Australian Government

Cotton Research and
Development Corporation

SUBMISSION BY THE

COTTON RESEARCH & DEVELOPMENT CORPORATION

to the

Productivity Commission Inquiry into

Rural Research & Development Corporations

June 2010

CONTENTS

EXECUTIVE SUMMARY

This submission provides a short overview of the Australian cotton industry and the Cotton Research and Development Corporation (CRDC) before addressing the terms of reference for this inquiry directly.

The key points of this submission are that:

- This is a timely review, and a great opportunity to improve the rural R&D model by building on its strengths.
- There is a compelling rationale for Commonwealth Government investment in rural R&D. The challenges of meeting societal objectives for food, water and energy security, against a backdrop of a highly variable climate exacerbated by climate change, rapid demographic changes in Australia, and increasing competition for land and water resources, intensify the need for high quality rural research that targets both public and private objectives, preferably in an integrated manner.
- The rural RDC model has consistently generated a high level of return on levy-payer and tax-payer investment compared with most other public investments.
- The rural 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 Australian cotton industry excels in terms of productivity, quality and environmental sustainability. Australian cotton is the highest-yielding, finest, cleanest and greenest cotton in the world. The impact of CRDC investment in R&D which sustaining and improves upon these achievements into the future will be as equally important. The balance of public and private investment through the CRDC has been reflected in the substantial public and private benefits generated by the research funded through the corporation. The interrelationships between natural and agricultural systems are apparent. The results can be seen in an internationally competitive industry that generates significant employment and export income. It contributes to food and fibre security and is at the forefront of environmental management systems, adaptation and mitigation to climate change.
- Rural R&D is equally about defending current productivity and environmental assets from threats such as diseases, pests and weeds. The Australian cotton industry contributes to this national agenda with the support of CRDC funded research.
- Of increasing strategic importance is investment in research capacity and human capability to successfully meet the future challenges set out above for rural industries. CRDC has placed increased strategic emphasis on human capacity in its investments and is concerned with declining public sector commitment to science capacity given the apparent future needs and public benefits.
- The CRDC directly funds about 20% of the cotton research effort in Australia and through its partnerships is involved in 60% of all cotton research in Australia. The most recent evaluation of the CRDC research portfolio (BDA Group 2008) estimated that CRDC's R&D investment between 2003 and 2008 delivered a minimum return of $431m to cotton growers, $292m to other sectors, $24m in environmental benefits and $68m in social benefits. This represents a minimum return of $7 to Australian cotton growers and $14 to Australia at large for every dollar invested by the CRDC over this period.
- The Cotton Research and Development Corporation is a highly competent research investor, broker, manager and coordinator, independent of any particular research provider. It has 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. 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 the nation.

- While it can be difficult to assess the counterfactual, this submission argues that, had the CRDC not been in existence and operating under the rural RDC model over the last twenty years, cotton research in Australia would have been significantly less well organised and coordinated, it would not have been sufficiently driven by the needs of industry (and thus 'owned' by industry), it would not have delivered the same emphasis on environmental benefits, cotton research capacity in Australia would be reduced, and the overall level and quality of Australian investment in cotton R&D would have been considerably weaker.

- The last 20 years has seen trends of increasing demands of rural R&D, declining investment by governments and cost shifting to the RDCs. Arguably the RDC model has been the only source of consistent leadership and investment throughout.

1. THE AUSTRALIAN COTTON INDUSTRY and the CRDC

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

On a global scale, Australia is not a large cotton producer — only around 3 per cent of the global crop is grown within Australia. However Australia is one of the largest exporters of cotton, and over 95 per cent of the national crop is exported, generating in excess of one billion dollars in export revenue annually.

The Australian cotton industry is relatively compact, and concentrated in northern New South Wales and southern and central Queensland, with between 700 and 880 cotton enterprises currently producing the crop. Cotton is produced in multi-enterprise farms comprising a mix of summer and winter growing crops as well as livestock. Cotton production is highly mechanized, capital intensive, technologically sophisticated and requires high levels of management expertise. National cotton production averages 2.5m bales (227kg/bale) of cotton lint and 850,000 tonnes of cottonseed (oilseed).

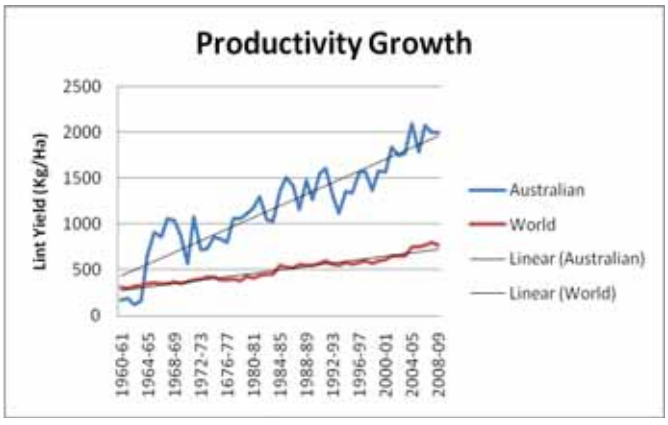
Beyond the farm gate, a sophisticated network of cotton gins, product classing and supply chain logistics add market value to cotton lint, while extractive industries process cotton seed oil. Nationally the Australian cotton industry generates significant wealth. It also provides an economic foundation to many regional and remote rural economies with employment of up to 14,000 people. The industry with the support of R&D is building new relationships with Australian textile manufacturers and brand owners.

The Australian cotton industry continues to take responsibility for improving its performance. The industry has transformed its pesticide use and is responding to increasing water scarcity with substantial improvements in water use. The cotton industry was the first major agricultural industry to undertake a comprehensive external examination of its environmental performance in 1991 with a subsequent environmental audit conducted in 2003 (GHD 2003). The industry recognises the importance of natural assets and is committed to continuous improvement in sustainable practices.

1.1 Productivity

Australia produces the highest average yield for irrigated cotton in the world, and its productivity growth outstrips its competitors, as outlined in Figure 1 below (CRDC from International Cotton Advisory Council data).

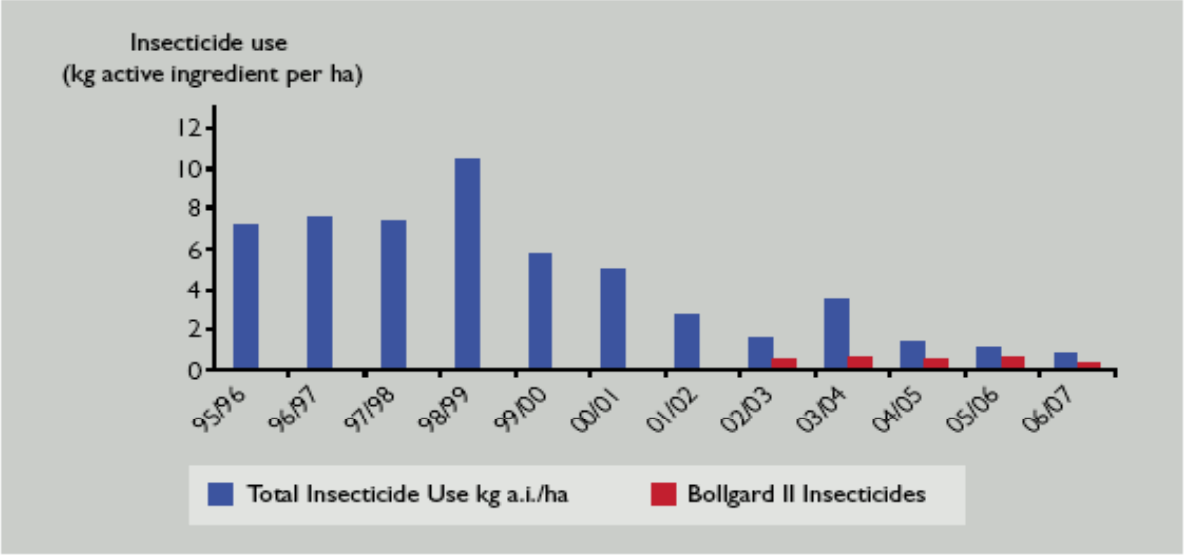
Figure 1. Comparative productivity growth in cotton production, Australia vs world



1.2 Sustainability

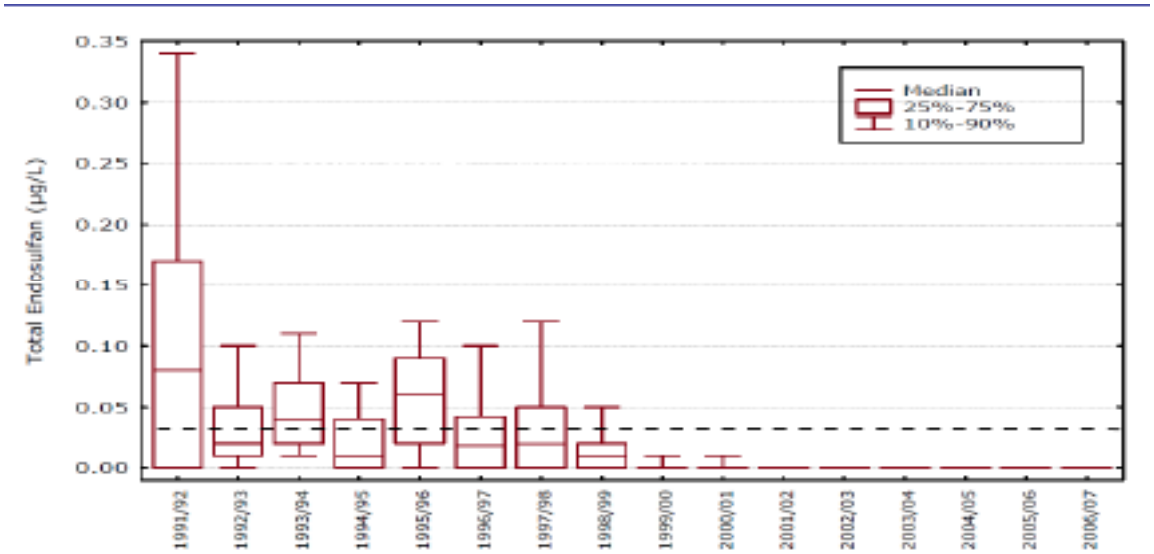
On the farm, investment in R&D has significantly reduced the quantity of insecticides used to control the major insect pests and this applies to both 'conventional' non-genetically modified cotton, and to genetically modified cotton (Bollgard II), as Figure 2 below illustrates. The Australian cotton 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 which resist attack.

Figure 2. Reduction in pesticide use on Australian cotton crops over 12 years



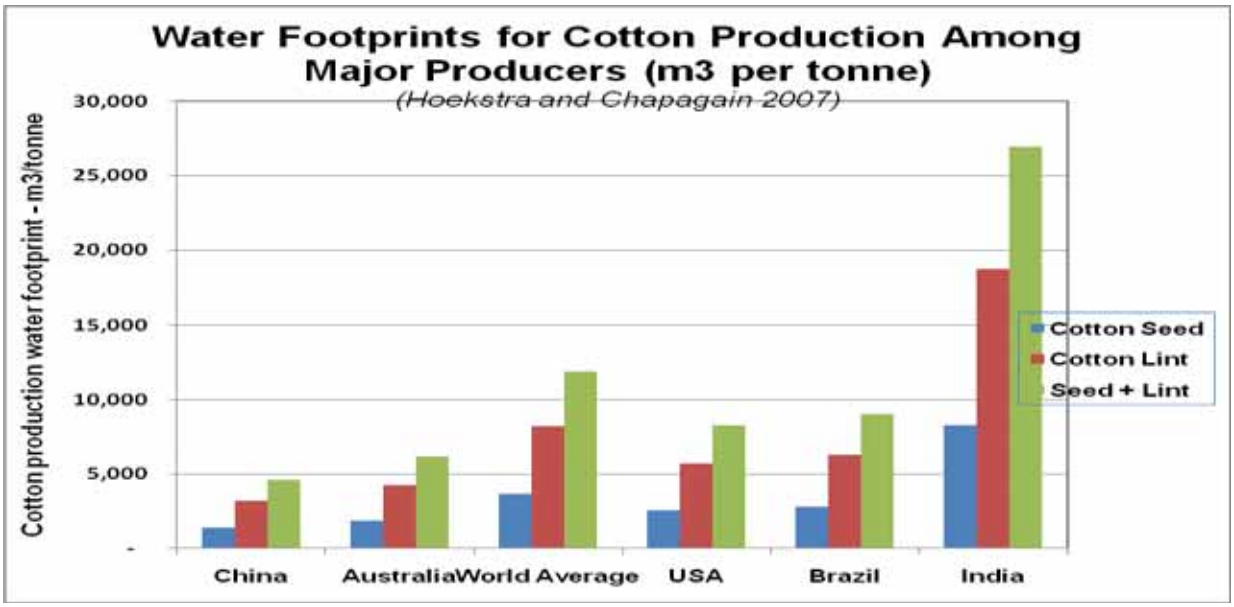
This reduction in pesticide use within the industry has delivered significant environmental benefits. Figure 3 below (W.Mahwinney 2008 Dept Water & Energy) illustrates the elimination of river contamination by Endosulfan (in this case for the Namoi River) from the mid-1990s after the introduction of the Cotton BMP Program, a situation mirrored in the case of export beef contamination.

Figure 3. Endosulfan concentration in the Namoi River, 1991-2 to 2006-7



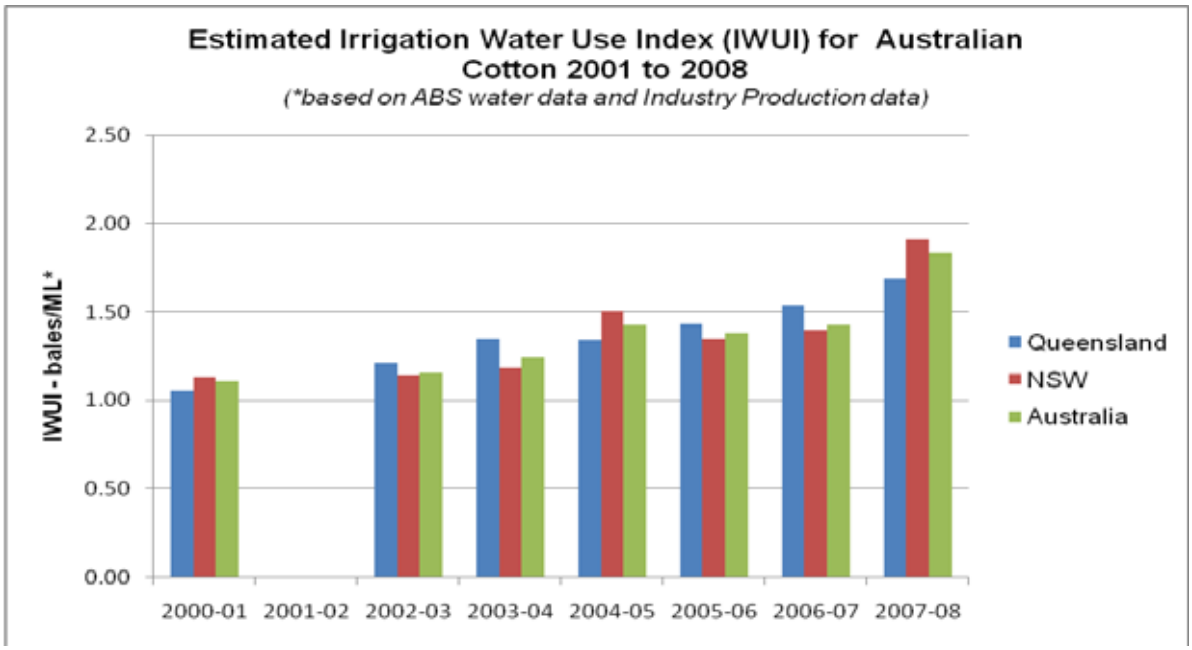
A crucial component of the cotton industry's environmental footprint is its water consumption, underlined during the prolonged intensive drought conditions of the last decade. Again, the Australian cotton industry is a world leader in water use efficiency, as illustrated in Figure 4 below.

Figure 4. Comparative water consumption in cotton production, various countries



Importantly, the water productivity of the Australian cotton industry continues to improve significantly, as Figure 5 below illustrates, 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.

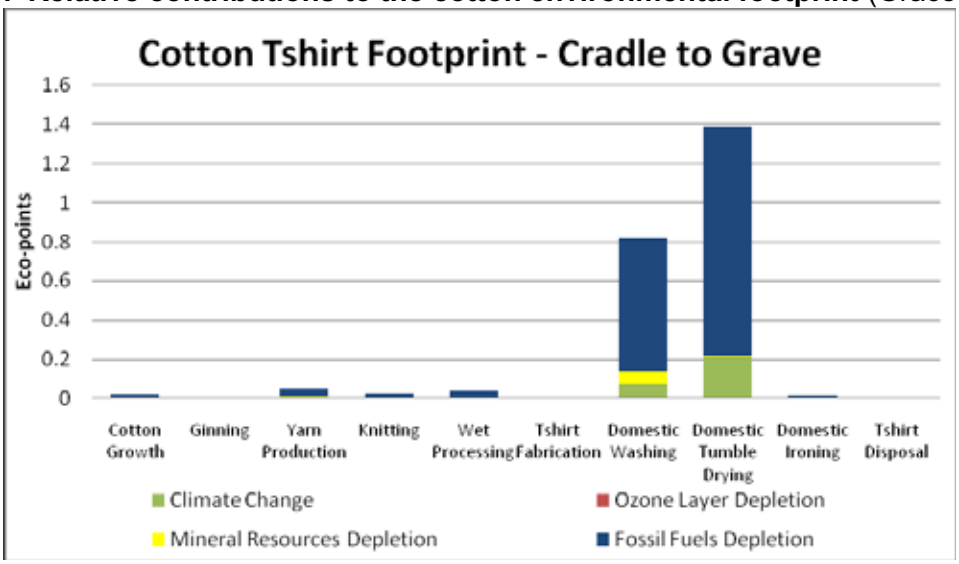
Figure 5. Cotton production per megalitre of water



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 (see Figure 6 below), 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.

Figure 6. Relative contributions to the cotton environmental footprint (Grace et al in prep)



Research investment by the CRDC has enabled the industry:

- to quantify and understand its carbon footprint plus some implications from a potential Carbon Pollution Reduction Scheme (CPRS);
- to improve the accuracy of the international calculation for Australian cotton GHG emissions from nitrogen fertilisers (and in this instance reduced the calculated impact), and R&D is also helping growers to improve nitrogen use efficiency; and
- to understand that GHG emissions from energy use on farm is similar to that from fertilizers, and R&D is also helping growers to improve energy use efficiency.

The importance of R&D in the cotton industry to its past, current and future performance is well understood. This is ongoing business. Research and development enables the industry to achieve the highest yields in the word (3 times the average). Despite drought, productivity gains of near 4% per annum are being derived from improved Australian-bred varieties and farm management practices (Respectively 45% and 55% of gains. Constable 2009). Improved practices have seen pesticide use reduce by 85% and water use efficiency improve by 40%. Improvements in fertiliser and energy use are driving an ongoing reduction in carbon pollution.

The CRDC invests in applied R&D that improves productivity, biosecurity, natural resource management and addresses climate change concurrently given the interrelationships between the issues. 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.

CRDC estimates that public and private R&D investment in the cotton sector is in the order of $60m annually. This R&D supports an industry that typically produces $1billion in gross value of production annually and contributes to broader social, environmental and economic benefits.

1.3 The Cotton Research & Development Corporation (CRDC)

The CRDC is regionally based in northwest NSW, in close proximity to the majority of providers and end users of the R&D in which it invests. The CRDC invests in R&D throughout the industry supply chain, and its new 2008-13 Strategic R&D Plan places increased emphasis on through chain issues. The CRDC is a small, highly efficient organization, with capable staff and directors who have an intimate knowledge of and commitment to the cotton industry and rural R&D.

A review by the BDA Group (2008) found that the CRDC accounts for some 20% of total cotton R&D investment in Australia, over 50% of which is undertaken by public R&D organisations. Through R&D partnerships, the CRDC is financially involved with around 60% of all cotton R&D undertaken in Australia.

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

- through its commitment and focus on delivering strategic outcomes;
- through its unique connections with the researchers and the end users of research – growers and supply chain participants;
- through fostering connections between all sectors of the industry, end users of Australian cotton and researchers;
- through skills in strategic investment as distinct from grant administration;
- through its responsiveness to the R&D priorities of government and industry;
- through 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); and
- through collaborating with other investors and research providers on initiatives from project to national program scales.

RDCs are required to strategically plan for R&D outcomes aligned over annual and 5 year time periods. CRDC's current strategic plan was prepared in the context of the Australian Government National Research Priorities, the Rural R&D Priorities and a 20 year outlook for agriculture and the cotton industry. Hence beyond responding to emergency issues such as biosecurity the CRDC manages its investments in accordance with its approved plans.

Within its portfolio of investments the CRDC manages a balance of shorter-term applied research and longer-term strategic research. The nature of the R&D varies with the strategic outcome sought but typically will entail a mixture of basic and applied research over time as well as development for practical application and adoption. Investment decisions are supported by detailed analyses including consideration of strategic fit, likely impact from investing or not investing, whether market failure exists, short or long term need, risk of not achieving outcomes and the likely adoption pathway.

Like other rural R&D Corporations (RDCs), the CRDC undertakes cost/benefit analyses ex-ante to inform investment decisions and ex-post as part of the Council of Rural R&D Corporation initiative to assess return on investment. The BDA Group (2008) review found that one in four R&D investments through the CRDC have resulted in a major industry impact – a success rate that is high compared to other rural R&D in Australia. Major impacts from CRDC's investment included developments in BMP, Water Use Efficiency, Fusarium Wilt Management, Bt Resistance Management, Cotton Breeding and EMS Pathways. Thirteen minor impacts were also identified.

Attribution is notoriously difficult in evaluating the impact of and benefits accruing from rural R&D (Campbell and Schofield 2007). Successful projects and initiatives, especially those

extending over many years to decades, invariably have many contributors. Disentangling cause and effect, and determining the relative attribution of benefit across many contributors, is not an exact science. Acknowledging these difficulties, the BDA Group (2008) study estimated that CRDC's R&D investment between 2003 and 2008 delivered a minimum return of $431m to cotton growers, $292m to other sectors, $24m in environmental benefits and $68m in social benefits. This represents a return of $7 to Australian cotton growers and $14 to Australia at large for every dollar invested by the CRDC over this period.

The CRDC actively leverages its investment capacity through research partnerships, to avoid duplication and address gaps, for industry and government outcomes. In doing so it has and continues to make a major contribution to the achievements of the Australian cotton industry and deliver benefits to Australia more broadly. This includes sustaining research capacity in an environment of reducing government investment. Examples of this contribution are discussed briefly in this submission, and evidenced in more detail in the Annual reports of the corporation.

2. RATIONALE FOR GOVERNMENT FUNDING SUPPORT

ToR 1. Rationale for Commonwealth Government investment in rural R&D

There is a strong public policy case for Commonwealth investment in rural R&D.

National and international reviews and evaluations (eg. Pardey & Alston 2010, Mullen 2007, Alston, Beddow & Pardey 2009a and 2009b, Rural RDCs 2008), have found consistently that investment in agricultural research generates high returns on public investment. Alston, Beddow and Pardey (2009a) in an article in *Science*, argued that there are strong linkages between levels of investment in R&D and productivity growth in agriculture, and that declining public investment in agricultural R&D is correlated with declining rates of productivity growth — and consequently in food security, economic development and environmental protection.

The public policy case for Commonwealth investment in rural R&D is outlined in more detail in the submission from the Council of Rural R&D Corporations (CRRDC) to this inquiry. The CRDC endorses the arguments put forward in that submission. The points about market failures and spillovers, the non-divisibility of research costs, the non-excludability of research results, and the spillovers of benefits in multiple directions are very pertinent in the Australian cotton industry as they are in other sectors of Australian agriculture. The examples described in the previous section concerning the cotton breeding program and the cotton BMP program illustrates these points. There is no way the 700 - 880 cotton growers could or would fund the current level of R&D within the industry themselves, there is no evidence that private investment would be attracted to fill any reduction in public investment, and it is highly unlikely that the public benefits currently being delivered through CRDC would continue to be delivered if the proportion or level of public investment declined. Importantly Government funding of rural R&D enables strategic long term research as industry will typically prioritise research funding for current and shorter term production needs.

The CRDC also endorses the arguments developed in the CRRDC submission about the urgent need to increase Commonwealth investment in rural R&D to respond effectively to major looming challenges in food, energy and water security, to manage in an increasingly variable climate, to anticipate and position agriculture in a potential carbon market, and to

secure the long-term productive capacity of the resource base in the face of the above forces. Keating and Carberry (2010) analyse these issues in some depth, and highlight the importance of agricultural R&D and education in positioning Australia to address them effectively.

While cotton is not identified as a food crop, the CRDC and the Australian cotton industry have identified three ways in which it can contribute to increasing food production:

- *Continuing to drive productivity gains in crop outputs*
  For every two tonnes of cotton lint produced, three tonnes of cottonseed are also produced. Cottonseed and its by-products are major food and stock feed ingredients. Beyond quantity there is investigation underway to enhance the nutritional quality of cottonseed and its bi-products.

- *Continuing to drive the efficiency and resilience of the farming system.*
  Cotton, usually the most profitable crop within its production zone, drives the economics of a complementary farming system with grain crops.

- *By broadly sharing the results of R&D and innovation*
  As a leading industry in productivity growth through innovation, the cotton industry can provide significant spillovers from the knowledge, practices and technology developed through cotton R&D for adaptation and application to the production of food crops.

The cotton industry has on-going challenges in maintaining its premium position in the world cotton market and maintaining competitiveness against on-going declining terms of trade. There is a substantial public benefit in terms of the prosperity of regional communities throughout northern New South Wales, southern and central Queensland through a strongly competitive and profitable Australian cotton industry.

ToR 2. Balance between industry-specific and broader community benefits

Research investments through the CRDC have generated considerable public good spillovers, a classic example of which is the Cotton BMP program.

Best Management Practice (BMP) in the Cotton Industry

In the early 1990s, chemicals in common use in the cotton industry were implicated in contamination of export beef and fish kills in rivers, and there was widespread community concern and media focus on pesticide drift over towns and non-cotton properties in cotton-growing regions. In 1991/92, river monitoring in Central & North Western Rivers in NSW (Muschel & Cooper 1998) found 59% of water samples contained Endosulfan.

After reviewing what could be done, the CRDC in conjunction with the then Land & Water Resources R&D Corporation (LWRRDC) and the Murray Darling Basin Commission (MDBC) established a “Joint Pesticides R&D Program” in 1993. This program brought to bear focused scientific attention on the issue and started to develop management options. However the issue with chemical contamination is that an industry is only as good as, and in effect is judged by, its worst practice rather than its leading producers. So having technical solutions was only the start of the process to improve management of pesticides in the cotton industry and eliminate pesticide contamination issues that were threatening the social licence to operate of the cotton industry.

In conjunction with Cotton Australia, the CRDC led the development of a voluntary industry code of practice called Cotton Best Management Practice (BMP), documented in a detailed manual and subject to various levels of on-farm auditing. The first iteration in 1996 covered: Application of Pesticides; Storage & Handling of Pesticides; Integrated Pest

Management; and Farm design & Management. The industry itself later added Farm Hygiene, Petrochemical Storage & Handling, and Land & Water Management. In 1999 & 2000 Cotton Australia ran BMP workshops across the industry and 96% of cotton growers were introduced to the BMP manual. By 2009, about 50% of growers had had their operations audited at least once. The overall benefit: cost ratio (measured very conservatively) for this program was 5.9:1 with an internal rate of return (IRR) of 45% (Schofield et al 2007).

Such a systematic approach over a fifteen-year period, combining research with extension and education to develop an integrated package, designed around the needs of cotton businesses, is an excellent illustration of the advantages of the RDC model and its close ownership by industry. The public good aspects of this work for river health and biodiversity are also reflected in the CRDC partnership with LWRRDC and MDBC, and of course in the government investment in CRDC through matching funds.

It is difficult to imagine how the Cotton BMP program and its outputs and impacts could have been achieved through short-term grant-based research funding managed in isolation from industry.

Building Capacity in Cotton Research and Development

The CRDC has been the largest contributor to the Cotton Cooperative Research Centre since its inception and through all three phases to the present version, called the Cotton Catchments and Communities CRC. The BDA Group (2004) found that in its first five years of operation, the Australian Cotton CRC invested a total of $72m, on cotton research, development, extension and education, delivering an estimated $510m in benefits to the Australian cotton industry — $7.08 for each dollar invested.

The current phase of this CRC has placed a strong emphasis on the broader social and environmental aspects of the cotton industry with its explicit focus on catchments and communities. The leadership shown by the CRDC and its investment through the CRC as a major delivery partner for the CRDC has been a substantial commitment to the broader public good aspects of the cotton industry in Australia.

Through the CRC and through its direct investments, the CRDC has made a major contribution to the development and maintenance of world leading Australian research capacity. Sustaining rural R&D capacity to meet the future strategic challenges is a crucial investment.

3. THE RDC MODEL

Again, the CRDC endorses and the arguments made in the submission from the Council of Rural R&D Corporations (CRRDC) to this inquiry, and there is no need to reiterate those arguments here.

ToR 3. Enhancing competitiveness and productivity of rural industries

The great strength of Australia's rural R&D model is the partnership between government and industry that is hard-wired into the model, and is the envy of many of Australia's agricultural competitors internationally. The ownership that levy-payers feel towards research outputs has been a key contributor to high adoption rates for research results, that have in turn contributed to a doubling of productivity in Australian agriculture over the

last 25 years — considerably higher productivity increases than the economy as a whole. This ownership also feeds into extensive end-user input into research priorities, which means that research outputs tend to be relevant and adoptable. The model engenders high levels of collaboration between researchers and end-users, and also a degree of national coordination of research activity within each sector.

A classic example of this is provided in the case of the cotton breeding program described below.

Development of World Best Cotton Varieties

The CRDC investment in plant breeding and biotechnology with the cotton industry and by its research partners over the last 25 years has positioned the Australian cotton industry as a world leader.

The first phase of the program involved the development by the CSIRO Cotton Breeding Team of new premium cotton varieties through traditional breeding. This work was continually upgraded including with options for incorporating adaptations of American gene technology to local conditions from the mid-1990s. Australian cotton varieties now produce the world's highest yields and now incorporate genes which resist the crop's number one insect enemy, *Helicoverpa*.

Coupled with integrated pest management (see below), this innovative technology has helped the industry to reduce overall insecticide use by 85 per cent over the last decade. In addition, Australian varieties have captured 25 per cent of the United States cotton seed market, with royalties funding further innovative Australian research not only in cotton as CSIRO utilises their share more broadly.

It is estimated that a return of over $5 billion to the Australian cotton industry and the nation and a benefit:cost ratio of 86 has been achieved from this program (CIE 2002). It was awarded the inaugural Australian Government Prize for Rural Innovation in 2005.

ToR 4. Appropriateness of current funding levels and arrangements

The CRDC strongly endorses the points made in the Council of Rural R&D Corporations (CRRDC) submission to this inquiry that there is a strong case for increased public funding for Rural R&D in general, and that the RDC model remains an appropriate vehicle for such investment.

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 has sought to sustain core R&D capability and deliver strategic outcomes throughout a period of prolonged drought on revenue through the combination of using reserves and reducing its budgeted expenditure.

Separately the CRDC observes that the Government provides additional contributions to the Fisheries R&D Corporation for environmental outcomes. The CRDC sees equal opportunity for the Government to provide such support for natural resource management outcomes through other industry RDCs, in part to fill the void left by the winding up of Land & Water Australia.

ToR 5. Improving the RDC model

The CRDC provides comments on improvements to the rural R&D system as a whole and the RDC model.

CRDC Governance

The board and chair are appointed by the Minister in accordance with the legislated PIERD Act requirements. CRDC Directors operate in accordance with a board charter that sets out their role and responsibilities. The Board conducts regular performance reviews in ensuring best-practice governance of the corporation. The Executive Director is appointed by the Board and remunerated in accordance with relevant commercial and public sector benchmarks. A skills-based Board allows for the highest level of board governance and performance, without the complication of political or industry advocacy.

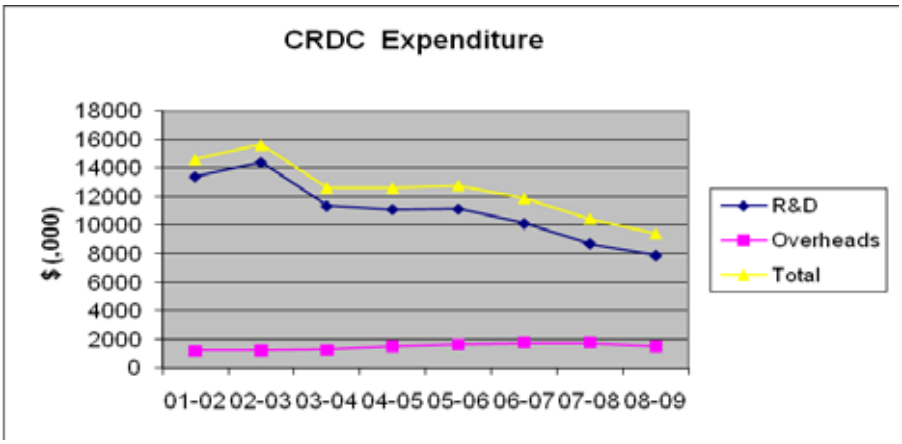
Increasing Administrative Efficiency

The CRDC is committed to continuous improvement in the efficiency of its expenditure whilst maintaining or improving the effectiveness of its R&D investments. In doing so CRDC takes a holistic business approach that recognizes not only the costs but also the risks and returns in delivering outcomes from the 85 - 90% of CRDC expenditure in R&D. Having skilled and experienced people that can scan, scope and proactively manage portfolios of R&D investment through to adoption for strategic outcomes is an important element of capacity within the rural R&D system. This is quite a different process to administration of government grants or research provider program management.

CRDC has experienced a significant reduction in revenue as a result of the drought, as illustrated in Figure 7 below. In response the CRDC has taken a number of steps to improve the efficiency and effectiveness of its operations.

Firstly total staffing levels have been reduced by 25%; with R&D management experience and capacity increased within a smaller team of personnel. The need for dedicated administrative assistance is less given downsizing of the business activity, better IT systems and personnel taking responsibility for their own clerical needs. Being based in regional Australia provides advantages in connectedness to the research and end users as well as minimises associated location costs.

Figure 7. CRDC Expenditure



Secondly the CRDC continues 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. This includes standardisation of agreements and intellectual property policy positions.

Thirdly in late 2008 and early 2009 the CRDC and Grains RDC undertook an investigation of collaboration options, up to and including a full merger of the two corporations. The investigation highlighted that:

- There are significant areas of commonality where R&D collaboration make sense but equally there are crop and industry specific research needs, particularly relating to the supply (value) chain, where it does not.
- Research providers are passively supportive of potential benefits from greater R&D collaboration.
- The Australian cotton industry represented by Cotton Australia did not support the option of CRDC and Grains RDC merging on the basis that it would undermined the focus, responsiveness and effectiveness of their investment in R&D.
- Separately the investigation did not identify a cost-benefit from structural changes such as establishing a new entity, or the partial and full merger options.
- The investigation identified the potential for further improvement to existing collaboration through better alignment of planning and investment processes at a management level.

The results of this investigation are being implemented through joint R&D management processes to deliver integration of investment in R&D and its adoption targeting shared productivity, natural resource management and biosecurity outcomes.

Fourthly the CRDC and Grains RDC revisited the examination of shared back office functions in 2010. CRDC concluded that whilst it is possible to outsource its administrative functions from Grains RDC the savings (up to $190,000) do not outweigh the benefit of having committed capability integrated within the business: which is immediately available, understands the business, its stakeholders and suppliers. Importantly responsibility and authority are aligned appropriately and from a risk management perspective appropriately deals with authorisation procedures, business continuity and succession planning. The examination has resulted in ongoing collaboration with Grains RDC on best practices and innovation in IT, finance and administration.

In summary CRDC has examined the opportunities to eliminate perceived duplication of effort, to streamline governance and to achieve economies in back office functions. While some such savings are possible, they are unlikely to be significant unless the cuts to the number of offices, boards, staff and committees are so deep as to undermine the core focus and strength of the current model, which is the degree of industry identification with and ownership of the commodity-based corporations and companies. This would likely detract from the perceived industry relevance and subsequent adoption of research outputs, and consequently the return on investment. It is thus likely to be a false economy.

Evaluation for a Purpose

The CRDC undertakes cost/benefit analyses ex-ante to inform investment decisions and ex-post as part of the Council of Rural R&D Corporation initiative to assess return on investment primarily for reporting purposes but also to inform future planning. CRDC also assesses the adequacy of the portfolio of its R&D investments in terms of achieving its 5 - year strategic plan outcomes. Adequacy is determined with reference to the status of achieving relevant outputs and measures of success. Where the portfolio is deemed inadequate, additional investments are scoped and/or the strategy reviewed. Further the CRDC considers both entry and exit points for investments.

Co-ordination and Collaboration for Impact

The CRDC actively collaborates at project, industry and national scales where a common need or opportunity is identified and a clear value proposition exists. The Minister and Department have advised they desire greater coinvestment from RDCs in national strategic

issues. CRDC is seeking to support this request. Further engagement is required on the business case or detail of the portfolio of R&D that would be undertaken.

The CRDC observes from its experience with the National Program for Sustainable Irrigation and Climate Change Research Strategy for Primary Industries that the greatest benefits of collaboration come from fostering awareness of research and interaction of researchers across a range of institutions and disciplines around strategic themes. This builds capacity and engages researchers to more effectively tackle collective challenges. Whilst much of the policy and basic R&D work can conceivably be done nationally, the majority of R&D investment will be in applied R&D through industry or regional pathways to ensure adoption. CRDC had anticipated that the National RD&E Framework cross sectoral plans would be the basis for identifying and collaborating to address national strategic R&D gaps.

Adoption is Key

A strength of the RDC model is that it is tuned to the needs of the end users of research. Resultantly the adoption rates of the innovations produced are higher than they would be if produced by a Government agency or directly by the researchers themselves.

R&D without adoption is not a good investment for applied R&D investors like the CRDC. The cotton industry has continued to evolve its model for supporting R&D adoption. The industry pioneered its own extension system in partnership with state departments during the 1980s. This model was highly successful but has become redundant as the industry has matured and consolidated. A new more commercial like and customer-driven model is emerging that links the outputs of R&D to growers and industry through its best management practices program and other delivery pathways that better engage with consultants and agribusiness. The new model is moving beyond technology transfer approaches to evaluation of market needs and targeted delivery. The CRDC recognises that governments are also end users of R&D and seeks to better support adoption by the government sector.

Soundness of the Rural R&D System

Within the system there are a number of complementary delivery models. In improving the system as a whole, the National RD&E Framework is an important process for fostering a culture of collaboration and coordination to improve the efficiency and effectiveness of rural R&D.

Despite the collective commitment made to the Framework, the ongoing cuts by governments to budgets for rural R&D undermines its credibility. The impact of pressures on rural R&D resources are already evident. Symptoms of these pressures include:

- An increasing focus on inputs and control rather than outcomes
- A decreasing capacity to respond to biosecurity issues
- Public research providers shifting costs to RDCs for research staff and operating expenses at the same time as arguably inflating the in-kind value of infrastructure and administration contributions. RDCs risk becoming the de facto employers for public research provider scientists as these positions are progressively changed from permanent to temporary positions, which RDC's then fund. Greater reliance is being placed on RDCs to sustain and fund the development of future research capacity within public research organisations. CRDC estimates that it now provides 1 of every 3 dollars within research projects compared to 1 in every 5 in 2004.

- Commercialisation of IP being seen as a source of funding rather than as means to benefit industry and Australia.
- Public research providers necessarily chasing alternative funding streams of the moment e.g. mining and resource policy with attendant distractions from a core role of developing basic science and science capacity.

In response the CRDC has sought to define and focus its investments in core R&D capability for its industry recognising that the purchasing power for R&D outcomes is being eroded. Arguably the impact of "consolidation" of public research provision would have been far greater without the RDC model providing a consistent contribution to rural R&D direction and investment.

Perversely this drives questions as to the long term value proposition for providing funding to public research providers.

Soundness of the Rural RDC Model

The CRDC has identified the need for better engagement with Government at Ministerial and Departmental levels as a key factor for improvement in shared understanding, ownership and commitment to the RDC model.

Currently engagement with Government is primarily focused on governance and compliance matters. Beyond high-level strategy setting for Rural R&D, the Government has not matched the industry commitment to engage with CRDC on planned R&D investments and to consider and adopt the outcomes. This longstanding issue has been exacerbated by the removal of government directors from the boards of RDCs in response to the Uhrig Review of Corporate Governance in CAC Act bodies in 2007. The cotton industry, as investors and end-users of R&D, have a strong ownership of the research outputs and this supports high levels of adoption. This is the opportunity for Government. The CRDC will seek to facilitate greater engagement by Government with industry in its planning of research investments and discussion of research results.

As an alternative to competitive grants programs Government could consider could directly engaging RDCs to deliver the outcomes sought, given RDCs have significant capacity to manage R&D investments and the advantage of connections that foster high levels of end user engagement.

CONCLUSION

The Cotton R&D Corporation welcomes the Productivity Commission Inquiry into Rural Research and Development. This is a timely review, and a great opportunity to improve the rural R&D model.

There is a compelling rationale for Commonwealth Government investment in rural R&D as the Australian rural sector faces enormous challenges, and global demand for our outputs will increase substantially over coming decades. The rural R&D model — exemplified in the case of the CRDC — generates a high level of return on levy-payer and tax-payer investment compared with most other public investments, and does a better job at research procurement and management compared with research programs managed internally by policy agencies.

The Australian cotton industry excels in terms of productivity, quality and environmental sustainability. Australian cotton is the highest-yielding, finest, cleanest and greenest cotton in the world. The CRDC has made a substantial contribution to the achievement of these outcomes, generating a minimum return of around $7 for each dollar invested (BDA 2008).

Had the CRDC not been in existence and operating under the rural RDC model over the last twenty years, we contend that cotton research in Australia would have been significantly less well organised and coordinated, it would not have been sufficiently driven by the needs of industry (and thus 'owned' by industry), it would not have delivered the same emphasis on environmental benefits, cotton research capacity in Australia would be reduced, and the overall level and quality of Australian investment in cotton R&D would have been considerably weaker.

In contemplating changes to the RDC model, it is crucial not to recognise and build upon the strengths identified while improving the performance of the model and rural R&D system as a whole. The achievements of the current model as illustrated by the CRDC mean that there would need to be a high degree of confidence that any proposed changes will deliver substantial net benefits — over and above what the current model currently delivers — in order to justify such changes to a model that is the envy of our global competitors.

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