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Australian Government Department of Agriculture, Fisheries and Forestry

Submitted online

13 December 2023

Agriculture and Land Sectoral Plan

On behalf of the Cotton Research and Development Corporation (CRDC), please accept this letter as our submission to the Department of Agriculture, Fisheries and Forestry's (DAFF) [Agricultural and Land Sectoral Plan](#) (the Plan).

CRDC welcomes the opportunity to comment on the Plan and to highlight the investments CRDC is making on behalf of its levy payers and the Australian Government to lower the carbon footprint of Australian cotton. Our submission is framed by DAFF's request to understand better the potential of the agricultural sector to reduce emissions and the technologies and practices that require investment to help the sector transition.

CRDC's overarching priority is to invest in RD&E to establish a sustainable low-carbon cotton production system for a changing future.

A partnership between the Commonwealth Government and Australian cotton growers, CRDC exists to invest in world-leading research, development, and extension (RD&E) to benefit Australia's dynamic cotton industry and the wider community.

CRDC supports the industry's ambition to reduce the greenhouse gas (GHG) emissions created by cotton production while improving biodiversity and soil health on cotton farms. As such, we focus our GHG emission RD&E investments on two key areas: emissions mitigation and systems adaptation. We ensure that these investments translate to on-farm adoption of low-emissions farming practices through our wide-reaching CottonInfo extension program, the industry best practice program *myBMP*, and the Australian Cotton Sustainability Framework PLANET. PEOPLE. Paddock., (the sustainability framework).

The sustainability framework provides the overarching guidance for how the various industry organisations work together to manage climate risks and contribute to the Paris Agreement's aim for a climate-neutral world. This includes regularly reporting the industry's performance on key sustainability metrics, including its carbon footprint¹. [CRDC's 2023-2028 Strategic RD&E Plan](#) includes a specific focus on carbon, with the objective of establishing a sustainable low-carbon cotton production system for a changing future. CRDC's immediate priority is understanding the opportunities for growers to reduce their GHG emissions. We will continue to engage with various stakeholders to ensure that identified priorities and pathways for reducing GHG emissions meet grower, market and community expectations for Australian-grown cotton and support government policy outcomes.

CRDC, in partnership with Cotton Australia, the representative body for Australian cotton growers, has established the Australian Cotton Sustainability Reference Group (ACSRG) as a formal platform to help the industry better understand stakeholder expectations and discuss the sector's sustainability performance. The ACSRSG brings together a group of advanced and independent thinkers along the cotton supply chain who question, challenge and guide the industry's sustainability activities. It involves representatives from brands and retailers, environmental organisations, First Nations, governments, merchants, regulators, community organisations, health and safety, cotton growers, researchers, input providers and other broadacre agriculture sustainability frameworks. Regular engagement with the ACSRSG provides the cotton industry with confidence that our sustainability aspirations and initiatives are guided by science and aligned with stakeholder expectations.

¹Cotton Australia and Cotton Research Development Corporation (2022). *Australian Cotton Sustainability Update* (<https://cottonaustralia.com.au/assets/general/Documents/2022-Sustainability-Update.pdf>).

The Australian cotton industry is investigating and shaping emission reduction pathways for 2035 and assessing the technical feasibility of net zero for 2050.

While the cotton industry's contribution to national GHG emissions is minor at 0.2 per cent of Australia's total emissions², Australia's cotton farmers are likely to be amongst those most affected by the impacts of climate change. Although most emissions reductions are likely to be delivered through nationally transforming energy supply systems, we recognise an opportunity for our industry to play a small but essential role in reducing emissions. As such, we will continue to monitor, evaluate, and report progress in reducing the industry's emissions intensity.

The Australian cotton industry has already made significant gains in managing GHG emissions by increasing the adoption of minimum tillage farming, incorporating residue rather than burning, incorporating legumes into cotton rotations, and adopting precision technologies, including controlled traffic, for protecting soil health.

To achieve GHG emissions targets aligned with market expectations, cotton growers will need to improve nitrogen use efficiency, reduce energy emissions from fuel and electricity use and increase carbon sequestration and storage on-farm. Efficiencies in nitrogen use will be critical for transitioning to a low-carbon cotton production system, given that approximately 70 per cent of emissions are associated with nitrogen use, equally shared through on-farm nitrogen losses and emissions embedded in fertiliser manufacture.

CRDC is currently initiating an investment in understanding the technical feasibility of a suite of abatement strategies, including (but not limited to) afforestation, renewable energy, enhanced efficiency fertilisers, reduced inputs, increased tree carbon, and increased yield or productivity. While this RD&E will likely provide a transition framework to a low-carbon cotton production system for 2030, achieving a 2050 net zero target will be more difficult for the Australian cotton industry. The pathways to net zero are currently unclear. They are confounded by climatic variability, natural fluxes in biological systems for carbon and nitrogen, and uncertainty around carbon market opportunities. Currently, no technologies eliminate GHG emissions for crop production systems, as emissions are embedded in natural biological processes, such as nitrogen and carbon cycling, which are essential for soil health, plant growth and development, and crop productivity.

The Australian cotton industry is remobilising to a higher level of ambition.

CRDC plans to invest approximately 12 per cent of its budget for the [Strategic Plan 2023-28](#) on RD&E to establish a sustainable low-carbon cotton production system for a changing future. Our RD&E investments intend to meet grower, market, community, and government expectations by:

1. Establishing ways to reduce GHG emissions on cotton farms, including improving nitrogen use efficiency by more precisely matching fertiliser application with plant demand.
2. Defining and describing pathways for carbon sequestration and capture on farms.
3. Improving understanding about managing soils for organic carbon and supporting soil health.

Through the sustainability framework, CRDC supports the industry in remobilising to a higher level of ambition for managing GHG emissions. The industry engages along the cotton supply chain to respond to evolving market signals around broader initiatives that support low-carbon cotton production, including:

1. Considering opportunities to assess and establish an evidence-based target for GHG emissions that facilitates the transition to low-emissions cotton production systems and aligns with the industry's commitment to being a global leader in sustainable cotton production;

² Cotton Australia and Cotton Research Development Corporation (2022). *Australian Cotton Sustainability Update* (<https://cottonaustralia.com.au/assets/general/Documents/2022-Sustainability-Update.pdf>).

2. Identifying and contextualising the market opportunities and incentives for growers to transition to a low-emissions production system, including de-risking decisions made around nitrogen fertilisers, e.g. through the use of insurance products;
3. Developing low-carbon cotton systems that also promote biodiversity and soil health;
4. Investing in RD&E that supports transparency and traceability along the supply chain for low-carbon cotton, e.g. CRDC is investing significantly in a data platform that will enable growers to undertake robust and streamlined carbon accounting across their business and provide certainty regarding the provenance and sustainability credentials of Australian-grown cotton; and
5. Participating in the circular economy by providing carbon-conscious and sustainable end-of-life solutions for cotton textiles, including regional composting of pure cotton textile waste.

CRDC is currently investing in RD&E to reduce emissions for Australian-grown cotton.

CRDC continues to invest in research for measuring and reducing on-farm GHG emissions. This research has allowed the industry to develop cotton-specific approaches for lowering GHG emissions whilst critically allowing cotton growers to understand GHG emissions reduction strategies across their entire farming businesses, including native vegetation and riparian land, cereals, pulses, pastures and livestock enterprises. As an example of taking a whole-of-business approach to GHG emissions mitigation, CRDC is co-investing in Agricultural Innovation Australia's (AIA) *Environmental Accounting Platform* (previously 'know and show' you carbon footprint carbon calculator). This cross-commodity investment approach aligns with feedback from cotton growers on the importance of investing in both cotton-specific and farming systems RD&E to deliver emissions reduction and abatement technologies in a coordinated and user-centric manner.

As approximately 70 per cent of emissions from cotton farms are associated with using nitrogen fertilisers for crop nutrition³, CRDC has several critical investments in optimising nitrogen placement and crop utilisation. We continue to prioritise RD&E investment in optimising nutrient (including fertiliser and manure) application, improving nitrogen use efficiency, nutrient cycling and plant nitrogen availability, the role of arbuscular mycorrhiza fungi, cover cropping, fertiliser emissions measurements, and nutrient stewardship. These investments all focus on maximising the return from nitrogen fertilisers by ensuring that cotton growers apply the right fertiliser, at the right rate, at the right time and in the right place.

CRDC is particularly interested in new pathways for dramatically reducing emissions associated with nitrogen fertilisers, including green fertilisers (to reduce or eliminate manufacturing emissions) and enhanced efficiency fertilisers (to reduce field GHG emissions). We note in section 3.2 of the Plan that nitrification inhibitor-coated fertiliser could reduce nitrous oxide emissions by 79 per cent in grain production systems, and we believe that cotton-specific research is critical to understand whether similar reductions could be made in cotton production soils and systems.

We acknowledge that a holistic approach must be taken to guide the Australian cotton industry toward sustainable cotton production. CRDC is also investing in research to help the Australian cotton industry position itself for future markets that require low-emissions produce sourced from farming systems with verifiable biodiversity and soil health credentials. As such, we've prioritised investment in native vegetation and soil research, including soil health, natural capital and biodiversity benchmarking. We're also investing in translating our research outcomes into on-farm emissions reductions encompassing climate, carbon, nutrition, natural resources (including biodiversity), and soil health through investment in the CottonInfo extension network. These broader investments will empower cotton growers to protect and nurture their cotton production systems, including forests and soils, for generations into the future.

³ Ekonomou A., Eckard, R.J. (2021), University of Melbourne C-GAF based on the Australian National Greenhouse Gas Inventory methodology.

CRDC supports ongoing Commonwealth investment to enable change.

CRDC supports the continued work by DAFF to transition Australian agriculture to a low-emissions sector. Government investment in RDCs is critical for delivering commodity-specific RD&E outcomes, such as low-carbon cotton production, that meet the supply chain expectations. This investment is similarly vital in facilitating cross-sectoral collaboration for transitioning change to low-emissions farming systems and communities, including the recently announced Zero Net Emissions CRC (of which CRDC will be a partner), the Emerging National Rural Issues forum facilitated by AgriFutures, and the National soil health strategy.

Section 5.2.3 of the Plan references numerous calculators that generate carbon emissions data with various degrees of transparency, certainty and relevance to Australian agriculture. We support the suggestion that the government could play a stronger role in assuring the performance of calculators available to Australian producers. We envisage that this could include:

1. Implementing an Australian standard for carbon accounting
2. Endorsing an Australia-wide calculator for GHG emissions and carbon sequestration potential, such as the AIA carbon calculator
3. Requiring private calculators to be transparent regarding their underpinning methodology and background data sources
4. Considering opportunities for ensuring that the cost of any data verification required to assure agricultural supply chains is minimal.

We note that scope 3 emissions are out-of-scope for the Plan; however, given the significant contribution that the manufacturing of nitrogenous fertilisers make to the footprint of cotton production, we would ask that consideration be given to a nationally coordinated approach for reducing industrial emissions for nitrogen fertilisers, as critical for assuring sustainable low-carbon cropping systems that meet future market needs.

Further information.

CRDC is committed to timely and transparent reporting of our ambitions and investments for our stakeholders. Our carbon emissions and abatement investments outlined in this submission are annually updated and published in our [CRDC Annual Report](#). Industry progress against sustainability targets is annually updated and posted to our [sustainability webpage](#).

CRDC would be very pleased to provide further information on its strategic approach, current investments and projected impacts on GHG emissions reduction RD&E and the Australian cotton industry's transition to a low-carbon production system that meets future market requirements.

Yours sincerely



Allan Williams
Acting Executive Director
Cotton Research and Development Corporation