SUBMISSION TO THE PRODUCTIVITY COMMISSION INQUIRY INTO THE RURAL RESEARCH AND DEVELOPMENT CORPORATIONS MODEL

Inquiry Terms of Reference

• *examine the economic and policy rationale for Commonwealth Government investment in rural R&D;*

• *examine the appropriate level of, and balance between public and private investment in rural R&D;*

• *consider the effectiveness of the current RDC model in improving competitiveness and productivity in the agriculture, fisheries and forestry industries through research and development;*

• *examine the appropriateness of current funding levels and arrangements for agricultural research and development, particularly levy arrangements, and Commonwealth matching and other financial contributions to agriculture, fisheries and forestry RDCs;*

• *consider any impediments to the efficient and effective functioning of the RDC model and identify any scope for improvements, including in respect to governance, management and any administrative duplication;*

• *consider the extent to which the agriculture, fisheries and forestry industries differ from other sectors of the economy with regard to research and development; how the current RDC model compares and interacts with other research and development arrangements, including the university sector, cooperative research centres and other providers; and whether there are other models which could address policy objectives more effectively;*

• *examine the extent to which RDCs provide an appropriate balance between projects that provide benefits to specific industries versus broader public interests including examining interactions and potential overlaps across governments and programs, such as mitigating and adapting to climate change; managing the natural resource base; understanding and responding better to markets and consumers; food security, and managing biosecurity threats;*

• *examine whether the current levy arrangements address free rider concerns effectively and whether all industry participants are receiving appropriate benefits from their levy contributions.*

Submission

Through its *National Committee on Plant and Animal Sciences*, the Australian Academy of Science is pleased to provide a Submission to the Productivity Commission public inquiry into Rural Research and Development Corporations

The general thrust of this Submission is that the current model of funding of plant and animal sciences in Australia via the Research and Development Corporation system is sound. Changes are needed in some areas, especially the extent to which the funding model can promote the image and attractiveness of plant/animal/agricultural science as a career and thus increase high quality tertiary enrolments in this general area. This implies a need for greater coordination between RDC funding and Commonwealth funding of the university sector.

The agriculture, fishery and forestry (AFF) chain consists of upstream farmers, fishers and foresters and downstream distributors, marketers and retailers. Government or institutional emphasis is usually on the producers, because they represent over 40% of the total value of the chain. The remaining 60% consists of the downstream component, which receives less attention. Before commenting on or making recommendations about RDC funding, it is pertinent to ask if this funding model has worked in the past in supporting this supply chain.

Australian Research and Development Corporations – Have they worked?

The RDC are major players in the funding of research in the plant/animal sciences, providing some $500 million of the approximately $1.7 billion spent annually on rural-related R&D (see, for example, Core 2009; CRRDCC 2008a,b; CRRDCC 2010). These funds have in part underpinned the productivity growth in the rural sector which, contrary to public perception, has been high, sustained and a major contributor to the maintenance of food security in the face of increasing populations and climatic challenge (see Pardey 2009). Equally, the above reports provide evidence of a slowing in the pace of productivity growth and (not coincidentally) a slowing of investment in rural-related R&D.

Productivity growth and rural R&D investment are certainly related and RDC investment has had major economic impact. The assessment of 32 randomly selected RDC projects by CRRDCC (2008), for example, showed an average return of A$11 for every A$1 invested. Further, the estimated returns from the RDC's investments would have more than paid for the entire investment of the Corporations in 600 projects over the previous decade. Further analysis (CRRDCC 2010) demonstrated that, contrary to some perceptions of investment in rural research, the payback on invested RDC dollars was quick, with 60% of projects showing a positive net value by year 5. It is noteworthy that

in the 10- and 25-year timeframes used by CRRDCC (2010) there were no negative returns at the program level; this would be the expected result if R&D investment was sub-optimal

Comment 1: Evidence strongly suggests that in terms of return to the dollars invested in projects, the RDC model has been very successful

A concern of the current inquiry is the extent to which the returns have flowed primarily to the perceived 'users' of the research (e.g. rural producers) cf. to the nation as a whole (see dot points 2, 4 and 7 of Terms of Reference). This concern stems from the current funding model, in which compulsory levies from primary producers are matched by Commonwealth funding up to a ceiling of 0.5% of the Gross Value of Production (GVP) of the agricultural commodity concerned. In practice, the funding ratio has been that for every A$ invested by the Australian Government, the industry levies have contributed about A$1.50.

Recent evidence strongly suggests that this concern is misplaced and that there have been major 'public good' outcomes and benefits from RDC investment. CRRDCC (2008), for instance, reports that of $10.5 billion of quantified benefits from RDC investment, $5 billion will be benefits captured not by the rural industry itself, but by consumers, other participants in the supply chain and the wider public. Similar data can be found in other reports (Pardy 2009; AIAST 2010; CRRDCC 2010).

Comment 2: There is strong evidence that RDC investment in rural R&D has resulted in substantial public good outcomes as well as maintaining productivity growth in the primary industries concerned. This supports the notion of maintaining the current co-funding model of compulsory levies matched by Australian Government input. Indeed, to the extent that the long-term GVP of rural industries has been adversely affected by poor seasonal conditions and prices, it would be valuable to increase the R&D pool by increasing the ceiling level for Government fund matching from 0.5% to 0.6-0.7%, at least in the medium term.

Are there 'free riders' in the current funding model?

A further concern in the current funding model is that of the 'free-rider' effect, that is, that beneficiaries of the R&D funding have not been contributors to that funding (see last dot point under Terms and Conditions). For example, are there primary producers who have benefitted from RDC-supported research without having contributed funds to the research investment? Similarly, have the benefits of the RDC-funded research been so concentrated in the primary industries themselves that the primary producer can be seen as a 'free rider' on the taxpayer, via the Australian Government contribution. The above reports provide no support for these concerns. For example, the compulsory nature of levy funding means that within an industry, all producers pay the levy and stand to gain from the research the levy supports. Even if the research spans several rural industries e.g. sheep-meat, beef, wool, grain production, the free-rider effect is not a concern to the

extent that many primary producers conduct mixed-farming enterprises and pay levies relating to all these industries.

Neither should there be a concern about primary producers free-riding on taxpayer dollars injected into RDC research funding. This might be a concern if there were no public-good benefits flowing from RDC investments but, as already indicated, this is far from the case. Public good benefits from RDC investment are very substantial in dollar terms and as a proportion of the total investment.

Comment 3: Concern about possible 'free riders' on RDC funding is unwarranted from a research outcome perspective and should not be used as a rationale to drive change.

The RDC funding model and universities

The current university funding structure within Australia is closely related to what undergraduates wish to study; universities cannot afford to invest heavily in areas that do not attract students. At present, basic plant and animal biology in general, and agricultural science courses in particular are not popular with students and have collapsed in terms of student demand, despite increasing demand in the employment market for AFF graduates. This has inevitably led to an underinvestment in AFF in Australian universities, with a demand for AFF graduates that is nearly three times the graduate output. This constitutes a major failure in capacity building for future R&D. To a limited extent, the RDCs have attempted to deal with this failure. For example, the GRDC has supported Chairs in some universities. However, ultimately, only greater industry support, underpinned by an equivalent Government contribution, will help to overcome the problem.

Comment 4: We see an urgent need to strengthen funding to the tertiary sector to build capacity for future rural R&D, in two ways. First, to indicate that the rural industries are far from 'sunset' industries and will be a vital component of ensuring continued food security as world population advances toward 9 billion. Second, by exploring and adopting funding models that allow universities to recommence investment in courses involving basic plant and animal biology and involving agricultural science.

Comment 5: We have a concern that within the current RDC structure, there remains a pervasive model that there is a one-way flow of new technology into rural activities, couched in a dominant language of "technology transfer; extension; delivering outcomes". However, this is an oversimplification, if not a flawed idea. Much innovation takes place on farm, and many pertinent novel research ideas have arisen from dialogues between farmers, farm advisers, consultants and the wider R&D community. Innovation by producers relies in large part on novel combinations of current options that have emerged from earlier R&D – both management techniques and varieties. Rural resilience has benefited from the investments made by the RDCs not only in Australian-based research but also in institutions whose research has also been of benefit to the rural and wider community in Australia. That intellectual capital

is often represented by basic information that researchers take for granted that if translated into a suitable form (and format) would greatly benefit end-users. This is particularly the case in sampling, identification and decision-making in pest management. Future RDC funding needs to recognize and be designed to accommodate the complexity and multidirectional flow of technological development and innovation.

Comment 6: Consideration should be given to improving engagement between public investment in rural R&D and Early Career Researchers in terms of career opportunity and structure. The aging demographic profile of AFF researchers and declining AFF student numbers is a major strategic risk to the efficient and effective functioning of any future RDC model.

Given the uncertainty about the future, there is a need to provide a greater range of options to provide resilience for rural production and thence rural communities. Primary producers change management techniques rapidly to deal with changed circumstances – prices, weather/climate, pests and diseases, regulations. They make use of known principles to change mixes of enterprises (e.g. livestock/cropping in farming). There are many examples from the last few years (e.g. the move from spring rains to the summer has resulted in farmers storing the summer rains in the subsoil for use by the subsequent crop; sowing crops in dry soil to take advantage of late sowing rains – this latter was promoted by mobilising existing physiological knowledge; the use of dual purpose crops that can be grazed during the winter but still give good grain harvests). Field scientists (breeders, agronomists, crop physiologists, animal scientists, pest & disease specialists) are already striving to deal with deleterious high and low temperatures and water deficits (both amount and timing), the frequency of which could alter with climate change. Thus, in relation to this extract from the issues paper (p 11):

> **"What importance should be placed on outcomes-based rationales for government funding support for rural R&D, such as enabling Australia's rural industries to meet increased global competition; facilitating adjustment to climate change; furthering food and bio-security objectives; and fostering regional development? Is there a risk that seeking to use government funding to drive specific outcomes such as these could distort the pattern of R&D investment and thereby reduce the overall returns to the community?"**

Comment 6: We regard the answer to the last question is a resounding "yes". As alluded to above, the last decade has seen major erosion of intellectual infrastructure and basic research capacity which supports the AFF sector. State Agriculture Departments, at least in terms of research and research support, and University Faculties / Departments are in decline under the current policy and funding arrangements. These trends do not bode well for future responses to identified challenges in rural sectors no matter what future model of Commonwealth Government investment in rural R&D may be in place.

The Commission is charged with "***examin(e)ing the appropriateness of current funding levels and arrangements for agricultural research and development, particularly levy arrangements, and Commonwealth matching and other financial contributions to agriculture, fisheries and forestry RDCs";***

This is an appropriate question particularly at a time when many Governments and NGOs around the world are struggling with less than effective outcomes when the public sector tries to go it alone in enhancing the resilience of the wider community. The message that comes through repeatedly is that public-private partnerships are the most effective way to achieve a sustainable future for the rural and wider community. This was also the conclusion of the The Crawford Fund's Fifteenth Annual International Conference at Parliament House in Canberra, 2009.

References

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