Queensland Audit Office

Agricultural science research, development and extension programs and projects

Report 3: 2015–16

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Queensland Audit Office

November 2015

The Honourable P Wellington MP
Speaker of the Legislative Assembly
Parliament House
BRISBANE QLD 4000

Dear Mr Speaker

Report to Parliament

This report is prepared under Part 3 Division 3 of the *Auditor-General Act 2009*, and is titled

Agricultural science research, development and extension programs and projects.

In accordance with s.67 of the Act, would you please arrange for the report to be tabled in the Legislative Assembly.

Yours sincerely

Andrew Greaves
Auditor-General

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Summary

Agriculture is vital to both the Queensland and Australian economies. The annual value of farm production in Australia is approximately $50 billion.

The Australian Government's recent decisions to enter into new free trade agreements mean that Australia's agricultural sector will need to become more productive to remain internationally competitive.

The agricultural sector relies on research, development and extension (RD&E) to drive growth through innovation and productivity improvements. 'Research and Development' includes pure, strategic and applied research as well as experimental development. ‘Extension’ includes providing advice, information and community education.

National and international research bodies have investigated the social and economic benefits of investments in RD&E. While hard to quantify with any precision, there is little doubt that the overall payoff for both producers and the community from past investments has been significant.

In Australia, the federal, state and Northern Territory governments, along with other research providers, coordinate RD&E activities under a national framework. This approach aims to avoid duplication of effort and maximise net benefits for Australia's agricultural industries.

The Department of Agriculture and Fisheries (DAF) is one of Queensland's largest research providers. DAF is responsible for delivering RD&E to increase the productivity of Queensland's 30 500 agriculture businesses. DAF undertakes RD&E through Agri-Science Queensland's (ASQ) three science branches — Animal Science, Crop and Food Science, and Horticulture and Forestry Science. In 2014–15, ASQ managed 498 RD&E projects of varying size, scope and value.

In 2014–15, ASQ spent approximately $65 million on agricultural RD&E projects. Of this, $30.6 million was from the Queensland Government's consolidated revenue and $34.7 million was from sources external to Queensland Government. External sources of RD&E funding include industry levies, the Australian Government, other state governments, and industry voluntary contributions. Both government and external sources of funding for RD&E are declining.

In this audit, we examined how well ASQ invests in and manages agricultural science RD&E projects and programs to determine how effectively it supports economic growth and contributes to a productive and prosperous agricultural sector.

Conclusions

ASQ makes a positive contribution to Australia's agriculture sector through leading and participating in the development of industry RD&E strategies and delivering RD&E projects aligned to those strategies.

The prospect of increased international competition, most recently through the proposed elimination of regional trade barriers, and the recent trend of declining direct government investment in RD&E makes it more important that ASQ gets its mix of projects right — that it backs those state industries and activities that will maximise agricultural productivity in Queensland — its major goal.

However, it cannot be sure that it has an optimal mix of research, development and extension activities — largely because it is operating without important strategic context and without the information it needs to know how well it has performed.

In terms of setting the strategic context, DAF has not established its RD&E priorities for Queensland or clearly articulated these in detail in its RD&E plan. By doing so DAF could better demonstrate the extent of alignment between industry priorities and Queensland's priorities. This would serve also to highlight state strategic priorities that are independent of existing industry priorities and provide necessary context for making decisions about which projects to fund.

In terms of its own performance, DAFs capacity to evaluate the outcomes and impact of its RD&E projects over the medium to long term has been significantly curtailed through resource constraints. Failing to invest in and maintain robust evaluation methodologies is short-sighted. It means that valuable information on the success or otherwise of its program is lost, making it harder for any lessons to be learnt and eliminating a useful source of information when making future funding decisions.

Investing in the right research, development and extension

If it is to increase Queensland's agricultural productivity, DAF must target its investment in RD&E activities towards the state's agriculture priorities.

We expected DAF to align its RD&E investments with a clear plan to ensure it funds the right projects and makes transparent decisions to achieve Queensland's strategic objectives for agriculture. A clear plan would also give decision makers a tool to assess individual project proposals fairly and prioritise those projects to achieve strategic objectives and optimal benefits.

Establishing a strategic framework

DAF is involved in the development of industry RD&E strategies. Participating in this national approach to RD&E aims to achieve efficiencies by reducing duplicative planning processes and through sharing knowledge.

However, industry strategies are national documents, which appropriately do not make Queensland's priorities explicit. This means that DAF cannot demonstrate through this process alone how industry priorities align specifically to Queensland's priorities and objectives and therefore how ASQ's project selection contributes to achieving Queensland's strategic objectives.

DAF's own strategic framework for RD&E investment consists of a collection of internal and external (national, state and industry) documents. DAF's internal documents describe its RD&E priorities and investment criteria or principles only in broad terms. As such, they are not sufficiently detailed or specific enough to guide RD&E investment decisions in the projects that will best achieve Queensland's strategic objectives for agriculture.

One stated investment principle is *to invest in agricultural RD&E where there are clear benefits to Queensland, including economic, environmental and social benefits*. This broad requirement to demonstrate a clear benefit is a low hurdle and not useful of itself in making investment decisions between competing projects. All projects that DAF completes are likely to achieve some level of benefit at some point for Queensland. Greater clarity and enhanced utility would be achieved by restating this principle to require investment in projects that will achieve the greatest benefits. DAF's current strategic framework does not achieve this.

DAF has commenced developing a new ten-year research and development blueprint for agriculture and food, which is a good opportunity to define Queensland’s priorities clearly.

Aligning project decisions to RD&E priorities

For most of the projects we reviewed, ASQ had documented how they contributed to industry priorities, but recorded little or no information about the expected outcomes or benefits the projects will achieve for Queensland and how they align with Queensland priorities.

Because DAF has not documented its priorities in sufficient detail, it cannot demonstrate how well, or whether, industry priorities align with Queensland's RD&E priorities. Some activities that may be a priority for Queensland may only be of benefit to new or emerging industries that do not yet have an industry strategy or funding. DAF's RD&E plan indicates that it will invest in RD&E where there is market failure but does not provide specific information about how it identifies those projects. For example, DAF is exploring a project to develop a variety of pulse that has potential to become a new export commodity but it is not clear how DAF identified this opportunity or prioritised this work.

In the context of national RD&E, it is important that DAF achieve the right balance between Queensland-specific priorities and the priorities of its industry partners. However, because it relies primarily on a workforce employed on an ongoing basis, DAF is constrained in the short to medium term in the extent to which it can progress RD&E priorities in areas where its existing workforce may not have the necessary skills and capabilities. These workforce limitations influence RD&E investment decisions.

Having a clear strategy with clearly stated priorities will also facilitate better strategic workforce planning and better enable DAF to shift the composition of its workforce over the medium term to meet its future needs.

Monitoring and evaluating RD&E outcomes

ASQ does not have a monitoring and reporting framework and ASQ's executive management does not require regular portfolio-level reports on project data. As a result, ASQ has not established the systems needed to capture and provide such information. Without this information, executive management cannot be sure that the three science branches are managing their projects effectively.

Industry evaluates the impact of RD&E investments, to which Queensland has contributed. However, ASQ does not routinely evaluate its own RD&E projects or programs. As a result, DAF cannot clearly demonstrate how well it spends Queensland's RD&E funds. ASQ does not evaluate the benefits to, or impact of, its RD&E investment on the Queensland economy, society and environment in the longer term. This means that DAF cannot assure government and the community that its RD&E investment is having the desired effect and is meeting DAF's strategic objectives. This also means that ASQ is missing the chance to gather valuable information to inform future RD&E investment decisions.

Because ASQ's systems do not capture performance data about, and ASQ does not routinely evaluate, projects or programs, ASQ cannot provide sufficient information that enables DAF to decide whether it is achieving its strategic objectives efficiently, effectively and economically as required by section 12(1) of the Financial and Performance Management Standard 2009.

Previously DAF had systems and processes to manage its RD&E project portfolio strategically and evaluate the outcomes it achieved. However, due to budget and staffing cuts, ASQ has not reviewed its portfolio of RD&E projects strategically, re-allocated resources between science branches or evaluated outcomes or impact since 2012. The three science branches now make investment decisions separately and independently; there is a siloed approach with limited opportunity for cross-branch prioritisation of projects.

Managing research, development and extension projects

The three science branches manage a number of RD&E projects at any one time. We expected ASQ to have robust project management methodology and systems to manage projects well and ensure they achieve their objectives. Project management does not need to be an onerous process and the specific requirements will vary depending on the nature, size, costs and risks associated with the project.

Managing RD&E projects

ASQ delivers individual RD&E project outputs as agreed with industry funding bodies largely because of the diligence and efforts of key personnel who focus on achieving project milestones. This is despite having uneven project management skills and abilities. Project leaders advised that they often learn project management on the job. All project leaders and directors interviewed stated that project leaders would benefit from project management training.

ASQ submits project proposals to the industry funding body explaining how it proposes to undertake the required research, development and/or extension. To avoid duplication, ASQ does not require its project leaders to develop a separate project plan. However, the industry proposal templates do not record some aspects of project management that would usually feature in a project plan, for example governance arrangements and risk management.

As external funding bodies co-fund most projects, they define the scope and objectives of the projects as well as the outputs/deliverables, resourcing (staffing and budget) and timeframes/milestones. They also review the reports and other documents ASQ produces to ensure they meet the needs of their industries.

ASQ's industry partners consistently pay ASQ at the various project milestones stages, which is an indication they are satisfied with the outputs ASQ has delivered.

Project management systems

ASQ has draft project management guidelines, which it has not implemented or trained any staff in. As a result, the quality of ASQ's management of individual projects depends on the skills and experience of the project leaders.

Critical system limitations create inefficiencies in project delivery and portfolio governance. There is a reliance on manual manipulation to undertake program and ASQ portfolio analysis and governance. The key system limitations include:

- DAF's information system does not record all relevant information or allow comprehensive reporting — there is no single, reliable source of all necessary project data.
- Each science branch records key project data in discrete databases or spreadsheets. The databases are not linked to DAF's information system.
- DAF consolidates portfolio project data manually and that data is not comprehensive or reliable.

Recommendations

We recommend that Department of Agriculture and Fisheries (DAF):

1. improves its research, development and extension (RD&E) plan so that it is sufficiently detailed to enable Agri-Science Queensland (ASQ) to make consistent and transparent investment decisions, including:
    - identifying the outcomes DAF seeks to achieve over the next 10 years (DAF's strategic objectives) and how they align to other state, national and industry priorities
    - defining DAF's investment criteria or principles to select which RD&E projects and programs to invest in
    - identifying the skills and capability required to deliver current and future projects
    - providing guidance on how DAF will prioritise when resource-constrained
    - outlining how DAF will measure, monitor, and report progress towards achieving its strategic objectives
2. reviews the ASQ portfolio of RD&E projects at appropriate intervals to ensure:
    - the projects still align to DAF's strategic priorities
    - the projects will achieve or contribute to DAF's strategic objectives
3. schedules evaluations of significant RD&E projects and/or programs to ensure the portfolio of projects is achieving strategic objectives, having an impact and ultimately benefitting industry and the community
4. implements a robust project management system that assists staff to manage RD&E projects and enables ASQ to manage and monitor the portfolio of projects, including:
    - scalable project planning based on the nature, size, cost and risks associated with the project
    - a monitoring and reporting framework to track project delivery against the plan
    - consistent, accurate and comprehensive capture of project data for portfolio monitoring, reporting and evaluation
5. finalises and implements ASQ's project management guidelines and train relevant staff as required.

Reference to comments

In accordance with s.64 of the *Auditor-General Act 2009*, we provided a copy of this report to the Director-General of the Department of Agriculture and Fisheries with a request for comment.

We considered the department's views in reaching our audit conclusions and we have included them in this report as relevant and warranted.

We have included the comments in Appendix A of this report.

1. Context

The national context

The Australian Government has prioritised agriculture as one of five pillars of the economy.

In July 2015, it released its Agricultural Competitiveness White Paper: *Stronger Farmers, Stronger Economy* (the White Paper). The White Paper outlines agriculture's importance to the Australian economy. In 2013–14:

- the value of farm production was $51 billion
- agriculture added $25 billion to the economy by underpinning Australia's largest manufacturing industry (food, beverage and tobacco processing).

Recent developments in international trade agreements between Australia and other markets will make it increasingly important that Australia's agriculture sector remains internationally competitive.

The White Paper notes that productivity growth in Australia's agricultural sector is critical to maintaining its competitiveness, and the main driver of productivity growth is innovation. Research and development programs foster innovation and productivity improvements.

National research development and extension framework

In April 2007, the Primary Industries Ministerial Council agreed to establish the National Primary Industries Research, Development and Extension Framework (the national framework). 'Research and Development' includes pure, strategic and applied research as well as experimental development. ‘Extension’ includes providing advice, information and community education. We have included detailed definitions in Appendix B.

In June 2009, the Australian, state and Northern Territory governments, the rural research and development corporations, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and universities (the parties to the national framework) agreed to better coordinate and harmonise their research, development and extension (RD&E) roles. The aim was to avoid duplication of effort and maximise net benefits for Australia's agricultural industries.

The parties to the national framework, including the Queensland Government through the Department of Agriculture and Fisheries (DAF), have progressively developed strategies to implement the national framework. To date, there are 14 primary industry sector strategies and eight cross-industry sector strategies. The strategies outline the national priorities for RD&E and the role that various agencies will take in progressing those priorities.

Parties have a lead, support or link role for each strategy. Figure 1A describes these roles.

Figure 1A
National framework role descriptions

Role	Description
National lead	The party has identified the topic as a major priority and commits to deliver national research, including infrastructure for that sector.
Support	The party undertakes some research in collaboration with national providers, but another party provides most of the research.
Link	The party undertakes little or no research itself, but accesses information and resources from other parties.

Source: Queensland Audit Office — adapted from DAF's summary of Agri-Science Queensland's role in the National RD&E Framework

The state context

In 2014–15, agriculture:

- generated approximately $15 billion in gross value of production, which represents approximately 5 per cent of Queensland's gross state product
- employed over 300 000 Queensland workers, either directly or indirectly, in approximately 30 500 businesses
- accounted for 19 per cent (or $8.973 billion) of the state's merchandise exports.

DAF's vision is for Queensland to have *productive and prosperous agriculture, fisheries and forestry sectors*.

DAF's 2014–18 strategic plan included a strategy to *improve industry performance through innovation*. DAF updated this strategy in its strategic plan for 2015–19 to *drive innovation and productivity through RD&E*.

DAF's current agricultural research, development and extension plan (the RD&E plan) states that RD&E leads to improvements in productivity through:

- lowering the costs of production
- increasing yields
- improving sustainability
- encouraging efficient resource allocation
- providing opportunities to enter new markets.

The RD&E plan also states that RD&E is critical in preventing and responding to emergent pest and disease incursions that could harm agricultural production in Queensland.

Ultimately, these outcomes benefit consumers by providing affordable and safe food and fibre products.

Queensland's role in the national strategies

Figure 1B shows DAF's role (through Agri-Science Queensland) for each strategy under the national RD&E framework.

Figure 1B
Queensland's role in national primary industries RD&E strategies

Strategy	National lead	Support	Link
Animal biosecurity		●	
Animal welfare		●	
Beef production	●		
Climate change		●	
Cotton		●	
Dairy		●	
Fishing and aquaculture		●	
Food and nutrition		●	
Forest and wood (1)		●	
Grains		●	
Horticulture (2)		●	
New and emerging industries		●	
Bioenergy	●		
Plant biosecurity		●	
Pork		●	
Poultry		●	
Sheep meat			●
Soils		●	
Sugarcane	●		
Water use		●	
Wine			●
Wool			●

Notes:

(1) Under the Forest and Wood Products Sector RD&E Strategy, DAF is the lead for tropical and sub-tropical. Under the Grains Industry National RD&E Strategy, DAF is the lead for summer grains.
(2) Under the Horticulture National RD&E Strategy, DAF is the lead for tropical and sub-tropical.

Source: Queensland Audit Office — adapted from DAF's summary of Agri-Science Queensland's role in the National RD&E Framework

Legislative and policy framework for RD&E investment

There is no specific Queensland or federal legislation governing investment in RD&E projects. However, because those projects involve a mix of public funds (from consolidated revenue) and external funds, DAF must comply with the *Financial Accountability Act 2009*, the Financial and Performance Management Standard 2009 and the Guide to the Queensland Government Performance Management Framework (PMF).

Accountability for the use of public funds

The *Financial Accountability Act 2009* requires accountable officers to achieve reasonable value for money by ensuring agencies carry out their operations efficiently, effectively and economically.

The Financial and Performance Management Standard 2009 requires agencies to retain information on whether they are achieving their strategic objectives efficiently, effectively and economically. Agencies' systems for evaluating achievement of those objectives must include assessing:

- the appropriateness of the objectives, and the services agencies deliver to achieve their objectives
- whether the performance information collected by agencies can be used to assess the extent to which the objectives have been achieved
- options to improve the efficiency, effectiveness and economy of the agencies' operations.

The aim of the PMF is to improve performance management, measuring and monitoring of results, and public reporting. The PMF sets out reporting requirements for agencies such as DAF. They are required to plan, at the whole of government, agency and individual levels, to determine what services to deliver to customers, stakeholders and the community. It also outlines:

- requirements for measuring and monitoring agencies' achievements
- how agencies should report their results for accountability, for transparency, to drive continuous improvement, and to influence trust and confidence in public sector service delivery.

Roles and responsibilities

The Minister

Queensland's Agriculture Strategy, released in 2013, outlines the then government's vision for agriculture and its target to double Queensland's agricultural production by 2040.

In May 2015, the Premier of Queensland and Minister for the Arts wrote to the Minister outlining her expectations and priority tasks. This ministerial charter letter required the Minister to develop a ten-year research and development blueprint for agriculture and food to enhance scientific collaboration within Queensland. This blueprint will replace the current RD&E plan.

To progress the new blueprint, the Minister will release a discussion paper for public consultation. DAF expects the Minister to release the blueprint by February 2016.

In August 2015, the Minister for Agriculture and Fisheries and Minister for Sport and Racing (the Minister) released the Queensland Government's new Food and Fibre Policy. This policy outlined the government's high-level vision to support a productive and prosperous food and fibre sector.

Department of Agriculture and Fisheries

DAF's role is to provide leadership for the growth and sustainable development of food, fibre, fishing and forestry industries. It is also required to optimise DAF's contribution to economic, environment and social outcomes for Queensland. DAF is responsible for delivering, through Agri-Science Queensland (ASQ), RD&E programs that lift the productivity of Queensland's agricultural businesses.

DAF will develop the new blueprint for RD&E on the Minister's behalf. In the meantime, it will implement the new Food and Fibre Policy by continuing to deliver key services across the sector and will refocus those services through the following five priority actions:

- drive growth, efficiency and sustainability
- support a modern and skilled workforce
- advance research and development
- improve Queensland's biosecurity capability
- deliver service innovation.

As the Minister released the new Food and Fibre Policy in August 2015 and DAF is still to develop the new blueprint for RD&E, we did not consider these documents during the audit.

Other parties

Other RD&E providers include state government agencies, the CSIRO, a range of Australian Government-funded cooperative research centres, and universities. Industry and private providers also work in development and extension.

These other parties are outside the scope of the audit.

Agri-Science Queensland

DAF undertakes agricultural RD&E through ASQ, which has three science branches — Animal Science, Crop and Food Science and Horticulture and Forestry Science. Figure 1C describes the focus of each science branch.

Figure 1C
Key focus of each ASQ science branch

Science branch	Key focus
Animal Science	Queensland's tropical and sub-tropical livestock industries and fisheries with a focus on aquaculture, beef, bees, dairy, fisheries, pork, poultry and sheep.
Crop and Food Science	Queensland's tropical and sub-tropical broad-acre cropping and food industries with a focus on crop improvement, crop protection, sustainable farming systems and innovative food technologies.
Horticulture and Forestry Science	Queensland's tropical and sub-tropical horticulture and forestry industries with a focus on deciduous fruit, sub-tropical fruit and nuts, tropical fruit, vegetables and forestry.

Source: Queensland Audit Office

In 2014–15, ASQ's science branches managed 498 RD&E projects as follows:

- Animal Science — 77 projects
- Crop and Food Science — 143 projects
- Horticulture and Forestry Science — 278 projects.

The size and scope of these projects vary. Some projects are very small (around $20 000 in total) and some are larger ($5 million over five years). The majority of projects run for three to five years.

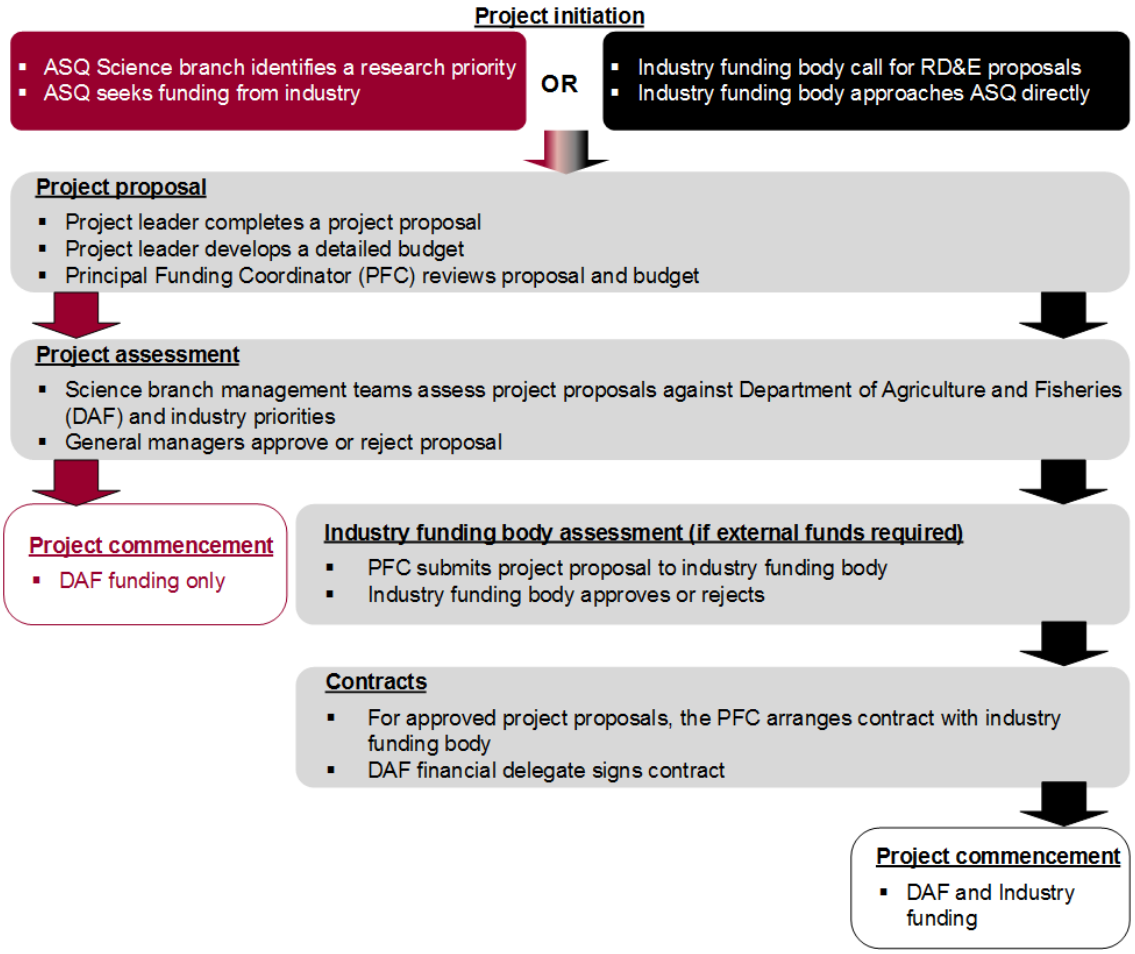
RD&E project commencement process

ASQ begins new RD&E projects in one of two ways. The first is that an industry funding body — usually a research and development corporation — releases a 'call for submissions' or 'expression of interest' seeking project proposals. In some cases, an industry funding body contacts ASQ directly and asks a scientist to develop a proposal on a particular research topic. One or more of ASQs scientists then develop a project proposal for ASQ senior officers to consider, and if supported, ASQ submits the proposal to the funding body.

The second way is that ASQ initiates the project proposal development. In these cases, an ASQ scientist develops a project proposal for senior officers to consider without industry first seeking submissions.

We have summarised ASQ's RD&E project approval process in Figure 1D.

Figure 1D
ASQ's RD&E project approval process



Source: Queensland Audit Office

ASQ's information management systems

ASQ records information about its RD&E projects in a number of discrete information systems shown in Figure 1E.

Figure 1E
ASQ's discrete information systems

System	System purpose
Clarity	Clarity is a project management system. ASQ currently uses Clarity to manage the project approval process and to store project documents such as contracts, sub-contracts, project budgets and project variations.
SAP	SAP records project-related financial transactions.
Datapond	Datapond is an application connecting Clarity and SAP. It draws information from SAP each evening and updates Clarity with expenditure transactions. Datapond also links information from SAP with the Animal Science database.
Animal Science database	The Animal Science branch uses a database to record and report on key project-related information.
Crop and Food Science database	The Crop and Food Science branch uses a different database to record and report on key project-related information.
Horticulture and Forestry Science spreadsheet	The Horticulture and Forestry Science branch uses a spreadsheet to record and report on key project-related information.

Source: Queensland Audit Office

Research, development and extension funding

Funding for RD&E comes from a variety of sources including industry levies, the Australian Government, state governments and industry voluntary contributions.

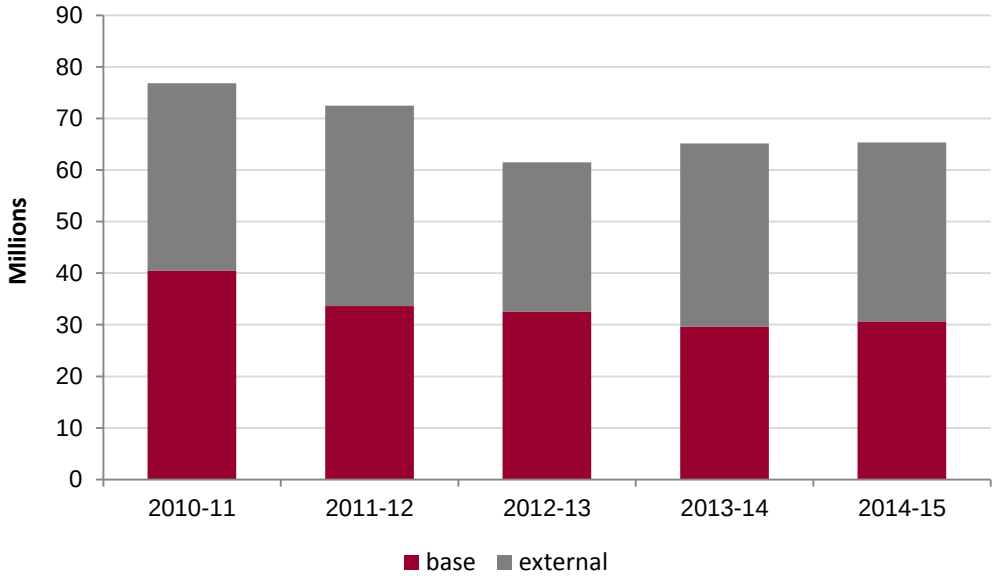
In 2014–15, ASQ spent approximately $65 million on agricultural RD&E projects, down from $77 million in 2010–11. Of this, $30.6 million was base funding (from consolidated revenue) and $34.7 million was from external sources including industry.

Figure 1F show that the total combined external and base funding for RD&E projects declined over the five years to 2014–15. This is partly due to the establishment of university partnerships, which attract external funds direct from the research and development corporations (RDCs).

DAF has split the total expenditure across the three science branches in relatively consistent proportions over the last four years:

- Animal Science — approximately 25 per cent
- Crop and Food Science — approximately 42 per cent
- Horticulture and Forestry Science — approximately 33 per cent.

Figure 1F
Agriculture RD&E project expenditure



Source: Department of Agriculture and Fisheries

Departmental changes relevant to RD&E

The Queensland Government's machinery of government changes have changed the name and functions of the department responsible for Queensland's agriculture and fisheries industry. Figure 1G shows departmental name changes over the last 10–11 years.

Figure 1G
Department names

Year	Name of department
2004	Department of Primary Industries and Fisheries
2009	Department of Employment, Economic Development and Innovation
2012	Department of Agriculture, Fisheries and Forestry
2015	Department of Agriculture and Fisheries

Source: Queensland Audit Office

In January 2010, the then Department of Employment, Economic Development and Innovation (DEEDI) made internal structural changes, including splitting up one of its business units, the Research and Development Strategy Group (also known as the Investor Group). Prior to the changes, this group:

- assessed all new project proposals to determine whether they aligned with Queensland's strategic priorities
- facilitated an annual review of ASQ's portfolio involving peer review ranking of all current projects
- undertook scheduled evaluations of agricultural RD&E projects and programs.

In late 2010, DEEDI ceased using the investor model processes and moved staff to other activities.

In addition to machinery of government changes, DAF's budget and staffing have changed significantly over the last three years. In 2011, and again in 2012, the then government required agencies to find budget savings and reduce non-front line full time equivalent (FTE) staff.

To achieve the savings, DAF undertook a process of identifying non-core activities or activities not aligned with key priorities. ASQ took the opportunity to look at the whole RD&E portfolio and made decisions about what RD&E activities to stop. DAF invited staff to apply for voluntary separation packages and/or voluntary redundancies. As a result, DAF's workforce has reduced by approximately 600 FTE in total since 2012. This included a number of staff from ASQ as well as staff who previously performed the investor model function.

Audit objective and cost

The objective of the audit was to establish whether ASQ's agricultural, science RD&E programs and projects support economic growth and contribute to an efficient, innovative and profitable sector.

The audit addressed the objective through the following sub-objectives:

- Determine whether a strategic framework aligns agricultural RD&E investment to state and national priorities.
- Establish whether ASQ manages its RD&E projects well to achieve their objectives and deliver the intended benefits.

The audit cost $320 000.

Report structure

We have structured the remainder of this report as follows:

Chapter	Description
Chapter 2	assesses DAF's investment in RD&E projects and activities
Chapter 3	evaluates DAF's management of RD&E projects
Appendix A	contains the responses received on this report
Appendix B	contains definitions of research, development and extension
Appendix C	describes the audit methodology
Appendix D	outlines the Department of Primary Industries and Fisheries Research and Development Strategy Group Assessment Criteria

2. Investing in the right research, development and extension projects

In brief

The Department of Agriculture and Fisheries (DAF) invests in research, development and extension (RD&E) projects to increase Queensland's agricultural productivity and help grow Queensland's economy.

Investing in the right mix of projects and managing the portfolio of projects well is crucial in ensuring that DAF's RD&E resources maximise benefits for the agricultural sector and Queensland as a whole.

Conclusions

DAF operates in a national system and invests in RD&E that contributes to the objectives of Australia's agriculture industry. It is clear how DAF is contributing to national industry priorities. However, because DAF has not documented Queensland's RD&E priorities sufficiently and its decision-making is not transparent, it cannot demonstrate that it is investing in RD&E projects, which together, will achieve the strategic objectives for Queensland's agriculture sector. Therefore, we cannot be confident that Queensland's investment in agriculture industries will optimise productivity and international competitiveness.

Weaknesses in ASQ's systems mean that DAF does not have all the information needed to assess whether it is achieving its strategic objectives efficiently, effectively and economically. The specialised nature of DAF's workforce constrains it in reallocating resources across its project portfolio and, because DAF has not documented detailed strategic priorities for the future, it cannot identify the skills and capabilities it will need to deliver them.

Findings

- DAF participates in the development of national industry strategies for RD&E but those strategies do not make Queensland's priorities explicit.
- DAF does not have a sufficiently detailed RD&E plan to ensure that it invests in the right mix of projects to achieve its strategic objectives.
- Without a clear plan and a formal assessment process, DAF relies on Agri-Science Queensland's (ASQ) senior officers to make investment decisions aligned to the state's priorities and strategic objectives.
- ASQ does not have a reporting framework or systems to collect, aggregate and analyse project milestones, budgets, expenditure and risks across its three science branches.
- ASQ does not routinely evaluate its RD&E projects at the program (groups of projects) level.
- ASQ has not reviewed its entire project portfolio since 2012, and there is limited reallocation of resources across the three science branches.

Recommendations

We recommend that the Department of Agriculture and Fisheries (DAF):

1. improves its research, development and extension (RD&E) plan so that it is sufficiently detailed to enable Agri-Science Queensland (ASQ) to make consistent and transparent investment decisions, including:
    - identifying the outcomes DAF seeks to achieve over the next 10 years (DAF's strategic objectives) and how they align to other state, national and industry priorities
    - defining DAF's investment criteria or principles to select which RD&E projects and programs to invest in
    - identifying the skills and capability required to deliver current and future projects
    - providing guidance on how DAF will prioritise when resource-constrained
    - outlining how DAF will measure, monitor, and report progress towards achieving its strategic objectives
2. reviews the ASQ portfolio of RD&E projects at appropriate intervals to ensure:
    - the projects still align to DAF's strategic priorities
    - the projects will achieve or contribute to DAF's strategic objectives
3. schedules evaluations of significant RD&E projects and/or programs to ensure the portfolio of projects is achieving strategic objectives, having an impact and ultimately benefitting industry and the community.

Introduction

Increasing Queensland's agricultural productivity requires targeted investment in research, development and extension (RD&E) activities that address the state's priorities. Queensland's RD&E investment occurs within a complex national system, which involves the Department of Agriculture and Fisheries (DAF) working collaboratively with other states and territories, the Australian Government, rural research and development corporations, and universities.

To achieve its strategic objectives, DAF needs a clear plan to align its RD&E investment to its strategic objectives. This would allow DAF to demonstrate how it selects the right projects to achieve those objectives. Given that DAF operates in a national system, we expected its RD&E plan to show how DAF's RD&E priorities align to national, state and industry priorities.

It is also important that DAF manages its portfolio of RD&E projects well, including monitoring and reporting key project data, evaluating projects and programs and strategically reviewing the portfolio at appropriate intervals. By doing this, DAF could show that its RD&E investment is achieving its strategic objectives efficiently and effectively.

In this chapter, we examine whether DAF is selecting and managing a portfolio of projects designed to deliver increased agriculture productivity. Specifically, we assessed:

- whether the strategic framework for RD&E investment is an effective guide for consistent, transparent and objective decisions aligned to Queensland's agriculture priorities
- whether DAF monitors and evaluates the RD&E portfolio's performance to ensure it delivers benefits and meets the strategic objectives.

Conclusions

While it is clear that DAF works within a national system for RD&E and invests in a suite of projects that assist in addressing industry priorities, it is not clear how DAF's contribution addresses Queensland's strategic objectives for agriculture. This is partly because DAF has neither documented Queensland's agricultural RD&E priorities in sufficient detail nor shown how they link to industry priorities. It is also because DAF's project documentation does not clearly state how the projects will contribute to the achievement of Queensland's priorities.

DAF has not designed a sufficiently detailed strategic framework to guide project selection. As a result, DAF may invest in a wide range of RD&E projects that may or may not deliver the required increases in productivity. Government and the community cannot be confident that DAF is investing in the RD&E projects that contribute the most to the productivity and competitive advantage of Queensland's agriculture sector.

DAF does not have the systems in place to meet all aspects of its obligations under section 12(1) of the Financial and Performance Management Standard 2009 or show how well it is using Queensland's RD&E resources. This is because it does not manage and report on its portfolio of RD&E projects in a holistic and transparent way. Specifically, it does not capture or monitor key project data at a portfolio level or evaluate the effectiveness of its project delivery in achieving intended benefits and impacts for Queensland.

In addition, it has not strategically reviewed its entire project portfolio for the last three years. In saying this, DAF cannot simply reallocate resources across its project portfolio because of the specialised nature of its science workforce. Without a detailed workforce development plan to identify gaps in skill requirements, and ability to address those gaps, skills and capability considerations influence investment decisions.

Establishing a strategic framework

A clear and comprehensive plan for investing in RD&E projects should include:

- the specific outcome/s DAF seeks to achieve — what Queensland wants to achieve in the agriculture industry by a set timeframe
- the specific current and future agricultural science RD&E priorities DAF will focus on in order to achieve the outcomes
- how DAF's priorities align to national, state and industry priorities
- DAF's investment criteria or principles and how DAF will make investment decisions
- how DAF will balance competing priorities
- how DAF will measure, monitor and report on its progress towards achieving the outcomes.

A comprehensive plan provides a clear line of sight between individual projects and groups of related projects (programs) and the desired outcomes. It also gives decision-makers a tool for assessing individual project proposals fairly and prioritising those projects to achieve strategic objectives and optimal benefits.

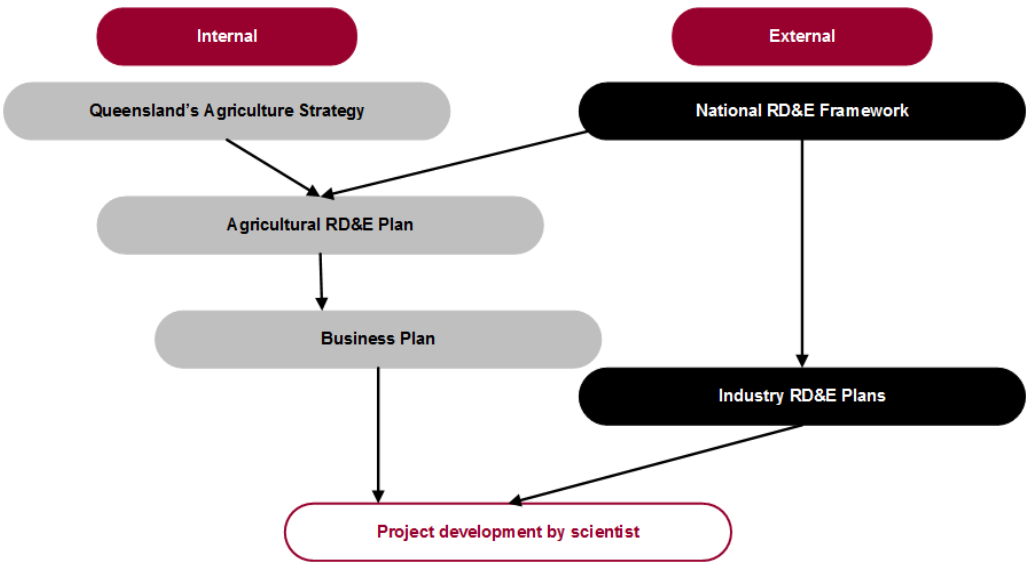
DAF's strategic framework for RD&E investment is complex because it is a collection of separate national, state and industry documents and frameworks. Priorities are not static and parties renegotiate them periodically through national planning processes.

DAF's RD&E strategic framework consists of a range of internal and external (national and industry) documents including:

- Queensland's Agriculture Strategy, 2013
- DAF's agricultural research, development and extension plan (the RD&E plan), 2013
- DAF's Agriculture Business Plan, 2014–15
- the National Primary Industries Research, Development and Extension Framework (the national framework)
- twenty-two current industry RD&E strategies, which support the national framework.

Figure 2A shows DAF's existing strategic framework.

Figure 2A
DAF's pathway to determining RD&E priorities (strategic framework)



Source: Queensland Audit Office

Internal documents

Queensland's Agriculture Strategy

This document, released in 2013, is the then government's strategy for the agriculture sector. It states that the 2040 vision for Queensland's agriculture, fisheries and forestry industries is to have an efficient, innovative, resilient and profitable sector that thrives in the long term.

In support of this vision, the then government set a clear, ambitious target to double Queensland's agricultural production by 2040. The strategy outlines four pathways to growth, including driving productivity growth across the supply chain and minimising the costs of production. It notes that the key to productivity growth is development and adoption of innovation across the supply chain.

The strategy also committed the then government to implementing an RD&E plan that set clear targets for transformational research, capability, industry development, sustainability and improved international linkages.

Agriculture RD&E plan

The current RD&E plan, released in 2013, expresses DAF's priorities as outcome statements aligned to the then government's objective of doubling productivity by 2040. It describes DAF's RD&E strategies and investment principles in broad terms.

For example, one of the strategies in the RD&E plan is:

> 'RD&E strategies will minimise the cost of production by … improving systems for integrating new technologies, focusing on people, enterprises and business management to support adoption and uptake of new innovations.'

The RD&E plan outlines generic principles for investment. They are not specific enough to assist decision makers in assessing whether a particular project is suitable for investment or in prioritising one project over another. For example, one of the principles is:

> '… invest in agricultural RD&E where there are clear benefits to Queensland — including economic, environmental and social.'

All projects that DAF completes are likely to achieve some level of benefit at some point for Queensland. The RD&E plan is not a comprehensive plan to guide decisions and provide transparency. It does not contain sufficient details about DAF's priorities to direct RD&E investment towards the areas of greatest strategic priority for Queensland. Specifically, it does not explain:

- how DAF makes investment decisions and balances competing priorities
- how DAF's priorities align to national, state and industry priorities
- how DAF will measure, monitor and report on progress towards achieving its objectives
- how DAF will govern its RD&E investment.

Because the RD&E plan is broad and non-specific, it is possible to say that any project aligns with its priorities and investment principles. It does not direct DAF scientists towards the highest priority projects. The RD&E plan notes that industry strategies will guide detailed operational RD&E planning and funding. This means that DAF intended that industry strategies would provide the detailed guidance about prioritising projects, which makes it critical that those strategies clearly align to Queensland's priorities.

Agriculture Business Plan

DAF's Agriculture Business Plan lists strategies and activities for the financial year, including RD&E projects. Due to its short-term nature, the business plan does not guide future investment decisions, but it could still state how DAF's priorities align with other state, national or industry priorities.

External documents

National framework

The aim of the national framework is to improve coordination of RD&E nationally, maximising the impact of resource investment and minimising fragmentation and duplication of these resources throughout Australia. The national framework recognises that parties to the framework can provide basic and strategic research from a distance, and that they can adjust and extend the research to help industry gain the most value from innovation.

The national framework does not in itself guide RD&E investment decisions, rather it sets up a system for Australian research providers and funders to work together to coordinate their RD&E effort.

Industry strategies

Twenty-two current industry RD&E strategies support the national framework. The industry strategies are specific to an industry or commodity (for example, pork, beef and grains) or address a cross-sectoral issue (for example, climate change or animal biosecurity) at the national level. The strategies outline the specific RD&E activities that each industry will focus on during the term of the strategy.

The industry strategies are specific enough to guide decision-makers in making national RD&E project choices. Understandably, they do not contain state specific priorities as their focus is national and state borders are therefore irrelevant.

Assessing RD&E project alignment with Queensland's priorities

Historical approach to RD&E priority alignment

Historically, DAF assessed its RD&E projects with the assistance of the Research and Development Strategy Group (also known as the Investor Group) under the former Department of Primary Industries and Fisheries (DPI&F). The Investor Group reviewed all new project proposals to determine whether they aligned with Queensland's strategic priorities.

The Investor Group implemented a two-stage proposal assessment process, which required project proponents to self-assess against 11 criteria and complete an assessment form. We have provided the list of criteria in Appendix D. The Investor Group then reviewed the assessment forms and made recommendations about whether the projects should proceed.

With this process, DPI&F aligned its portfolio of RD&E projects to Queensland's strategic priorities and clearly documented that alignment.

In 2009, a machinery of government change established the Department of Employment, Economic Development and Innovation (DEEDI). This included the former DPI&F. On 4 January 2010, DEEDI restructured in an attempt to extend the Investor Group processes across the broader DEEDI and its functions. This was unsuccessful and DEEDI stopped using the assessment process later in 2010.

Aligning to industry strategic priorities

Although DAF no longer formally assesses new project proposals using the Investor Group model, it does align projects with industry priorities.

The alignment of DAF's projects to industry priorities is generally clear. The RD&E project proposal documents we reviewed indicate how the projects align with relevant industry strategies or plans. When industry agrees to co-fund RD&E projects with ASQ, it does so because it is satisfied that the projects will meet industry needs and achieve benefits for industry.

Aligning to Queensland strategic priorities

It is not clear how DAF's RD&E projects align to Queensland priorities.

DAF participates in industry forums and contributes to the development of industry RD&E strategies. As result, DAF asserts that Queensland's priorities are included in the industry strategies and that projects aligned to the industry strategies are contributing towards addressing Queensland priorities.

However, the strategies do not make Queensland's priorities explicit, so DAF cannot demonstrate clearly how its RD&E projects align to Queensland's priorities and objectives.

One way to test ASQ's strategic approach to project selection — one that balances the priorities of industry with Queensland's broader priorities — would be to consider projects it undertakes without the involvement of an industry partner. This could include activities where there might not be a current industry in place to provide co-funding.

ASQ does sometimes conduct RD&E projects that are solely base funded, which means it has no co-investment from industry partners. ASQ was able to provide limited documentation about a solely base funded mango breeding project. This project involved developing new and improved varieties of mangos, which takes many years to achieve commercial fruition. At the time, industry did not have the funding to invest in this longer-term RD&E project and DAF decided to do it alone. Industry has co-funded subsequent projects.

DAF's RD&E plan indicates that it will invest in RD&E where there is market failure but does not provide specific information about how it identifies those projects. For example, DAF is exploring a project to develop a variety of pulse that has potential to become a new export commodity like mungbeans, but it is not clear how DAF identified this opportunity or prioritised this work.

DAF does not consistently record data about these projects. As a result, it cannot show that it invests strategically in RD&E projects that will address Queensland's strategic priorities regardless of industry involvement.

Making investment decisions

ASQ's project leaders and directors explained to us why ASQ approved three particular projects we explored in more detail. They also explained why the projects were important for Queensland. We have outlined these reasons in Figure 2B.

Figure 2B
Project approval reasons as reported by project leaders and directors

Project	Reasons provided by ASQ personnel
Understanding apple and pear production	The external funding body chose Queensland to manage the project because the most competent and articulate scientist working in the field was living in Queensland at the time. Queensland is a significant player in the industry. It is the third largest apple producing state and has the highest level of production per hectare in Australia. To ensure sustainability and productivity of the apple and pear industry, it is important to research the changing requirements for chilling as the climate warms. Knowledge gained from researching the climate change impacts on apples is transferrable to other Queensland crop industries.
National barley foliar pathogen variety improvement program	The project manager is the leading barley pathologist in Australia. It is important to maintain the skills levels of staff working with endemic diseases in crops so that if an exotic incursion occurs DAF has the staff capability and capacity to respond (in conjunction with Biosecurity Queensland). Foliar disease is a major production constraint in Queensland — more than in any other state — and therefore research can enhance productivity. This project can make significant contributions to barley production by controlling disease to gain better yields and better quality barley (which is used to make malt for beer).
Leading Sheep 2011–2015	Despite Queensland's sheep industry being relatively small (although slightly increasing) the project is important to Queensland's economy as it will enhance productivity and profitability of the sheep and wool industry by demonstrating and sharing methods to change farm practices and produce more (and better quality) sheep and wool.

Source: Queensland Audit Office

It is clear that the scientists involved are satisfied that their projects align with Queensland's priorities as well as industry priorities. However, ASQ has not clearly documented its reasons for investing in these projects.

With limited resources, ASQ needs to be able to demonstrate it is investing in the highest priority areas for Queensland. It is unclear whether this is occurring, based on the siloed nature of the decision-making and the lack of strategic direction from a planning perspective.

Skills and capability considerations

For two of the three projects we explored in further detail, project leaders and directors advised that they supported the projects because they assisted in developing or retaining scientists' skill levels. The project leaders and directors did not document this as part of the project approval process.

This is an important consideration in project selection, as the RD&E plan identifies building skills and capacity as a principle for investment. However, the plan does not provide further guidance on how to weight this principle against other strategic priorities. As a result, ASQ could give developing and/or retaining the skills of ASQ's current cohort of scientists as a reason for approving every potential new project. Because DAF is constrained in the extent to which its specialised permanent workforce can be reallocated or reduced, workforce considerations influence RD&E investment decisions.

ASQ only proceeds with a potential new project if one or more of its scientists develop a project proposal for its senior officers to endorse and/or approve. This raises a question as to whether ASQ misses potential new project opportunities if the scientists it currently employs do not have an interest, the specialised skills or capacity to develop a project proposal.

DAF does not consistently capture data or document reasons for decisions about RD&E project ideas ASQ considered but did not progress. As a result, DAF cannot prove that it rejects project ideas because they are not a strategic priority for Queensland. It also cannot show the extent to which potential new projects, which may be of high value to Queensland, did not proceed because ASQ's existing scientists did not develop a proposal.

This could suggest that the only projects that ASQ progresses for approval are those that ASQ's existing scientists have an interest in, relevant skills or capacity to complete. DAF's workforce plan for ASQ does not include determining whether, and if so, where, it has gaps in its workforce.

Documentation

Without a detailed RD&E plan and a formal assessment process to guide investment decisions, DAF relies on the combined knowledge and experience of ASQ senior officers to make investment decisions aligned to the state's priorities and strategic objectives. This means it is critical that those officers document their reasons for proposing, supporting and/or approving specific projects so that those decisions are transparent.

ASQ's senior officers do not document how they make their investment decisions. For all seven projects we reviewed, ASQ recorded little or no information about how each project aligned with Queensland priorities. In contrast to DPI&F's former project assessment forms, recent project documentation does not outline why ASQ approved the project, the project's strategic importance or the expected outcomes or benefits for Queensland.

This approach limits transparency in investment decisions and DAF cannot demonstrate that individual projects align with Queensland's and DAF's strategic priorities. DAF also cannot show that it is investing in the best mix of RD&E projects to maximise outcomes from spending public funds.

Monitoring and evaluating RD&E outcomes

To invest strategically in RD&E DAF requires a structure for prioritising and selecting the right portfolio of projects and programs, aligned to industry and Queensland strategic priorities. It needs to allocate appropriate resources and then evaluate the outputs and outcomes of the portfolio to demonstrate successful delivery of the strategy.

To maximise returns from investment, effective portfolio management includes:

- collecting and analysing relevant data
- monitoring and reporting progress against key outcomes
- evaluating the use of inputs and the achievement of outputs and outcomes
- evaluating impact
- ensuring ongoing alignment with strategic objectives.

Monitoring and reporting progress

Section 12(1) of the Financial and Performance Management Standard 2009 requires agencies to obtain information on whether they are achieving their strategic objectives efficiently, effectively and economically. This requires ASQ to collect key performance information about its RD&E projects.

ASQ collects data at an individual project level on time, cost and milestone delivery within each science branch. However, ASQ does not have a reporting framework or systems to collect, aggregate and analyse project milestones, budgets, expenditure and risks across the three science branches. This means DAF does not have the information to assess whether it achieves the objectives stated in its strategic plan efficiently, effectively and economically.

ASQ's executive management does not require the science branches to provide and analyse aggregated portfolio data on a regular basis. As a result, ASQ has not implemented effective systems for capturing and reporting relevant data and, with one exception, the only portfolio reports ASQ produces are narrative based. These reports outline key achievements for a selection of projects but do not provide a holistic view of the portfolio, including data on the extent to which the portfolio is on track in terms of time, cost or milestone delivery.

The one exception is that ASQ provides an Excel spreadsheet of current projects to the Director-General on a quarterly basis. ASQ's three science branches update it manually over several weeks. It is inherently unreliable as it depends on manual data entry. We found this spreadsheet to contain inconsistencies and significant gaps. One of the key issues is that it did not include the total value of each current project, only the value of the industry funded component of the project.

Reviewing portfolio alignment

We expected DAF to review its entire project portfolio systematically and at appropriate intervals to ensure projects remain viable and aligned to DAF, Queensland and national priorities. This no longer occurs.

The Investor Group previously facilitated an annual review of ASQ’s portfolio involving peer review ranking of all current projects. It made recommendations to DPI&F's Board of Management (Director-General, Deputy Directors-General, Executive Directors and Chief Financial Officer) about reallocation of investment over time between the science branches where appropriate.

These annual review processes served a useful purpose and assisted DPI&F to manage its project portfolio effectively. However, in 2010, the former DEEDI discontinued these processes.

Now the three science branches make investment decisions separately and independently, there is a siloed approach with limited opportunity for cross-branch prioritisation of projects. This is partly because DAF has not clearly specified its strategic priorities and investment criteria or principles.

DAF reported that as part of the annual budget process ASQ prioritises projects across the three branches to determine funding requirements. However, it could not provide evidence supporting these assertions at the time of the audit.

Evaluating impact

The Queensland Government Program Evaluation Guidelines state that evaluation is an essential part of the management and delivery of public sector programs. The guidelines outline a set of broad principles that underpin evaluation of programs that the Queensland Government funds. They clarify expectations for evaluation of public sector programs in Queensland and set minimum requirements for planning, implementing and managing program evaluations.

Well-designed evaluations are a valuable tool for public sector agencies to use in strengthening the efficiency of their program delivery and demonstrating program effectiveness and impact.

Impact evaluation provides assurance to government and the community that RD&E investment delivers benefits.

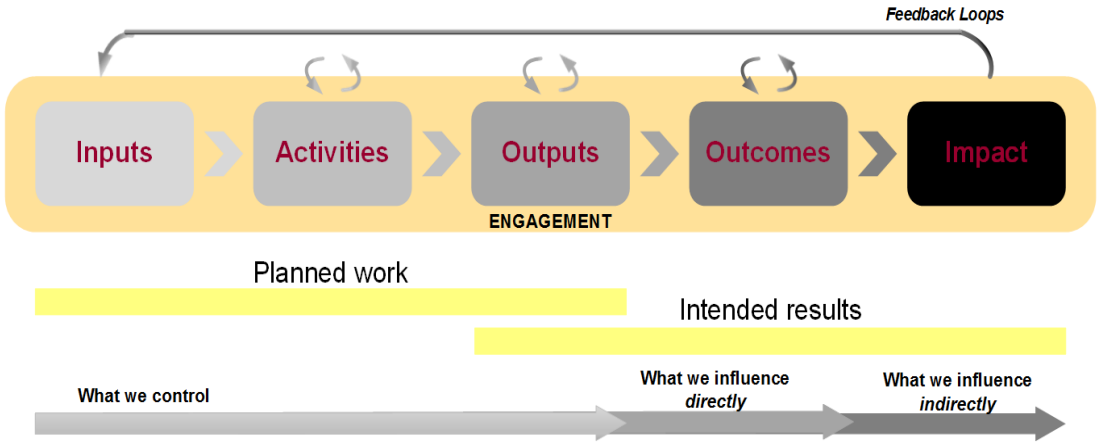
The Commonwealth Scientific and Industrial Research Organisation (CSIRO) defines impact as:

> An effect on, change or benefit to the economy, society or environment, beyond those contributions to academic knowledge.
>
> Impact includes, but is not limited to an effect on, change or benefit to the activity, attitude, awareness, behaviour, capacity, opportunity, performance, policy, practice, process or understanding of an audience, beneficiary, community, constituency, organisation or individuals in any geographic location whether locally, regionally, nationally or internationally. Impact also includes the reduction, avoidance or prevention of harm, risk, cost or other negative effects.

The CSIRO has developed a framework based on the concept that in order to assess the value of research, it must be possible to track the process from inputs to impacts. The CSIRO Impact Evaluation Guide identifies the inputs and activities required to deliver research outputs, and the uptake and adoption outcomes that will need to occur to eventually lead to the desired impact.

Figure 2C sets out a schematic of the CSIRO's Impact Logic Model, which is included in its Impact Evaluation Guide. This model provides useful guidance to agencies such as DAF, which (like CSIRO) are responsible for investing public funds in RD&E to achieve outcomes, create impact and ultimately benefit industry and the community.

Figure 2C
CSIRO's Impact Logic Model



Source: Queensland Audit Office — Adapted from CSIRO's Impact Evaluation Guide

DAF does not have evaluation guidelines or a logic model for its RD&E investment to demonstrate how its projects contribute to achieving its strategic objectives.

Historically, the former DPI&F regularly evaluated its RD&E activities and initiatives at the program level.

In 2010, when DEEDI restructured the Investor Group, it ceased scheduled evaluations of agricultural RD&E activities. As a result, DAF can no longer show how well it spends Queensland's RD&E funds and what benefits the projects and programs deliver. This means it is missing important information necessary to determine whether it is meeting its strategic objectives efficiently, effectively and economically as required under section 12(1) of the Financial and Performance Management Standard 2009.

Individual industry research and development corporations (RDCs) commission industry or commodity evaluations of RD&E investment. However, these reports cover national investment (not just Queensland). They enable RDCs to account for their investments to their levy payers.

While these reports are useful to industry, they do not specifically evaluate DAF's RD&E investment. As a result, DAF cannot rely on them to meet its statutory obligations.

There is a body of national and international evidence showing the economic and social benefits from expenditure in RD&E. However, DAF can no longer demonstrate the benefits its expenditure in RD&E is contributing to Queensland.

Recommendations

We recommend that the Department of Agriculture and Fisheries (DAF):

1. improves its research, development and extension (RD&E) plan so that it is sufficiently detailed to enable Agri-Science Queensland (ASQ) to make consistent and transparent investment decisions, including:
    - identifying the outcomes DAF seeks to achieve over the next 10 years (DAF's strategic objectives) and how they align to other state, national and industry priorities
    - defining DAF's investment criteria or principles to select which RD&E projects and programs to invest in
    - identifying the skills and capability required to deliver current and future projects
    - providing guidance on how DAF will prioritise when resource-constrained
    - outlining how DAF will measure, monitor, and report progress towards achieving its strategic objectives
2. reviews the ASQ portfolio of RD&E projects at appropriate intervals to ensure:
    - the projects still align to DAF's strategic priorities
    - the projects will achieve or contribute to DAF's strategic objectives
3. schedules evaluations of significant RD&E projects and/or programs to ensure the portfolio of projects is achieving strategic objectives, having an impact and ultimately benefitting industry and the community.

3. Managing research, development and extension projects

In brief

In 2014–15, Agri-Science Queensland (ASQ), through its three science branches, spent approximately $65 million on 498 research, development and extension (RD&E) projects. The branches managed these projects using a variety of project management approaches. ASQ captures information about these projects in multiple systems, databases and spreadsheets.

Conclusions

ASQ is generally delivering individual project outputs within scheduled time, cost and quality and in line with industry RD&E objectives as evidenced by external parties continuing their funding support.

However, the Department of Agriculture and Fisheries (DAF) has not established and rolled out robust project management guidelines and supporting systems to efficiently manage its large portfolio of projects.

Findings

- ASQ has a draft project management manual but it has not formally approved it. The science branches are not all aware that the manual exists and they do not all use it.
- Project leaders, directors and others monitor project time, cost and quality through various tools they have developed.
- External funding bodies co-fund most RD&E projects. They also monitor ASQ's delivery of individual projects and only pay ASQ at the various milestone stages when ASQ delivers the expected outputs.
- ASQ uses a range of different and discrete information systems to record data about RD&E projects — there is no single point of truth.
- ASQ monitors individual projects but the separate systems the branches use do not support efficient aggregation to monitor at the program and portfolio level.

Recommendations

We recommend that the Department of Agriculture and Fisheries (DAF):

4. implements a robust project management system that assists staff to manage RD&E projects and enables ASQ to manage and monitor the portfolio of projects, including:
    - scalable project planning based on the nature, size, cost and risks associated with the project
    - a monitoring and reporting framework to track project delivery against the plan
    - consistent, accurate and comprehensive capture of project data for portfolio monitoring, reporting and evaluation
5. finalises and implements ASQ's project management guidelines and train relevant staff as required.

Introduction

Agri-Science Queensland's (ASQ) core business is about providing research, development and extension (RD&E) to help farm businesses to improve their productivity, profitability and sustainability.

Through its three science branches, ASQ manages approximately 500 RD&E projects each year. Those projects vary in size, scope and total value from as little as $20 000 to around $5 million over three to five years. Industry jointly funds the majority of these projects and ASQ undertakes a number of them collaboratively with other research providers.

To ensure that these projects achieve their objectives, ASQ needs robust and repeatable project management processes supported by effective tools, technology and information systems.

This chapter examines how well:

- ASQ plans, executes, monitors and reports on its RD&E projects
- ASQ's information systems support project management.

Conclusions

ASQ delivers its externally funded RD&E projects, within their scheduled time, cost and quality parameters despite not having robust project management systems. It does not have an approved project management methodology or operating policies and procedures for project management. It manages time, cost, and quality of the RD&E projects using industry methods and processes and tools developed by the three science branches. This is due to the efforts and skills of individual staff members.

Industry monitors ASQ's delivery of projects and continues to support ASQ with funding. This indicates satisfaction with delivery of RD&E outputs.

ASQ monitors individual project performance but it is not efficient as each branch is manually entering information into multiple separate systems.

It is not monitoring performance at a portfolio level (in aggregate across the three branches) due to information system limitations. It does not analyse the performance of the portfolio of RD&E projects because:

- there is no single point of truth about project data
- each science branch records key project data in a discrete database. The databases are not linked to DAF's information system or to each other
- DAF compiles its consolidated portfolio project data manually and it is not comprehensive.

Managing RD&E projects

Project management is the ongoing process of scoping, planning, directing, coordinating, and controlling the activities associated with a project to produce the agreed outputs and achieve the desired outcomes. Project management skills are required in order to deliver a project and achieve the objectives within the expected performance targets for time, cost, quality, scope, benefits and risk.

Project management does not need to be an onerous process and the specific requirements will vary depending on the nature, size, cost and risks associated with the project. Effective project management includes:

- defining the project's scope and objectives
- delivering the project's outputs and deliverables
- identifying and delivering expected outcomes and benefits
- managing and coordinating resources, staffing and budget
- meeting set timeframes/milestones
- identifying and managing issues and risks
- identifying key performance indicators (KPIs) and how the data will be captured and stored
- monitoring and reporting against KPIs and tracking project delivery against the plan.

Figure 3A shows ASQ's project management roles and responsibilities.

Figure 3A
ASQ project management roles and responsibilities

Role	Responsibilities
Project leader	Plans, coordinates and undertakes individual RD&E projects
Director	Leads and manages a group of RD&E project leaders and provides scientific input into projects
Science branch general manager	Leads, delivers and reports on the suite of projects and programs within the branch
Principal funding coordinator (PFC)	Develops and manages processes and systems supporting project management. PFCs oversee key project management processes including milestone and progress reporting and liaising with external funding entities
ASQ's Executive Director	Delivers DAF's agri-science programs, influences and guides strategic policy and aligns resources. The Executive Director is accountable for delivering RD&E outcomes to stakeholders according to departmental policies and strategies

Source: Queensland Audit Office

Project planning

Industry funding bodies provide approximately half of the funding for the RD&E projects. ASQ submits a project proposal to the funding body explaining how it proposes to undertake the required research, development and/or extension. If the funding body accepts the proposal, the proposal generally becomes the project schedule, which is part of the head contract with the funding body.

Project proposal templates are specific to each industry funding body. Generally, they cover a project's:

- background
- research methodology
- objective
- benefits — with a focus on benefits to the industry concerned
- outcomes
- outputs/deliverables
- milestones — when project reports are due
- budget — including external funding and third party contributions as well as the cost of ASQ's staff
- intellectual property and commercialisation considerations.

To avoid duplication, ASQ does not require its project leaders to develop a separate project plan. The proposal templates meet the industry funding bodies' needs but they do not record all aspects of project management that would usually feature in a project plan, for example:

- scope — inclusions and exclusions
- governance arrangements
- risk assessment/management — especially in relation to risks to DAF or the Queensland Government
- monitoring and reporting against key performance indicators (other than project funding milestones).

In addition, ASQ only undertakes cost benefit analyses or implements stop/go decisions at the industry funding body's request. Therefore, ASQ does not always undertake value for money assessments prior to spending industry and public funds.

DAF could strengthen its project management approach with a robust and scalable project management methodology. The methodology needs to be able to accommodate the variety of project types and sizes undertaken by ASQ. Staff would then be able to address the gaps between industry's project management requirements and DAF's methodology.

Project execution

ASQ does not have a current approved project management methodology or operating policies and procedures to guide and assist staff managing projects. ASQ developed a draft project management manual in March 2012 but it did not finalise or implement it.

As a result, the quality of ASQ's management of individual projects depends on the skills and experience of the project leaders.

Project leaders have varied project management skills and abilities primarily learned on the job. Some directors encourage their staff to undertake courses as part of their annual performance review process. Generally, project leaders would benefit from project management training.

Because industry co-funds most projects, funding bodies are involved in defining a project's objectives as well as the outputs/deliverables, resourcing (staffing and budget) and timeframes/milestones. They also pay close attention to the quality of the reports and other documents ASQ produces to ensure they meet their industries' needs.

As a result, ASQ's industry partners also monitor ASQ's delivery of individual projects. External funding bodies do not pay ASQ at the various project milestones stages until they are satisfied with the outputs ASQ has delivered.

This suggests ASQ together with its industry partners are satisfactorily delivering individual RD&E project outputs, but this is more due to the effort of ASQ's personnel rather than robust project management arrangements and good systems.

Project monitoring and reporting

Project leaders, team leaders, principal funding coordinators (PFCs) and directors all monitor project time, cost and quality through various tools they have developed. There is a PFC for each science branch to assist with monitoring project milestones to ensure that external funding bodies pay ASQ at the agreed project stages. Directors and general managers review the quality of project reports before submitting them to funding bodies.

Two of the science branches have developed their own operational management reports to assist directors and general managers in monitoring their respective group of projects. The third science branch uses an Excel spreadsheet, which does not produce automated reports.

The inconsistent reporting approach does not facilitate any automated aggregation of results across the three science branches. It involves data entry across multiple stand-alone systems. This does not allow for systematic portfolio level monitoring of the department's investment in RD&E projects aligned to its strategic goals.

Project management systems

DAF’s project and performance management system — Clarity

In 2004, the former Department of Primary Industries and Fisheries (DPI&F) commissioned a review of its project and performance management systems to identify the most appropriate systems and processes to monitor and manage programs and projects. The review found DPI&F had no central project database or reporting capability.

In 2005, DPI&F implemented a performance and project management system, called Clarity for the whole department. DPI&F intended to gain greater visibility of the performance of projects, programs, portfolios and alignment to its strategic objectives.

With the establishment of the Department of Employment, Economic Development and Innovation (DEEDI) in 2009, departmental commitment to Clarity was lacking.

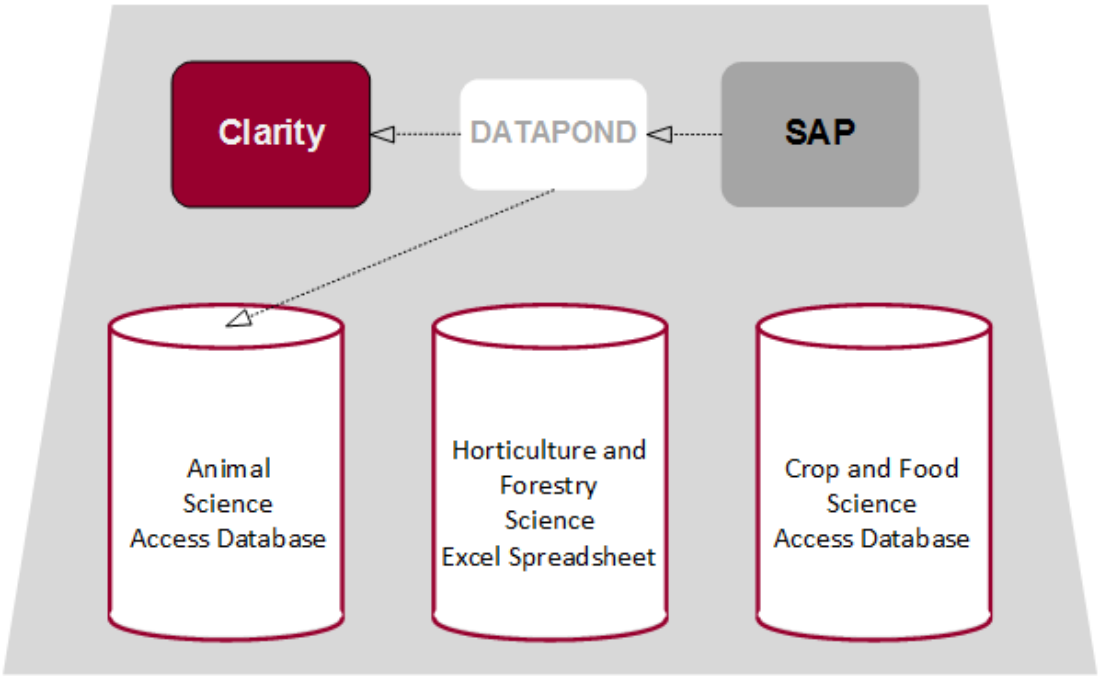
In practice, the way DAF was using Clarity did not meet ASQ’s operational requirements. Its value as a project management system diminished as it no longer adequately supported the planning or project management process. The way DAF used Clarity also resulted in significant reporting limitations.

As a result, the three PFCs stopped recording all relevant project data in Clarity. They developed or continued to use their own existing databases to manage the contractual arrangements with the various industry funding bodies.

Inconsistencies in the current systems

Figure 3B shows the various systems that record RD&E project information.

Figure 3B
Systems used to record RD&E data



Source: Queensland Audit Office

Clarity contains records about RD&E projects as well as a range of non-RD&E projects, for example, fee for service arrangements. ASQ uses Clarity to manage the project approval process and to store project documents such as contracts, sub-contracts, project budgets and project variations. However, ASQ does not use Clarity to record all relevant information or allow comprehensive reporting — there is no single point of truth about project data. For example, ASQ does not record in Clarity the total value of each project.

The PFCs in two science branches store a duplicate set of project documents on corporate network drives. The science branches' PFCs capture information about RD&E projects as well as other types of contractual arrangements with funding bodies and industry partners in their separate databases. In other words, those databases do not capture one record for each RD&E project.

The PFCs record any changes to projects post approval in their separate databases and do not update Clarity once the project commences. This means that ASQ cannot reconcile information about the same project that is stored in both Clarity and one of the PFC's databases.

SAP records project-related financial transactions. Datapond draws information from SAP each evening and updates Clarity with financial expenditure data. ASQ has not linked the databases to each other or to Clarity or SAP. However, the Animal Science database draws some financial information from Datapond.

Figure 3C outlines key inconsistencies between the way ASQ uses Clarity and each of the science branch systems.

Figure 3C
System inconsistencies

System	Project data	Financial data	Reporting capability
Clarity	One record per project with a unique identifier allocated to each new project.	Does not store key project financial information including budgets and total project values.	Has limited reporting capability.
Animal Science access database	One record for each project with a unique identifier as well as the Clarity identifier.	Does not record all components of project budgets.	Has a range of branch portfolio operational reports (but these are different to the Crop and Food Science database).
Horticulture and Forestry Science Excel spreadsheet	One record for each contract and sub-contract within a project recorded against the same Clarity identifier (multiple records per project).	Records all components of project budgets.	Has limited reporting capability compared to the Access databases.
Crop and Food Science access database	One record for each contract and sub-contract within a project recorded against the same Clarity identifier (multiple records per project) as well as a separate identifier for each record.	Records all components of project budgets.	Has a range of branch portfolio operational reports (but these are different to the Animal Science database).

Source: Queensland Audit Office

We attempted to compile a complete data set of current and completed projects by combining the records from the three science branches' databases and Clarity. However, there were too many significant discrepancies and inconsistencies in the data to draw any reliable conclusions.

Key issues include:

- ASQ does not record, in any of the three databases, some projects that it records in Clarity, usually because there is no contract with an external funding body.
- Each project in Clarity has a unique identifier, but two of the PFCs' systems contain a record for each contract and sub-contract rather than for each project. As a result, there is an over count of records in those systems.
- Some key data is not captured at all (for example the total project value) in two of the PFCs' systems or in Clarity, and there is inconsistent data capture (different tables and field names) and many blank fields in each system.
- Data entry in Clarity is not always accurate, for example, ASQ has recorded the project status for a number of projects as ‘cancelled’ instead of ‘completed’.

The PFCs developed their databases to meet their respective general managers' business needs and reporting requirements. They did not intend to use the databases for ASQ corporate reporting on the portfolio of projects. As a result, ASQ compiles its consolidated portfolio project data manually, which is inherently unreliable, and it is not comprehensive.

For example, ASQ's collection of systems do not consistently record data on the total value of projects currently underway, or the extent to which the portfolio of projects is on track in terms of budgets and milestones.

Recommendations

We recommend that Department of Agriculture and Fisheries (DAF):

4. implements a robust project management system that assists staff to manage RD&E projects and enables ASQ to manage and monitor the portfolio of projects, including:
    - scalable project planning based on the nature, size, cost and risks associated with the project
    - a monitoring and reporting framework to track project delivery against the plan
    - consistent, accurate and comprehensive capture of project data for portfolio monitoring, reporting and evaluation
5. finalises and implements ASQ's project management guidelines and train relevant staff as required.

Appendices

Appendix A—Comments

In accordance with s.64 of the *Auditor-General Act 2009*, we provided a copy of this report to the Department of Agriculture and Fisheries with a request for comment.

This head of this agency is responsible for the accuracy, fairness and balance of the comments.

Comments received from Director-General, Department of Agriculture and Fisheries

Queensland Government

Department of Agriculture and Fisheries

Reference: CTS 25233/15

11 NOV 2015

RECEIVED
16 NOV 2015
QUEENSLAND AUDIT OFFICE

Mr Andrew Greaves
Auditor-General
Queensland Audit Office
PO Box 15396
CITY EAST QLD 4002

Dear Mr Greaves

Thank you for your letter of 21 October 2015 regarding the draft Report to Parliament for the performance audit on Agricultural science research, development and extension programs and projects.

I have given due consideration to the report and understand that departmental staff and Queensland Audit Officers worked in a cooperative manner to conduct the audit and inform the findings and draft recommendations.

The five recommendations are succinct, and I consider that they mainly focus on strategies, such as the Agriculture and Food R&D Blueprint, and business system improvements that are already acknowledged or well advanced in terms of planning or implementation. I agree that scheduled project and/or program reviews represent good stewardship of resources.

The attached response indicates my agreement with each of the five recommendations.

If you should wish to discuss any aspect of this response, please contact Dr Elizabeth Woods, Deputy Director-General, Agriculture on telephone 07 3239 3180 or email beth.woods@daf.qld.gov.au.

Yours sincerely

Jack Noye
Director-General
Department of Agriculture and Fisheries

Att

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Response to recommendations

Queensland Audit Office

Department of Agriculture and Fisheries, Agricultural science research, development and extension programs and projects (Report No. 3: 2015–16)

Response to recommendations provided by Dr Elizabeth Woods, Deputy Director-General, the Department of Agriculture and Fisheries on 28/10/2015.

Recommendation	Agree / Disagree	Timeframe for Implementation (Qtr. and Year)	Additional Comments
1. The Department of Agriculture and Fisheries (DAF) improves its research, development and extension (RD&E) plan so that it is sufficiently detailed to enable Agri-Science Queensland (ASQ) to make consistent and transparent investment decisions, including: – identifying the outcomes DAF seeks to achieve over the next ten years (DAF's strategic objectives) and how they align to other state, national and industry priorities – defining DAF's investment criteria or principles to select which RD&E projects and programs to invest in – identifying the skills and capability required to deliver current and future projects – providing guidance on how DAF will prioritise when resource-constrained – outlining how DAF will measure, monitor, and report progress towards achieving its strategic objectives.	Agree	April 2016 and ongoing	The Queensland Government is committed to the delivery of an Agriculture and Food Research and Development Blueprint. At the time of this response, DAF was finalising a discussion paper to enable public consultation on the Blueprint to commence in late 2015. The discussion paper canvasses R&D priorities and revised investment principles. When finalised in 2016, the Agriculture and Food R&D Blueprint will progress the Government's Food and Fibre Policy and replace the current agricultural research, development and extension plan; launched in 2013, including the priorities and investment principles. Agricultural RD&E is increasingly delivered in collaboration with other research providers, including similar agencies in other States, universities, and private providers, In-house capacity will need continual review and adjustment to reflect Government's best role in this evolving service provider mix. Outcomes of periodic reviews will be reflected in annually revised DAF business group level workforce plans.
2. The Department of Agriculture and Fisheries reviews the ASQ portfolio of RD&E projects at appropriate intervals to ensure: – the projects still align to DAF's strategic priorities – the projects will achieve or contribute to DAF's strategic objectives.	Agree	Annually as part of ongoing operational planning	At the time of Audit, operational planning across DAF had not been completed. Operational plans are now in place and show how RD&E projects are aligned to DAF strategic priorities as identified in the departmental Strategic Plan.
3. The Department of Agriculture and Fisheries schedules evaluations of	Agree	July 2016 and ongoing	DAF supports this recommendation, accepting that more regular and quantitative evaluations of RD&E projects will be needed to fully comply with

Recommendation	Agree / Disagree	Timeframe for Implementation (Qtr. and Year)	Additional Comments
significant RD&E projects and/or programs to ensure the portfolio of projects is achieving strategic objectives, having an impact and ultimately benefitting industry and the community.			the efficiency and effectiveness requirements of *section 12(1) of the Financial and Performance Management Standard 2009* DAF will expand its current planning and evaluation activities (beyond the current suite of strategic planning, agency objectives, relevant performance indicators, operational plans, Service Delivery standards and targets (reviewed and reported on annually) and Quarterly reports provided to the CEO), by:- • Improving quarterly reports to achieve a greater balance between qualitative and quantitative information, • Developing a RD&E Program evaluation schedule in consultation with the Performance and Delivery Office in the Department of the Premier and Cabinet to ensure appropriate consideration of priorities and resourcing, and • Introducing ongoing post-completion reviews of a sample of significant RD&E projects
4. The Department of Agriculture and Fisheries implements a robust project management system that assists staff to manage RD&E projects and enables ASQ to manage and monitor the portfolio of projects, including: – scalable project planning based on the nature, size, cost and risks associated with the project – a monitoring and reporting framework to track project delivery against the plan – consistent, accurate and comprehensive capture of project data for portfolio monitoring, reporting and evaluation.	Agree	Stage 1 to be completed by June 2016	On 13 August 2015 the DAF ICT Investment and Strategy Committee approved a three stage project to review the current project management system with a view to developing and implementing a system that will provide greater transparency, traceability and functionality. Reporting will be significantly improved over the current system in terms of comprehensiveness, flexibility and ease of use. The first stage of the project has commenced, with a prototype project management tool due to be delivered by June 2016. Stages two and three will see the delivery and implementation of an enterprise level solution and the decommissioning of existing systems by December 2017.
5. The Department of Agriculture and Fisheries finalises and implements ASQ's project management guidelines and trains relevant staff as required.	Agree	Completed by June 2016	DAF will revise and update the draft Project Management Guidelines as part of the development of the new project management system. Staff training needs will be identified and training implemented as part of this review.

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Appendix B—Glossary

Definitions of Research, Development and Extension

Research and Development

The Department of Agriculture and Fisheries defines Research and Development (R&D) according to the Australian Bureau of Statistics (2008:11) Australian and New Zealand Standard Research Classification (ANZSRC) 1297.0.

There are four types of R&D activity:

- pure basic research
- strategic basic research
- applied research
- experimental development.

Pure basic research is experimental and theoretical work undertaken to acquire new knowledge without looking for long-term benefits other than the advancement of knowledge.

Strategic basic research is experimental and theoretical work undertaken to acquire new knowledge directed into specified broad areas in the expectation of practical discoveries. It provides the broad base of knowledge necessary for the solution of recognised practical problems.

Applied research is original work undertaken primarily to acquire new knowledge with a specific application in view. It is undertaken either to determine possible uses for the findings of basic research or to determine new ways of achieving some specific and predetermined objectives.

Experimental development is systematic work, using existing knowledge gained from research or practical experience, which is directed to producing new materials, products, devices, policies, behaviours or outlooks; to installing new processes, systems and services; or to improving substantially those already produced or installed.

In particular, R&D is directed towards the improvement of economic and industrial activities, and towards the framework in which the economy operates.

Extension

Agricultural research and agricultural production are two systems linked by extension. For R&D to be relevant to local needs, extension activities are directed to facilitating researchers, farmers, industry and other stakeholders to work together to improve productivity, profitability and rural life.

Therefore, extension activity is integrated with R&D, and includes:

- engaging and developing networks and linkages
- identifying and prioritising research problems (co-design)
- developing and adapting new technologies (co-production)
- adopting and diffusing new technologies and practices locally, regionally and nationally and across sectors and industries
- evaluating and improving processes.

Appendix C— Audit methodology

Audit objective and scope

The objective of the audit was to examine whether agricultural science research, development and extension (RD&E) programs and projects support economic growth and contribute to an efficient, innovative and profitable agriculture sector.

We did not consider:

- RD&E in the Department of Agriculture and Fisheries' (DAF) other business groups and business units (for example Biosecurity Queensland)
- fee for service projects
- the scientific integrity of the projects
- how DAF's research infrastructure supports the conduct of agricultural RD&E across Queensland.

We also did not examine Agri-Science Queensland's (ASQ) expenditure on research partnerships (for example the Queensland Alliance for Agriculture and Food Innovation at the University of Queensland).

The audit addressed the objective through the sub-objectives and lines of inquiry outlined in Figure C1.

Figure C1—Audit Scope

Sub-objectives		Lines of inquiry	
1	A comprehensive strategic framework for agricultural RD&E aligns investment with state and national priorities	1.1	A strategic framework clearly outlines Queensland's agricultural priorities and investment criteria/principles
		1.2	RD&E projects are aligned to agreed priorities to ensure that the right projects are funded and investment decisions are transparent
2	Projects are well managed to achieve their objectives and deliver the intended benefits	2.1	Projects are monitored and reported to ensure they are on track
		2.2	Governance arrangements are clear and effective so that decision makers are well informed
		2.3	Projects are evaluated to ensure that they deliver their intended benefits and lessons learned are identified for continuous improvement

Source: Queensland Audit Office

Performance audit approach

The Queensland Audit Office (QAO) conducted the audit in accordance with the *Auditor-General of Queensland Auditing Standards — September 2012*, which incorporate the requirements of standards issued by the Australian Auditing and Assurance Standards Board.

QAO conducted the audit between May 2015 and October 2015. DAF was the only subject of this audit.

The audit included:

- interviews with a selection of DAF staff and external stakeholders
- a review of ASQ databases (Clarity, Animal Science Access database, Crop and Food Science Access database and Horticulture and Forestry Science Excel spreadsheet)
- a review of a selection of RD&E projects as indicative of the range of projects ASQ manages.

Project selection

Purpose

The purpose of reviewing a selection of projects was to assess:

- whether projects align to strategic priorities
- how well ASQ plans, manages and monitors those projects.

Project selection approach

DAF provided a spreadsheet of current projects as at February 2015. ASQ had manually compiled this spreadsheet previously for a different purpose. It was neither comprehensive nor accurate. We grouped the projects for the three science branches and sorted them by highest to lowest value.

We considered a number of projects from each science branch to try to identify examples of:

- high value projects
- active and completed co-funded projects
- active and completed sole DAF-funded projects
- cancelled projects.

We attempted to identify projects that were completed and had an evaluation report available. We discussed a number of projects from each science branch with the respective principal funding coordinators. From these discussions, due to differences between the spreadsheet of projects, Clarity and the PFC's own databases, we reduced the final selection of projects to seven that we could confirm were RD&E and not fee for service projects and for which ASQ could provide relevant documents.

Figure C2 shows a list of the seven projects included in the final selection.

Figure C2—Agriculture RD&E projects selected for review

Branch	Clarity ID No.	Project name
Animal Science	04272	Greenhouse gas emissions from beef manure management
	06405	Leading Sheep 2011–2015
Horticulture and Forestry Science	04760	Commercialising cocoa growing in North Queensland
	05905	Controlling plant and fruit diseases in strawberry fields
	06727	Understanding apple and pear production
Crop and Food Science	07385	National barley foliar pathogen variety improvement program
	07131	Fusarium wilt management in cotton

Source: Queensland Audit Office

We reviewed the available project documentation of each of these projects. As the documentation was not sufficient to enable a full understanding of the projects, why ASQ had approved them and how ASQ had or was managing them, we selected one from each science branch for more analysis. We interviewed the project leader and director involved in each of the following three projects:

- Understanding apple and pear production
- National barley foliar pathogen variety improvement program
- Leading Sheep 2011–2015.

Appendix D—DPI&F's Research and Development Strategy Group Assessment Criteria

Figure D1—DPI&F's Research and Development Strategy Group Assessment Criteria

Criteria	Business Unit Comments	R&D Strategy Comments
1. Scientific and academic excellence How has the project been reviewed to ensure the research methodology is of a high standard and will accomplish the objectives?		
2. Clear and demonstrable benefit What benefits will there be for the immediate users of the research? Describe how these benefits will contribute to Queensland's economic, social and environmental objectives.** Which Queensland R&D priorities does this proposal address and how does it address these? What DPI&F R&D priorities does this proposal address?		
3. Competitive advantage How will the proposal develop Queensland's emerging, internationally competitive and value-adding industries? How will this activity enhance DPI&F's leadership of this business area?		
4. Critical mass What research capacity will this maintain or enhance for Queensland and how will the proposal do this?		
5. Collaboration How have other agencies, industry and regional bodies and the private sector been involved in the proposal (national and international)? Adequacy of plans and strategies for technology uptake by research users. Do collaboration plans inhibit later application or commercialisation of the research outcomes? If so, explain why the project should still proceed.		

Criteria	Business Unit Comments	R&D Strategy Comments
6. Commercialisation Is there IP generation or commercialisation potential within the proposed work? If yes — are the IP protection and commercialisation plans adequate? Is access to other party's enabling IP called for by the project proposal? If yes — are IP management plans adequate for ensuring other party's IP rights are not infringed? Does the use of other party's enabling IP inhibit later application or commercialisation of the research outcomes? Has a sound strategy for adoption by end-users been addressed?		
7. Public Benefit (as opposed to direct commercial benefit) Describe the public benefits e.g. health, employment, environmental sustainability of the proposal.		
8. Value-adding How will the project lead to a significant advancement/improvement of products and/or processes against one or more of Queensland's R&D priority areas?		
9. Ethical principles Are the project methodologies subject to ethical and animal welfare issues or licensing requirements? If so, please outline the action to be taken to address these issues/requirements.		
10. Contestability Why should this proposal be allocated R&D resources in preference to other R&D activity? What are the key characteristics of this proposal that would make it stand out in a competitive review process?		
11. Investment risk Why should this research be undertaken by the DPI&F rather than in the private sector? What is DPI&F's unique position for doing this work?		

Note: ** Refer to the table below for additional information required

Source: Department of Agriculture and Fisheries

Figure D2—Additional information required

** Where projects identify increases in productivity as an objective, provide quantified information
The likely benefits in dollar terms per unit e.g. per hectare (usually requires budgeting work in terms of calculating improved gross margins or something like that).
The number of units to which the research could potentially apply.
The likely adoption rate per year over time.
The chance of research success (expressed as a percentage).
How long it will take to get results and the number of years these will be applicable for.
The cost of the research (salaries, operating, capital) for each year of the research.

Source: Department of Agriculture and Fisheries

Auditor-General Reports to Parliament

Reports tabled in 2015–16

Number	Title	Date tabled in Legislative Assembly
1.	Results of audit: Internal control systems 2014–15	July 2015
2.	Road safety – traffic cameras	October 2015
3.	Agricultural science research, development and extension programs and projects	November 2015

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