

RESEARCH & DEVELOPMENT PLAN 2016 - 2021



RURAL INDUSTRIES
Research & Development Corporation

VISION

Australian rural industries
are innovative, adaptive
and valuable

PURPOSE

Through research and development
increase knowledge and understanding
that fosters innovative, adaptive and
valuable rural industries

GOALS

1

Discover

emerging opportunities
and issues impacting
rural industries

2

Deliver

research that achieves
value for rural industries
and for Australia

3

Encourage

diversity and advance
the potential of people
in rural industries and
their communities

STRATEGIES

- Analyse priority issues and technologies that impact on the value and resilience of Australian rural industries
- Strategic research investments based on the feasibility, value and potential competitiveness of plant and animal industry opportunities
- Facilitate the development and delivery of national cross-sectoral initiatives that address priority issues

- Work with industries and other stakeholders to prioritise and efficiently administer research
- Facilitate adoption and commercialisation customised to target audience and industry preferences
- Develop customised tools, systems and partnerships to support efficient cross-sectoral research investment

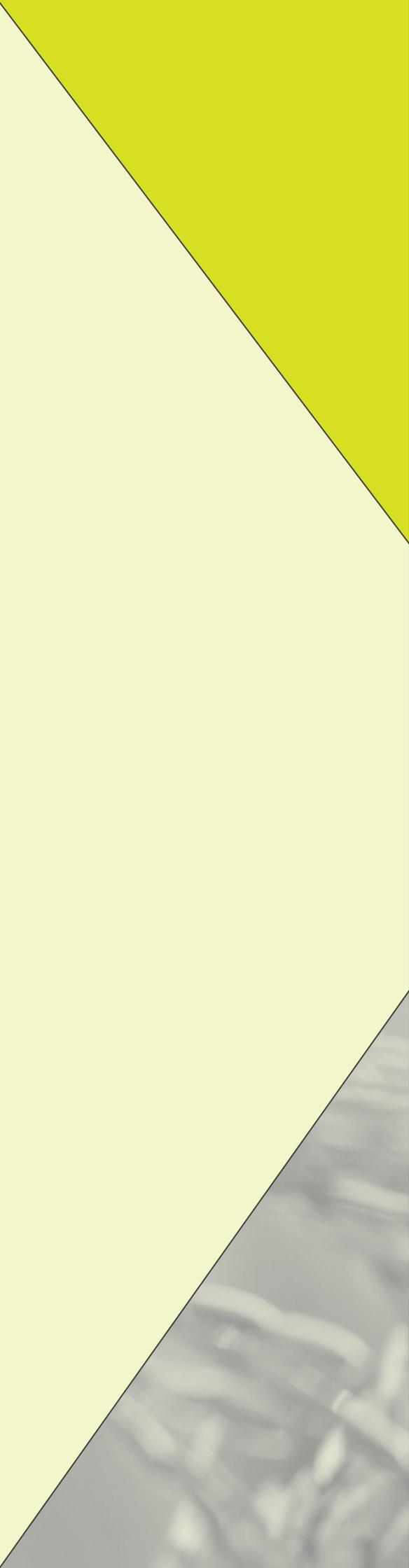
- Invest in leadership and capacity building programs
- Encourage the adoption of new practices and technologies in rural industries
- Increase the connectedness of people in the rural sector and their communities

OUTCOME

Increased knowledge that fosters sustainable, productive and profitable new and existing rural industries and furthers understanding of national rural issues through research and development in government-industry partnership.

Applying the life-cycle to target investment





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Message from the Chair

As incoming Chair of the Rural Industries Research and Development Corporation (RIRDC) I am committed to working with Australia's rural industries to accelerate their advancement. I am committed to ensuring that we deliver to all our stakeholders the best possible return and maximize the impact and benefit of RIRDC supported research and development (R&D). I congratulate and thank the outgoing Chair Professor Stehlik for her contribution and leadership to RIRDC over the years and acknowledge that this 2016-2021 five year R&D plan was completed prior to my appointment as Chair.

RIRDC supports rural industries that do not have their own Research and Development Corporation (RDC) including the rice, chicken meat, honey bees and pollination, horse, pasture seeds and export fodder, ginger and tea tree oil industries.

RIRDC invests in research and development to accelerate the establishment of new and emerging rural industries such as truffles, redclaw, emu, deer, fibre goats, quinoa, Kakadu plums and crocodiles. It is my intention that we will further advance the program by enlisting full engagement and collaboration across agricultural communities, all relevant stakeholders including the Minister, Government and Departmental operatives. I overwhelmingly believe in consultation and working together as a team to advance agriculture.

RIRDC also invests in research and development to address issues that are common across agriculture, fisheries and forestry sectors. Issues like: better seasonal forecasting; studies to identify new and emerging issues that may affect competitiveness; studies to improve policy debate by government and industry on issues relevant to agricultural and rural policy in Australia. I am committed to having RIRDC collaborate to deliver value for money across sectors and to ensure we have maximum cooperation with joint initiatives where appropriate.

Our vision is that *Australian rural industries are innovative, adaptive and valuable.*

This R&D Plan 2016 - 2021 sets out our vision, purpose, goals and investment approach for the next five years. It guides our approach and our decision making.

The first of our three goals is to **discover** new enterprises, technologies, opportunities and challenges that may positively or negatively impact rural industries.

Our second goal is to **deliver** tangible and practical improvements to rural industries in terms of farm-gate profitability.

Our third goal is to **encourage** people in rural industries to develop their leadership potential, for example, I was overwhelmed by the energy enthusiasm and knowledge that was displayed at the partnership between RIRDC and the Department of Agriculture and Water Resources in convening the recent GrowAg conference.

GrowAg was designed to facilitate collaboration amongst a diverse range of future leaders and decision makers within agriculture, demonstrate the Australian Government's commitment to contributing to the future of the sector and to highlight R&D achievements on farm offering a feedback loop for continued learning and interaction.

It was exciting to witness demonstrated leadership in a cross industry innovation forum where participants could share ideas, be motivated and value the opportunity to engage in learning, capacity building, knowledge sharing and community building for these young professionals. The intention is to continue to build on this strength of the organisation.

The broad range of new rural industries and investment opportunities available to RIRDC has seen the application of a 'life cycle' analysis approach to investment decisions. This ensures that our R&D investment is aligned with the developmental stage of each emerging industry. It also frees up funding for us to make new investments when an industry has reached the point where it is able to support its own R&D.

RIRDC is about partnerships and collaboration. When we invest in R&D, we do so in partnership with the rural industries that we serve. Once R&D priorities have been determined, we partner with research organisations to undertake the research. Increasingly, RIRDC is looking to collaborate with other RDCs when addressing issues that are common across industry sectors. The Board, Management and staff at RIRDC will continue to work diligently, respecting the vision of our industries so that together we can contribute to a better working, lifestyle and environmentally sustainable rural and regional Australia.

With the growing importance of the private sector in Australian agriculture, we anticipate that over the next five years RIRDC will be increasingly partnering with the private sector to meet the needs of our industry and government stakeholders. From my observation I believe RIRDC to be well placed to partner in value adding between the private sector and our agriculturalists.

Our commitment to regional Australia will see RIRDC move its operations from Canberra to Wagga Wagga in New South Wales. This presents new and exciting opportunities for our organisation and the rural industries we support. These opportunities and the addition of new industries and ventures may mean that we need to revise this five year R&D Plan before June 2021. Any changes would, of course, only be made following due process, including consultation with our industry and government stakeholders.

Australian rural industries have and always will operate in a dynamic environment, shaped by domestic and global forces that are increasingly complex. Access to world-class expertise and leadership in ground-breaking research and innovation is critical to ensuring rural economy continues to grow and prosper. In collaboration with the resilient rural industries we serve, RIRDC has a unique contribution to make both to individual industries and more broadly across Australian agriculture, fisheries and forestry. We look forward to being part of the blueprint that will shape the future of Agriculture and deliver benefits to the entire nation.

Mrs Kay Hull AM

Chair, Rural Industries Research and Development Corporation

Introduction

RIRDC was established in 1989 under the *Primary Industries Research and Development Act 1989* (PIRD Act) to invest in research and development (R&D) for primary industries that do not have a dedicated R&D Corporation and to address multi-industry and national interest R&D needs.

This five-year Research and Development Plan (R&D Plan) has been developed to guide RIRDC's activities and investment for the period 2016 – 2021.

In developing this plan, RIRDC consulted widely, analysed the current operating environment and the circumstances facing rural industries and considered long term trends likely to impact on the value, and innovative and adaptive capacity of Australian rural industries.

RIRDC also considered the National Science and Research Priorities announced by the Australian Government in May 2015 and the Rural Research and Development Priorities announced in July 2015.

The R&D Plan commits RIRDC to investments that will enhance rural industries' innovation, adaptive capacity and value. It identifies three goals:

1. Discover emerging opportunities and issues impacting rural industries
2. Deliver research that achieves value for rural industries and for Australia
3. Encourage diversity and advance the potential of people in rural industries and their communities

These goals are supported by specific strategies that will guide RIRDC investment and operations.

RIRDC commits to two approaches to underpin all investment decisions:

- Applying a life-cycle analysis to investment
- Developing R&D partnerships for rural industries

For this R&D Plan, rural industries refer to agricultural, fishing and forestry industries.

This R&D Plan has been developed to comply with RIRDC's obligations under the PIRD Act, the *Public Governance, Performance and Accountability Act 2013* (PGPA Act), and RIRDC's funding agreement with the Australian Government.

Operating environment

All rural industries, regardless of their size or level of maturity face a common set of challenges, including the need for continued productivity gains while maintaining or increasing sustainability and improving market intelligence to drive growth and profitability.

Through the life of this R&D Plan and beyond rural industries will need to respond to many challenges and opportunities including:

- Competing demands for land from non-food and fibre industries
- Competing demands for and availability of water
- Managing for climate variability and change
- Increasing demand for products from Australian rural industries from countries with increasing population and/or wealthier middle income classes
- Changing consumer preferences
- Management of enterprise risk
- New technologies
- People leadership

Positioning Australian rural industries to respond to evolving challenges and opportunities is critical to their continuing success. This not only requires effective R&D at a commodity level, but leadership in cross-sectoral R&D.

RIRDC's operating environment reflects the increasing complexity facing Australian rural industries. Unlike other Rural Research and Development Corporations (RDCs) that represent one or a few similar industries, RIRDC manages R&D for a diverse portfolio of plant and animal industries all at varying stages of development. RIRDC's funding agreement with the Australian Government recognises this unique role as well as a role in encouraging and driving cross-sectoral R&D.

Since the implementation of the last five-year plan from 2012, RIRDC has evolved into today's lean, responsive organisation that develops partnerships that best service rural industries and governments.

The outlook for Australian agriculture

Because Australian rural industries are predominantly export oriented, the sector is dependent on the performance of global markets. Farm-gate returns have become increasingly unpredictable as a consequence of climate variability, volatile exchange rates and fluctuations in market demand, which is forecast to continue. To respond to these factors, agribusiness is increasingly attracting investment and capital from new sources and new on-farm and supply chain innovations are driving advances in the rural industry sector.

Developing the human capacity to drive improvements in competitiveness through the adoption of R&D outcomes and innovation is just as important as the research itself. RIRDC is committed to developing rural leaders who will create valuable and adaptive rural industries, while promoting the opportunities of food and fibre production.

The family farm will remain the most common ownership structure in rural industries but the trend to fewer, larger farms will continue in response to the need for improved competitiveness. On-farm productivity gains, including increased labour productivity, will be required to deal with competitive terms of trade and an ageing labour force.

Landscape and climate

Globally, according to the United Nations Food and Agriculture Organization (FAO), the world must increase agricultural output by 70 per cent by the year 2050 to feed a growing global population. However, it is estimated that globally 12 million hectares of agricultural land is lost each year to desertification and urbanisation.

Therefore, access to quality production resources (arable land, reliable water and proximity to markets) will remain major factors in planning for increased production capacity.

The effects of climate change on food production will vary geographically and as the certainty grows around how climate change will impact the regions, collaborative research to quantify the impacts on food and fibre production, and to design sectoral responses, will be required.

Balancing productive water use with environmental needs will continue to challenge policy makers and producers. While water sharing arrangements may change over time, agriculture will likely continue to operate within a policy setting that provides less water for production.

Food and fibre production may also be impacted by a rising demand for land to meet the burgeoning market for renewable energy, either through the establishment of energy infrastructure or the production of biofuel crops. Land may also be put aside to achieve greenhouse gas mitigation targets.

Research that increases crop yield and grazing productivity will be critical to maximising the efficiency of existing farm land. The discovery and adoption of new plant and animal industries that complement existing farm enterprises, or create new opportunities for land considered marginal for traditional enterprises, will play an important role in increasing productivity.

Market drivers

Income growth, both domestically and internationally, is driving an increase in food and fibre consumption. In the developing Asian region alone some 1.02 billion people will move into the middle income classes, with average incomes forecast to rise from US\$12,000 per person to US\$44,000 per person by the year 2060.

Rising wealth is already having impacts on commodity markets as people increase their average daily calorie intake, including protein consumption. The transition to middle income classes can also be characterised by people moving out of subsistence food production to become more reliant on purchasing their food at markets and retail outlets.

Australia is well positioned both geographically and comparatively to supply growing overseas markets. However, despite recent successes by the Australian Government to negotiate Free Trade Agreements with major trading partners, the food sector in many countries remains highly subsidised and trade barriers restrict Australian exports.

Collaborative approaches to understanding where Australian agriculture can position itself to capture the benefits of rising wealth, while managing global and domestic constraints to growth, will be an important feature of industry development over the next 20 years and beyond.

Consumer trends

The consumer of the future will have high expectations of the food and fibre products they purchase. Today's consumer has different tastes, preferences and ethical concerns to the consumer of twenty years ago. For example, organic certification, free range eggs, health labels and fair trade logos are relatively new additions to food labelling and have influenced production methods. Such trends are likely to continue and it is therefore important for agriculture to position itself to respond to predicted future preferences.

Health is likely to become a particularly prominent driver of food choice and consumption patterns, which has impacts at the farm-gate and beyond. Consumers across the world are increasingly interested in functional foods designed to provide a specific health benefit over and beyond basic nutrition, such as added vitamins or soluble fibre. The global market for functional foods was estimated at US\$90.5 billion in 2013.

Information technology will increasingly enable the consumer to selectively access, share and validate information about products along the whole supply chain. Therefore, ethical production and provenance are likely to play a larger role in consumer choices about food and fibre purchases in coming decades.

Australian rural industries already have a market advantage as healthy, safe and fresh. Ensuring production methods, biosecurity protocols and supply chain efficiencies continue to keep pace with consumer demands will require cross-sectoral collaboration.

Risk

Risk is an ever present characteristic of Australian rural industries. Due to the inter-connectedness of global socio-economic and environmental systems, Australian producers are exposed to fluctuations in the global climate and world economy creating new and potentially deeper risks.

The globalisation of supply chains, which provide inputs (e.g. fertilisers, fuel, chemicals) critical for rural industries, increases the number of links in the production system, and therefore, the risk of supply chain breakdowns. One challenge is increased weed and pest resistance to herbicides and pesticides which is reducing their effectiveness.

The reliance by producers on a single agricultural output creates a higher exposure to the volatility in world markets and environmental and climate impacts. By increasing diversification into new animal and plant industries, producers can reduce their risk exposure. RIRDC's research provides opportunities for farmers in other industries to consider options for their enterprise mix.

Supporting diversification will contribute to the growth and broadening of rural industry exports, which will go some way to mitigating risk. This will also position Australian rural industries to take advantage of structural changes in emerging economies as growing middle income classes, especially in Asia, drive demand for a more diverse range of food and fibre products, including conventional products.

Technology and innovation

Advances in technology within the fields of digital, genetics and materials science will change the way food and fibre products are produced. Genetic technology will allow crop and pasture yields to improve and become more resistant to weeds, pests and climate risks. Advanced sensory systems and data analytics will permit advanced and highly integrated supply chains.

These forces are complex, with diverse drivers and impact all agricultural industries. The key to effectively responding to these opportunities and challenges will be multi-industry RD&E.

RIRDC's investment approach

Two approaches guide RIRDC's investment in RD&E:

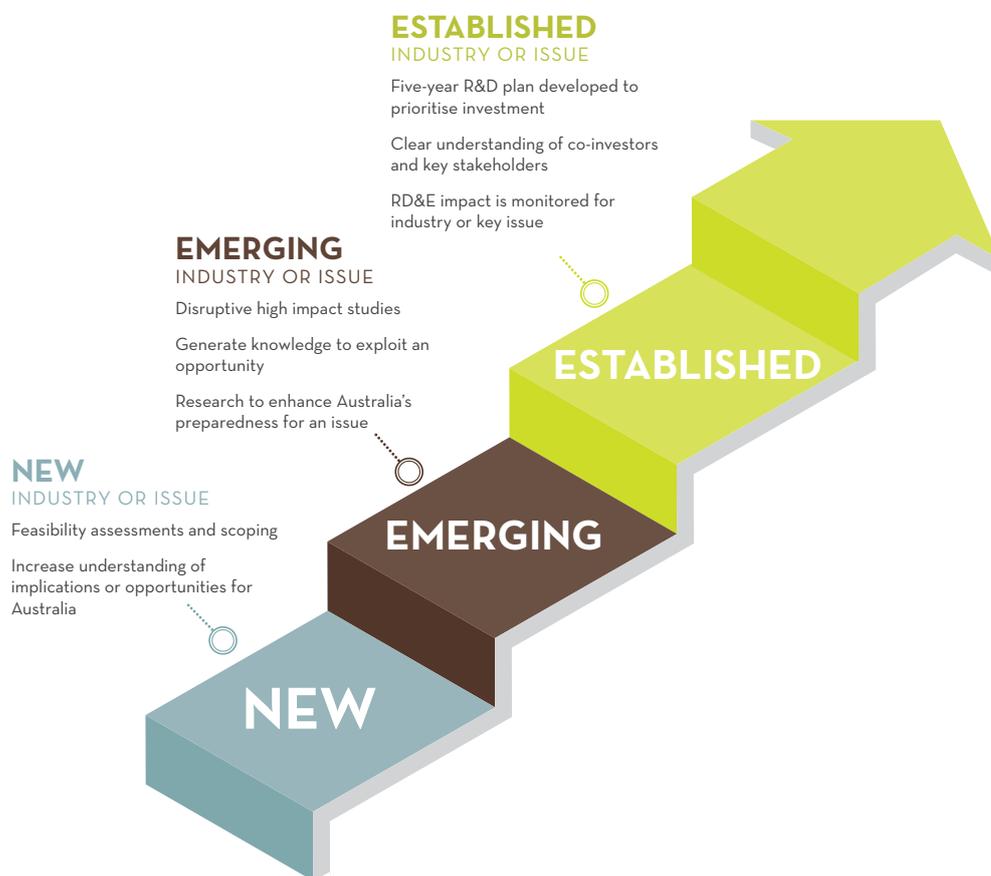
1. Applying the 'life-cycle' approach to target investment
2. Developing RD&E partnerships for rural industries

Applying the 'life-cycle' approach to target investment

RIRDC is charged with identifying and supporting the development of new rural industries that will make an economic contribution to Australia and ultimately fund their own development and RD&E. To do this more efficiently, RIRDC introduced a life-cycle approach to investment in its last five year plan. The life-cycle approach has provided clarity around appropriate levels of intervention and investment in industries as they progress from new, to emerging and established. The life-cycle approach ensures the RD&E investment is fit for purpose, and targeted to the industry's developmental stage.

Drawing on the lessons learnt and the success from applying the life-cycle approach to targeting investment over the last five years, RIRDC will simplify the model as it applies to industries but will expand the concept of using issue maturity and development stage to assess the level of intervention and investment required in national and cross-sectoral issues research.

Phased growth path for industries or issues

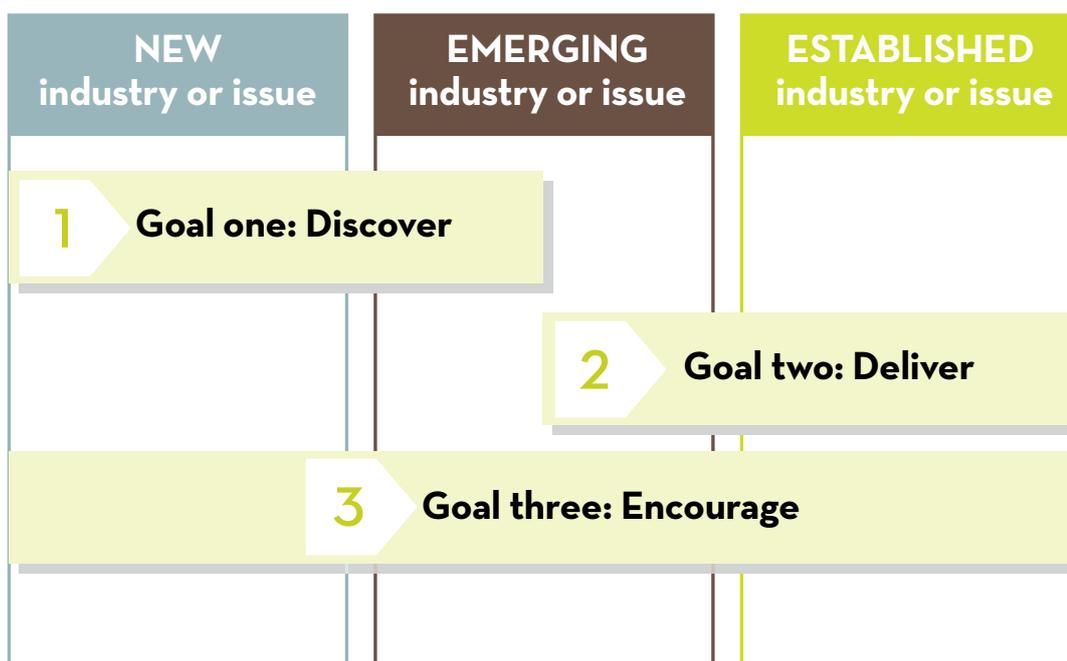


Similar to its application to newer industries, the stage of maturity of an issue, or the understanding of the issue relative to the Australian rural industry’s position, will help determine whether a response is required, and if so the nature of R&D needed and the key stakeholders for engagement.

Over the next five years, RIRDC will focus on identifying new technologies and issues that may create either a step-change improvement or significant shock to agricultural production. This will result in a stronger alignment of research activities that address RIRDC’s legislative requirements and the government’s research priorities, within the context of industry development. It will also allow RIRDC to effectively build partnerships with key stakeholders to best position Australian rural industries.

Similar to new industry development, some issues will require research investment to capture the benefits and develop responses. RIRDC will introduce a structured approach to partner industries and research organisations to identify when collaborative research initiatives should be pursued and the nature of the collaboration.

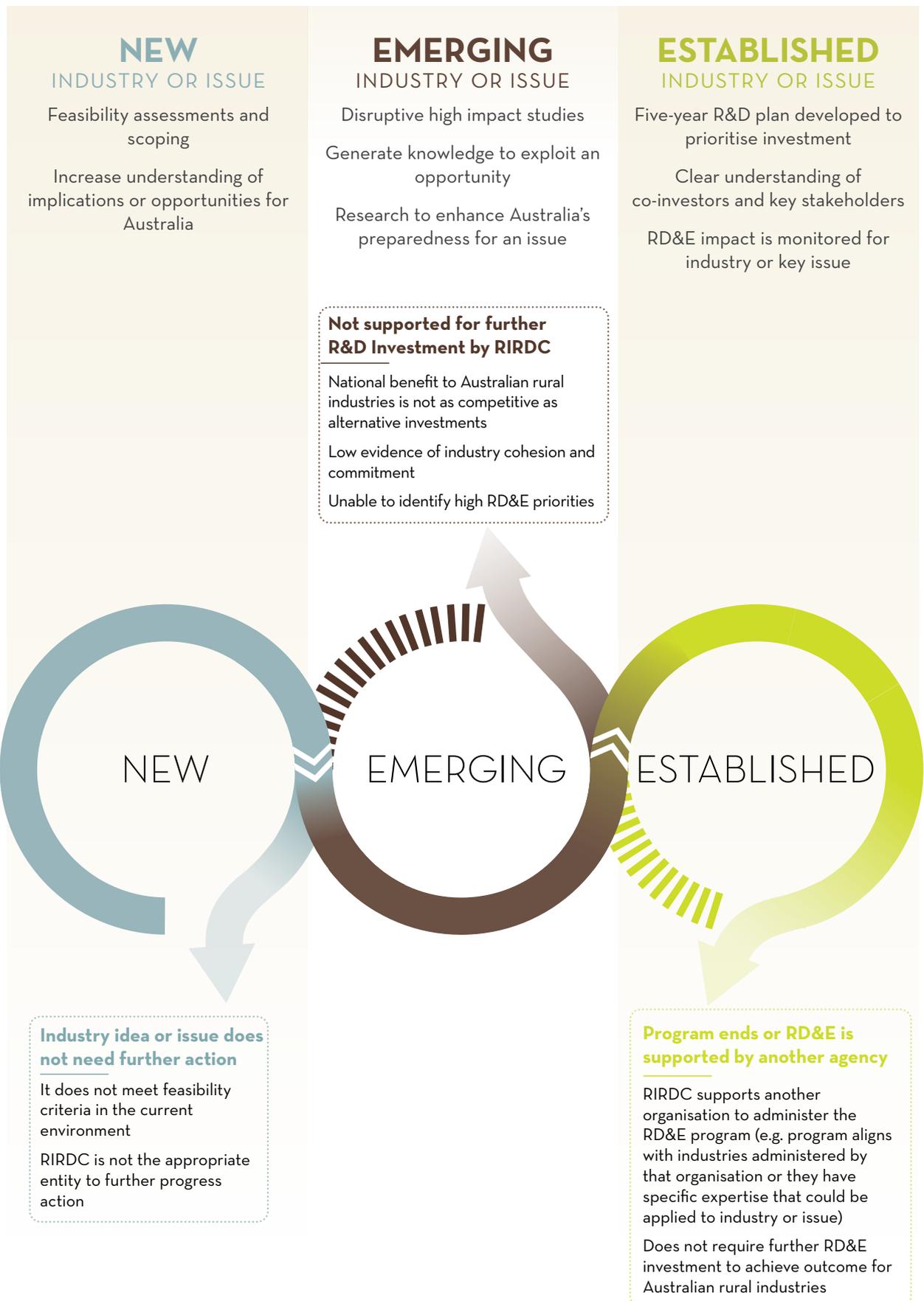
Where the RIRDC goals fit within the life-cycle phases



Each stage of the life-cycle requires different types of RD&E and RIRDC focus

	New	Emerging	Established
Industry Characteristics	<p>A few pioneers, very enthusiastic about a novel idea or starting their own research</p> <p>No industry cohesion</p> <p>Infrastructure non-existent or in early discovery phase construction</p> <p>No funding mechanism</p>	<p>An increasing number of producers trying to develop the industry, or their own business and private investors wanting to join in along the supply chain and in various market segments</p> <p>Industry cohesion is forming through an association, and commitment to RD&E is evident through establishment of a formal levy or informal funding commitments</p> <p>Emerging supply chain</p>	<p>Further expansion of the number of producers in the industry and private investors along the supply chain</p> <p>Consolidated businesses and some vertical integration</p> <p>An established supply chain</p> <p>Strong industry cohesion with an established association and levy or alternate R&D investment structure</p>
Issues/themes	<p>A trend, issue or policy change is emerging that could positively or negatively impact Australian rural industries</p> <p>There is limited understanding of the issue or change and how it impacts Australian rural industries</p>	<p>There is urgency or need for Australian rural industries to consider the issue and identify how it wants to respond or how it will need to respond</p> <p>Different industry sectors are interested in exploring the trend, issue or policy change and understand what it means for their industry and the options available</p>	<p>There is an agreed need and purpose for collaborative cross-sectoral research to respond to the trend, issue or policy change</p> <p>Co-investment and collaboration arrangements are in place</p> <p>R&D plan guides action and investment agreed by participating parties</p>
Growth	Limited	Accelerated	Stabilised
R&D approach and type	<p>Feasibility assessments and scoping</p> <p>Increase understanding of implications or opportunities for Australia</p> <p>Discovery and detection</p>	<p>Invest in disruptive high impact R&D which overcomes a specific barrier or identifies the opportunity required to benefit Australian rural industries</p> <p>R&D investment aims to enhance Australia's preparedness for issue (options, business case for response, partnership commitment)</p>	<p>Five-year R&D plan prioritises and focuses investment to benefit industry or multiple industries</p> <p>There is a clear understanding of co-investors and key stakeholders</p> <p>R&D impact monitored for industry or key issue</p>
RIRDC focus	<p>Nurturing and advising role</p> <p>Testing industry options for Australia</p> <p>Resources and advice to undertake feasibility assessment</p> <p>Identifying issues and communicating with industry partners</p>	<p>Facilitate bringing key parties together to undertake further R&D and identify future options</p> <p>Make knowledge available on potential emerging industries and the characteristics of these industries</p>	<p>Industry sets RD&E priorities and RIRDC provides RD&E management support, communications and coordination</p> <p>Partners work together to prioritise required research and invest</p>

RIRDC's life-cycle approach to R&D investment



Developing R&D partnerships for rural industries

RIRDC's funding agreement recognises the importance of RIRDC's role in cooperative RD&E and acknowledges existing systems for coordination and priority setting of the national rural RD&E effort.

This R&D Plan signals RIRDC's intention to further engage and partner with stakeholders to improve cross-sectoral RD&E, by facilitating priority setting and the provision of constructive advice that can strengthen the national agricultural research and innovation effort.

RIRDC will seek to develop new partnerships domestically and internationally to address the larger, more dynamic issues in order to contribute to enhancing Australian rural industry and research outcomes.

There are a large number of stakeholders involved in rural industries development. RIRDC aims to facilitate a community of practice between these stakeholders where national benefits can be identified.

It is important to recognise that not all areas require cross-sectoral RD&E and if they do, the nature of the RD&E approach may be different. Collaboration between industries, rural RDCs and other supply chain stakeholders might be considered in the following situations and circumstances:

- Where 'critical mass', or 'fast tracking' to address a specific problem, issue or development of new technology can be achieved
- To bring together different capabilities, knowledge, skills, and experience
- To facilitate and foster cross-disciplinary interactions and relationships
- To encourage knowledge and skills transfer
- To facilitate the wider adoption, application and use of research outputs and outcomes
- To leverage investment to achieve a greater outcome

RIRDC will broker partnerships with rural industries, rural RDCs and other research agencies, and supply chain and private sector participants in areas where a collaborative approach would be beneficial.

All RIRDC investments, be they industry specific or cross-sectoral in nature, rely on partnerships with research providers and other investors to deliver outcomes to rural industries. RIRDC will invest in maintaining existing partnerships and building new investment relationships to identify emerging national rural issues, where additional value and knowledge to the collaborative effort across the rural sector can be achieved.

RIRDC's goals

RIRDC's three complementary, interlinked goals will guide investments and operations to contribute to the vision of Australian rural industries being innovative, adaptive and valuable.

There is a clear link between innovative capacity, technological progress and economic prosperity. Innovative rural industries are thus those that can develop and adopt new ideas and use technology in a way that can create productivity benefits as well as creating differentiating characteristics that create advantages for Australian rural producers.

RIRDC believes valuable industries can be characterised by enterprises that are profitable and structured for sustainable growth. Valuable industries also make a contribution to the prosperity of regions, and the broader Australian economy.

Adaptive rural industries are characterised by enterprises that are responsive to changing environments – at operational, market and regulatory levels. These industries are economically and environmentally sustainable.

The three goals are:

Goal 1

Discover emerging opportunities and issues impacting rural industries

Goal 2

Deliver research that achieves value for rural industries and for Australia

Goal 3

Encourage diversity and advance the potential of people in rural industries and their communities

Underpinning RIRDC's R&D investment for each of these goals is the life-cycle approach and the intention to develop new partnerships. These goals are also supported by strategies that respond to industry needs, both at a commodity level and a broader cross-sectoral level.

Goal 1

DISCOVER emerging opportunities and issues impacting rural industries

Adaptive and valuable rural industries are characterised by their ability to innovatively identify and respond to new opportunities while mitigating any emerging risks.

It is particularly important for nascent industries or product developers to have a clear understanding of their pathway to market or commercialisation to provide the best chance of success.

Industry participants need access to knowledge that supports better decision-making in relation to opportunities and risks. While supply chain participants actively and continually assess their environment and pursue opportunities that optimise their profitability, productivity and sustainability, the picture is often incomplete. Some areas requiring knowledge transfer will not be addressed effectively generally because the issue is only just emerging, making it difficult to scope, or the issue is too large or cross-sectoral, requiring a wider buy-in of stakeholders that cannot be facilitated by one industry.

RIRDC's role is to complement individual industry RD&E investment by supporting research into national rural issues that are cross-sectoral and where value to the rural industry sector, and to Australia, can be demonstrated. RIRDC will

assess these issues using the life-cycle analysis to ensure the scale and scope of an issue, and the urgency of dealing with it, is thoroughly determined.

The bulk of RD&E carried out in this goal will be within the 'New' phase of the life-cycle, with the potential for some RD&E to cross into the 'Emerging' phase.

RIRDC strategies in this area are to:

- Analyse priority issues and technologies that impact on the value and resilience of Australian rural industries
- Invest in strategic RD&E based on the feasibility, value and potential competitiveness of plant and animal industry opportunities
- Facilitate the development RD&E of national cross-sectoral initiatives that address priority issues

Desired Outcomes

Promising rural entrepreneurial industry, product and innovative opportunities are nurtured

New industries play a role in enabling other industry sectors and communities to be more innovative, adaptive and valuable

Early assessment of issues and innovations result in momentum and action

Businesses, industries, governments and other research organisations use knowledge generated by RIRDC to inform decision-making (policy, investments and actions)

Goal 2

DELIVER research that achieves value for rural industries and for Australia

RIRDC manages the RD&E for a diverse portfolio of animal and plant industries as they progress along the life-cycle from new, through emerging, and into established industries. Success is determined by an industry's capacity to take advantage of opportunities and respond to challenges, regardless of their developmental stage.

Just as the industries are diverse, so are their needs. RD&E underpins the success of rural industries by providing solutions and services in a diverse range of areas including breeding and genetics, agronomy, biosecurity, technology and market development.

RIRDC supports industries to identify and invest in their priority RD&E needs and ensures the research results in practical knowledge and innovations that can be adopted. To achieve this, RIRDC must consider and manage a range of factors including understanding the circumstances and priorities that will drive industry development, identifying a role for RD&E in delivering the desired outcomes and implementing the best RD&E solutions. RIRDC must also consider the capability and availability of skilled researchers who understand the purpose and intended use of the RD&E outcomes, ensuring outputs are relevant, practical and adopted by the target users.

This results in a highly targeted, customised approach to RD&E for each industry and cross-sectoral theme that best reflects the needs and circumstances.

RIRDC's investments in this goal are predominantly focused in the 'Emerging' and 'Established' phases of the industry or issue life-cycle.

RIRDC strategies in this area are:

- Work with industries and other stakeholders to prioritise and efficiently administer research
- Facilitate adoption and commercialisation that is customised to target audience and industry preferences
- Develop customised tools, systems and partnerships to support efficient cross- sectoral RD&E investment

Desired Outcomes

Knowledge assists rural industries to be more innovative, adaptive and valuable	Rural industry priorities are identified and used to focus RD&E effort	Leadership on cross-sectoral RD&E for the benefit of rural industries
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Goal 3

ENCOURAGE diversity and advance the potential of people in rural industries and their communities

People using land for rural industries confer a range of benefits on society by maintaining and sustaining rural landscapes while undertaking a range of farm business-related activities. These activities convert land into an asset that creates employment, economic activity, export income and contributes to vibrant rural and regional communities.

By focusing on the diversification of individual enterprises the broader rural industry sector will benefit through the spreading of risk, the encouragement of innovation adoption, entry into a diverse mix of domestic and international markets, and potentially greater regional economic activity and employment opportunities.

To maximise benefits accrued to farmers and the broader Australian community, RIRDC facilitates access to knowledge for new and existing farmers to diversify their operations to spread income risk and build resilience. Effective diversification practices can reduce the impacts of financial, environmental and market pressures.

In order for RIRDC research to be adopted and for industries to grow and be valuable, people in rural industries must have the skills and knowledge to make informed decisions about the future of their enterprises and industries. While new technologies, systems, processes and business models are important for rural industries to grow, people play a crucial enabling role.

To support people in rural industries, RIRDC invests in a number of leadership, capacity and skills development programs. This includes developing partnerships with other investors, industry and community groups to ensure a coordinated effort to build capacity.

RIRDC's investments in this goal are across all three phases of the life-cycle – 'New', 'Emerging' and 'Established'.

This goal commits RIRDC to:

- Invest in leadership and capacity building programs
- Encourage the adoption of new practices and technologies in rural industries
- Increase the connectedness of people in the rural sector and their communities
- Encouraging the diversification of individual rural enterprises

Desired Outcomes

Capability and diversity of people in rural industries is improved

People in rural industries are better connected benefiting industries and communities

Knowledge supports innovative, adaptive and valuable rural businesses

Measuring success

The table below details the outcomes and impacts RIRDC will deliver. This aligns with RIRDC's outcome: *Increased knowledge that fosters sustainable, productive and profitable new and existing rural industries and furthers understanding of national rural issues through research and development in government-industry partnership.*

Vision	Goal	Outputs	Outcomes and Impacts	Key Performance indicators
Australian rural industries are innovative, adaptive and valuable	1. DISCOVER emerging opportunities and issues impacting rural industries	<ul style="list-style-type: none"> At least one new industry or issues assessment report delivered annually Ongoing management of RD&E for industries in alignment with the RIRDC life-cycle methodology Annual consultation with industry and Government on cross-sectoral RD&E priorities Make publicly available RD&E outcomes related to the identification of emerging issues or new industries 	<ul style="list-style-type: none"> Promising rural entrepreneurial industry, product and innovative opportunities are nurtured Risks for Australian rural industries are identified and analysed for their likely implications New products play a role in enabling other industry sectors and communities to be more innovative, adaptive and valuable Early assessment of issues and innovations result in momentum and action that better positions Australian rural industries Businesses, industry, government and other research organisations use knowledge generated by RIRDC to inform their decision-making (policy, investments and actions) 	<ol style="list-style-type: none"> Potential new Australian primary industries receive suitable RD&E investment. All RD&E programs have plans that are meeting their objectives. RD&E programs are contributing to the delivery of innovative, adaptive and valuable primary industries and rural communities through an impact assessment or evaluation process.
	2. DELIVER research that achieves value for rural industries and for Australia	<ul style="list-style-type: none"> RD&E results are made available to all relevant industry participants using the most appropriate channels 	<ul style="list-style-type: none"> Knowledge assists rural industries to be more innovative, adaptive and valuable Rural industry priorities are identified and used to focus RD&E effort Leadership on cross-sectoral RD&E for the benefit of rural industries 	<ol style="list-style-type: none"> Identification, prioritisation and implementation of R&D strategies and actions for cross-sectoral issues are facilitated. Extension and adoption of R&D investments are facilitated
	3. ENCOURAGE diversity and advance the potential of people in rural industries and their communities	<ul style="list-style-type: none"> Programs are in place to encourage, support and develop the skills of rural women and youth Regularly encourage farmers to explore diversification options and to access the www.farmdiversity.com.au website Support is given to encourage skills development and research through targeted scholarships or funding 	<ul style="list-style-type: none"> Capability and diversity of people in rural industries is improved People in rural industries are better connected benefiting industries and communities Knowledge supports innovative, adaptive and valuable rural businesses 	<ol style="list-style-type: none"> Leadership and capability of rural industries is enhanced.

Investment framework

As a statutory corporation, RIRDC is accountable to the Australian Parliament through the Minister for Agriculture and Water Resources and must meet certain corporate planning, reporting and legislative requirements.

Planning and reporting

Primary Industries Research and Development Act 1989 Public Governance, Performance and Accountability Act 2013 RIRDC Regulations 2000	Legislative framework under which RIRDC operates and reports
Funding Agreement between the Commonwealth of Australia and RIRDC	RIRDC's acceptance to carry out appropriate and relevant R&D cost effectively and within the guidelines and priorities set by the Government
Strategic Science and Research Priorities Rural Research and Development Priorities	Sets out Government's national and rural priorities. RIRDC makes investments to contribute to their achievement
New Government Priorities (Initiatives)	RIRDC's contribution to delivery of new Government priorities and initiatives is considered
RIRDC's R&D Plan 2016 - 2021	Overseen by the RIRDC Board, the Plans sets the direction of the Corporation over the next five years
RIRDC's Investment Framework	Allocates resources against R&D Plan strategies and outcomes
Stakeholder consultation	RIRDC consults its industry and government stakeholders and adopts appropriate new priorities
Program Five Year Plans (Research investments) (refer to appendix for more details about individual program five year RD&E plans)	Within framework of RIRDC R&D Plan, program RD&E priorities are identified and appropriate projects are funded. Program Advisory Panels contribute to program Plan development and monitor progress
Corporate Annual Operating Plan (AOP)	Overseen by RIRDC Board, the AOP specifies annual priorities and allocates resources for the forward year
RIRDC Annual Report	Reports to Minister and RIRDC Representative Industries on performance of Corporation RIRDC Board undertakes annual review of progress against R&D Plan and AOP

Investment with a focus on the Government's R&D priorities

The Strategic Science and Research Priorities and Rural Research and Development Priorities of the Australian Government provide an over-arching framework for public investment in rural R&D, and all R&D investments made by RIRDC are guided by these priorities.

RIRDC addresses the Australian Government's research priorities in the following manner:

- The strategies in this R&D Plan align with the Government's priorities.
- Each levied industry has its own program five year or three year R&D plan, which incorporates industry and government research priorities and is aligned with the Strategic Science and Research Priorities and Rural Research and Development Priorities.
- Through annual reports RIRDC reports on the outcomes from RIRDC investments against the Strategic Science and Research Priorities and Rural Research and Development Priorities.

Strategic Science and Research Priorities

1. Food

Optimising food and fibre production and processing; agricultural productivity and supply chains within Australia and global markets

2. Soil and Water

Improving the use of soils and water resources, both terrestrial and marine

3. Transport

Boosting Australian transportation: securing capability and capacity to move essential commodities; alternative fuels; lowering emissions

4. Cybersecurity

Improving cybersecurity for individuals, businesses, government and national infrastructure

5. Energy

Supporting the development of reliable, low-cost, sustainable energy supplies.

6. Resources

Understanding the structure, composition, and processes governing the formation and distribution of resources in Australia.

7. Advanced Manufacturing

Supporting the development of high value and innovative manufacturing industries in Australia

8. Environmental Change

Mitigating, managing or adapting to changes in the environment

9. Health

Improving the health outcomes for all Australians

Rural Research and Development Priorities

- **Advanced technology**, to enhance innovation of products, processes and practices across the food and fibre supply chains through technologies such as robotics, digitisation, big data, genetics and precision agriculture.
- **Biosecurity**, to improve understanding and evidence of pest and disease pathways to help direct biosecurity resources to their best uses, minimising biosecurity threats and improving market access for primary producers.
- **Soil, water and managing natural resources**, to manage soil health, improve water use efficiency and certainty of supply, sustainably develop new production areas and improve resilience to climate events and impacts.
- **Adoption of R&D**, focusing on flexible delivery of extension services that meet primary producers' needs and recognising the growing role of private service delivery.

Program five year and three year RD&E plans

Program five year and three year plans are developed by RIRDC, in consultation with industry stakeholders, to outline an industry's RD&E objectives. The objectives in these plans are mapped against the Government's Strategic Science and Research Priorities and the Rural Research and Development Priorities. The objectives in the program plans are shaped by the goals and strategies of the RIRDC R&D Plan.

In developing program RD&E plans, other external industry-specific strategies and plans are taken into consideration to ensure alignment and to prevent duplication of RD&E efforts.

Refer to the appendix of this R&D Plan for more details about RIRDC's individual program five year and three year RD&E plans.

Stakeholder input

Key messages from our stakeholders

Productivity and profitability

- The life-cycle approach to investment is useful and makes industries plan strategically.
- The decline in traditional extension services will require an increased focus by RIRDC on communicating research outcomes, including investigating new and novel information transfer technologies.
- Whole of supply chain research is needed, particularly for new and developing industries, to ensure they are agile enough to respond to challenges and opportunities.
- Marketing is the weak link for many new and developing industries and does not keep pace with industry development.
- Research is needed to support Australia's claim of 'clean, green and safe' produce as industries seek to pursue opportunities in export markets.
- The development of some smaller, newer industries is restrained by a lack of technology in value chains. (e.g. mechanisation, processing, logistics).
- New technology is going to significantly change the way food is produced and industries need to understand how to manage the resulting challenges and opportunities.

Issues-based R&D

- RIRDC's brokering role in addressing cross-sectoral issues is valued.
- Effective business models should be considered part of the necessary RD&E in the development of successful rural industries.
- All RIRDC industries would benefit from a better understanding of consumer trends; in particular health and nutrition trends, and functional foods.
- Better understanding of climate change and variability mitigation strategies is essential for future planning, particularly for exploring diversification options.
- Consider landscape use in the context of options for diversification and link options to issues, including low rainfall regions or saline soils.
- Access to data infrastructure to support technological innovation is essential for industry development.
- A 'whole of life' interdisciplinary approach to supporting the development of people and skills capacity in rural industries should be considered.

Operational issues

- RIRDC's diverse industry base provides untapped opportunities for internal collaboration.
- Developing international collaborations or partnerships would value-add to Australian research investment.

A core requirement for the development of the RIRDC R&D Plan 2016–2021 was the incorporation of relevant priorities of the Australian Government, and consultation with the two organisations RIRDC must report to annually, the Australian Chicken Meat Federation and the National Farmers' Federation. Consultation was also undertaken with other stakeholders RIRDC identified as appropriate to help shape the Corporation's priorities and strategies.

A tactical and practical stakeholder engagement approach was undertaken to obtain insights and perspectives that helped inform the Corporation and shape the R&D plan.

The consultation with stakeholders involved two-way discussions that considered:

- Analysis and insights on research achievements and impacts
- Current and past performance of the organisation
- How the current and likely future rural industry operating environment might influence research and development investment
- Research priorities and preferences
- Organisational structure, approaches and systems

Stakeholders

RIRDC's primary stakeholders are the Australian Government, including the Department of Agriculture and Water Resources, and the rural industries on whose behalf the Corporation invests. In addition to these primary stakeholders, the Corporation has a diverse stakeholder base, beyond those who interact directly with RIRDC.

RIRDC's broader stakeholder group comprises Australian Government agencies, industry groups state government agencies, research providers, universities, the CSIRO, other research and development corporations (RDCs), rural community leaders and organisations, supply chain companies, compliance agencies, non-government organisations, farm advisors, natural resource management groups, individual farmers and the general public.

In 2014 an external, independent agency was engaged to undertake a stakeholder survey for the organisation. Feedback from this survey was considered in the development of the RIRDC R&D Plan and used to design the consultation process for target stakeholders.

Stakeholders consulted by RIRDC as part of the R&D Plan development process included federal and state government agencies and departments, agricultural representative bodies, representative organisations for RIRDC's portfolio levy and non-levy industries, research organisations and other organisations with a rural or agricultural focus.

Other RDC's involved with RIRDC through cross-sectoral initiatives and inter-organisational committees were included in the consultation process, as were RIRDC's internal stakeholders, including all RIRDC employees and external program managers.

Consultative approaches undertaken during the consultation period

RIRDC employed a number of approaches to seek input from stakeholders prior to the drafting of the R&D Plan. These approaches were customised for different target audiences and included:

- RIRDC's advisory panels – existing advisory groups and committees provided RIRDC with input and advice
- Face-to-face meetings – a series of meetings were held with a number of key stakeholders
- Online questionnaire
- Written submissions

Communication and promotion of the R&D Plan consultation process

A number of communication channels were used to announce the development of the RIRDC R&D plan and provided information on how stakeholders could contribute ideas and input, and updated stakeholders on progress of the development of the plan.

RIRDC regularly promoted the R&D Plan consultation process using both traditional and digital communication formats, including:

- Stories in RIRDC's corporate magazine *Diversity*
- Stories in RIRDC's monthly electronic newsletter *Diversity* in brief with a distribution list of nearly 2,000 people including a cross section of the target stakeholders and journalists
- RIRDC's website provided information about the R&D Plan consultation process
- RIRDC's Twitter account was used to provide regular information and notifications about the R&D Plan consultation process

Financial information

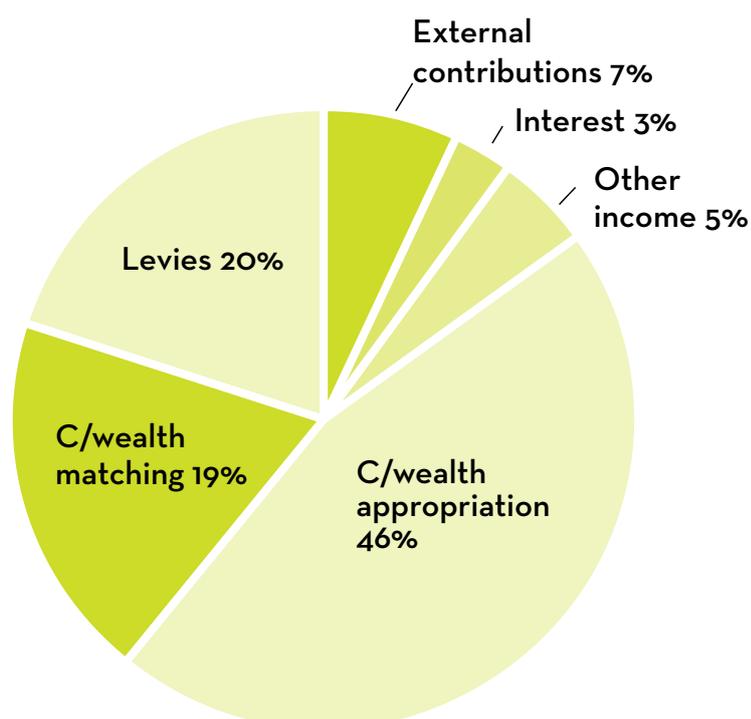
RIRDC's funding sources

RIRDC receives funds for RD&E investment from the following sources:

- An annual Australian Government appropriation
- Industry levy funds with a matched Australian Government contribution
- Voluntary industry contributions
- Other contributions from Australian Government-specific programs, private companies, rural RDCs, state and territory governments and research providers

Income Forecast	2016-17 (\$,000)	2017-18 (\$,000)	2018-19 (\$,000)	2019-20 (\$,000)	2020-21 (\$,000)
C/wealth appropriation	9,170	9,379	9,526	9,284	9,400
C/wealth matching	4,139	4,199	4,201	4,202	4,200
Levies	4,050	4,551	4,585	4,620	4,634
External contributions	1,623	1,485	1,395	1,395	1,395
Interest	600	600	600	600	600
Other income	1,524	1,131	871	881	900
Total Income	21,106	21,345	21,178	20,982	21,129

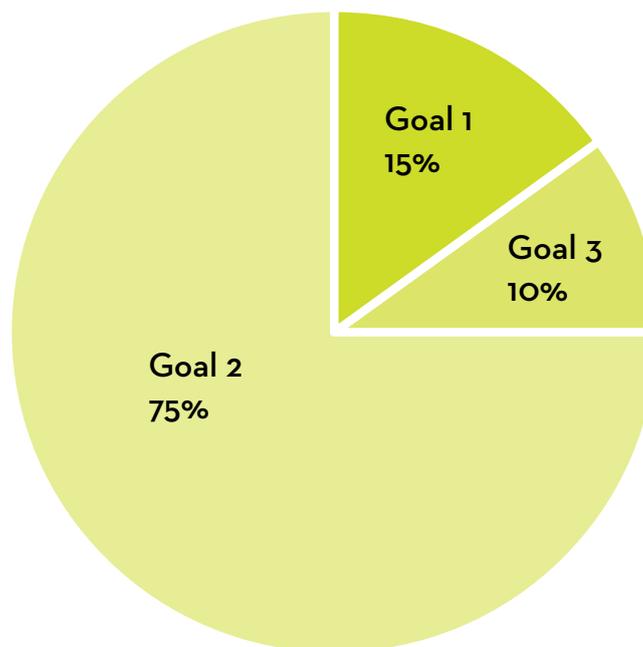
Income forecast 2016-21



Proposed future investments against the goals of the Plan

Expenditure forecast	2016-17 (\$,000)	2017-18 (\$,000)	2018-19 (\$,000)	2019-20 (\$,000)	2020-21 (\$,000)
Total Goal 1	3,166	3,202	3,177	3,147	3,169
Total Goal 2	15,830	16,009	15,884	15,736	15,847
Total Goal 3	2,111	2,135	2,118	2,098	2,113
Total Expenses	21,106	21,345	21,178	20,982	21,129

Expenditure forecast 2016-21



Investment portfolio

RIRDC invests its RD&E funds through a number of 'New', 'Emerging' and 'Established' industry programs, along with a number of national and cross-sectoral programs and initiatives. RIRDC's R&D programs in place at the commencement of this Plan are listed below. Some program areas supported by RIRDC will change over the life of the Plan due to:

- New program areas being established in response to:
 - New national issues
 - New Australian Government priorities
 - The identification of new industries
 - New collaborations
- Industries voting for an RD&E or marketing levy:
 - Where RIRDC is selected as the Program Manager
 - Industries departing RIRDC to have their RD&E or marketing managed by another organisation
- Existing programs conclude (e.g. special initiatives with specific Australian Government funding for a set time period) or become less attractive for investment.

RIRDC's R&D programs as at 1 July 2016

Goal 1	Goal 2	Goal 3
<ul style="list-style-type: none"> • New and Emerging Animal Industries (including levied industries: Buffalo; Deer; Goat Fibre; and Kangaroo) • New and Emerging Plant Industries • National Rural Issues 	<ul style="list-style-type: none"> • Bioenergy, Bio-products and Energy • Chicken Meat • Export Fodder Crops • Ginger • Honey Bee and Pollination • Primary Industry Health and Safety Partnership • Pasture Seeds • Rice • Tea Tree Oil 	<ul style="list-style-type: none"> • Investing in People (includes the Rural Women's Award and Horizon Scholarship) • Extension and Adoption (includes www.farmdiversity.com.au and extension portals)

Goal 1 programs undertake research to **discover** emerging opportunities and issues impacting rural industries.

Goal 2 programs **deliver** research that achieves value for rural industries and for Australia.

Goal 3 programs **encourage** diversity and advance the potential of people in rural industries and their communities.

Investment approach

The R&D Plan will be implemented through an investment approach that facilitates the most efficient and effective application of RIRDC's resources to deliver the strategies. There are two overarching directions that guide this approach:

- Applying the life-cycle approach to target investment
- Developing R&D partnerships for rural industries

Balanced portfolio

RIRDC invests its RD&E funds through a number of new, emerging and established industry programs, along with a number of national and cross-sectoral programs and initiatives.

RIRDC allocates its expenditure using a range of measures that ensure a balanced, financially responsible approach to its investment of both industry and core funds.

RIRDC's investments integrate the triple bottom line objectives of economic, environmental and social responsibility. The majority of investment will be aligned with short- to medium-term adaptive research outcomes and investment returns with the remainder contributing to long-term strategic research objectives.

RIRDC's project management system enables the portfolio of investments to be viewed through various perspectives including:

- Government research priorities
- Program objectives
- Project length
- Levels of risk, return and leverage

RIRDC is willing to engage with, manage and bear a moderate amount of risk in the pursuit of its goals.

RIRDC's Industry Advisory Panels assist in identifying and advising on specific RD&E priorities to implement the RD&E Plans, but ultimately investment is determined by industry, with support from the Australian Government where appropriate, and RIRDC's own evaluation of the RD&E need against investment priorities.

RIRDC's Industry Advisory Panels will provide advice as to the appropriate balance of investment between industry-specific RD&E priorities and cross-sectoral investment.

Where RIRDC is the appropriate lead agency, the Corporation will manage and develop collaborative investment programs with partners. Areas which are well suited to collaborations include climate change issues, natural resource management, health, safety and welfare, capacity building and leadership.

Corporate governance

RIRDC Board

The Australian Government provides the legislative framework under which RIRDC operates. The government also provides a core appropriation through the Department of Agriculture and Water Resources and matching Commonwealth funds to those RIRDC industries with a statutory levy. A Board, comprising nine Directors - a Chairperson, an Executive Director (titled Managing Director) and seven nominated Directors - provide strong leadership to the Corporation. Directors other than the Managing Director are appointed by the Minister for Agriculture and Water Resources and hold office for a specified term not exceeding three years. Directors are selected from a wide cross-section of rural industries and offer expertise in production, processing, marketing, R&D administration, business management, social sciences, technology transfer and environmental and ecological science.

The Managing Director is appointed by the Corporation for a specified term, and an acting Managing Director may be appointed by the Corporation for a specified term, if required.

The Board and the Managing Director have powers conferred to them by the PIRD Act.

The RIRDC Board is committed to governance systems that enhance performance and compliance. The RIRDC Board Charter sets out the function, duties and responsibilities of the Board in order to facilitate Board and management accountability for RIRDC's performance and strategic direction.

All members of the Board agree to be bound by the principles contained in the Board Code of Conduct, which is provided to all Directors as part of the induction process and provides guidance on their responsibilities including to act ethically, honestly, and with due care and diligence.

The Board fulfils its duties to the Corporation, abiding by all relevant laws and regulations and providing employees with a safe and rewarding working environment. The Board requires management to ensure that RIRDC staff have their qualifications, skills and experience enhanced with formal and on-the-job training each year.

The Board manages the potential for conflict of interest for Directors and senior management through an annual declaration of potential conflicts and other matters of disclosure through a standing agenda item at each Board meeting that requires Directors to declare any potential conflicts in relation to items for discussion. Where a material potential conflict is identified the Director vacates the meeting during discussion of the matter and does not participate in decision-making related to the conflict. Potential conflicts are recorded in the Board minutes and are available for consideration by the Corporation's Auditors.

The Audit Committee is established as a sub-committee of the Board and other sub-committees are established from time to time to support the Board. Members of the Audit Committee also provide an annual written declaration to the Board stating they do not have any conflicts of interest that would preclude them from being members of the committee. The Board's Audit Committee oversees preparation and implementation of the Corporation's fraud control policy and the Corporation's Fraud Control Plan is approved by the Audit Committee and Board.

The decision making process for the Corporation's financial transactions, including related entity transactions, is guided by RIRDC's Accountable Authority Instructions and Financial Policy and Procedures. All RIRDC staff are bound by the Corporation's Financial Policy and Procedures and related Accountable Authority Instructions. The Accountable Authority Instructions details powers delegated to RIRDC staff under sections 90 and 91 of the PIRD Act 1989. RIRDC's Conflict of Interest policy also applies to all staff who are delegated the power to approve financial transactions.

Industry advisory panels, consisting of individuals with skills relevant to RIRDC research programs ensure that R&D projects are properly guided and that industry and government funds are invested wisely.

Under Section 143 of the PIRD Act, the Minister may give written directions to the Corporation as to the performance of its functions and the exercise of its powers.

Under Section 22 of the PGPA Act, the Minister may give written directions to the Corporation regarding complying with the general policies of the Government.

Reporting

During the year the Board reviews policies and processes concerning all major areas of Board operations, including Board induction processes, Director and Board performance; risk management; conflicts of interest; Board sub-committees; and the Managing Director's performance. The Corporation's management policies and procedures will continue to be refined and updated as standard practice within the organisation.

Each year's Annual Report includes a description of how strategic directions, policies and processes have been applied during the year.

For the purposes of reporting on operations, RIRDC has two organisations prescribed by Section 7 of the PIRD Act, the Australian Chicken Meat Federation and the National Farmers' Federation. RIRDC is required to report to these organisations annually on its activities each financial period. This accountability runs parallel to RIRDC's Annual Report to the Minister and the Parliament.

Risk oversight and management systems

RIRDC has a risk management policy that clearly articulates the philosophy, processes and practices in place to identify, communicate and manage key risks across the organisation. The policy also ensures that responsibilities have been appropriately allocated and communicated for risk management.

The RIRDC Board oversees the establishment and implementation of the risk management framework, annually reviews the effectiveness of the framework, sets the risk appetite, and confirms risk management policy and strategy.

Risk management is a role shared across RIRDC, from staff to management with associated responsibilities and roles that reflects the individual and collective risk management environments. Management reports to each Board and Audit Committee meeting on the status and progress of the management of any key risks.

Resources within RIRDC are allocated appropriately to ensure that risk management is able to continually improve with early identification and treatment of potential risk factors. The risk management framework is reviewed regularly (at least annually) to ensure it remains appropriate to the organisation and reflects current risks.

The risk management policy is an important part of RIRDC's business planning and corporate governance framework. It identifies risks to achieving objectives and is a mechanism for ensuring that existing controls continue to mitigate risks and that proposed risk treatments are developed and implemented.

The policy is reviewed annually by both the Audit Committee and the Board to ensure all risks are reviewed where there have been changes in the internal or external operating environments, and to consider any emerging risks.

The control framework comprises a risk assessment methodology and a risk register with relevant mitigation strategies. This risk management methodology is designed to guide and support risk management activities at all levels of RIRDC, from high level whole-of-organisational risk assessments down to day-to-day risk management activities conducted by all staff of the Corporation.

RIRDC initially categorises risks as either "Key" or "Program" risks. Key risks are those that require Senior Management review and response, along with monitoring by the Board. These risks are managed through the Key Risk Register at the corporate level.

Program risks are managed through day-to-day processes and are risks assessed and managed in the project management system by relevant Senior Program Managers. Project risks are those associated with research, development and extension (RD&E) proposals and investments.

Communication and research adoption

The diverse nature of RIRDC's industry stakeholders, each with different requirements and each at a different level of maturity, means the communication of RIRDC's research outcomes needs to be especially targeted, specific and relevant to each of these audiences.

RIRDC's communication and extension functions focus on producing communication outputs that are accessible, easy to understand and encourage real changes in process, practice or thinking (i.e. outputs that result in outcomes).

RIRDC's communications strategies

RIRDC's communication and extension function has three clear strategies:

- i. Implement **communications for specific research projects and for specific audiences**.
These communications outputs can be targeted in one or more of these ways: sectoral, regional, topical, seasonal.
- ii. With a central focus on the www.farmdiversity.com.au website, implement a **broad, wide reaching communications campaign to promote the opportunity of diversification** to all producers in all industries across Australia.
- iii. **Build awareness** of what RIRDC does and maintain relationships in order to strengthen the uptake and advocacy of RIRDC's research.

Actions to be undertaken to implement the three strategies

i. Communications for specific research projects and for specific audiences.

Action: Each completed research project will be treated as an individual communications campaign, whereby the target audience and the tactics used to reach this target audience will be identified and scheduled ahead of the research being published.

ii. Implement a broad, wide reaching communications campaign to promote the opportunity of diversification to all producers in all industries across Australia.

Action: Critical to the success of this particular strategy is the ongoing maintenance and promotion of the www.farmdiversity.com.au website. The website provides users with information that will give producers a starting point in the journey towards diversifying their enterprise.

iii. Build awareness of what RIRDC does and maintain relationships in order to strengthen the uptake and advocacy of RIRDC's research.

Action: RIRDC's stakeholder management plan sets out regular, planned contact with key stakeholders to ensure an open and timely flow of information. This stakeholder management plan also nominates RIRDC personnel with responsibility for maintaining contact with each key stakeholder.

Encouraging adoption of RIRDC's R&D

Disseminating RIRDC's R&D outcomes to target audiences will be enhanced through industry engagement, partnerships with industry (either through commercial partners or industry representative groups), capacity building and the commercialisation of R&D outcomes.

RIRDC's stakeholders must see practical benefit in using R&D outcomes so communication and advocacy of practice-change often become the most successful method of increasing adoption.

This advocacy can take a number of forms, with active involvement from industry leaders and industry ownership of strategic R&D needs and communication of outcomes to stakeholders being among the most effective methods of driving adoption.

Appendix

All of the established levied industries in RIRDC's portfolio have individual program five-year RD&E plans, as does the New and Emerging Animal Industries program and the Primary Industries Health and Safety Partnership that RIRDC administers. RIRDC's New and Emerging Plant Industries program has a three year RD&E program.

As of 1 July 2016, the RIRDC programs that had individual program five year or three year RD&E plans were:

- Chicken Meat
- Ginger
- Honey Bee and Pollination
- New and Emerging Animal Industries
- New and Emerging Plant Industries
- Pasture Seeds
- Primary Industries Health and Safety Partnership
- Rice

RIRDC RD&E program plans under Goal 1 - Discover emerging opportunities and issues impacting rural industries:

- New and Emerging Animal Industries
- New and Emerging Plant Industries

RIRDC RD&E program plans under Goal 2 - Deliver research that achieves value for rural industries and for Australia:

- Chicken Meat
- Ginger
- Honey Bee and Pollination
- Pasture Seeds
- Primary Industries Health and Safety Partnership
- Rice

The full three or five year RD&E plans for each of the programs can be accessed via the RIRDC website: www.rirdc.gov.au.

The aims, objectives and key performance indicators (KPIs) for these programs are summarised in the following pages.

Overview of the Chicken Meat program five year RD&E plan

Program aim	
Stimulate and promote R&D that will deliver a productive and sustainable Australian chicken meat industry that provides quality wholesome food to the nation.	
Plan life span	
2014 – 2019	
Program objectives and key performance indicators (KPIs)	
Objectives	KPIs
Objective 1. Increase the productivity and efficiency of chicken meat production	<ul style="list-style-type: none"> • A reduced incidence of foot pad dermatitis and hock lesions. • Industry further reduces its usage of antibiotics. Changes in antibiotic use will be assessed using opinions of industry veterinarians or by publicly available surveillance data, where it is available. • By 2019, each major company able to report an improvement in at least one key indicator of on-farm productivity or efficiency, such as reduced mortality, improved FCR (beyond that attributable to genetics), improved cost effectiveness of feed formulation, or energy utilisation / kg of live bird produced. • At least one alternative source of litter evaluated by 2019. • Current capacity available to the Program in the bird nutrition research area is maintained.
Objective 2. Deliver safe food and good animal welfare outcomes	<ul style="list-style-type: none"> • Processing plant microbiological test results demonstrate an ongoing reduction in key pathogen levels. • Consumers indicate that chicken meat is a wholesome and safe product through a Usage and Attitudes (U&A) survey in 2018. • Research outputs funded by the Program inform Welfare Standards and Guidelines development in 2014 and 2015. • By 2019, have access to data (original research or literature reviews) that provides further insight into the connection between stocking density, housing, husbandry and management and bird welfare and farm sustainability. • Animal welfare research capacity is maintained at current levels throughout the life of the 5-Year Plan.
Objective 3. Manage the environment for sustainable development	<ul style="list-style-type: none"> • Planning and environmental support tools available and used by growers and local government by 2019. • The industry has access to at least one additional odour management option that is economically feasible. • New uses and markets for spent litter have been identified, and specifically, a solution has been found to the issue of spent litter disposal in WA.
Objective 4. Create foundations for the future, including capacity and market insight	<ul style="list-style-type: none"> • Critical and high priority researcher and early career scientists continue to be supported through provision of appropriate scholarships and projects. • The industry has demonstrably benefited from the availability of international specialists. • Opportunities for further education and up-skilling of industry participants have been created and taken up. • Cooperative research structures for the post CRC period are considered prior to 2016. • Usage and attitudes research is completed by the end of 2018. • A business case for a RIRDC Chicken Meat levy increase is prepared by 2017.

Overview of the Chicken Meat program five year RD&E plan continued

Objectives	KPIs
<p>Objective 5. Ensure research adoption via extension and communication</p>	<ul style="list-style-type: none"> • A RIRDC Chicken Meat Program Communication Plan has been developed and implemented. • Policy makers are better informed about the outputs of the RIRDC research program and the needs of industry • Producer and/or processor training is delivered and/or key meetings events supported in each year of the 5-Year Plan.

Overview of the Ginger program five year RD&E plan

Program aim

To provide RD&E to support a sustainable, growing and prosperous ginger industry supplying product of the highest quality that is strongly sought-after by discerning consumers in Australia and around the world.

Plan life span

2012 – 2017

Program objectives and key performance indicators (KPIs)

Objectives	KPIs
<p>Objective 1. Maintenance of Biosecurity protection</p>	<ul style="list-style-type: none"> • Pro-active biosecurity protection and readiness is improved each year through the R&D Program. • Appropriate scientific resources are mobilised in reaction to biosecurity risks as and when they occur. • Industry Biosecurity Plan is completed by 30 June 2013.
<p>Objective 2. Solving Disease and production problems</p>	<ul style="list-style-type: none"> • Comprehensive review of ginger diseases and control strategies completed by 30 June 2014. • Completion of QDAFF's Pythium R&D research projects (phases 1-4) over the 5 year period, including annual delivery of strategies that can noticeably stop the spread and/or incidence of the disease. • At least one field day held each year to impart information from R&D findings to growers. • Evidence of adoption of R&D outcomes by growers responsible for at least 70% of production.
<p>Objective 3. Food Safety and Quality Assurance</p>	<ul style="list-style-type: none"> • Review and on-going international updates in place – on-going documentation of AGIA Food safety compliance in place by June 2016. • Evidence of annual delivery of outcomes / training to growers. Documentation of annual improvements to food safety practices in the industry.
<p>Objective 4. Gain a better understanding of markets to identify new market opportunities</p>	<ul style="list-style-type: none"> • Pilot study completed by June 2013. If warranted (resources/ priorities permit), a more comprehensive project on consumer priorities completed by June 2017.

Overview of the Ginger program five year RD&E plan continued

Objectives	KPIs
<p>Objective 5. Conduct education and extension work that promotes awareness of ginger and ginger products.</p>	<ul style="list-style-type: none"> • Initial (cursory) Literature review completed by December 2015. If warranted (resources/ priorities permit), Australian product assessment project in place by June 2016. • If warranted (resources/ priorities permit), project in place to monitor and report to growers on consumption trends from December 2015. • Pilot study “Analysis of Market potential for fresh and processed ginger” completed and findings delivered to growers by June 2013.
<p>Objective 6. Stimulate innovation to develop and deliver new products (including value-added products) that match the needs of target consumers.</p>	<ul style="list-style-type: none"> • Project reviewing value-adding options and providing discussion paper completed and findings. presented to growers by May 2014. • Value-adding project underway by December 2015 (following open-call for proposals in 2014).
<p>Objective 7. Improve industry relationships, coordination, communication and industry representation in support of R&D opportunities and impacts.</p>	<ul style="list-style-type: none"> • Ongoing funding/support supplied to maintain Ginger extension and communication position for the duration of the 5 year priorities and strategies. • Annual feedback from industry in support of continued resourcing of position.
<p>Objective 8. Facilitate the updating and implementation of the industry’s strategic R&D Priorities and Strategies</p>	<ul style="list-style-type: none"> • Annual re-prioritisation of Industry strategies and thence R&D priorities through AGIA and levy-payer meetings.
<p>Objective 9. Work cooperatively with the industry’s growers and stakeholders, as well as with other industries to facilitate industry growth through R&D.</p>	<ul style="list-style-type: none"> • Evidence of communication, meetings and teleconferences with like- industries/ researchers on cross sectoral issues of mutual interest.

Overview of the Honey Bee and Pollination program five year RD&E plan

Program aim

Support RD&E that will secure a productive, sustainable and more profitable Australian beekeeping industry and secure the pollination of Australia's horticultural and agricultural crops.

Plan life span

2014 – 2019

Program objectives and key performance indicators (KPIs)

Objectives	KPIs
<p>Objective 1. Reduce the incidence and impact of pests and diseases on the beekeeping and pollination services industries</p>	<ul style="list-style-type: none"> • The National Bee Pest Surveillance Program incorporates project outputs from the Pollination Program by 1 July 2015. • Ongoing NBPSP funding by the beekeeping, horticultural industries and other organisations is encouraged. • The incidence of pests and diseases in hives delivering pollination services is considered to be low. • Development of the Australian Beekeeping Code of Practice or QA Program for bee health management, particularly for managing American Foulbrood. • Development of a test to identify Africanized genes in semen. • Early detection of any Varroa or Tropilaelaps incursion • Industry survey indicates a reduction in production losses caused by pests and diseases as a result of RIRDC RD&E investments.
<p>Objective 2. Increase the productivity and profitability of beekeepers</p>	<ul style="list-style-type: none"> • Survey industry undertaken to evaluate whether RIRDC RD&E investments have resulted increased productivity and profitability of beekeepers
<p>Objective 3. Increase understanding of the role of flora in honey bee management</p>	<ul style="list-style-type: none"> • The level of chemical residues are measured in hives used to pollinated canola and almonds. • Funds invested in resource access, landscape and nutrient management for effective pollination. • Research outcomes regarding the role of public forest flora to the beekeeping and pollination services industries are communicated to land-use policy makers to help inform decisions regarding beekeeping and pollination services industries access to public land. • Technology developed to determine floral resource yields. • Native floral flowering cycles determined. • A synthesis is undertaken of the likely impact of climate change on productivity in the beekeeping and pollination services industries. • Research undertaken that could inform FSANZ as to the allowable levels of pyrrolizidine alkaloids in food.

Overview of the Honey Bee and Pollination program five year RD&E plan continued

Objectives	KPIs
<p>Objective 4. Understand the role of pollination in delivering more productive systems</p>	<ul style="list-style-type: none"> • A 10% increase in average productivity of pollination, or a 10% reduction in cost of pollination, results from an investment to understand the role of pollination in delivering more productive systems.
<p>Objective 5. Promote extension, communication and capacity building</p>	<ul style="list-style-type: none"> • Program outputs are made available in user-friendly format. • Initiatives for capacity building are supported. • Conferences supported at which researchers present the results of their Honey Bee and Pollination Program funded project. • Production of three Honey Bee and Pollination Program Newsletters each year. • Collaborative funding opportunities with other industries and agencies are pursued that are aligned with the aim and objectives of this plan.

Overview of the National Rural Issues program

Program aim

To deliver independent, trusted and timely research to inform industry and government leaders who influence the operating environment of Australia's rural industries.

Plan life span

As of July 2016 the plan for the National Rural Issues program was under development.

Program objectives and key performance indicators (KPIs)

Objectives	KPIs
Objective 1. Develop improved understanding and knowledge on international and domestic emerging trends or themes that will impact rural industries	<ul style="list-style-type: none">• New issues or themes are identified and analysis is robust and informative.• Research informs industry and government policy makers and influences discussion.
Objective 2. Analyse policy areas and/or themes which impact a range of rural industries to inform policy decision making	<ul style="list-style-type: none">• Research informs industry and government policy makers and influences discussion• Key stakeholders are involved in guiding cross-sectoral projects and the outcomes of these projects help to inform future priorities and actions.

Overview of the New and Emerging Animal Industries program five year RD&E plan

Program aim

To conduct RD&E for new and emerging animal industries that contributes to the profitability, sustainability and productivity of regional Australia.

Plan life span

2013 – 2018

Program objectives and key performance indicators (KPIs)

Objectives	KPIs
Objective 1. Provide new and developing animal industries with regular and up-to-date market assessments	<ul style="list-style-type: none"> • Two assessments per financial year with reports presented to industry
Objective 2. Enhance industry success through targeted industry-specific RD&E	<ul style="list-style-type: none"> • Open call and project commissioning result in judicious investment in projects which address industry priorities and are thus supported by industry
Objective 3. Facilitate new industry growth through multi-disciplinary approaches that potentially advantage several industries	<ul style="list-style-type: none"> • Three cross-industry issues identified over the planning period and research commissioned
Objective 4. Facilitate new industry growth through	<ul style="list-style-type: none"> • At least one project per open call that incorporates undergraduate, Masters, PhD or PostDoctoral participation • At least one project per open call to build the capacity of a new, emerging or maturing industry

Overview of the New and Emerging Plant Industries program three year RD&E plan

Program aim

To facilitate the development of new rural industries based on plants or plant products that have commercial potential for Australia

Plan life span

2015 – 2018

Program objectives and key performance indicators (KPIs)

Objectives	KPIs
<p>Objective 1. Feasibility studies and industry literature reviews</p>	<ul style="list-style-type: none"> • A template for the RIRDC feasibility studies completed and approved by early-2015. • Four feasibility studies are received each year for the three years to 30 June 2018. Feasibility studies are completed for plant industries for both new, as well as currently or previously funded industries. • By 30 June 2018 four industries have completed a literature review to assist with or augment the development of a feasibility study. • By 30 June 2018 simple MOUs are signed with three prospective industries that are eligible and prepared to meet RIRDC's co-funding criteria
<p>Objective 2. Incubate new and emerging plant industries, support breakthrough projects</p>	<ul style="list-style-type: none"> • Two breakthrough projects are funded each year for the three years to 30 June 2018. Projects are generally completed for plant industries that have already invested in a feasibility study. • Subsequent economic evaluation of industry specific RD&E projects in 2019 reveals an average return on investment on RIRDC funds of at least 8:1. • All stages of the RIRDC industry life cycle have had a project supported by 30 June 2018.
<p>Objective 3. Industry building and connectivity</p>	<ul style="list-style-type: none"> • Each year two industries are assisted with a strategic plan, communication tools, and an investment in capacity building or guidance on the development of a sustainable funding mechanism.
<p>Objective 4. RD&E to generate benefit across several plant industries</p>	<ul style="list-style-type: none"> • One cross-industry RD&E project supported each year to 30 June 2018. • Cross-industry RD&E projects receive funding from multiple industries.

Overview of the Pasture Seeds program five year RD&E plan

Program aim	
To invest in prioritised research, development and extension (RD&E) that maximises the opportunities and minimise the risks for a profitable and environmentally sustainable temperate pasture seed industry, and that creates a domestic and global demand from this reputation.	
Plan life span	
2013 – 2018	
Program objectives and key performance indicators (KPIs)	
Objectives	KPIs
Objective 1. Focus on growth of domestic and export pasture seeds markets	<ul style="list-style-type: none"> • Two significant export development projects have been funded by the Program by 2018. • Market research to scope export development opportunities has been completed by 2017. • Data on the benefit to key Australian industries of growing temperate legumes has been prepared and communicated to potential RDC partners by 2016. • Data on the benefit of certified seeds has been prepared and communicated to relevant landholders in temperate Australia through appropriate extension channels by 2016.
Objective 2. Improved industry capacity through skills and leadership training	<ul style="list-style-type: none"> • Two potential industry leaders have benefited from Nuffield, ARLP, Horizon, Rural Women or similar by 2018. • Gaps in research capacity identified and consideration given by the Pasture Seeds Program to provision of funding to fill the most critical – KPI delivered by 2017. • Two additional competency modules added to SITAG training courses by 2018. • A 10% increase in temperate seed industry participation in SITAG training courses by 2018. A pasture seeds researcher partially funded in a project by 2017. • International researchers are contributing to the Pasture Seeds Program by 2018.
Objective 3. Production and processing efficiency and improved sustainability	<ul style="list-style-type: none"> • A biosecurity plan incorporating industry requirements for entomology and pathology is prepared and communicated to growers, their advisors and policy makers by 2017. • Investment into pollination research that increases Lucerne seed set has been completed and information delivered to growers by 2018. • Broadening of the Pasture Variety Trial to be incorporated within the MLA trial has been achieved by 2018. • Investments in plant breeding deliver one new pasture seed variety valued by growers by 2018. • Three global best practice guidelines, incorporating outputs from breeding, agronomic, biosecurity and sustainability investments, are prepared and distributed to growers by 2018. • Agronomy project outputs inform global best practice guidelines by 2018. • One significant investment is made in harvest machinery efficiency by 2018. • RIRDC has invested in scoping a pasture seeds industry EMS by 2016.
Objective 4. Improved industry knowledge with data, extension and communication	<ul style="list-style-type: none"> • A profile, international market shares, competencies, capabilities and pipeline report is available to industry by 2016. • Cost effective and partner aligned extension and communication is achieved by 2017. • A communication strategy is produced with the industry by 2018. • Reliable production and GVP statistics available to the industry by 2015.

Overview of the Primary Industries Health and Safety Partnership program five year RD&E plan

Program aim

To support increasingly healthy, safe and productive working lives in the primary industries through investment in RD&E to drive sustainable improvements to work health and safety outcomes

Plan life span

2013 – 2017

Program objectives and key performance indicators (KPIs)

Objectives	KPIs
<p>Objective 1. To draw on our understanding of the various elements (including enablers) that influence WHS in the primary industries and the interactions between them to influence WHS outcomes.</p>	<ul style="list-style-type: none"> • Report of current knowledge of WHS in the primary industries. • Evidence-based reporting of the WHS priorities for each relevant industry sector within the primary industries. • Definition of the gaps in knowledge. • Identified drivers, enablers and influencers of WHS decision making, including interactions between them. • Identified opportunities to leverage these drivers, enablers and influencers to deliver positive change in WHS. • Strategies that gain the commitment of key stakeholders to actively leverage their influence on primary industries to deliver improved WHS
<p>Objective 2. To address the barriers to the adoption of improved WHS outcomes.</p>	<ul style="list-style-type: none"> • Identified barriers to the adoption of improved WHS practices. • Identified interactions between the barriers to adoption. • Analysis of the impacts of each identified barrier, and their relative ranking. • Clearly defined mechanisms to address the priority barriers to adoption.
<p>Objective 3. To develop and implement approaches that will deliver improved WHS outcomes within the primary industries.</p>	<ul style="list-style-type: none"> • Translation of relevant approaches used by other industries to effectively manage WHS risks. • Strategies to adapt and apply translated approaches to the primary industries • A framework applicable to each industry sector that will use new and existing structures and arrangements to deliver improved WHS outcomes. • Extension strategy and framework completed and implemented. • Collaborative arrangements successfully implemented.

Overview of the Rice program five year RD&E plan

Program aim	
To improve the productivity and sustainability of the Australian rice industry through the organisation, funding and management of a research, development and extension program that is aligned with industry reality and stakeholder needs.	
Plan life span	
2012 – 2017	
Program objectives and key performance indicators (KPIs)	
Objectives	KPIs
Objective 1. Rice breeding - varietal and quality improvement	<ul style="list-style-type: none"> Advanced germplasm with 4 degree celcius cold tolerance by 2017.
Objective 2. Prescription farming and sustainability	<ul style="list-style-type: none"> Improved production efficiency – a three year industry average of 11t/ha in 2017. Improved water use efficiency – a three year industry average of 0.9t/ML in 2017. Progress towards two crops, rice plus a winter cereal, totalling 20t/ha every 12 months.
Objective 3. Crop inputs, crop protection and grain receival	<ul style="list-style-type: none"> Maintain our control options for all major weed classes. All rice varieties tested for chemical tolerance by 2017. Elimination of nitrogen as a cause of yield loss during production cold snaps. All rice pests covered with a cost effective, APVMA compliant, control strategy. Maintenance of the industry's low disease status across its Riverina production base. Growers recognised and rewarded for quality at point of receival.
Objective 4. Extension, communication and partnership development	<ul style="list-style-type: none"> Retention of the rice industry's reputation for rapid adoption of new varieties and production technologies – established by a formal grower survey at the end of the plan period and measured against benchmarks generated during the planned review of extension. An annual allocation of resources dedicated to partnership development. Resources to be used for travel, workshops, staff exchange and other worthwhile cooperative endeavours.
Objective 5. Human capital formation and succession planning	<ul style="list-style-type: none"> Yanco rice researcher embedded in IRRI cold tolerance research, PhD students with meaningful rice research projects, rice industry Nuffield Scholars and Australian Rural Leadership Program graduates, successful travel applications and a lowering of the average age of members on the Rice R&D Committee
Objective 6. Blue sky research	<ul style="list-style-type: none"> One substantial blue sky research project funded between 2012 and 2017.



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