

A coordinated approach to research and development

6.1 Professor Mark Dodgson, of the University of Queensland, told the Committee:

Just like every other productive sector in Australia, the fundamental issue confronting innovation is how well the various parts of the chain are connected.¹

6.2 It was proposed that agricultural innovation be thought of as more than the adoption of new technology, but also as a 'systematic process grounded in functioning and well-orchestrated relationships between multiple stakeholders'.² Such stakeholders include farmers and communities; developers and suppliers of technology; people and organisations who educate and advise farmers; participants in the product supply chain; and policy-makers and regulators.³

6.3 The Committee heard evidence that some features of the current agricultural innovation system, which facilitates important relationships between industry, government and knowledge providers (universities), can be prohibitive to agricultural innovation and collaboration. The Committee also heard that innovation is being stymied by competing incentives across these key players.

6.4 This chapter considers the current agricultural innovation system in Australia, and the barriers this model may create in furthering agricultural innovation and adopting emerging technologies across the sector. The chapter also considers current issues that affect investment in agricultural research and development (R&D) by universities and the private sector,

1 Professor Mark Dodgson, University of Queensland, *Submission 86*, p. 1.

2 University of Melbourne, *Submission 4*, p. 1.

3 University of Melbourne, *Submission 4*, p. 1.

and the role that effective partnerships and collaboration will play in the future of agricultural innovation.

Collaboration in research and development

- 6.5 Mr Tim Lester, from the Council of Rural Research and Development Corporations (Council of Rural RDCs), stated that effective collaboration must be driven by shared purpose, as collaboration is a resource intensive exercise:

Collaborations work best when there is strategic alignment, rather than saying, 'Well, we should collaborate for the sake of it.'

Collaborating for the sake of it is just a drain on resources.

Collaboration is actually resource intensive. If you are driving purely for efficiency of outcome, then that is not necessarily going to drive a lot of collaborative behaviour either. However, there are points of strategic alignment, and we are working on those.⁴

- 6.6 Inquiry participants raised the need to facilitate and encourage more collaboration across the agricultural industry to drive further innovation. In particular, evidence suggested that more cross-sectoral collaboration was required to harness emerging technologies and boost productivity across agriculture.
- 6.7 Before considering how government might further encourage and facilitate collaboration and cooperation throughout the agricultural sector, it is first prudent to consider the collaboration on agricultural innovation currently taking place between the government, industry, and knowledge providers.

Industry collaboration

- 6.8 As outlined in Chapter 2, federal Research and Development Corporations (RDCs) and Cooperative Research Centres (CRCs) each have an important role to play in agricultural innovation.
- 6.9 RDCs are service providers to industry, creating partnerships between government and industry, and setting the direction for investment in and adoption of R&D.⁵ CRCs have a narrower role, and operate to facilitate researchers working on a specific issue within a defined period of time.⁶

4 Mr Tim Lester, Operations Manager, Council of Rural RDCs, *Committee Hansard*, Canberra, 25 February 2016, p. 1.

5 See Council of Rural RDCs, *Submission 90*, p. 4.

6 Mr Tim Lester, Operations Manager, Council of Rural RDCs, *Committee Hansard*, Canberra, 25 February 2016, p. 2.

In this way, each has a distinct role in driving collaboration in the agricultural sector.

- 6.10 As discussed in Chapter 2, contributions to R&D investment from industry are made through levies on production, where the Australian Government matches contributions made by industry (through RDCs) to a capped limit.⁷ As discussed below, this levy system is said to affect the levels of collaboration across the sector.

Cooperative Research Centres

- 6.11 The Committee heard evidence supporting the CRC model as an effective means of driving innovation within the agricultural sector, and facilitating collaboration across and outside the sector.

- 6.12 Professor James Rowe, Chief Executive of the CRC for Sheep Industry Innovation, considered that CRCs were an effective and transparent model that advanced innovation:

Right now, you have to explain very clearly what you will do at the end of the CRC before you start and update it every year. I really believe that it is a model that keeps everything evolving, that keeps getting better, that stays focussed on that industry-researcher partnership driven by industry.⁸

- 6.13 Professor David Lamb, Project Leader of the University of New England SMART Farm, told the Committee of his experience with a number of CRCs over 18 years:

We are cherry-picked for our specific capacity to deliver on a specific industry problem. I have found myself working with people I would never have dreamt that I would ever work with, in a collaborative environment and with an industry footprint that I would never have expected to have ...

... I would have no hesitation in suggesting that that has been a very significant set of innovations in terms of investing in R&D.⁹

- 6.14 The University of Queensland noted that CRCs are a critical source of funding for agricultural research, and that these should be fostered to enable 'longer term[,] more transformational research'.¹⁰

7 Council of Rural RDCs, 'The Rural RDC Model - funding arrangements' <www.ruralrdc.com.au/rural-innovation-in-australia/#rural-rdc-model> viewed 13 April 2016.

8 Professor James Rowe, Chief Executive Officer, CRC for Sheep Industry Innovation, *Committee Hansard*, Armidale, 13 April 2016, pp. 29, 30.

9 Professor David Lamb, Project Leader, University of New England SMART Farm, *Committee Hansard*, Armidale, 13 April 2016, p. 30.

10 University of Queensland, *Submission 2*, p. 1.

- 6.15 CRCs are considered to be an effective vehicle for generating new technologies and new knowledge.¹¹
- 6.16 Australian Pork Limited submitted that collaboration was part of the pork industry's culture, through its involvement with the CRC program (through two iterations of the Pork CRC), as well as the RDC and Rural R&D for Profit Programme – the latter of which are discussed further below.¹²
- 6.17 Mr Darryl D'Souza, of Australian Pork Limited, explained that the biggest areas of learning flowing from the two CRCs had been the industry collaboration with Australian Pork Limited and the CRCs themselves:
- The proof in the pudding for us, at the end of this CRC, which is 2018–19, is the industry partners have come out and said, 'This is a pretty good model, in terms of you having pretty competitive research being undertaken.'¹³
- 6.18 Mr Michael Keogh, Executive Director of the Australian Farm Institute, submitted that the finite life of CRCs was one of the weaknesses of the CRC model, noting that setting up a CRC was resource intensive:
- ... it lasts perhaps seven years and then the tent folds up and the circus moves on.¹⁴
- 6.19 Professor Lamb stated that, as CRCs had a finite life, gaps left by a CRC's conclusion needed to be addressed.¹⁵

Research and Development Corporations

- 6.20 Much of the evidence regarding how innovation is facilitated within the agricultural sector has been focussed around the operation of RDCs.
- 6.21 It was submitted that the current system of agricultural innovation operates in a traditional, linear way that discourages innovation outside the RDC structure, and encourages the creation of silos throughout the sector based on industry groups.

11 Professor Anthony Sorensen, *Committee Hansard*, Armidale, 13 April 2016, p. 30.

12 Australian Pork Limited, *Submission 70*, p. 4.

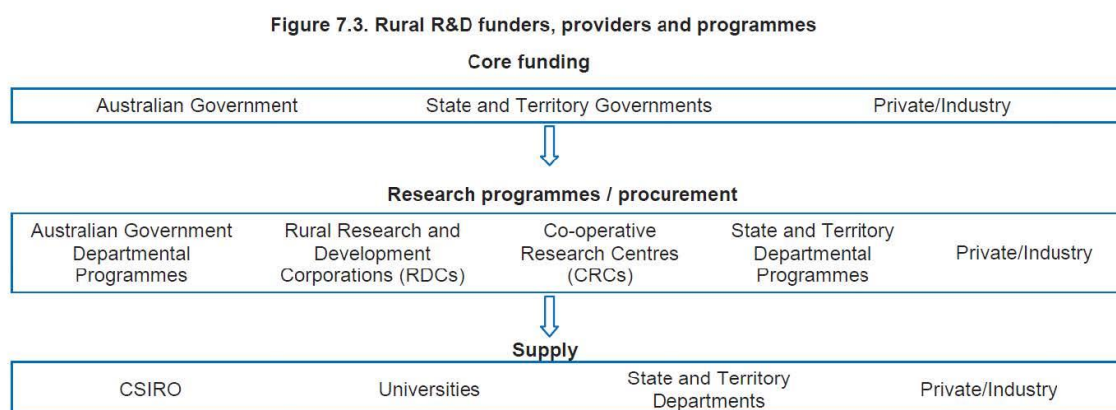
13 Mr Darryl D'Souza, General Manager, Research and Innovation, Australian Pork Limited, *Committee Hansard*, Canberra, 29 February 2016, p. 2.

14 Mr Michael Keogh, Executive Director, Australian Farm Institute, *Committee Hansard*, Sydney, 14 April 2016, p. 5.

15 Professor David Lamb, Project Leader, University of New England SMART Farm, *Committee Hansard*, Armidale, 13 April 2016, p. 30. See also, Mr Darryl D'Souza, General Manager, Research and Innovation, Australian Pork Limited, *Committee Hansard*, Canberra, 29 February 2016, p. 6.

6.22 The Commonwealth Scientific and Industrial Research Organisation (CSIRO) illustrated the linear model of innovation R&D, through a table which is replicated in Figure 1.

Figure 1 Rural research and development funders, providers and programmes



CSIRO: Commonwealth Scientific and Industrial Research Organisation.

Source: Productivity Commission (2011), *Rural Research and Development Corporations*,

<http://www.pc.gov.au/projects/inquiry/rural-research>.

Source CSIRO, *Submission 55*, p. 12, Figure 2.

6.23 Several submissions suggested that the adoption of innovation is being impeded by the RDC model, whereby RDCs are funded by levies on a specific commodity. This barrier is discussed below.

6.24 While accepting the value of the RDC system in providing important links between government and individual industry groups, CSIRO explained that the need to provide general outputs for all levy payers meant that tailored solutions for farming were limited, as research was only as specific or general as the commodity being served. In this way, levy-funded research would generally not address niche or cross-sectoral problems or wider system improvement.¹⁶

6.25 Southern Farming Systems and the Australian Controlled Traffic Farming Association suggested that the RDC structure:

... is an impediment to farming systems groups banding together, identifying priorities, monitoring and controlling the research and commercialising the outcomes.¹⁷

6.26 This point was illustrated by Professor Michael Friend, of Charles Sturt University, who told the Committee that the current system struggled to cope with cross-industry, integration, and sustainability issues:

¹⁶ CSIRO, *Submission 55*, p. 13; Dr Graham Bonnet, Research Director, Agriculture, CSIRO, *Committee Hansard*, Canberra, 26 November 2015, p. 9.

¹⁷ Southern Farming Systems and the Australian Controlled Traffic Farming Association, *Submission 61.1*, p. 4.

If you try to work with GRDC [Grains Research and Development Corporation] to get a project up, they are interested in the grain outcome. If you are working with MLA [Meat and Livestock Australia], they are interested in the meat outcome and so on, whereas the majority of farmers we deal with have mixed farms. You can pull one lever in terms of grain or you can pull another lever for meat, but often the biggest outcomes at the farm financial performance level can come from the integration of the different bits of the system. Quite often it is not in the interests of the RDCs to look at that sort of integration approach, although they are starting to recognise that.¹⁸

- 6.27 CSIRO noted that under the current system, one levy payer's dollar could effectively leverage multiple additional dollars into the RDC system, in matching government funding, through publicly funded RDCs, entities like CSIRO, the university sector and CRCs. While advantageous for RDC-led innovation, this leveraging effect could pull resources away from other parts of the sector, making it difficult to promote innovation through any projects outside the RDC system.¹⁹

Cross-sectoral collaboration

- 6.28 The Committee was told that the current agricultural innovation system favours short-term, sector-specific research.²⁰ However, inquiry participants submitted that addressing cross-sectoral priorities through collaboration could increase the efficiency and effectiveness of R&D investments.²¹
- 6.29 Examples of important cross-sectoral priorities that have been identified include issues of climate change, soils, and water.²²
- 6.30 AusBiotech suggested that initiatives that support consolidation, cooperation and collaboration between sectors would help to reduce duplication. Further, they could enhance synergies where familiar challenges and barriers to adoption exist across the industry.²³

18 Professor Michael Friend, Charles Sturt University, *Committee Hansard*, Wodonga, 28 January 2016, pp. 35-36, 37.

19 Dr Daniel Walker, Research Director, Agriculture, CSIRO, *Committee Hansard*, Canberra, 26 November 2015, pp. 1-2.

20 See, for example, the University of Melbourne, *Submission 4*, p. 5; Australian Academy of Science as cited by Grain Trade Australia, *Submission 21*, p. 2; The University of Queensland, *Submission 2*, pp. 1-2.

21 See, for example, Council of Rural RDCs, *Submission 90*, p. 8.

22 Mr Phillip Glyde, DAWR, *Committee Hansard*, Canberra, 12 November 2015, p. 4.

23 AusBiotech, *Submission 33*, p. 6.

- 6.31 The model for collaboration between key players in the agricultural innovation system – for example, CSIRO, the RDCs, and the private sector – has evolved over time. Dr Graham Bonnet from CSIRO argued that where collaboration was previously organic, and players sought outside assistance on an as-needed basis, this was no longer viable in many cases, as resources were already leveraged into other activities.²⁴ Dr Bonnet explained:
- I think there is a tightness in the system that is not allowing that organic collaboration, and so the concentration, rather than being on the outcome, comes onto the resources to further the outcome.²⁵
- 6.32 The University of Melbourne raised the need to support the use of multi-disciplinary and trans-disciplinary R&D teams to address the adaptation challenge of agricultural technologies and their interaction with sectors outside agriculture.²⁶
- 6.33 The University submitted that, as a result of not supporting such systems, important issues such as farmer interfaces, useability of new technologies, and ‘system integration’ between the paddock and the value chain were not being included in research designs, and were considered too late in the innovation process.²⁷
- 6.34 Mr Kim Russell, from Southern Farming Systems, stated that there were many opportunities to work with cross-sectoral groups, as a means of sharing and adopting innovations. Mr Russell gave the example of their recent adoption of new methods for composting, which resulted in significant improvements in productivity. Mr Russell considered that involving farming systems groups in managing and commercialising innovation or directing research projects would be helpful.²⁸
- 6.35 Murdoch University contended that national governments retain a pivotal role in nurturing collaborations between higher education institutions, industry, and international partners.²⁹ Specifically, it was argued that a national government’s facilitative role should not be restricted to investment in scientific research, but that it should include helping to

24 Dr Graham Bonnet, Research Director, Agriculture, CSIRO, *Committee Hansard*, Canberra, 26 November 2015, p. 2.

25 Dr Graham Bonnet, Research Director, Agriculture, CSIRO, *Committee Hansard*, Canberra, 26 November 2015, p. 2.

26 University of Melbourne, *Submission 4*, p. 4.

27 University of Melbourne, *Submission 4*, p. 4.

28 Mr Kim Russell, Southern Farming Systems, *Committee Hansard*, Canberra, 22 February 2016, pp. 3–4.

29 Murdoch University, *Submission 37*, p. 1.

facilitate intellectual property, growers' rights, and commercialisation as well as knowledge transfer between sectors and between countries.³⁰

Rural Research and Development for Profit Programme

- 6.36 A number of inquiry participants identified the Rural Research and Development for Profit Programme, outlined in Chapter 2, as a current example of cross-sectoral collaboration on innovation.³¹
- 6.37 The Council of Rural RDCs submitted that the program allowed RDCs to collaborate with one another, as RDCs were working together on project bids in precision agriculture, transformative technologies, digital agriculture, and automation. The Council advised that 12 projects were approved under the first round of the program, with most projects directly pursuing the implementation of new technologies for improved industry efficiency and productivity. More than 35 project partner organisations, in addition to the RDCs, are expected to be involved in the delivery of the projects.³²
- 6.38 Dr Stephen Thomas, of the Grains Research and Development Corporation (GRDC), was in favour of the program as a means of providing incentives for cooperation, and to identify gaps that require further R&D.³³
- 6.39 Dr Alex Ball, from Meat and Livestock Australia, considered that the Rural R&D for Profit Programme facilitated collaboration between RDCs that would normally not collaborate. Dr Ball provided the example of the customer and consumer insights program, a collaborative program across several RDCs, which also involved about eight private providers. Dr Ball highlighted the potential benefits of this type of model:
- ... the technology we develop today has a real-time impact tomorrow because the people who are investing in the program in the R&D are actually going to see the outcomes coming straight out. We would not have had that opportunity if we had not had that type of structure.³⁴

30 Murdoch University, *Submission 37*, p. 1.

31 See, for example, Mr Darryl D'Souza, General Manager, Research and Innovation, Australian Pork Limited, *Committee Hansard*, Canberra, 29 February 2016, p. 5; Dr Nicola Cottee, Policy Officer, Research Direction and Stewardship, Cotton Australia, *Committee Hansard*, Canberra, 29 February 2016, p. 8.

32 Council of Rural RDCs, *Submission 90*, p. 8.

33 Dr Stephen Thomas, Chief Operating Officer, Grains Research and Development Corporation, *Committee Hansard*, Canberra, 29 February 2016, p. 14.

34 Dr Alex Ball, General Manager, Red Meat Innovation, Meat and Livestock Australia, *Committee Hansard*, Canberra, 3 December 2015, p. 8.

Committee comment

- 6.40 The Committee notes evidence suggesting that the current agricultural innovation system, centred on the operation of RDCs, can stymy innovation by encouraging a silo mentality among industry groups, and creating a disjointed and disconnected sector, at the cost of broader, cross-sectoral innovation.
- 6.41 The Committee also notes calls for further cross-sectoral collaboration within and beyond the agricultural sector, to seize opportunities relating to emerging technologies with application across the sector.
- 6.42 For example, the Committee heard evidence relating to emerging technology relevant to the agricultural sector, in the area of soil management. Specifically, the United States Studies Centre at the University of Sydney considered that ‘improved soil management provides the biggest single opportunity to dramatically increase agricultural productivity’, and yet was a ‘forgotten resource’ in agricultural research and development.³⁵
- 6.43 The Committee considers soil management to be an example of an important issue with relevance across the agricultural sector, and thus an area with opportunities for cross-sectoral innovation.
- 6.44 The Committee further acknowledges the examples provided of successful models for facilitating cross-sectoral collaboration and innovation, including the CRC Programme and the Rural R&D for Profit Programme.
- 6.45 The Committee considers that RDCs have a pivotal role in facilitating collaboration within industry sectors, and notes their ongoing importance in linking industry to government and knowledge providers in the innovation process. RDCs ensure that innovation is industry-led, and assist in facilitating the adoption of emerging technologies, by working to provide industry with information and education on the application of new technologies at the farm gate.
- 6.46 However, the Committee notes that due to the nature of RDCs, there appears to be a focus on RDC-driven research, related to a particular commodity or industry, at the expense of cross-sectoral innovation.
- 6.47 The Council of Rural RDCs, in representing the 15 RDCs, indicated that it is currently undertaking work to harness the combined resources of the RDCs and find areas of common interest where collective effort will achieve gains for the whole sector. The Committee encourages continuation of the Council’s work in this area.

35 The United States Studies Centre at the University of Sydney, *Submission 39*, p. 3.

- 6.48 The Committee also notes that CRCs, as part of the CRC Programme within the Australian Government's National Innovation and Science Agenda and the Rural R&D for Profit Programme, have also played a significant role in harnessing cross-sectoral collaboration and driving the development of new technologies for the benefit of the agricultural sector.
- 6.49 On evidence provided to the Committee, the CRC model has been proven to facilitate industry-led collaboration between researchers, industry and communities for the benefit of the agricultural sector as a whole. The Committee is confident that further investment in the CRC model will strengthen its capacity to contribute to cross-sectoral, collaborative research on agricultural innovation.
- 6.50 Evidence throughout the inquiry revealed broad support for the outcomes of CRCs and for the continuation of the CRC model. The Committee notes that the CRC Programme was established in 1990 and that, at the time of writing, the selection process for the 18th round of CRCs is underway. However, in evidence to the inquiry, there appeared to be some apprehension among stakeholders that the future of the CRC model was not certain. Therefore, some reassurance about the intended future of the CRC model would be beneficial.
- 6.51 The Committee recognises the significant benefits of the CRC model and its ability to attract cross-sectoral support and investment, including from RDCs. The Committee also supports the development of incentives to ensure that CRCs are well resourced, including through industry, and sees a role for government in facilitating this.

Recommendation 9

The Committee recommends that the Department of Agriculture and Water Resources, in conjunction with the Department of Industry, Innovation and Science, investigate establishing appropriate incentives for the greater allocation of resources from rural Research and Development Corporations to relevant Cooperative Research Centres.

- 6.52 The Committee expects that this recommendation will enhance contributions from the private sector, enabling CRCs to maximise the outcomes of available funding and create longer-term revenue streams. This may assist in effectively lengthening the funding cycle and providing longer-term focus to research priorities.

- 6.53 Evidence to the inquiry also addressed the relatively short funding cycles for research grants, including those through the Australian Research Council. The Committee considers that three year grants are too short to effectively support innovation in agriculture, and instead favours four to five year cycles. Longer funding cycles would also help to address concerns about career paths for researchers and retention of talent, discussed in Chapter 5.

Recommendation 10

The Committee recommends that the Australian Research Council review its programs for funding research, with a view to increasing the duration of grants to be at least five years.

A partnership approach

- 6.54 The Committee heard evidence that a stronger partnership approach to agricultural innovation is fundamental to improving innovation performance.³⁶
- 6.55 CSIRO stated it had observed a general degradation of effective partnerships in the agricultural sector, in an environment where activities are short-term, project-based, and transactional. CSIRO submitted that this has produced a purchaser-provider relationship, rather than a more dynamic partnering culture.³⁷
- 6.56 Professor Friend advised that industry partnerships are important to Charles Sturt University's work in agricultural innovation – whether that be with farmers' groups or multinational companies – because those partnerships are important for increasing their chance of research outcomes being adopted.³⁸
- 6.57 Mr Tim Neale, Manager of Precision Agriculture Pty Ltd, argued that successful public-private agreements must engage private companies as 'true partners' from the beginning of the innovation process.³⁹

36 CSIRO, *Submission 55*, p. 14.

37 CSIRO, *Submission 55*, p. 14.

38 Professor Michael Friend, Director, Graham Centre for Agricultural Innovation, Charles Sturt University and NSW Department of Primary Industries, *Committee Hansard*, Wodonga, 28 January 2016, p. 33.

39 Mr Tim Neale, Manager, Precision Agriculture Pty Ltd, *Committee Hansard*, Armidale, 13 April 2016, pp. 6-7.

- 6.58 Charles Sturt University noted that one-third of its external research funding comes from partnerships with industry (double the sectoral average), and includes ongoing research collaborations through RDCs, farming systems groups, multinationals, peak bodies, and state governments.⁴⁰
- 6.59 CSIRO called for a reframing of partnerships with research providers, where 'participation is priced on value and outputs (and not on inputs), with shared income streams from the value that is created.'⁴¹
- 6.60 CSIRO detailed the example of innovation within the Australian cotton industry, where there was a 'virtuous circle between public and private interests'.⁴² Similarly, several inquiry participants praised the partnership between GRDC and Bayer CropScience as a further example of a successful public-private partnership where individual groups see a common goal and work together to achieve an outcome of mutual benefit.⁴³
- 6.61 Both of these case studies are discussed below.

A case study: Cotton

- 6.62 Cotton variety breeding is carried out by a private-public partnership – Cotton Breeding Australia (CBA) – between Cotton Seed Distributors and CSIRO.⁴⁴
- 6.63 CSIRO outlined some of the positive features of the partnership, which include:
- value-based pricing of technology innovations is reinvested by CSIRO and CBA in long-term R&D;
 - the Cotton RDC adds value, without seeking to dominate and control the innovation ecosystem;
 - the industry has a strong leadership with coherent common interests; and
 - the partnership takes a value chain approach that focusses on a differentiated high value quality end product, achieved via multi-

40 See Charles Sturt University, *Submission 17*, p. 1.

41 CSIRO, *Submission 55*, p. 14.

42 CSIRO, *Submission 55*, p. 14.

43 Associate Professor Daniel Tan, Director, Australian Institute of Agricultural Science and Technology, The University of Sydney, *Committee Hansard*, Sydney, 14 April 2016, p. 9; Dr Broughton Boydell, *Committee Hansard*, Sydney, 14 April 2016, p. 41; Mr Matthew Cossey, Chief Executive Officer, Croplife Australia, *Committee Hansard*, Canberra, 22 February 2016, p. 14.

44 CSIRO, *Submission 55*, p. 14.

disciplinary teams extending from plant breeding to farm management to textile science.⁴⁵

A case study: GRDC and Bayer partnership

6.64 The GRDC recently collaborated with Bayer CropScience in the ‘Herbicide Innovation Partnership’, whereby the GRDC committed \$45 million over five years, and Bayer CropScience committed to increase its herbicide discovery and optimisation program with a focus on Australian cereal farming systems, Australian weeds and early testing of promising new chemistries in Australian field trials.⁴⁶

6.65 The GRDC said of the partnership:

It is expected that the collaboration will yield new chemistries for Australian conditions and released in Australia at least at the same time as our international competitors. Given the extremely high cost of weed control in Australian cropping systems, any new chemistry delivered even one or two years earlier to Australia will have significant production efficiency outcomes for Australian growers.⁴⁷

6.66 This model was praised as an example of a public-private partnership that would result in productivity gains for Australian agriculture.⁴⁸

6.67 Mr Richard Dickmann, Chief Executive of Bayer CropScience, suggested that partnering in global consortia ‘is now an indispensable route to accessing global technologies’, however noted that recent reports suggested that Australian was lagging in these areas:

We are last amongst OECD countries in terms of collaboration between universities and business, and we are third-last in terms of global collaborations amongst the OECD. I think you have seen the figures: we are 10th in R&D investment, we are 81st in terms of innovation efficiency, and recently The Economist indicated that only one to two per cent of Australian companies – and this is broadly across the economy – are said to be innovating.⁴⁹

45 CSIRO, *Submission 55*, p. 14.

46 GRDC, *Submission 87*, pp. 12-13.

47 GRDC, *Submission 87*, pp. 12-13.

48 Mr David McKeon, General Manager, Advocacy and Policy, Grain Growers Ltd, *Committee Hansard*, Canberra, 22 February 2016, p. 6. See also, ABC, ‘Grains Research and Development Corporation teams up with global chemical giant to fight weeds and herbicide resistance’ <www.abc.net.au/news/2015-06-02/grdc-bayer-sign-deal-to-tackle-herbicide-resistance/6515536> viewed 15 April 2016.

49 Mr Richard Dickmann, Head, New Business Development, Bayer Crop Science Pty Ltd, *Committee Hansard*, Canberra, 29 February 2016, p. 17.

- 6.68 Mr Dickmann submitted that for Australia to attract investment from global companies requires Australia to establish and maintain itself as a world leader in agricultural research. This requires consistency of investment in CSIRO and systems that support university research; strengthening policy settings around the commercialisation of research; sending consistent messages around international collaboration; removing regulatory barriers to innovation; and adhering strictly to the science based approach to assessing new technologies.⁵⁰

Committee comment

- 6.69 The Committee heard about a number of successful partnerships that have developed between industry, private sector, knowledge providers, government, farming groups, and communities.
- 6.70 The Committee supports the continued development of public-private partnerships, and partnerships between knowledge providers and industry groups. It is clear that with a common goal in mind, partnerships can drive innovation and achieve enormous gains for the Australian agricultural sector.
- 6.71 Where possible, the Committee encourages government to continue to support such partnerships, through programs and initiatives such as the CRCs, the Rural R&D for Profit Programme, and through RDCs.
- 6.72 The Committee is of the view that establishing clear national leadership on agricultural innovation will go some way to facilitating further successful public-private partnerships in the future.

National research and development priorities

- 6.73 Professor Edward Barlow, of the Australian Academy of Technological Sciences and Engineering (ATSE), told the Committee that the agricultural innovation system is diverging, because three of the key players – the university sector, CSIRO, and the state agriculture departments – are all headed in different directions.⁵¹
- 6.74 CSIRO agreed there was a lack of connectedness between the key players, and an over-emphasis on on-farm production at the expense of value

50 Mr Richard Dickmann, Head, New Business Development, Bayer Crop Science Pty Ltd, *Committee Hansard*, Canberra, 29 February 2016, p. 17.

51 Professor Edward (Snow) Barlow, Deputy Chair, Agriculture Forum, Australian Academy of Technological Sciences and Engineering, *Committee Hansard*, Canberra, 29 January 2016, p. 19.

- chains, business innovation, cross commodity issues, and farming systems.⁵²
- 6.75 Associate Professor Ruth Nettle, of the University of Melbourne, suggested that leadership around managing the innovation process and the sectors, by 'directing traffic and shaping', was important in achieving productivity outcomes.⁵³
- 6.76 Referring to biosecurity, the Plant Biosecurity CRC submitted that national and coordinated leadership was needed to ensure strategic and efficient investment in innovation, infrastructure and capability, and to underpin the productivity of Australian agriculture for the future.⁵⁴
- 6.77 Professor Nettle outlined a New Zealand government-funded initiative with co-investment by most of the industry bodies in New Zealand (for example, horticulture, dairy and forestry). The objective of the initiative was to assess methods for innovation across all agricultural sectors, and to examine the whole innovation system for primary industries.⁵⁵
- 6.78 Professor Friend considered that some form of overarching government leadership may be necessary to link the different segments of the sector. For this to be successful, buy-in would be required from all of the peak bodies, the RDCs, and representatives of the different research organisations. However, achieving such buy-in would be challenging due to the many vested interests involved.⁵⁶
- 6.79 AusBiotech praised the development of long-term sector priorities, which could be seen in the development of the National Primary Industries RD&E Framework (the Framework) as outlined in Chapter 2. AusBiotech stated that the Framework has led to a national approach to developing sector priorities and has helped to align RD&E activities with these sector priorities.⁵⁷
- 6.80 Mr Tim Lester, of the Council of Rural RDCs, told the Committee that the Council actively engages with others within the Framework:
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52 Dr Michael Robertson, Science Director, Agriculture, CSIRO, *Committee Hansard*, Canberra, 26 November 2015, p. 1.

53 Associate Professor Ruth Nettle, Leader, Rural Innovation Research Group, Faculty of Veterinary and Agricultural Sciences, University of Melbourne, *Committee Hansard*, Canberra, 29 January 2016, p. 50.

54 Plant Biosecurity Cooperative Research Centre, *Submission 36*, p. 8.

55 Associate Professor Ruth Nettle, Leader, Rural Innovation Research Group, Faculty of Veterinary and Agricultural Sciences, University of Melbourne, *Committee Hansard*, Canberra, 29 January 2016, p. 49.

56 Professor Michael Friend, Charles Sturt University, *Committee Hansard*, Wodonga, 28 January 2016, p. 36.

57 AusBiotech, *Submission 33*, p. 6. See also, National Primary Industries RD&E Framework, <www.npirdef.org> viewed 16 April 2016.

We come together quite regularly with our state and territory colleagues to talk with the Commonwealth on how do we drive alignment, where are the opportunities and where we will take it. They are important questions. It is not an easy process, but I think we are getting better at it.⁵⁸

6.81 However, AusBiotech noted the Framework has had mixed success in enhancing cross-sector cooperation, despite this being a primary objective:

Whilst in general the Framework led to the development of good sector-specific strategies, the performance of some strategies was found by the Allan Consulting Group to be disappointing. Many of the sectors have not published updated strategies since their initial commissioning in 2010.⁵⁹

6.82 AusBiotech suggested that the limited success of cross-sectoral cooperation could be due to sector leaders' responsiveness to their stakeholders (that is, levy payers) and the inherent incentives for sector leaders to pursue activities directly benefiting their sector, rather than those cross-sectoral activities that may indirectly benefit their sector.⁶⁰

6.83 CSIRO raised concerns about the current performance of the agricultural innovation system. The organisation argued for a closer examination of the contemporary and future needs of the agri-food innovation system, having regard to a number of factors, including the national innovation agenda, emerging market opportunities, and changing patterns of competitive pressures in global agriculture.⁶¹

6.84 To address these concerns, CSIRO recommended the creation of a national leadership forum, or national working group on agricultural innovation, focussed on improving the functionality of the agri-food/fibre innovation system, with evidence-based leadership inputs from government, industry and knowledge institutes.⁶²

6.85 The proposed working group would conceive and describe one or more models of the agri-food innovation system to meet Australia's needs in 2030. CSIRO envisaged that the group would consist of a diverse set of perspectives, with representatives of institutions such as the National Farmers Federation, the Australian Food and Grocery Council, CSIRO, the

58 Mr Tim Lester, Operations Manager, Council of Rural RDCs, *Committee Hansard*, Canberra, 25 February 2016, p. 2.

59 AusBiotech, *Submission 33*, p. 6.

60 AusBiotech, *Submission 33*, p. 6.

61 CSIRO, *Submission 55.1*, p. 1.

62 CSIRO, *Submission 55.1*, p. 1.

Australian Farm Institute, and relevant Australian Government Departments.⁶³

- 6.86 Specifically, outputs of the proposed working group would be:
- overarching options for the future structure and function of Australia's agri-food innovation system with particular emphasis on innovative models for the interaction of RD&E with agriculture and on cross-sector, value chain and whole of system performance metrics;
 - description of the roles and responsibilities of the types of organisations expected to be involved in the proposed models; and
 - options for exploring the transition from the current state to the proposed future agri-food innovation system architecture.⁶⁴

Committee comment

- 6.87 The Committee heard evidence that there is a lack of clear leadership and connectedness between the key players within the agricultural innovation system, which was a barrier to whole-of-sector innovation.
- 6.88 While it is clear that there are successful links between key players across the different industry groups, the Committee notes the view that national leadership is needed to connect the industry groups and develop strategies for whole-of-sector innovation and reform.
- 6.89 The Committee notes evidence about the mixed success of attempts at establishing national priorities for RD&E, including the National Primary Industries RD&E Framework.
- 6.90 The Committee notes with interest CSIRO's proposals for the establishment of a national forum or working group, to consider longer-term and 'whole of system' performance issues across the agricultural sector, and to explore a future innovation system capable of maintaining Australia's competitive position in agricultural innovation, in an era of rapid global change.
- 6.91 The Committee considers the National Primary Industries RD&E Framework to be an important framework within which Commonwealth and state and territory governments can work with industry partners and knowledge providers to set national priorities and goals for agricultural innovation.
- 6.92 However, the Committee considers that there may be benefit in a detailed consideration of the agricultural innovation system. The Committee therefore supports CSIRO's proposal to develop a national working group

63 CSIRO, *Submission 55.1*, p. 2.

64 CSIRO, *Submission 55.1*, p. 2.

on agricultural innovation, with a view to addressing longer-term and whole of system issues.

- 6.93 The Committee is of the view that such a working group should form part of a strategy established through the National Primary Industries RD&E Framework, and should be supported by a secretariat within the Department of Agriculture and Water Resources.

Recommendation 11

The Committee recommends that the Australian Government develop a national working group on agricultural innovation, focused on improved functionality of the agrifood/fibre innovation system. This working group should be developed as part of a wider strategy of cross-sectoral agricultural innovation, within the National Primary Industries RD&E Framework.