	
I feel a personal responsibility to be part of a local research and development group	
I feel a personal responsibility to maintain my soil's productive capacity	
There is adequate compensation or support for conservation activities on my farm	
I usually include another person or people in my on-farm management decisions If yes, please indicate who (i.e. spouse, agronomist):	
I am interested in learning more about alternative/holistic farming approaches	
I have the time available to be involved in the wider agricultural community (i.e. field days, meetings)	
I have good systems in place to manage my farm data	
I would like to do some sort of study/activity to improve my farm management skills	

7. YOUR VIEWS & EXPERIENCE (CONT.)

STATEMENTS	YOUR VIEW
I would like to use less chemicals on my farm but it is too difficult in practice	
I am coping well with the associated stresses & challenges of managing my farm	
Most years I am satisfied with the income from my farm	
Fundamental changes are required to make our region's farming systems sustainable	
Our on-farm income is enough for about everything we want with some left over for savings	
Grower groups are the best way to drive and direct local research, development and extension	
I feel confident working with numbers and managing my farm accounts	
Primary producers should do all they can to reduce carbon emissions from their activities	
I feel adequately supported to conduct farming and land management activities on my property	

QUESTIONS

What is your main source of support for your agricultural and land management activities (e.g. grower groups, friends, consultants)?

What sort of support would enhance your agricultural and land management activities?

Which group/organisation/department do you think would be most appropriate to provide this support?

Are you aware of the existence of EPARF and/or LEADA? Yes No I'm a member

Do you know that EPARF & LEADA have amalgamated to form AIR EP to drive farmer-led research and innovation?

Yes No

STATEMENTS (please indicate the extent to which you agree with the following)	YOUR VIEW
EPARF/LEADA provide valuable information about soil agronomy and farm management	
I can rely on LEADA and/or EPARF (now AIR EP) to keep landholders' interests in mind when making decisions about research priorities	
AIR EP should play an advocacy role/lobby on behalf of the EP agricultural community's needs in regards to Research, Development & Extension (R, D & E)	
AIR EP should drive local R,D & E but nothing more	

What would you most like to see from AIR EP?

8. TOP SOURCES OF INFORMATION

In the past 12 months what have been your sources of information about topics related to the management of your property on the Eyre Peninsula? Please place a tick besides relevant sources in the table below.

SOURCE OF INFORMATION		SOURCE OF INFORMATION	
Television	<input type="radio"/>	PIRSA/SARDI	<input type="radio"/>
Books	<input type="radio"/>	LEADA	<input type="radio"/>
Magazines	<input type="radio"/>	EPARF	<input type="radio"/>
Newspapers	<input type="radio"/>	Local farming groups (e.g. Ag Bureau, Landcare)	<input type="radio"/>
Email	<input type="radio"/>	Other farmers	<input type="radio"/>
Local Radio	<input type="radio"/>	Local Council	<input type="radio"/>
National/State radio	<input type="radio"/>	Universities/CSIRO	<input type="radio"/>
Field days	<input type="radio"/>	Eyre Peninsula NRM	<input type="radio"/>
Websites	<input type="radio"/>	Bureau of Meteorology	<input type="radio"/>
Instagram	<input type="radio"/>	Rural R&D organisations (e.g. GRDC, MLA, AWI, SANTFA)	<input type="radio"/>
Twitter	<input type="radio"/>	Direct contact with researchers/extension officers	<input type="radio"/>
Brochures/leaflets/newsletters	<input type="radio"/>	Environmental organisations, eg. Greening Australia	<input type="radio"/>
YouTube	<input type="radio"/>	Commodity groups	<input type="radio"/>
Podcasts	<input type="radio"/>	Friends/neighbours/relatives	<input type="radio"/>
Journals (research papers)	<input type="radio"/>	Independent agricultural consultants, agronomists or stock agents	<input type="radio"/>
Facebook	<input type="radio"/>	Commercial agricultural consultants, agronomists or stock agents	<input type="radio"/>
Whatsapp or Messenger groups	<input type="radio"/>	Soil CRC	<input type="radio"/>
EP Farming Systems Summary	<input type="radio"/>	For your selection/s above, please indicate the title/ name of your preferred top source (e.g. radio station, paper, organisation or website)	
Other – please specify	<input type="radio"/>		

9. YOUR VIEWS ABOUT RISK, TRUST AND CLIMATE

In this section we would like to explore your **views about the taking risks, trusting others, and climate change**. For each statement in the table, place the number of your response in the **'Your view'** column.

RESPONSE OPTIONS:

STRONGLY DISAGREE	DISAGREE	UNSURE	AGREE	STRONGLY AGREE	NOT APPLICABLE
1	2	3	4	5	6

STATEMENTS	YOUR VIEW
People are almost always interested only in their own welfare	
I am usually an early adopter of new agricultural practices and technologies	
You can't be too careful when dealing with people	
I prefer to avoid risks	
This may not be the best farm around but there is no real need to change	
I really dislike not knowing what is going to happen	
I am open to new ideas about farming	
I usually view risks as a challenge to embrace	
Financially, I can afford to take a few risks and experiment with new ideas	
I don't have enough time to consider changing my practices	
Climate change poses a risk to the region	
Human activities are influencing changes in climate	
It is not too late to take action to address climate change	
If we do nothing, climate change will have dire consequences for all living things, including humans	

10. MANAGEMENT PRACTICES ON YOUR PROPERTY

This section asks about **practices undertaken** on your main or 'home' property in the Eyre Peninsula region previously, as well as those intended for the future. *Tick all where relevant; Some actions may not be relevant to your situation; please ignore those topics.*

PRACTICES IMPLEMENTED ON YOUR MAIN OR "HOME" PROPERTY IN THE EYRE PENINSULA REGION	AT SOME POINT (prior to 2015)	PAST 5 YEARS (2015-2020)	INTEND TO IMPLEMENT IN NEXT 5 YEARS
Planting of trees and shrubs (incl. direct seeding)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fencing of native bush/grasslands to manage stock access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of time controlled, cell or rotational grazing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sowing perennial pastures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of no-tillage techniques to establish crops or pastures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of precision farming techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At least one lime application to arable land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deep ripping of arable land	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Application of soil ameliorants other than fertiliser and lime (e.g. gypsum, organic manure)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Testing of soils for nutrient status in paddocks where have applied fertiliser/soil conditioners in the past	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preparation of a nutrient budget for all/most of the property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planting legumes or pulses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lethal control of pest animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dry sowing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduction of chemical use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase in chemical use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organic farming (whether certified or not)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Farming activities that you consider to be regenerative practice/s For example:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What is the most important influence on your soil health?

In the last 12 months, what was the most important influence on your profitability?

What was the most important non-weather related influence on your profitability, in the last 12 months?

11. YOUR PROPERTY AND YOU

BACKGROUND INFORMATION	PLEASE TICK OR FILL IN YOUR RESPONSE
What is the total area of rural land you own on the Eyre Peninsula? (excluding land you manage but do not own)	_____ total Ha owned
Is your Eyre Peninsula property your principal place of residence?	<input type="radio"/> Yes <input type="radio"/> No
What area of additional land do you manage (lease/sharefarm/agist from others) on the Eyre Peninsula (additional to the figure you provided above)?	_____ additional Ha managed
How long have you or your family owned or managed all/some part of your property?	_____ yrs
What area of your property is leased, share farmed or agisted by others?	_____ Ha
How many rural properties do you own? (within and outside of the Eyre Peninsula)?	_____ No. of properties
How many of these properties are on the Eyre Peninsula?	_____ No. of properties
INFORMATION ABOUT YOU AND YOUR MAIN OR 'HOME' PROPERTY	PLEASE TICK OR FILL IN YOUR RESPONSE
Has this enterprise bought additional land in this region in the past 20 years?	<input type="radio"/> Yes <input type="radio"/> No
Have you subdivided or sold part of your property in this region in the past 20 years?	<input type="radio"/> Yes <input type="radio"/> No
Are other family members working on your property on a daily or weekly basis ? If yes, please indicate who they are (e.g. daughter)	<input type="radio"/> Yes <input type="radio"/> No
1. _____ 2. _____ 3. _____	
What is your gender?	<input type="radio"/> Male <input type="radio"/> Female <input type="radio"/> Non-binary
What is your age?	_____ yrs
What is the highest level of formal education you have completed?	
What is your main occupation (e.g. farmer, teacher, investor, retiree)?	
In the past 5 years have you or your partner/spouse completed a short course/workshop relevant to property management? (e.g. financial planning, integrated pest management)	<input type="radio"/> Me <input type="radio"/> My partner
Estimate the number of hours per week that you worked on farming/property related activities (average over the past 12 months).	
Have you prepared/are you preparing a property management or whole farm plan that involves a map or other documents that address the existing property situation and include future management and development plans?	<input type="radio"/> Yes <input type="radio"/> No
Are you a member or involved with any industry group? (e.g. Livestock SA, Grain Producers SA)	<input type="radio"/> Yes <input type="radio"/> No
In the past 12 months have you changed your financial or on-property operations as a result of seasonal changes in weather patterns?	<input type="radio"/> Yes <input type="radio"/> No

In the past 12 months have you changed your operations to increase the soil carbon on your property (e.g. by revegetation, soil management)	<input type="radio"/> Yes <input type="radio"/> No
In past 12 months have you changed your on-property operations as a result of considering opportunities to reduce carbon emissions (e.g. generating solar and/or wind power, increased power use efficiency, improved grazing practices, improved nitrogen use efficiency)	<input type="radio"/> Yes <input type="radio"/> No
Is any part of your land presently lost to production due to soil problems? a) If yes, what is the approximate proportion of your property? _____	<input type="radio"/> Yes <input type="radio"/> No
b) Please specify the issue/s:	
Did you earn income from agriculture on your Eyre Peninsula property during the 2018/2019 financial year?	<input type="radio"/> Yes <input type="radio"/> No
If yes, did your Eyre Peninsula property return a net profit during the 2018/2019 financial year? (i.e. income exceeded all expenses before tax)	<input type="radio"/> Yes <input type="radio"/> No
If yes, was your net 2018/2019 agricultural income above \$50,000?	<input type="radio"/> Yes <input type="radio"/> No
Did you or your spouse/partner receive a net off-property income (after expenses and before tax) last financial year (2018/2019)?	<input type="radio"/> Yes, me <input type="radio"/> Yes, my partner <input type="radio"/> No
If yes, was the total off-property income for you or your partner above \$50,000?	<input type="radio"/> Yes <input type="radio"/> No
Estimate the number of days that you were involved in paid off-property work in the past 12 months	
Has your Eyre Peninsula property returned a net profit over the last 10 years? (i.e. income exceeded all expenses before tax, on balance, over the 10 year period)	<input type="radio"/> Yes <input type="radio"/> No
In the last financial year, what percentage of you (and your spouse's) income was earned off-farm? (eg from shares, rental income, employment, other business)	
Did you attend field days/farm walks/demonstrations focused on soil health & productivity in the past 12 months?	<input type="radio"/> Yes <input type="radio"/> No
If you ticked no to attending field days/farm walks/demonstrations, what may have prevented you from attending?	
What has been the most important influence on your profitability over the last ten years ?	
Over the last 10 years, is there a particular practice change that has played a major role in your farm's profitability? Please describe:	
In the next 10 years , what would you see as likely being your biggest challenge and/or opportunity ?	

12. LONG-TERM PLANS FOR YOUR PROPERTY

Please indicate the possibility that your **long-term plans** for your property in the **next 10 years** will involve each of the choices in the table below. *Examine the response options underneath this paragraph. For each choice in the table, place the number of your response option in the 'Your view' column.*

RESPONSE OPTIONS:

HIGHLY UNLIKELY	UNLIKELY	UNSURE	LIKELY	HIGHLY LIKELY	NOT APPLICABLE
1	2	3	4	5	6

LIKELIHOOD YOUR LONG-TERM PLANS WILL INVOLVE	YOUR VIEW
Ownership of the property will stay within the family	
The property will be sold	
The property will be subdivided and a large part of the property sold	
I will move off the property around/soon after reaching retirement age	
All or most of the property will be leased or share farmed	
Additional land will be purchased	
Additional land will be leased or share farmed	
The enterprise mix will be changed to diversify income sources	
The enterprise mix will be changed to more intensive enterprises	
The enterprise mix will be changed to less intensive enterprises	
A family member will seek additional off-property work to support the farm	
Some part of my property will be set aside for conservation purposes	
Buying property outside of my current area to mitigate increased seasonal variability	

Do you have **family members interested in taking on your property in the future**? *Please tick your answer.*

- Yes
 No
 Unsure/too early to know

If **Yes**, has your family agreed to a **succession plan**? *Please circle your answer.*

Not started
 Early stages
 Halfway
 Well advanced
 Completed/Ongoing

OTHER COMMENTS AND THANK YOU FOR YOUR TIME

Do you have any other comments about any of the topics covered in the survey, or other aspects of land and soil management in the Eyre Peninsula region? Please use the space provided to write your comments or attach additional sheets. Your comments will be recorded by the research team.

We appreciate the time you have spent answering the questions. **Please return the completed survey in the stamped envelope provided.**

If you need assistance with the survey, or wish to make specific comments about it, please contact Dr Hanabeth Luke via **1800 317 503**.

