Rural Research and Development Corporations

Submission to the Productivity Commission Inquiry

Introduction

Agriculture is rapidly changing in Australia and globally. The drivers of this change are a complex, interconnected mix of cross-sectoral social, environmental and technological issues which affect how we approach agriculturally oriented R&D. In order for Australia to maintain a competitive position in the global food market and to meet the challenges of food production in a changing environment considerable ongoing research and innovation will be required.

Clearly the availability of quality food is of fundamental importance to society. Research and development led to the so called “green revolution” in agriculture in which the production of crops and food in a number of developing countries almost doubled over a 20 year period post-World War II. There are strong indications that a second agricultural “green revolution” will be required to alleviate hunger throughout the world today. As a major global food exporter, Australia has a role to play in this process.

Research Development and Extension in the agricultural sector

Research is the process of invention and discovery that results in new knowledge. Innovation is the translation of that knowledge into a process or system that leads to a beneficial change. The translation of research outcomes into policy and practice is complex, and there is no single formula that can be uniformly and universally applied.

One model of R&D is that basic research is non-rival and non-excludable and tacit. As the knowledge moves towards application and product development it becomes rival, excludible and codified. The benefits from the development accrue to the users of the products and to the product producers in the form of profit. In some cases there may be broader national environmental and/or social benefits from the use of the product.

As an example, basic research into environmental sensing, that early on is non-rival and non-excludable, could lead to a product that tests for legionella in real-time in cooling towers. This benefits air conditioning system service companies, building owners and the test producer. However it has a broader public health benefit in reducing legionella outbreaks in the community. Some, but not all, agricultural RD&E fits this model. For example, the basic research that led to insect resistant crops rapidly became seen as a rival and was excludable as the research outcome was patent protected. The product benefited the developer as well as producers through increased production at lower costs. In this case there are broader environmental and biodiversity benefits as a consequence of lower insecticide use.

But most agricultural RD&E does not fit this model. Basic research in the agricultural sector will be non-rival and non-excludable. However, in contrast to the above model, application and adoption oriented research is also non-rival and non-excludable. This is primarily because the majority of this research has to be applied on-farm to primary producers in the form of changes in behaviour or practice. Almost by definition such research must be non-rival and non-excludable as it has to be available to all producers. In some cases the benefits only flow to a specific industry sector. However, much of this type of research has public good spill over benefits. As an example, research into improved salinity control will benefit at risk producers and will also have broader national benefits on biodiversity and land and water quality.

The national RD&E frameworks, in their current state, are a start in the process of articulating priorities. The lack of clear priority signals to research providers from industry will inevitably result in industry/researcher tension. This may be a consequence of a lack of agreement on priorities and a lack of understanding of research and technology. It is difficult for the developers of the RD&E frameworks to get the priority driven activities at a level where the researchers can clearly identify projects. Research provider input into the process tends to result in a technology, vested interest driven outcome. It is a challenge to develop a priority driven process that reaches a level whereby researchers can clearly identify projects that address the priorities.

Generally the timelines that are required to undertake the larger more complex R&D are not well aligned with the pace of change in the industry. Over the life of a three year research project there can be a substantial change in the external environment that may make the original research question of less importance. However all research provider parties are still committed and are required to support staff.

Benefits will often take many years to be delivered. An analysis of CRC projects showed that the average time to deliver benefits was nine years.

The activities of industry-specific CRCs seem, at least on the surface, to be complementary to RDC activity, with some RDCs making contributions to the activities of some CRCs. Industry-specific CRCs are another example of industry levering government cash to support industry specific R&D. The gap is in the cross-sectoral and generic research, which is very difficult to get funded through the RDC process.

This highlights the need pro-actively co-ordinate agricultural RD&E in Australia (or have some mechanism to do so) because of the diversity of primary industries, their geographical distribution across Australia and the different interests of the States.

RD&E inputs

Support for agricultural RD&E comes from many sources, some of which are clear and some less obvious. Support is delivered through cash, in-kind and infrastructure. This resource comes from:

- Agricultural industry (cash and in-kind)
- Commonwealth matching levy funds provided through RDCs
- State Governments (cash, in-kind and infrastructure support)
- Universities (in-kind and infrastructure support)
- Commonwealth Government (cash and in-kind through various Programs, e.g. Australian Centre of Excellence in Risk Analysis, National Collaborative Research Infrastructure Strategy, Commonwealth Department of Agriculture support for the CSIRO Australian Animal Health Laboratory, support for PhD students, Australian Centre for International Agricultural Research, AUSAID, Australian Research Council, Cooperative Research Centres)
- CSIRO (in-kind and infrastructure support)
- Pharmaceutical industry (cash and in-kind)

It is important to recognise that the RDCs and CRCs are the only source of discretionary funds in the sector with the States, Universities and CSIRO providing a substantial level of infrastructure.

The recipients of the resources are the primary research providers. These are primarily CSIRO, universities and state governments. There are other minor recipients that include primary producers. It should be noted that there is often overlap between RD&E and operations. The industry levy and the matching government funds are the primary source of discretionary funds to support R&D activities.

RD&E beneficiaries

The beneficiaries from agricultural RD&E in Australia are broad. Clearly the primary beneficiaries are the industries themselves. However there is a broader range of spill over national benefits that accrue to rural communities (education, health care and other rural infrastructure), the environment and the national economy. Research also provides information that supports policy development. It is difficult if not impossible to separate the industry-specific benefits from the broader community, environmental and national benefits. It should also be noted that some benefits are intended and others are unintended and difficult to measure.

As an example, Australia undertakes a range of surveillance activities for avian influenza (bird flu). These are supported by both industry and government. The benefits accrue to industry through an improved ability to detect and respond to an incursion, and protection of public confidence in the product. There are additional national benefits that are related to biodiversity and public health. The latter benefits are less tangible but, none-the-less, just as important.

A further benefit arises from education and training programs in universities, often with involvement of CSIRO and state departments. While these programs often address issues of industry concern, the major national benefit is in the increased pool of PhD graduates who have industry awareness. This can be contrasted with graduates who have had a more conventional academic training who often have difficulty in understanding application oriented research issues and approaches.

Commonwealth funds

The withdrawal of Commonwealth levy matching funds will most likely have a significant adverse impact on the overall R&D effort by substantially reducing the major source of discretionary funds. While it remains to be tested, it would seem unlikely that the agricultural industries will increase levies to make up for any loss of government funds. This is especially so at a time of drought and financial stress. It is

possible that levy funds may decrease as the loss of government leverage reduces the incentive for industries to collect levies. As noted above it should be recognised that the industry levies and matching government funds are the primary source of discretionary funds that support agricultural RD&E. The other resources are tied to the support for infrastructure such as laboratories, and as such are not available for the support of RD&E.

The research supported by the RDCs tend to be low-risk, application oriented, short term activities. This is primarily because the industries see the total pool of funds in an RDC as owned by the industry and express a strong desire to control the way “their” money is spent. Not surprisingly, they want to see an immediate return on the investment. In some situations there has been a lack of understanding of the inherent uncertainties associated with the research process resulting in an unwillingness to fund more speculative high-risk, long-term research, even if it addresses an industry problem.

Alternative Approaches

One potential approach could be to use levy funds to support short-term, industry-specific application oriented RD&E, and matching government funds to support longer term, higher risk, cross-sectoral activities that may be more generic in nature and with less certain outcomes. The benefits from this type of research are more likely to have broader application and be of national benefit. This would be more in line with government support for the Australian Research Council, recognising that the Australian Research Council would be unlikely to fund research directed at specific industry questions even if it is long-term and high-risk.

Many RDCs have functions in addition to supporting research. It could be argued that there may be benefit in separating industry specific functions such as marketing, from RD&E.

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