



QUEENSLAND FARMERS' FEDERATION

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Submission

4 August 2017

R&D Policy and Partnerships
Department of Agriculture and Fisheries
GPO Box 267
BRISBANE QLD 4001

Via email: AgricultureRoadmap@daf.qld.gov.au

Dear Sir/Madam

Re: Agriculture and Food Research, Development and Extension 10-Year Roadmap

The Queensland Farmers' Federation (QFF) is the united voice of intensive agriculture in Queensland. It is a federation that represents the interests of peak state and national agriculture industry organisations, which in turn collectively represent more than 13,000 primary producers across the state. QFF engages in a broad range of economic, social, environmental and regional issues of strategic importance to the productivity, sustainability and growth of the agricultural sector. QFF's mission is to secure a strong and sustainable future for Queensland primary producers by representing the common interests of our member organisations:

- CANEGROWERS
- Cotton Australia
- Growcom
- Nursery & Garden Industry Queensland (NGIQ)
- Queensland Chicken Growers Association (QCGA)
- Queensland Dairyfarmers' Organisation (QDO)
- Burdekin River Irrigation Area Irrigators Ltd (BRIA)
- Central Downs Irrigators Ltd (CDIL)
- Bundaberg Regional Irrigators Group (BRIG)
- Flower Association
- Pioneer Valley Water Cooperative Ltd (PV Water)
- Pork Queensland Inc.
- Queensland Chicken Meat Council (QCMC)
- Queensland United Egg Producers (QUEP)

QFF welcomes the opportunity to comment on the 'Agriculture and Food Research, Development and Extension 10- year Roadmap Discussion Paper' (discussion paper). QFF provides this submission without prejudice to any additional submission provided by our members or individual farmers.

The united voice of intensive agriculture



QFF is encouraged by the government's recognition of the uniqueness of Queensland agriculture and its farming systems (from wet tropics to temperate and arid zones), its vital contribution to the state's economy, its importance to regional and rural communities, and its potential to capitalise on the demographic changes taking place in neighboring countries. However, there currently appears to be a disconnect between what is said and written about agriculture and demonstrable government action and support. QFF considers that the roadmap to be developed out of the discussion paper must reset this situation. Responses to the specific 17 questions follow. QFF provided a separate submission on behalf of the Rural Jobs and Skills Alliance that specifically addresses workforce implications and needs.

1. What would a successful Queensland agriculture and food sector look like in 10 years?

Vision: A strong pillar of the economy that produces sustainable, high quality products with minimum waste that are underpinned by world leading integrity systems. The sector will be resilient, sustainable, adaptable, forward thinking and globally competitive. The sector is effectively managing the challenges of climate change, capitalising on changing consumer perceptions and expectations, and delivering on its environmental stewardship and social licence obligations.

Population growth and demographic changes in wealth, diet and consumer expectations will be the macro-economic drivers of the sector's future. The Food and Agriculture Organisation of the United Nations (FAO) advises that between now and 2050, the world's food system will need to produce 70 per cent more food to feed an increasingly crowded world. Continued productivity growth and improved management of existing land and resources is key to meeting these demands. For Queensland agriculture to capitalise on this opportunity, it will need to move to more intensive farming systems and maximise its use of scarce resources.

Other 'visionary' documents recently released will need to be observed. The Food Innovation Australia Ltd (FIAL) Sector Competitiveness Plan¹ outlines a ten-year vision and strategy for the food and agribusiness sector. Developed in response to the Federal Government identifying the sector as a key priority for the nation's economy, the plan includes the key knowledge priority areas and regulatory reform items to enable this vision to be realised. Achieving the vision will require industry to be supported to access new markets, and increase its productivity and/or competitiveness. Similarly, the Decadal Plan for Australian Agricultural Sciences 2017–26² attempts to identify and define actions that will position Australia's agricultural sector to take advantage of major scientific and technological advances occurring over the coming decade.

2. What policies could assist Queensland competitiveness in agriculture and food RD&E?

Assessing the competitiveness of any economic sector is a complex task, as there are a wide range of factors that can impact this measure – either in isolation or in combination (e.g. climate change, exchange rates etc.). Recent attempts to develop a trial composite agricultural competitiveness index to assist policy makers found a lack of robust, internationally-comparable agricultural sector statistical data was a major limitation³. This suggests that the tools to properly underpin the design and measure the success of competitiveness policies are not available and should be investigated further.

¹ FIAL (2017). Industry Growth Centre: Food and Agribusiness Sector Competitiveness Plan, April 2017 (https://fial.com.au/system/files/knowledge_repository/FIAL-SectorCompetitivenessPlan.pdf).

² Academy of Science (2017). Grow.Make.Prospere. The Decadal plan for Australian Agricultural Sciences 2017-26 (<https://www.science.org.au/files/userfiles/support/reports-and-plans/2017/agricultural-decadal-plan-2017-26.pdf>).

³ RIRDC (2015). Assessing the Competitiveness of Australian Agriculture, August 2015 (<https://rirdc.infoservices.com.au/items/15-054>).

The simplest and most effective policy the Queensland Government could adopt is one that recognises the importance of public sector investment in RD&E to ensure productivity gains. Policies are frequently driven by budgets rather than by anticipated outcomes, and while governments across Australia talk up agriculture as the next boom sector and a pillar of the economy, cuts to R&D budgets are common. There has also been a tendency for state governments to cut their level of funding when the Australian Government has increased RD&E funding. The 10-year roadmap should start by increasing the amount of funding for RD&E and incrementally increasing this amount.

Increasingly, modern farming businesses, research institutions and agribusinesses are not restricted by state jurisdictions. It is therefore important that policy reflects these changes and where possible is consistent with and/or complementary to national and other state policies. For example, the *Gene Technology (Queensland) Act 2016*, which commenced on 1 March 2017, brought the state's gene technology laws in step with Commonwealth legislation by automatically adopting Commonwealth laws, while allowing Queensland to opt out of future changes to Commonwealth laws where those changes aren't in the state's interests. An example where this has not occurred, at least to date, is policies about Northern Australia development. State and federal priorities and actions often appear to be at odds rather than complementary.

A cohesive, stable policy framework is important. It is incumbent on governments to foster a business environment that encourages investment and where industry can work constructively and proactively within the confines of community expectation. 'Joined up' thinking between policy priorities by government and reducing 'partisan pendulum swings' in policy with changes of government will give confidence to the industry to invest longer term.

Agricultural policies must also be more forward looking. For example, the total economic cost of natural disasters in an average year in Australia is expected to be about \$18 billion by 2030 and \$33 billion by 2050, even without considering the potential impact of climate change⁴. Queensland is the most disaster impacted state in Australia⁵. The greatest amount of diversity and high value agriculture in the state occurs east of the Great Dividing Range – the region most frequently impacted by natural disasters. Agricultural policies, particularly development and extension related activities, are not currently addressing the sector's needs and do not have it well prepared.

Another example of agricultural policy deficiency in Queensland is the lack of attention given to the energy-water nexus. Energy and water are inextricably connected. There is a connection between climate change and the water-energy nexus and how efforts to increase efficiency in both energy and water end uses can increase the agricultural sector's resilience. Climate change is continuing to affect water availability and put new stresses on energy systems (particularly in constrained areas) but the degree of future impacts is uncertain.

Efficiency in energy and water use can reduce the sectors exposure to acute and chronic stressors, including high utility bills which, with the changing climate, are negatively impacting agricultural productivity. Agriculture stands to gain significantly from an energy-water productivity agenda which acknowledges climate change, as does the entire food, fuel, foliage and fibre supply chain.

⁴ Deloitte Access Economics (2016). The economic cost of the social impact of natural disasters (<http://australianbusinessroundtable.com.au/assets/documents/Report%20-%20Social%20costs/Report%20-%20The%20economic%20cost%20of%20the%20social%20impact%20of%20natural%20disasters.pdf>).

⁵ Queensland Government (2017). Queensland Strategy for Disaster Resilience – making Queensland the most disaster resilient state in Australia (<http://qldreconstruction.org.au/u/lib/cms2/Queensland%20Strategy%20for%20Disaster%20Resilience%202017.pdf>).

It is important that governments look at how other policies impact on RD&E policies. Without the right operating environment, RD&E outcomes will not be as effective as they should, and the highest return on investment (ROI) will not be realised. For example, unless governments make the right infrastructure investments and challenge the lack of market transparency in concentrated markets, the impact of RD&E dollars will be limited for some industries because enabling and/or root causes have not been addressed. Similarly, the planning framework is urban focused and does not effectively protect (e.g. recent examples of large-scale solar facilities on prime agricultural land), foster (e.g. no uptake of rural precincts in SEQ after nearly 10 years), or promote the expansion of agricultural activities.

Finally, as R&D and the agricultural sector strengthen connections with international markets and research institutions, policies will need to ensure these connections are achievable and with limited 'red tape'. Policy needs to be continuously informed by consultative processes with relevant parties. This should remain and be strengthened to ensure that appropriate reforms and initiatives are funded.

3. How can the Queensland Government ensure new knowledge is used to inform and continuously improve the state's agricultural policies using adaptive management?

RD&E needs to have an effective feedback loop. Currently it is viewed as a linear progression – from research to development to extension – rather than a cycle of continuous improvement. More recently, the RD&E continuum has been 'broken', as state governments have largely withdrawn from extension and there are sometimes unhelpful debates about what is research and what is development. To imbed continuous improvement, there needs to be more emphasis on feedback, and feedback needs to be incorporated in to policy decision making.

Preparedness, risk management and increasing self-reliance policies play a role in continuous improvement due to their effects of farmer decision making. These empowering policies can bring about a cultural shift where farm businesses seek new information and adapt to the dynamic systems they operate in.

It is acknowledged that the delivery of extension services has undergone significant change, largely due to technological advances, but state governments withdrew from traditional extension services without ensuring alternative arrangements were in place. The Queensland Government appears to have realised this error and a new extension capacity building program in the reef catchments has commenced to help deliver on its reef water quality targets. As is the case for research projects funded over longer timeframes, it will be important that the government has a 5-10 year timeframe for this project to provide stability and ensure the best people are attracted to the agricultural sector.

4. What are the main strengths of the current Queensland agriculture and food RD&E system?

A major strength of the sector is its R&D talent. Australia is leader in many farming fields including animal production, plant biology and environmental input. Australia has also developed a strong capability in climate change research including studies on impacts, adaptation and mitigation; although this area of research is often subject to the whims of the government of the day.

The collaborative partnerships between government, industry, universities and other research providers is also a major strength, as it delivers more holistic and targeted research outcomes and ultimately results in greater ROI.

5. *What systems or models could the Queensland Government use to ensure the appropriate resources are available for the delivery for agricultural and food RD&E?*

There are numerous examples of the value of complementary, rather than competitive, public and private sector agricultural R&D, especially in a relatively small market such as Australia. We have relatively unique production systems for a range of different commodities, so without public R&D investment and the willingness to form collaborative partnerships, new technologies and innovations in these industries would be limited or simply not occur.

Balancing the R&D portfolio should be a key consideration. One of the biggest challenges managing an R&D portfolio is achieving the appropriate mix of projects ranging from basic research through to market ready projects. The recent trend has been a shift away from long term basic research activities towards short term applied research activities. While this delivers more immediate results, it creates a risk that innovations will be fewer over the longer term.

Funding timeframes must also be considered. Projects funded over longer timeframes (5-10 years) provide more secure employment for the best researchers, who may otherwise be lost or not attracted to agriculture.

6. *How can the Queensland Government make sure that the public money invested in agriculture and food RD&E gives the best value to the state?*

Changes could be made to current funding arrangements to create more efficient processes to stretch R&D funds further. For example, the overly complex and bureaucratic funding model structures in universities should be reviewed and efficiencies found. A lot of funding also goes to lawyers these days who spend considerable time trying to secure potential intellectual property (IP) revenue. Collaborative research projects have higher than necessary 'transaction costs' as projects are generally controlled by the organisation with the most complicated governance processes.

Components of the available research funding should be dedicated to 'new science' to drive the sector forward and remain a leader in agricultural innovation and R&D. If this is not the case, there is a risk that Australia will become dependent on international spill-overs rather than generating our own research. Designated funds need to be identified to ensure there is an avenue for strategic and transformative research that will benefit the sector in the long term. The sector needs to be able to take calculated risks and invest in 'new science' research that can bring bigger gains. R&D that can successfully expand export demand is adding value and it is likely to provide benefits to the farming and processing sectors if it can be achieved.

Productivity gains anywhere along the value chain are invariably good for the economy. This means food produced with fewer resources. However, this should be economically and environmentally viable. Making decisions about where to allocate R&D funds requires having an in-depth knowledge of the economic features of the market and the interactions that take place within them. Allocation of R&D funds need to consider opportunities along the entire length of the value chain.

The Queensland Government should monitor investment flows to ensure that funding and activities reflect priorities and be reactive to farmer or industry feedback, and address the comments made under question 2.

7. How can the Queensland Government ensure that the RD&E, with potentially large environmental and social returns, receives adequate financial investment?

There is a compelling case for increasing RD&E funding for agriculture. Since 1997, Australian agricultural productivity growth rates have effectively been at or close to zero. By contrast, growth rates of other comparable nations have been 1–3 per cent per annum. Productivity growth in agriculture reflects increases in the efficiency of production processes over time. It is a key determinant of farm profitability and an important mechanism for maintaining international competitiveness⁶. The prices we get in overseas markets is largely determined in overseas markets and we can't do much about those, so we must focus on the only thing we have control over in the long term – how productive we are.

Domestic policy settings are important determinants of agricultural productivity because they shape farmers' incentives and capacity to innovate and improve productivity⁷. Governments have reformed market interventions to the point where the level of agricultural support is the second lowest in the in the OECD area. These reforms made decision-making in Australian agriculture more responsive to market forces, but the productivity gains have now largely run their course.

The US public sector R&D investment has steadily grown over the past 20 years, while Australian public investment levels have remained static. Given the 15–30 year lag time between R&D investment and productivity growth, it is reasonable to suspect that investment is a factor in the stalled productivity growth being observed in Australia. If productivity growth is not addressed, the prospects of Australian and Queensland agriculture capitalising on the Asian consumption boom are limited.

As a general rule of thumb, public funding should be directed to projects that adhere to the triple bottom line principles - economic, environmental and social outcomes. It can also be argued that an increased focus on 'new science' could have increased environmental and social returns. Transformative research leads are unknown, but have the potential to open new areas and ideas that are untapped.

8. How can the Queensland Government and industry attract and increase investment for RD&E in the Queensland agriculture and food sector?

Refer question 2. The most influential thing the Queensland Government could do is create an environment where investors are in no doubt that the agriculture and food sector is 'open for business' and 'joined up thinking' at a whole of government level is apparent.

Greater coordination across government initiatives, and a more coordinated effort across research institutes – instead of the highly competitive process – would also likely attract wider investment. Cooperation across different research institutes would have additional benefits – shared resources, networks and technology – resulting research dollars being leveraged and going further.

Agriculture is an important sector and there is huge global investment in research, much of this is from the private sector. Australian researchers are partnering with the public and private sector overseas, so it's important we leverage these partnerships for the of benefit for the sector in Australia.

⁶ ABARES (2015). A manual for measuring total factor productivity in Australian agriculture, October 2015 (http://data.daff.gov.au/data/warehouse/9aap/2015/mmtfpd9aap_20151015/ManualMsrngTFPAustAg_20151015_v1.0.0.pdf)

⁷ ABARES (2014). Australian agricultural productivity growth – past reforms and future opportunities, February 2014 (http://data.daff.gov.au/data/warehouse/9aap/2014/apgpdf9abp_20140220/AgProdGrthPstRfmFtrOppsv1.0.0.pdf).

9. What are the key RD&E challenges that the Queensland agriculture and food sector is likely to face over the next 10 years?

Digital agriculture holds the promise of significant productivity benefits for the sector. However, the potential impact and implications of the 'digital agricultural revolution' are still unclear. There is much uncertainty around the rules that govern big data and its application (i.e. who owns the vast amounts of data that are being collected and how can it be used), and Australia is lagging in its acceptance and development of open data platforms. The other main challenge is the enabling infrastructure – Queensland lacks the fast, accessible, robust telecommunications network that is required.

There has been an increase in reactive research and there has always been a large focus on traditional research topics and industries. Research needs to be forward thinking and adaptive, answering emerging questions, undertaking research for developing industries rather than having a large focus on fine tuning the existing and being reactive to current events.

Australia also ranks the lowest across OECD area in collaboration between industry and research. If research continues with limited collaboration, there is a chance it could lose relevance to farmers and industry and not help progress the sector.

10. What are the key drivers of RD&E and innovation that will impact the Queensland agriculture and food sector in the next 10 years?

Australia's key drivers for innovation include:

- Food safety and management of biosecurity risks.
- Protecting the environment and managing the risks associated with climate change.
- Using technologies to optimize efficiencies, minimize waste and creating products that are viable, different and add value to the consumer.
- New markets, products and opportunities.
- Meeting and exceeding consumers' specific needs and understanding their unique characteristics.

11. How can RD&E assist those in the agriculture and food sector to best adapt to the impacts of climate change?

Climate change is one of the biggest risks for the agricultural sector in Queensland. Industry, with funding from the Department of Environment and Heritage Protection, recently completed the Queensland Climate Adaptation Strategy – Agricultural Sector Adaptation Plan. The following six recommendations are taken from the Agricultural Sector Adaptation Plan:

1. Optimise access to climate hazard information and projections at scales that can inform industry and farm-level risk assessments.
2. Continue to develop and refine tools and resources that support farm, regional, supply chain and industry-level management decision-making.
3. Support the delivery of facilitation and engagement programs
4. Improve access to necessary finance and agriculture insurance
5. Explore mechanisms to enable climate risk management and climate adaption to be addressed across agricultural supply chains
6. Enhance investment in programs and initiatives that support and catalyse innovation and resilience, with a particular focus on the 'next generation' in the agriculture sector.

12. What is the role of industry and government in climate change RD&E?

Industry and government both have a large responsibility to ensure the sector is prepared for climate change and that RD&E is meeting the needs of farm businesses. Responsibilities are not mutually exclusive. Some of the issues that need to be resolved include:

- Dedicating more R&D funding to climate change.
- Greater climate change education and trust in information.
- Adopting lessons learnt.
- Developing better business support tools.
- Developing carbon farming markets through 'small businesses bundling' opportunities and better upstream/downstream valuations.
- Identification and organisation of intermediary channels for climate change programs.
- Removing red tape.
- Increased flexibility around ROI limitations placed on RDCs (as climate change RD&E does not stack up).
- Putting a price on carbon to send a market signal.

13. What are the big RD&E opportunities for the Queensland agriculture and food sector?

improvements have and will continue to be largely driven by prevailing challenges in the sector. Recognition of the complex inter-relationships between societal, economic, environmental and technological challenges is required to drive future science solutions for change.

Table 2.1 in the Decadal Plan for Australian Agricultural Sciences 2017–26 (p. 17) provides a useful summary of likely research frontiers and theme areas. Noting the issues raised in question 9, technology and digital agriculture will create many opportunities.

Australia has a successful public and private agricultural R&D sector. With its current reputation, it has an opportunity in many fields of agricultural and food research. Australia's proximity to Asia and its understanding of the market means that it is well positioned to meet the needs and capture an increased share of this growing market. Science and technology are playing a bigger role than ever before in creating new markets.

The value proposition and product differentiation offered by Queensland's agriculture and food sector must be at the core of decision making for big RD&E opportunities. We must continue to transition from commoditised to high value products that consumers are prepared to pay a premium for. Improving our integrity systems (several competitor countries have breached our previous comparative advantage), waste management and ethical practices will be important for instilling credence attributes in our products. There will also be opportunities in functional foods. Products that have a potentially positive effect on health beyond basic nutrition (e.g. contain higher nutritional or medicinal content, such as berries containing high antioxidant concentrations) align with and build on the 'clean and green' image already established and help better differentiate our products in an increasingly competitive global marketplace.

14. How can businesses capitalise on these big RD&E opportunities while staying competitive?

Agribusinesses and farm businesses need to have the capability to both collaborate with and take part in research, and be positioned to adopt appropriate research findings.

Increasing Australia's production and its ability to capitalize on the opportunities will depend upon the development and delivery of technologies that lead to an increase of sustainably produced products.

This must be achieved with the constraints of the environment and the available land for production, and under conditions where the frequency and severity of climate events are likely to increase because of climate change.

Adequate infrastructure is also a prerequisite for the future growth of the sector by making it more cost-competitive and increase the capacity to channel products domestically and overseas.

15. What respective roles should government and industry play in agriculture and food RD&E?

Both government and industry need to facilitate the RD&E processes, and work to improve the feedback loop for R&D.

Government has a defined role in guiding, supporting and funding the overarching strategic direction of agriculture and food research to ensure it is adhering to a triple bottom line framework and is equitably spread across the sector and its competing interests.

Reducing regulatory burdens on farmers could facilitate the adoption of technologies and products. For example, commercialisation of GM crops, use of chemicals, risk analysis of biosecurity risks etc.

It is also important that there is increased collaboration between research institutions, government and industry. Data shows that industry collaboration with researchers, including universities, has a positive effect in business productivity growth.

16. How can the Queensland Government better partner with others for the provision of agriculture and food RD&E?

Continuity and known quantum in funding would go a long way towards enabling a 10-year plan. In other areas of public administration in Australia where there is shared responsibility by different levels of government, this problem has been overcome by a binding COAG agreement. It is time that such an arrangement was put in place for agricultural RD&E funding. This would also hold governments to account on the rhetoric around doubling agricultural production, being a pillar of the economy, and becoming the food bowl/delicatessen of Asia etc. Partnerships and alliances with industry would be a natural next step.

Domestic R&D and collaboration should be complemented by developing relationships and projects with established international networks to facilitate the rapid adoption of international technology best practice into Australian farms and processing facilities.

17. How can the Queensland Government and industry ensure the RD&E outcomes are effectively adopted?

Australia ranks the lowest across the OECD area in collaboration between industry and research. Only a small proportion of Australian agriculture and food businesses have a strong awareness of the breath of capabilities that lie within the research community and even fewer have structures in place to take advantage of them. Reinforcing the linkages across participants can help facilitate technology transfer and adoption of research. These partnerships can also facilitate creating more innovative solutions to problems and highlight early the direction research needs to go. Enabling industry to be involved in research will help spread the message of the research, something that industry is currently not good at.

Australia's research community is frequently characterized as too complex and difficult to engage with. Common reasons provided by industry included overly complicated IP arrangements, priority



misalignment and lack of quality translators who can understand both business needs and scientific solutions.

Agriculture is increasingly embracing new technology that require a significant level of skills and expertise in the production and research workforce. This means there is a need to ensure appropriate training and education for the future workforce is a priority. Fostering skills and closing the infrastructure gaps could provide and important boost to innovation.

Producers with good general, technical and business education would generally be more willing and better at adoption innovation. For adoption of the new technologies and products producers require understanding of background principles, and the gains and risks involved.

Provision of extension services by state and territory government has created a service gap that has in some cases not been covered by RDCs. Agribusiness has expanded their services to cover services in commercially viable cases such as the chemical or fertiliser services. There has been a shift on the extension delivery and the role of extension. These services are important for farmers to access improved technology to adapt to changing circumstances. These links can also help facilitate farmer participation in the innovation network. The issue is the willingness to pay for a service, which varies across commodities.

QFF looks forward to continuing to work with the government to develop an agriculture and food RD&E 10-year roadmap and action plan.

Yours sincerely

Travis Tobin
Chief Executive Officer