Australian Government
Department of Agriculture and Water Resources

This project is supported by funding from the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit program.

Stimulating private sector extension in Australian agriculture to increase returns from R&D

Research Report Summary A:
Farmer demand for agricultural extension services

May 2018

Rural Innovation Research Group
Faculty of Veterinary & Agricultural Sciences
University of Melbourne

Contents

Figures

Tables

To cite this report: Nettle, R., La, N., Smith, E., 2018., Research Report A: Farmer demand for agricultural extension services. Prepared for: *'Stimulating private sector extension in Australian agriculture to increase returns from R&D'*. (May, 2018). A project of the Department of Agriculture and Water Resources (DAWR) Rural R&D for profit program, University of Melbourne, Melbourne, Australia

About the project

Stimulating private sector extension in Australian agriculture to increase returns from R&D is a three-year project to research, develop and test models to build the capacity of the commercial and private sector in delivering R&D extension services to Australian producers.

Led by Dairy Australia, the project is a collaboration involving nine partner organisations including six Research and Development Corporations (RDCs) – Dairy Australia, Meat & Livestock Australia, Cotton Research & Development Corporation, Sugar Research Australia, Australian Pork Limited, Horticulture Innovation Australia – as well as the Victorian and NSW governments, and the University of Melbourne.

The project is funded by the partners and the Australian Government's Department of Agriculture and Water Resources as part of the Australian Government's Rural Research and Development for Profit program.

The project is in response to the trend towards increasing roles for industry and private services in delivering agricultural extension. This represents a shift away from traditional, government-funded extension services over the past 20 years. Currently the extent of private sector involvement in extension varies across industries, depending on product markets, policy settings, regional issues and industry demographics.

The private sector is now a well-used information source for producers, however there is scope to enhance the capability of the private sector in delivering extension. Improving the capacity of private extension service providers will contribute to on-farm productivity gains and profitability.

Companion reports

This report provides a summary of findings from research into farmers' demand (and willingness to pay) for agricultural advisory and extension services (information, advice and support). It is one in a series of four research reports from national surveys of farmers and advisers prepared for the project *Stimulating private sector extension in Australian agriculture to increase returns from R&D*.

- Report A: Farmer demand (this document)
- Report B: Advisory services
- Report C: The advisory and extension system
- Report D: Farmer and adviser networks.
- Report E: The professional development needs of farm advisors
- Research data tables: Focus groups and surveys of farmers and advisors.

Background: Australia's evolving agricultural extension system

Over time, the means and mechanisms by which Australian farmers access and receive their information, advice and support has changed markedly. This is largely because there has been:

- Changes to the role of government and their investment in and coordination of agricultural extension services in each state of Australia.
- Variation in the way Australia's rural Research and Development Corporations have invested in and positioned extension functions.
- Variation in the extent to which a range of private providers have engaged in extension functions and the business models of agricultural service firms.
- Technological change in society, particularly, information and communication technologies.

Executive summary

This report draws upon the results from four focus group workshops held in 2016 and a national survey conducted in 2016. It provides a snapshot of Australian farmers' demand (and willingness to pay) for agricultural advisory and extension services (information, advice and support). The analysis provides a benchmark of the key pinch-points or problem areas in extension and identifies areas for strategic intervention. Overall, the study provides a means for monitoring improvement and progress in these areas.

The key findings are.

Farmers are making on-farm changes in relation to farming practices and management decisions associated with changes to inputs and products, farm business and finally infrastructure, machinery and equipment. However, modern agricultural practices challenge farmers in terms of their skills, knowledge and cost structures. This creates a demand from farmers for advisory and extension services.

Although farmers currently use a wide range of information sources, independent advisers are the most prevalent main source of information. There is some ambivalence among farmers about the trustworthiness, independence and value of the information, advice and support they pay for.

In the near future (five years) there is a likely increase in use of information and advice, particularly in the fee-for-service sector but less so for the Government sector.

The project identified some issues that would be important in unlocking the potential demand from farmers for fee-for-service information, advice and support:

- Increasing the real and perceived value of advice.
- Supporting issues of access.
- Creating opportunities for key groups to be involved in the research, development and extension (RD&E) system.

Research methods

In seeking to better understand farmer 'demand' for advisory and extension services it was important to consider:

- Farmers' current use of advisory and extension services; who they use for information and advice; how they access services and on-farm changes they make.
- Farmers' attitudes towards information/advice and the importance of this in their farming.
- Their involvement in extension projects and willingness to pay.

The findings reported here are drawn from two activities undertaken to better understand farmers' demand for extension services in Australia:

- Four regional forums with farmers and advisers held in 2016 in Queensland, NSW, Victoria and South Australia (143 participants).
- A national survey of farmers (1003 responses) conducted in 2016.

The regional forums used a focus group approach to discussing current key issues and priority areas for private sector involvement in agricultural research, development and extension. The forums were organised by the University of Melbourne's Rural Innovation Research Group. Forums involved 143 farmers and advisers from a range of enterprises across sheep, beef, dairy cotton, sugar, horticulture, pork and poultry in NSW, SA, Queensland and Victoria.

The national farmer survey explored and quantified the extent to which the issues identified by the focus groups were reflected across a broader population of farmers. Stratified sampling techniques were used to ensure a range of enterprises, farm sizes, social and demographic characteristics were represented. Enterprises included grain, sheep, beef, mixed (cropping and grazing), dairy, cotton, horticulture (vegetables), horticulture (fruits), sugar cane, pork/poultry, rice fisheries/aquaculture and 'other'.

The farmer survey employed both on-line (non-random) and telephone interview (random) methods. This work was undertaken by Quantum Market Research.

The survey questions were formulated to allow for comparison with previous Australian studies on these topics (e.g. RIRDC, 2009; Stone, 2011; Wilkinson et al, 2011; AFI, 2014) and allow for comparison with current studies in Europe (E.g. Prager et al., 2016; 2017). In addition, where qualitative information was available in the survey responses, qualitative data analysis techniques (Gibbs, 2004) were applied with the assistance of nvivo-10™ software to generate themes and response counts by categories of farm change (farmer survey).

Research questions

The specific research questions were:

RQ1: How are Australian farmers experiencing the changes in agricultural extension and services?

RQ2: Who are farmers relying on for information advice and support and is the quality and effectiveness of this support meeting their current and future needs?

RQ3: How do farmers discern/decide on what to pay in terms of extension (e.g. decision criteria for paying for advice vs levy-schemes vs memberships)?

RQ4: How do farmers assess the quality and value of advice?

Findings - Regional focus group forums

The findings reported here are from the issues identified during the focus group discussions at the regional forums.

Further reading
Fact Sheet 2: Regional Forums http://rirg.fvas.unimelb.edu.au/ data/assets/pdf_file/0011/2374724/Fact-sheet-forums.pdf

Farmers attending the forums used services provided by consultants, agronomists, agricultural machinery advisers, financial services, genetics and breeding groups, public-service extension, vets and animal nutritionists, their processor, their research and development corporation, farm input retailers, sheep consultants, human resource advice, farm benchmarking services, Landcare, discussion groups, and rural financial counsellors.

Topics discussed at the focus group discussions fell into four themes:

1. Issues that influence farmers' demand for services.
2. Criteria farmers use to choose an adviser and seek advice.
3. Skills farmers expect from advisers.
4. Recognition of farmers' knowledge.

Appendix A provides an overall summary of findings from regional forums with farmers and advisers.

Issues that influence farmers' demand for services

Farmers' demand for services was influenced by access to services, the accessibility and usefulness of information or advice, knowing what information and advice they needed and their limited time to attend events or sift through relevant information.

Access to services was enhanced by being a member of an industry body, part of producer groups, interacting with agronomists at meetings or having phone access to consultants. Other ways farmers accessed information included through on-line tools and 'word-of-mouth'.

Accessibility and usefulness of information or advice. This included how well information was interpreted and packaged, if it was co-ordinated with other advice, if what was needed was accessed through internet searching or relevant for their location.

Knowing what information and advice they needed. This influenced the choice of consultants/advisers but farmers reported it was not always straight-forward. Farmers recognised the importance of choosing an adviser for the right stage of the business and having someone asking the right questions and bringing their attention to relevant issues.

Limited time to attend events or sift through relevant information. This was a driver for the use of an adviser, particularly related to whole of farm advice.

Criteria farmers use to choose an adviser and seek advice

When seeking advice, the criteria used by farmers to select a suitable adviser included the kind of advice needed, return on investment, the adviser's specific knowledge or skills and their 'whole farm' expertise.

The kind of advice needed. Farmers considered the adviser's ability to help with choosing the right kind of advice and the independence of advice.

Return on investment. Farmers expected to make a return on their investment in advisory support ('getting the bang for bucks') but acknowledged that the return was not always clear. Farmers believed most farmers won't pay for advice.

The specific knowledge/skills of the adviser. This related particularly to specific advice on herbicides, sprays etc. and advice on long-term effects. Participants noted a lack of advisers in "precision ag" including robotic systems.

The extent of whole farm expertise. This related to the consultants' ability to look at whole farm issues; often cross-sector.

Skills farmers expect from advisers

Apart from technical capability, farmers expected advisers to have skills related to whole farm knowledge, practical experience, customer focus and soft/interpersonal skills.

Whole farm knowledge and practical experience. Farmers sought advisers with an understanding of the farm as a system and with holistic skills (preference for those who farm themselves). They looked for an ability to integrate advice (multi-discipline) and handle multi-enterprise operations.

Customer focus. Farmers said they needed advisers who 'know and understand our business'; 'an adviser who listens'; someone who 'fits your style/circumstances.'

'Soft'/interpersonal skills. Farmers recognised the importance of good relationships based on trust; they sought advisers with highly developed 'soft skills' who would be more of a coach or could train others. Farmers noted it was difficult to develop close relationships. There were also expectations for advisers to be well connected into networks – such as with researchers or other farmers and with R&D bodies to 'bridge the gaps' between producers, advisers and R&D.

Farmers' own knowledge

Farmers felt there was either not enough acknowledgement or respect of their own knowledge in the advisory relationship and advisory firms or that some farmers followed advice too much. This was expressed in thoughts that 'good consultants are feeding off good farmers' and expectations that advisers have to be bringing more than what the farmer already knows.

Suggestions for acknowledging farmer knowledge more were:

- Leading farms to plug into research.
- Farming system group model: research on farm supported by technical experts as resource.
- The approach used by some research and development corporations that supports collaboration between farmers, advisers and researchers.

Findings – National farmer survey

The survey findings fall within six themes

1. Adoption/practice change is happening
2. Sources of information, advice or support
3. Credibility of sources
4. Future demand trends
5. Farmer learning behaviours
6. Paying for advice

Appendix B includes some of the key response tables, including a breakdown by farming sector. More detailed survey results are available in Milestone Report 3.

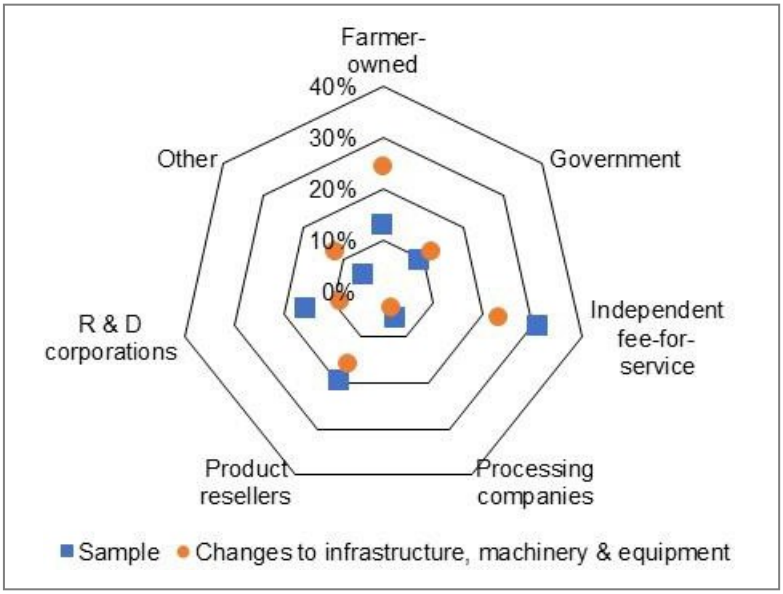
Adoption/practice change is happening

Adoption and practice change on farm is occurring. Changes related to use of farm inputs; the purchase/use of farm machinery/infrastructure; farm business management and farm practices.

- More than 70% of farmers mentioned specific changes made to the management or operation of their farm, as a result of interaction with a 'main' source of information, advice or support.

Farmers credited their engagement with their 'main source' as influencing changes in their farm operations. Private, industry, not for profit and public sector organisations were all used by farmers in practice change. Further analysis of changes made by farmers showed patterns of use of different main sources of advice relative to the type of farm management decisions. For example, farmer-owned organisations were used more than other advisors/organisations for decision making related to infrastructure, machinery and equipment. This reflects the importance of farm demonstrations and trust in peer experiences relating to product choices and large investment decisions.

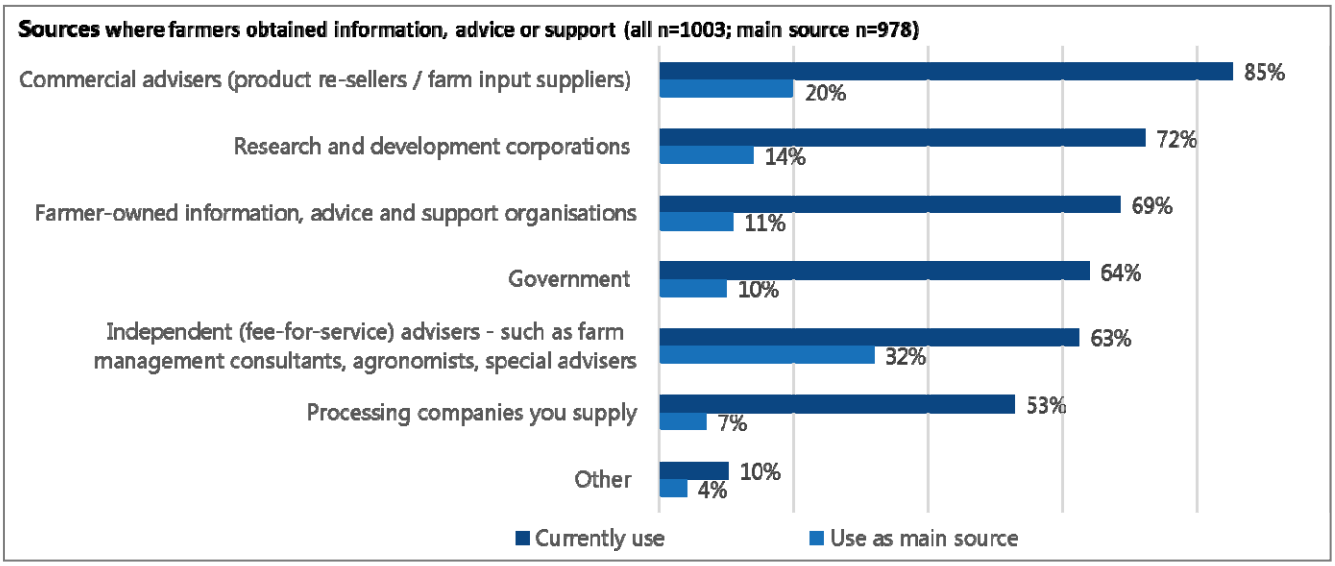
Figure 1: Farmer-owned organisations and other sources were over-represented in terms of farmers changing infrastructure/machinery/equipment. For these decisions, independent fee for service and R&D corporations were under-represented.



Sources of information, advice or support

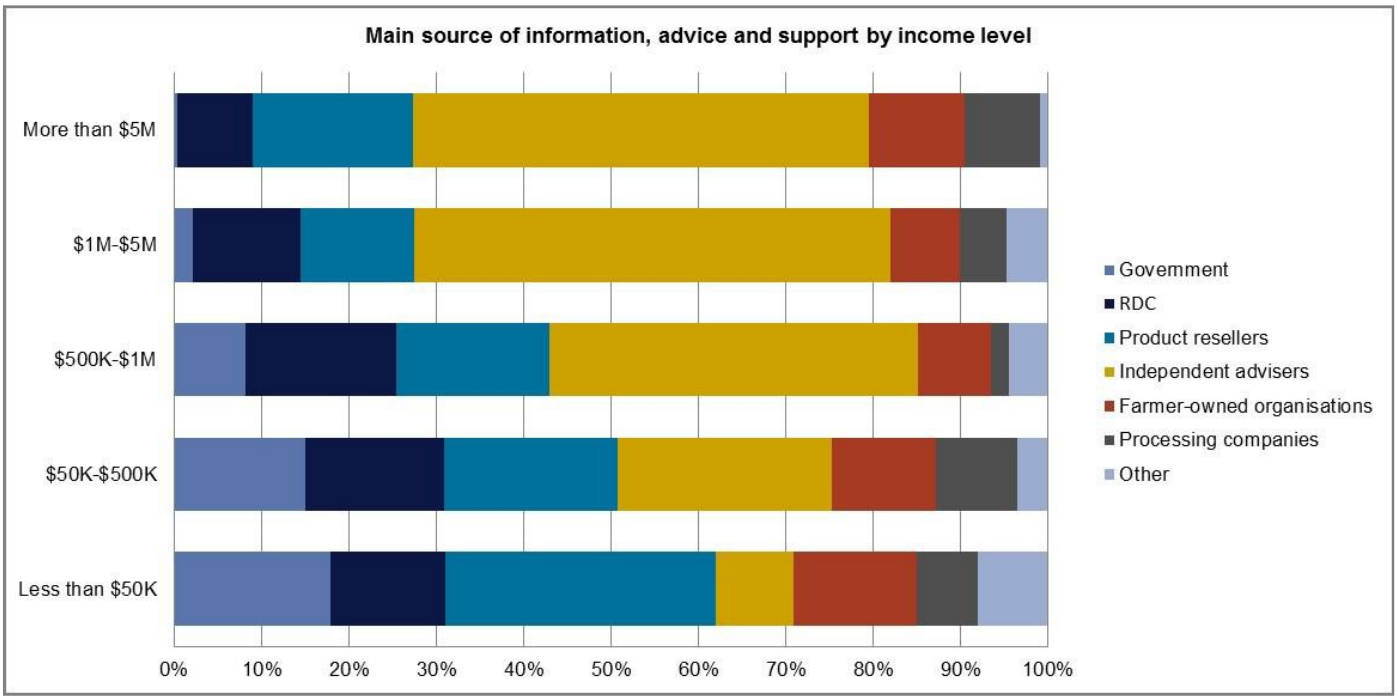
No single provider has the monopoly on providing information, advice or support. While commercial advisers (product resellers/farm input suppliers) were most commonly used, independent advisers were also a prominent main source. Other sources included research and development corporations, government, independent advisers and processing companies (Figure 2).

Figure 2: Sources of information, advice or support for farmers



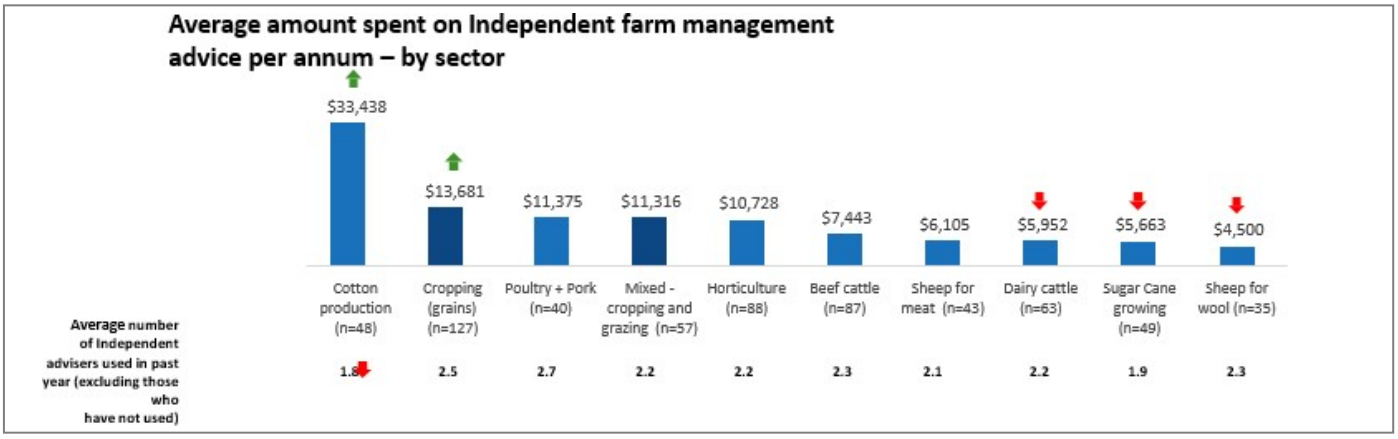
The use of different sources of information, advice and support varied by farm size. For example, smaller farms tended to use commercial advisers (product resellers/farm-input suppliers) and government agencies as a main source of information, advice and support; larger farms (>$501,000 average gross farm income) tended to use independent (fee-for-service) advisers. Figure 3 summarises the relative importance of different sources of information, advice and support by farm income level.

Figure 3: Main source of information, advice and support by income level



The use also varied by industry, with cotton and grains farmers spending the most on independent, fee-for-service advice (Figure 4) – but using the same number of advisers as others. For example, 75% of grains farmers used independent advisers in the past 12 months, with most spending more than $5000. The average expenditure was between $11,000 and $13,000 and 2.5 advisers per farm.

Figure 4: Average amount spent on independent farm management advice per annum – by sector



Credibility of sources

Farmers placed great value on the trustworthiness; value/benefit and independence of information advice and support they sought. However, there was some ambivalence about the trustworthiness, independence and value of information, and support they pay for or receive from their '*main* source'.

- On average, 63% of farmers agreed/strongly agreed they trusted the advice received (75% of those selecting 'government', 72% independent; 62% RDCs) and 59% agreed/strongly agreed it represented value for money) (69% for independent fee for service advisers; 57% government; 49% RDCs).
- Between 29% and 36% of farms neither agreed or disagreed that advice was relevant, useful, trusted or value for money.

The relative influence of providers depended on the type of farm decision. For example, farmer-owned organisations stood out as having greater influence on changes related to infrastructure, machinery and equipment.

Future demand trends

Farmers indicated positive attitudes about the need for information, advice and support:

- 76% of farmers agree it is important to look for new opportunities in farming.
- 78% agree information on farm performance assists control in farming.

However, 69% of farmers said they were not currently participating in extension programs or projects. This could be related to changes in the funding, delivery and 'branding' of extension efforts.

The study found indicators of trend to overall increased future demand for information, advice and support amongst the farming population. While some farmers expect to use more advisory services and others expect to use less, on average, a net 21% of farmers expect their use of information, advice and support from their *main* source to increase (more/a lot more) over the next five years. This was across advisory types:

- Government (net 5% increase: 25% more, 20% less).
- Independent fee-for service advisers (net 27% said increase).
- Research and development corporations (net 31% said increase).

Larger farms were most likely to drive the overall increase in demand for services (38% 'more' 1001+ha vs 26% 0-1000ha) and farms in an expanding phase (39% more). This was also the case for farms in NSW (38% 'more').

Those who expected to use services 'less' tended to be older (17% 60+ years), winding down operations (27%), sole decision-makers (15%) and those who had mainly used government in the past (20%).

Farmer learning behaviours

Farmers recognised that new skills and capabilities are needed in farming.

- Only 56% of farmers agreed that they have all the skills and knowledge needed to manage their properties. However, they don't always know where to get information, advice and support they need.
- Only 40% of farmers agreed they 'always know' where to get the services.

There is demand for both individual and group learning environments. The preferred methods for sourcing information amongst farmers included: attending field days/workshops, searching on the internet and talking to other farmers.

At this stage, social media is of limited importance to farmers as a source of information, advice and support.

- Only 2% preferred social media as a source. Younger, tertiary qualified grains and dairy farmers had higher use of social media.
- Only 4% used Twitter, Facebook or online discussion forums as a method for this purpose.
- When prompted, social media was noted as a source of information by 27% of farms.

Paying for advice

Independent (fee-for-service) advisers have an important role in providing information, advice and support to Australian farmers.

- They are a significant a source for 63% of farmers.
- The main source for 32% of farmers.

Some farming sectors are higher users of independent services than others, ranging from 48% by beef producers to 98% by cotton growers Table 1.

Table 1: Use of fee-for-service advisers by industry sector

		Beef	Cotton	Dairy	Grain	Hort (Fruits)	Hort (Veg)	Mixed crop	Pork and poultry	Rice	Sheep	Sugar cane	Other
Independent (fee-for-service) advisers	Ever use	48%	96%	78%	74%	71%	52%	75%	67%	67%	55%	56%	42%
	Main use	19%	58%	36%	50%	20%	24%	45%	39%	17%	23%	10%	40%

There are mixed attitudes among farmers related to buying/paying for advice:

- Of those farmers nominating their main source as independent 'fee- for service' advisers, 81% agreed/strongly agreed that the advice was relevant/useful (compared with the average of all = 69%).
- 35% of farmers intended to pay for advice (related to farm management) in the next 12 months.
- 28% of farmers were familiar with, and had access to a 'fee-for-service' adviser, but were not willing to pay for this as an individualised service.
- 40% of farmers were unsure of the benefit from paying for advice.

A large proportion of farmers are 'fence-sitting' (i.e. not overtly positive or negative) on this topic and appear to be waiting to be convinced about the benefits. Those less likely to pay for independent advice included farmers 'starting out' and smaller farms. Affordability is an issue for some, with 28% saying it would be difficult to pay for advice in the next 12 months. Some farmers could 'miss out' if there are expectations farmers need to increasingly pay for advice.

Discussion and conclusions

Farmers are making on-farm changes in relation to farming practise and management decisions associated with changes to inputs and products, farm businesses and infrastructure including machinery and equipment. However modern agricultural practises challenge farmers in terms of their skills, knowledge and cost structures. This creates a demand from farmers for advisory and extension services.

Current sources of information, advice and services

Farmers are using a range of sources for their information, advice and support needs including public, industry and private providers. The prevalence of commercial information and advice as a source for farmers is noteworthy with 85% of farmers saying they use commercial farm input and product resellers as a source of information, advice and support, with 20% using these providers as their main source. These providers are the ones least involved in research, development and extension (RD&E) projects. Whilst demand for independent fee-for-service advice is set to increase, currently only 32% of farmers pay for this form of advice and 35% of farmers intend to pay for advice in the next 12 months.

Although farmers currently use a wide range of information sources, independent advisers form the most common source of information.

This pattern of multiple sources of information, advice and support reflects findings from previous research conducted in Victoria (Wilkinson et al, 2011). In a study of 1300 farmers and their use of different kinds of services or information, most farmers used multiple sources of information such as government/department of primary industry (DPI) and either a consultant or retailer or both (19%). Those who relied on a single source used government only (10%), consultants only (12%) and commercial farm input/retailers only (14%). Larger farms spent much more on consultants than the average. The gross expenditure on consultants by larger farms reflected continued growth trends of the past decade. In that study, the authors recommended that to support productivity and economic policy objectives related to growth, the role of government should be focused toward working with private consultants and farm product retailers as intermediaries and supporting their engagement in the extension system, given their central role working with expansion-oriented farms.

Demand trends

Farmers indicated increased 'substantive' demand for services (Klerkx, 2006) with between 76-78% of farmers surveyed seeing the value of information and advice in farm management and the importance of identifying new opportunities in farming. Demand is likely to increase in the next five years with 21% (net) of all farmers agreeing/strongly agreeing their demand for information, advice and support will increase more/a lot more.

Demand increases for advisory services will focus toward independent fee-for-service advisers and research and development corporations. However, government services remain important for some farmers, particularly smaller farms and in the beef sector.

Profit is not the only driver for seeking information, advice and support, with 62% of farmers agreeing it is an important focus to have and 21% suggesting it will be hard to further lower costs of production.

'Economic demand' (Klerkx, 2006) of farmers is a trade-off between receiving what they need from a range of providers and a low willingness to pay for advice. Australian farmers clearly value independent, practical advice that can make a difference to their farm business. However, there is some ambivalence among farmers about the trustworthiness, independence and value of information, advice, and support they pay for. Some (28%) farmers already have some interaction with a fee-for-service adviser but are not willing to pay. The main reasons for this unwillingness to pay are affordability and the perception of value and benefit from these services. While those farmers who pay for advice see the relevance and value, government is still considered a trusted source of advice.

Methods to increase trust in, and value from, advice from the private sector can assist farmers in having greater confidence.

Accessing services

An emerging issue is farmers' understanding of the role of the private sector in extension. The gradual withdrawal of public-funded extension projects and programs and greater diversity of providers of services means extension material is not necessarily 'packaged' or 'branded' under a particular extension project or program name.

Farmers may find it difficult to recognise extension projects/programs and understand the role of the private sector in extension at all.

This uncertainty was reflected in farmers' participation in extension projects (69% not participating) and in responses to questions related to private sector involvement in extension. The non-government sector (e.g. farm management consultants, agronomists, specialist advisers, commercial input providers; processing companies etc.) have had an increasing role in providing information, advice and support to farm productivity and industry development. When farmers were asked their opinion on the trend related to the quality, effectiveness of delivery and willingness to pay for extension services provided by the private sector, 52% of farmers neither agreed nor disagreed with statements, reflecting a high level of uncertainty about the role of the private sector. Only a third of farmers viewed non-government agricultural extension services as high quality and felt they are effective in delivery (32%). Only 18% were willing to pay to be involved in extension programs managed and delivered by the private sector. Those sectors least willing to pay for private-sector managed or delivered extension services were beef farmers (40% not willing); sugar

growers (39% not willing); pork and poultry (38% not willing), horticulture and sheep meat (29% not willing) and dairy (28% not willing).

These trends reflect findings from overseas studies related to the privatisation process and the rise of 'pluralistic' extension systems (Birner, 2009). As government extension providers withdraw, the number and diversity of providers of extension functions increases. In response, farmers identify less with 'extension' and indicate increased uncertainty with where to get the information and advice they need (Klerkx and Leewuis, 2006). In other countries, this has stimulated new organisations and services related to brokering or connecting farmers with specific services. Given agricultural productivity growth depends on the application of knowledge (both existing and new), it is important to address any gaps or fragmentation in the knowledge system.

Effective sign-posting and sophisticated searching support can make it easier for farmers to locate who and what they need. This requires coordination and effort by industry and government as well as providers being clearer on what they can offer. However, the results suggest that the issues in the knowledge system in Australia extend beyond that of access and signposting to current services. Farmers indicated that the challenges of farming mean new skills and capabilities are needed. Here, farmers expressed interest in interacting with researchers and research organisations more, reflecting demand for opportunities to discuss, interpret and experiment with change and evaluate options.

An extension system based on one-way communication methods and sources alone is clearly not the system valued by farmers.

Meeting this demand presents additional challenges for RD&E with the research investment and research performance measures separate from the extension system (Keogh, AFI, 2014 and 2017). This also relates to information and communication technologies. Advances in digital information and communication technologies are recognised as a key part of agriculture's future. However, both farmers and advisers highlight the importance of field days, meetings and group learning alongside internet searching as key ways to source information. There is a high risk in pursuing only digital communication and engagement strategies to support significant practice change in farming.

Future opportunities

The results reinforce international studies that indicate that farmers are most engaged by extension systems that are tightly coupled with R&D and have diverse providers (Garforth *et al,* 2003). Advisory methods are not necessarily substitutable but cumulative and reinforcing (Leeuwis and Aarts, 2011).

The nature of farmers' demand revealed in this study, suggests that greater investment is needed to:

- Generate more value from the diversity of providers.
- Enhance the value and benefits for farmers from independent advice.
- Increase clarity of access and farmers' connection with providers (including researchers).
- Put strategies in place to engage the diversity of farm-level providers in the broader RD&E system and its activities.

Limitations

The farmer survey has aligned with results of the face-to-face forums and with similar studies in Australia and overseas, but the survey was conducted at the end of a period in which some agricultural industries had experienced low commodity prices and some areas of Queensland had experienced prolonged drought. Farm incomes of our respondents may well have been unusually low. This would particularly be the case for dairy farmers affected by the flow-on impacts of decisions by Murray Goulburn and Fonterra to reduce milk process mid-season. This affected the response rate of dairy farmers and their potential responses related to income and use of advice. However, not all industries and farmers experienced low prices, and not all regions of Queensland were impacted by drought. In addition, some respondents may have confused gross income with net income which may distort results related to farm size in the analysis. Results from the survey that relate to specific industries have been provided, however some responses from states such as Western Australia, Tasmania and the Northern Territory were low. The greatest

confidence in results relate to the states of Queensland, NSW and Victoria as well as the grains, beef, sheep and horticulture sectors. The survey findings provided in this report relate to the national sample of farmers and have a low margin of error.

Project publications

Nettle, R. 2017, Workshop paper: farmers adoption and farmers benefitting from R&D – where are we now? University of Melbourne

Nettle, R., Klerkx, L., Faure, G., Koustouris, A., 2017, Governance dynamics and the quest for coordination in pluralistic agricultural advisory systems, *The Journal of Agricultural Education and Extension* 23:3, 189-195, DOI: 10.1080/1389224X.2017.1320638

Nettle, R., La, N., Smith, E.: Milestone Report 3, University of Melbourne.

Paschen, J. A., Reichelt, N. King, B. Nettle, R., 2017, Enrolling advisers in governing privatised agricultural extension in Australia: challenges and opportunities for the research, development and extension system, Journal of agricultural education and extension http://dx.doi.org/10.1080/1389224X.2017.1320642

References

AFI, 2014, The Public and Private Sector Grain Advisory Systems in Australia (part 1) and Optimizing future extension systems in the Australian grains industry (Part 2), Australian Farm Institute, September, 2014. ISBN 978-1-921808-34-0

Birner, R., K. Davis, J. Pender, E. Nkonya, P. Anandajayasekeram, J. Ekboir, A. Mbabu, et al. 2009, From Best Practice to Best Fit: A Framework for Designing and Analyzing Pluralistic Agricultural Advisory Services Worldwide. *The Journal of Agricultural Education and Extension 15 (4): 341–355*

Garforth, C., B. Angell, J. Archer, and K. Green. 2003. "Fragmentation or Creative Diversity? Options in the Provision of Land Management Advisory Services." *Land Use Policy* 20 (4): 323–333. doi: http://dx.doi.org/10.1016/S0264-8377(03)00035-8

Gibbs, G.R. 2004. Searching for Text, In: Seale, C. (ed.) *Social Research Methods- A reader*, Routledge, London, pg 301-311.

Keogh, M, Julian, C. AFI, 2014. The Public and Private Sector Grain Advisory Systems in Australia (part 1) and Optimizing future extension systems in the Australian grains industry (Part 2), Australian Farm Institute September, 2014. ISBN 978-1-921808-34-0

Keogh, M, Heath, R, Henry, M & Darragh, L. AFI, 2017. Enhancing Private-Sector Investment in Agricultural Research Development and Extension (R,D&E) in Australia December, 2017, ISBN 978-1-921808-42-5

Klerkx, L., K. De Grip, and C. Leeuwis. 2006. "Hands Off But Strings Attached: The Contradictions of Policy-Induced Demand-Driven Agricultural Extension." *Agriculture and Human Values* 23 (2): 189–204.

Klerkx, L., & Leeuwis, C. 2008. Matching demand and supply in the agricultural knowledge infrastructure: Experiences with innovation intermediaries. *Food Policy, 33*, 260–276

Labarthe, P., M. Caggiano, C. Laurent, G. Faure, and M. Cerf. 2013. *Concepts and Theories Available to Describe the*

Leeuwis, C., and N. Aarts. 2011. "Rethinking Communication in Innovation Processes: Creating Space for Change in Complex Systems." The Journal of Agricultural Education and Extension 17 (1): 21–36.

Mullen, J. D., Vernon, D. and Fishpool, K. I. 2000, 'Agricultural extension policy in Australia: Public funding and market failure' in *The Australian Journal of Agricultural and Resource Economics,* vol. 44, no. 4, pp. 629-645

Prager, K, Labarthe, P, Caggiano, M, Lorenzo-Arribas, A. (2016) How does commercialisation impact on the provision of farm advisory services? Evidence from Belgium, Italy, Ireland and the UK. Land Use Policy, 52, 329-344.

Prager, K., R. Creaney, and A. Lorenzo-Arribas. 2017. "Criteria for a System Level Evaluation of Farm Advisory Services." Land Use Policy 61: 86–98.

RIRDC, 2009, Maximising the Connection between RD&E Providers and Agribusiness - Establishing and testing a Management System that will facilitate the transfer of RD&E through agribusiness to growers. A report for the Cooperative Venture For Capacity Building RIRDC Publication No 08/180 by Gordon Stone & Associates (Project No GSA-2A).

Stone, G., 2011, National RD&E Survey Australian RDC and CRC organisations.

Wilkinson, R., Barr, N., and Hollier, C. (2011) Segmenting Victoria's farmers, Department of Primary Industry, State of Victoria.

Appendix A: Overall summary of regional farmer and adviser forum findings

The project held a series of regional forums in the first half of 2016, which were attended by close to 150 advisers and farmers from a range of agricultural industries. Forums were held in: Adelaide and South Australia (March); Traralgon, Victoria (April); Toowoomba, Queensland (May) and Wagga Wagga, NSW (June).

The forum aims were to:

- Define key issues farmers and advisers face related to the agricultural research, development and extension system;
- Identify opportunities for improvement in engaging the private sector in extension; and,
- Provide feedback on suggested trial concepts.

The forums used a focus group approach to discussing current key issues and priority areas for private sector involvement in agricultural research, development and extension. Participant comments were noted down in 'workbooks'. Thematic clusters of key issues and opportunities emerging from the overall discussions were established:

1. **More collaborative knowledge production approaches** were needed: Forums/a platform for co-operative engagement between producers, researchers and advisers based on equal partnership and involving:
   - Encouraging and listening to producer feedback (e.g. surveying producers re R&D needs; producer initiated projects).
   - Initiatives driven by farmers and knowledgeable advisors.
   - Involve advisers in research projects.
   - More focus on applied research.
   - Utilise farmer/producer extension groups.
2. **Research directions need to draw more from adviser/producer needs** and provide strategic-level support to issues in the RD&E system
   a. Address financial constraints to accessing research and advice and engaging in the RD&E system (advisers and producers):
      – "Most people won't pay for private advice."
      – "Access to the latest research often comes at great time and financial costs for small businesses."
   b. Greater cross-industry exchange/networking and partnership approaches at the local or regional level was sought**:** They saw opportunities to better transition research findings into D (development) and E (extension). Participants wanted to explore opportunities for collaborative activities to: involve producers and advisers (e.g. advisory committees); work with private organisations for local best practices/ideas; work across industries to pool information, resources, and ideas; reduce duplication of research.
   c. Making advice relevant requires more than information provision: Significant funds are invested by rural research and development corporations on communication and extension, yet the content was often seen as not relevant at the farm level, or difficult to see how it could be applied in practice. Participants reported that Australian farmers are time poor and operate in an era of information overload. More important questions were: "What is and what isn't relevant? Which adviser do I need? How can I set my priorities right?"
   d. Whole farm systems approaches in RD&E are needed**:** Participants saw a need for translation of research into practice, particularly in the whole farms systems context. Producers are looking for consultants (advisers in the private sector) who can provide advice that fits into the 'whole farm picture' but this requires hands on, practical experience and diverse skills whereas many advisers have specialist knowledge. Participants reported a lack of farm advisers who could provide systematic/integrated advice that considers the whole farm business, including marketing, climate, machinery, nutrition, financial and 'soft' (HR/people) issues. They acknowledged a lack of opportunities for advisers to gain experience

e. Research and research communication methods need to change: more involvement of advisers and farmers to: identify research needs, extending the findings of research; have an equal partnership in driving research priorities. They suggested that better collaboration and 'more structured talking' would reduce the current level of waste and duplication of research
f. Innovation and change in the way RD&E is done – new models are needed. Good research did not always equate to increased profit. They identified challenges with:
    i. measuring the true economics of research on farm/whole business impact/gains.
    ii. the time involved in deciphering and understanding research findings before extending.
    iii. finding people who can translate research output into recommended farming practices that have a real impact.
    iv. the need for consistency of messaging and co-ordinated delivery of information.
    v. facilitators with 'soft skills'.
    vi. access to research data, research outcomes and better management.

Forum participants called for 'fundamental changes' – a new model based on the core drivers of farmers on the ground. Recognising that many producers are multi-industry (e.g. livestock and crop producers), participants asked for 'out of the square' solutions, calling for a new model that would ensure application of R&D outcomes. They saw the need for a 'cross-industry group' of senior decision makers who could approve projects, then leave a project team to implement it. They wanted the complexity of extension to be recognised – that one solution doesn't fit all.

They recognised that the next generation of advisers and producers needed to be engaged and motivated to be self-directed learners, involved in the industry and able to understand the system implications of research findings.

Appendix B: Survey response tables

Table 2: Results of farmer attitudinal statements

Attitudes toward farming	Agree	Neither agree nor disagree	Disagree
Having information about a farms performance is important for control in farming (n = 1003)	78%	19%	2%
Identifying new opportunities in farming is essential (n = 1003)	76%	22%	2%
It is important in farming to focus on profit n = 1003)	62%	36%	2%
I currently have the skills and knowledge required to manage the property / farm effectively (n = 512)	56%	39%	5%
I always know where to get the information or advice that I need (n = 512)	40%	51%	9%
I can further lower my cost of production (n = 512)	37%	42%	21%
I prefer to leave experimenting with new ideas to someone else (n = 1003)	15%	45%	40%
I don't make plans because they don't work out in reality (n = 512)	6%	20%	74%

Table 3: Sectoral differences with respect to attitudinal statements

Attitudes of farming	Beef	Cotton	Dairy	Grain	Hort (Fruits)	Hort (Veg)	Mixed crop	Pork and poultry	Rice	Sheep	Sugar cane	Other
Having information about a farms performance is important for control in farming (% Agree - 6 & 7)	75%	88%	78%	82%	91%	87%	78%	88%	67%	67%	84%	58%
Identifying new opportunities in farming is essential (% Agree - 6 & 7)	76%	72%	64%	78%	88%	83%	74%	82%	75%	68%	81%	75%
It is important in farming to focus on profit (% Agree - 6 & 7)	52%	78%	69%	71%	63%	70%	70%	62%	58%	51%	73%	42%
I currently have the skills and knowledge required to manage the property / farm effectively (% Agree - 6 & 7)	47%	63%	63%	56%	55%	73%	56%	62%	0%	53%	75%	50%
I always know where to get the information or advice that I need (% Agree - 6 & 7)	32%	54%	46%	38%	44%	64%	46%	29%	0%	33%	58%	0%
I can further lower my cost of production (% Agree - 6 & 7)	43%	63%	27%	24%	42%	55%	38%	50%	100%	42%	29%	50%
I prefer to leave experimenting with new ideas to someone else (% Disagree - 1 & 2)	37%	36%	46%	36%	62%	52%	38%	55%	67%	37%	44%	42%
I don't make plans because they don't work out in reality (% Disagree - 1 & 2)	75%	88%	78%	82%	91%	87%	78%	88%	67%	67%	84%	58%

Table 4: Farmers sources of information, advice and support (all farms) by organisation

Source of information, advice and support	Use of source		Main source	
	N	%	N	%
Any source	979	98%	-	-
Government	655	64%	92	11%
Research and development corporation	761	72%	152	14%
Product reseller / farm input suppliers	866	85%	194	20%
Independent (Fee-for-service) advisers	650	63%	305	33%
Farmer-owned information, advice and support organisations	705	69%	126	11%
Processing companies	576	53%	60	7%
Other	104	10%	49	4%

Table 5: Farmers sources of information, advice and support (all use and main source) by sector

		Beef	Cotton	Dairy	Grain	Hort (Fruits)	Hort (Veg)	Mixed crop	Pork and poultry	Rice	Sheep	Sugar cane	Other
Government	Ever use	62%	80%	56%	66%	74%	52%	71%	58%	83%	64%	66%	42%
	Main use	22%	6%	6%	3%	10%	5%	7%	7%	8%	11%	5%	10%
Research and development corporations	Ever use	60%	94%	72%	82%	76%	70%	84%	73%	92%	76%	89%	42%
	Main use	14%	20%	11%	13%	10%	10%	9%	18%	8%	23%	26%	0%
Product re-sellers / farm input suppliers	Ever use	83%	96%	94%	87%	87%	83%	92%	72%	100%	80%	97%	67%
	Main use	23%	12%	28%	14%	19%	33%	21%	18%	25%	23%	14%	30%
Independent (fee-for-service) advisers	Ever use	48%	96%	78%	74%	71%	52%	75%	67%	67%	55%	56%	42%
	Main use	19%	58%	36%	50%	20%	24%	45%	39%	17%	23%	10%	40%
Farmer-owned information, advice and support organisations	Ever use	57%	74%	64%	81%	75%	61%	74%	68%	83%	60%	92%	67%
	Main use	11%	2%	9%	11%	15%	10%	9%	11%	17%	8%	41%	10%
Processing companies you supply	Ever use	48%	80%	69%	53%	62%	43%	54%	52%	100%	49%	78%	33%
	Main use	9%	0%	10%	6%	4%	10%	7%	4%	25%	6%	2%	0%
Other	Ever use	9%	4%	5%	6%	30%	13%	9%	7%	17%	10%	6%	42%
	Main use	2%	2%	0%	3%	22%	10%	3%	5%	0%	5%	1%	10%
Total		**181**	**50**	**81**	**171**	**107**	**23**	**76**	**60**	**12**	**142**	**88**	**12**

Table 6: Farmers' evaluation of information, advice, or support

	Agree	Neither agree nor disagree	Disagree	Don't know
Relevant and useful (n=978)	69%	29%	1%	0
Value for money (n=952)	61%	37%	2%	0
Trust (n=977)	63%	35%	2%	0
Result in change of farm management / business (n=976)	53%	43%	4%	0

Table 7: Farmers' evaluation of information, advice, or support by sector (among those who agree)

	Beef	Cotton	Dairy	Grain	Hort (Fruits)	Hort (Veg)	Mixed crop	Pork and poultry	Rice	Sheep	Sugar cane	Other
Relevant and useful (n=687)	27%	0%	6%	33%	8%	1%	9%	1%	0%	9%	3%	2%
Value for money (n=598)	26%	0%	6%	32%	9%	2%	10%	1%	0%	9%	3%	3%
Trust (n=639)	27%	0%	6%	31%	9%	2%	10%	1%	0%	9%	3%	2%
Result in change of farm management / business (n=539)	29%	0%	7%	28%	9%	1%	10%	1%	0%	8%	3%	3%

Table 8: Farmers' attitudes toward non-government sector extension services

	Agree	Neither agree nor disagree	Disagree	Don't know
The non-government sector is able to effectively deliver agricultural extension services (n=999)	32%	52%	12%	4%
I feel that the quality of non-government sector agricultural extension services is high (n=998)	33%	52%	11%	5%
I would be willing to pay to be involved with agricultural extension programs, where they are managed or delivered by a non-government sector organisation (n=999)	18%	52%	28%	2%

Table 9: Willing to pay for non-government extension services (by sector)

	Beef	Cotton	Dairy	Grain	Hort (Fruits)	Hort (Veg)	Mixed crop	Pork and poultry	Rice	Sheep	Sugar cane	Other
Agree	15%	24%	14%	21%	27%	26%	21%	18%	8%	20%	14%	8%
Neither agree nor disagree	44%	64%	54%	63%	42%	39%	55%	38%	58%	54%	43%	75%
Disagree	40%	8%	28%	15%	27%	35%	24%	38%	33%	26%	39%	17%
Total (n)	179	50	81	170	107	23	76	60	12	142	87	12

Table 10: Farmers' opinion on how well the agricultural extension system currently operates for farmers (by sector)

		Cotton production (n=49)	Sugar Cane growing (n=87)	Dairy cattle (n=79)	Horti-culture (n=128)	Cropping (grains) (n=167)	Sheep for meat (n=83)	Beef cattle (n=171)	Mixed - cropping and grazing (n=73)	Poultry / Pork (n=55)	Sheep for wool (n=55)
Farmers in your sector / industry	% Agree (6 & 7)	**49%**	**25%**	23%	19%	18%	15%	15%	12%	12%	11%
	% Disagree (1 & 2)	8%	18%	22%	**22%**	8%	9%	16%	18%	**26%**	13%
You and your farm	% Agree (6 & 7)	**41%**	**25%**	19%	19%	17%	16%	13%	15%	12%	13%
	% Disagree (1 & 2)	8%	19%	23%	23%	10%	14%	25%	25%	**39%**	20%
Farmers in your local area	% Agree (6 & 7)	**27%**	**23%**	11%	16%	15%	12%	9%	11%	7%	11%
	% Disagree (1 & 2)	12%	18%	**24%**	21%	9%	11%	18%	18%	21%	11%
Farmers in your State	% Agree (6 & 7)	**18%**	10%	14%	9%	9%	8%	6%	8%	8%	7%
	% Disagree (1 & 2)	12%	14%	**22%**	16%	8%	12%	11%	19%	14%	11%