



Australian Government



Cotton Research and Development Corporation

Fisheries Research and Development Corporation

Grains Research and Development Corporation

AgriFutures Australia



Wine Australia

Council of Rural Research and Development Corporations

Submission to

The 2017 Review of the National Gene Technology Scheme

September 2017

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EXECUTIVE SUMMARY

The Council of Rural Research and Development Corporations (the Council) welcomes the opportunity to make a submission to the third review of the National Gene Technology Scheme.

Australia's 15 Rural Research and Development Corporations (RDCs) facilitate positive change that makes a difference for our rural industries, communities, and the nation. Our role is to invest in research, development and extension to address the sustainability, productivity and competitiveness challenges facing our agricultural, fishing and forestry industries.

Innovation is critical to achieving this positive change. Innovation, including new tools and technologies, is essential for Australian agricultural industries to remain competitive in the face of global pressure, to meet environmental, social and economic challenges, and to capitalise on new opportunities. Innovation, driven and supported by a sustainable and effective rural research, development and extension effort, is crucial to the long-term competitiveness of the Australian rural sector. Without innovation, our industry will not be able to compete against increased production in lower-cost jurisdictions.

The development and implementation of new technologies enables transformation. Australia's Rural RDCs deploy a range of technologies and techniques, including gene technologies, across a wide spectrum of sectors. Some sectors, such as cotton and grains (oilseeds) have a wealth of experience in this area, having grown commercial genetically modified (GM) crops in Australia for between nine and 20 years. Other sectors, including horticulture and red meat, support research projects exploring opportunities in genetic modification and newer gene editing techniques to examine the potential benefits for pest protection and animal welfare.

The Council strongly supports Australia's science-based gene technology regulatory scheme, recognising a rigorous, transparent and risk-based approach. Such systems are critical to ensure the safe and responsible use of science and the safety of the community and the environment. The Council notes that since the establishment of the Gene Technology Scheme, new gene technologies have emerged and some uncertainty exists as to whether these techniques fall within our outside of the scope of the *Gene Technology Act 2001*. The Council believes that this uncertainty needs to be urgently addressed and that decisions regarding how these new techniques are handled must follow the same overarching principles of the current scheme – that is, decisions must be science-based and any necessary regulation commensurate with the risk.

A strong science-based regulatory framework provides a predictable path-to-market for research and development outcomes and investment certainty. However, the Council notes that the state-based moratoria, allowed under a policy principle, undermine a science-based approach, break down the national system, and deliver investment uncertainty. The Council calls for the removal of the moratorium 'mechanism' to ensure that Australia's agricultural, fishing and forestry sectors all have the opportunity to benefit from research outcomes deploying gene technologies. The removal of the moratoria will also serve to provide investment certainty for both public and private investors. Further, the Council believes such decisions should be market-based and made by the relevant industry sector, with several sectors having demonstrated their ability to manage product stewardship such as the Australian cotton industry.

Lastly, the Council supports the current gene technology funding scheme. While GM crops may be 20 years old, Australia is still in its infancy in terms of commercial products developed through genetic modification and the application of newer gene technologies. The Council supports the continuation of a government-funded regulatory scheme which will support a continued R&D effort and also help to build community trust through a completely independent regulatory authority.

INTRODUCTION

The Council welcomes the opportunity to make a submission to the 2017 Review of the National Gene Technology Scheme. This response is provided on behalf of Australia’s 15 Rural RDCs, and, as such, will focus on high level issues and policy settings. Individual RDCs may also make their own submissions focused on their own industries and circumstances and the arrangements that apply in each case.

The Council is the structure through which the 10 industry-owned companies and five statutory corporations, collectively known as the Rural RDCs, collaborate and coordinate collective efforts on matters of common interest.

The 15 Rural Research and Development Corporations	
Industry owned companies	Statutory corporations and authorities
<ul style="list-style-type: none"> • Australian Egg Corporation • Australian Meat Processor Corporation • Australian Pork Limited • Australian Wool Innovation • Dairy Australia • Forest & Wood Products Australia • Horticulture Innovation Australia • Livecorp (the Australian Livestock Exporters Corporation) • Meat & Livestock Australia • Sugar Research Australia 	<ul style="list-style-type: none"> • AgriFutures Australia (formerly Rural Research and Development Corporation) • Cotton Research and Development Corporation • Fisheries Research and Development Corporation • Grains Research and Development Corporation • Wine Australia (the Australian Grape and Wine Authority)

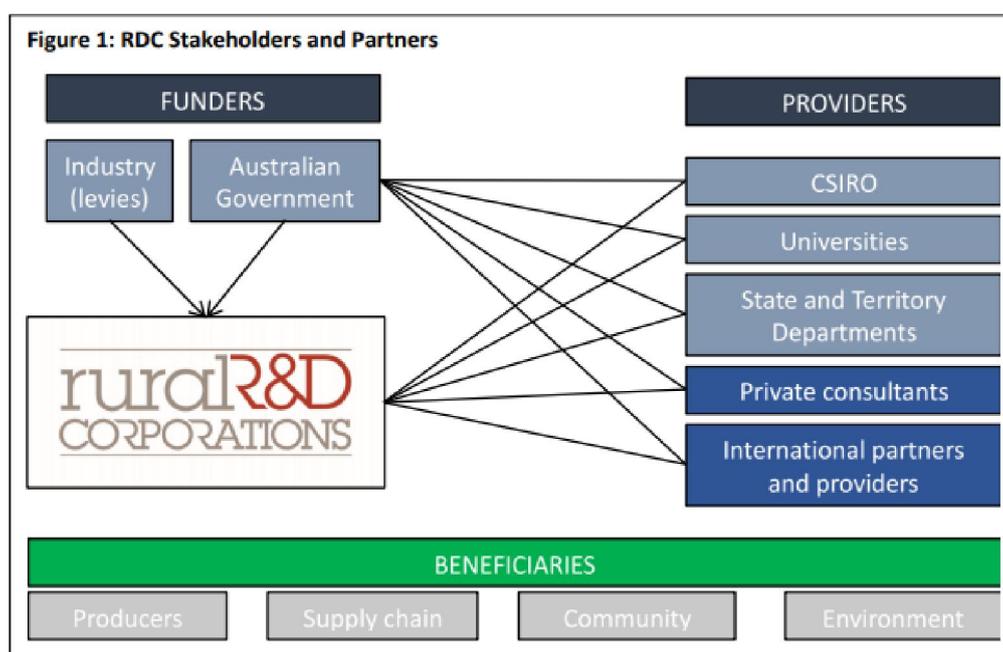
The role of the Council is to support and facilitate the RDCs to fulfil their broad purpose where collective and coordinated action will deliver better investments and outcomes. The Council provides a mechanism for the Rural RDCs to harness the strength of their combined resources and networks, aggregate intelligence, amplify and disseminate messages and engage with common stakeholders. In particular, the Council operates on behalf of all RDCs to promote, strengthen and provide advocacy for Australia’s highly regarded rural RDC model, the research investment made and the benefits delivered.

Throughout this submission, unless otherwise indicated, the term “RDC” refers collectively to the 10 industry-owned companies and five statutory research and development corporations, who have responsibility for research and development for their respective industries.

The ambition of the Council is to ensure Australia’s rural industries are thriving through innovation, now and into the future. It builds on the work of the Rural RDCs who invest in research, development, technology transfer and adoption, and in some cases market access, market development and promotion, to deliver economic, environmental and social benefits for producers, rural industries, rural and regional communities and the nation.

The Rural Research and Development Corporations

The Rural RDCs are a long-standing partnership between industry and government to plan, invest in, manage and evaluate research, development and extension (RD&E) that delivers economic, environmental and social benefits for rural industries and the nation. They prioritise, coordinate and integrate the needs of industry and government and align the capabilities of research providers responsible for primary industries RD&E. They are funded through a co-investment model which involves levies on production and a matching government contribution for RD&E. Some of the RDCs also undertake market access, market development, promotion or other industry services. (Functions that are not related to RD&E are not eligible for matching funding from the Australian Government).



The RDCs support activities across the spectrum from basic research to applied science and product development, and they fund, manage and are engaged in the translation, extension and adoption of R&D outcomes. The RDCs balance effort across the whole production and supply chain — from the environment in which production occurs, through transport, storage, processing and marketing of intermediate and consumer products, often well into our overseas markets. Research, development and extension touches a wide range of industries, businesses and workers, and the benefits are felt widely throughout the community. New technologies, services and products are some of the pathways through which research findings can move from the laboratory to the paddock and consumer.

The RDC model and portfolio delivers a balance so that RD&E investments have high relevance to industry, address government priorities and optimise efficient, effective and appropriate expenditure of levy and taxpayer funds. The model is highly flexible and has been successfully tailored to suit the requirements of industries large and small. This approach is highly regarded domestically and internationally as a way to identify, prioritise, fund and deliver industry-relevant rural R&D in the context of domestic and international value chains.

The RDCs do not seek to dictate to industry what technologies will be adopted. Instead they work to ensure industry has sufficient and appropriate levels of information to determine whether a technology is suitable and under what circumstances, what benefits it offers, and what risks may need to be managed should it be adopted. The RDCs see gene technology as another technology which needs to be available in the toolbox to deliver a potential wide range of research, breeding, production and consumer benefits.

GENE TECHNOLOGIES AND AUSTRALIA'S RURAL RESEARCH AND DEVELOPMENT CORPORATIONS

While Australia's rural industries are only a small part of the overall Australian economy they provide a critical foundation for society. The food and fibre products derived from rural industry are essential for life — they are consumed every day by all members of the community. Few non-rural goods have such pervasive consumption patterns and naturally wide distribution of benefits. The agriculture, fisheries and forestry industries also provide inputs for a number of downstream industries.

The rural sector has a strong culture of innovation of processes, practices, knowledge and skills. Industries are actively seeking out and adopting leading edge technologies to better business decision-making, improve practices and production, enhance supply chains and connect with consumers.

The Rural RDCs have a varied experience with gene technologies from broad scale commercialisation to initial laboratory-based research experiments. The following provides some examples:

- Cotton - For two decades the Australian cotton industry has been growing GM cotton varieties which now account for well over 90 per cent of Australia's cotton industry. Commercialisation in 1996 came after years of research and development and was supported by extension and strong industry stewardship from the beginning. The industry has largely deployed gene technology to successfully deliver insect resistant and herbicide tolerant varieties. Newer research programs, supported by the Cotton Research and Development Corporation (CRDC), are now utilising new gene technology techniques to explore the potential to improve cotton fibre, develop virus protection in varieties and explore new market opportunities such as cotton seed for human consumption.
- Grains - Australian farmers gained access to GM herbicide tolerant canola varieties in 2008. The Grains Research and Development Corporation (GRDC) is currently collaborating with CSIRO and Nuseed to develop new canola varieties that express long-chain omega-3 oils that are currently sourced mainly from algae-eating fish. The new canola varieties aim to help alleviate pressure on wild fish stocks by providing a land-based source of these oils. Following successful field trials, the canola lines are currently being assessed by global regulatory agencies including the Office of the Gene Technology Regulator (OGTR).
- Horticulture – Horticulture Innovation Australia is supporting research in partnership with the Western Australian Department of Primary Industries and Regional Development – Agriculture and Food and Oxitec to examine the potential to eradicate the Mediterranean fruit fly (Medfly) a damaging horticulture pest. Genetic modification is used to sterilise the male Medfly, preventing female offspring from reaching adulthood. To date, the research has been undertaken in glasshouses in Western Australia.
- Dairy – the Australian dairy industry, with the support of Dairy Australia, is investing in a designer forages program which includes the use of a range of gene technologies to develop new ryegrass varieties that will deliver, in the first instance, extra energy to a grazing animal. The industry believes that a variety of gene technologies will offer other beneficial opportunities for the sector including (a) quality traits for pasture (b) welfare and disease resistant traits for animals and (c) improving feed supply including grains and hay.

Other Rural RDCs are exploring broader benefits that gene technologies may provide. For example, Wine Australia sees the potential of gene technology to improve sustainability, deliver vines tailored to specific regions particularly in light of climate change adaptation, and provide disease resistance, while Meat and Livestock Australia is exploring the potential of gene editing to produce polled livestock (cattle without horns) to improve welfare outcomes in horned breeds.

Overall, while RDCs have varying degrees of experience with, and investments in, gene technologies, the Council recognises that access to these tools and technologies is critical for the future of the sector. Coupled with this access comes a science-based, rigorous and transparent regulatory system. Australia, through the OGTR, has such a system in place although this system needs the ability to incorporate new science techniques and provide a predictable path-to-market for R&D investments.

RESPONSE TO THE TERMS OF REFERENCE

Current developments and techniques, as well as extensions and advancements in gene technology to ensure the Scheme can accommodate continued technological development.

The rural sector has a strong history of innovation and development, which has been critical to its success to date. The sector is exposed to international markets and has a history of adapting quickly to market forces, adopting new technology, altering product output, product type and production methods in response to shifting demands. The technology employed in the rural sector is at the leading edge across a range of fields of science including gene technologies.

Applications of gene technology have advanced from traditional genetic modification to more advanced and precise techniques known as gene or genome editing. Gene editing is a form of gene technology in which DNA is inserted, deleted or replaced in the genome of a living organism using engineered nucleases or “molecular scissors”. (Wikipedia, 2017). In essence, it allows specific changes to be made to the DNA, by cutting the DNA at a specific sequence and when repaired by the cell a change or ‘edit’ has been made to the sequence. Gene editing in itself can be done via a range of means including CRISP (*Clustered regularly interspaced short palindromic repeats*), ZFNs (zinc finger nucleases) and TALENS (transcription activator-like effector-based nucleases).

Gene technologies provide a range of potential benefits for the agriculture, fisheries and forestry sectors. These benefits include:

- Improved precision for researchers, allowing to the selection of exact characteristics and a reduction in the delivery time from the laboratory to glasshouse to the paddock.
- A broader genetic base for breeders, providing options beyond the scope of conventional breeding.
- Improved pest and disease resistance, increased productivity, products tailored to meet specific climatic conditions, improved qualities (such as healthier products or products better suited for processing), and products for new markets.
- Improve animal welfare outcomes – including reducing the need for dehorning, slick coated genes in beef cattle for improved heat tolerance and tick resistance.
- Improved nutrition for consumers such as altered fats, proteins and vitamins; allergen-free foods; altered oils and starches; reduced anti-nutritionals.
- Food security for developed and developing nations – delivering a reliable, consistent, and sustainable food supply.
- A reduction in food waste through modified taste, texture, appearance and consistency, and maintaining food appearance and nutritional qualities.
- New sources of health prevention and solutions including vaccines and antibodies from plants and pharmaceuticals from animals (for example, medicines from milk).

The Rural RDCs will continue to utilise genetic modification and deploy a range of new gene technologies – now and into the future – for the continued improvement of Australia’s rural industries.

Existing and potential mechanisms to facilitate an agile and effective Scheme, which will ensure continued protection of health and safety of people and the environment.

The majority of Australia’s Rural RDCs do not have direct dealings with the OGTR as they largely fund third party research organisations to undertake RD&E for the sector. The Council supports the

current Scheme as a rigorous science- and risk-based system. The Council believes that it is critical for urgent clarity regarding whether newer gene technologies fall within, or outside of, the scope of the current Scheme. As such, the Council supports any changes to the current Scheme which provide greater flexibility in delivering a Scheme which, into the future, can respond quickly as greater scientific knowledge and new techniques emerge.

A flexible and agile, predictable science-based Scheme will inform Rural RDC investment decisions and encourage investment – public, private and public/private partnerships. Such a Scheme will also help to build community confidence in the regulatory system and the safety of end products. Further, the Council supports continued outreach by the OGTR to share the principles of Australia’s science-based regulatory system with other countries around the world, particularly those looking to develop regulatory frameworks. Predictable science-based systems will provide certainty in the international marketplace, particularly with Australia’s trading partners. The Council also notes that in making any changes to the current Scheme, Australia must be mindful of international developments to ensure that Australia’s Scheme is workable and aligned with global best practice systems around the world.

The appropriate legislative arrangements to meet the needs of the Scheme, now and into the future, including the Gene Technology Agreement.

The Council supports Australia’s gene technology regulatory scheme, recognising that it is world class and provides a strong science-based risk assessment framework. However, the Council believes that the state-based moratoria, enabled by a policy principle, undermine Australia’s national, science-based scheme. The Council calls for the removal of this policy principle and the resulting moratoria. In addition to weakening a national evidence-based system, the moratoria provide considerable investment uncertainty with applicants potentially unable to commercialise their products in key markets – for example, farmers in South Australia are still unable to access GM canola varieties that their peers in New South Wales and Victoria have been growing since 2008. This ban is currently in place until 2019.

The Productivity Commission Inquiry into regulation in Australian agriculture noted that, “Other regulations were identified as reducing flexibility, constraining the use of more efficient production techniques and discouraging investment. Examples include ... state and territory moratoria (effectively bans) on genetically modified (GM) crops, that deny farmers access to technological advances.” (Productivity Commission 2016a)

The Inquiry recommended that, “New South Wales, South Australian, Tasmanian and Australian Capital Territory Governments should remove their moratoria (prohibitions) on genetically modified crops. All state and territory governments should also repeal the legislation that imposes or gives them powers to impose moratoria on genetically modified organisms by 2018”. (Productivity Commission 2016b).

Under the intergovernmental Gene Technology Agreement, the “Recognition of Designated Areas Principle” allows states and territories to designate geographical areas under the state and territory law to preserve the identity of GM or non-GM crops for marketing purposes. The Council calls for the removal of these bans which have effectively left farmers without access to new GM varieties and proven plant science. Further, the Council notes the ability of the agriculture sector, to successfully manage products in the supply chain to meet customer needs. Such market-based decisions do not require government regulation.

Funding arrangements to ensure sustainable funding levels and mechanisms are aligned with the level and depth of activity to support the Scheme.

The Council supports the continuation of the current funding arrangement for the Scheme – a government-funded regulatory agency.

Genetically modified crops have been grown for two decades, including in Australia, and Australian scientists have been at the forefront of this research, however, despite research across a range of crops and traits the commercialisation of end products has been slow. As such, the Council

believes the gene technology 'industry' is still in its infancy in Australia and the continuation of a government-funded Scheme will allow continued R&D efforts, particularly by public sector agencies which currently dominate the landscape. Rural RDCs have also noted that a government funded regulatory agency will help to build community trust in an independent, science-based system.

CONCLUSION

Australian scientists are at the leading edge in many fields of research, including gene technology. Australia's Rural RDCs support RD&E across a range of sectors – cotton, dairy, eggs, fisheries, forestry, grains, horticulture, meat, pork, sugar, wine and wool – for the continued improvement of the sectors and to deliver benefits to the broader community.

Australia competes in a global marketplace. Innovation, including new tools and technologies, is critical for our agriculture sector to remain competitive, address challenges, and take advantage of new opportunities.

The Council of Rural Research and Development Corporations supports the continued use and application of gene technology research as one innovation which delivers potential benefits to the sector and the broader community.

The Council supports Australia's science-based risk assessment Gene Technology Scheme and encourages government to ensure that the Scheme continues to be fit-for-purpose as new scientific discoveries emerge and one that is aligned with global best practice systems. A predictable, science-based system is critical to inform investment decisions. Once an application of gene technology is demonstrated to be safe and effective, governments should limit interference that restricts or bans adoption. The Rural RDCs play an important role in Australia's innovation system, which includes prioritising and funding RD&E into new technologies that deliver potential economic, environmental and social benefits.

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