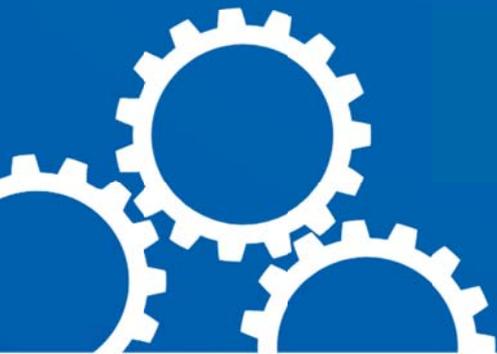




Australian Government
Cotton Research and
Development Corporation

Response to Agricultural Competitiveness White Paper Issues Paper



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EXECUTIVE SUMMARY

The future productivity – and ultimately profitability – of Australia’s agricultural sector relies on strong investment in RD&E, driving farm gate return for farmers and helping them compete on an increasingly uneven international playing field. This is particularly important for Australian cotton growers, given the export dependent nature of the cotton industry. The Cotton Research and Development Corporation (CRDC) believes there is a strong need for the Government to continue its co-investment in rural research, development and extension (RD&E), working hand in hand with the Australian agricultural sector.

This submission in response to the Agricultural Competitiveness White Paper Issues Paper provides a short overview of the Australian cotton industry and the CRDC before addressing the specific questions/issues posed to the RDCs by the Task Force:

- How industries and governments can better identify, prioritise and fund research development and extension
- The CRDC’s views on the current R&D model
- How the \$100 million committed over four years to rural RD&E might best be spent
- The role of research and development corporations in extension.

Our purpose is to show how developments in the cotton industry are relevant to the wider issue of agricultural competitiveness, and which lessons may be applied more broadly.

The Australian cotton industry is one of the success stories of Australian agriculture and rural R&D. Australia’s cotton industry generates in excess of \$AUS2 billion in export revenue annually and provides an economic foundation to many regional and remote rural economies. Arguably, the Australian cotton industry would not exist today but for R&D resulting in the reduction in pesticide use during the 1990’s and sustaining the effectiveness of biotech pest control traits in Australian cotton varieties since their introduction 17 years ago.

Australian cotton is the highest-yielding, finest, cleanest and greenest cotton in the world. Cotton is an industry taking responsibility for itself by undertaking practice changes to meet societal expectations. The key to the cotton industry’s success in improving efficiency, sustainability and profitability lies in the success of its R&D program, incorporating a culture of innovation within the industry, supported by and embracing a well-organised R&D framework.

The CRDC focuses equally on achieving productive industry and public outcomes through close and collaborative relationships with rural industries and government. It provides an industry-driven, market-responsive approach to rural innovation, and creates strong ownership by industry, which contributes funds and helps set priorities.

While being recognised as some of the most innovative, adaptable and efficient producers in the world, Australian cotton farmers face new challenges for competition from man-made fibres as well as an ongoing cost/price squeeze and declining terms of trade. Australia’s current globally competitive resource efficiency is not sufficient to sustain the profitability of its

cotton production system. The issues faced by the industry are, in many ways, the same as those faced across agriculture. Continued profitability growth can only come through increasing productivity and efficiency, and capturing full value for Australian cotton. One of the key challenges facing cotton RD&E (and agriculture more broadly) is how to continue increasing annual productivity while approaching the limits of such increases.

We submit that the current RDC model is already highly effective at identifying, prioritising and funding RD&E, and we support opportunities for greater collaboration and investment addressing national strategic rural R&D issues.

We suggest that cross-sectoral collaboration could be improved by RDCs committing to re-allocate 5-10 percent of existing funds to a virtual pool for relevant projects identified by the Council of Rural RDCs in collaboration with the Department of Agriculture and then implemented by the RDCs. A feature of this process is that it minimises the administrative and governance costs which commonly undermine the benefit of collaboration. The Council would need to develop business plans that identify the collaboration priorities, research tasks required and identify specific RDCs to implement projects. This approach also leverages the RDCs strong connections with industry extension.

The CRDC suggests that the Task Force consider the following principles which underlie our planning for RD&E, as they are important for understanding how rural RD&E can best be identified, prioritised and funded in the future:

- Doing the same RD&E, or the same better, will not be sufficient to secure the industry's future.
- Incremental improvements will still be important but transformational improvements will be vital.
- Transformational improvements to profitability are just as likely to be derived from capturing the full value of products as they are from reductions in production costs or on-farm productivity gains.
- Changes to the emphasis of components of RD&E may be required.
- Opportunities exist for investment in end market RD&E and routes to market.
- The relationships between farmers, industry and customers will be increasingly important to understanding and managing future uncertainty.
- An increased emphasis on development and extension through partnerships in industry joint ventures can enhance adoption and the performance of investments in RD&E.
- Investment in the ability of people to communicate is central to their capacity to innovate, understand and apply knowledge; and these are keys to future industry capacity.
- New collaborative forums and partnerships engaging researchers, farmers, industry and customers are essential drivers to realise the benefits from RD&E investments.

The CRDC recommends that the Task Force consider ways of better supporting the rural RDCs to sustain RD&E capacity during prolonged drought periods (and other catastrophic events). Such methods might include: disproportional matching funding, whereby the Government contributes a greater proportion during periods of drought-reduced levy

income, which industry repays in later non-drought high levy seasons; and allowing rural RDCs to forward plan the use of existing reserves in periods of prolonged drought.

The CRDC recommends that the Task Force consider the future needs for research provision (as opposed to research) in agriculture and how these may be met. Options may include ensuring continued funding for public agencies (such as CSIRO and universities), and ensuring a greater commitment, funding and coordination of state-based research agencies through the Agriculture Senior Officials Committee (formerly the Primary Industries Standing Committee) and providing the legislated capacity for the rural RDC model to evolve to undertake research provision.

The CRDC recommends that the Government's additional budget allocation of \$100m to rural RDCs should be spent on priority areas that impact all of agriculture. The greatest industry-wide benefit is likely to flow from investing in critical cross-sectoral collaborative goals with a focus on productivity gains. These investments would address key constraints to productivity growth in areas already identified for collaboration such as the soils and water RD&E strategies as well as new areas with the potential for transformational gains such as digitalisation; big data management; robotics; energy supply; and end use efficiency. We believe the best avenue to achieve this would be through leadership of the RDCs working in partnership with the Department of Agriculture, to help achieve real productivity gains.

The CRDC believes there is a strong role for the rural RDCs in extension, and that delivering research outcomes is a vital role and a critical part of the RDC process. This is reflected in our strategic plan, where we have purposely embedded investment in development and extension within the research programs. Programs such as CottonInfo, which integrate research, development and extension into R&D, could provide a useful model (with adaptations as necessary) for other industries.

INTRODUCTION

The Cotton Research and Development Corporation (CRDC) welcomes the Agricultural Competitiveness White Paper Process as a timely opportunity to set the future direction for Australian agriculture, including rural research and development (R&D), in the coming decades.

We note the comments made by Paul Morris, Chair of the Agricultural Competitiveness White Paper, who has posed the following questions to rural RDCs in relation to the Agricultural Competitiveness Issues Paper:

- We are particularly interested in the question of how industries and governments better identify, prioritise and fund research, development and extension.
- We are interested in your views on the current R&D model – and whether you think there are changes that are needed.
- We are interested in how the \$100 million over four years that the Government committed to prior to the election might best be spent.
- We are interested in the role of R&D corporations in extension – particularly in light of the changes that have occurred in this area over the last decade or so.

This submission provides a short overview of the Australian cotton industry and the CRDC before addressing these questions. Our purpose is to show how developments in the cotton industry are relevant to the wider issue of agricultural competitiveness, and which lessons may be applied more broadly. The CRDC also endorses the arguments presented in the Council of Rural R&D Corporations (CRRDC) submission to this inquiry.

The future productivity of Australia's agricultural sector relies on strong investment in RD&E, driving farm gate return for farmers and helping them compete on an increasingly uneven international playing field. This is particularly important for Australian cotton growers, given the export dependent nature of our industry, in which 99 percent of our raw cotton is exported. We believe there is a strong need for the Government to continue its co-investment in cotton R&D and the wider rural R&D system, working hand in hand with the Australian agricultural sector.

THE AUSTRALIAN COTTON INDUSTRY

The Australian cotton industry is one of the success stories of Australian agriculture. A culture of innovation within the industry, supported by and embracing a well-organised R&D framework, has been a major contributor to this success.

Australian cotton is the highest-yielding, finest, cleanest and greenest cotton in the world. On a global scale, Australia is not a large cotton producer — only around three percent of the global crop is grown within Australia, by some 1,300 cotton growers. However Australia is one of the largest exporters of cotton, with nearly 100 percent of the national crop exported, generating in excess of \$AUS2 billion in export revenue annually. The industry generates significant wealth and provides an economic foundation to many regional and remote rural economies, employing up to 14,000 people.

Improved practices over the past 15 years have seen insecticide use reduced by 95 percent and water use efficiency improved by 40 percent, while improvements in fertiliser and energy use are driving an ongoing reduction in greenhouse gas emissions. The best cotton producers now achieve more than two bales of cotton per megalitre of water – almost double the industry average of just a decade ago. The industry is at the forefront of environmental management systems, and climate change mitigation and adaptation.

Importantly, cotton is an industry taking responsibility for itself by undertaking practice changes to meet societal expectations. The introduction of the industry's best management practice program 'myBMP', the uptake of biotechnology to help reduce pesticide use, and the implementation of the industry's environmental assessment and resulting actions are all examples of the cotton industry recognising the need for change, and working with the R&D system to enact it. Whether the Australian cotton industry would still exist in its current form, had these practice changes not been enacted, is an important consideration.

The Australian cotton industry continues its rapid adoption of new technologies. For example, it is estimated that round module pickers, introduced for the first time in 2008, will harvest more than 90 percent of the cotton crop in 2014. We expect that the pace of technological change will only increase, incorporating new ways to communicate, digitalisation, open networks for innovation, dramatically better sensor and computing power, GIS as an enabling technology, advances in automation, use of drones and robotics, and advances in molecular nanotechnology and biology. This presents opportunities for whole new approaches to research, as well as making existing research more efficient and effective.

The key to the cotton industry's success in improving efficiency, sustainability and ultimately profitability lies in the success of its R&D program; the fact that cotton R&D delivers benefits to growers and other sectors, as well as environmental and social benefits; and the strong culture of R&D adoption that has now become the industry norm. Cotton growers have a vital interest in research results from CRDC-funded projects, due at least partly to their individual annual levy contributions, which give producers a stake in 'their' research.

THE ROLE OF THE CRDC

A major factor in the cotton industry's success is its culture of innovation, supported by and reinforcing a well-organised research and development framework, headed up by the CRDC.

The CRDC focuses equally on achieving productive industry and public outcomes through close and collaborative relationships with rural industries and government. It provides an industry-driven, market-responsive approach to rural innovation, and creates strong ownership by industry, which contributes funds and helps set priorities.

The CRDC invests in R&D throughout the industry supply chain. Like other RDCs, the CRDC is co-funded through an industry levy and matching Government contributions. In 2013-14, the CRDC invested \$22 million in cotton R&D; in 2014-15, this figure will equal \$24 million. CRDC analysis of a study by the Cotton Innovation Network in 2013 showed the CRDC accounted for 32 percent of total cotton R&D investments and was involved in over 80 percent of all cotton R&D undertaken in Australia. It is estimated that the minimum return on investment for the 2003-08 period was 7:1 for growers (a \$7 benefit to growers for every \$1 invested) and 14:1 for society at large (a \$14 benefit to society for every \$1 invested).

Overall, the CRDC estimates that public and private R&D investment in the cotton sector is in the order of \$60m annually, supporting an industry that typically generates in excess of \$AUS2 billion in export revenue annually and contributes to broader social, environmental and economic benefits.

The CRDC portfolio is a balance between five key areas: farmers, industry, customers, people, and performance. It includes: R&D that seeks to 'protect and defend' the production base from pest threats; productivity R&D focused on maintaining a positive rate of increase while ensuring resource use efficiency; enhancing product value through the supply chain; building a capable industry; and an element of research discovery. The CRDC invests in applied R&D that improves productivity, biosecurity, natural resource management and manages climate variability concurrently given the interrelationships between the issues.

The CRDC adds value to investment in research in the cotton industry and more broadly through:

- Promoting an outward and future looking culture
- Its commitment and focus on delivering strategic outcomes
- Its unique connections with the researchers and the end users of research – growers and supply chain participants
- Fostering connections between all sectors of the industry, end users of Australian cotton and researchers
- Skills in strategic investment
- Its responsiveness to the R&D priorities of government and industry

- The connections it fosters between all sectors of the cotton industry (seed and chemical distributors, growers, consultants, researchers, pickers, truckers, ginners, classers, merchants, spinners and brand owners)
- Collaborating with other investors and research providers on initiatives from projects to national program scales.

In the past two decades, the CRDC has invested in industry research and adoption, resulting in a culture where sustainable farm practices drive profitable farm businesses that contribute strongly to the socio-economic viability of regional communities. A key element of the strong industry R&D culture is the commitment of many individual growers to hosting and/or conducting on-farm trials in commercial situations across different product regions.

The CRDC's experience in rural R&D is that public and private good outcomes are rarely delivered in isolation. This win/win connection contributes to achieving public good outcomes that may not otherwise be achieved as effectively. The CRDC is required to focus equally on achieving productive industry and public outcomes and we do this by ensuring the needs of industry and government are integrated. Through close and collaborative relationships with other rural industries that are mandated by government and industry alike, the CRDC ensures expertise and resources are coordinated and leveraged to maximise the benefits to both industry and the community.

Collaboration across the rural RD&E system as a whole is also important and the rural RDCs, along with the Australian, state and territory governments, CSIRO and universities, are working together for this outcome under the National Primary Industries RD&E Framework. Collaborative partnerships are a key implementation strategy in the CRDC's strategic plan for both research and development and we are committed to partnering in national cross-sectoral initiatives including in soils, water, climate and biosecurity research, and to collective approaches to improvement in the investment of RD&E at a national level.

The CRDC continues to build collaborative partnerships with rural and regional industry organisations, regional NRM bodies, state and federal government agencies and commercial agribusinesses to foster the adoption of research. We recognise that through a collaborative effort on common issues, there is the scope to access these broader networks, share resources and collectively achieve change through the delivery of timely and relevant research.

In short, the CRDC, the Government and the cotton industry have a strong track record of working together and achieving productivity and efficiency improvements on farm together with public good outcomes, based on the CRDC's core strengths of efficiency, effectiveness and collaboration, and the underlying strengths of the RDC model, which have been extensively documented.

KEY ACHIEVEMENTS IN AUSTRALIAN COTTON RD&E

The importance of RD&E in the cotton industry to its past, current and future performance is well understood, as part of ongoing business. In fact the most recent cotton grower survey found that 91 percent of growers consider that R&D drives continuous improvement of the Australian cotton industry (Roth Rural, 2013). Research and development enables the industry to achieve the highest yields in the world (three times the average). Despite drought, productivity gains of near four percent per annum are being derived from improved Australian-bred varieties and farm management practices (Respectively 45 and 55 percent of gains). Thirty percent less land and 40 percent less water is now required to produce one tonne of cotton lint, compared to 1999 (land) and 2003 (water). These huge advances in cotton production since the crop was introduced commercially in Australia in the 1960s are largely due to R&D.

The Australian cotton industry excels in terms of environmental sustainability. On the farm, investment in R&D has significantly reduced the quantity of insecticides used to control the major insect pests and this applies to both 'conventional' non-genetically modified cotton, and to genetically modified cotton (Bollgard II). Supported by R&D investment, the industry has successfully implemented resistance management plans to mitigate the risks of resistance developing to either of the proteins contained in Bollgard II cotton. The Australian cotton industry has made significant environmental inroads over the last decade with the adoption of Best Management Practices (BMP), Integrated Pest Management (IPM) and the application of biotechnology in the form of genetically modified (GM) plants that resist attack. This reduction in pesticide use within the industry has delivered significant environmental benefits, such as the elimination of river contamination by Endosulfan in the Namoi River (Mahwinney, 2008) from the mid-1990s after the introduction of the Cotton BMP Program.

A crucial component of the cotton industry's environmental footprint is its water consumption, underlined during the prolonged intensive drought conditions of the last decade. The industry is a world leader in water use efficiency (Hoekstra & Chapagain, 2007) and its water productivity continues to improve significantly, with the best producers now achieving in excess of two bales of cotton per megalitre of water — almost double the industry average of just a decade ago.

Another component of the environmental impact that is growing in importance due to concerns about greenhouse gas emissions and rising energy prices is the cotton industry's carbon footprint. While the growing and processing of cotton is a very small component of the overall footprint for a cotton garment it is nevertheless important that the industry seeks to improve its efficiency and productivity in the use of energy and fertilisers as well as pesticides. Research investment by the CRDC has enabled the industry to:

- Quantify and understand its carbon footprint
- Improve the accuracy of the international calculation for Australian cotton greenhouse gas emissions from nitrogen fertilisers and help growers improve nitrogen use efficiency

- Understand that greenhouse gas emissions from energy use on farm are similar to that from fertilisers, and help growers improve energy use efficiency.

With the support of R&D, the cotton industry was the first major agricultural industry to undertake a comprehensive external examination of its environmental performance in 1991 with subsequent environmental audits conducted in 2003 (GHD, 2003) and 2012 (Inovact Consulting, 2012). In 2014, the Australian cotton industry will launch its first ever sustainability report. All of which evidence that the industry recognises the importance of natural assets and is committed to continuous improvement in sustainable practices and stewardship.

FUTURE CHALLENGES FOR COTTON RD&E

Australian cotton farmers continue to face an ongoing cost/price squeeze and declining terms of trade. Increasing input costs are outweighing the value created by improvements in yield. Australia's current globally competitive resource efficiency is not sufficient to sustain the profitability of its cotton production system.

Cotton also faces increasing challenges from man-made fibres due to lower prices, unpredictability of cotton prices, enormous investments in the man-made fibre sector plus newer uses of man-made fibres.

The past five years have seen Australian cotton production fluctuate dramatically, and this has occurred in an environment of increasing complexity, volatility and uncertainty. The issues faced by the industry are, in many ways, the same as those faced across agriculture (though with some specific differences). Maintaining profitability for producers continues to be the industry's major challenge – and RD&E is a critical input for achieving this.

Meanwhile the industry remains under constant threat from exotic and native pests, weeds and diseases. With more than 90 percent of the cotton grown in Australia now containing genetically modified traits, effective stewardship of these traits and the declining chemical alternatives available is a critical risk management issue.

The need for continued gains in value and productivity

Australian cotton farmers lead the world in yield largely because of annual productivity gains from improved varieties and management. However, yields are now approaching the genetic limits for cotton. Elite Australian-bred cotton varieties produced by the commercially funded CSIRO plant breeding program are the key enablers underpinning Australia's high yields and reliability as a supplier of high quality cotton with superior staple length and strength, uniformity and low contamination.

Cotton's best yields are getting ever closer to the plant's expected physiological yield limit of 19.1 bales per hectare, and a future challenge for the industry is maintaining year on year yield increases. In this context, the importance of sustaining productivity growth through improved crop management is even more critical.

Over the long term, profits per hectare from cotton farms have been close to flat. Gains coming from improved yields, quality and efficiency have been offset by increased costs, decreased prices, or a combination of the two.

Profitability growth can only come through increasing productivity and capturing full value for Australian cotton. Two of the key challenges facing cotton RD&E in doing this is how to capture tangible benefits for Australian farmers from investments broadly focused on improving cotton's global competitiveness with man-made fibre (such as investments in the value chain, like spinning, dyeing and textile innovation, where benefits are shared globally); and (like agriculture more broadly) how to continue increasing annual productivity domestically while approaching the limits of such increases.

The need for strategic decision making in industry development

The continued development of the Australian cotton industry, both in northern and southern Australia, presents complexities in terms of cotton RD&E.

Plans for opening parts of northern Australia to development for agriculture may result in additional irrigated lands becoming available for cotton in the top end. The possibility offers a major opportunity to grow Australia's cotton industry, but also presents a number of challenges around infrastructure, diseases, and the need for suitable cotton varieties. Biosecurity will be of critical importance in such a development, particularly as cotton leaf roll dwarf virus (regarded as the second-most damaging virus to commercial cotton) has just been detected in East Timor. Close involvement of the relevant RDCs will be essential to ensuring that development in northern Australia is environmentally sustainable, and that biosecurity and other risks are well understood and carefully managed. A long-term focus in decision making is critically important.

Equally, further development in the south also requires strategic, future-focused decision making to ensure an efficient use of capital. Cotton is a high input, high output crop that requires significant investment in infrastructure at farm, service and processing industry levels. It is an intensive broadacre enterprise involving a large financial outlay per hectare in order to obtain significantly higher returns per hectare and per megalitre. One of the risks behind such investment is that infrastructure can become 'stranded' by changes in government policy. Strategic and long-term policy decisions provide a more conducive environment to long-term R&D outcomes.

ADDRESSING THE RELEVANT TERMS OF REFERENCE – ISSUE 6

How can rural industries and governments better identify, prioritise and fund research, development and extension?

The current RDC model is already highly effective at identifying, prioritising and funding RD&E, and we support opportunities for greater collaboration and investment addressing national strategic rural R&D issues.

RD&E priorities at a ‘whole of agriculture’ level are identified and prioritised by the Government in the National Rural R&D Priorities, which are enacted by the National Primary Industries RD&E Framework. The framework has been developed through the Primary Industries Ministerial Council (PIMC), the Australian, state and Northern Territory governments, rural R&D corporations, CSIRO, and universities to encourage greater collaboration and promote continuous improvement in the investment of RD&E resources nationally. The framework provides the structure and institutional arrangements needed to strengthen national research capability and better address cross-sectoral and sectoral research and development.

RD&E priorities in the cotton industry are identified and prioritised through a process in which Government and growers work together. CRDC works with grower advisory panels, headed by Cotton Australia, to identify priorities, seek feedback on research proposals and determine successful funding applicants. Importantly, both growers and the Government have a say on where research funds are invested.

We suggest that the Task Force consider the principles underlying our activities. Building on the strengths of the RDC framework, the CRDC has recently prepared its Strategic R&D Plan 2013-2018 which sets the direction of its operations and investment in cotton RD&E over those five years. It is in alignment with the cotton industry’s ‘Vision 2029’, giving the CRDC a balance of medium-term and long-term outlooks for setting strategies. The CRDC sought and considered insights regarding the future for agriculture and society as whole. We therefore believe the following selected insights and assumptions that underpin the plan may be useful to consider in developing the Agricultural Competitiveness White Paper, as many of them apply across the whole of agriculture, as well as within the cotton industry.

- Doing the same RD&E, or the same better, will not be sufficient to secure the industry’s future.
- Incremental improvements will still be important but transformational improvements will be vital.
- Transformational improvement to profitability can just as likely to be derived from capturing the full value of products as they are from reductions in production costs or on-farm productivity gains.
- Changes to the emphasis of components of RD&E may be required.
- Opportunities exist for investment in end market RD&E and routes to market.

- The relationships between farmers, industry and customers will be increasingly important to understanding and managing future uncertainty.
- An increased emphasis on development and extension through partnerships in industry joint ventures can enhance adoption and the performance of investments in RD&E.
- Investment in the ability of people to communicate is central to their capacity to innovate, understand and apply knowledge; and these are keys to future industry capacity.
- New collaborative forums and partnerships engaging researchers, farmers, industry and customers are essential drivers to realise the benefits from RD&E investments.

These principles are important in understanding how rural RD&E can best be identified, prioritised and funded in the future.

The CRDC's views on the current RDC model

As demonstrated in the CRDC's two submissions to the 2010 Productivity Commission Inquiry into Rural Research and Development Corporations (Cotton Research and Development Corporation, 2010a, 2010b) – and as acknowledged in the 2014 Issues Paper for the Agricultural Competitiveness White Paper – investment in rural R&D and its adoption on-farm through extension are integral to the future competitiveness of Australian agriculture. CRDC strongly believes that this should take place through the current RDC model, within the National Primary Industries RD&E Framework, which is operating extremely successfully.

The great strength of Australia's RDC model, and one of the key reasons it is envied internationally, is that it brings together government and industry research investment on mutually agreed priorities through strategic five year plans to deliver a range of public and private benefits through well-managed, integrated research portfolios.

The RDC model is tuned to the needs of levy payers (industry) and Government. CRDC and other RDCs have shown that adoption rates of successful innovations are higher than they would be if produced by the Government agency alone, or directly by the researchers themselves. It is this unique researcher, industry and Government partnership that makes the RDC model efficient and effective.

The rural RDC model has consistently generated a high level of return on levy-payer and taxpayer investment compared with most other public investments. A 2010 analysis of return on R&D investment between 2001 and 2009 found that for every dollar invested, \$10.51 is returned after 25 years (Council of Rural Research and Development Corporations Chairs, 2010).

The RDC model arguably does a better job at rural research procurement and management compared with programs managed internally by policy agencies given its strong connections with both the providers and end-users of research.

The CRDC is a highly competent research investor, broker, manager and coordinator, independent of any particular research provider. We have mature systems and processes that are fit for purpose, and a very sound governance structure that enables appropriate inputs to research strategy from both industry and government, while ensuring that investments are overseen by an independent, skills-based board, and managed by professional staff with extensive experience, industry networks and directly relevant expertise. We ensure the most relevant and beneficial research is conducted by working closely with Cotton Australia's grower advisory panel. These are important features of the rural RDC model that have worked very well for the Australian cotton industry, for the rural communities in which the industry operates, and for the nation.

As outlined in our second submission to the Productivity Commission Inquiry (Cotton Research and Development Corporation, 2010b), the CRDC supports a number of the recommendations made in relation to data collection and coordination, the need for flexibility with respect to RDC involvement in marketing, and the need to improve mechanisms for evaluation and performance review, and consolidated performance reporting of RDCs by DAFF.

The CRDC supports the need for greater collaboration and investment addressing national strategic rural R&D issues. **We suggest that cross-sectoral collaboration could be improved by RDCs committing to re-allocate 5-10 percent of existing funds to a virtual pool for relevant projects identified by the Council of Rural RDCs in collaboration with the Department of Agriculture and then implemented by the RDCs.**

A feature of this process is that it minimises the administrative and governance costs which commonly undermine the benefit of collaboration. The Council would need to develop business plans that identify the collaboration priorities, research tasks required and identify specific RDCs to implement projects. This approach also leverages the RDCs strong connections with industry adoption pathways.

CRDC sees several areas that require improvement or further development within the RDC model, particularly funding during drought, and a commitment to investment in public R&D provision. These are outlined in the next section.

The CRDC's views on the additional \$100m investment

The CRDC is pleased to see the Government's recognition of the need for greater investment in rural RD&E.

Australian public RD&E directly accounted for nearly a third of the productivity growth experienced in Australia's broadacre farming sector between 1952–53 and 2006–07 according to an ABARES analysis (Sheng, Gray, Mullen, & Davidson, 2011).

But apart from a spike in investment in 2001, Australia has had little growth in real R&D investment since the mid-1970s. There is a time lag of several decades for the impact of R&D investment to show up in agricultural productivity. ABARES has identified a downturn in total factor productivity growth in the mid-1990s, and this slowdown has probably been

caused by a combination of adverse seasonal conditions and stagnant public R&D expenditure since the late 1970s (Sheng, Mullen, & Zhao, 2011, p. 1). The ABARES report concludes that although R&D is just one factor contributing to agricultural productivity growth, the innovations needed to address changing climate conditions and future resource constraints in 2050 and beyond are likely to depend on investments made in agricultural R&D today (Sheng, Mullen, et al., 2011, p. iii).

While the CRDC could identify many areas within cotton R&D that could benefit from additional funding, our recommendation is to utilise the additional spend on a cross-sectoral approach to incentivise adoption of R&D findings. We see the need for greater opportunities for farmers – across all agricultural sectors – to understand the benefits of adopting R&D outcomes, driving productivity growth at the farm gate.

As such, the CRDC recommends that the Government’s additional budget allocation of \$100m to rural RDCs should be spent on priority areas that impact all of agriculture. The greatest industry-wide benefit is likely to flow from investing in critical cross-sectoral collaborative goals with a focus on productivity gain.

These investments would address key constraints to productivity growth in areas already identified for collaboration such as the soils and water RD&E strategies as well as new areas with the potential for transformational gains such digitalisation; big data management; robotics, energy supply and end use efficiency. We believe the best avenue to achieve this would be through leadership of the RDCs working in partnership with the Department of Agriculture, to help achieve real productivity gains.

The CRDC’s views on the role of RDCs in extension

The CRDC believes there is a strong role for the rural RDCs in extension, and that delivering research outcomes is a vital role and a critical part of the RDC process. This is reflected in our strategic plan, where we have purposely embedded investment in development and extension within the research programs. Our three leading programs, ‘Farmers’, ‘Industry’, and ‘Customers’, are considered to be research, development and extension programs. We consider RD&E as a collective process in the achievement of outcomes, as opposed to being separate and segmented activities.

As the various state governments have steadily withdrawn their extension officers, and the private sector has not been able to deliver the resources, CRDC has embarked upon a public–private partnership to deliver extension to growers. We have built capacity within our team and the industry in order to deliver this extension model, which provides great benefits to the industry, but also involves risk, as during periods of low income, staff numbers may have to be reduced due to lower revenues.

The CottonInfo partnership – an industry joint venture between CRDC, commercial seed company Cotton Seed Distributors and cotton’s industry representative body Cotton Australia – was established in 2012 for a period of five years to achieve the following goals:

- Improve industry practices
- Improve communication of research
- Improve responsiveness to support farmers and to meet industry needs.

Through this unique partnership, a team of 25 people (on-ground regional development officers, researchers who are technical specialists in their specific fields, and the myBMP staff), are delivering research outcomes directly to cotton growers, and the supporting industry including agronomists, consultants and other researchers.

Integral to the joint venture is the continued industry-wide commitment to myBMP. myBMP is positioned as the principal RD&E information extension system for farmers and their advisors and has capacity to certify best-practice production and performance of the Australian cotton industry. myBMP offers a transformed way for growers to be able to:

- Access the latest information from research via the CottonInfo team under 11 modules
- Compare their practices with standards that would enable them to meet legislative requirements, as well as industry standards
- Apply best practice knowledge to lift their farm performance above industry standards
- Apply for an industry audit to seek BMP certification for their farm.

The CRDC believes this joint industry initiative provides an excellent model for research development and extension that could be modified and adapted by other industries.

ADDITIONAL KEY CONSIDERATIONS

Funding during prolonged drought and other catastrophic events

Drought is a major challenge for the Australian cotton industry, given that cotton is predominantly an irrigated crop. While the CRDC manages its reserves to ensure the industry is able to sustain R&D during dry seasons, extreme circumstances of prolonged dry conditions or serious floods have major impacts on production – and thus R&D.

The CRDC experienced a significant reduction in revenue between 2002 and 2010 as a result of reduced research levy collected from drought-impacted crops. During this time, the drought-induced reduction in industry and government research funding saw our abilities seriously challenged. Strategic outcomes continued to be met during this time but R&D capacity in the cotton industry was reduced by near 25 percent and the impact of these constraints on strategic outcomes were being felt for some time after this period.

As this period demonstrated, reserves are an important tool for ensuring cash flow requirements, capacity to meet liabilities and respond to an emergency or urgent strategic R&D need. The CRDC sought to sustain core R&D capability and deliver strategic outcomes throughout this period through the combination of using reserves and reducing budgeted expenditure.

During this time, the CRDC took a number of steps to improve efficiency and effectiveness, including:

- Reducing total staffing levels
- Improving IT systems and personnel taking responsibility for their own clerical needs
- Continuing to work with the Council of Rural R&D Corporations in investigation of administrative efficiency gains within the RDCs and the rural R&D system as a whole (including standardisation of agreements and intellectual property policy positions)
- Assessing the costs and benefits of collaboration options including partial and complete merger with the Grains RDC, and sharing back office functions
- Assessing the costs and benefits of collaboration options.

This period demonstrated that the RDC model does not have an effective way of managing reduced RD&E funding due to lower levy collections in periods of intense and sustained drought, or in response to other catastrophic events such as floods or major pest damage. RDCs that have reserves may be allowed to access them in the immediate forward years, but the current whole of government budgeting process is not conducive to approving use of reserves via loss applications for future years, adding an additional administrative requirement, creating uncertainty, and taking away the board's ability to govern – all at a time when resources are already stretched.

Given the likelihood of increased climate variability and more frequent droughts in the future, the issue of reduced revenue during drought is critically important.

The CRDC recommends that the Task Force consider ways of allowing the rural RDCs to sustain RD&E capacity during prolonged drought periods (and during other catastrophic events). Such methods might include disproportional matching funding, whereby the Government contributes a greater proportion during periods of reduced levy income, which industry repays in later high levy seasons, allowing rural RDCs to forward plan the use of existing reserves in periods of prolonged drought.

Access to research provision

There has been a steady decline in the contribution of ‘base funded’ personnel from all research provider agencies over recent times, as public agencies move away from investing in public research provision. Increasingly, project proposals submitted to CRDC for funding include researcher and technical officer salaries in addition to operating expenses. Research providers are increasingly resorting to ‘leveraging’ administration and capital overheads through project proposals while the RDCs are increasingly investing in researcher capacity. The end result is that the CRDC’s ability to leverage its stakeholder dollars and get full value for money is compromised.

This continual decline in agency research investment has other, wider implications for agriculture. One is that in areas where there is market failure (such as biosecurity), the withdrawal of state agencies presents a significant strategic risk for agriculture as a whole, given our dependence on state-based researchers for managing incursions and working on long-term solutions.

Secondly, a reduction in the number of research suppliers would increasingly drive the CRDC towards international collaboration. While this has advantages in some R&D situations, allowing us access to innovation and new ideas in international R&D, in others it sees us losing our status as world leaders and potentially disclosing some of the reasons for the Australian cotton industry’s competitive advantage. There is a risk that significantly replacing Australia’s research provision capacity with overseas sources could have similarly perverse outcomes.

Partnering with private research providers, such as agribusinesses, is a potential option for future R&D research provision. Such partnerships are already working well in the cotton industry’s extension program (as outlined in the CottonInfo example), and could be enhanced within the industry’s R&D, with the potential for a transformational impact on the industry. However the commercialisation pathway needs streamlining for this to be fully effective. The current commercialisation arrangements – including laws protecting the ownership of intellectual property and the regulations, costs and uncertainties associated with product registration processes – present barriers to working with agribusinesses.

Ultimately, a key question facing the CRDC is if it will be able to access the services it needs for future research in a cost effective manner. One possibility for future exploration is making the RDC model more flexible to allow RDCs to undertake research themselves, as well as funding research, akin to how the model was recently changed to give statutory authorities the freedom to carry out marketing functions. This may align advantageously

with a circumstance where industry RD&E is reliant upon greater involvement of agribusiness and private investment in RD&E.

The CRDC recommends that the Task Force consider the future needs for research provision (as opposed to research) in agriculture and how these may be met. Options may include ensuring continued funding for public agencies (such as CSIRO and universities), and ensuring a greater commitment to, funding and coordination of state-based research agencies through the Agriculture Senior Officials Committee (formerly the Primary Industries Standing Committee) and providing the legislated capacity for the rural RDC model to evolve to undertake research provision.

CONCLUSION

We applaud the Government's decision to move forward with the Agricultural Competitiveness White Paper and its commitment of additional funding to rural Research and Development Corporations (RDCs). We believe the successes of the cotton industry may help to offer insights and examples in relation to the achievements of the existing RDC model, the advantages of industry collaboration, and the opportunities available for RDC involvement in extension, across the broader agricultural sector.

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