



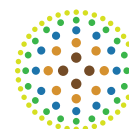
Australian Government

Rural Industries Research and
Development Corporation



Ginger Program RD&E Plan 2017 – 2022

By Michael Clarke



RURAL INDUSTRIES
Research & Development Corporation



Australian Government

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Foreword

The Australian ginger industry is regionally significant, employs local people in value added processing and had a farm-gate GVP of \$32 million in 2015. In RIRDC terms ginger is an established rural industry with a statutory RD&E levy.

The ginger RD&E levy was put in place in 2010 initially to deal with critical disease issues threatening the industry's viability. Research, development and extension success has seen a recovery in industry production and the outlook is for additional industry growth. Program review indicates a strong return on investment from levy funds and matching government payments.

This plan builds on the success of the inaugural RIRDC Ginger RD&E Plan and focusses on three critical objectives: on farm productivity to ensure the industry can compete with fresh ginger imports; market research to identify profitable channels for anticipated production growth; and industry engagement to ensure uptake of research outputs.

Program RD&E Plans are a key part of implementing RIRDC's broader RD&E strategies, and are the basis on which RIRDC invests on behalf of industries.

These RD&E Plans identify productivity and sustainability RD&E priorities and the planned outcomes for each industry, and each has an appropriate balance of productivity and sustainability RD&E priorities.

RIRDC has three clear top-level strategies to increase profit and productivity in rural industries:

1. Undertake priority research development and extension which meets specific industry needs.
2. Facilitate investments which deliver economic, social and environmental benefits for rural industries and the broader community.
3. Adopt a life-cycle approach to investment in new, developing and established industries.

The profitability, productivity and sustainability of rural industries is RIRDC's core business, and the Corporation works with its portfolio industries to invest in their priority RD&E needs. RIRDC fosters strong relationships with industry partners, including the ginger industry, to ensure RD&E investment leads to practical knowledge and innovation which can be adopted by industry members.

In making its RD&E investments for new, developing and established industries, RIRDC takes a life-cycle approach. These investment decisions acknowledge the maturity and development of each of the industries within the RIRDC portfolio. Whilst managing a very diverse portfolio of new, developing and established small industry opportunities for Australia, the life-cycle approach assists RIRDC to make appropriate RD&E investments.

RIRDC will continue to work with the ginger industry to ensure the industry's five year research priorities meet industry needs and are informed by government priorities. The adoption of RD&E outcomes is fundamental to success, and just as we have with this Ginger Industry Five Year Plan, RIRDC will work with industry and government stakeholders to ensure the Corporation invests in knowledge that is useful and adopted by end users.

John Harvey
Managing Director
Rural Industries Research and Development Corporation

What is a Five Year Plan?

The Five Year Plan has been developed by RIRDC, in consultation with industry stakeholders, to outline the Ginger Industry's research, development and extension (RD&E) objectives until 2022. These objectives have been shaped by the goals and strategies of the RIRDC R&D Plan 2016 – 2021 which is available on the RIRDC website, www.rircd.gov.au/about-rircd.

In developing the Ginger Industry Five Year Plan 2017 - 2022, the New and Emerging Industries National RD&E Strategy has been considered. The National RD&E Strategy aims to ensure more efficient and effective RD&E in primary industries, through better coordination and collaboration.

Acknowledgments

Members of the Ginger Advisory Panel: Noel Stevens, Mike Smith, Jason Keating, Scott Kirkwood, Shane Templeton, Russell Parberry

Abbreviations

ACIAR	Australian Centre for International Agricultural Research
AGIA	Australian Ginger Industry Association
AOP	Annual Operating Plan
DAF	Queensland Department of Agriculture and Fisheries
FTA	Free Trade Agreement
GVP	Gross Value of Production
MUP	Minor Use Permit (for chemicals)
PHA	Plant Health Australia
RD&E	Research, Development and Extension
RIRDC	Rural Industries Research and Development Corporation
SWOT	Strengths, Weaknesses, Opportunities and Threats
UQ	The University of Queensland

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Introduction

The Rural Industries Research and Development Corporation (RIRDC) manages the Ginger Research, Development and Extension (RD&E) Program on behalf of the industry.

Ginger is an established industry with an R&D levy (RIRDC 2016). The ginger levy was introduced in 2010. Levy receipts are matched by the Australian Government up to 50% of R&D program spend or 0.5% of Gross Value of Production (GVP).

Alignment with Government and RIRDC Priorities

The Ginger RD&E Plan 2017 – 2022 dovetails with the Australian Government Strategic Science and Research Priorities; the Rural Research & Development Priorities; and RIRDC’s R&D Plan 2016-2021 - Table 1.1.

Table 1.1 Priorities Hierarchy in which the RIRDC Ginger Program Fits

Priority	Relevant ‘Fit’
Strategic Science and Research Priorities	<p>Food: optimising food and fibre production and processing, agricultural productivity and supply chains within Australia and global markets.</p> <p>Soil and water: improve use of soil and water resources, both terrestrial, marine.</p> <p>Transport: moving essential commodities, alternative fuels, lowering emissions.</p> <p>Cybersecurity: for individuals, businesses, government, national infrastructure.</p> <p>Energy, resources: structure, processes governing formation/distribution.</p> <p>Advanced manufacturing: high value and innovative industries in Australia.</p> <p>Environmental change: mitigating, managing or adapting to changes.</p> <p>Health: improving health outcomes for all Australians.</p>
Rural R&D Priorities	<p>Advanced technology: to enhance innovation of products, processes and practices across the food and fibre supply chains through technologies such as robotics, digitalisation, big data, genetics and precision agriculture.</p> <p>Biosecurity: to improve understanding and evidence of pest and disease pathways to help direct biosecurity resources to their best uses, minimising biosecurity threats and improving market access for primary producers.</p> <p>Soil, water and managing natural resources: to manage soil health, improve water use efficiency and certainty of supply, sustainably develop new production areas and improve resilience to climate events and impacts.</p> <p>Adoption of R&D: focussing on flexible delivery of extension services that meet primary producers’ needs and recognising the growing role of private service delivery.</p>
RIRDC R&D Plan 2016-2021	<p>Goal 1: Discover emerging opportunities and issues impacting rural industries – technologies, feasibility, cross-sectoral initiatives</p> <p>Goal 2: Deliver research that achieves value for rural industries and for Australia – prioritise and administer, facilitate adoption, cross sectoral partnerships</p> <p>Goal 3: Encourage diversity and advance people in rural industries and their rural communities – leadership, capacity, connectedness of people</p>

Source: RIRDC R&D Plan 2016 – 2021 accessed 20 December 2016 [http://www.rirc.gov.au/docs/default-document-library/rirc-strategic-plan_161024_fa\(web\)-\(2\).pdf?sfvrsn=2](http://www.rirc.gov.au/docs/default-document-library/rirc-strategic-plan_161024_fa(web)-(2).pdf?sfvrsn=2)

The Ginger RD&E Plan 2017 – 2022 aligns with RIRDC R&D Plan 2016-2021 Goal 2 ‘Deliver research that achieves value for rural industries and for Australia’.

RD&E Program Management and Expenditure

The RIRDC Ginger Program is supported by a Ginger RD&E Advisory Panel of four panel members including a chair and technical advisor. Two observers from the Australian Ginger Industry Association (AGIA) attend panel meetings.

The Panel is responsible for developing and ranking priority research proposals within the five year plan framework. The Panel provides recommendations on the allocation of RD&E contributions to the RIRDC Board.

Ginger R&D expenditure since program establishment in 2012 is shown in Table 1.2.

Table 1.2 RIRDC Ginger Program Expenditure 2012 – 2016 (\$)

	2011-12	2012-13	2013-14	2014-15	2015-16
Opening Balance	\$2,503	\$19,704	\$31,095	\$48,602	\$94,740
Revenues					
Commonwealth Contributions	\$80,310	\$71,722	\$136,177	\$113,400	\$144,684
Industry Levies	\$104,756	\$92,209	\$159,329	\$173,837	\$160,385
Industry Levy Penalties	\$326	\$268	\$675	\$469	\$486
Project Refunds	\$0	\$0	\$7,709	\$0	\$0
Other Income (pubs, interest, other)	\$3,395	\$2,341	\$3,580	\$4,124	\$3,383
Total Revenue	\$188,787	\$166,540	\$307,471	\$291,830	\$308,938
Expenditure					
R&D Projects	\$154,145	\$135,874	\$254,952	\$200,887	\$265,343
Panel expenses (meetings, accom)	\$4,580	\$2,729	\$4,313	\$1,065	\$1,065
Levy Collection Costs	\$10,965	\$11,440	\$9,901	\$18,890	\$13,671
RIRDC expenses (meeting, travel)	\$1,896	\$5,105	\$501	\$3,668	\$320
RIRDC Management Fee	\$0	\$0	\$20,297	\$21,182	\$22,639
Total Expenditure	\$171,586	\$155,149	\$289,964	\$245,692	\$303,038
Closing Balance	\$19,704	\$31,095	\$48,602	\$94,740	\$100,640

Source: RIRDC Annual Reports

The Ginger R&D Program supported 17 projects between 2012 and 30 June 2016. Four additional projects were funded in the second half of 2016. Average project value 2012 to 30 June 2016 was approximately \$60,000.

Between 2010 and 2012, and prior to the formalisation of the Ginger R&D Program, some individual ginger RD&E projects were funded by RIRDC and industry.

Prior to 2010, ginger projects were supported with core funds through RIRDC’s New and Emerging Plant Industries Program. These projects were often co-funded by Horticulture Innovation Australia Limited, the Queensland Department of Agriculture and Fisheries (DAF), ACIAR and voluntary grower contributions. These early partnership projects addressed pests and diseases impacting ginger production (A. Robb, pers. comm., 2016).

Ginger R&D Plan 2012 - 2017

The 2012-2017 Ginger R&D Plan articulated three objectives organised into nine strategic priorities:

1. Assure industry competitiveness

- 1.1 Provide solid scientific advice to secure the biosecurity of the industry in Australia.
- 1.2 Solve disease and production problems that threaten reliability and quality of industry produce including development and support of integrated pest management strategies.
- 1.3 Provide R&D in support of the maintenance of food safety and quality assurance.

2. Build stronger linkages with customers and the market

- 2.1 Understand market opportunities and drivers that can create economic success in Australia and in export markets.
- 2.2 Provide R&D in support of education and extension activities in support of the industry.
- 2.3 Supply R&D in support of increasing the level of innovation within the industry – particularly in respect of value adding.

3. Coordinate the industry's future direction

- 3.1 Build industry relationships and improve coordination, communication and industry representation relating to R&D opportunities and impacts.
- 3.2 Facilitate the updating and implementation of the industry's strategic R&D Priorities and Strategies.
- 3.3 Work cooperatively with the industry's growers and stakeholders, as well as with other industries to promote and facilitate industry growth through R&D.

Projects Supported 2012 - 2017

Projects funded under the 2012-2017 plan and the strategic priority addressed are shown in Table 1.3.

Table 1.3 Ginger RD&E Projects 2012 – 2017

Project Name	Start	Finish	Researcher	Strategic Priority addressed
Controlling Pythium and associated pests in Ginger	1/04/10	30/08/11	Qld DAF	1.2
Development of an Industry Biosecurity Plan	30/03/12	31/05/13	PHA	1.1
Improved tissue culture production of clean planting material	1/06/14	30/05/18	Qld DAF	1.2
Extension & Education Officer - Ginger industry	15/01/12	15/05/13	AGIA	2.2
Controlling Pythium in Ginger: Phase 2	24/02/12	31/07/13	Qld DAF	1.2
Ginger Tech Support and Minor Use Permit renewals	17/02/12	15/05/13	AGIA	1.2
Assessment of Pythium diversity in ginger	6/04/12	12/06/15	UQ	1.2
Improved clean seed distribution systems	23/03/12	30/06/12	Hallways	1.2
Technical recommendations for biosecurity protection	23/05/12	8/06/12	Julie Stanton	1.1
Improving Soil Health to Suppress Soil Borne Diseases	2/01/13	30/11/16	Qld DAF	1.2
Understanding the Domestic Market for Australian Ginger	30/05/13	30/11/13	Brand Story	2.1
Technical support, extension and minor use permits	30/05/13	15/05/17	AGIA	2.2, 3.3
Extension, Education and Communication of R&D	30/05/13	31/07/15	AGIA	2.2
Health benefits of ginger: a review of the literature	1/05/14	31/10/14	Brand Story	2.1
Global ginger market assessment, especially value adding	1/05/14	31/10/14	Colmar Brunton	2.3
Best practice supply chain management information	1/05/14	29/02/16	RMCG	1.3, 3.1
Pathogenicity and methyl bromide control of Nematodes	15/10/15	30/05/17	Qld DAF	1.2
Regional Ginger Extension Program	17/08/15	31/05/17	AGIA	2.2

Ginger strategic plan and R&D priorities	1/06/13	30/03/16	AGIA	3.2
Economic Evaluation of RIRDC Investment in Ginger R&D	28/07/16	2/12/16	Agtrans	3.2
Emergency Plant Pest Response Levy proposal	16/09/16	31/08/17	B&LC Duncan	1.1

Source: RIRDC Program Records

Economic Evaluation of Projects 2012 - 2016

An independent economic evaluation of 17 Ginger RD&E projects completed or substantially progressed between 1 July 2012 and 30 June 2016 was prepared by Agtrans Research (2016). These projects addressed all three of the Ginger R&D strategic priorities and demonstrated industry impacts, a number of which were valued in monetary terms in the impact assessment.

Impacts identified and valued in the economic evaluation included:

- Reduced risk of losses associated with exotic pest incursion
- Increased average yields
- Increased profitability including profitability realised from increased ginger demand
- Increased industry and scientific capacity
- Increased adoption of research outputs
- Maintenance of ginger production area
- Improved control of key ginger diseases
- Increased chemical usage
- Increased costs on-farm including the cost of adopting best management practices
- Increased regional income (a 'spillover' benefit).

Most of the benefits either realised or likely to be realised in the future from RD&E investment were private in nature and captured by the ginger industry. Public benefits included environmental and social benefits. Most private benefits were realised by ginger growers with ginger processors sharing some of the forecast gains. Benefits to other industries as a result of ginger industry research investment included increases in both industry and scientific capacity. The RIRDC Ginger R&D Program contributed to Australian Government Rural R&D Priorities especially priority 2 (biosecurity) and priority 4 (adoption of R&D). Ginger R&D also contributed to Science and Research priority 1 (food) and 2 (soil and water).

Total funding from all sources for all 17 Ginger RD&E projects totalled \$2.92 million (present value terms). Of the 17 projects, the impacts from four of the projects were valued.

Funding for the four projects where impacts were valued totalled \$1.17 million (present value terms) and produced aggregate total expected benefits of \$23.35 million (present value terms). This gave a net \$22.2 million, and a benefit-cost ratio of 19.9 to 1. The four projects valued represented approximately 40% of total funding for the 17 projects in the project population.

When the benefits for the impacts valued (\$23.35 million) were compared to the total investment in all projects in the population (\$2.92 million), this lowered the investment criteria. The total investment in the 17 projects produced a net present value of \$20.4 million (present value terms), and a benefit-cost ratio of 8.0 to 1.

Agtrans Research (2016) concluded, given the assumptions made in valuing the impacts, that the benefit-cost ratio for the investment in the Ginger R&D Program lies somewhere between 8.0 and 19.9 to 1.

Investments in ginger R&D managed through the RIRDC Ginger Program 2012 – 2017 have produced a favourable return on investment.

Ginger Industry and RD&E Profile

Ginger Production

Ginger is the rhizome of the perennial plant *Zingiber officinale* and is used widely as a culinary herb and medicine (Foster 2014).

Ginger production takes place in Australia’s sub-tropical and tropical production regions. The main concentration of growers is located within South East Queensland, including the Sunshine Coast and Wide Bay-Burnett regions. Other small areas of ginger production include Far North Queensland, Northern NSW and the Northern Territory (Foster 2014).

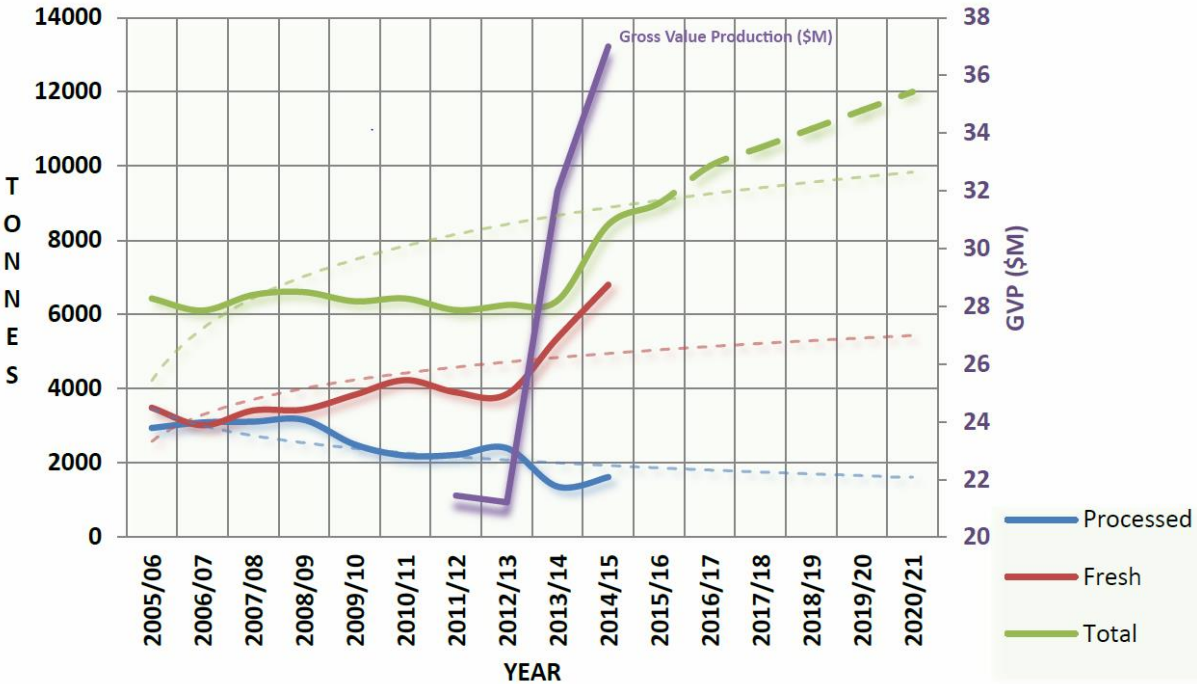
Ginger production is both labour and capital intensive. A high capital outlay is incurred in irrigation, specialised planting and harvesting equipment and planting materials. Maximum yields are obtained in quality coastal soils using clean seed and high inputs of water (10 ML/ha), fertiliser and organic matter (Camacho and Brescia 2009).

In 2015 the area under cultivation for ginger production totalled 260 ha and the principal ginger varieties grown were *Queensland* and *Jumbo* (also known as *Canton*) (Keating 2016). *Jumbo* is preferred for the fresh ginger market. A small area of Australian ginger is grown and certified organic.

Historically production has been adversely affected by pest and disease pressure including Fusarium, Pythium, Symphylids/Coeloptera, and nematodes. Pest and disease management remains a major production cost. Other production challenges include difficulty in securing inputs (irrigation water, farm labour, quality seed, suitably priced land) and an aging grower base.

Following the introduction of the Ginger RD&E levy in 2010 a better account of the industry’s metrics could be made and an upward trend in production volume became apparent (Keating 2016). In 2014-15 Australia produced 8,000 tonnes of ginger with a gross value of \$32 million – Figure 2.1.

Figure 2.1 Australian Ginger Production, Value and Trends



Source: Keating 2016

Available Australian ginger production, export and import data 2005-06, 2011-12 and 2014-15 is summarised in Table 2.1.

Table 2.1 Australian Ginger Production, Exports and Imports

	Unit	2005-06	2011-12	2014-15
<u>Production</u>				
Growers	number	46	49	49
Area	hectares	232		260
Volume [#]	tonnes	7,575		8,000
Gross value	\$'000	22,726	21,442	32,000
<u>Exports</u>				
Volume	tonnes	2,401	1,431	
Value	\$'000	12,659	8,566	
<u>Imports</u>				
Volume	tonnes	1,149	1,727	
Value	\$'000	2,986	3,989	

Source: Foster 2014 and Keating 2016 # includes crushed, ground, in-syrup, prepared and preserved

Australian ginger production decreased 2006 to 2012 in response to declining prices, drought and Pythium disease. There has been a recovery in production since 2012 and the trend has been away from growers supplying product for processing and toward fresh ginger sales (Foster 2014).

World Production and Trade

Australia accounts for less than 1% of world ginger production. World production is dominated by China and India which together account for more than 50% of world output. Indonesia, Nepal and Nigeria are also large ginger producers. In 2015 world production was estimated at approximately 2 million tonnes.

In 2015 the world ginger trade was 1 million tonnes. Major ginger exporters were China (62% of world exports), Thailand (14%), and Nepal (7%). Major importers were Japan (33% of world imports), Pakistan (13%), the United States (10%), India (9%) and Malaysia (6%). The world ginger trade has been growing strongly since the late 1990s (Foster 2014).

Products, Prices and Markets

About 80% of the ginger grown in Australia is sold on the domestic fresh ginger market, 20% is sold to the domestic ginger processing sector (Keating 2016).

Processing mainly involves drying and preservation using sugar. Product forms include dried, pickled, preserved, crystallised/candied, powdered and ground (Camacho and Brescia 2009). Australian firms that process ginger supply both domestic and export markets. One third of Australia's total ginger production is exported in a processed form (Foster 2014). Fresh ginger exports are mainly confined to New Zealand (Foster Facilitators 2009).

Most Australian ginger exports are preserved in sugar or syrup. Export volumes and value estimates include (Foster 2014):

- 2009-10 Australia exported 2,066 tonne, valued \$10.7 million, unit value \$5.17/kg
- 2010-11 Australia exported 2,113 tonne, valued \$10.7 million, unit value \$5.03/kg
- 2011-12 Australia exported 1,432 tonne, valued \$8.6 million, unit value \$5.98/kg

Australia's main export markets for ginger products are the United Kingdom (34% of the total value of Australia's exports in the three years to 2011-12), the United States (27%), Germany (19%), Canada

(6%) and New Zealand (3%) (Foster 2014). Japan has the potential to be an important market for Australian ginger (Camacho and Brescia 2009).

Most ginger imported into Australia is in a prepared/preserved form, volumes and values include (Foster 2014):

- 2009-10 Australia imported 685 tonne, valued \$1.6 million, unit value \$2.31/kg
- 2010-11 Australia imported 798 tonne, valued \$2.4 million, unit value \$2.94/kg
- 2011-12 Australia imported 811 tonne, valued \$2.4 million, unit value \$2.90/kg

Imports of fresh ginger rhizomes have been prohibited by Australian authorities on biosecurity grounds. In 2014 Fiji established a fresh ginger export trade with Australia and shipments followed in 2015.

The Australian fresh ginger market varies according to supply and demand. Recent wholesale prices have varied between \$2.50/kg and \$4.00/kg but have spiked as high as \$12.00/kg and as low as \$1.50/kg. Key factors impacting fresh ginger price received include seasonality, competition and product quality (Camacho and Brescia 2009).

The retail value of manufactured products in which processed Australian ginger is a key ingredient was more than \$80 million in 2007 (Camacho and Brescia 2009) and is believed to be approaching \$100 million in 2015.

Economic Importance to Australia

The Australian ginger industry consists of 49 growers, 30 of whom are full time. There are 200 full-time farm workers employed in ginger growing plus 385 casuals during peak harvest periods. (Camacho and Brescia 2009).

Farm-gate GVP is presently estimated at \$32 million (Keating 2016).

Firms involved with ginger processing employ 560 staff, 30% of whom work directly in the ginger component of the processing business (Camacho and Brescia 2009). Buderim Ginger makes an important contribution to the tourist economy of the Sunshine Coast (Foster Facilitations 2009).

Industry Structure and the Supply Chain

The Australian ginger industry consists of growers, input suppliers such as seed producers, production consultants, processors and fresh ginger wholesalers located Australia wide in fresh produce markets (Camacho and Brescia 2009).

Growers produce for both fresh and processor markets. Growing ginger for the processing sector is or has been an integral part of almost every Australian ginger grower's business (Camacho and Brescia 2009).

Buderim Ginger Limited is the largest processor of Australian ginger taking over 95% of local ginger produced for processing. Other smaller processors include Bundaberg Brewed Drinks Pty Ltd, Gourmet Garden Limited, Veg Master Limited and Sunshine Tropical Limited (Camacho and Brescia 2009).

Buderim Ginger Limited operates a production quota system with prices linked to the prices received for its ginger products (Foster 2014). Growers have mixed views about this quota system and there have been periods when Buderim Ginger Limited has found it difficult to secure sufficient Australian grown ginger (Foster Facilitations 2009).

Research Providers and Funding Partners

The Australian ginger industry is supported by capable researchers in QDAF who have delivered critical pest and disease knowledge. Other research organisations important to the ginger industry include UQ and AGIA. Market assessment specialists have been secured for the R&D Program on an 'as needs' basis.

Current funding partners include RIRDC and research providers. In the past, funding support has been provided by ACIAR and Hort Innovation. Opportunities exist for both the Ginger R&D Program and the ginger industry to secure funding through targeted government programs such as Rural Research for Profit.

Public Good Outcomes Provided by the RD&E Program

Public good outcomes generated by RIRDC Ginger R&D Program investments have included increased scientific capacity, increased industry capacity and increased regional incomes due to the increased profitability of the Australian ginger industry (Agtrans Research 2016).

Ginger Industry Outlook

In 2016 Australian ginger growers are positive about their future but acknowledge the importance of growing markets to remain competitive in a global trading environment (Keating 2016).

Production is focussed on the fresh domestic market and a combination of favourable growing conditions and improved biosecurity and management practices have increased yield and quality and placed pressure on grower returns (Keating 2016).

Over the horizon the outlook for Australian processed ginger products such as ginger beverages is positive. Continued incremental growth in the ginger processing sector will underpin the long term sustainability of the Australian ginger industry (Keating 2016).

Globally consumers are moving towards healthy eating lifestyles and ginger is well placed to capitalise on this trend. Ginger is a natural fit with lighter Asian-style meals and fresh salads. Ginger is perceived as an aid to digestion in some Asian cultures.

In Australia, per capita consumption of fresh ginger is low and there is opportunity to increase consumption with market research and promotion targeting the quality, safety and positive health attributes of Australian ginger.

Investigation of the scope for Australian ginger overseas may also present opportunities for growers. In particular the negotiation of Free Trade Agreements (FTAs) with North Asian countries (Korea, Japan and China) may help build prosperous links for processed and fresh ginger exports (Keating 2016).

Industry SWOT and its Implications for RD&E Planning

An RD&E focussed Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was completed for the Australian ginger industry along with an analysis of resulting implications for research planning. Results are shown in Table 2.2.

Table 2.2 SWOT and Research Planning Implications

SWOT	RD&E Requirement
Strengths	
<ul style="list-style-type: none"> Suitable production locations and ‘know-how’ 	<ul style="list-style-type: none"> Research to secure production base/land resource
<ul style="list-style-type: none"> World leader in food safety for ginger 	<ul style="list-style-type: none"> QA systems to underpin the food safety promise Code of practice for growers
<ul style="list-style-type: none"> Ginger with a unique and attractive flavour 	<ul style="list-style-type: none"> Market research to differentiate Aust product Market research to target promotion
<ul style="list-style-type: none"> Australian ginger is environmentally friendly 	<ul style="list-style-type: none"> Code of practice environmental stewardship
<ul style="list-style-type: none"> Unique varieties 	<ul style="list-style-type: none"> Market research for export opportunities
Weaknesses	
<ul style="list-style-type: none"> Diseases and pests – difficult and costly to control 	<ul style="list-style-type: none"> Promote best practice growing and management Ensure chemical supply via minor use permits Investigate nematode control measures
<ul style="list-style-type: none"> Labour intensive production 	<ul style="list-style-type: none"> Research global innovation opportunities
<ul style="list-style-type: none"> Poor quality seed limits production expansion 	<ul style="list-style-type: none"> Extension to support use of certified seed
<ul style="list-style-type: none"> Irrigation water, expensive land, aging growers 	<ul style="list-style-type: none"> Best practice guides to maximise productivity
Opportunities	
<ul style="list-style-type: none"> World ginger trade is growing strongly 	<ul style="list-style-type: none"> Market research for export opportunities
<ul style="list-style-type: none"> FTAs provide opportunity for ginger export 	<ul style="list-style-type: none"> Market research for export opportunities
<ul style="list-style-type: none"> Japan holds potential for ginger export 	<ul style="list-style-type: none"> Investigate trade barriers
<ul style="list-style-type: none"> Periodic shortfalls in supply for processing 	<ul style="list-style-type: none"> Productivity research to lower the cost of supply
Threats	
<ul style="list-style-type: none"> Importation of low cost fresh ginger 	<ul style="list-style-type: none"> Improve on-farm productivity Biosecurity measures including PHA levy Market research to differentiate Australian ginger Market research to target promotion
<ul style="list-style-type: none"> Exotic pest and disease incursion 	<ul style="list-style-type: none"> Biosecurity measures including PHA levy

Industry Commitment to RD&E

The Australian ginger industry is committed to RD&E and the statutory levy that supports research funding. RIRDC is the industry’s recognised service provider and AGIA is committed to delivering the research priorities detailed in this 5 Year RD&E Plan.

Ginger Industry Strategic Plan 2016 - 2021

The RIRDC 5 Year RD&E Plan 2017 - 2022 is consistent with AGIA’s Australian Ginger Industry Strategic Plan 2016 – 2021.

AGIA represents the whole ginger industry supply chain and its Mission Statement is for Australia to be recognised globally for the production of ‘Food Safe Quality Ginger’.

AGIA’s Industry Production Target is to lift Australian ginger production from 8,000 to 12,000 tonnes per annum by 2021 while sustaining profitable farm gate prices.

AGIA’s positioning statement for Australian ginger is summarised in Table 2.3.

Table 2.3 AGIA’s Positioning Statement for Australian Ginger

Criteria	Positioning
Opportunity domain	Asian cooking; natural health and well-being
Target markets and customers	Australian and overseas
Product scope and offering	Fresh whole ginger, processed – transformed; ingredient; seed ginger
Value proposition to customers	Food safe, high quality, flavour, healthy
Competitive intent	For growers to underpin their business practices to ensure Quality Assurance protocols are in place and a reliable supply of ginger
Sources of competitive advantage	Food safety, health and therapeutic benefits (i.e. digestive aid), distinctive flavour characteristics for delivering an enjoyable and exotic ‘eating experience’

Source: Keating 2016

The Ginger Program RD&E Plan 2017 – 2022 focusses on those parts of the AGIA Strategic Plan relevant to research and its implementation. AGIA strategic priorities that address marketing or broader industry issues (such as political representation, the functioning of a peak industry body) are not addressed in this document.

RD&E Plan 2017 – 2022

RIRDC is committed to achieving significant benefits to industry within its available resources, through the implementation of **targeted** and **high-impact** RD&E projects. The consultation process and resulting Australian Ginger Industry Strategic Plan 2016 – 2021 highlighted a number of issues that the ginger industry considers roadblocks to growth and development. Of these impediments, those that can be addressed with targeted RD&E have shaped RIRDC’s investment priorities for the next five years. Whilst not every problem raised can be addressed, these priorities aim to achieve high-impact, far-reaching benefits to the industry.

Goal

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

Objectives

The Ginger RD&E Plan 2017 - 2022 is formulated around three critical objectives:

1. Drive on-farm productivity – disease management, innovative technology and certified seed
2. Lift the demand for Australian ginger – brand and market research
3. Encourage industry engagement – extension, communication, leaders and partners.

These objectives will be reviewed annually, as part of RIRDC’s Annual Program Review process. Further consultation and feedback will be sought from stakeholders, to adjust or amend objectives as the industry moves forward.

Allocation of funding for these priorities will also be considered annually, as part of RIRDC’s Annual Operating Plan (AOP). The AOP is available on the RIRDC website, <https://rirdc.infoservices.com.au/items/12-001>.

Budget Allocation

Suggested budget allocation provides an overview of relative Program emphasis - Table 3.1.

Table 3.1 Suggested Resource Allocation by Plan Objective (%)

Objective	Proposed Allocation 2017 - 2022
Objective 1: Drive on-farm productivity – disease management, innovative technology and certified seed	50%
Objective 2: Lift the demand for Australian ginger – brand and market research	20%
Objective 3: Encourage industry engagement – extension, communication, leaders and partners	30%

Objective 1: Drive on-farm productivity – disease management, innovative technology and certified seed

Objectives

The Australian ginger industry is dependent on on-farm productivity growth to ensure growers remain profitable and able to supply competitively priced ginger to fresh and processing markets. The ongoing threat of fresh ginger imports from countries that have production cost advantages (low cost labour) will continue to put pressure on the performance of Australian farm businesses. Improved on-farm productivity is one way of competing with low cost imports. Highest priority investments to drive on-farm productivity have been identified as improved industry pest and disease management, harnessing innovative technology and adoption of clean certified seed.

Strategies

- Improve pest and disease management
 - Research nematode control measures including pathogenicity and methyl bromide
 - Invest in minor use permit applications to ensure growers have access to best practice chemical controls for pest and disease management
 - Research requirements for a ginger grower ‘Code of Practice’ that addresses supply chain management, food safety, biosecurity and environmental stewardship
 - Extension – prepare a pest and disease management best practice manual
 - Extension – provide growers with pest and disease management technical support.
- Harness technological innovation to be globally competitive
 - Investigate ginger production mechanisation opportunities e.g. seed cutting technology
 - Review and refine innovative technology to make it applicable to ginger production e.g. drones, spatial mapping and decision making apps.
 - Communicate opportunities to adopt innovative technology solutions that lower production cost
- Facilitate the use of clean, certified ginger seed
 - Research improved tissue culture techniques to generate clean planting material
 - Prepare a best practice ginger seed production manual
 - Extension – communicate the benefits to growers of using certified ginger seed.

Key Performance Indicators

- Better control measures for ginger nematodes developed by 2018
- Minor use permit applications prepared and lodged 2017 through 2022
- A voluntary code of practice available for grower adoption by 2018
- Best practice pest and disease manual prepared by 2019
- Identification and adoption of one innovative technology for ginger growing by 2022
- Greater awareness of production costs and productivity improvement by 2022
- Greater than 70% of growers using clean seed planting material by 2018

Indicative Share of RD&E Budget

- An annual investment of 60% of proposed program expenditure is suggested.

Objective 2: Lift the demand for Australian ginger – brand and market research

Objectives

The production outlook for Australian ginger is positive and is driven by improved farm management including breakthroughs in pest and disease control. Consequently, yield and quality are forecast to increase and Australian ginger production is targeted to expand from 8,000 tonnes in 2016 to 12,000 tonnes in 2021 (Keating 2016). Supply and demand is currently in balance and market development will be required to absorb this additional output.

AGIA understands that if growers are to maintain or improve farm business returns over the life of this plan, a combination of market research, brand development and promotion is needed (Keating 2016). The RIRDC managed RD&E levy is not able to assist with ginger promotion (a marketing activity). Consequently this objective addresses brand and market research.

Strategies

- Gather market intelligence and identify priority domestic and export market segments for Australian ginger
- Prioritise and explore new markets for Australia ginger
- Identify distribution channels in priority markets and develop a detailed understanding of each channel's requirements for ginger
- Communicate messages about preferred market channels and work with growers and the supply chain to ensure the Australian ginger brand embodies market requirements
- Research options and grower support for an Australian Ginger Marketing Levy.

Key Performance Indicators

- Australian ginger industry GVP increases in line with the increase in production volume i.e. Ginger GVP grows from \$32 million in 2016 to \$48 million by 2021

Indicative Share of RD&E Budget

- An annual investment of 20% of proposed program expenditure is suggested.

Objective 3: Encourage industry engagement – extension, communication, leaders and partners

Objectives

To deliver the industry's goal of a sustainable, growing and prosperous ginger industry, investment is needed in communicating research outputs, assisting industry with research adoption, building industry capacity and developing investment and implementation partnerships. This objective targets extension, communication, leadership and partnership development. Working with PHA on plant health issues is an immediate priority for the ginger industry.

Strategies

- Prepare and pilot a Regional Ginger Extension Program and evaluate whether the program assists with the uptake of research results
- Maintain proven annual industry extension events and workshops
- Provide an analysis of farm productivity benchmarks including paddock yield and quality data
- Communicate RD&E Levy Program management processes and the outcomes realised from levy investments via a well-used industry website
- Complete an independent evaluation of ginger levy return on investment
- Identify and build grower capacity including capacity in research project leadership
- Work with PHA to establish appropriate biosecurity arrangements including the funding of an Emergency Plant Pest Response Levy
- Partner with the Australian Government to identify scientifically proven effective measures to protect the industry from exotic pests e.g. Burrowing Nematode (*Radopholus similis*) from Fiji

Key Performance Indicators

- An effective extension program – performance measured annually through grower survey
- Productivity benchmarks developed and reported annually
- Effective communication including a website that provides RD&E program updates
- Independent evaluation of levy return on investment completed in 2021
- Emergency Plant Pest Response Levy proposal taken to a grower vote by 2018

Indicative Share of RD&E Budget

- An annual investment of 20% of proposed program expenditure is suggested.

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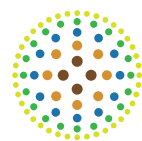


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