



ANNUAL OPERATIONAL PLAN

2021-22



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2021–22

Responsible Minister

The Hon. David Littleproud MP
Minister for Agriculture, Drought and Emergency Management

CRDC Board

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<i>Deputy Chair</i>	Rosemary Richards
<i>Executive Director</i>	Dr Ian Taylor
<i>Non-executive Directors</i>	Prof Les Copeland
	Ross Burnett
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<i>R&D Manager (contractor)</i>	Stacey Vogel
<i>R&D Manager (contractor)</i>	Rachel Holloway
<i>M&E Manager (part-time)</i>	Ben Simpson
<i>Commercialisation Manager (contractor)</i>	Dr Jarrod Ward
<i>Project Administration</i>	Megan Baker
<i>Project Administration</i>	Lynda George
<i>Project Administration/Reception</i>	Callie Hudson
<i>Senior Accountant</i>	Emily Luff
<i>Accountant</i>	Emma Cain
<i>Accounts Officer (part-time)</i>	Jeevi Arjunan
<i>Executive Assistant (part-time)</i>	Christie Hunt

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 exists to invest 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, and the challenges associated with COVID-19, the industry continues to go through a period of growth. In recent years, cotton has expanded from its predominant growing base in New South Wales (NSW) and Queensland (Qld) to northern Victoria (VIC), the Northern Territory (NT) and northern Western Australia (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 world-leading RD&E.



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Introduction

CRDC's investments are governed by a five-year strategic plan, and the 2021-22 year marks the fourth 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.

Progress towards this goal has been tempered by the dry conditions during much of the Strategic Plan period, and the challenges associated with COVID-19, but we remain optimistic about the future of the cotton industry and focused on maximising the benefits to growers and the community.

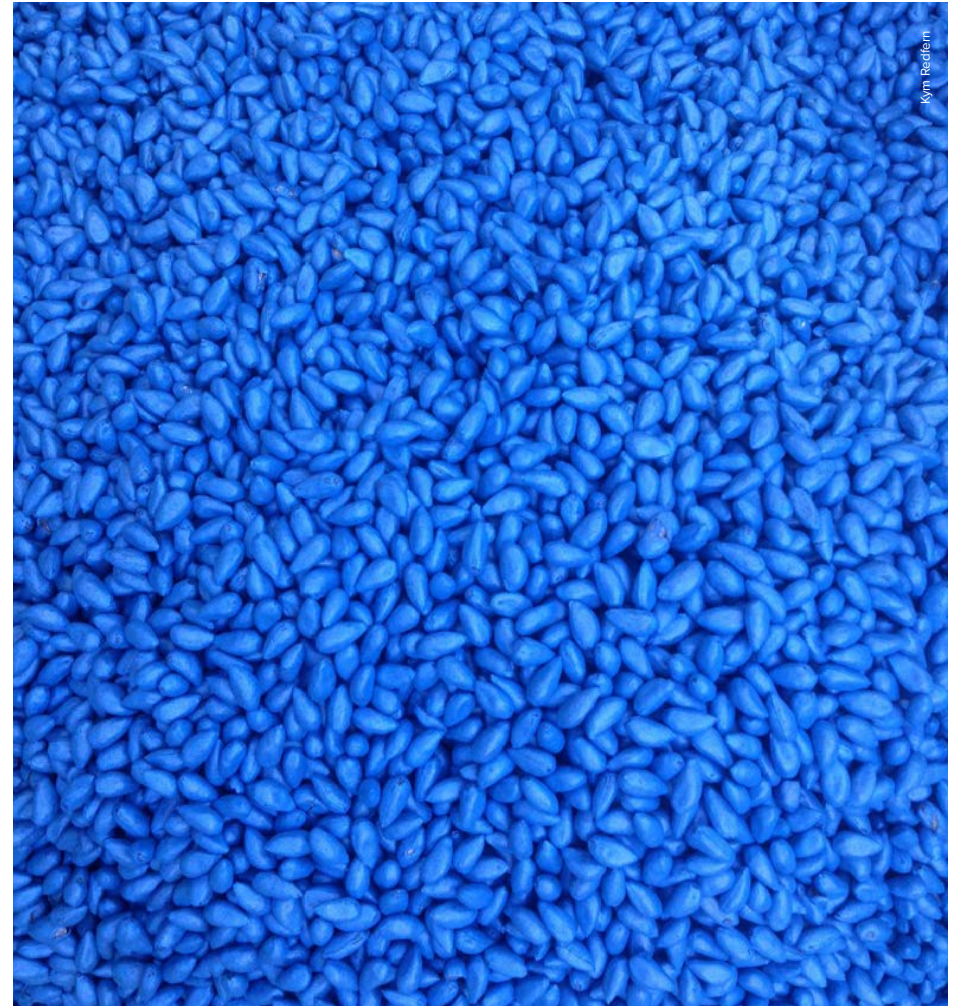
The strategic RD&E investments that CRDC will make in 2021-22 under this plan will help continue to drive the Australian cotton industry towards a future of innovation, increased commercialisation and digital transformation.

During this year, Australian cotton growers and the Commonwealth Government will co-invest \$18.9 million through CRDC, in collaboration with around 100 research partners.

The investments will be made in five key areas identified in the CRDC 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.

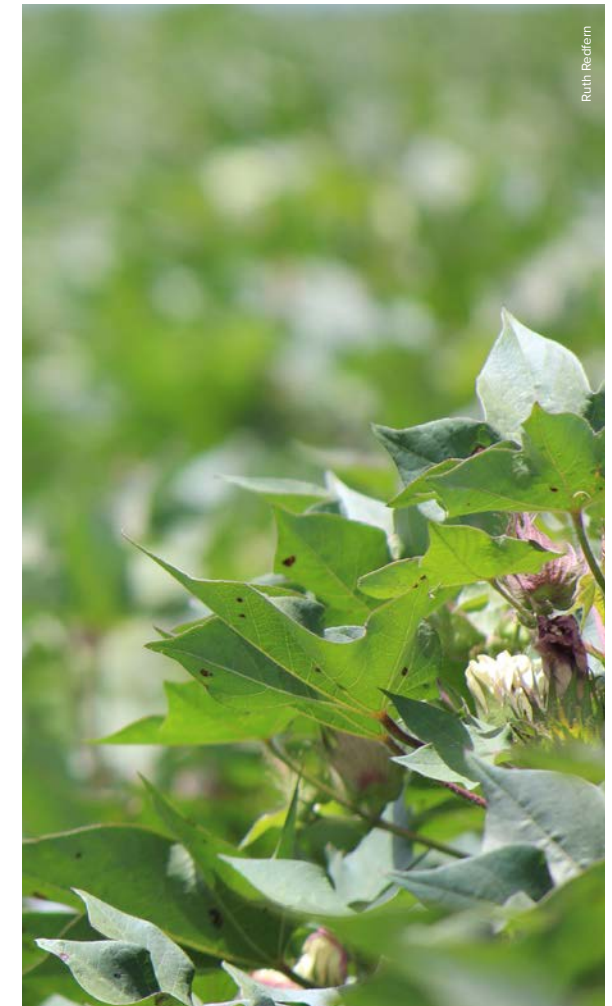
This Annual Operational Plan outlines these investments and the targets CRDC aims to achieve in the 2021-22 year.





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

GOALS	KEY FOCUS AREAS
 <p>Increase productivity and profitability on cotton farms</p>	<ul style="list-style-type: none"> • Optimised farming systems • Transformative technologies • Protection from biotic threats and environmental stresses
 <p>Improve cotton farming sustainability and value chain competitiveness</p>	<ul style="list-style-type: none"> • Sustainability of cotton farming • Create higher-value uses for cotton • Measurement and reporting throughout the value chain
 <p>Build adaptive capacity of the cotton industry</p>	<ul style="list-style-type: none"> • Science and innovation capability, and new knowledge • Futures thinking
ENABLING STRATEGIES	KEY FOCUS AREAS
 <p>Strengthening partnerships and adoption</p>	<ul style="list-style-type: none"> • Partnerships and collaboration • Best practice (<i>myBMP</i>) • Innovation and commercialisation
 <p>Driving RD&E impact</p>	<ul style="list-style-type: none"> • Impact and effectiveness



Ruth Reardon



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 2021-22 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; and

ENABLING STRATEGY 2: Driving RD&E impact.

Through focusing on these five strategic priorities, CRDC is working to 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 is monitored, evaluated and reported annually, in the Annual Report, the Performance 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)	2021–22 targets
	GOAL 1: Increase productivity and profitability on cotton farms	Improved yield and quality	Increase in average bales/ha from 9.86 to 11.6 bales/ha for irrigated cotton, and from 4.0 to 4.7 bales/ha for dryland cotton	Annual increase of 0.35 bales/ha for irrigated cotton, and 0.14 bales/ha 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 to participate in 6 global initiatives per annum.
	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 per annum.
	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 to include cross sectoral partnerships per annum.
	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 of Australian cotton farms is CRDC's aim within this goal. To work towards 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 our 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 aim to increase 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 not only responsibly manage known biotic threats but to increase our preparedness for biosecurity incursions.

The combined outcomes of these research priorities aim to support Australian cotton growers to increase their long-term productivity and profitability. In 2021-22, CRDC's investments in this goal account for 67 per cent of our R&D expenditure. This reflects CRDC's prioritisation of core industry research and capacity given the impact of the drought on CRDC's budget.



GOAL TWO: Improve cotton farming sustainability and value chain competitiveness

Improving value chain competitiveness and sustainability to derive greater 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 work towards 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 help ensure Australian cotton continues to be produced to the highest environmental and social standards, with increased competitiveness and sustainability. In 2021-22, CRDC's investments in this goal account for nine per cent of our R&D expenditure.



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 work towards this, CRDC is focusing investments to deliver science and innovation capability and new knowledge, and facilitate futures thinking.

CRDC's investments are helping to ensure the science and innovation capacity of Australian cotton is strengthened and strategically fit for a changing and digital future. These investments tap 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 help strengthen our adaptive capacity. In 2021-22, CRDC's investments in this goal account for six per cent of our R&D expenditure.



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 work towards this, CRDC is focusing investments in strengthening partnerships and collaboration, best practice through *myBMP* 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 *myBMP* 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 proactively increased through improved processes and by ensuring intellectual property (IP) assets are managed holistically. CRDC is also working with research partners to improve adoption pathways and to support those partners who are in the strongest position to commercialise IP.

In 2021-22, CRDC’s investments in this enabling strategy account for nine per cent of our R&D expenditure.



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 work towards 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 2021-22, CRDC’s investments in this enabling strategy account for two per cent of our R&D expenditure.



Janelle Montgomery

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, Annual Reports and Performance 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

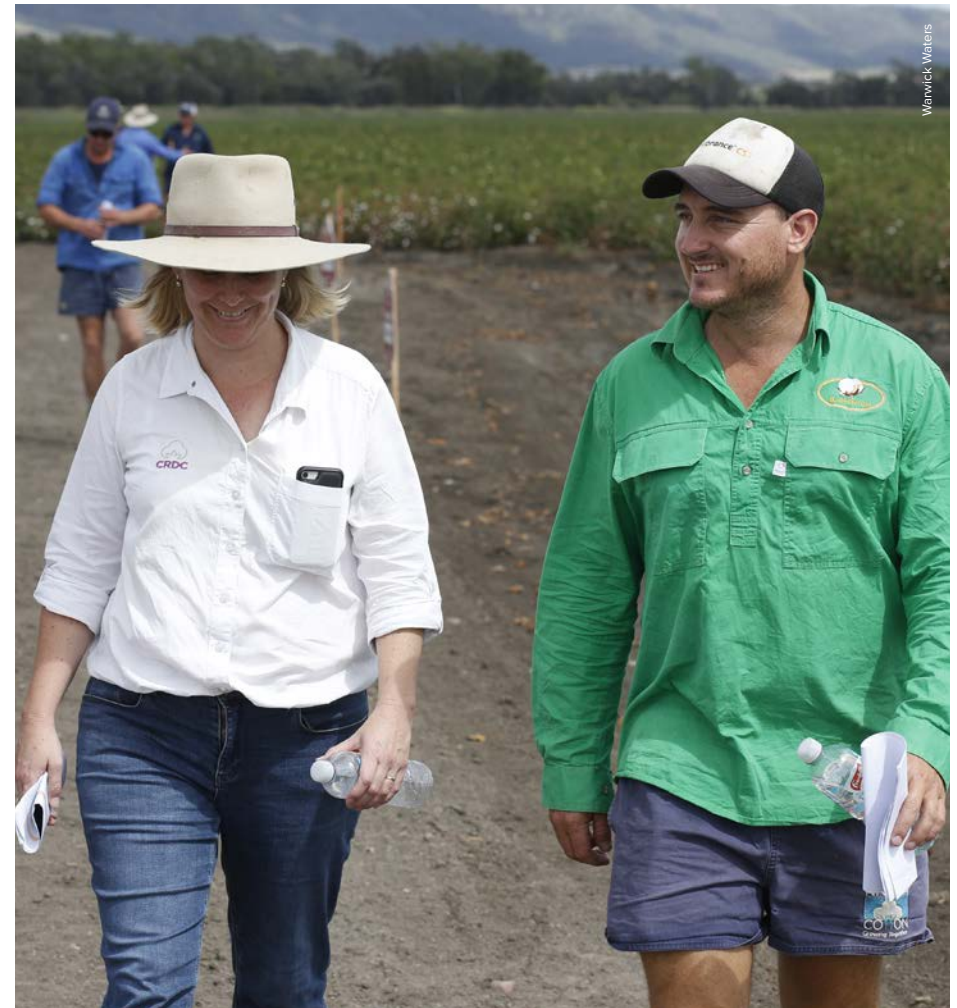
National Primary Industries RD&E Framework and the Cotton Sector RD&E Strategy

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.

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

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

Under this framework, 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. CRDC is an active participant in Agricultural Innovation Australia Pty Ltd, established to facilitate joint investment and collaboration in cross-industry issues of national importance. Cross sectoral collaboration is a key focus for CRDC under Enabling strategy one: Strengthening partnerships and adoption.



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 six Non-executive Directors in 2021-22, including superannuation, is \$521,787.

Payment to representative bodies

The Corporation's industry representative body in 2021-22 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 any 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 2021-22, CRDC has budgeted to pay Cotton Australia \$40,000 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 secondary levy is drawn from exported seed cotton at a rate of \$4.06 per tonne. Australian ginning and the 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). The trigger that will apply depends on the price of cotton, timing of the harvest and ginning, and the variability of the crop size.

Royalties from intellectual property licences, 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. 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 2021-22, 42 per cent of all CRDC investments will be made in cross-sectoral RD&E, exceeding the Strategic RD&E Plan goal of 40 per cent.



The year ahead: 2021–22 industry and financial outlook

Industry

As at June 2021, the 2020-21 cotton season is drawing to a close. Approximately 300,000 hectares were planted to irrigated and dryland cotton this season – well down on the record high of 600,000 hectares in 2010-2011, but an increase on 58,000 hectares in 2019-20 due to an increase in rainfall and stored moisture across the valleys.

Cotton harvest is still underway, so the full results of the season are not yet known. However, it is estimated that total production will reach 2.7 million bales for 2020-21, with an irrigated yield average of 9.1 bales per hectare, compared with 10.1 bales per hectare in 2019-20, 9.5 bales per hectare in 2018-19, and 10.3 bales per hectare in 2017-18. This yield prediction may change based on continued wet weather across cotton growing valleys, which may result in quality downgrades.

Looking forward to the 2021-22 cotton season, the current industry estimate is for 460,000 hectares to be planted to cotton, achieving 4.1 million bales. This reflects the growth of cotton production in new production areas (particularly WA and the NT), the increased optimism resulting from recent rainfall, and increases in stored irrigation water levels.

Financial

In 2021–22, CRDC has budgeted for a deficit of \$5.5 million, based on revenues of \$13.4 million and expenditure of \$18.9 million, which includes RD&E expenditure of \$14.6 million. To cover this deficit, CRDC will use its reserves which are strategically held for the purpose of ensuring RD&E investment can continue during difficult times.

Wherever possible, CRDC aims 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 2021–22 investment portfolio

CRDC's total planned expenditure including RD&E investment in 2021-22 is \$18.9 million.

CRDC had planned to invest a total of \$125 million over the five-year Strategic Plan period, however due to the prolonged dry seasonal conditions, cotton production in most cotton growing regions has reduced, thus impacting CRDC's revenue and ability to invest. The current forward estimate is for a total investment of \$94.3 million over the five-year plan.

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 knowledge creation, knowledge transfer/application, innovation, benchmarking, and capacity and education.
- In-project risks.
- Researcher experience, capability and capacity.
- Research providers.
- Timeframe to outcomes.
- The likely return on investment for projects and programs.
- Expenditure on RD&E management.

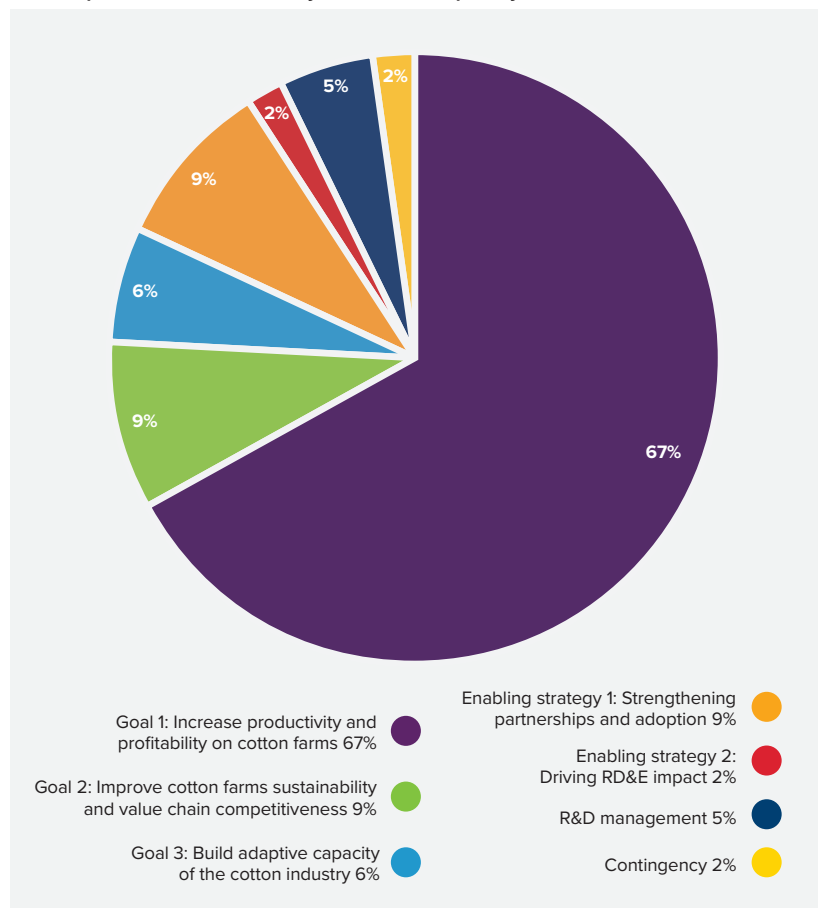
Of this expenditure, \$3.3 million is to be invested in new research commencing in 2021-22 as part of the total RD&E portfolio.



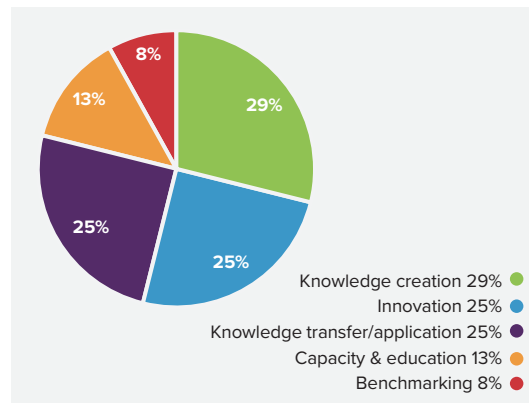
CRDC 2021–22 portfolio balance

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.

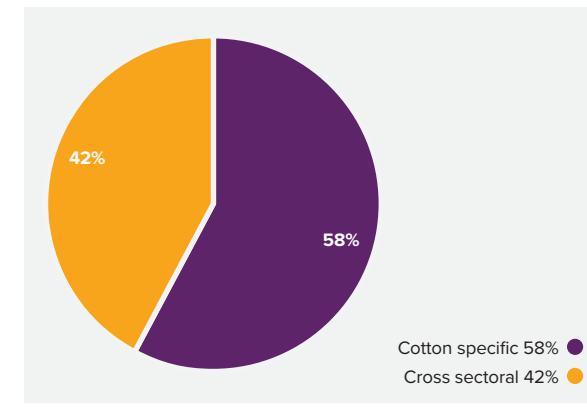
RD&E expenditure - investment by the five CRDC priority areas:



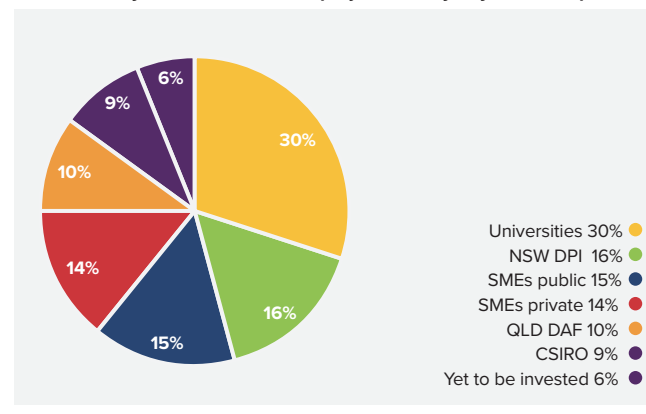
Investment by research type:



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 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 discipline forums with research partners, to identify any emerging research issues.

From here, CRDC determines the investment priorities. As part of 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. The final decision-making authority rests with the CRDC Board.

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.

2021–22 R&D priorities

The annual R&D priorities forum, normally held in May in conjunction with Cotton Australia's general meeting, was not held in 2020 due to COVID-19. In lieu of this, Cotton Australia conducted a priorities survey and CRDC engaged virtually with growers and the research panels to identify key areas of focus for future RD&E investment.

These key areas were prioritised for investment considering strategic research gaps, maintenance of core industry research capacity given the impact of the drought on CRDC's budget, and feedback received from the advisory panels in November 2020.

These key areas included:

- Integrated Pest Management (IPM) technical leadership;
- Novel options and strategies for IPM;
- Improved management of silverleaf whitefly on cotton farms;
- Defoliating cotton in an increasingly difficult environment;
- Validation and implementation of new molecular tools for Bt resistance monitoring;
- Climate proofing Australia's cotton industry through improving crop water use and photosynthetic carbon assimilation;
- Tools for assessing and achieving pesticide sustainability targets for the Australian cotton industry;
- Review of the biosecurity plan for the cotton industry;
- Improved water productivity in fully and partially irrigated systems;
- Understanding the environmental co-benefits of irrigation water in the northern Murray Darling basin;
- Towards carbon-neutral cotton production: Greenhouse gas baseline and mitigation for cotton;
- Delivering best practice to manage future workforce skills; and
- Supporting adaptive research capacity for careers in the cotton industry.

Through the 2021-22 procurement process, CRDC is investing in projects to address these key needs.



Our 2021–22 investments by priority area



GOAL ONE: Increasing productivity and profitability on cotton farms

Outcome	Key Activity	R&D Investments 2021-22	Collaborative Partners
OPTIMISED FARMING SYSTEMS			
Improved yield and quality	Investigating and communicating the application of beneficial new on-farm technologies and scientific approaches	<ul style="list-style-type: none"> • A continuing project investigating the opportunity for increased yield through improved management of soil constraints. • Continuing research to support the production of high-quality cotton. • A PhD assessing yield and fibre quality variability in cotton systems through data science for improved management. • Improving dryland cotton farming systems. 	USQ Textile Technical Services USYD DCRA
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	<ul style="list-style-type: none"> • Continuing projects focused on improving soil health. • Continuing projects focused on benchmarking water use efficiency and measurement for improved water productivity in fully and partially irrigated systems. • A continuing project investigating the requirements for carbon neutral cotton production. • New projects investigating dryland and limited water farming systems. 	UNE, WSU NSW DPI, CSIRO CSIRO CSIRO, DCRA
On-farm sustainable development is supported	Testing and providing information on the social, environmental and economic viability of new farming systems	<ul style="list-style-type: none"> • A continuing project providing science leadership for cotton development in northern Australia. • New projects investigating novel cotton farming systems, including innovative IPM strategies. • A collaborative project with GRDC and the CRC for Northern Australia investigating the potential for broadacre cropping in the Northern Territory. • 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. • A PhD classifying the suitability of Murrumbidgee Valley soils for cotton production. 	CSIRO TBA, QLD DAF CRCNA NSW DPI CSIRO AgriFutures USYD
Improved reliability of cotton production	Investigating the drivers behind farming system volatility and potential mitigations	<ul style="list-style-type: none"> • A continuing project to minimise in-field yield variability. • A continuing project supporting southern cotton farming systems. 	NSW DPI NSW DPI



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	<ul style="list-style-type: none"> • Three continuing projects to develop precise real-time automated cotton irrigation systems for improved water productivity. • A continuing project to identify sensors for better integrated pest management (IPM) in cotton. • A continuing project to improve nitrogen use efficiency through integrating technology. • A suite of projects as part of the Rural R&D for Profit grant Smarter Irrigation for Profit 2 program. • A continuing project to develop a spray hazard prediction system. • A new project investigating options for defoliating cotton in an increasingly difficult environment. 	USQ, Deakin University, GVIA USQ QUT USQ, Deakin University, GVIA, CSIRO, UMELB, NSW DPI, DJPR, UTAS GRDC ICAN
Cotton farms are digitally enabled	Working with partners to develop strategies to support digital applications and develop frameworks for digital agricultural tools in Australia	<ul style="list-style-type: none"> • A continuing project to support the demonstration of the latest digital and irrigation technologies as part of the Rural R&D for Profit grant Smarter Irrigation for Profit 2 program. 	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	<ul style="list-style-type: none"> • A continuing project to investigate the use of DNA diagnostics to monitor disease suppressive farming systems. • A new project to evaluate and compile cotton disease research findings for future direction. • A new project looking at improving crop water use and photosynthetic carbon assimilation. 	Crown Analytical TBA WSU
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	<ul style="list-style-type: none"> • A continuing project to develop more resilient cotton production systems. • Continuing projects for improved management of weeds in cotton and grains farming systems, including an area-wide approach. • A continuing project focused on southern NSW cotton crop protection, including disease management technical leadership. • A continuing project for sustainable insect management through improved insect resistance monitoring. • A continuing project to improve the management of silverleaf whitefly. • A continuing project to characterise disease suppressive farming systems. • A continuing project to evaluate the efficiency of novel chemistries, bio control agents and management practices to control <i>Alternaria</i> and black root rot in cotton. • A continuing project investigating the use of biological-based products for improved cotton production. • A new project to provide technical leadership in IPM systems for high yielding cotton. • A continuing collaborative project to develop a spray hazard prediction system. • A continuing collaborative project for alternative methods of pest control. • A new project applying molecular tools to inform the Bt resistance management plan for Helicoverpa and Fall armyworm. • Two new projects looking at novel options for IPM in Australian cotton. 	CSIRO NSW DPI, GRDC NSW DPI NSW DPI QLD DAF QLD DAF WSU QLD DAF GRDC HIA, UQ CSIRO CSIRO CCA
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	<ul style="list-style-type: none"> • A new project to review the biosecurity plan. • Membership of Plant Health Australia. • Membership of the collaborative Plant Biosecurity Research Initiative (PBRI). • A collaborative project to boost the diagnostic capacity for plant production industries. 	PHA PHA PBRI GRDC



GOAL TWO: Improve cotton farming sustainability and value chain competitiveness

Outcome	Key Activity	R&D Investments 2021-22	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	<ul style="list-style-type: none"> • A continuing project to identify alternative energy technologies and policy solutions for the Australian cotton industry. • A continuing project aimed at minimising evaporation losses from water storages. • A continuing suite of National Landcare Program supported projects to increase natural capital (biodiversity) on cotton farms. • A continuing project to quantify the potential environmental impacts of pesticides used on cotton. • A continuing project to undertake the fourth environmental audit of the Australian cotton industry. • A continuing project to mitigate the impact of irrigation infrastructure on aquatic biodiversity. • A new project building profitable farming systems for the future through increasing soil organic carbon. • A continuing project investigating the requirements for carbon neutral cotton production. • A new project investigating the environmental co-benefits of irrigation water in the northern Murray-Darling Basin. 	UTS UMelB UNE NSW DPI TBA QLD DAF DCRA CSIRO GU
	Understanding and informing the methodologies and metrics used to assess the footprint of raw materials and their value chains	<ul style="list-style-type: none"> • A continuing collaborative project investigating the methodologies used to assess the environmental impacts of agricultural production according to the EU's Product Environmental Footprint Category Rules. • A new project to support the revision of the industry's sustainable biodiversity indicators, metrics and target areas. 	AWI TBA
CREATE HIGHER VALUE USES FOR COTTON			
Increased understanding of market requirements & opportunities throughout the value chain	Investigating market requirements and opportunities throughout the value chain, and communicating those to industry	<ul style="list-style-type: none"> • A continuing project for improving labour conditions within the Australian cotton value chain. • A continuing cross-RDC project focused on understanding and enhancing community trust for agriculture. 	QUT, UTS AgriFutures



MEASUREMENT AND REPORTING THROUGHOUT THE VALUE CHAIN

CRDC collaborates in global leadership for sustainability initiatives	Facilitating and participating in global sustainability forums	<ul style="list-style-type: none"> • Two continuing projects supporting membership of the Sustainable Apparel Coalition and the Sustainable Agriculture Initiative. • A continuing collaborative project supporting Australian participation in the EU's Product Environmental Footprint Category Rules development process 	SAC, SAI AWI
The value chain is transparent and understood by participants to improve market opportunities	Providing information to the value chain	<ul style="list-style-type: none"> • Two continuing projects to support the reporting of the Australian industry's sustainability performance. • Two continuing PhD projects investigating cotton supply chain accountability and transparency. • A new project to undertake the 4th environmental audit of the Australian cotton industry. 	Sustenance Asia, Canberra University QUT, University of Leeds TBA



GOAL THREE: Build adaptive capacity of the cotton industry

Outcome	Key Activity	R&D Investments 2021–22	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	<ul style="list-style-type: none"> Continuing projects to support CRDC summer scholars and the ABARES Science and Innovation Awards. A continuing project investigating how to improve grower decisions in complex systems. A continuing project to develop a digital strategy for the Australian cotton industry. A new project supporting adaptive research capacity for careers in the cotton industry. 	CRDC, DAWE QUT AgThentic, DataGene CSIRO
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	<ul style="list-style-type: none"> A continuing collaborative project focused on understanding and enhancing community trust for agriculture. A continuing project to understand and plan for the future cotton workforce. Continuing support for the 'People in Agriculture' website. 	AgriFutures CQU DA
Increased opportunities for innovation skills development	Working collaboratively with cross-sectorial partners to support regional innovation	<ul style="list-style-type: none"> 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 continuing project investigating the opportunity for increased yield through improved management of soil constraints. Projects that support the development of future leaders for the industry. 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. A continuing collaborative project with GRDC and the CRC for Northern Australian investigating the potential for broadacre cropping in the Northern Territory. 	USQ, Deakin University, GVIA QUT USQ ARLF, Cotton Australia, Nuffield Australia QLD DAF, NSW DPI GRDC CRCNA
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	<ul style="list-style-type: none"> A continuing project to support the work of the Rural Safety and Health Alliance. Continued support for CRDC Grassroots Grants to local Cotton Grower Associations. 	RSHA CRDC, CGAs
Increased opportunities for strategic foresighting	Investigating existing and future markets for Australian cotton and communicating this to the industry	<ul style="list-style-type: none"> A continuing project to support cotton growers on the research and development advisory panels. 	Cotton Australia



ENABLING STRATEGY ONE: Strengthening partnerships and adoption

Outcome	Key Activity	R&D Investments 2021–22	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	<ul style="list-style-type: none"> • 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 QLD DAF 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	<ul style="list-style-type: none"> • A suite of projects that provide technical leadership for CottonInfo across core research investment areas, including pests, weeds and diseases, IPM, Bt stewardship, fibre quality, water, crop productivity, biosecurity, natural resource management, soil health, nutrition, climate and energy. • A continuing project developing videos to communicate best practice cotton production. 	NSW DPI, QLD DAF, CSIRO, UNE, AgEcon, Stacey Vogel Consulting, Rene van der Sluijs Consulting QLD DAF
Partnerships are strengthened to engage multi-disciplinary and multi-institutional resources (centres of excellence)	Working collaboratively for mutual benefit	<ul style="list-style-type: none"> • CRDC currently invests in over 50 new and continuing collaborative/cross sectoral projects representing 42 per cent of our investment portfolio in 2021-22. • Continued support for field demonstration trial sites • Membership of Agriculture Innovation Australia 	Various CottonInfo AIA
BEST PRACTICE (<i>myBMP</i>)			
Best practice is based on science and measured impact	Working closely with partners to ensure R&D outcomes are included in <i>myBMP</i> practice modules	<ul style="list-style-type: none"> • 13 technical and module lead projects to update <i>myBMP</i> modules from R&D outcomes annually. 	CSIRO, NSW DPI, QLD DAF, 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)	<ul style="list-style-type: none"> • As part of the Rural R&D for Profit grant Smarter Irrigation for Profit 2 program, expressions of interest are being sought from potential commercial partners who wish to access the technologies being developed. • A continuing project to develop a spray hazard prediction system. 	CSIRO, UMEILB, USQ GRDC



ENABLING STRATEGY TWO: Driving RD&E impact

Outcome	Key Activity	R&D Investments 2021–22	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	<ul style="list-style-type: none"> • A continuing project to support 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	<ul style="list-style-type: none"> • 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. 	CCA Cotton Australia Intuitive Solutions
CRDC funded projects demonstrate value and return on investment	Assessing the impact and return on investment from RD&E projects	<ul style="list-style-type: none"> • A continuing project to evaluate the potential economic impact of adopting improved nitrogen management practices. 	AgEcon
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	<ul style="list-style-type: none"> • Continuing projects supporting the CottonInfo initiative to 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 2021–22 financial budget statements

TABLE 1.1: RESOURCE STATEMENT

	2020–21 Estimated actual \$'000	2021–22 Estimate \$'000
Opening balance/cash reserves at 1 July	33,025	23,579
Funds from Government		
Special appropriations^(a)		
<i>Primary Industries Research and Development Act 1989 s.30(3)</i> – Cotton R&D Corporation	4,323	9,183
Total special appropriations	4,323	9,183
Total funds from Government	4,323	9,183
Funds from industry sources		
Levies ^(b)	2,160	4,790
<i>less amounts paid to the CRF</i>	<i>(2,160)</i>	<i>(4,790)</i>
Total funds from industry sources	-	-
Funds from industry sources		
Interest	122	100
Royalties	60	5
Other	4,537	3,725
Total funds from other sources	4,719	3,830
Total net resourcing for CRDC	42,067	36,592
	2020–21	2021–22
Average staffing level (number)	15	15



(a) The CRDC is a corporate Commonwealth entity (CCE) under the PGPA Act and does not receive direct appropriations. Instead, this funding passes through DAWE 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 2021–22 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.

	2020–21 Estimated actual \$'000	2021–22 Budget \$'000	2022–23 Forward estimate \$'000	2023–24 Forward estimate \$'000	2024–25 Forward estimate \$'000
PROGRAM 1.1: COTTON RESEARCH AND DEVELOPMENT CORPORATION					
Revenue from Government					
Special appropriations					
<i>Primary Industries Research and Development Act 1989 s. 30(3) – Cotton R&D Corporation</i>	2,160	4,790	7,288	8,705	8,705
Special appropriations – Industry Levies	2,160	4,790	7,288	8,705	8,705
Revenues from other independent sources	4,442	3,831	1,058	355	365
Expenses not requiring appropriation in the budget year ^(a)	9,495	5,511	(2,670)	(3,699)	(3,132)
Total expenses for program 1.1	18,257	18,922	12,964	14,066	14,643
OUTCOME 1 TOTALS BY RESOURCE TYPE					
Revenue from Government					
Special appropriations	2,160	4,790	7,288	8,705	8,705
Special appropriations – Industry Levies	2,160	4,790	7,288	8,705	8,705
Revenues from other independent sources	4,442	3,831	1,058	355	365
Expenses not requiring appropriation in the budget year ^(a)	9,495	5,511	(2,670)	(3,699)	(3,132)
Total expenses for Outcome 1	18,257	18,922	12,964	14,066	14,643
	2020–21	2021–22			
Average staffing level (number)	15	15			

(a) Expenses not requiring appropriation in the Budget year are made up of depreciation expenses, amortisation expenses, make good expenses and audit fees.

Note: Departmental appropriation splits and totals are indicative estimates and may change in the course of the budget year as government priorities change.

Prepared on Australian Accounting Standards basis.

Our 2021–22 financial budget statements

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

	2020–21 Estimated actual \$'000	2021–22 Budget \$'000	2022–23 Forward estimate \$'000	2023–24 Forward estimate \$'000	2024–25 Forward estimate \$'000
EXPENSES					
Employee benefits	1,870	2,172	2,277	2,382	2,491
Suppliers	1,148	1,272	1,336	1,238	1,247
Grants	15,068	15,287	9,140	10,268	10,727
Depreciation and amortisation	171	191	211	178	178
Total expenses	18,257	18,922	12,964	14,066	14,643
LESS:					
OWN-SOURCE INCOME					
Own-source revenue					
Interest	175	100	90	100	110
Royalties	60	5	5	5	5
Other Grants	3,957	3,476	713	-	-
Other	250	250	250	250	250
Total own-source revenue	4,442	3,831	1,058	355	365
Net cost of (contribution by) services	13,815	15,091	11,906	13,711	14,278
Revenue from Government^(a)					
Commonwealth contribution	2,160	4,790	7,288	8,705	8,705
Industry contributions	2,160	4,790	7,288	8,705	8,705
Total revenue from Government	4,320	9,580	14,576	17,410	17,410
Surplus/(deficit) attributable to the Australian Government	(9,495)	(5,511)	2,670	3,699	3,132
Total comprehensive income/(loss) attributable to the Australian Government	(9,495)	(5,511)	2,670	3,699	3,132

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

Prepared on Australian Accounting Standards basis.

Our 2021–22 financial budget statements

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

	2020–21 Estimated actual \$'000	2021–22 Budget \$'000	2022–23 Forward estimate \$'000	2023–24 Forward estimate \$'000	2024–25 Forward estimate \$'000
ASSETS					
Financial assets					
Cash and cash equivalents	7,079	7,115	5,226	4,902	3,971
Trade and other receivables	929	1,327	3,826	3,826	3,826
Investments in Shares	144	144	144	144	144
Investments	16,500	10,500	12,500	16,500	20,500
Total financial assets	24,652	19,086	21,696	25,372	28,441
Non-financial assets					
Land and buildings	746	781	816	851	886
Property, plant and equipment	368	401	459	447	475
Intangibles	144	131	98	98	98
Total non-financial assets	1,258	1,313	1,373	1,396	1,459
Total assets	25,910	20,399	23,069	26,768	29,900
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	454	454	454	454	454
Total provisions	454	454	454	454	454
Total liabilities	4,654	4,654	4,654	4,654	4,654
Net assets	21,256	15,745	18,415	22,114	25,246
EQUITY*					
Parent entity interest					
Reserves	307	307	307	307	307
Retained surplus	20,949	15,438	18,108	21,807	24,939
Total parent entity interest	21,256	15,745	18,415	22,114	25,246
Total Equity	21,256	15,745	18,415	22,114	25,246

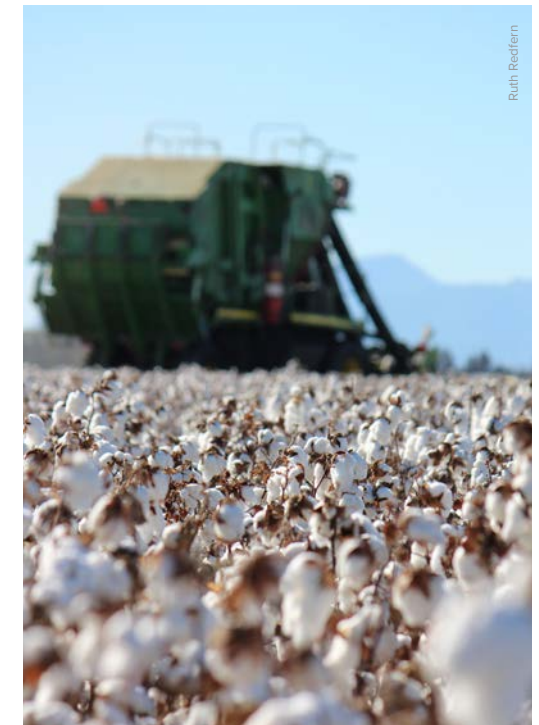
*Equity is the residual interest in assets after deduction of liabilities.
Prepare on Australian Accounting Standards basis.

Our 2021–22 financial budget statements

TABLE 3.3: DEPARTMENTAL STATEMENT OF CHANGES IN EQUITY (BUDGET YEAR 2021–22)

	Retained earnings	Asset revaluation reserve	Other reserves	Total equity
	\$'000	\$'000	\$'000	\$'000
OPENING BALANCE AS AT 1 JULY 2021				
Balance carried forward from previous period	20,949	273	34	21,256
Adjusted opening balance	20,949	273	34	21,256
COMPREHENSIVE INCOME				
Surplus (deficit) for the period	(5,511)	-	-	(5,511)
Total comprehensive income	(5,511)	-	-	(5,511)
of which:				
Attributable to the Australian Government	(5,511)	-	-	(5,511)
Estimated closing balance as at 30 June 2022	15,438	273	34	15,745
Closing balance attributable to the Australian Government	15,438	273	34	15,745

Prepared on Australian Accounting Standards basis.



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Our 2021–22 financial budget statements

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

	2020–21 Estimated actual \$'000	2021–22 Budget \$'000	2022–23 Forward estimate \$'000	2023–24 Forward estimate \$'000	2024–25 Forward estimate \$'000
OPERATING ACTIVITIES					
Cash received					
Industry contributions	2,160	4,790	7,288	8,705	8,705
Revenue from Government	2,163	4,393	4,788	8,705	8,705
Interest	122	100	90	100	110
Net GST received	1,747	1,649	972	1,017	1,072
Other Grants	3,957	3,476	713	-	-
Other	640	254	256	255	255
Total cash received	10,789	14,662	14,107	18,782	18,847
Cash used					
Employees	1,830	2,172	2,277	2,382	2,491
Suppliers	1,137	1,272	1,336	1,238	1,247
Grants	16,942	16,936	10,112	11,285	11,799
Total cash used	19,909	20,380	13,725	14,905	15,537
Net cash from (used by) operating activities	(9,120)	(5,718)	382	3,877	3,310
INVESTING ACTIVITIES					
Cash received					
Investments	30,000	20,000	20,000	20,000	20,000
Total cash received	30,000	20,000	20,000	20,000	20,000
Cash used					
Purchase of property, plant and equipment	326	246	271	201	241
Purchase of investment	29,500	14,000	22,000	24,000	24,000
Total cash used	29,826	14,246	22,271	24,201	24,241
Net cash from (used by) investing activities	174	5,754	(2,271)	(4,201)	(4,241)
Net increase (decrease) in cash held	(8,946)	36	(1,889)	(324)	(931)
Cash and cash equivalents at the beginning of the reporting period	16,025	7,079	7,115	5,226	4,902
Cash and cash equivalents at the end of the reporting period	7,079	7,115	5,226	4,902	3,971

Prepared on Australian Accounting Standards basis.



Our 2021–22 financial budget statements

TABLE 3.5: DEPARTMENTAL CAPITAL BUDGET STATEMENT

	2020–21 Estimated actual \$'000	2021–22 Budget \$'000	2022–23 Forward estimate \$'000	2023–24 Forward estimate \$'000	2024–25 Forward estimate \$'000
PURCHASE OF NON-FINANCIAL ASSETS					
Funded internally from departmental resources ^(a)	326	246	271	201	241
TOTAL	326	246	271	201	241
RECONCILIATION OF CASH USED TO ACQUIRE ASSETS TO ASSET MOVEMENT TABLE					
Total purchases	326	246	271	201	241
Total cash used to acquire assets	326	246	271	201	241

(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 2021–22 financial budget statements

TABLE 3.6: STATEMENT OF ASSET MOVEMENTS (BUDGET YEAR 2021-22)

	Land	Buildings	Other property, plant and equipment	Computer software and intangibles	Total
	\$'000	\$'000	\$'000	\$'000	\$'000
As at 1 July 2021					
Gross book value	190	599	723	993	2505
Accumulated depreciation/amortisation and impairment	-	(43)	(355)	(849)	(1247)
Opening net book balance	190	556	368	144	1,258
CAPITAL ASSET ADDITIONS					
Estimated expenditure on new or replacement assets					
By purchase – other ^(a)	-	50	136	60	246
Total additions	-	50	136	60	246
Other movements					
Depreciation/amortisation expense	-	(15)	(103)	(73)	(191)
Total other movements	-	(15)	(103)	(73)	(191)
As at 30 June 2022					
Gross book value	190	649	859	1,053	2,751
Accumulated depreciation/ amortisation and impairment	-	(58)	(458)	(922)	(1,438)
Closing net book balance	190	591	401	131	1,313

(a) "By purchase-other" refers to funding provided through other internal funding sources.

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 2021–22 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
\$526	\$773	\$3,883	\$2,147	\$4,241	\$276	\$435	\$942	\$326	\$0	\$13	\$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	\$60	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$466	\$0	\$442	\$0	\$50	\$0	\$0	\$0	\$14,579

Science and Research Priorities

Priority 1: Food (and Fibre)

- 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 2021–22 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	\$2,529	\$3,868	\$5,246	\$2,937	\$14,579
Percentage of total	17%	27%	36%	20%	100%



Attachment B: Research partner acronyms

AgriFutures	AgriFutures Australia	GVIA	Gwydir Valley Irrigators Association
AIA	Agricultural Innovation Australia	NSW DPI	NSW Department of Primary Industries
ARLF	Australian Rural Leadership Foundation	PHA	Plant Health Australia
AWI	Australian Wool Innovation	QLD DAF	Queensland Department of Agriculture and Fisheries
CCA	Crop Consultants Australia	QUT	Queensland University of Technology
CGAs	Cotton Grower Associations	RSHA	Rural Safety and Health Alliance
CQU	Central Queensland University	SAC	Sustainable Apparel Coalition
CRCNA	Cooperative Research Centre for Northern Australia	SAI	Sustainable Agriculture Initiative
CRDC	Cotton Research and Development Corporation	UMELB	University of Melbourne
CSIRO	Commonwealth Scientific and Industrial Research Organisation	UNE	University of New England
DAWE	Department of Agriculture, Water and the Environment	UQ	University of Queensland
DCRA	Dryland Cotton Research Association	USQ	University of Southern Queensland
GRDC	Grains Research and Development Corporation	UTS	University of Technology Sydney
GU	Griffith University	WSU	Western Sydney University



Cotton Research and Development Corporation
2 Lloyd Street (PO Box 282)
Narrabri NSW 2390
Phone: 02 6792 4088
Email: crdc@crdc.com.au

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