

# **DEPARTMENT OF AGRICULTURE AND FOOD WESTERN AUSTRALIA SUBMISSION TO THE PRODUCTIVITY COMMISSION INQUIRY INTO RURAL RESEARCH AND DEVELOPMENT**

## **KEY POINTS**

The Department of Agriculture and Food Western Australia (DAFWA) is pleased to make a submission to the Productivity Commission Inquiry into Rural Research and Development. DAFWA believes that overall the Research Development Corporation (RDC) model has served Australia well and contributed strongly to a vibrant and internationally competitive rural sector. It should be continued, although there are improvements that can be made to the model and its operation through:

- Greater emphasis on industry performance, analysis and strategic planning – this can be guided by the identification of key productivity drivers for each RDC.
- Stronger focus on achieving change in practice and outcomes rather than on funding research projects and underpinning a research industry for its own sake.
- Greater focus on customer, supply chain and environment issues being included in achieving the outcome/assessment of any project.
- Being strategic in investing in capability in the areas of Australia where the greatest proportion of product is being produced (rather than where the largest population and/or research capacity is located) otherwise there is a risk the research and development will become uncoupled from industry needs, particularly for industries with the strong reliance on the export market.
- The RDC system could be simplified by reducing the number of bodies (through amalgamations) and introducing a standardised project management system across all RDC's.
- The RDC's need to remain committed and actively engaged in the implementation of the National Research Development and Extension Framework.

## **PREAMBLE**

DAFWA is the government agency responsible for developing the long-term profitability of Western Australia's (WA) agricultural and food sectors that provide 11 per cent of the state's jobs and 9 per cent of its Gross Product. DAFWA has significant plant, animal, natural resource management and economic research, development and extension (RD&E) capability delivered through individual project frameworks.

Annual RD&E expenditure by DAFWA is \$80 million provided by the state government and a further \$40 million coming from co-investment by mainly Research and Development Corporations (RDC's).

The Grains RDC is DAFWA's largest individual external funder. This reflects the importance of winter grains in the WA agriculture sector. Nationally, WA is a major grain producer but this is not the case when it comes to other agricultural commodities. Historically, DAFWA has provided the principal investment channel for each of the RDCs with an interest in WA.

In general terms, DAFWA believes the current RDC model requires significant modernisation to improve its efficiency and effectiveness. This submission deals primarily with issues of principle rather than specifics. It focuses on functions directly relevant to the furthering of R&D rather than those geared towards marketing, promotional or industry representation.

This submission is structured around six themes documented in the Productivity Commission's discussion paper:

- the appropriateness of government investment in rural R&D (*page 10 of discussion paper*)
- the effectiveness of the current rural R&D and extension framework (*page 11*)
- the fundamental soundness of the RDC model (*page 13*)
- the level of public and private investment in rural R&D (*page 15*)
- the model's application to emerging industries (*page 17*)
- the scope for reducing administrative costs (*page 20*)

## OPINIONS ON IDENTIFIED THEMES

### 1. Government support of rural R&D

*Does the basic case for such support rest mainly on wider (spill over) benefits for the community, or are there other important rationales that the Commission should take into account?*

In economic terms, there is a case for government intervention in rural research and development if it is considered that there will be under-investment by the private sector if firms and individuals are acting solely on market forces. This may occur for a number of reasons, such as:

- The product of the research cannot be adequately appropriated by the people who have invested the money to produce it,
- The product of the research will benefit others who have not paid their share of the costs,
- The benefits of the research have such a long lead time that they occur outside the planning horizons of private firms.

DAFWA argues that government intervention through the imposing of levies on produce, setting up of RDC's, and putting in place appropriate legislation to allow capture returns from development of intellectual property have combined to support investment in rural research and development. It is important to note that States do not have the ability to impose compulsory levies for research under the Constitution.

DAFWA sees a strong case for continued government investment in rural R&D, based on the following key points:

There is a substantial case for well-placed government investment in rural R&D because of its potential to create strategic value. Creating and maintaining a critical mass of scientific capacity (human and physical), provides a means of exercising greater options and flexibility in the face of uncertainty and future opportunities.

Several analysts suggest future significant increases in the price of agricultural commodities. These increases may present lucrative opportunities for Australia; however strategic investment will be needed to fully take advantage of these opportunities. At the same time, there are a number of significant threats arising from new and evolving international drivers that the Australian agricultural sector will not be able to manage without commensurate government and private investment.

A lack and/or imbalance in information can distort and disrupt market demand and supply. Private firms are often reluctant to invest in R&D to manage a particular risk when insufficient or inaccurate information exists.

Although investment in agricultural R&D can occasionally deliver a leap in productivity, more often gains are achieved in small increments. Further, true increases in productivity often require several years of research (and funding) to confirm. Failure to maintain investment in agricultural R&D may jeopardise the long term prospects for Australian agriculture. If funding of agricultural R&D becomes uncertain, such work will be seen as an unattractive career path for scientists, reducing our national R&D capability.

This raises concerns over the ability of the private sector to maintain R&D investments when the lag time and uncertainty of returns may be great. Even if projections indicate that R&D investments will deliver profitable returns, there is no guarantee that private firms will be able to capture/protect a sufficient share of these returns to warrant their investment. The common perception is that private companies focus on short-term, single-issues that offer the highest likelihood of a quick financial return to shareholders.

As R&D becomes more applied, the likelihood that private investors can capture the benefits of R&D by creating and exercising Intellectual Property (IP) through copyright, patents, plant variety protection legislation and royalties increases. However, these arrangements can be expensive to maintain, limit the spread of innovation and not readily applicable to all research.

The level of sophistication between and within individual agricultural industries varies markedly, with many being too small and/or not yet capable of generating and/or attracting private research investment in their own right despite some generating significant (albeit small) returns through employment, processing/value adding, marketing, tourism and appeal. The ability of smaller industries to remain competitive will necessarily depend on (catalytic) government investment into R&D.

If Australia wishes to have an internationally competitive agricultural sector, then levels of support need to be commensurate with those applying to our principal competitors – with R&D being a more rewarding means of support than either subsidies or tariffs.

Australia is an outlier in terms of level of support for its agricultural industries. Although the nominal rate of assistance to agriculture (i.e. protection) has lessened in many countries over recent years, in relative terms it has increased due to assistance to other sectors being reduced by an even greater degree.

The following graph, based on 2009 World Bank data shows the current relationship between the subsidization of major agricultural producing or exporting countries and how favoured are the agricultural sectors within those economies, with those countries that preferentially protect their agriculture also spending more on agriculture such that their agricultural sectors benefit in both relative and absolute terms. Australia (the red star) is an exception. By international comparison we do not subsidize our agriculture in either relative or absolute terms.

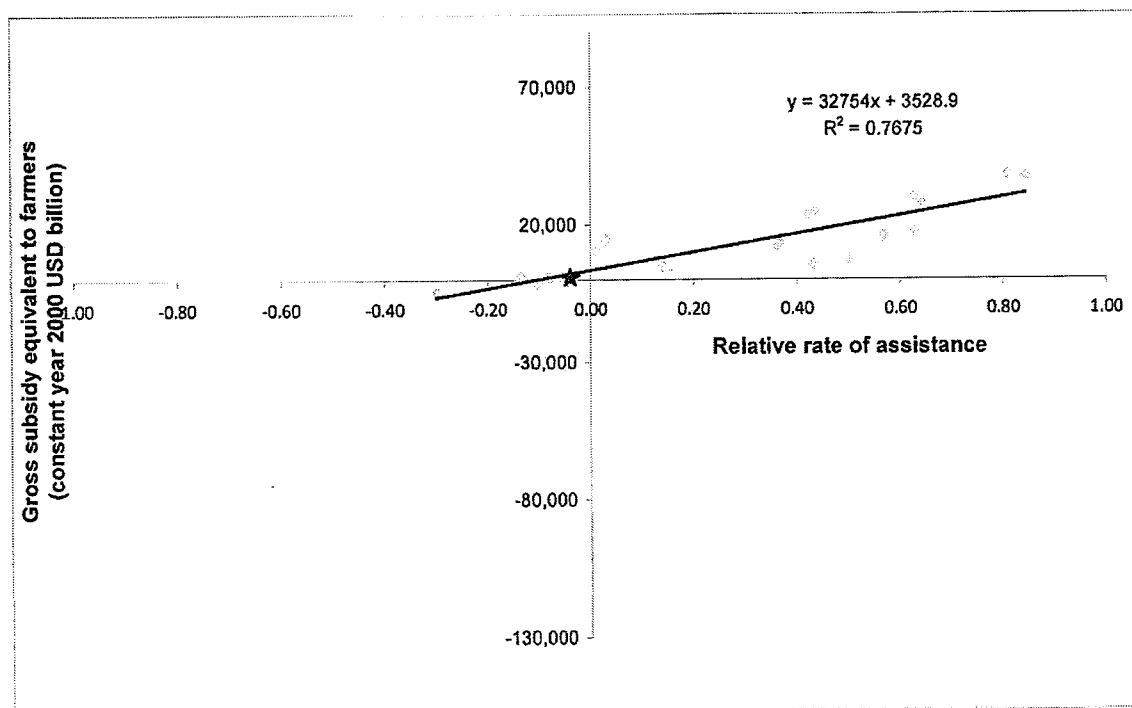


Figure 1: Relationship between the subsidization of major agricultural countries and their relative rate of assistance, with Australia depicted as the star immediately to the left of the y axis

While there are a few Australian rural industries that are recognised on the global level, the majority of our agricultural industries are, and will continue to be, seen as minor markets for innovation. This means that, the extent to which the private sector can be expected to participate in rural R&D will continue to be limited by the fact that our industries offer them a very limited return for any innovation effort tailored to Australian conditions.

Also the increasingly global nature of innovation means Australian operators will likely face concerted competition from larger overseas operators in any area where they start to make significant headway where research is 'generic' and can be applied over a wide range of environments and little additional costs (GM could be an example).

RDC funding to universities is a major driver, without which Australia risks losing its agricultural and land resource management specialist training capability.

A recent report on DAFWA's involvement in research, development and extension stressed the importance of training in innovation; and of the role of governments in facilitating the innovation system:

*"The different actors in the innovation system often interact in surprising ways. For example, the capability to innovate might be influenced by the willingness of consumers to try new products, the capacity of the food sector's processing, distribution and marketing systems to develop new products, and the ability of growers to successfully adapt to new varieties or new farming systems. Education and training systems, industrial arrangements and policy settings can have a significant impact on the innovation system and capacity to innovate.*

*... Governments are essential components of the innovation system and because of their policy advice, industry development, education and training and investment roles are uniquely positioned to influence the shape and effectiveness of the overall system. "*

Agriculture provides the most feasible means of managing our land and water resources – and there are few incentives for private investment in this area. There is a particularly strong economic case for extension when it helps to produce public benefits related to natural resource management and biosecurity.

## **2. Effectiveness of current rural R&D and extension frameworks**

*Is the role of the RDCs within that framework appropriate and clearly defined?*

The current RDC model is a necessarily complex system that will always require periodic adjustment to improve its performance.

Overall, DAFWA considers the current system has served Australia well in regard to:

- Identifying whole-of-sector research priorities at enterprise, regional and national levels;
- Providing a means for gaining a financial contribution from a diverse suite of end-users who are the immediate beneficiaries of the resulting innovation, minimising free-rider and spill-over issues;
- Guarding against the adoption of practices and technologies inappropriate to the Australian environment but promoted on the basis of their performance elsewhere;
- Providing a means for developing a national innovation infrastructure and network;
- Underpinning the development of a high quality, applied science capability, and
- Contributing to a higher than average productivity return when compared with other industry sectors in Australia, such as mining.

The framework's shortcomings stem primarily from its failure to retain currency with the evolving needs and aspirations of the agricultural sector. While there is considerable difference between the individual RDCs in this regard, a number of them do not adequately and/or effectively do some or all of the following:

- Fund rigorous, strategic, industry-level economic, value driver and benchmarking analysis to ensure investment decisions target the areas of highest business and economic return.
- Recognise the need to foster innovation rather than research - research tending to be seen as an end unto itself rather than one of the approaches by which innovation can be fostered.
- Address post-farm gate issues and opportunities, or other more broadly-based fundamental issues which limit and/or threaten Australia's rural capability.
- Recognise or fund the industry adoption phase of innovation - instead seeking to 'commoditise' research through mass media extension.
- Address key constraints to adoption in the project funding process.
- Employ staff (within the corporations) with sufficient experience in the craft of applied agricultural research or extension.
- Inform or nurture policy and its development.
- Articulate the benefits to taxpayers offered by the security, safety, quality and affordability of our domestic food supply; the financial benefits of a viable export sector; and the environmental benefits arising from effective land management.
- Foster the establishment of attractive career pathways.
- Foster an effective R&D capability and/or ethos within the private sector.
- Evaluate its direct and consequential impacts of their investments and policy decisions.
- Look for ideas, knowledge or solutions outside of agriculture.
- Ensure effective coordination between RDC chairs and government – Australian and State.

Provide transparent and cost effective access by investors (i.e. levy payers and taxpayers) to the R&D they have paid for. The current practice of shielding the great majority of completed R&D under "confidentiality clauses" is not conducive to producer adoption of the work their levies have funded. All RDC's should ensure project final reports are made publicly available. Of course commercial-in-confidence issues will need to be managed prior to the release of these reports.

A common criticism of the RDC model is its perceived failure to deal with cross-sectoral issues such as environmental challenges (e.g. salinity, drought, climate change). However, the counter-factual of governments' actual responses to these issues suggests that the RDC model is not alone in its deficiencies.

For example, governmental responses to climate change impacts for agriculture (see figure below) are often piece-meal, involving high transaction costs with many players and funders competing and collaborating in different ways and in various fora. In hindsight there would have been better ways to ensure that public and private R&D funds could have been better co-ordinated to achieve greater effect and impact.

MITIGATION	ADAPTATION
<b>Climate Change Strategy for Primary Industries (CCRSPI)</b>	
	<b>NCCARF Primary Industries Adaptation Research Network</b>
	<b>NCCARF Primary Industries National Adaptation Research Plan</b>
<b>DAFF Climate Change R&amp;D Program</b>	
<b>Rural Research and Development Corporations</b>	
<b>State Governments and Agencies</b>	
<b>Universities and CRCs</b>	
<b>CSIRO Sustainable Agric Flagship</b>	<b>CSIRO Climate Adaptation Flagship</b>

DAFWA considers that a number of inadequacies regarding coverage of cross-sectoral issues are largely historical, with the Primary Industries Standing Committee (under the National RD&E Framework) now having a considerable and consistent focus on cross-sectoral/portfolio issues. There is, however, a continuing problem regarding soils and pastures - neither of which is adequately addressed by the industry RDCs that rely upon them.

Key ways that DAFWA sees the RDC model can be improved include:

- conducting 'priority setting research' as the basis for establishing investment priorities;
- articulating and demonstrating the value of their investment to Australia and its people;
- fostering and facilitating the systematic identification and use of global innovation;

- balancing investment in: (i) the social and political components of change with that of technical issues; (ii) long term strategic issues with that of short-term tactical issues; and; (iii) the effort taken to define an issue and select the approach with that of developing the solution;
- rigorous assessment of past and future constraints of approaches (research and social components) to achieve the desired change in practice.
- Move from a focus on funding research to funding a 'change in practice' and the impact achieved from change.
- building investment strategies around industry impact rather than research outcomes;
- taking a whole-of-supply-chain approach to the identification of investment objectives;
- promoting and supporting innovative paths to market;
- fostering learning systems that deliver an educated and skilled population capable of creating and using knowledge to its full potential;
- reducing the number of innovation investment (and provider) agencies, and
- fostering national centres of excellence with multi-disciplinary, whole-of-value-chain, strategic capabilities based on evolving industry needs as an extension of the National RD&E Framework.

While the Australian R&D system is only a minor contributor to the total 'innovation inflow' to Australian agriculture, there is considerable potential to influence the other, bigger sources of innovation. The effectiveness of RDC investment could be significantly increased by maximizing Australia's influence on the total 'innovation system'.

DAFWA believes that there is a pressing need to increase the exchange of knowledge between Australia and the rest of the world, with this being currently constrained by a number of attitudinal and structural settings. The RDCs are well placed to drive this broader focus by fostering:

- funding and career-path arrangements that encourage the sharing of foreign knowledge rather than favouring 'home-grown' solutions.
- systemic capabilities to identify, access, interrogate, translate, adapt and integrate international knowledge.
- international collaborations in disciplines, industries and activities of strategic importance to Australian agriculture.

For example, one impediment to forming international linkages beneficial to Australian agriculture is the fear of spending public funds on international travel. Often the rationale for these intentional collaborations are not referenced back to the organisations in the strategic or industry plans, but rather in terms of what is good for the individual researchers or project.

The effectiveness of the RDCs can also be improved by addressing some of the shortfalls common amongst research providers, including by:

- undertaking or commissioning meaningful analysis of industry economic performance and value drivers as a precursor to RDCs making R,D&E investment decisions;
- requiring researchers to demonstrate that the knowledge and technologies they seek to produce cannot be sourced elsewhere - nationally or internationally; and then being prepared to invest in Australian researchers in the validation and/or adaptation of imported knowledge, and
- requiring all investors and providers to apply a common comprehensive assessment framework that accounts for "total factor productivity variables (such as weather) that do not directly relate to inputs but affect productivity results when assessing programs,



with all impacts needing to be both sustainable and achievable within an acceptable social context.

### **3. Fundamental soundness of the RDC model**

DAFWA believes that the current RDC model is fundamentally sound, but in need of modernisation to improve its efficiency and effectiveness.

DAFWA's preference would be to retain the current model and develop cohesive plans instituted to address the following key issues:

- the considerable difference in effectiveness of individual RDCs.
- a trend to focusing on the east coast, making it difficult for WA to gain benefits commensurate with its investment
- inadequate shift to accommodate consumer, supply chain and environmental issues that has occurred since the 1970s when the RDC model was first introduced.

There is also a case for the RDCs reviewing their support of the Cooperative Research Centre (CRC) system. A number of CRCs are still viewed as being fragmented, having disjointed links with industry and states, and being primarily orientation around the science rather than industry. It is recognised that recent changes to the CRC model have improved this situation, but the extent of that improvement needs to be tested given the level of funding committed to the CRC sector. DAFWA does not see the CRC model as an alternate to the RDC model.

The plethora of agricultural R&D funders and providers in Australia creates competitive tension and reduced collaboration between and within these groups. This can and does lead to wasteful use of R&D funds and researchers' time and effort to secure funding and reporting on its use.

Core funding to agricultural R&D providers typically has diminished in real terms over the last decade, increasing institutional contestability and leading to expenditure on provider promotion, and problems of funder capture. These outcomes are unlikely to represent the use of scarce R&D funds that best serves the levy payers and the nation.

**4. Principles and benchmarks the Commission should use to assess appropriate funding for the totality of rural R&D to achieve the right balance between public and private funding**

*Is there any new empirical work which specifically focuses on how changes to current overall funding would affect community well-being?*

*Is it possible to determine the right balance between public and private funding across the totality of rural R&D using broad indicators and principles? Or must such assessment have regard to the characteristics of individual programs that provide public funding for rural R&D and, in particular, to the type of R&D that is sponsored through each of these programs?*

As an economic development arm of the WA Government, DAFWA recognises that its goal of maximising the total sustainable wealth of the state will most often be achieved through the development of public goods (products and services that are neither excludable nor rivalrous) that generate the private wealth upon which the wealth of Western Australia is built.

However, public investment which confers private benefit is warranted where such involvement is demonstrably essential to achieving a higher-order public benefit. This differs from purely commercial interests, where the investment is typically focused on gaining immediate to short term benefits, with these at times being antagonistic to long term needs of the industry, community or environment.

DAFWA seeks to match its total and comparative investment on the basis of industry analysis, industry preparedness to pay, cost benefit analyses, risk-spreading portfolio investment and the market failure, with such assessments being mindful of 'the next pinch point' in the industry's development potential.

A potential test of the level of investment may be by assessing the marginal return on investment (ROI) of the last \$10 million invested through the RDC system. If this marginal ROI is significantly lower than that expected by the RDC's entire investment, then the level of investment is adequate or even excessive. If, however, the marginal ROI remains attractive, then a marginal increase in investment is justified. Any such assessment must necessarily consider the availability (or attainability) of appropriate personnel and/or facilities.

**5. Adequacy of the RDC model and the RIRDC industry umbrella arrangement for the research needs of emerging primary industries**

*If not, what should be changed? In allocating government funding to the industry RDCs, should any account be taken of differences in the longer term competitive prospects of those industries, or their potential for productivity improvements?*

*Alternatively, does basing the government contribution on the value of industry output provide an appropriate means to calibrate contributions given the inherent risks in trying to pick winners or losers?*

DAFWA sees a need for a greater focus on post-farm-gate issues. The current funding base means there is no incentive for RDC's to do this. It is important to note that the GRDC does not have a significant investment in post farm-gate research and development or fund work on improving supply chain efficiencies. Its justification is that the benefits of this work do not flow back to the levy payers (growers). There is an opportunity to develop a new national funding model that uses some grower levy funds and funds from a levy on traders and processors to fund such activities. While such a scheme would see traders and processors looking to transfer the cost back to growers through a reduced price to offset the levy cost, if the levy was based around each transaction as grain passes through the supply chain, there could be additional benefits. It appears that Australia exported 20 million tonnes of grain last year but 60 million tonnes were traded. This suggests that each tonne was traded three times and ways to create greater efficiencies, such as a transaction levy, could be useful.

With the model being driven in large part by industry incumbents, most of who are closely aligned to a particular established farming system, there is little incentive for RDCs to venture into alternate product types. Similarly, the model provides little incentive for RDCs to seek to accommodate variations in the likely future contributions of different parts of any one industry, at times focusing on geographic regions or elements of an industry that have little prospect of continued development.

There is also a tendency to focus investment around pre-existing R&D capabilities facilities and/or historic industry centres rather than around areas of evolving industry needs and this is likely to be exacerbated due to a number of 'lead' capabilities under the National RD&E Framework being essentially dislocated from the industries they seek to develop.

While DAFWA is supportive of the RDCs looking closely at potential new industries, we believe that significant investment in this area should only be made where there is a clear case that a proposed new industry has the potential to become a significant contributor at a regional, if not national, level. Such a pre-condition is commensurate with the low success rate that must be expected from such endeavours.

## **6. Scope to reduce the costs of administering the RDC model without diminishing the outcomes it delivers**

DAFWA believes there is moderate scope to reduce costs and inefficiencies that arise from the way RDCs are currently administered without diminishing the outcomes they deliver.

While not necessarily intrinsic in the RDC model, the way they are currently structured and operated can be characterised as being overly-complicated, with excessive overheads and an inordinate fixation on intellectual property. The current approach results in unnecessary costs for research providers and, in all likelihood, the RDCs themselves.

While recognising the need for 'the spur of contestability', the drive to engender competitiveness should not be elevated to the point that it restricts collaboration, particularly given the collaborative model developed under the National RD&E framework.

The current industry-based structure of the RDCs has two side effects that both limit effectiveness and increase overheads. By 'starting at the individual industry level', individual RDCs do not adequately address the higher-order issues (such as succession planning and capital management) that are central to enterprise viability or the farming systems issues that are essential to enterprise resilience. As a consequence, organisations geared towards industry development (such as DAFWA), frequently seek to cobble together 'investment amalgams' involving a number of RDCs in order to address whole-of-enterprise or whole-of-farming-system type issues. The administrative cost associated with this is considerable.

While several of these issues have been addressed to some extent through the National RD&E Framework, there are still significant opportunities for improvement.

While recognising limitations flowing from Corporation Law, DAFWA believes there are opportunities for significant improvement through the use of standardised contractual and reporting arrangements. In DAFWA's experience, the issues faced by each of the RDCs and the outcomes they seek in regard to those issues, are essentially similar.

The use of standardised contractual templates would appear to offer significant advantages for both the RDCs and their service providers. This would be particularly beneficial with regard to intellectual property agreements for which the time, cost and frustration associated with their establishment often exceeds their potential return.

To the extent possible under Corporation Law, DAFWA would also welcome the establishment of a 'legal secretariat' as a means of driving a consistent approach to such issues across the full suite of RDCs.

A project management system consistent across all RDC's would be extremely valuable – State and Federal Departments could also adopt the same or similar system enabling progress and achievements in RDC's, State, and Federal Government funded projects/programs to be handled in the same way. This approach could enable easier collaboration and reduce potential duplication, enabling greater synergy of effort and impact

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