CRDC

ANNUAL OPERATIONAL PLAN

2019–20

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Responsible Minister

Senator the Hon. Bridget McKenzie
Minister for Agriculture

CRDC Board

Chair	Richard Haire
Deputy Chair	Kathryn Adams
Executive Director	Dr Ian Taylor
Non-executive Directors	Elizabeth Alexander
	Greg Kauter
	Rosemary Richards
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CRDC/CottonInfo Communication Manager	Ruth Redfern
R&D Manager	Susan Maas
R&D Manager (Contractor)	Jane Trindall
R&D Manager (Contractor)	Stacey Vogel
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Commercialisation Manager (Contractor)	Jarrod Ward
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Project Administration	Megan Baker
Project Administration	Lynda George
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Accounts Officer (part-time)	Jeevi Arjunan

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About CRDC

The Cotton Research and Development Corporation (CRDC) delivers outcomes in cotton research, development and extension (RD&E) for the Australian cotton industry.

A partnership between the Commonwealth Government and cotton growers, CRDC invests in world-leading RD&E to benefit Australia's dynamic cotton industry, and the wider community. We invest in innovation and transformative technologies to deliver impact, and as an organisation we are ambitious, agile, and adaptive.

Cotton is a major contributor to the economic, environmental and social fabric of rural Australia. The industry's national exports generate an average of $1.9 billion in annual revenue, and the industry is a major employer in rural and regional communities.

Despite prolonged dry seasonal conditions across many of the cotton growing valleys, the industry continues to go through a period of growth. In recent years, cotton has expanded from its predominate growing base in NSW and QLD to VIC, and commercial trials are underway in the NT and WA.

RD&E and its resulting innovations are a key driving force behind our industry's continued success - and CRDC's purpose is to power the success of Australian cotton through this world-leading RD&E.

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Introduction

CRDC's investments are governed by a five-year strategic plan, and the 2019–20 year marks the second year under CRDC's Strategic RD&E Plan 2018–23.

The Strategic Plan provides an ambitious roadmap for CRDC's investments. Through this plan, our aim is to contribute to creating $2 billion in additional gross value of cotton production for the benefit of Australian cotton growers and the wider community.

As such, the 2019–20 year is focused on ensuring the second round of strategic RD&E investments under this plan help set the direction for the Australian cotton industry – one of innovation, increased commercialisation and digital transformation.

To help achieve this, Australian cotton growers and the Commonwealth Government will co-invest $20.2 million through CRDC into cotton RD&E during 2019–20, across approximately 300 projects and in collaboration with around 100 research partners.

The investments will be made in five key areas identified in the 2018–23 Strategic RD&E Plan:

- increasing productivity and profitability on Australian cotton farms;
- improving cotton farming sustainability and value chain competitiveness;
- building the adaptive capacity of the Australian cotton industry;
- strengthening partnerships and adoption; and
- driving RD&E impact.

This Annual Operational Plan outlines these investments and the targets CRDC aims to achieve in the 2019–20 year.

Ruth Redfern

CRDC's Strategic RD&E Plan 2018–23 snapshot

GOALS	KEY FOCUS AREAS
Increase productivity and profitability on cotton farms	• Optimised farming systems • Transformative technologies • Protection from biotic threats and environmental stresses
Improve cotton farming sustainability and value chain competitiveness	• Sustainability of cotton farming • Create higher-value uses for cotton • Measurement and reporting throughout the value chain
Build adaptive capacity of the cotton industry	• Science and innovation capability, and new knowledge • Futures thinking
ENABLING STRATEGIES	**KEY FOCUS AREAS**
Strengthening partnerships and adoption	• Partnerships and collaboration • Best practice (*my*BMP) • Innovation and commercialisation
Driving RD&E impact	• Impact and effectiveness

Our R&D investment priorities: the 2018–23 CRDC Strategic RD&E Plan

CRDC has documented five strategic outcomes that it seeks to achieve under the 2018–23 Strategic RD&E Plan, which in turn are the key focus areas for R&D investment under this 2019–20 Annual Operational Plan:

GOAL 1: Increasing productivity and profitability on Australian cotton farms

GOAL 2: Improving cotton farming sustainability and value chain competitiveness

GOAL 3: Building the adaptive capacity of the Australian cotton industry

ENABLING STRATEGY 1: Strengthening partnerships and adoption

ENABLING STRATEGY 2: Driving RD&E impact

Through focusing on these five strategic priorities, CRDC will achieve its outcome of delivering *increased economic, social and environmental benefits for the Australian cotton industry, and the wider community, by investing in knowledge, innovation and its adoption.*

Achievement against these outcomes will be monitored, evaluated and reported annually, in both the Annual Report and the Portfolio Budget Statement. The Strategic RD&E Plan targets are outlined in this table.

Strategic Plan goals	Performance criteria	End of Plan targets (to achieve by 2023)	2019–20 targets
GOAL 1: Increase productivity and profitability on cotton farms	Improved yield and quality	Increase in average bales/ha to 11.6 bales/ha for irrigated cotton, and 4.7 bales/ha for dryland cotton	Annual increase of 0.35 bales per hectare for irrigated cotton, and 0.14 bales per hectare for dryland cotton
GOAL 2: Improve cotton farming sustainability and value chain competitiveness	CRDC collaborates in global leadership for sustainability initiatives	CRDC participates in 6 global initiatives	CRDC participates in 6 global initiatives
GOAL 3: Build adaptive capacity of the cotton industry	Science and innovation capacity is strengthened and strategically fit for a digital future	50+ researchers supported through strategic career pathways	10+ new/early career researchers supported through strategic career pathways
ENABLING STRATEGY 1: Strengthening partnerships and adoption	Partnerships are strengthened to engage multi-disciplinary and multi-institutional resources (centres of excellence)	40 per cent of CRDC investments include cross sectoral partnerships	40 per cent of CRDC investments include cross sectoral partnerships
ENABLING STRATEGY 2: Driving RD&E impact	CRDC monitors and evaluates RD&E impact	CRDC delivers 5 RD&E impact reports	One RD&E impact report per annum

Our five key investment priorities

GOAL ONE: Increasing productivity and profitability on Australian cotton farms

Increasing the productivity and profitability on Australian cotton farms by $1.5 billion by 2023 is CRDC's aim within this goal. To achieve this, CRDC is focusing investments in RD&E to deliver optimised farming systems, adapt transformative technologies and protect our industry from biotic threats and environmental stresses.

Our investment priorities are helping to improve production yield, quality and input efficiencies, support sustainable on-farm development and strengthen the reliability of cotton production to optimise farming systems. RD&E is ensuring that cotton growers benefit from the adaption of transformative technologies and are supported to increase their on-farm use of digital and emerging technologies.

CRDC's investments are increasing our protection from biotic threats (pests, diseases and weeds) and environmental stresses (drought, extreme temperature, low rainfall and associated risks, e.g. spray drift) by improving surveillance, our understanding of the impacts, and sustainable and responsible management. RD&E is assisting the Australian cotton industry to responsibly manage known biotic threats and to increase our preparedness for biosecurity incursions.

The combined outcomes of these research priorities will support Australian cotton growers to increase their long-term productivity and profitability. In 2019–20, CRDC's investments in this goal account for 59 per cent of our total expenditure, including RD&E investments.

GOAL TWO: Improve cotton farming sustainability and value chain competitiveness

Improving value chain competitiveness and sustainability to derive $0.5 billion in additional value for Australian cotton growers - and helping Australian cotton achieve its ambition to be the highest yielding, finest, cleanest and most responsibly produced cotton in the world – are CRDC's aims within this goal.

To achieve this, CRDC is focusing investments in RD&E to create higher value uses for cotton, ensure the sustainability of cotton farming, and support measurement and reporting through the value chain.

CRDC's investment into improving the understanding of markets and trends is helping to identify opportunities to add value across the cotton value chain, while our investments in economic research are identifying key areas for innovation and improvement. In addition, our investments into measurement and reporting are helping to create transparency, ensure the continuous adoption of best practice, address emerging issues, and encourage collaboration in global leadership for sustainability.

The combined outcomes of these research priorities will ensure Australian cotton continues to be produced to the highest environmental and social standards, with increased competitiveness and sustainability. In 2019–20, CRDC's investments in this goal account for 13 per cent of our total expenditure, including RD&E investments.

GOAL THREE: Build adaptive capacity of the cotton industry

Building the adaptive capacity of the Australian cotton industry and enabling the industry to achieve its future vision is CRDC's aim within this goal. To achieve this, CRDC is focusing investments to deliver science and innovation capability and new knowledge, and facilitate futures thinking.

CRDC's investments are ensuring the science and innovation capacity of Australian cotton is strengthened and strategically fit for a changing and digital future. These investments are tapping into the depth and diversity of industry knowledge and ability across regional communities to unearth opportunities for problem solving and innovation, and provide the industry with opportunities to develop and advance innovation skills. CRDC is also investing to enhance strategic foresighting, allowing the industry to respond and adapt to possible future eventualities.

The combined outcomes of these research priorities will strengthen our adaptive capacity. In 2019–20, CRDC's investments in this goal account for five per cent of our total expenditure, including RD&E.

Our five key investment priorities (ctd)

ENABLING STRATEGY ONE: Strengthening partnerships and adoption

Further strengthening our collaboration and relationships with our partners, and working together to ensure the effective adoption pathway for research outcomes, are CRDC's aims within this enabling strategy.

To achieve these, CRDC is focusing investments in strengthening partnerships and collaboration, best practice through *my*BMP and supporting innovation and commercialisation.

CRDC is working with the industry to ensure research investments add value and remain relevant to growers. The CottonInfo and *my*BMP partnerships are being enhanced, connecting growers with best practice information that reflects the latest R&D outcomes. National and international collaborations are being fostered and cross-sectoral research strengthened to develop multi-disciplinary and multi-institutional resources, and create cotton industry centres of excellence. Commercialisation of R&D is being increased through improved processes and by ensuring intellectual property assets are managed holistically and proactively. CRDC is also working with research partners to improve adoption pathways.

In 2019–20, CRDC's investments in this enabling strategy account for seven per cent of our total expenditure, including RD&E investments.

ENABLING STRATEGY TWO: Driving RD&E impact

Ensuring CRDC's investments deliver impact and effectiveness, therefore creating value for our stakeholders, is CRDC's aim within this enabling strategy. To achieve this, CRDC is ensuring our RD&E investments meet grower, industry and government needs and our projects align with stakeholder priorities.

To demonstrate the delivery of RD&E impact, CRDC is using a monitoring and evaluation framework to report on performance against desired impacts, and assess the capacity to which funded projects demonstrate value and provide a positive return on investment. We will ensure that growers, the wider industry and government are informed and aware of the impact of the RD&E.

In 2019–20, CRDC's investments in this enabling strategy account for 3 per cent of our total expenditure, including RD&E investments.

Setting the priorities

CRDC works with the Australian cotton industry to determine the sector's key RD&E priorities; with Government to determine its overarching agricultural RD&E priorities; and with both the industry and Government to determine the Cotton Sector RD&E Strategy.

In turn, these priorities help to shape CRDC's strategic RD&E priorities, which are formalised under the 2018–23 Strategic RD&E Plan.

Industry accountability

CRDC is accountable to the cotton industry through its representative organisation, Cotton Australia. As the industry peak body, Cotton Australia is responsible for providing advice on industry research priorities.

CRDC engages with Cotton Australia in a formal process of consultation in the development and implementation of the Strategic RD&E Plan including R&D investments. This engagement ensures industry research priorities are regularly reviewed; emerging issues are actively considered; and facilitates the uptake of research in the form of best practices and the overall performance of the Australian industry.

Cotton industry priorities for RD&E:

- Invest in the skills, strengths and occupational health and safety of the human resources in the cotton industry and its communities.
- Improve the sustainability of the cotton industry and its catchments.
- Improve the profitability of the cotton industry.
- Create and support a strong, focused and committed research program.

Government accountability

CRDC is accountable to the Australian Government through the Minister for Agriculture. Government communicates its expectations of CRDC through Ministerial direction, enunciation of policy, administration of the *Primary Industries Research and Development (PIRD) Act 1989*, and priorities (Science and Research Priorities and Rural RD&E Priorities). CRDC responds to government expectations through regular communication; compliance with the Funding Agreement, policy and legislated requirements; and the development of Strategic RD&E Plans, Annual Operational Plans and Annual Reports.

Government research priorities

The PIRD Act makes provision for funding and administration of primary industry research and development with a view to:

- increasing the economic, environmental and social benefits to members of primary industries and to the community in general by improving the production, processing, storage, transport or marketing of the products of primary industries;
- achieving the sustainable use and sustainable management of natural resources;
- supporting the development of scientific and technical capacity;
- developing the adoptive capacity of primary producers; and
- improving accountability for expenditure upon research and development activities in relation to primary industries..

The Australian Government describes Science and Research Priorities and Rural RD&E Priorities.

The Science and Research Priorities are:

- Food
- Soil and water
- Transport
- Cybersecurity
- Energy
- Resources
- Advanced manufacturing
- Environmental change
- Health

The Rural RD&E Priorities are:

- Advanced technology
- Biosecurity
- Soil, water and managing natural resources
- Adoption of R&D

National Primary Industries RD&E Framework and the Cotton Sector RD&E Strategy

The Australian, state and territory governments, rural research and development corporations (RDCs), CSIRO, and universities have jointly developed the National Primary Industries Research, Development and Extension Framework to encourage greater collaboration and promote continuous improvement in the investment of RD&E resources nationally.

National research, development and extension strategies have been or are being developed for the following primary industry and cross industry sectors:

- cotton, beef, dairy, fisheries and aquaculture, forests, grains, horticulture, pork, poultry, sheep meat, sugar, wine, wool, and new and emerging industries;
- animal biosecurity, animal welfare, biofuels and bioenergy, climate change and variability, food and nutrition, soils, plant biosecurity and water use in agriculture.

CRDC, research organisations, industry and government are committed to the implementation of the Cotton Sector RD&E Strategy and its five research priorities:

- Better plant varieties.
- Improved farming systems.
- People business and community.
- Product and market development.
- Development & delivery.

CRDC provides the secretariat for the Cotton Innovation Network which is responsible for implementing the Cotton Sector RD&E Strategy. CRDC is also committed to supporting the implementation of the cross sectoral strategies including climate change, soils, plant biosecurity and water use.

Melanie Jenson

Our structure: CRDC governance

CRDC Board

CRDC is managed by a Board consisting of up to nine Directors. The Chair and our current six non-executive directors are appointed by the Minister for Agriculture. The Executive Director is appointed by the Board. The CRDC Board sets the Corporation's strategic direction and delegates responsibility of day-to-day management to the Executive Director.

The Board is committed to high standards of corporate governance that ensure CRDC meets its obligations to government and industry stakeholders, and appropriately manages resources to achieve its outcome and strategic plan goals.

The Board has established a governance framework and systems that enhance performance and ensures that CRDC is operating according to accountability provisions of the PIRD Act and the *Public Governance, Performance and Accountability (PGPA) Act 2013.*

The Board's functions include:

- Establishing goals and setting strategic direction.
- Developing and approving a five-year RD&E Plan, Annual Operational Plan, Statements of Intent, and producing an Annual Report.
- Establishing policies and instructions for the operation of CRDC.
- Ensuring that risk assessment and management frameworks are in place to minimise business and financial risk.

Remuneration of Directors

The Chairperson and Non-Executive Directors are remunerated under the PIRD Act in accordance with such remuneration as is determined by the *Remuneration Tribunal established under the Remuneration Tribunal Act 1973*. Under the PIRD Act, the Executive Director's remuneration is determined by the Board through the recommendation of the Remuneration Committee.

The total budgeted remuneration for the Chair, Executive Director and 6 non-executive Directors in 2019–20, including superannuation, is $505,181.

Payment to representative bodies

The Corporation's industry representative body in 2019–20 is Cotton Australia. The role of the industry representative body involves:

- Participation in the development and review of the five-year Strategic RD&E Plan. This ensures CRDC's strategic planning continues to address evolving industry R&D needs.
- A meeting to receive and discuss the CRDC Annual Report for the preceding year. This enables the industry representative body to assess whether CRDC's activities for that year have met its strategic objectives, and to question senior staff on many matters of interest and concern.
- Other RD&E related activities which vary from year to year.

While CRDC does not pay a fee for service to the industry representative body it may fund discrete RD&E projects and contribute to the expenses incurred as authorised under the PIRD Act.

In 2019–20, CRDC has budgeted to pay Cotton Australia $25,000 for the direct meeting costs incurred in consultation activities involving its research and development advisory panels which consist of voluntary members (cotton growers and ginners). The advice received from Cotton Australia's research and development advisory panels is used by CRDC in considering changes to its research strategy, priorities and in making research investment decisions.

CRDC Corporate standards

In carrying out the functions of the Corporation, Directors and staff members are required to:

- Commit to excellence and productivity.
- Be accountable to stakeholders.
- Act legally, ethically, professionally and responsibly in the performance of duties.
- Strive to maximise return on investment of industry and public funds invested through CRDC.
- Strive to make a difference in improving the knowledge base for sustainable cotton production in Australia.
- Value strategic, collaborative partnerships with research providers, other research and development bodies, industry organisations, stakeholders and clients, for mutual industry and public benefits; including cooperation with kindred organisations to address matters of national priority.
- Value the contribution, knowledge and expertise of the people within our organisation and that of our contractual consultants, external program coordinators and research providers.
- Promote active, honest and effective communication.
- Commit to the future of rural and regional Australia.
- Comply with and promote best practice in corporate governance.
- Commit to meeting all statutory obligations and accountability requirements in a comprehensive and timely manner.

CRDC revenue sources

CRDC's revenue is drawn from two main sources:

1 Cotton farmers pay a levy based on production. The main source of levies is from cotton ginned in Australia based on $2.25 for each 227-kilogram bale of cotton. A new levy was introduced on 1 April 2017 for seed cotton exports of $4.06 per tonne of exported seed cotton. Australian ginning and export of seed cotton occurs from March to September of each calendar year. Therefore, cotton levy revenue in any financial year is drawn from two consecutive cotton crops.

2 The Australian Government matches expenditure of levies on eligible R&D, capped at 0.5 per cent of the three-year average gross value of production or the cumulative levy receipts, whichever is the lesser. The setting and collection of the industry levy is enabled by the *Primary Industries Levies and Charges Collection Act 1991* and the *Primary Industries (Excise) Levies Act 1999*.

The Australian Government general matching of industry contributions is expected to be limited by either the value of levies collected or 0.5 per cent of the cotton industry's three-year average Gross Value of Production (GVP). Which trigger will apply depends on the price of cotton, timing of the harvest and ginning, and the variability of the crop size.

Royalties from commercialised intellectual property, interest on investments, external grant revenue and research project refunds make up the balance of CRDC's income.

Ensuring efficiency

Ensuring continuous improvement in organisational efficiency and productivity is a key focus for CRDC, to optimise our own input efficiency. CRDC is charged with investing in RD&E on behalf of cotton growers and the Government, so ensuring these funds are used to best effect is critically important. CRDC has invested in improved systems and infrastructure to ensure continuous improvement in the organisation's productivity.

Additionally, in order to achieve both industry and national RD&E efficiency, CRDC works in collaboration with other cotton industry organisations, the Cotton Innovation Network and other rural RDCs to achieve greater strategic outcomes for the cotton and other rural industries. CRDC's collaborative approach underpins our investment strategy: we partner in approximately 80 per cent of RD&E projects conducted in the cotton sector.

In addition, at present, 26 per cent of all CRDC investments are made in cross-sectoral RD&E.

The year ahead: 2019–20 industry and financial outlook

Industry

As at June 2019, the 2018–19 cotton season is drawing to a close. There was a significant decline in the total area planted to cotton this season, as a result of below average rainfall, very low levels of soil moisture, and a lack of stored irrigation water. According to the ABARES Australian Crop Report, 280,000 hectares of irrigated and dryland (rain-grown) cotton was planted in 2018–19, down 44 per cent on the previous year.

As a result, total cotton production also decreased in 2018–19. The final results for the season are expected to equal approximately 2.1-2.2 million bales, down from 4.5 million in 2017–18. The yield is expected to average 9.5 bales per hectare, compared to 10.3 bales per hectare in 2017–18, and 8.2 bales per hectare in 2016–17.

Looking forward to the 2019–20 cotton season, the current industry estimate is for 1-1.2 million bales, which reflects ongoing challenging seasonal conditions and very low levels of stored irrigation water. Cotton prices remain well above long term averages as a result of strong demand, however, ABARES predicts a softening of prices between 2019 and 2021 due to high cotton stock levels and competition from man-made fibres.

Production growth in 2019–20 will be constrained by the availability of irrigation water, although any improvement in seasonal conditions leading up to cotton planting could see a significant increase in forecast cotton production.

Financial

CRDC has budgeted for revenue of $14.8 million in 2019–20 and expenditure of $20.2 million, providing for a net deficit of $5.4 million, decreasing reserves to an estimated $30.8 million at 30 June 2020.

Wherever possible, CRDC will aim to use its reserves to maintain research investment at a consistent level despite years where crop levels are below average due to climatic conditions. The use of CRDC's reserves complies with the organisation's Financial Reserves Policy which ensures the organisation maintains sufficient financial reserves to ensure the efficient and effective performance of its business, the achievement of its strategic RD&E outcomes, and capacity to meet its fiduciary responsibilities.

Our 2019–20 investment portfolio

CRDC's total planned expenditure including RD&E investment in 2019–20 is $20.2 million. CRDC's estimated total expenditure over the five years of the CRDC 2018–23 RD&E Plan is approximately $125 million. CRDC's objective is to achieve a balanced RD&E portfolio that considers distribution of investment across:

- The RD&E strategies.
- The type of research including basic, applied, blue sky, development and delivery.
- In-project risks.
- Researcher experience and capacity.
- Research providers.
- Timeframe to outcomes.
- The likely return on investment for projects and programs.
- Expenditure on RD&E management.

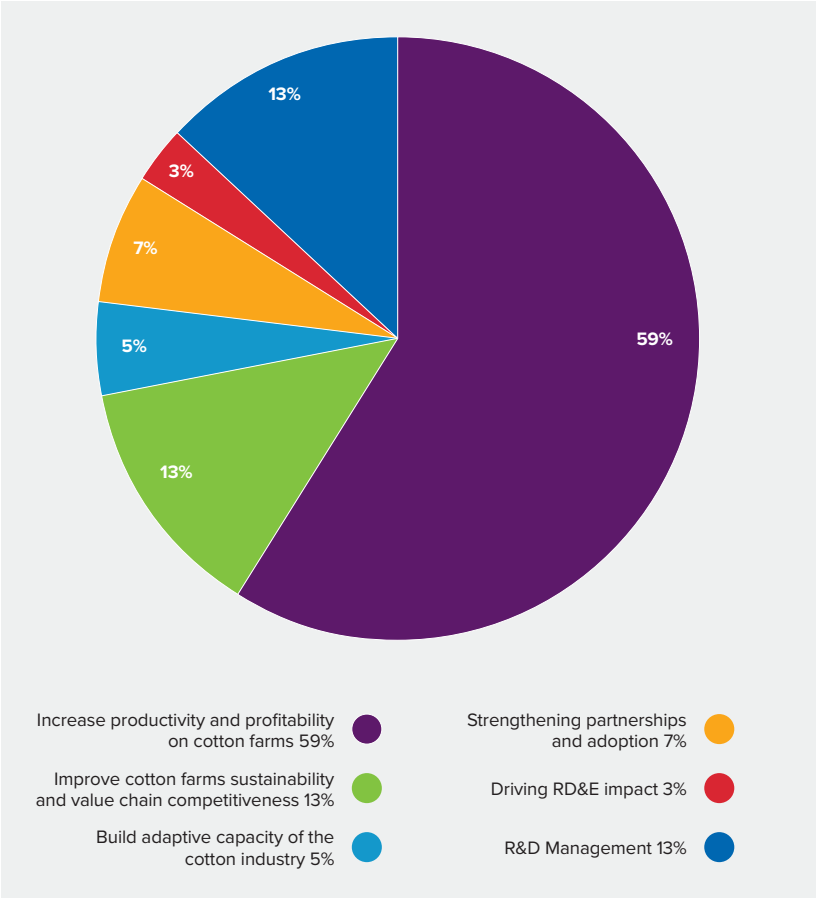
Of this expenditure, $5.16 million is to be invested in new research commencing in 2019–20 as part of the total RD&E portfolio.

Melanie Jenson

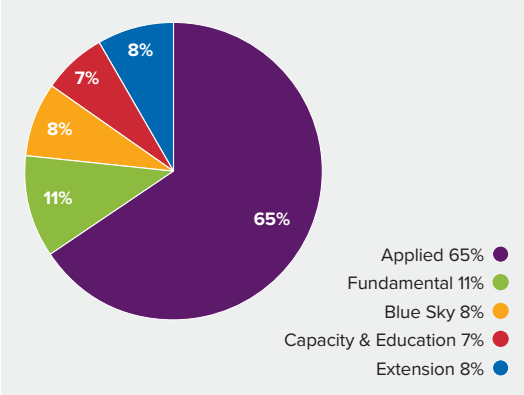
CRDC 2019–20 portfolio balance

Each year CRDC reviews the portfolio balance together with the measures of success for each program to inform decisions on any adjustments to research priorities and the allocation of resources.

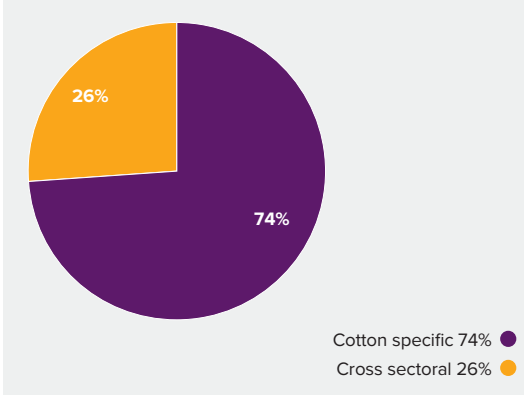
Expenditure including RD&E – investment by the five CRDC priority areas:



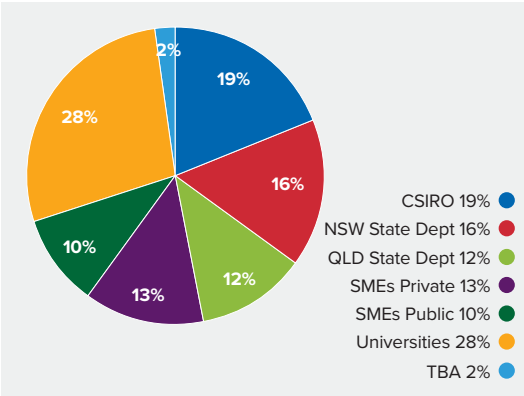
Investment by research type



Investment by sector – cotton specific and cross sectoral RD&E



Investment by CRDC in the RD&E projects led by key research partners



Our investment process

The process of deciding where to invest CRDC's annual RD&E funding is a collaborative one, involving all major stakeholders.

CRDC works closely with the industry's peak representative body, Cotton Australia, and the Australian Government on an annual basis to identify and evaluate the cotton industry's requirements for RD&E. Cotton Australia provides ongoing advice to the CRDC on research projects and where research dollars should be invested, guided by the priorities established in the 2018–23 Strategic RD&E Plan.

In line with this Plan, CRDC holds an annual research priority forum, bringing together the Cotton Australia research and development advisory panels to identify the gaps in the existing research portfolio and opportunities for new research. CRDC also holds a series of discipline forums with research partners, to identify any emerging research issues.

From here, CRDC issues a targeted annual call for research proposals against these identified opportunities and priorities. In determining which proposals are successful, CRDC again undertakes a process of consultation with growers, via the Cotton Australia panels, prior to making the final investment decision.

Successful proposals become contracted projects with CRDC and are delivered by our research partners. Critically, CRDC's success in delivering RD&E outcomes to growers and the industry is contingent upon strong relationships with our research partners, who deliver projects on our behalf.

2019–20 R&D priorities

The 2019–20 priorities forum, held in June 2018, identified key areas of focus for future RD&E investment. These key areas formed the basis of the targeted call, with 21 expressions of interest developed on these areas to guide researchers in developing their proposals. The key areas of focus included:

- Development of disease suppressive farming systems;
- Sustainable insect management through improved insect resistance monitoring;
- Improved management of weeds in cotton and grains farming systems;
- Sustainable management of *Helicoverpa* through pre-emptive resistance management strategies;
- Improved weed and disease management through the use of cover crops;
- Supporting southern cotton farming systems;
- Benchmarking of water use efficiency in irrigated and dryland cotton production systems;
- Sustainability reporting, including the development of baselines for social capital and well-being;
- Development of more resilient cotton production systems;
- Improving soil health;
- Cotton production course support; and
- Developing higher value uses for cottonseed oil

Through the 2019–20 procurement process, CRDC has invested in projects to address these key needs.

Blue sky research

In addition to immediate cotton industry priorities, CRDC also identifies and invests in longer-term priorities, specifically around ensuring a future for the industry that is profitable, sustainable and competitive. Investments are made into potentially transformational R&D projects, known as blue sky research. In 2019–20, eight per cent of CRDC's R&D investment is in blue sky research.

Our 2019–20 investments by priority area

GOAL ONE: Increasing productivity and profitability on cotton farms

Outcome	Key Activity	R&D Investments 2019–20	Collaborative Partners
OPTIMISED FARMING SYSTEMS			
Improved yield and quality	Investigating and communicating the application of beneficial new on-farm technologies and scientific approaches	• A project investigating the opportunity for increased yield through improved management of soil constraints • Continuing research to support the production of high-quality cotton • Continuing research into precision management for improved cotton quality • A new project for improved weed and disease management through the use of cover crops	USQ Rene van der Sluijs Consulting CSIRO CCA
Improved input efficiencies	Investing in real time monitoring, building adoption capacity and developing benchmarks, decision tools and practices to support on-farm resource efficiency decisions	• A new project focused on improving soil health • A continuing project to optimise the management of manures in southern NSW cotton production systems • A continuing project to improve nitrogen use efficiency through better understanding the role of dissolved organic nitrogen • New and continuing projects focused on benchmarking water use efficiency and measurement for improved water productivity in fully and partially irrigated systems • Two continuing projects to improve water use efficiency in a changing climate • 14 continuing projects as part of the More Profit from Nitrogen program	UNE Deakin University CSIRO NSW DPI, CSIRO CSIRO, UNSW NSW DPI, QUT, UTAS, UQ, NTDPIR, QDAF, UMELB
On-farm sustainable development is supported	Testing and providing information on the social, environmental and economic viability of new farming systems	• A continuing project providing science leadership for cotton development in northern Australia • Continuing support for the National Soils RD&E Strategy • Continuing support for the National Water RD&E Strategy • Continuing support for the Climate Research Strategy for Primary Industries	CSIRO NSW DPI CSIRO AgriFutures
Improved reliability of cotton production	Investigating the drivers behind farming system volatility and potential mitigations	• A continuing project to minimise in-field yield variability • A collaborative project with GRDC to quantify the effectiveness of cover crops as a means of increased water infiltration • A new project supporting southern cotton farming systems • A new project to improve crop establishment, termination and weed control in dryland cotton farming systems	NSW DPI GRDC, QDAF NSW DPI DCRA

TRANSFORMATIVE TECHNOLOGIES			
New technologies are adapted for use in cotton	Investigating and facilitating the development (by third parties) and adaption of beneficial new technologies and systems for cotton farms	• Three continuing projects to develop precise real-time automated cotton irrigation systems for improved water productivity	USQ, Deakin University, GVIA
		• A continuing project to develop a platform for monitoring and analysing the cotton crop canopy to assess nitrogen status and yield	Fluorsat Pty Ltd
		• A continuing project to develop and apply molecular tools to monitor resistance allele frequency in *Helicoverpa spp*	CSIRO
		• A continuing project to identify sensors for better IPM in cotton	USQ
		• A continuing project to improve nitrogen use efficiency through integrating technology	QUT
Cotton farms are digitally enabled	Working with partners to develop strategies to support digital applications and develop frameworks for digital agricultural tools in Australia	• A new project to support a demonstration 'smart farm'	GVIA
PROTECTION FROM BIOTIC THREATS AND ENVIRONMENTAL STRESSES			
Increased understanding of the impact of pests, diseases and weeds, and environmental stresses	Investigating and monitoring the economic, environmental and social impacts of biotic threats and environmental stresses	• A continuing IPM project to support management of emerging cotton pests	CSIRO
		• A continuing project investigating the biology of *Amaranthus hybridus*, *mitchelli* and *powelli*	UQ
		• A continuing project to transform *verticillium dahliae* the causal agent of verticillium wilt of cotton	NSW DPI
		• A continuing project investigating how to mitigate the impact of insects and weather on cotton quality	CSIRO
Improved identification, surveillance and management systems for pests, diseases and weeds, and environmental stresses	Investigating and delivering new and improved tools, systems and strategies for the surveillance, prevention and sustainable and responsible management of biotic threats and environmental stresses	• A new project to develop more resilient cotton production systems	CSIRO
		• A new project for sustainable management of *Helicoverpa* through pre-emptive resistance management strategies	CSIRO
		• A new project for improved management of weeds in cotton and grains farming systems	NSW DPI
		• A new project for sustainable insect management through improved insect resistance monitoring	NSW DPI, QDAF
		• Continuing projects to improve the management of silverleaf whitefly, mirids and mealy bugs	QDAF
		• A continuing project to develop ready to use soil tests to manage the risks associated with black root rot	Microbiology Laboratories Australia
		• A new project to develop disease suppressive farming systems	QDAF
		• A continuing project to provide technical leadership for the management of cotton diseases	CCA
		• A continuing project looking at innovative solutions for cotton diseases	QDAF
		• A new project to provide technical leadership in IPM systems for high yielding cotton	NSW DPI
		• Seven continuing projects investigating biosecurity threats, weather forecasting, insect weed and disease management issues in cotton systems	NSW DPI, MLA, QDAF, UQ, CSIRO, HIA
Industry is prepared for a biosecurity incursion	Working collaboratively with growers and consultants to deliver industry-led biosecurity preparedness activities and address identified knowledge gaps	• A continuing project to run a large-scale biosecurity scenario to support cotton industry preparedness.	PHA
		• A continuing project to support the Plant Biosecurity Research Initiative	HIA

GOAL TWO: Improve cotton farming sustainability and value chain competitiveness

Outcome	Key Activity	R&D Investments 2019–20	Collaborative Partners
SUSTAINABILITY OF COTTON FARMING			
Improved environmental footprint for cotton farms	Undertaking research on how to improve the most significant components of cotton's environmental footprint, including water and nitrogen management, native vegetation and soil carbon	• A continuing project to identify alternative energy technologies and policy solutions for the Australian cotton industry	UTS
		• A continuing project aimed at minimising evaporation losses from water storages	UMELB
		• A feasibility study of managed aquifer recharge for improved water productivity	ANU
		• A continuing project to identify management strategies for healthy water systems	UNE
		• A continuing suite of National Landcare Program supported projects to increase natural capital (biodiversity) on cotton farms	UNE
		• A continuing project quantifying the nitrogen cycle: from farm gate to catchments, groundwater and atmosphere	ANSTO
		• A continuing project to quantify the potential environmental impacts of pesticides used on cotton	NSW DPI
		• A continuing project synthesising the natural resource assets in the cotton growing region of eastern Australia	Eco Logical Australia
	Understanding and informing the methodologies and metrics used to assess the footprint of raw materials and their value chains	• A continuing project to understand the environmental and resource impacts of changing demand for Australian cotton	Integrity Agricultural Services
		• A continuing project to improve the ability of the Australian cotton industry to report on its sustainability	QUT
		• A new project investigating the methodologies used to assess the environmental impacts of micro-fibres	UNSW

CREATE HIGHER VALUE USES FOR COTTON			
Increased value for Australian cotton	Identifying opportunities for improving cotton product performance, and high-value uses for cotton	• A new project developing higher value uses for cotton seed • A continuing project exploring nanofibrous coating on cotton fabric with versatile protection and dynamic comfort • A continuing project to develop an eco-friendly treatment to improve the look and handle of cotton fabric • A continuing project to develop renewable fine chemicals from cotton biomass • A continuing project performance testing cotton-rich compression athletic wear garments	CSIRO RMIT Deakin University SRA Deakin University
Increased understanding of market requirements & opportunities throughout the value chain	Investigating market requirements and opportunities throughout the value chain, and communicating those to industry	• A new project for improving labour conditions within the Australian cotton value chain • A continuing project investigating the generation of micro-particles from the laundering of cotton and other fabrics • A continuing project to investigate the bio degradation of dyed cotton fabrics	QUT, UTS NCSU NCSU
MEASUREMENT AND REPORTING THROUGHOUT THE VALUE CHAIN			
CRDC collaborates in global leadership for sustainability initiatives	Facilitating and participating in global sustainability forums	• Two continuing projects supporting membership of the Sustainable Apparel Coalition and the Sustainable Agriculture Initiative • A new project to support participation in the ‘Cotton 2040’ initiative	SAC, SAI Forum for the Future
The value chain is transparent and understood by participants to improve market opportunities	Providing information to the value chain	• Two new projects to support the reporting of the Australian industry’s sustainability performance • Two PhD projects investigating cotton supply chain accountability and transparency	Sustenance Asia, Canberra University QUT, University of Leeds

GOAL THREE: Build adaptive capacity of the cotton industry

Outcome	Key Activity	R&D Investments 2019–20	Collaborative Partners
SCIENCE AND INNOVATION CAPABILITY, AND NEW KNOWLEDGE			
Science and innovation capacity is strengthened and strategically fit for a digital future	Facilitating and participating in global initiatives, supporting researchers to use new technologies and uses for data, and creating and facilitating opportunities for national and international RD&E exchange	• Continuing projects to support CRDC summer scholars and ABARES Science and Innovation Awards • Improving grower decisions in complex systems	CRDC, Department of Agriculture UN
Increased understanding of and participation from the diverse human capital in regional communities	Investigating regional community demographics and available service providers and supporting opportunities for greater diversity in the cotton industry	• A continuing project to understand and plan for the future cotton workforce	USQ
Increased opportunities for innovation skills development	Working collaboratively with cross-sectorial partners to support regional innovation	• Three continuing projects to support the development of real time automated irrigation systems for improved water productivity • A continuing project to improve nitrogen use efficiency through integrating technology • A project investigating the opportunity for increased yield through improved management of soil constraints • A project to run a large-scale biosecurity exercise across cotton growing regions • 14 continuing projects as part of the More Profit from Nitrogen program • A continuing project to quantify the effectiveness of cover crops as a means of increasing water infiltration • Two continuing projects to improve the management of cotton diseases within the cotton farming system • A continuing project to develop a spray hazard prediction system	USQ, Deakin University, GVIA QUT USQ PHA NSW DPI, QUT, DSITI, NTDPIR, UTAS, QDAF GRDC, QDAF QDAF, NSW DPI MRES
FUTURES THINKING			
Australian cotton growers are able to adapt to change	Assessing and monitoring grower resilience and on-farm natural capital, and supporting and communicating initiatives to address knowledge gaps	• A continuing project investigating thresholds of resilience in rural communities • A continuing project to continue the work of the Rural Safety and Health Alliance • A continuing project to support the Association of Australian Cotton Scientists Conference	UMELB RSHA AACS
Increased opportunities for strategic fore-sighting	Investigating existing and future markets for Australian cotton and communicating this to the industry	• A continuing project to build capacity with the cotton growers on the research and development advisory panels	Cotton Australia

ENABLING STRATEGY ONE: Strengthening partnerships and adoption

Outcome	Key Activity	R&D Investments 2019–20	Collaborative Partners
PARTNERSHIPS AND COLLABORATION			
Growers/consultants value CRDC farming systems research outcomes	Investing in research that meets the needs of growers and consultants and working with partners to tailor and disseminate research outcomes	• A continuing project to support the Cotton Production Course • A continuing project to conduct annual quantitative and qualitative surveys of cotton crop consultants • A continuing project developing videos to communicate best practice cotton production • A continuing project to assess grower sentiment and issues relating to RD&E	UNE CCA QDAF Intuitive Solutions
CottonInfo partnership is maintained and practice change improved	Working collaboratively with CottonInfo to demonstrate, build and communicate practical applications for R&D outcomes	• A suite of projects that provide technical leadership in cotton diseases; weed management; IPM for high yielding cotton crops; and Bt stewardship and support of the IRMS, fibre quality, water use efficiency and crop productivity, biosecurity and disease extension, natural resource management, soil health, nutrition, climate, energy and water • A continuing project to communicate cotton best production practices	NSW DPI, QDAF, CSIRO, UNE, AgEcon, Stacey Vogel Consulting QDAF
Partnerships are strengthened to engage multi-disciplinary and multi-institutional resources (centres of excellence)	Working collaboratively for mutual benefit	• CRDC currently invests in over 50 new and continuing collaborative/cross sectoral projects representing 21 per cent of our investment portfolio in 2019–20	Various
BEST PRACTICE (*my*BMP)			
Best practice is based on science and measured impact	Working closely with partners to ensure R&D outcomes are included in *my*BMP practice modules	• 13 technical and module lead projects to update *my*BMP modules from R&D outcomes annually	CSIRO, NSW DPI, QDAF, UNE
INNOVATION AND COMMERCIALISATION			
Improved R&D innovation and commercialisation	Working with research partners from development to proof of concept and commercialisation (where a strong business case exists)	• *CRDC is yet to invest in this new outcome under the new 2018–23 Strategic RD&E Plan*	

ENABLING STRATEGY TWO: Driving RD&E impact

Outcome	Key Activity	R&D Investments 2019–20	Collaborative Partners
IMPACT AND EFFECTIVENESS			
CRDC's RD&E investments meet grower, industry and government needs	Engaging with stakeholders and partners annually to identify and prioritise the challenges and opportunities facing the Australian cotton industry	• A continuing project to support engagement with grower panels to identify and prioritise RD&E issues and opportunities to benefit the Australian cotton industry	Cotton Australia
CRDC monitors and evaluates RD&E impact	Assessing and monitoring the effectiveness of RD&E investments and the extent to which stakeholder priorities are addressed	• A continuing project surveying cotton consultants to quantitatively and qualitatively assess practice change and the impact of RD&E • A continuing project that identifies how RD&E priorities identified by cotton growers have been addressed • A continuing project surveying cotton growers about their on-farm practices • A continuing project analysing the comparative economic performance of cotton farmers	CCA Cotton Australia Intuitive Solutions BCA
CRDC funded projects demonstrate value and return on investment	Assessing the impact and return on investment from RD&E projects	• A new project to assess the impact and ROI of selected clusters of research conducted in accordance with the CRRDC evaluation methodology and framework	AgTrans
Growers, the cotton industry and government are informed and aware of RD&E outcomes	Effectively communicating the outcomes and impacts of RD&E investments to stakeholders	• Continuing projects supporting the CottonInfo initiative that communicate outcomes and impacts of RD&E investments • A continuing project to communicate RD&E outcomes and impacts to government and grower stakeholders • Supporting regional demonstration field trials	CottonInfo CRDC CottonInfo

Our 2019–20 financial budget statements

TABLE 1.1: RESOURCE STATEMENT

	2018–19 Estimated actual $'000	2019–20 Estimate $'000
Opening balance/cash reserves at 1 July	**35,037**	**35,204**
Funds from Government		
Special appropriations[a]		
Primary Industries Research and Development Act 1989 s.30(3) –		
Cotton R&D Corporation	19,646	11,678
Total special appropriations	**19,646**	**11,678**
Total funds from Government	**19,646**	**11,678**
Funds from industry sources		
Levies[b]	9,170	5,839
less amounts paid to the CRF	(9,170)	(5,839)
Total funds from industry sources	-	-
Funds from industry sources		
Interest	704	600
Royalties	681	675
Other	4,929	1,814
Total funds from other sources	**6,314**	**3,089**
Total net resourcing for CRDC	**60,997**	**49,971**

	2018–19	2019–20
Average staffing level (number)	15	15

Melanie Jenson

(a) CRDC is not directly appropriated as it is a corporate Commonwealth entity under the PGPA Act. Appropriations are made to the Department of Agriculture and then paid to CRDC and are considered departmental for all purposes.

(b) Levies imposed and collected under the following legislation: *Primary Industries Research and Development Act 1989* (PIRD Act), *Primary Industries (Excise) Levies Act 1999*, *Primary Industries Levies and Charges Collection Act 1991* and associated legislation.

CRF – Consolidated Revenue Fund

Prepared on a resourcing (i.e. appropriations available) basis.

Please note: All figures shown above are GST exclusive - these may not match figures in the cash flow statement.

Our 2019-20 financial budget statements

TABLE 2.1: BUDGETED EXPENSES FOR OUTCOME 1

Outcome 1: Adoption of innovation that leads to increased productivity, competitiveness and environmental sustainability through investment in research and development that benefits the Australian cotton industry and the wider community.

	2018–19 Estimated actual $'000	2019–20 Budget $'000	2020–21 Forward estimate $'000	2021–22 Forward estimate $'000	2022–23 Forward estimate $'000
PROGRAM 1.1: COTTON RESEARCH AND DEVELOPMENT CORPORATION					
Revenue from Government					
Special appropriations					
Primary Industries Research and Development Act 1989 s. 30(3) –					
Cotton R&D Corporation	9,155	5,839	6,815	8,705	8,705
Special appropriations – Industry Levies	9,170	5,839	6,815	8,705	8,705
Revenues from other independent sources	6,321	3,089	2,320	1,630	1,630
Reserves	1,461	5,446	3,991	2,230	-
Total expenses for program 1.1	**26,107**	**20,213**	**19,941**	**21,270**	**19,040**
OUTCOME 1 TOTALS BY RESOURCE TYPE					
Revenue from Government					
Special appropriations	9,155	5,839	6,815	8,705	8,705
Special appropriations – Industry Levies	9,170	5,839	6,815	8,705	8,705
Revenues from other independent sources	6,321	3,089	2,320	1,630	1,630
Reserves	1,461	5,446	3,991	2,230	-
Total expenses for Outcome 1	**26,107**	**20,213**	**19,941**	**21,270**	**19,040**

	2018–19	2019–20
Average staffing level (number)	15	15

Our 2019–20 financial budget statements

TABLE 2.2: PERFORMANCE CRITERIA FOR OUTCOME 1

Outcome 1: Adoption of innovation that leads to increased productivity, competitiveness and environmental sustainability through investment in research and development that benefits the Australian cotton industry and the wider community.

PROGRAM 1.1: COTTON RESEARCH AND DEVELOPMENT CORPORATION

Objectives	**Increase productivity and profitability on cotton farms** Deliver RD&E for cotton producers to increase productivity, successfully protect crops from biotic threats and environmental stresses, adopt transformative technologies and innovate for improved profitability.	Delivery
	Improve cotton farming sustainability and value chain competitiveness Deliver RD&E and innovation to create higher value uses for cotton and assist the industry achieve its ambition to be the highest yielding, finest, cleanest and most responsibly produced cotton in the world.	
	Build adaptive capacity of the cotton industry Deliver RD&E to develop science and innovation capacity as well as new knowledge to strengthen adaptive capacity.	
	Strengthening partnerships and adoption Deliver RD&E and innovation through collaborative partnerships to ensure adoption of best practice, new knowledge, products and services.	
	Driving RD&E impact Deliver assessments of the impact of CRDC's RD&E investments that inform future investment direction and continuous improvement.	

Increase productivity and profitability on cotton farms Strategically prioritise investment in basic, applied and blue-sky research collaboratively with research and cross-sectoral partners to develop new knowledge, practices and adapt transformative technologies for on-farm application that also protect industry from biotic threats and environmental stresses.	
Improve cotton farming sustainability and value chain competitiveness Strategically prioritise investment in basic, applied and blue-sky research collaboratively with research, industry and cross-sectoral partners to develop new knowledge, practices, processes, higher value products and innovative approaches to improve the sustainability of cotton farming and strengthen value chain competitiveness.	
Build adaptive capacity of the cotton industry Strategically prioritise investment in RD&E collaboratively with research, industry and cross-sectoral partners to develop new knowledge, futures thinking, science and innovation capability.	
Strengthening partnerships and adoption Strategically prioritise investment in the effective adoption of research by strengthening partnerships and collaboration, development of best practice and supporting innovation and commercialisation.	
Driving RD&E impact Strategically prioritise investment in research, data capture, analysis and reviews with stakeholders and partners to demonstrate that RD&E investments deliver impact.	

PERFORMANCE INFORMATION

Year	Performance criteria	Targets
2018–19	**Increase productivity and profitability on cotton farms** Improved yield and quality.	Annual increase of 0.35 bales per hectare for irrigated cotton and 0.14 bales per hectare for dryland cotton.
	Improve cotton farming sustainability and value chain competitiveness CRDC collaborates in global leadership for sustainability initiatives.	Participates in six global initiatives.
	Build adaptive capacity of the cotton industry Science and innovation capacity is strengthened and strategically fit for a digital future.	10+ new/early career researchers supported through strategic career pathways.
	Strengthening partnerships and adoption Partnerships are strengthened to engage multi-disciplinary and multi-institutional resources.	40 per cent of annual RD&E investments are through cross sectoral partnerships.
	Driving RD&E impact CRDC monitors and evaluates RD&E impact.	One RD&E impact report per annum.
2019–20	As per 2018–19.	As per 2018–19.
2020–21 and beyond	As per 2018–19.	As per 2018–19.

Our 2019–20 financial budget statements

TABLE 3.1 COMPREHENSIVE INCOME STATEMENT (SHOWING NET COST OF SERVICES) FOR THE PERIOD ENDED 30 JUNE

	2018–19 Estimated actual $'000	2019–20 Budget $'000	2020–21 Forward estimate $'000	2021–22 Forward estimate $'000	2022–23 Forward estimate $'000
EXPENSES					
Employee benefits	2,230	2,446	2,416	2,474	2,533
Supplier expenses	1,249	998	1,068	1,038	1,159
Grants	22,369	16,510	16,198	17,499	15,089
Depreciation and amortisation	259	259	259	259	259
Total expenses	**26,107**	**20,213**	**19,941**	**21,270**	**19,040**
LESS:					
OWN-SOURCE INCOME					
Own-source revenue					
Interest	720	600	500	400	400
Royalties	681	675	940	980	980
Other Grants	4,420	1,314	630	-	-
Other	500	500	250	250	250
Total own-source revenue	**6,321**	**3,089**	**2,320**	**1,630**	**1,630**
Net cost of (contribution by) services	**19,786**	**17,124**	**17,621**	**19,640**	**17,410**
Revenue from Government[a]					
Commonwealth contribution	9,155	5,839	6,815	8,705	8,705
Industry contributions	9,170	5,839	6,815	8,705	8,705
Total revenue from Government	**18,325**	**11,678**	**13,630**	**17,410**	**17,410**
Surplus/(deficit) attributable to the Australian Government	**(1,461)**	**(5,446)**	**(3,991)**	**(2,230)**	**-**
Total comprehensive income/(loss) attributable to the Australian Government	**(1,461)**	**(5,446)**	**(3,991)**	**(2,230)**	**-**

(a) Revenue from Government includes a Commonwealth contribution under the PIRD Act and levies collected from industry by the Department of Agriculture for R&D activities.

Prepared on Australian Accounting Standards basis.

Our 2019–20 financial budget statements

TABLE 3.2: BUDGETED DEPARTMENTAL BALANCE SHEET (AS AT 30 JUNE)

	2018–19 Estimated actual $'000	2019–20 Budget $'000	2020–21 Forward estimate $'000	2021–22 Forward estimate $'000	2022–23 Forward estimate $'000
ASSETS					
Financial assets					
Cash and cash equivalents	2,204	1,747	1,604	996	935
Trade and other receivables	3,809	3,809	3,809	3,809	3,809
Investments in Shares	88	88	88	88	88
Investments	33,000	28,000	24,000	22,000	22,000
Total financial assets	**39,101**	**33,644**	**29,501**	**26,893**	**26,832**
Non-financial assets					
Land and buildings	760	795	830	865	900
Property, plant and equipment	706	667	719	1,082	1,043
Intangibles	380	395	460	440	505
Total non-financial assets	**1,846**	**1,857**	**2,009**	**2,387**	**2,448**
Total assets	**40,947**	**35,501**	**31,510**	**29,280**	**29,280**
LIABILITIES					
Payables					
Suppliers	200	200	200	200	200
Grants	4,000	4,000	4,000	4,000	4,000
Total payables	**4,200**	**4,200**	**4,200**	**4,200**	**4,200**
Provisions					
Employee provisions	491	491	491	491	491
Total provisions	**491**	**491**	**491**	**491**	**491**
Total liabilities	**4,691**	**4,691**	**4,691**	**4,691**	**4,691**
Net assets	**36,256**	**30,810**	**26,819**	**24,589**	**24,589**
EQUITY*					
Reserves	251	251	251	251	251
Retained surplus	36,005	30,559	26,568	24,338	24,338
Total Equity	**36,256**	**30,810**	**26,819**	**24,589**	**24,589**

* 'Equity' is the residual interest in assets after deduction of liabilities. Prepared on Australian Accounting Standards basis.

Our 2019–20 financial budget statements

TABLE 3.3: DEPARTMENTAL STATEMENT OF CHANGES IN EQUITY (BUDGET YEAR 2019–20)

	Retained earnings $'000	Asset revaluation reserve $'000	Total equity $'000
OPENING BALANCE AS AT 1 JULY 2019			
Balance carried forward from previous period	36,005	251	36,256
Adjusted opening balance	**36,005**	**251**	**36,256**
COMPREHENSIVE INCOME			
Surplus (deficit) for the period	(5,446)	-	(5,446)
Total comprehensive income	**(5,446)**	**-**	**(5,446)**
of which:			
Attributable to the Australian Government	(5,446)	-	(5,446)
Estimated closing balance as at 30 June 2020	**30,559**	**251**	**30,810**
Closing balance attributable to the Australian Government	**30,559**	**251**	**30,810**

Prepared on Australian Accounting Standards basis.

Our 2019–20 financial budget statements

TABLE 3.4: BUDGETED DEPARTMENTAL STATEMENT OF CASH FLOWS (FOR THE PERIOD ENDED 30 JUNE)

	2018–19 Estimated actual $'000	2019–20 Budget $'000	2020–21 Forward estimate $'000	2021–22 Forward estimate $'000	2022–23 Forward estimate $'000
OPERATING ACTIVITIES					
Cash received					
Industry contributions	10,162	5,839	6,815	8,705	8,705
Revenue from Government	9,484	5,839	6,815	8,705	8,705
Interest	704	600	500	400	400
Net GST received	20	-	-	-	-
Other Grants	4,420	1,314	630	-	-
Other	1,170	1,175	1,190	1,230	1,230
Total cash received	**25,960**	**14,767**	**15,950**	**19,040**	**19,040**
Cash used					
Employees	2,190	2,446	2,416	2,474	2,533
Suppliers	1,234	998	1,068	1,038	1,159
Grants	21,532	16,510	16,198	17,499	15,089
Total cash used	**24,956**	**19,954**	**19,682**	**21,011**	**18,781**
Net cash from (used by) operating activities	**1,004**	**(5,187)**	**(3,732)**	**(1,971)**	**259**
INVESTING ACTIVITIES					
Cash received					
Investments	30,000	30,000	34,000	36,000	30,000
Total cash received	**30,000**	**30,000**	**34,000**	**36,000**	**30,000**
Cash used					
Purchase of property, plant and equipment	837	270	411	637	320
Purchase of investment	35,000	25,000	30,000	34,000	30,000
Total cash used	**35,837**	**25,270**	**30,411**	**34,637**	**30,320**
Net cash from (used by) investing activities	**(5,837)**	**4,730**	**3,589**	**1,363**	**(320)**
Net increase (decrease) in cash held	**(4,833)**	**(457)**	**(143)**	**(608)**	**(61)**
Cash and cash equivalents at the beginning of the reporting period	7,037	2,204	1,747	1,604	996
Cash and cash equivalents at the end of the reporting period	**2,204**	**1,747**	**1,604**	**996**	**935**

Prepared on Australian Accounting Standards basis.

Our 2019–20 financial budget statements

TABLE 3.5: DEPARTMENTAL CAPITAL BUDGET STATEMENT

	2018–19 Estimated actual $'000	2019–20 Budget $'000	2020–21 Forward estimate $'000	2021–22 Forward estimate $'000	2022–23 Forward estimate $'000
PURCHASE OF NON-FINANCIAL ASSETS					
Funded internally from departmental resources[(a)]	837	270	411	637	320
TOTAL	**837**	**270**	**411**	**637**	**320**
RECONCILIATION OF CASH USED TO ACQUIRE ASSETS TO ASSET MOVEMENT TABLE					
Total purchases	837	270	411	637	320
Total cash used to acquire assets	**837**	**270**	**411**	**637**	**320**

(a) Includes the following sources of funding:
- internally developed assets

Consistent with information contained in the Statement of Asset Movements and the Budgeted Statement of Cash Flows.

Our 2019–20 financial budget statements

TABLE 3.6: STATEMENT OF ASSET MOVEMENTS

	Land	Buildings	Other property, plant and equipment	Computer software and intangibles	Total
	$'000	$'000	$'000	$'000	$'000
As at 1 July 2019					
Gross book value	190	585	984	1,066	2,825
Accumulated depreciation/amortisation and impairment	-	(15)	(278)	(686)	(979)
Opening net book balance	**190**	**570**	**706**	**380**	**1,846**
CAPITAL ASSET ADDITIONS					
Estimated expenditure on new or replacement assets					
By purchase – other	-	50	45	175	270
Total additions	**-**	**50**	**45**	**175**	**270**
Other movements					
Depreciation/amortisation expense	-	(15)	(84)	(160)	(259)
Total other movements	**-**	**(15)**	**(84)**	**(160)**	**(259)**
As at 30 June 2020					
Gross book value	190	635	1,029	1,241	3,095
Accumulated depreciation/amortisation and impairment	-	(30)	(362)	(846)	(1,238)
Closing net book balance	**190**	**605**	**667**	**395**	**1,857**

Prepared on Australian Accounting Standards basis.

Attachment A: CRDC expenditure across the Government priorities

Note: These tables exclude budgeted employee and supplier expenditure, and corporate research activities which support RD&E planning and adoption.

TABLE A: RESEARCH AND DEVELOPMENT EXPENDITURE ESTIMATES 2019–20 ACROSS THE SCIENCE AND RESEARCH PRIORITIES

Food ($'000)						Soil and Water ($'000)			Transport ($'000)			Cybersecurity ($'000)			
1.1	**1.2**	**1.3.1**	**1.3.2**	**1.3.3**	**1.3.4**	**2.1**	**2.2**	**2.3**	**3.1**	**3.2**	**3.3**	**4.1**	**4.2**	**4.3**	**4.4**
$597	$795	$2,729	$543	$4,952	$0	$930	$1,894	$1,657	$0	$0	$0	$0	$0	$0	$0

Energy ($'000)			Resources ($'000)				Advanced Manufacturing ($'000)			Environmental Change ($'000)			Health ($'000)				Total ($'000)
5.1	**5.2**	**5.3**	**6.1**	**6.2**	**6.3**	**6.4**	**7.1**	**7.2**	**7.3**	**8.1**	**8.2**	**8.3**	**9.1**	**9.2**	**9.3**	**9.4**	
$0	$0	$0	$0	$0	$0	$100	$120	$0	$0	$478	$100	$869	$0	$20	$0	$0	$15,783

Science and Research Priorities

Priority 1: Food

1.1 Knowledge of global and domestic demand, supply chains and the identification of country specific preferences for food (and fibre)

1.2 Knowledge of the social, economic and other barriers to achieving access to healthy Australian food (and fibre).

1.3 Enhanced food production through:

- 1.3.1 novel technologies, such as sensors, robotics, real-time data systems and traceability, all integrated into the production chain.
- 1.3.2 enhanced food production through better management and use of waste and water; increased food (and fibre) quality, safety, stability and shelf life.
- 1.3.3 enhanced food production through protection of food (and fibre) sources through enhanced biosecurity
- 1.3.4 enhanced food production through genetic composition of food (and fibre) sources appropriate for present and emerging Australian conditions.

Priority 2: Soil and Water

2.1 New and integrated national observing systems, technologies and modelling frameworks across the soil-atmosphere-water-marine systems.

2.2 Better understanding of sustainable limits for productive use of soil, freshwater, river flows and water rights, terrestrial and marine ecosystems.

2.3 Minimising damage to, and developing solutions for restoration and remediation of, soil, fresh and potable water, urban catchments and marine systems.

Priority 3: Transport

3.1 Low emission fuels and technologies for domestic and global markets.

3.2 Improved logistics, modelling and regulation: urban design, autonomous vehicles, electrified transport, sensor technologies, real time data and spatial analysis.

3.3 Effective pricing, operation, and resource allocation.

Priority 4: Cybersecurity

4.1 Highly-secure and resilient communications and data acquisition, storage, retention and analysis for government, defence, business, transport systems, emergency and health services.

4.2 Secure, trustworthy and fault-tolerant technologies for software applications, mobile devices, cloud computing and critical infrastructure.

4.3 New technologies and approaches to support the nation's cybersecurity: discovery and understanding of vulnerabilities, threats and their impacts, enabling improved risk-based decision making, resilience and effective responses to cyber intrusions and attacks.

4.4 Understanding the scale of the cyber security challenge for Australia, including the social factors informing individual, organisational, and national attitudes towards cyber security.

Priority 5: Energy

5.1 Low emission energy production from fossil fuels and other sources.

5.2 New clean energy sources and storage technologies that are efficient, cost-effective and reliable.

5.3 Australian electricity grids that can readily integrate and more efficiently transmit energy from all sources including low- and zero-carbon sources.

Priority 6: Resources

6.1 A fundamental understanding of the physical state of the Australian crust, its resource endowment and recovery.

6.2 Knowledge of environmental issues associated with resource extraction.

6.3 Lowering the risk to sedimentary basins and marine environments due to resource extraction.

6.4 Technologies to optimise yield through effective and efficient resource extraction, processing and waste management.

Priority 7: Advanced Manufacturing

7.1 Knowledge of Australia's comparative advantages, constraints and capacity to meet current and emerging global and domestic demand.

7.2 Cross-cutting technologies that will de-risk, scale up, and add value to Australian manufactured products.

7.3 Specialised, high value-add areas such as high-performance materials, composites, alloys and polymers.

Priority 8: Environmental Change

8.1 Improved accuracy and precision in predicting and measuring the impact of environmental changes caused by climate and local factors.

8.2 Resilient urban, rural and regional infrastructure.

8.3 Options for responding and adapting to the impacts of environmental change on biological systems, urban and rural communities and industry.

Priority 9: Health

9.1 Better models of health care and services that improve outcomes, reduce disparities for disadvantaged and vulnerable groups, increase efficiency and provide greater value for a given expenditure.

9.2 Improved prediction, identification, tracking, prevention and management of emerging local and regional health threats.

9.3 Better health outcomes for Indigenous people, with strategies for both urban and regional communities.

9.4 Effective technologies for individuals to manage their own health care, for example, using mobile apps, remote monitoring and online access to therapies.

TABLE B: RESEARCH AND DEVELOPMENT EXPENDITURE ESTIMATES 2019–20 ACROSS THE RURAL RD&E PRIORITIES.

	Advanced Technology ($'000)	Biosecurity ($'000)	Soil, water and managing natural resources ($'000)	Adoption of R&D ($'000)	Total ($'000)
Expenditure	$2,629	$6,076	$4,994	$2,153	$15,852
Percentage of total	17%	38%	32%	14%	100%

Attachment B: Research partner acronyms

AACS	Association of Australian Cotton Scientists
AFI	Australian Farm Institute
AgriFutures	AgriFutures Australia
AgTrans	AgTrans Research and Consulting
AGWA	Australian Grape and Wine Authority
ANSTO	Australian Nuclear Science & Technology Organisation
ANU	Australian National University
ARLF	Australian Rural Leadership Foundation
BCA	Boyce Chartered Accountants
CA	Cotton Australia
CCA	Crop Consultants Australia
CCRSPI	Climate Change Research Strategy for Primary Industries
CRDC	Cotton Research and Development Corporation
CRRDC	Council of Rural Research and Development Corporations
CSIRO	Commonwealth Scientific and Industrial Research Organisation
D2D CRC	Data to Decisions Cooperative Research Centre
DA	Dairy Australia
DCRA	Dryland Cotton Research Association
DSITI	Queensland Department of Science, Information Technology and Innovation
GRDC	Grains Research and Development Corporation
GVIA	Gwydir Valley Irrigators Association
HIA	Horticulture Innovation Australia Limited
ICD	Initiated Coordinated Delivered (ICD) Project Services
IREC	Irrigation Research and Extension Committee
MLA	Meat and Livestock Australia
MRES	Micro Meteorology Research & Education Services
NCEA	National Centre for Engineering in Agriculture
NCSU	North Carolina State University
NSW DPI	NSW Department of Primary Industries
NTDPIR	Northern Territory Department of Primary Industries and Resources
PHA	Plant Health Australia
PYIA	Picture You in Agriculture
QDAF	Queensland Department of Agriculture and Fisheries
QUT	Queensland University of Technology
RMIT	Royal Melbourne Institute of Technology
RSHA	Rural Safety and Health Alliance
SAC	Sustainable Apparel Coalition
SAI	Sustainable Agriculture Initiative
SRA	Sugar Research Australia
UMELB	University of Melbourne
UN	University of Newcastle
UNE	University of New England
UNSW	University of New South Wales
UQ	University of Queensland
USQ	University of Southern Queensland
USYD	University of Sydney
UTAS	University of Tasmania
UTS	University of Technology Sydney
UWA	University of Western Australia
UWS	University of Western Sydney

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