



Australian Government

Department of Agriculture, Fisheries and Forestry

INQUIRY INTO PATHWAYS TO TECHNOLOGICAL INNOVATION

SUBMISSION TO THE STANDING COMMITTEE ON SCIENCE AND INNOVATION

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INTRODUCTION

Agriculture is a vital part of Australia's economy, with 386,000 people employed in the sector in 2001-02 and 120,000 commercial farms spread across 60% of the Australian land mass. In addition, Australia has a strong food and beverage processing sector, which covers meat, dairy, seafood, horticulture, sugar and beverage manufacturing, with approximately 3,400 firms employing 187,000 people.

Australia's agriculture and food sector continues to represent a vital and diverse part of the national economy. Although its contribution to Australia's GDP was ~3% in 2003-04, it contributed ~25% of Australia's export earnings in the same period. The economic importance of the sector and its interdependence with other parts of the economy was underlined during the 2002-03 drought, when a fall of 19% in the gross value of agricultural production contributed to a 1% decline in Australia's gross domestic product.

Innovation and adoption and utilisation of new products and practices, play a key role in driving the productivity and sustainability of Australia's rural industries. The *Australian Agriculture and Food Sector Stocktake* highlighted that agricultural innovation is estimated to have driven 85% of the 2 to 4% a year average productivity increase sustained by many parts of the agricultural sector over an extended period. However, it should be noted that such increases varied significantly between industries, regions and different farms.

This submission considers four major programs delivered by the Australian Government Department of Agriculture, Fisheries and Forestry (the Department), which provide examples of strategies for successful technological innovation to drive productivity in the agriculture and food sector.

1. The rural Research and Development Corporations and Companies (RDCs) provide a model of demand-driven research and development (R&D) through a partnership involving joint priority – setting and funding. Industry's involvement ensures that the R&D projects remain focussed on user-friendly outputs that can be easily adopted;
2. The New Industries Development Program (NIDP) provides 'seed funding', experiential learning opportunities and decision-making tools for rural and regional businesses to commercialise innovative goods and services. Applicants must be able to demonstrate that their proposals are market-driven in order to qualify for funding;
3. The National Food Industry Strategy - Food Innovation Grants (FIG) program provides assistance for Australian-based food processing firms to undertake R&D projects with a strong focus on commercial outcomes;
4. The Agriculture - Advancing Australia (AAA) is a package of Australian Government programs designed to help producers in agriculture, fishing, forestry and the processed food industry become more competitive, sustainable and profitable. In particular, 2 AAA programs and 1 collaboration with the RDCs encourage producers to profit from changing circumstances; provide access to professional advice; and provide incentives for ongoing farm adjustment to enhance their capacity to improve the viability and profitability of their business.

These programs address key potential impediments to innovation and adoption, such as:

- Lack of user-focus in commissioning R&D;
- Lack of sufficient capital to support the commercialisation of innovative goods and services;
- Lack of awareness of the importance of innovation as a driver for business growth;

These programs together work to present industry participants with tools to innovate on whatever scale is appropriate to their business needs.

1. RURAL RESEARCH AND DEVELOPMENT CORPORATIONS

Terms of Reference covered by this program - pathways to commercialisation; intellectual property and patents; research and market linkages; factors determining success.

Basis for the Rural Research and Development Corporations Model

The Australian Government rural Research and Development Corporations and Companies (RDCs) are a unique and effective partnership between government and rural industry that promotes investment in R&D and rural innovation to support internationally-competitive industries and sustainable practices across the agriculture sector. The RDCs operate under the *Primary Industries and Energy Research and Development Act (1989)* and mirror legislation that applies in the dairy, egg, horticulture, meat, pork and wool industries. Each RDC is managed by an independent, skills-based board.

The role of each RDC is to ascertain what issues industry is facing, what new products and processes are needed, then to commission and disseminate R&D, including encouraging its adoption. Each RDC prepares a strategic plan that sets out objectives and priorities for a five year period, and outlines the strategies that will be used to meet those objectives. These plans are prepared through a process of consultation with industry, research providers and Government. Also, the RDCs are required to prepare an annual operating plan for each financial year that is consistent with the strategic plan and provides details of the programs that will be funded in pursuit of the objectives of the strategic plan. Such rigorous planning has a number of benefits including:

- Providing researchers, industry and government with a clear indication of the RDC's future direction; and
- Allowing the evaluation of funding applications and the outcomes of R&D against the strategies and priorities identified in the plans.

Funding arrangements under the Model

Thirteen rural-industry based RDCs operate within the Agriculture, Fisheries and Forestry Portfolio serving the cotton, dairy, egg, fisheries, forest and wood products, grains, grape and wine, horticulture, meat – including livestock export, pork, sugar and wool sectors. These RDCs are generally funded on the basis of the Government matching, dollar-for-dollar, industry –wide R&D levies. These levies are put in place by the Australian government, at the request of the prospective levy-paying industry.

The Government matching of expenditure is subject to a cap at a maximum of 0.5% of the industry's gross value of production (GVP). The Government matching contribution is designed to provide an incentive for the primary sector to increase its R&D funding and to become more involved in R&D priority setting and the adoption of outcomes, and also recognises that activities funded by the RDC generate a mix of public and private benefits.

Two other RDCs, Land and Water Australia, and Rural Industries RDC receive a substantial proportion of their funding from Government appropriation, in recognition of the broad public

interest in environmental issues, and the need to pursue generic rural R&D and support new and emerging rural industries.

In 2003-04, the RDCs expended over \$460 million on agricultural innovation, with industry contributing \$222 million and the Commonwealth Government invested \$203 million in matching funds and appropriations.

Adoption of technological innovation by the RDCs

It is widely recognised that effective adoption of R&D outcomes is greatest where all parties involved in R&D and adoption of innovation are committed to change and industry has a sense of involvement and ownership of the process. Inputs and actions from the participants in the process, particularly the users of technological innovation, are just as vital as the new knowledge derived from R&D. The RDC experience is consistent with this view.

In the case of the RDCs, determination of industry research priorities is based on information from the industry, including industry marketing performance and opportunities, production constraints, cost structure, management practices, the cost savings from any new techniques and the likely rate and extent of its adoption. Scientific knowledge is also required, including information on the appropriate research methods, an estimate of the cost of the research program, its duration and the likelihood of achieving the scientific and technical objectives.

The RDCs have a strong record of facilitating adoption of technological innovation by industry that has fostered:

- Better farm management;
- Advances in breeding new plant and animal varieties;
- Improved crop rotations with better pest and weed control;
- New herbicides;
- More efficient fertiliser use; and
- Advances in tractor and machinery design.

Several studies have demonstrated the effectiveness of RDC facilitation of the adoption of R&D outcomes, leading to technological innovation.

- The cotton RDC supported industry uptake of *Helicoverpa* spp. - resistant Bollgard®II in the 2003-04 season. Adoption rates were high with Bollgard®II's proportion of the cotton planted rising from 32% in the 2003-04 season to 70% in the 2004-05 season.
- Dairy Australia (DA) "Shed Shakeup" workshops are aimed at helping dairy farmers adopt innovative milking management tools and technologies developed under DA's "CowTime" program.
 - The workshops were attended by 900 farmers in 2003-04 – a survey indicated that 99% of participants considered the exercise worthwhile and 72% of attendees were intending to make changes to their operation as a direct result of attending the workshop.
 - An independent re-survey in June 2004 confirmed that almost 60% of participants had made changes on-farm, with a further 14% still planning changes.
- An independent performance study conducted for grains RDC highlighted that, of the survey group, 24% stated that their adoption of newly developed winter cereal varieties in the past 2 years had been influenced by grains RDC activities. Further, 82% believed that they had directly benefited from grains R&D in the past 5 years.

As well as disseminating technological innovation through broad – based ‘open access’ strategies, the intellectual property management strategies of a number of the RDCs set out that they will choose commercialisation – patents or other limited monopoly rights, licensing and royalty streams – as the adoption path when it clearly provides a cost effective, faster, more sustainable or more practical avenue for making goods or services available to their levy payers.

The increase in experience with commercialisation is captured in part by the expansion in licensing and royalty income across the RDCs. For some RDCs in 2003-04, most notably grains RDC (\$601,000) and cotton RDC (\$821,000), the income is becoming a more significant part of their revenue stream, which is then used to fund further R&D. However, as noted above, this adoption path is but one of many paths available.

Research and market linkages

By designing the role of the RDCs as industry-driven research brokers, it is in their interests to ensure that the R&D projects are relevant to industry needs – as set out in each RDC’s strategic plan - and to maximise the potential that the R&D outputs will be utilised.

The broad spread of RDC investments flows from their commitment to a “whole of industry” approach. This approach is best demonstrated by the fact that the dairy, grains, horticulture, meat and wool industries individual primary producers pay the R&D levy, yet are prepared to approve R&D investments in off-farm, downstream activities. In effect the producers pay the R&D levy, but downstream industries are the main beneficiaries, producers only receiving indirect benefits through increased demand for farm outputs.

Given this broad remit, the RDCs often need to seek partners and collaborative opportunities between themselves and with other Australian government programmes to commission R&D to meet the needs of their industries. As such, there is a strong partnership culture between the RDCs and the CSIRO, the Cooperative Research Centre (CRC) programme, State and Territory agencies and universities, and the Australian Research Council. This collaboration consolidates research efforts and provides a critical mass of funding to develop and disseminate leading-edge technologies.

Examples of technological innovations developed by RDCs and adopted by industry

The range of RDC projects that have been trialled and adopted by rural industries over the past decade includes advances in crop and pasture varieties, genetic improvements in animals, technological improvements in equipment, advances in crop management and animal husbandry, more efficient input use, enhanced control of pests and diseases, improved harvesting techniques, better resource management, and improved risk management tools.

- Meat and Livestock Australia (MLA), in collaboration with the Cooperative Research Centre for Cattle and Beef Quality and the CSIRO Division of Livestock Industries, has developed and commercialised new cattle genetic markers for specific meat traits, such as marbling and tenderness.
 - The isolation of the marbling (fat content in muscle) genetic marker will help producers manage the breeding of their cattle in such a way to increase the value of their product on export markets.
 - The trait will be particularly important in securing access to high value Japanese markets where the preference is for higher marbling scores.

- The markers are used under license by Genetic Solutions, a company established to provide for commercial delivery of the tests.
- The Grape and Wine RDC funded collaborative research by Charles Sturt University, the NSW Department of Primary Industries and CSIRO Land and Water into the influence that irrigation and fertiliser management have on the movement of water and nutrients within and below grapevine root-zones.
 - Devices to monitor and measure these soil chemical and physical properties and appropriate benchmarks for industry are the major outputs of this project.
 - These devices will enable drip irrigation to be better matched to the infiltration rate of different soil types and help avoid vine health setbacks through the growing season.
 - The new research could result in the national average water use efficiency among winegrape growers exceeding 85% within the next five years.
- The Forest and Wood Products RDC funded CSIRO scientists to develop a forest biomass measurement device to enable more efficient forest management.
 - The prototype device, ECHIDNA™, is based on a light radar and will produce remotely sensed data from the forest floor and is therefore very cost-efficient.
 - The data will enable accurate inventory and structural information to be recorded about the forest and could be particularly valuable to carbon accounting projects.
 - The prototype has been trialled in plantations around Australia and market surveys and business planning are being undertaken to further assess its commercial potential.
- In collaboration with the Australian Cotton Cooperative Research Centre, the Cotton RDC has released an irrigation management package for cotton irrigators – called WATERpak - to help to improve water use efficiency in the cotton industry.
 - WATERpak is used in conjunction with a software system called HydroLOGIC that enables growers to simulate their water use, plan irrigation applications, and forecast final potential crop yield.
 - The WATERpak decision support tool forms part of a range of Cotton RDC projects aimed at improving water use efficiency.
 - Cotton RDC is developing a 'glove box' version of WATERpak for use by irrigators in the field.
- Horticulture Australia Limited (HAL) has invested in research by the Queensland Department of Primary Industries and Fisheries to develop an on-farm software system that will enable banana growers to predict fruit production levels three months in advance.
 - Growers will be able to improve their farm management and planning, particularly logistics, budgeting and resource management. For example, growers will be able to use the software to make advance decisions about staffing levels for harvest.
 - The tool is expected to enable growers to supply their product more strategically and this will translate to industry-wide benefits such as more stable pricing, better planned marketing activities and industry-wide crop forecasts.

2. NEW INDUSTRIES DEVELOPMENT PROGRAM (NIDP)

Terms of Reference covered by this program - pathways to commercialisation; skills and business knowledge; factors determining success.

The New Industries Development Program (NIDP) is administered by the Department and aims to help rural and regional businesses to develop and commercialise innovative products, services and technologies. NIDP provides funding to innovative agribusiness ventures through its Pilot Commercialisation Grants and In-Market Experience Scholarships. The program operates under the Government's national innovation strategy – *Backing Australia's Ability* and is intended to cover a range of rural sectors. NIDP builds the business skills and resources of Australian agribusinesses to enable them to capture new and niche market opportunities.

Pathways to commercialisation of technological innovation

Recipients of NIDP funding are typically small or start-up companies that are in the process of commercialising and establishing markets for innovative agribusiness ventures. These ventures have a clear sense of their intended market but are often unable to secure the capital investment that will enable them to improve access to these markets. In order to qualify for funding, the product, service or technology being commercialised must have less than \$1 million per annum in sales from all Australian sources.

The NIDP's **Pilot Commercialisation Project Grants (PCPs)** provide competitive-based funding assistance for agribusinesses with the Government matching the recipient's contribution on a dollar-for-dollar basis. PCPs of between \$35 000 and \$120 000 are intended to be innovative, market-driven and sustainable and aim to commercialise new products, varieties, technologies and services. This may also include using currently ignored by-products, or changing the form, presentation and delivery of traditional products. To obtain funding, projects will have already completed the R&D stage and have identified a significant target market opportunity.

The NIDP's **In-Market Experience Scholarship** is currently worth \$12,500 and enables recipients to develop their own program of in-market visits and research, including training courses suited to their personal and business development needs. Also included is attendance at a Business Readiness Workshop. The training recipients receive is intended to allow them to improve their commercial skills and develop networks and strategies in business and supply chain management. Scholarships can be used to fund business education and training courses; market visits and investigations; and costs associated with the preparation of business plans.

Dissemination of skills and business knowledge

NIDP grants include a condition that the recipients must share their experiences and knowledge with their regional community, fostering more receptive attitude to innovation that spreads beyond the immediate participants to include their regional communities. By careful selection of projects that feature outputs that can be conceptually transferred to other rural products and industries, NIDP builds cross-industry linkages and fosters the development of local networks of smaller rural enterprises that would otherwise be unlikely to participate in innovation.

Examples of technological innovations developed by NIDP recipients

The outcomes of the NIDP are provided through the program's *Made In Australia* publication and on the Agribiz website at www.daff.gov.au/agribiz. Projects include:

South Australia – Agrilink Holdings Pty Ltd – \$110,000

Agrilink Holdings aim to improve its sales support and provide better training for employees and distributors for its soil moisture sensor – the 'C-Probe'. It is expected to earn more than \$6 million within five years and provide an additional up to ten new manufacturing jobs.

Queensland - Jola Farm Management Pty Ltd – \$78,100

Jola Farm Management Pty Ltd will commercialise their range of high quality dairy smallgoods to meet a growing demand. The project funds will be used to establish production facilities, utilising small scale, batch based technology.

New South Wales – Fresh Vent Pty Ltd – \$99,000

Fresh Vent will commercialise a new technology that minimises the deteriorating affect of ethylene gas and the adverse odours of horticultural produce in storage.

Tasmania - Spring Bay Seafoods Pty Ltd – \$110,000

The Spring Bay Seafoods will commercialise the mechanised production and marketing of high quality debysed live blue mussels for the first time in Australia. These mussels will have their byssus mechanically removed, be cleaned, graded and packed. In this form the mussels have an increased value, are considerably easier and faster to prepare, cook, handle and package.

Victoria - Murray Goulburn Co-op Ltd – \$83,050

Murray Goulburn Co-op will undertake pilot commercialisation trials of a new process for production of dried cheese powder, which uses extrusion and drying process rather than the more expensive traditional spray drying process.

Western Australia - Agtech International – \$105,050

Agtech International will commercialise a unique piece of machinery called the 'long reach mantis'. The mantis allows an operator to spot spray, or control an arm with a high degree of slewing action, from the safety of its cabin. It includes a patented 'global spray head' and significantly improves health and safety aspects for spray contractors. Ten units will be built as part of the project and further marketing activities undertaken.

3 NATIONAL FOOD INDUSTRY STRATEGY FOOD INNOVATION GRANTS PROGRAM

Terms of Reference covered by this program - pathways to commercialisation; skills and business knowledge; factors determining success.

The Australian Government's \$102.4 million National Food Industry Strategy (NFIS) includes the Food Innovation Grants (FIG) program, which aims to

- Improve the innovation performance of Australian-based food processing firms leading to the commercialisation of R&D;
- Increase linkages and partnerships between food firms and research institutions to achieve commercial outcomes from food science and technology;
- Increase commitment to implementing innovation strategies as an integral element of strategic business activity,
- Improve capability for managing the innovation process; and

- Greater awareness of the importance of innovation as a driver for business growth.

Recipients receive grants of up to \$1.5 million in dollar-for-dollar matching. The program also supports the objectives of the NFIS Centres of Excellence program to develop critical mass, enhanced capability and the international reputation of Australia's food innovation infrastructure. More than \$30 million has been approved for grants under the FIG program since its commencement in 2002-03, leveraging total new R&D investment in food to more than \$71 million.

An independent mid-term evaluation of the FIG program by the Allen Consulting Group has recently been completed. The review confirmed the success of the program in terms of appropriateness, efficiency and effectiveness and found that it "occupies a unique position" amongst government-funded programs supporting business innovation.

Examples of innovation supported by the FIG program

Anchor Foods, Fremantle, WA - \$935,000 of which \$311,000 is FIG contribution.
Commercial production of specialty vinegars.

Australians spend approximately \$15 million each year on imported balsamic and specialty vinegars. Commercial vinegar producers in Australia have not been able to compete effectively against this imported product for various reasons including lack of flexibility and technical challenges associated with difficult fermentation and maturation processes and unsuitable existing infrastructure.

The project will overcome the technical challenges associated with new and difficult fermentation and maturation processes common to speciality vinegars. A pilot plant for commercial production will be completed utilising, in part, existing infrastructure focussed on traditional vinegar products.

Project benefits include:

- Potential import replacement for the retail and food service sectors;
- Increased employment opportunities;
- Development of Australian specialty vinegar products that complement our 'clean and green' reputation as suppliers of quality products.

AJ Bush & Sons, Beaudesert, Queensland - \$1.43 million of which \$715,000 is FIG contribution.
Sustainable power generation from liquid organic waste using bundled technologies

AJ Bush & Sons is Australia's largest animal by-products rendering plant. Animal by-products are problematic given the potential for environmental impact of high organic load materials, yet it is a vital function of the Australian meat industry.

This project seeks to establish the best combination of innovative treatment technologies to utilise food processing wastes to their full potential in a sustainable fashion. The first phase of the project will establish an advanced pilot plant to examine the potential commercial application of a range of wastes and the second phase will establish a commercial scale prototype for technology demonstration to industry and further R&D.

Project benefits include:

- Reduce environmental footprint due to sustainable use of existing by-produce resources;
- Opportunity to identify branded food products as 'greenhouse friendly';

- Use of waste materials for energy will improve competitiveness of Australian products;
- Ongoing low cost renewable energy from wastes;
- Carbon tax credits to participating companies;
- Higher quality waste water at substantially less cost than current industry practice;
- Re-use of captured methane for electrical or thermal energy reduces CO₂ emissions;
- Potential for export opportunities of the technology.

Cool Health, Melbourne, Vic - \$470,000 of which \$235,000 is FIG contribution
Creation of new chocolate products using new processing methods to a range of base ingredients.

Current processing techniques available for smaller chocolate manufacturers do not necessarily enable the development of innovative products containing functional food ingredients. This project aims to better understand the relationship between the processing techniques and the use of ingredients in current chocolate processing equipment and procedures.

It will use variations of some basic food ingredients, combined with innovative new ingredients, to produce a range of chocolate products not currently available. If successful, it will mean a range of innovative new food products that use less fat, less sugar and incorporate healthier ingredients such as fruit.

Project benefits:

- Healthier snack food alternatives for consumers, with less fat, less sugar and more fruit;
- Technical and scientific work associated with better understanding of ingredient mix and production;
- Techniques for small scale confectionery manufacturing will be valuable to all smaller manufacturers, leading to increased sales and therefore increased employment opportunities;
- Potential for export opportunities, particularly to the US and Asian markets, as these products are not currently available elsewhere in the world.

Weston Technologies, Sydney, NSW - \$3.3 million of which \$1.5 million is FIG contribution
Development of new applications using premium plant ingredients.

This project will develop premium protein ingredients using an environmentally-friendly process to develop products for high value domestic and export food markets in a variety of sectors. The technical challenges involved in the project include the commercial viability of the process during scale-up, modification of ingredient properties to meet market needs and inclusion in identified niche products.

Project benefits:

- Positioning of the Australian base of a multi-national company as a producer and supplier of premium ingredients in identified niche markets;
- Value-adding to, and increasing production of, a commodity;
- Increased employment opportunities across the value chain, including in regional areas;
- An alternative non-dairy protein source;
- Export opportunities, particularly to Asia;
- Potential for technology transfer to other Australian companies.

Numico Research Australia, Oakden, South Australia - \$3.2 million of which \$1 million is FIG contribution.

Antibody rich milk for inclusion in foods to enhance immunity.

Antibodies are an existing part of milk with the potential to deliver health benefits to consumers, but antibodies in cows milk are currently denatured during the pasteurisation process thereby limiting the ability of processed milk to act as a natural carrier of functional antibodies.

Numico Research Australia will use low heat processing methods for reducing microbial load while ensuring antibody retention in milk and maintenance of specific antibody activity in milk powder. The project will develop vaccines to optimise specific antibody activity in milk throughout lactation and will be targeted against human diseases. Numico Research Australia is part of the Royal Numico company which operates in 100 countries and employs 28,500 people worldwide.

Project benefits:

- Creation of new domestic and international markets, leading to increased exports for Australia, of particular benefit to dairy farmers and processors;
- New range of convenient and nutritious food products containing specific antibody rich milk ingredients that will help prevent illness;
- Manufacture and sale of vaccines;
- The development and commercialisation of a significant R&D base established in Australia by the large multi-national company, Royal Numico (based in the Netherlands).

4 INITIATIVES UNDER THE AGRICULTURE – ADVANCING AUSTRALIA (AAA) PACKAGE OF PROGRAMS

Terms of Reference covered by this program – skills and business knowledge; factors determining success.

Training and education is a fundamental element of the *Agriculture – Advancing Australia (AAA)* package of programs administered by the Department. The adoption of a continuous learning culture and improved management skills are key drivers in building the self reliance, competitiveness and capacity of Australian farmers to meet the challenge of change. Three initiatives under the AAA package have the potential to assist the capacity of primary producers to uptake technological innovation.

a) Industry Partnerships Program

The Industry partnerships program is a new initiative, with funding of \$19.7 million over four years, aimed at helping industries build self-reliance and manage change and adjustment pressures. In 2004-05 a limited number of industries are participating in pilot projects that will involve working with government to share information and build a plan for action.

Under the program, the Australian Government is engaging industry in close, information-driven partnerships to identify future challenges, training and leadership needs, market opportunities and adjustment pathways. The program will stimulate innovation, appropriate adjustment and improved management within the partner industry.

b) FarmBis Program

The FarmBis program is a partnership between the Australian Government, the States and the Northern Territory and has been the foundation of a strong learning culture among Australia's primary producers since 1997. FarmBis provides financial support for primary producers, fishers and rural land managers to participate in learning activities which focus on enhancing their capacity and skills to manage their business, natural and human resources. FarmBis training activities are driven by primary producer demand and focus on short and medium term learning activities. A strategic, planned approach to learning by participants is encouraged and they contribute to the cost of training.

The program is widely recognised and supported by primary producers across rural and regional Australia. Approximately 150,000 primary producers, fishers and rural land managers across Australia participated in FarmBis-subsidised training from 1997 to 30 June 2004. In the 2004-05 Budget the Australian Government allocated a further \$66.7 million over four years to continue the successful FarmBis program until 30 June 2008.

c) Cooperative Venture for Capacity Building in Rural Industries initiative

The Cooperative Venture for Capacity Building in Rural Industries Project (Cooperative Venture) was established in 2001 by some RDCs - in collaboration with the Department's AAA FarmBis program - to support learning by farmers and rural communities so that they can prosper and grow as Australian agricultural industries adapt to global change. In particular, the Cooperative Venture has commissioned research to better understand the issues affecting capacity building in rural industries and identify effective and innovative approaches to further improve primary producers' uptake of research outputs at the farm level, in order to boost the productivity and sustainability of Australian agriculture.

Since its inception, the Cooperative Venture has brought together the resources and experience of key agencies interested in improving the uptake of R&D outputs in rural industries, such as:

- The Murray-Darling Basin Commission (MDBC);
- Rural Industries Research and Development Corporation (RIRDC) - Secretariat;
- Meat and Livestock Australia (MLA);
- Australian Wool Innovation (AWI);
- Dairy Australia (DA);
- Land and Water Australia (LWA);
- Grains RDC;
- Sugar RDC; and
- Department of Agriculture, Fisheries and Forestry (on behalf of the Australian Government).

While some of the outputs of the Cooperative Venture are long term, important outcomes to date include:

- Pooling of research from a wide range of service providers on the drivers for capacity building; and
- Better informed efforts to improve capacity building across agricultural industries in order to focus R&D outcomes delivery and better coordinated adoption of the latest technologies and information.

CONCLUSION

Despite the diversity inherent in the portfolio, all businesses within portfolio industries have a need to use innovation as a tool to enhance productivity and sustainability. The Government's design and delivery of the range of programs set out in this submission address the impediments to productivity across these diverse industries.

These programs address commercial, social and environmental outputs in both large and small industry sectors to assist producers to identify their business needs, trial new products and practices, provide capital and promote a culture of learning to support adoption of innovation. Encouraging innovators to share experiences and knowledge with their local community and their industry peers further drives innovation.