



Statement of Corporate Intent

2013/14 – 2017/18



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INTRODUCTION

Plant & Food Research is one of New Zealand's largest scientific research organisations, bringing together over 80 years of food, horticulture, arable and seafood research in a single institute to deliver knowledge and technology that serves New Zealand industry and society.

Plant & Food Research's mission, defined in our Statement of Core Purpose, is for a high impact contribution to our nation's economic, social and environmental prosperity, achieved by engagement with the horticulture, arable, seafood, food and beverage industry sectors. Furthermore, as a Crown owned company, it is expected that Plant & Food Research will operate as a sustainable business.

The impact of Plant & Food Research's science will be measured through the industry sectors that our work underpins. These industries make a significant contribution to our national wealth and wellbeing. Combined annual turnover in the horticulture, wine, arable and seafood industries is over \$11 billion. The wider food and beverages sector accounts for about 10% of New Zealand's GDP and nearly half of total exports.

Our research is helping to increase this contribution, particularly from growth in exports. Horticultural exports increased 5.5% to reach a total of \$3.6 billion in 2012. Seafood exports of \$1.5 billion annually are continuing to increase in value.

These sectors, with sustainably produced, high value premium products, are well placed to capitalise on global food trends such as food security, health, novelty, convenience and sustainability. While traditional Western markets are still large, there is strong growth in export markets in Asia driven by the rising incomes of consumers and demand for high quality New Zealand-origin foods and beverages.

Our strategy and vision aims to take us to the next level of performance. Building on our established strengths, we will focus on market-led as well as production-oriented opportunities, taking a proactive leadership role in pursuit of impact and competitive advantage for New Zealand. There will be challenges for both Plant & Food Research and its industry stakeholders in achieving this potential. Success will be achieved with a strong focus on:

- Investing in research for impact
- Partnering effectively
- Science and operational excellence
- Our resources – people, leadership, infrastructure and assets.

EXECUTIVE SUMMARY

OUR PURPOSE

“Plant & Food Research’s purpose is to enhance the value and productivity of New Zealand’s horticultural, arable, seafood and food and beverage industries to contribute to economic growth and the environmental and social prosperity of New Zealand.”

From Plant & Food Research’s Statement of Core Purpose

OPERATING ENVIRONMENT

Our Shareholder, the Crown, expects Plant & Food Research to deliver research with demonstrable impact on New Zealand’s current and future prosperity, and to operate sustainably as a business.

The industry sectors highlighted in our Statement of Core Purpose make a significant contribution to the New Zealand economy. Combined annual turnover in the horticulture, wine, arable and seafood industries is over \$11 billion. The wider food and beverages sector accounts for about 10% of GDP and nearly half of New Zealand’s exports. Exports from the primary sector need to double to achieve the Business Growth Agenda’s target for exports to increase from 30% to 40% of GDP.

OUR VISION AND STRATEGY

Our strategy is focused on growth and performance – both for New Zealand and Plant & Food Research. Key themes include:

- Broadening our thinking about how we achieve impact and competitive advantage for New Zealand
- Making choices, and taking a proactive leadership role
- Focusing on market-led as well as production-led opportunities
- Growing our international presence
- Increasing our organisation’s agility and flexibility
- Financial success for Plant & Food Research.

INVESTING FOR IMPACT

The introduction of Core Funding has enabled a strategic approach to our investments in research taking into account all sources of funding – Core Funding, Government contestable funding and commercial funding.

The allocation of resources for research in the coming period via will be similar to the current period. This document outlines the process by which decisions are made, changes in the past year, and trends which may influence decisions in the coming year.

Our research portfolio is focused on six key outcome areas, with the aim of maximising the impact of our research for New Zealand:

1. Better cultivars faster
2. Residue-free pest and disease control
3. More sustainable and profitable systems
4. Proprietary foods with premium prices
5. Secure, sustained seafood production
6. Premium foods and marine products.

Across these areas we focus on the sectors defined in our Statement of Core Purpose, as well as pan-sector programmes and a smaller portfolio of Future Science projects.

PARTNERING FOR SUCCESS

We will continue to have a strong focus on effective partnerships with clients and other stakeholders, so that we can identify high impact research opportunities based on industry and market opportunities, work with end-users and research collaborators to deliver research and technology transfer effectively, and subsequently assess the uptake and impact of the research.

Te Rārangā Ahumāra is our partnering approach with Māori to deliver on Vision Mātauranga and the opportunities in the Māori economy right across our key outcome areas and sector focus. In the coming period we will be increasing our investment in capability building and research.

To best fulfil our Core Purpose, Plant & Food Research must be active internationally to access research that is important for New Zealand, to strengthen our research capabilities, to understand key market and consumer trends, and to identify and develop opportunities for our New Zealand stakeholders. We expect to see further growth in our international activities in the coming period, focusing on New Zealand's key export markets.

SCIENCE AND OPERATIONAL EXCELLENCE

Our science practice and excellence will be benchmarked against the highest international standards, supported by the work of our Science Advisory Panel and science programme reviews.

Non-financial monitoring indicators that we will apply to measure our progress towards pursuing excellence in all our science activities are identified in Appendix 5.

We will continue to strengthen systems and culture that recognise and support the pursuit of robust, innovative and creative science.

Projected growth in revenue over the next five years will be achieved without increasing overall staff numbers, with increases in high priority areas being offset by reductions in lower priority areas.

RESOURCES

During this period we will be undertaking significant capital expenditure to upgrade or replace aging laboratories, containment facilities and buildings, mainly at our Mount Albert, Palmerston North, Lincoln and Nelson sites. We will also complete new facilities for finfish research at Nelson. Developments at the Palmerston North and Lincoln sites will be based on a common hub master plan shared with other organisations at those campuses.

FINANCIAL PERFORMANCE

Over the five-year period of this Statement of Corporate Intent the projection is for growth in commercial science revenue, a reduction in royalty income due to the impact of the Psa incursion in the kiwifruit industry, and continued cost containment and productivity measures. Overall profitability will continue to increase over the five-year period, after the downturn in recent years.

1. ROLE AND PURPOSE

The following excerpt from Plant & Food Research's Statement of Core Purpose defines our role, purpose and scope. A copy of the full Statement of Core Purpose is contained in Appendix 1.

PURPOSE

Plant & Food Research's purpose is to enhance the value and productivity of New Zealand's horticultural, arable, seafood and food and beverage industries to contribute to economic growth and the environmental and social prosperity of New Zealand.

OUTCOMES

Plant & Food Research will fulfil its purpose through the provision of research and transfer of technology and knowledge in partnership with key stakeholders including industry, government and Māori to:

- Increase the value of these industry sectors to the New Zealand economy through the development of high-value products and processes that meet current and future global market needs
- Protect and enhance market access in New Zealand's horticultural and arable sectors
- Sustain growth in these industry sectors, driving ongoing efficiency gains with the development of environmentally resilient production systems.

SCOPE OF OPERATION

To achieve these outcomes, Plant & Food Research is the lead CRI in the following areas:

- Novel fruit, vegetable and crop cultivars for the horticultural and arable industries
- Sustainable production and processing systems for the horticultural and arable industries
- Plant and seafood based foods, ingredients and biomaterials.

Plant & Food Research will work with other research providers and end-users to contribute to the development of the following areas:

- Biosecurity, land, soil and freshwater management
- Climate change adaptation
- Seafood and food and beverage sectors (including foods for human nutrition and health, and food technologies)
- Pastoral forage varieties.

2. OPERATING ENVIRONMENT

THE SHAREHOLDER'S EXPECTATIONS ARE CLEAR

This Statement of Corporate Intent charts our goals, strategies and priorities to meet the expectations of our shareholder, the Crown, and a refreshed mission and vision for Plant & Food Research.

The Government's expectations are clear: Plant & Food Research has a vital role to play in contributing to New Zealand's economic growth, and social and environmental prosperity. At the same time, we must operate sustainably as a business.

SIZE AND SIGNIFICANCE OF OUR SECTORS

The industry sectors highlighted in our Statement of Core Purpose make a significant contribution to New Zealand.

- The wider food and beverages sector contributes about 10% of New Zealand's GDP, and (at \$23 billion p.a.) nearly half of New Zealand's total exports
- Horticulture – industry turnover of \$6.6 billion p.a. with a strategy to grow to \$10 billion by 2020. Exports increased by 5.5% to reach a total of \$3.6 billion in the year ending June 2012
- Wine – a turnover of \$1.91 billion p.a., of which exports were \$1.17 billion
- Arable Crops – with a farm gate value of \$1.5 billion p.a., the arable sector is a key input to the wider food and beverage sector, and mixed cropping systems are an important contributor to the profitability and sustainability of dairy and other livestock production systems
- Seafood – industry exports are \$1.5 billion p.a., with the aim to double that through growth in aquaculture and to increase profitability with a lower environmental impact in the wild catch sector.

OPERATING ENVIRONMENT

We expect the current business environment to continue for at least the first part of the five-year period, characterised by a slow worldwide recovery from the global financial crisis and ongoing fiscal restraint in New Zealand and elsewhere in both public and private sector investment in research.

Key markets for the food industry sectors we support will continue current trends. Rising incomes in Asia continue to be a major driver of New Zealand's export growth. Exports to Europe and the USA have held up but local supply factors, the strong New Zealand dollar and continuing economic uncertainty have affected New Zealand margins. While there has been some improvement in these markets for some New Zealand export-oriented sectors, markets in Asia are increasing their share of New Zealand exports. Established markets in Japan, Korea and Taiwan are showing steady growth while China, Hong Kong and some Southeast Asian markets are seeing growth in both profitability and volume. Partners across all our Core Purpose sectors have indicated they intend to rebalance their marketing and supply efforts in line with this trend.

Plant & Food Research has a role to play in this. The Government's Business Growth Agenda has the goal of lifting the ratio of exports to gross domestic product to 40% by 2025. Exports of foodstuffs need to grow for this target to be met. This is a major driver for our strategy, research activities, investment decisions and industry and Government interactions.

We expect increased demand for research in areas such as market access, new cultivar development and consumer and sensory science. We will work closely with industry to prioritise resources for existing and new markets. We have seen some recovery in industry investment in research after the downturn caused by the Global Financial Crisis. We are projecting overall growth in investment in research by our New Zealand industry clients, with some increases and decreases in different sectors during the period of this plan.

There are significant opportunities for growth in the "Māori economy". Iwi, hapu, tribal incorporations and other organisations are developing investment and growth plans in sectors and areas where we can contribute.

As well as supporting growth opportunities we will maintain a strong focus on the bio-protection of our industries. Environmental, pest and disease threats are always present. The kiwifruit industry continues to grapple with the impact of the disease Psa - and expects to do so for the next few years as new orchard management practices, Psa-tolerant vines and other elements of the recovery solution are implemented. Likewise the vegetable sector continues to face hefty ongoing costs for the management of the Tomato Potato Psyllid and the beekeeping/pollination industries for management of the Varroa bee mite.

Internationally, while the research investment space is competitive, there are encouraging signs that Plant & Food Research can increase its activities in ways that directly support our New Zealand stakeholders.

3. VISION AND STRATEGY

The “scorecard” on the following page brings together the key elements of our mission, vision and strategy.

Our Statement of Core Purpose is the starting point and defines our mission. From there our vision and strategy aims to take us to the next level of performance and impact.

Our focus for the next five years is on growth and performance – for New Zealand and Plant & Food Research. Developing and implementing this strategy draws on some key themes:

1. Broadening our thinking about how we achieve impact and competitive advantage for New Zealand
2. Making choices, and taking a proactive leadership role
3. Focusing on market-led as well as production-led opportunities
4. Growing our international presence
5. Increasing our organisation’s agility and flexibility
6. Financial success for Plant & Food Research.

The strategies and goals outlined in this Statement of Corporate Intent reflect these themes.

Our high level goals are six outcomes for industry that drive our science strategies, resource allocation and performance assessment. These are:

1. Better cultivars faster	2. Residue-free pest and disease control	3. More sustainable and profitable systems	4. Proprietary foods with premium prices	5. Secure, sustained seafood production	6. Premium foods and marine products
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The following sections contain details of the resource allocation, impact indicators, and science strategies to deliver these outcomes.

Figure 1. Our Mission



CORE MEASURES OF OUR SUCCESS

For the Shareholder:

- Positive rating by core stakeholders of our science impact
- Quantified impact on social, economic and environmental prosperity
- Enduring commercial sustainability

For Customers:

- Relevant, quality, timely outputs and delivery
- High impact return on investment
- Vision and commitment to inform and to help to realise their goals

For Plant & Food Research:

- A performance culture with a talented, engaged workforce
- Greater depth and growth in research and commercial relationships
- Robust commercial performance

4. INVESTING IN RESEARCH FOR IMPACT

INVESTMENT AND PORTFOLIO MANAGEMENT

The introduction of Core Funding in 2011/12 increased the responsibility and accountability of Plant & Food Research for the research investment decisions we make and the subsequent impacts and outcomes for New Zealand.

We responded to this with a comprehensive framework for research investment and portfolio management across Plant & Food Research. The goal of this framework is to optimise the allocation of resources to maximise the impact of our research for the benefit of New Zealand. As all our activities are part of delivering on the three outcomes identified in our Statement of Core Purpose, we use this framework for our total research portfolio from all funding sources, not just the Core-funded portion.

Plant & Food Research's research investment and portfolio management approach follows six key principles:

- Impact/Outcome Orientation – investment decisions will be aligned and sized to strategic targets and be driven by the expected impact for the horticulture, arable and seafood industries in line with the agreed outcomes to which Plant & Food Research contributes
- Transparent – research areas will be evaluated on a set of criteria that will be effectively communicated to the relevant stakeholders
- Flexible – able to adapt and respond to changing conditions and priorities
- Transactional efficiency
- Encouraging collaboration – between research and industry and between researchers
- Monitoring and Evaluation – using metrics to evaluate the extent to which Plant & Food Research is delivering outputs and impacts that align with outcomes in our Statement of Core Purpose.

This process is central to Plant & Food Research's requirements for management, visibility and accountability of research investments around the delivery of impacts and outcomes.

There are two main categories in our research portfolio:

→ **Co-investment Driven**

This is the largest category and is based on joint investment and dialogue with the sectors and key stakeholders defined in our Statement of Core Purpose, for agreed outcomes and impacts. Over 80% of our research, from all sources of funding, is in this category. The principal features of this category are the key outcome areas in which Plant & Food Research is responsible for delivering and the industry or sector's vision and needs in areas that align with our key capability.

While principally sector aligned, there is also a pan-sector component for research directed to opportunities and needs that span multiple sectors. Investment in research that will benefit the Māori economy also spans our six outcome-oriented research portfolios and delivers value to a range of Māori interests. Our Te Rāanga Ahumāra strategy for contributing to the economic, social and environmental aspirations of Māori is outlined on pages 37-38.

→ **Future Science**

This is a smaller category that is directed at higher risk-higher reward initiatives in new science, long-term fundamental research, over-the-horizon future-oriented initiatives, and the development and future proofing of capability.

The structure of this research portfolio is represented diagrammatically in Figure 2 below.

In the sections that follow:

- Figure 3 shows total research investment by sector
- Figure 4 shows Core Funding investment by sector.

Capital Expenditure is a third category of investment. Our processes align capital expenditure with our strategy and with the prioritised research activities in the above categories.

Under this research investment process, management and the Board of Directors hold regular portfolio reviews and consider current and future research investment levels. The projected total investment and resource allocation across the different sectors and categories is outlined in the following sections. This includes the investment of Core Funding approved in 2012/13 and which will continue into 2013/14.

Figure 2. Plant & Food Research Investment Portfolio Matrix



As stated above, all of our activities are part of delivering on our Statement of Core Purpose, so we use this framework for our total research portfolio from all funding sources, not just the Core-funded portion. Figure 3 below contains this full view of our research portfolio.

Figure 3: Total Research Investment in Industry-Based Sectors.

This includes Plant & Food Research Core Funding, industry investment in research with Plant & Food Research, MBIE contestable funding and other Government funding. The data do not include Pan-sector investment. Research Intensity is calculated as the ratio of investment in research divided by the value (total revenue) of the sector. For this calculation, investment in research is the estimated total for all research, including programmes that do not involve Plant & Food Research.

Sector	PFR Research Portfolio (\$M)		Var (11/13) (%)	Industry Profile 2011/12					
	2011	2012/13		Domestic Revenue \$M	Export Rev \$M	Industry Rev \$M	CAGR (2007/2010) %	Sector Research Intensity %	Sector growth targets
Arable	9.2	10.5	14	378.4	94.6	473.0	6.5	4.0	Growth in forage for animal feed
Avocado	0.7	0.8	14	19.0	62.4	81.4	21.6	1.4	Export growth from consistent cropping and disease management
Berryfruit	2.8	2.6	-0.2	58.9	44.5	103.4	5.6	2.9	Growth opportunity linked to health and wellness properties for whole and process foods
Food	10.7	10.7	0	-	-	-	-	-	Adding value to whole and processed foods (health and wellness)
Kiwifruit	24.6	25	1.6	-	995.7	995.7	6.9	2.7	Recovery with new Psa-tolerant varieties
Pipfruit	12.5	11.5	-8.0	120.0	365.0	485.0	0.2	2.5	Refocusing on Asian markets and reducing production costs
Potato	6.0	6.1	1.6	286.5	95.5	382.0	-1.3	1.9	Growth from export of high value processed products into S.E. Asia
Onion	1.8	1.2	-33.3	31.5	114.3	145.8	-1.5	1.1	Novel varieties into Asian and S.E. Asian markets
Ornamentals	1.4	1.2	-14.3	224.3	77.0	301.3	18.0	0.6	New opportunities in propagation systems and a biotechnology platform
Other vegetables	3.3	2.9	9	-	-	-	-	-	Health and wellness properties associated with whole and fresh process foods
Summerfruit	1.1	1.1	0	42.0	31.0	73.0	-0.6	2.6	Growth in apricots and cherries into Asia and S.E. Asia
Seafood	4.2	8.0	90	149.0	1,494.0	1,643.0	6.0	2.1	Export of new high value products from wildfish, aquaculture and fish by-products
Wine	4.2	5.8	38.1	400.0	1,094.0	1,500.0	6.3	0.4	New wine styles into Asian markets and reduced production costs

Major changes in the portfolio in recent months have included the following:

- Increased industry funding in kiwifruit with some modification of Core-Funded projects, to incorporate Psa research targets
- Increased funding in seafood signalled from the PGP programme and associated redirection of Core Funding to modified targets to support potential created by changes in the structure of the seafood industry, renewed funding for Seafood Innovations Limited from MBIE as well as increased investment from industry
- Increased funding in mixed cropping to support a new research programme developed under a new governance umbrella with the Foundation for Arable Research and significant new investment from industry in forage brassica breeding
- New combined research programmes for the wine sector on: understanding consumer sensory responses to wine, de-synchronising flavour ripeness from sugar ripeness, grapevine leafroll virus elimination, and grapevine genetic improvement to better orientate our activities around the most effective areas and streamline project management and administration. PGP application is also progressing, and there is good support from industry for proposals to MBIE.
- Investment in research that will benefit the Māori economy is treated as a pan-sector activity because research delivered across our six outcome-oriented research portfolios delivers value to a range of Māori clients. Our Te Rāanga Ahumāra strategy for contributing to the economic, social and environmental aspirations of Māori is outlined on page 31.

None of the changes made has been at a level that affects the Government's Budget Output Expense categories outlined in the Core Funding table in the next section.

We anticipate further changes in a number of sectors in future months as individual sector plans continue to evolve, resource allocation is assessed against economic outcomes agreed with industry and other end-user partners, and the impacts of investments are evaluated over time. For example, we are developing a revised investment strategy with and for the kiwifruit sector as it works through its recovery. This will be ready for decision-making in 2013/14.

In the pipfruit sector there have been some positive responses to the challenge of weaker trading conditions in the traditional Northern Hemisphere markets. These include a closer focus on Asian markets. We continue to work closely with the industry to develop and commercialise new apple and pear varieties via Prevar, a joint venture between Pipfruit New Zealand, Apple & Pear Australia Limited and Plant & Food Research.

An important factor shaping our research portfolio is the outcome of the MBIE Science Investment Rounds for contestable funding. Funding from this source represents a significant proportion of our total research effort. In April 2013 Plant & Food Research submitted a range of proposals aligned with the Fund's investment priorities and delivery of our Core Purpose. Depending on the outcome, investment decisions on these proposals may require us to reassess our research investments.

In 2013/14 we plan to invest up to \$10.5M in Future Science, which represents about 10% of Plant & Food Research's research activity. This allocation is for Science Discovery projects that introduce and develop new science, establish new science platforms, establish and develop new science capability, and contribute to maintaining or redirecting existing capability. (Future Science is not the only home for fundamental research – some fundamental research is undertaken within the sector-led investment portfolios and is integrated with the delivery of sector-specific outcomes and/or part of a

cross-portfolio platform of activity.) Some will be invested in our Blue Skies scheme to provide seed funding for small, short, highly focused projects that test new and very innovative ideas, and work that has the potential to take us beyond our current business.

ALLOCATION OF CORE FUNDING

Introduced on July 1, 2011, Core Funding is an important source of investment within our research portfolio. The Core Funding currently allocated to Plant & Food Research corresponds to the following Government Budget Output Expense categories:

PFR Core Funding By Output Expense Category	\$ Excl GST
Biological Industries	
Primary industry productivity and sustainability	26,120,293
High value food and biological products and processes	2,844,444
Environmental Research	
Terrestrial ecosystems	1,504,889
Land and freshwater resources	2,222,222
Backbone	378,008
Capability Maintenance and Development	10,033,122
Total (excl GST)	43,102,978

Within these Budget Output Expense Categories, the allocation of Core Funding is as shown in Figure 4.

Figure 4. Investment of Core Funding by Sector

Sector	2011/12 Core	2012/13 Core	Rationale
Co-Investment Led			
Avocado	\$209K	\$298K	High growth sector with opportunity to leverage our investment with industry funding to deliver on critical industry needs
Berryfruit	\$645K	\$645K	Opportunity for Plant & Food Research to deliver impact from cultivars. Refocus on smart breeding tools
Cropping Systems	\$2,191K	\$2,941K	Increased opportunity for impact in forage and stock food industry
Kiwifruit	\$14,508K	\$14,540K	Support industry recovery and ongoing sustainable development
Onions	\$1,129K	\$629K	Refocus in line with industry priorities focused on sustainable developments
Vegetables	\$2,077K	\$1,577K	Refocus as major health and wellness programme reaches its planned commercial end point
Ornamentals	\$1,441K	\$1,170K	Reduce range of crops and focus on development of a new propagation platform technology
Pipfruit	\$5,155K	\$4,199K	Genomics shifts from developing to exploiting new knowledge. Increase investment on Asian market access and on reduced production costs
Potato	\$2,558K	\$2,239K	Continued focus on pest control, sustainable production and conventional breeding in line with industry priorities
Seafood	\$1,107K	\$2,107K	Invest to increase export of high value products from wildfish, aquaculture and fish by-products
Summerfruit	\$210K	\$210K	Growth in apricots and cherries into Asia and other export markets
Wine	\$3,131K	\$4,131K	New wine styles into Asian markets and reduced production costs
Biosecurity	\$3,192K	\$3,192K	Continued participation in successful multi-party collaboration
Crop Protection	\$989K	\$989K	Opportunity for impact for Agri-tech industry which spans multiple sectors
Environment	\$3,555K	\$3,555K	Continued participation in two programmes delivering to local government and other clients
Total	\$42,097K	\$42,421K	
Future Science			
Total	\$10,533K	\$10,533K	
Total Core Funding			
Total	\$52,630K	\$52,954K	

Any future reallocation of Core Funding will be undertaken via the investment and portfolio management framework outlined above and material movements will be reported to the shareholder. Plant & Food Research expects to work with MBIE on any new reporting requirements arising from the implementation of a performance-based framework for Core Funding in 2013/14, including disclosure of decision making and performance evaluation processes.

ALIGNMENT OF OUR SCIENCE KPIS WITH IMPACTS AND OUTCOMES

We are increasing our investment in the measurement of impact in order to confirm delivery of Core Purpose and guide sound research investment decisions. Our strategy is to deliver science that contributes to key impact targets brokered with our sectors across all six outcome areas. In 2013/14 Plant & Food Research will further develop its monitoring and evaluation framework to more closely align science outputs, science KPI milestones, impacts and outcome areas with SCP outcomes by developing impact agendas with associated timelines for each of our six outcome areas. These impact agendas will identify targets and timeframes agreed upon with key sector stakeholders. Impact targets, underpinning science programme goals, KPIs and associated IP identified through engagement will be aligned with our six outcome areas. Progress against these impact agendas will be reported on our Growing Futures website and in our 2013/14 Annual Report. The process of setting impact agendas across our outcomes areas will result in robust impact evaluations that will guide decision making in our investment process, enhancing the consistency of activity across the Core, contestable, commercial funding spectrum with SCP outcomes, as outlined below.

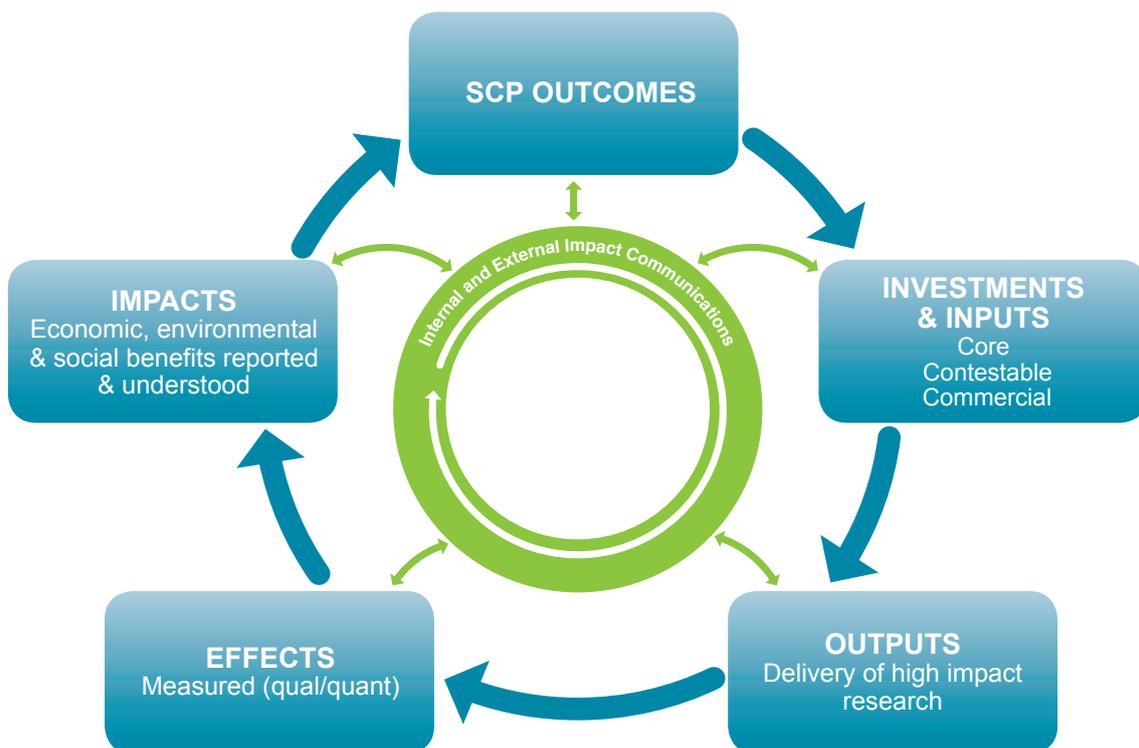


Figure 5. An integrated impact evaluation and investment cycle across the Core, contestable, commercial funding spectrum

OUTCOME AREAS

1. Better cultivars faster
2. Residue-free pest and disease control
3. More sustainable and profitable systems
4. Proprietary foods with premium prices
5. Secure, sustained seafood production
6. Premium foods and marine products

ADOPTION INDICATORS

PFR-bred cultivars grown in New Zealand and offshore	New Zealand industry and Central Government uses knowledge and tools from PFR science to inform a biosecurity system that minimises the frequency and impact of pest and disease incursions. Industries adopt a range of biological and ecologically based methods that provide highly effective pest and disease management solutions that balance phytosanitary and agricultural residue requirements of markets.	New Zealand agricultural and horticultural industries adopt PFR-developed production, harvesting, postharvest, packaging, handling and storage systems	Food industries in New Zealand and offshore use proprietary PFR cultivars and processes to generate processed foods and ingredients	Seafood industries in New Zealand and offshore use seafood technologies developed by PFR to generate premium seafood.
		Central and local government agencies use knowledge and tools from PFR science to inform policy development and systems design	Food companies and brands use PFR science to provide wellness-based claims and food solutions	Marine-based extract companies use PFR science to develop new high value products

IMPACT INDICATORS

1. Economic growth to New Zealand from the production of PFR-bred cultivars	1. Enhanced international competitiveness of export sectors through pest and disease management solutions to maintain and/or increase market access	1. Maintained and/or increased crop volumes, value and profitability	1. Growth in export value of whole foods and ingredients based on fruits, vegetables and grains	1. Growth in export volume and value of premium seafood
2. Category growth and market access maintained or increased in key markets through novel cultivar development	2. New Zealand's environmental quality enhanced by minimising pest and disease incursions, managing pests and diseases and reducing risks associated with pest management technologies	2. New Zealand's productive environments sustained or enhanced, generating products with verifiable reduced footprints to maintain and/or increase market access	2. Increased market share of high margin export food products and ingredients based on PFR cultivars, processes and knowledge that capture wellness benefits	2. Increased market share of high margin marine-based products and ingredients

OUTCOME AREAS

1. Better cultivars faster
2. Residue-free pest and disease control
3. More sustainable and profitable systems
4. Proprietary foods with premium prices
5. Secure, sustained seafood production
6. Premium foods and marine products

SCIENCE KPI MILESTONES FOR 2013/14

<p>Breeders' Database (EBrida) initiated for breeders of apples, <i>Vaccinium</i>, peas, <i>Prunus</i> and <i>Rubus</i>.</p> <p>'Best practice protocols' implemented to screen for resistance to Psa in kiwifruit, Psyllid/Zebra chip complex in potatoes, and European canker in apple, enabling the development of markers for use by breeders.</p> <p>High throughput phenotyping automated for 3 crop types for use in breeding programmes.</p> <p>Five new genotypes developed from wide hybridisation and/or ploidy manipulation for use in breeding programmes or commercial trials.</p> <p>Marker-assisted selection applied in 12 families from 7 PFR arable or fruit crops to guide the selection of breeding parents, and for 4 traits in pea, apple and kiwifruit to guide the selection of genetically elite individuals.</p> <p>Association of hexokinase 1 allelic variation and dry matter determined in kiwifruit. Papers published on starch phosphorylation and starch genetics.</p>	<p>A quantitative pest risk framework and appropriate risk mitigation tools for the apple and kiwifruit sectors delivered to these sectors to protect and expand market access opportunities.</p> <p>New diagnostic methods developed to detect target organisms from within metagenomic samples; results discussed with MPI to provide a basis for improved border testing.</p> <p>Disease susceptibility of newly released kiwifruit cultivars, advanced breeding lines and key parental lines determined and used to inform decision making by breeders.</p> <p>Best practice recommendations for managing European Canker updated and delivered to the pipfruit sector.</p> <p>Field trials completed to evaluate the effectiveness of reduced fungicide use in cereal crops with known genetic resistance; results and technology transfer plan discussed with cereal industry.</p>	<p>Advanced nutrient budgeting tools for at least 2 crops produced for use by regional councils to set environmental policy and for growers to ensure crop management is within policy.</p> <p>Orchard management guidelines produced for the kiwifruit industry supporting the release of new Psa-tolerant cultivars.</p> <p>A new RFID system for on-line monitoring of fruit volatiles developed and used by the fruit grading industry to enhance the novelty and value of export machines.</p> <p>At least 1 integrated dairy/cropping system (Crops for Cows) that improves production and environmental impact indicators identified and advanced to proof-of-concept with industry groups.</p>	<p>Functional efficacy of lead cultivars and/or ingredients tested in at least 2 animal and 1 human pilot controlled intervention studies to inform breeders and support product development and promotion.</p> <p>Efficacy of plant-based functional foods linked to New Zealand raw materials using human clinical trials tested for a minimum of 2 export products in collaboration with product manufacturers.</p> <p>Eye-tracking technologies evaluated as a tool to assess consumer response to visual aspects of novelty in kiwifruit and applications discussed with Zespri.</p> <p>Chemical phenotyping implemented to support efficient bioactive discovery and health biomarker identification, enabling researchers to identify compounds of interest more rapidly.</p> <p>Novel useful chemicals identified and related to flavour and health QTLs as well as the genes and compounds involved, supporting development of smarter marker-assisted selection by breeders.</p>	<p>Beta prototype technology for capturing and harvesting minimally damaged, minimally fatigued fish field tested on Sealord and Sanford fishing vessels.</p> <p>Alpha and beta prototypes fabricated and field tested with industry partners for selective harvest of wild-caught fish species.</p> <p>On-board chilled storage systems to maximise product quality of fish captured in wild fisheries developed and prototype tested by industry partner.</p> <p>Husbandry and conditioning methods for live storage of 2 species of commercial fin fish developed and communicated to PGP partners.</p> <p>A minimum of 5000 post-metamorphosis snapper juveniles produced for use in behavioural, physiological, breeding and harvesting studies.</p> <p>Techniques for producing post-metamorphic juveniles of 2 key New Zealand finfish species described, enabling industry assessment of potential for finfish aquaculture.</p>	<p>Bioactive peptides manufactured at pilot scale using free and immobilised proteases. Commercialisation pathway discussed with industry partners.</p> <p>Pilot-scale manufacturing trials for Cfine-Dry carried out along with efficacy testing as a fining agent in New Zealand wine. Results used to inform commercialisation pathway.</p> <p>An alternative animal model developed to assess <i>Listeria</i> virulence in seafood, enabling researchers to improve assessment of risk to consumers.</p> <p><i>Vibrio</i> isolates characterised (growth and pathogenicity); results and their implications for the New Zealand Pacific Oyster supply chain communicated to industry partners.</p>
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OUTCOME AREAS					
1. Better cultivars faster	2. Residue-free pest and disease control	3. More sustainable and profitable systems	4. Proprietary foods with premium prices	5. Secure, sustained seafood production	6. Premium foods and marine products

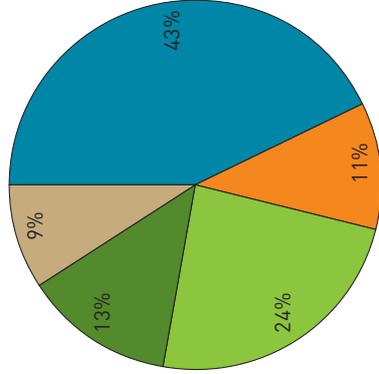
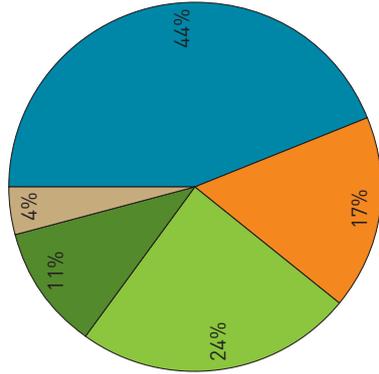
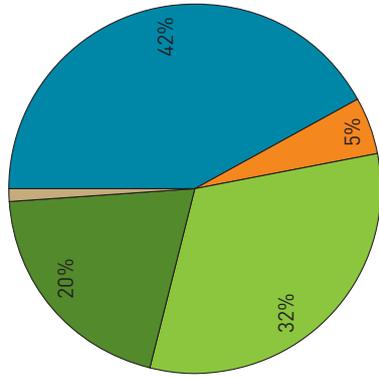
SCIENCE KPI MILESTONES FOR 2013/14 CONTINUED

<p>Marker for allele associated with low softening used by breeders.</p> <p>Cymbidium germplasm with novel vegetative pigmentation developed in conjunction with the Cymbidium Orchid Group.</p> <p>Two arable, 1 hops and 1 ornamental cultivar made available for commercialisation.</p>	<p>One new insect pest management tactic advanced based on pheromones or other semiochemicals in collaboration with commercial partners.</p> <p>Proof of concept established for a biopesticide against <i>Psa</i> with commercial potential.</p>		<p>Metabolite fingerprints identified for at least 1 storage disorder in new apple cultivars, and a screening tool developed for breeders to eliminate susceptible selections.</p> <p>A minimum of 3 plant species identified to target as sources of safety-inducing compounds and commercialisation pathway(s) scoped.</p> <p>Gut health efficacy of an existing, export, functional food product investigated <i>in vivo</i> in collaboration with a product manufacturer.</p>		
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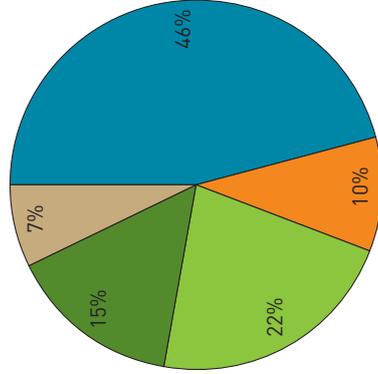
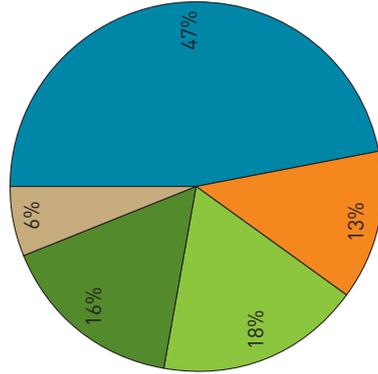
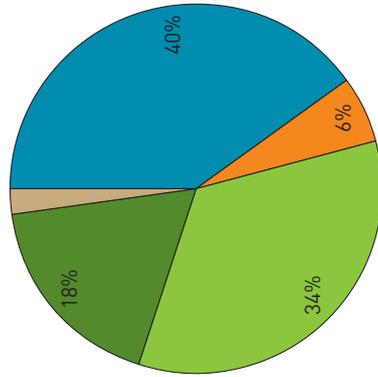
The charts on the following pages show the share of different sources of funding for each of these six outcome areas in 2011-12 and 2012-13.

OUTCOME AREAS
1. Better cultivars faster **2. Residue-free pest and disease control** **3. More sustainable and profitable systems**

2011-2012

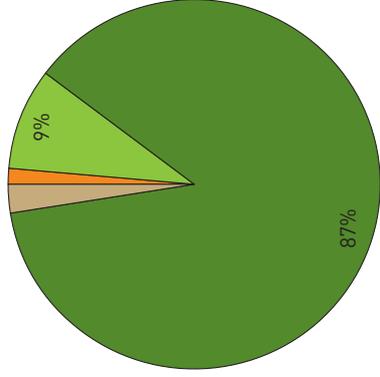
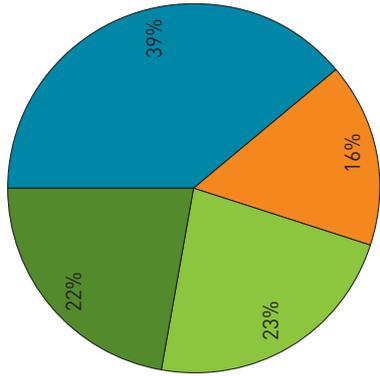
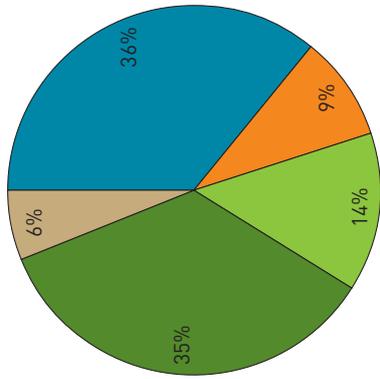


2012-2013

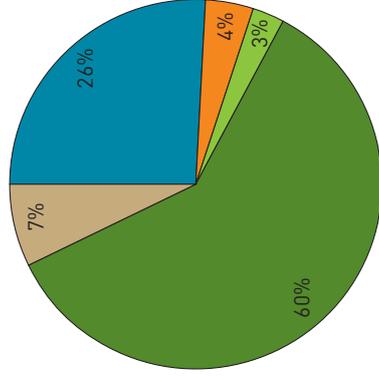
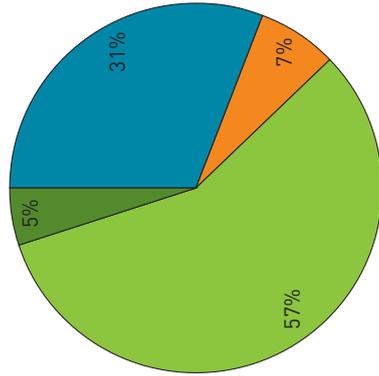
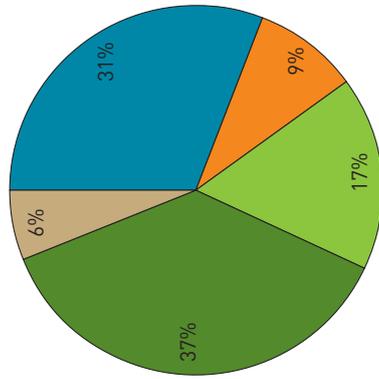


OUTCOME AREAS
 4. Proprietary foods with premium prices
 5. Secure, sustained seafood production
 6. Premium foods and marine products

2011-2012



2012-2013



SCIENCE STRATEGIES

Our research on New Zealand's plant-and seafood-based food resources will be targeted at six outcomes for industry:

Food from Horticulture and Cropping Sectors

1. Better Cultivars Faster. Accelerated breeding of new and improved food plants that possess attributes which attract price premiums and deliver competitive advantage
2. Residue-Free Pest and Disease Control. Control of plant pests and diseases, increasingly using biological and environmentally based control methods
3. More Sustainable and Profitable Systems. Increasing yield and efficiency in plant production, harvesting, processing and supply chains with an emphasis on economic and environment sustainability
4. Proprietary Foods with Price Premiums. New whole foods, beverages and nutraceuticals from proprietary cultivars, with proven functionality in wellness.

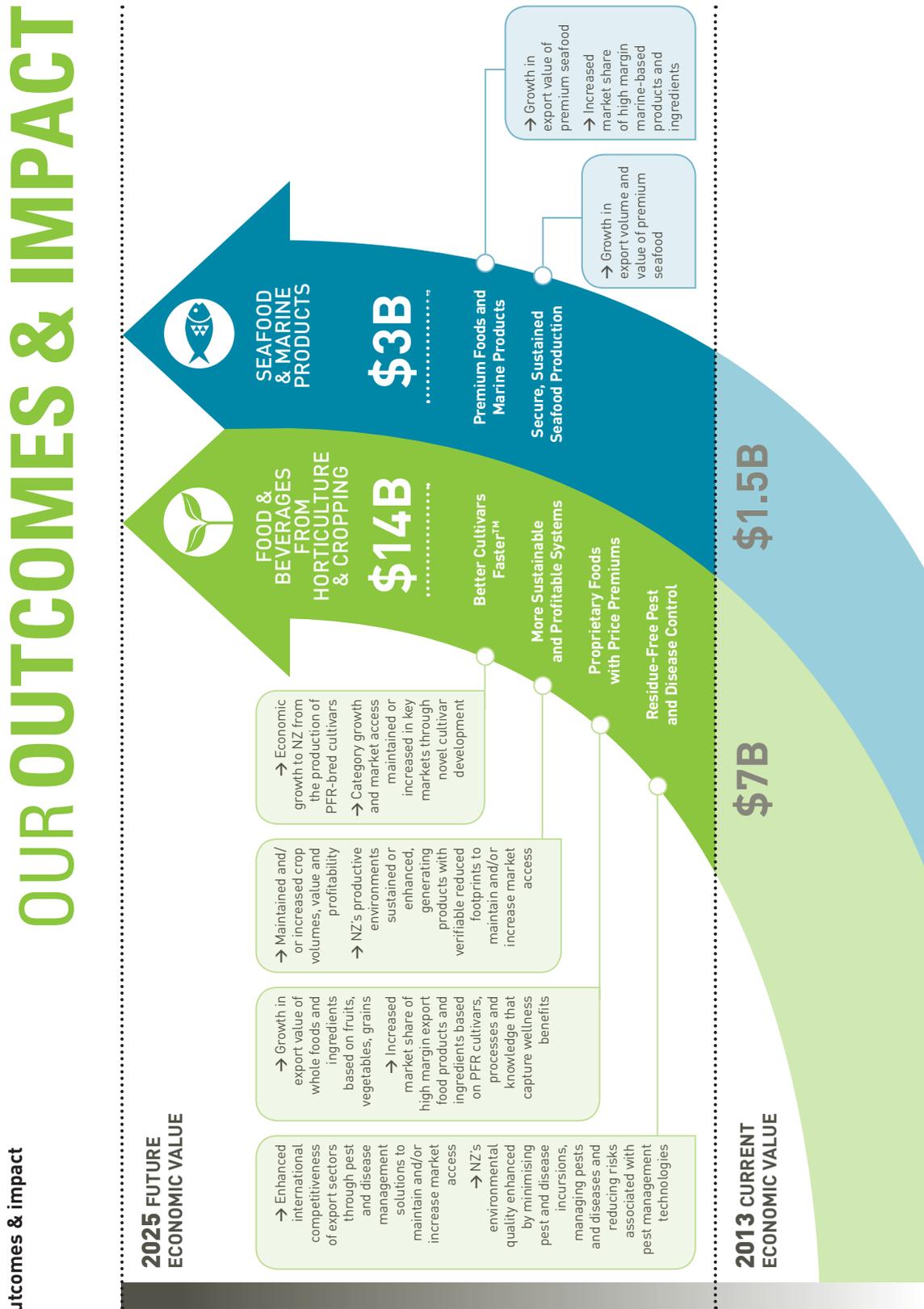
Seafood Sector

5. Secure, Sustained Seafood Production. New technologies for the sustainable production and harvest of premium seafood
6. Premium Foods and High Value Marine Products. Postharvest technologies to enhance consumer experiences and utilise high value components for new marine-based products.

These six outcome areas represent the principal levers for value enhancement. Our capability across the full food value chain is a point of difference for Plant & Food Research compared with peer research organisations overseas which typically focus on only part of the value chain. For example, a new cultivar may deliver a consumer benefit or pest resistance, but production techniques may need to be modified to achieve commercially viable productivity.

The diagram overleaf illustrates how these six outcome areas represent the application of our scientific research to industry growth and enhanced economic impacts and outcomes.

Figure 6. Our outcomes & impact



DETAILED SCIENCE STRATEGIES

In the following sections we describe the science strategy for each of the six outcome areas in more detail, the rationale for investment, and the impact our research will have on achievement of the end result or outcome we are targeting for New Zealand's economy, environment and/or society.

OUTCOME 1: BETTER CULTIVARS FASTER

RATIONALE FOR ACTIVITIES

A number of key industry strategies for the horticulture and arable sectors identify new proprietary cultivars as key to successful future growth by allowing value creation and price premiums, commercial growth and control of intellectual property. NZIER has modelled the benefit to the industry and identified that the investment to develop new cultivars will be the dominant driver of growth in the horticulture sector to achieve the target industry turnover of over \$10 billion by 2020.

Plant & Food Research therefore plans to invest capital and capability over the next five years in research to develop better proprietary cultivars over shortened time frames, as part of a supply chain of food products for which consumers will pay a premium.

We will use conventional breeding techniques to create new cultivars, using our knowledge of the genetics of key traits to inform the breeding process. This will create new fruits, vegetables, arable and ornamental crops with novel characteristics that appeal to the consumer, grow market share and attract a price premium, and provide advantages to the grower such as higher yield, pest and disease resistance, seasonality and storage potential. Our extensive germplasm collection provides us with a wide range of genetic diversity that will be included in our breeding programmes. Our genomics research will identify and isolate new genes, allowing our breeding team to screen for these genes faster and to narrow the search for parents with the ideal genetic traits. We will also screen offspring and isolate those plants with the most promising genetic potential for further breeding or commercial success, reducing the number and increasing the quality of selections entering assessment trials.

IMMEDIATE AND NEAR-FUTURE TARGETS (1 – 10 YEARS)

- A platform with new genomic and breeding tools delivering cultivars, against jointly agreed development targets, in half the time currently required for this activity
- Tailored cultivars for specific production systems, environmental variability and change
- Complete genomic sequencing and deep sequencing of germplasm, characterising allelic differences to provide numerous ecotypes for both New Zealand and global environments.

ANTICIPATED AND OVER-THE-HORIZON TARGETS (>10 YEARS)

- Enriched germplasm for next generation cultivars with stacked premium traits for whole fresh foods and ingredients
- All New Zealand crops supplied from cultivars that enable sustainable production in climates and environments that will be encountered in 2050.

¹Horticulture New Zealand (2009) Growing a New Future - Horticulture Industry Strategy 2009-2020

ADOPTION INDICATOR

Plant & Food Research-bred cultivars grown in New Zealand and offshore.

IMPACT INDICATORS

- Economic growth to New Zealand from the production of Plant & Food Research-bred cultivars
- Category growth and market access maintained or increased in key markets through novel cultivar development.

OUTCOME 2: RESIDUE-FREE PEST AND DISEASE CONTROL

RATIONALE FOR ACTIVITIES

To maintain access to international markets, invasive pests and diseases must be prevented from crossing borders, and existing pests and diseases must be controlled without leaving problematic chemical residues on produce for export. It has been estimated that an economic benefit of at least \$236M p.a. by 2022 could be achieved by research to address current export market access issues associated with phytosanitary pests and diseases affecting New Zealand's apple and kiwifruit sectors. More significantly, it is critical that research is conducted to reduce the risk of pests and diseases closing existing export markets for fresh produce worth \$1.8B in 2010. Airborne fungal and bacterial diseases are estimated to cause New Zealand direct economic losses and market uncertainties worth \$250-500M p.a.

Key industries will move increasingly from chemically to biologically and ecologically based methods for pest and disease control while still meeting profitability and market access expectations. Threat of major incursions or market access failures will be reduced because of strengthened border and pre-border protection.

Plant & Food Research therefore plans to invest capital and capability in research to develop new technologies, tools and protocols that sustainably protect the horticultural and arable industries from pests and diseases while maintaining quality and productivity.

We will apply an ecosystem approach in dealing with plant pests and pathogens, while minimising residues from traditional chemical controls to maintain market access. Our researchers will develop integrated pest and disease management systems that incorporate a range of methods applied throughout the pre- and postharvest systems. We will work with industry to enable a shift from traditional chemical-based programmes to those based on biological and ecological knowledge. We will also work across country borders to minimise incursions of new pests and pathogens and with industry in developing new control methods and protocols when challenged with new incursions.

IMMEDIATE AND NEAR-FUTURE TARGETS (1 – 10 YEARS)

- New tools and systems for biologically based pest and disease control
- New cultivars stacked with targeted pest and disease resistance
- New 'safe' disinfestation technologies
- Improved biosecurity risk assessments, detection technologies, optimised surveillance approaches and new tools for response and eradication.

²Analysis conducted for MBIE contract C06X0709 'Enhancing the economic performance of New Zealand's fruit sectors by overcoming technical challenges to market access'.

ANTICIPATED AND OVER-THE-HORIZON TARGETS (>10 YEARS)

- A whole-systems approach at a range of scales (from molecular to regional) to deliver new integrated pest and disease management systems.

ADOPTION INDICATORS

- New Zealand industry and Central Government use knowledge and tools from Plant & Food Research science to inform a biosecurity system that minimises the frequency and impact of pest and disease incursions
- Industries adopt a range of biologically and ecologically based methods that provide highly effective pest and disease management solutions that balance phytosanitary and agrichemical residue requirements of markets.

IMPACT INDICATORS

- Enhanced international competitiveness of export sectors through pest and disease management solutions to maintain and/or increase market access
- New Zealand's environmental quality enhanced by minimising pest and disease incursions, managing pests and diseases and reducing risks associated with pest management technologies.

OUTCOME 3: MORE SUSTAINABLE AND PROFITABLE SYSTEMS

RATIONALE FOR ACTIVITIES

New Zealand is a niche exporter of high value foods to markets that rank among the world's most discerning in their sensitivity to issues of quality and sustainability.

Plant & Food Research therefore plans to invest capital and capability over the next five years in research to develop tools and methods that allow growers to meet or exceed the world's most stringent sustainability requirements and at the same time increase profitability for growers.

We will employ science across a number of complementary disciplines including tree, vine and crop science, systems modelling, biometrics, bioengineering and soil, water and environmental sciences to fully integrate systems that reduce inputs and maximise productivity throughout the supply chain. Our decision support tools and system models will optimise water and nitrogen requirements in addition to minimising chemical inputs, dramatically reducing both the financial costs and the environmental footprint of production.

IMMEDIATE AND NEAR-FUTURE TARGETS (1 – 10 YEARS)

- Whole systems modelling and prediction platform
- Tools developed for eco-verification, footprinting and traceability (water, carbon, greenhouse gases, soil, biodiversity, pesticides, social equity)
- Improved production technologies and cultivars based on scaled up knowledge from molecular, physiological, soil, water and environmental sciences, integrated with system science.

ANTICIPATED AND OVER-THE-HORIZON TARGETS (>10 YEARS)

- Plant & Food Research creates key technologies and links with domestic and international partners to enable a cluster of new businesses to be created in Smart Management Technologies

- Characterisation and prediction of environmental changes and new conditions likely to be encountered using systems modelling to match crop genetics to environment
- Handling, transport and logistics systems for export crops which meet future sustainability demands with respect to energy, carbon cost, water, social and ethical issues
- Systems analysis and economic, logistics and social modelling
- New harvesting, packaging and handling systems.

ADOPTION INDICATORS

- New Zealand agricultural and horticultural industries adopt Plant & Food Research-developed production, harvesting, postharvest, packaging, handling and storage systems
- Central and local government agencies use knowledge and tools from Plant & Food Research science to inform policy development and systems design.

IMPACT INDICATORS

- Maintained and/or increased crop volumes, value and profitability
- New Zealand's productive environments sustained or enhanced, generating products with verifiable reduced footprints to maintain and/or increase market access.

OUTCOME 4: PROPRIETARY FOODS WITH PRICE PREMIUMS

RATIONALE FOR ACTIVITIES

The food sector contributes to around 10% of GDP and accounts for over half the country's export earnings (>\$23 billion in 2008, nearly trebling since 1990). The industry needs to reduce its vulnerability arising from a reliance on price-sensitive commodity exports that, over time, are falling in real value.

Plant & Food Research therefore plans to invest capital and capability over the next five years in research to develop high value plant products with a specific focus on verifiable wellness and quality attributes for food and beverage markets where consumers will pay a premium.

Our fruit, vegetable and arable food products will deliver high impact consumer experiences that are reflected in the premium prices they achieve in world markets. We will combine our research ability with our understanding of business needs, our recognition of the need to be efficient and cost effective, and an awareness of food market trends such as human health, personalised nutrition and wellbeing, food safety, convenience, novelty and environmental responsibility.

We will identify the wellness and health-promoting compounds within foods and define their delivery mechanisms. Then we will enhance, extract and make these compounds available in whole foods, through conventional breeding of elite plant cultivars, and the development of ingredients and new, safe and convenient foods and beverages. We will provide evidence to confirm the benefits of these natural compounds and our consumer and sensory science will help to ensure that whole and processed foods reaching the market meet the demands of the discerning consumer.

Our research will inform our breeding programmes, developing elite new cultivars with identified health and processing attributes. It will also inspire the development of new production systems tailored to produce precise amounts of key compounds in fresh produce.

IMMEDIATE AND NEAR-FUTURE TARGETS (1 – 10 YEARS)

- Premium whole fresh foods for wellness with functional bioavailability from exclusive proprietary cultivars developed with local and multinational companies
- New food and beverage ingredients from exclusive proprietary cultivars, based on knowledge of wellness and consumers, developed with local and multinational companies
- New food and beverage concepts based on ingredients from exclusive proprietary cultivars.

ANTICIPATED AND OVER-THE-HORIZON TARGETS (>10 YEARS)

- New Zealand is an innovation base for wellness-based multinational foods companies
- Food concepts based on human gene variability and responses
- Fully utilising all New Zealand-derived crops as food bio-resources (food, ingredients, compounds, packaging) with maximum value capture and minimised wastage to produce novel materials
- One or more food formats delivering nutritional needs for both deprived and affluent sectors.

ADOPTION INDICATORS

- Food industries in New Zealand and offshore use proprietary Plant & Food Research cultivars and processes to generate processed foods and ingredients
- Food companies and brands use Plant & Food Research science to provide wellness-based claims and food solutions.

IMPACT INDICATORS

- Growth in export value of whole foods and ingredients based on fruits, vegetables, and grains
- Increased market share of high margin export food products and ingredients based on Plant & Food Research cultivars, processes and knowledge that capture wellness benefits.

OUTCOME 5: SECURE, SUSTAINED SEAFOOD PRODUCTION

RATIONALE FOR ACTIVITIES

New Zealand's seafood industries are targeting to grow to \$1 billion p.a. from aquaculture by 2025 and to \$2 billion p.a. from wild catch fisheries by 2025. Plant & Food Research therefore plans also to invest in research to enhance and protect the profitability and sustainability of fishery resources by developing improved production methods and selective harvest technologies. This will ensure improved and predictable access to, and control of, raw products from the sea.

IMMEDIATE AND NEAR-FUTURE TARGETS (1 – 10 YEARS)

- New production systems including wild fisheries enhancement and aquaculture
- New technologies for selective harvest.

ANTICIPATED AND OVER-THE-HORIZON TARGETS (>10 YEARS)

- A seafood research platform spanning all the key research providers with funding mechanisms to the value of \$40 million
- Genetic improvement of new and existing species.

ADOPTION INDICATORS

- Seafood industries in New Zealand and offshore use seafood production technologies developed by Plant & Food Research to generate premium seafood.

IMPACT INDICATORS

- Growth in export volume and value of premium seafood.

OUTCOME 6: PREMIUM FOODS AND MARINE PRODUCTS

RATIONALE FOR ACTIVITIES

There is a significant opportunity to extract more value from seafood resources through the generation of products better aligned with defined consumer preferences. These include whole chilled food and functional foods such as nutraceuticals. Non-fillet products in the seafood supply chain can attract further value as products developed by extraction, characterisation and modification of marine-derived biochemical compounds.

IMMEDIATE AND NEAR-FUTURE TARGETS (1 – 10 YEARS)

- New harvest postharvest technologies to support live seafood exports and higher value chilled and frozen products
- New processing and preservation technologies to support extended shelf-life, product quality and food safety.

ANTICIPATED AND OVER-THE-HORIZON TARGETS (>10 YEARS)

- Fully utilising all marine-based resources with maximum value capture and minimised wastage to produce novel high value products
- Understanding and responding to consumer preferences for seafood and seafood-based products, including functional foods.

ADOPTION INDICATORS

- Seafood industries in New Zealand and offshore use seafood technologies developed by Plant & Food Research to generate premium seafood
- Marine-based extract companies use Plant & Food Research science to develop new high value products.

IMPACT INDICATORS

- Growth in export value of premium seafood
- Increased market share of high margin marine-based products and ingredients.

SPECIAL TOPIC: RESPONDING TO PSA

Responding to the Psa incursion currently affecting the New Zealand kiwifruit industry has been a major focus for Plant & Food Research in the past two and a half years and our research is continuing to play a key role in the industry recovery.

The bacterial plant disease *Pseudomonas syringae* pv. *actinidiae* (Psa) is a damaging bacterial pathogen that is specific to kiwifruit. Psa was provisionally identified in New Zealand on 5 November 2010 from a kiwifruit orchard in Te Puke. Subsequently the identification was confirmed and further infected orchards have been identified across the country. Two haplotypes of Psa have been identified, a less virulent haplotype (Psa-LV) and an aggressive haplotype (Psa-V). Psa-V has a more limited distribution but has been steadily spreading and has now infected 71% of hectares in New Zealand spanning as far north as Kerikeri to as far south as Gisborne and Hawke's Bay. Psa-V is a serious threat to the New Zealand kiwifruit industry and a significant amount of research is underway to address the problem.

Working in close collaboration with Zespri, Kiwifruit Vine Health, the wider industry and worldwide research collaborators, Plant & Food Research has established a large research programme focused on Psa. We have redirected significant resources and personnel into the fight against Psa and we have changed the focus of much of our existing kiwifruit research. Over 100 of our research staff have been involved in the Psa programme. In addition to the industry investment, significant Core Funding and internal KRIP funding has been applied to Psa research.

The research programme on developing solutions for Psa is made up of the following five research areas.

UNDERSTANDING THE PATHOGEN

This is developing knowledge of the biology and lifecycle of Psa, the conditions that influence the growth of Psa including within the plant, as well as the development of effective and rapid Psa diagnostic tools and crop monitoring systems. This understanding and the associated tools are essential in enabling the industry to make informed management decisions. A key outcome from this research to date has been the identification of the Psa genome and of genes specific to Psa-V. This has provided an understanding of the origins and global spread of Psa and more importantly has enabled the development of specific markers and diagnostic tools essential for managing Psa-V. Additionally, the identification of key genes involved in the infection process is informing the breeding programme.

ORCHARD MANAGEMENT

Providing tools and knowledge to growers to help combat Psa is at the heart of the Plant & Food Research Psa research programme. The information on the pathogen is a critical building block for this and aids to direct research that is specifically focused on the orchard system and on answering practical questions about the management of Psa on-orchard. Research includes the development of on-orchard management practices to minimise Psa, Psa-free pollination systems, the identification of the most effective chemical and alternative control approaches, induction of resistance within the existing kiwifruit cultivars, and systems for the production of Psa-free material. Results of the research have been pivotal in the establishment of orchard hygiene and management practices and have also enabled the industry to develop specific crop protection strategies for Psa. These practices and strategies are already providing a short-term solution for Psa on orchards with more tolerant cultivars such as 'Hayward' and 'Zesh002' (commonly known as Gold3). Work on the production of clean material is ongoing and is critical in the management of existing kiwifruit orchards, in the protection of the unique germplasm and breeding material and for the establishment of any new cultivars on existing orchards.

An example of this is Plant & Food Research's direct involvement in this area is the participation on the panel of the Tuhono Whenua Project, where Plant & Food Research scientists will directly provide input and solutions to real issues to orchards involved in the scheme. Alongside this, Plant & Food Research participates in the industry Psa-V steering group, which leads research initiatives and regularly provides speakers for industry grower meetings, hosts the Kiwifruit Research Forum and weekly KVH Psa-V Technical representative meetings and has provided the majority of speakers at the industry-led Psa Symposia.

TOLERANT CULTIVARS

The long-term management of Psa will involve a combination of new orchard management approaches and new cultivars; consequently the future of the kiwifruit industry depends on the development of a range of Psa-resistant cultivars. This is the medium to long-term solution for Psa. Research in this area is aimed at rapidly screening the existing kiwifruit material for tolerance (medium term) as well as the longer term goal of breeding novel resistant cultivars. Work is well advanced and several bioassays have already been developed and implemented. The results of these bioassays coupled with the ongoing disease phenotyping and orchard monitoring work have already identified significant variability in the degree of tolerance across different kiwifruit genotypes. This information has been integrated into the Zespri/Plant & Food Research breeding programme, with the first generation of new cultivars bred specifically to include Psa tolerance already in the field, and more importantly formed a crucial component of the information that led to the development of the industry recovery plan based around the new Gold3 variety. Plant & Food Research is also utilising its expertise in gene identification and sequencing to rapidly identify pathogen effector genes and Psa resistance genes that can be targeted and selected for use in the development of new resistant selections. Alongside the development of resistant cultivars it is essential to protect our existing germplasm and wider kiwifruit populations. Work is underway looking at the establishment of high health schemes and safe repositories for our unique kiwifruit material.

SUPPLY CHAIN

The impact of Psa is not limited to the orchard. Psa in Italy has had a significant impact on the entire kiwifruit supply chain from the orchard to the marketplace and the New Zealand industry expects to face the same issues. We are undertaking research to understand the impact of Psa on fruit development, orchard productivity, fruit size, dry matter, maturity consumer perception and storage. In addition the research will examine the potential outcome of the use of plant protection products and other Psa-related orchard management approaches on the same orchard and fruit attributes.

BIOSECURITY AND MARKET ACCESS

A key to ensuring that we are not faced with further similar occurrences in the future is working with researchers around the world to develop an understanding of the origin, distribution and spread of Psa. A preliminary “family tree” has been established for Psa and collaborations with scientist around the world, including China, are well established.

Psa has been a devastating and substantial challenge for the kiwifruit industry. However, a recovery plan is now in place and whilst the problem is far from solved, the outlook for the industry has improved dramatically on the back of the intense research effort described above. The industry is currently intending to keep on track to achieve its target of \$3 billion export revenue by 2030.

5. PARTNERING FOR SUCCESS

Strong and effective relationships are critical for our success – partnerships with clients and other end-users, Government stakeholders and research collaborators, in New Zealand and internationally.

ENGAGEMENT WITH SECTORS AND CUSTOMERS

While positive impacts are our focus, we can only directly control research outcomes. The link between desired impacts and research outcomes relies heavily on the strong partnerships that Plant & Food Research is developing with our national and international clients and stakeholders. Our aim is to have close relationships with our partners so that:

- We jointly create longer term plans for both organisations based on a shared view of market and consumer needs and what science can provide
- We work collaboratively to convert those long-term plans into tangible actions effectively using the capabilities of both organisations
- We jointly review and monitor progress ensuring that research outputs are taken up, commercial outcomes achieved and long-term impacts secured.

In order to build the collaboration required effectively, we will:

- Focus on high potential and high impact industry sectors and customers
- Develop sector plans which articulate the link between science outputs and the sectors targeted commercial outcomes jointly with key stakeholders from the sector
- Develop detailed internal partner plans to allow Plant & Food Research to interact with our most important partners in a coordinated manner
- Use sector plans to inform and challenge both our long-term science plans and also our resource allocation and portfolio management processes
- Seek feedback on customer satisfaction and work to optimise our business processes to maximise impact
- Secure and manage intellectual property in order to maximise the benefit for New Zealand while fairly rewarding Plant & Food Research and our partners for their role in intellectual property creation.

TE RĀRANGA AHUMĀRA

The opportunities for growth in the “Māori economy” are significant in their own right and for New Zealand. The Government has identified key actions for realising this potential through its ‘He kai kei aku ringa’ strategy. A series of goals and an action plan have been identified through this Crown-Māori Economic Growth Partnership. The 2012-17 action plan requires that engagement is improved between industry groups and Māori enterprises, that the Māori value proposition is capitalised upon in export markets, and links between the innovation system and Māori enterprises and collectives are enhanced. There is a clear role for Plant & Food Research in these initiatives.

Te Rārangā Ahumāra, our specialist Māori business team, operates across Plant & Food Research

to advance effective business and engagement opportunities with Māori. Its primary focus is to identify Māori research and innovation objectives and align them with activity across the six outcome areas in our Statement of Core Purpose. Te Rārangā Ahumāra will drive business opportunities with Māori by identifying key organisations whose needs are aligned with our business strategy. These organisations include the Māori Trustee, the Federation of Māori Authorities, Te Awanui Hukapak, Aotearoa Fisheries, and Wakatu Incorporation. Our approach is also to build relationships directly with runanga, including Te Runanga o Ngai Tahu and Te Runanga a Iwi o Nga Puhi and Te Runanga o Ngai Te Rangi.

A further role of Te Rārangā Ahumāra is to enhance relationships and trust and build capability within Plant & Food Research to respond to opportunities identified by Māori stakeholders. A key vehicle for building capability within Plant & Food Research and our Māori partners is the Vision Mātauranga Capability Fund. We aim to secure Connect and Placement initiatives in 2013/14 that will create greater involvement of Māori within Plant & Food Research and provide our scientists with insights into principles that are important to Māori. Our involvement in the Vision Mātauranga Capability Scheme will contribute to building indigenous innovation, increasing environmental sustainability, supporting Māori health outcomes and exploring indigenous knowledge, science and innovation.

We have recently strengthened our Nga Toa Ngaki Kai, internal staff network, by broadening it to include rangatahi and kaumatua, creating cultural support and mentorship. The increasing profile of Nga Toa Ngaki Kai across our organisation is increasing our scientists' understanding of opportunities to work with Māori in our six outcome areas. A further tool to engage with emerging Māori scientists is Te Kete Ahumara, a web-based platform for taking science innovation out to a young audience and inviting commentary on our research. These activities are an investment in young Māori who may be the scientists of the future, investors in RS&T and partners with our business in years to come.

In 2013/14 the following will generate important impacts for Māori through relationship building or delivery of RS&T projects:

KPI 1: Building sector-based opportunities with Māori

- A platform of research to explore the potential of manuka genetic resources that characterise this plant resource, pollination issues associated with the production of manuka-based products, and the business case to support more efficient utilisation of this resource by Māori
- Value-added opportunities to increase export potential for seafood products by incorporating native flavours or essences derived to build a unique Māori brand.

KPI 2: Building relationships with Māori and enhancing Māori understanding of the role of RS&T

- Building Māori science capability within Plant & Food Research through internships for young Māori
- Vision Mātauranga Capability Fund initiatives
- Building additional Māori business and relationship capability in Te Raranga Ahumara using Core funding, to engage additional Māori stakeholders in RS&T opportunities.

KPI 3: Increasing awareness within Plant & Food Research of Māori aspirations and the role of RS&T

- NTK activities for 2013/4
- VMCF initiatives.

Success in these initiatives relies upon the clear integration of our business for Māori across research underway in our six outcome areas to deliver on our Statement of Core Purpose.

TECHNOLOGY TRANSFER

The majority of our technology transfer will continue to be direct to our clients, partners, and other end-users via a range of mechanisms including reports, demonstrations and field days, training, and licensing. The technology transfer mechanism will be agreed with our industry partners as part of our partner planning process, and incorporated into the research programme design and delivery. The adoption and impact assessments outlined in our science strategies will measure the results.

There will be some instances where scientific discoveries do not fit with any current stakeholders or alternatively our plans are not sufficiently advanced to cover all eventualities. In these cases we will seek to commercialise the intellectual property in ways that maximise both the positive impact for New Zealand and a share of the value for Plant & Food Research without exposing us to inappropriate risk.

Appendix 5 identifies non-financial monitoring indicators that we will apply to measure our progress towards developing strong, long-term partnerships with industry, government and Māori; setting research priorities that are well linked to the needs and potential of our end-users; and transferring technology and knowledge from domestic and international sources to New Zealand industry, government and Māori.

RESEARCH COLLABORATION

We will continue to develop global research alliances that enhance our capability, science quality and delivery. We recognise that to deliver on our core purpose, we need top quality research teams and major international linkages. Plant & Food Research will not have all the capability it needs in-house and will access additional capability as required from other research organisations through genuine collaboration. Plant & Food Research also has a responsibility to access leading international science and resources, and to be a vehicle for introducing new technologies and concepts to New Zealand. This will be achieved through participation and partnerships with global programmes and international consortia in key areas for our business. Collaboration is a measure of Plant & Food Research's national and international standing, and therefore our science quality.

Non-financial monitoring indicators that we will apply to measure our progress towards developing collaborative relationships with other CRIs, universities and other research institutions within New Zealand and internationally to form the best teams to deliver Plant & Food Research's core purpose are identified in Appendix 5.

THE INTERNATIONAL DIMENSION OF PLANT & FOOD RESEARCH

While Plant & Food Research's focus is on the New Zealand sectors that we support, science is a global endeavour and in order to be world class at what we do, we need to operate internationally as well as domestically.

Our international activities are focused around three key objectives:

1. Providing in-market or behind-borders support for New Zealand companies, industries and licensees
2. Providing access to world-leading science capabilities (see the next section on Research Collaboration)

3. Commercialising intellectual property to realise value - where the New Zealand industry does not have capacity to do so.

Although these objectives are presented separately above, in practice they are often linked. For example, in order to provide behind-borders support to a New Zealand company we will often need to work with a research organisation in that geographic location. By doing so, we will at times initiate broader collaborations, which in turn could lead to in-licensing of technologies for the benefit of New Zealand sectors, or alternatively licensing out of some of Plant & Food Research's proprietary technologies.

These objectives will shape the degree of activity we have in any given international territory. Our priority territories are:

AUSTRALIA

Australia is an important territory for many of our New Zealand clients. Australia has close business, economic and governmental ties with New Zealand and is the home of a number of high quality research organisations in areas relevant to New Zealand. In addition, the Australian and New Zealand horticultural industries have a growing track record of collaboration on common research interests as wide ranging as crop productivity, pests, fruit breeding and irrigation (a number of which were initiated by Plant & Food Research). We will continue to work with industries, research organisations and funders in both countries to build this mutually beneficial collaboration and to diversify the sources of funding for research that benefits our New Zealand stakeholders. We expect to see continued growth in activities in Australia.

NORTH AMERICA & EUROPE

North America and Europe offer a broad range of opportunities that strongly support our core purpose, including behind-borders support for New Zealand companies, international science collaboration, and technology licensing opportunities. Our North American activity tends to be applied in focus; in contrast, a particular strength of our European activity is our collaborations with leading research institutes and collaboration networks. Variety and technology licensing is an important activity in both regions. Our focus will be on expanding and deepening these collaborations with selected research organisations, clients and licensees.

ASIA

With its proximity, strong growth (economically and in science capabilities) and its importance for New Zealand exporters, Asia is also a priority region for Plant & Food Research's international business. We focus our efforts on selected countries and territories, with the mix of behind-borders support for New Zealand companies, international science collaboration, and support for the New Zealand Government's foreign affairs and trade agenda varying among the countries we focus on.

We will give China greater emphasis in the coming period. We will be progressing several initiatives that build on our long-standing research relationships with institutes in China. The initiatives are aimed at research collaboration, supporting New Zealand businesses in that market, creating opportunities for New Zealand businesses, and supporting the New Zealand's Government's China strategy.

6. SCIENCE AND OPERATIONAL EXCELLENCE

SCIENCE EXCELLENCE

Our science practice and excellence will be benchmarked against the highest international standards. An important part of this has been the establishment of our Science Advisory Panel. This comprises:

- Prof. Marston Conder, University of Auckland (Chair)
- Dr Cathie Martin, John Innes Centre, UK
- Prof. Ernst van der Ende, Plant Research International/Wageningen University, The Netherlands
- Dr Alistair Robertson, CSIRO, Australia.

This panel will advise the Board on Plant & Food Research's science quality, strategy, and involvement in and uptake of new international developments.

In addition, Plant & Food Research runs science reviews, ranging from reviews of major research areas and groups with leading international scientists as panellists, through to more targeted in-house reviews. These cover science quality, performance and strategy, and relationships with commercial opportunities.

Non-financial monitoring indicators that we will apply to measure our progress towards pursuing excellence in all our science activities are identified in Appendix 5.

We will continue to strengthen systems and culture that recognise and support the pursuit of robust, innovative and creative science.

ENCOURAGING INNOVATION AND RELEVANCE

Our science teams are being structured to lift delivery of breakthrough innovation. We are placing much greater emphasis on managing for outputs to meet or exceed customer demand for quality, timeliness and relevance of research and advice.

NEW CAPABILITY DEVELOPMENT

To deliver on our strategy and the resulting science outputs will require us to develop new capabilities in a range of areas, most notably in human genetics, microbiology, bioprotection, life cycle assessment, quantitative genetics, bioinformatics and systems biology and modelling.

With revenue from the Crown expected to remain more or less constant over the next five years, the development of new areas will be achieved through a combination of redirecting of existing activity and growth through targeted recruitment, supported by additional commercial revenue and internal investments as royalty income grows. We also expect to access some of our new capability

needs through collaboration with national and international partners, particularly where they have established strengths in areas of common interest.

Recent success in the Primary Growth Partnership initiative 'Precision Seafood Harvesting' is intended to support new or expanded capabilities across a range of areas including pre- and postharvest physiology, production systems, evaluation and assessment and prototype and facilities design. This will be achieved through the development of existing capability combined with recruitment and external collaborations with seafood companies and other research institutes.

More generally, we are strongly committed to growing a vibrant world-class science and technology-literate workforce at Plant & Food Research, with people who create new ideas and develop technology and opportunities from science in our areas of focus for the benefit of New Zealand.

To do this we will place a strong emphasis on achievement and on science and commercial outputs (papers, people, patents and products). We are setting high standards for achievement by our staff and will reward drive and energy with improved remuneration, state-of-the-art facilities and well resourced technical teams. Lifting the ratio of technicians and technologists to scientists will ensure teams are well-placed to perform at an optimal level. This goal will be supported by a trainee technician programme targeted at promising science students.

PRODUCTIVITY ENHANCEMENT

The projected growth in revenue over the next five years will be achieved without increasing overall staff numbers, with increases in high priority areas being offset by reductions in lower priority areas. To further enhance the productivity of our science teams we will continue to increase the ratio of technicians to scientists. Together, these measures are expected to lift revenue per science FTE from the current \$191,000 per FTE to \$249,000 per FTE by 2017/18. These numbers are incorporated into the 5-year Business Plan.

7. OUR RESOURCES

PEOPLE, LEADERSHIP & CULTURE

We will continue to make significant investments in our people. While these will largely be directed at building scientific and technical knowledge and skills, we will also continue to invest in the development of leadership capability at all levels of the organisation through our highly regarded leadership programme. The programme forms a major element in a range of integrated initiatives for identifying and developing our next generation of leaders.

The challenging environment in which we are currently operating has the potential to affect staff engagement and retention levels as people experience and adapt to change and extra pressures. In these circumstances it is vital that they can have confidence in the future. To this end we will place a strong emphasis on ensuring Plant & Food Research remains an employer of choice for those with a passion for science. Exciting research programmes focusing on the major opportunities and challenges for our current and prospective clients, inspiring and supportive leadership, a positive work environment, career development opportunities and excellent conditions of employment are all important elements in this.

We will continue to promote an organisational culture that is built around our shared values of *achievement through leadership, the creative application of our knowledge, and relationships based on honesty, mutual respect and trust*. These values, together with a compelling vision for the future, provide a robust and enduring foundation for the Institute's ongoing success.

LAND, BUILDINGS AND RESEARCH FACILITIES

Plant & Food Research operates from three large research centres at Auckland, Palmerston North and Lincoln and nine smaller sites across New Zealand. The smaller facilities are closely associated with key production and processing regions for horticultural cropping industries, and in the case of the Nelson site, the seafood industry. Most of these facilities are owned by the Institute and comprise a diverse mix of largely specialist buildings and land used for experimental purposes.

Within this portfolio, there is considerable variation in their age, condition and overall suitability for our current and future needs. We will continue to review and where appropriate, redevelop buildings and associated research facilities, particularly at our three large centres, over the next five years. The priority for capital expenditure in this period will be essential remediation or upgrading of older buildings, laboratories and containment facilities.

At the largest site at Mt Albert, Auckland, a master plan outlines the site's long-term development and progressive renewal in the years ahead. During the past year we completed preparatory work and commenced detailed design for the upgrade of the main (Hamilton) building. We expect to commence the first stage of refurbishment of the building in 2013/14. Given the outdated and inadequate nature of some of the site's research facilities and urgent maintenance requirements, the renewal programme represents a major, high priority investment for the Institute.

In 2013/14 we also expect to complete expansion of facilities for our seafood facilities to support delivery of the research for the PGP-funded Precision Seafood Harvesting programme.

We will continue to develop long-term Master Plans for our other larger sites, including Palmerston North and Lincoln, in conjunction with the other members of these key research and technology hubs.

In parallel we will continue to assess and review our property holdings and ownership arrangements in light of our evolving research requirements.

INFORMATION RESOURCES, DATABASES AND COLLECTIONS

Advances in information technology provide both the opportunity and a responsibility to better structure the way the Institute collects and manages data and knowledge. While peer-reviewed publications represent a readily accessible record of the research undertaken on any topic, there is typically a far larger body of data and other information which, for one reason or another, is not published and which, as a consequence, is far less readily accessible.

Information management technologies provide a mechanism for collecting, storing and organising data and other knowledge so that they can be appropriately accessed and utilised at any future point. Properly designed and implemented, these technologies can facilitate improvements in the sharing of information for collaboration purposes, effective succession management and the creation and protection of valuable intellectual property.

As a government-owned research institute we have a particular responsibility to ensure that the data and knowledge we generate are readily available to future generations of researchers. Our significant investment in the development of new and improved systems for information management acknowledges this responsibility. This investment is also enabling us to meet our obligations under the Public Records Act.

Databases held by Plant & Food Research include general scientific and commercial information, together with highly specialised data relating to core business activities and specific research projects. These include fruit gene databases and germplasm collections. The Institute holds two collections that are designated as “nationally significant”:

1. The national collections of fruit crop germplasm including plantings of kiwifruit, pipfruit, summerfruit, berryfruit and other fruit crops, at various Plant & Food Research sites
2. The arable crops gene bank, comprising a comprehensive collection of crop species of both agricultural importance and research interest, most significantly “landrace” varieties of small grain crops.

Policies for the databases and reference collections in which Plant & Food Research has an interest are recorded in Appendix 2.

8. FINANCIAL PERFORMANCE

The following table contains our financial targets and expected performance over the five-year period. While we have revenue growth in some areas and have cut costs, our financial performance over the next two years will be affected by the impact of the Psa bacterial incursion on the New Zealand kiwifruit industry.

Figure 9. Summary of financial performance

Financial year	2013/14	2014/15	2015/16	2016/17	2017/18
\$(000's)					
Total Revenue	119,659	126,342	133,533	143,206	148,898
Total Costs	-109,964	-112,671	-117,183	-123,152	-126,215
Earnings before depreciation, interest & tax	9,695	13,671	16,350	20,054	22,684
Depreciation	-9,370	-10,679	-12,081	-13,173	-13,418
Earnings before interest & tax	324	2,992	4,269	6,880	9,266
Net Interest & Gain on Sale	3,134	4,982	3,705	3,615	-195
Net Profit before tax	3,458	7,974	7,974	10,496	9,071
Notional tax	-184	-854	-1,124	-1,819	-2,540
Net Profit after tax	3,274	7,120	6,851	8,677	6,531
% revenue	3%	6%	5%	6%	4%
ROE %	5%	9%	8%	10%	7%

Core financial indicators that we will apply to maintain a strong focus on our financial viability are identified in Appendix 5.

APPENDIX 1: PLANT & FOOD RESEARCH STATEMENT OF CORE PURPOSE

PURPOSE

Plant & Food Research's purpose is to enhance the value and productivity of New Zealand's horticultural, arable, seafood and food and beverage industries to contribute to economic growth and the environmental and social prosperity of New Zealand.

OUTCOMES

Plant & Food Research will fulfil its purpose through the provision of research and transfer of technology and knowledge in partnership with key stakeholders including industry, government and Māori to:

- Increase the value of these industry sectors to the New Zealand economy through the development of high-value products and processes that meet current and future global market needs
- Protect and enhance market access in New Zealand's horticultural and arable sectors
- Sustain growth in these industry sectors, driving ongoing efficiency gains with the development of environmentally resilient production systems.

SCOPE OF OPERATION

To achieve these outcomes, Plant & Food Research is the lead CRI in the following areas:

- Novel fruit, vegetable and crop cultivars for the horticultural and arable industries
- Sustainable production and processing systems for the horticultural and arable industries
- Plant- and seafood-based foods, ingredients and biomaterials.

Plant & Food Research will work with other research providers and end-users to contribute to the development of the following areas:

- Biosecurity, land, soil and freshwater management
- Climate change adaptation
- Seafood and food and beverage sectors (including foods for human nutrition and health and food technologies)
- Pastoral forage varieties.

OPERATING PRINCIPLES

Plant & Food Research will:

- Operate in accordance with a statement of corporate intent and business plan that describes how Plant & Food Research will deliver against this Statement of Core Purpose, and describes what the shareholders will receive for their investment
- Meet its obligations as a Crown Company and remain financially viable, delivering an appropriate rate of return on equity
- Develop strong, long-term partnerships with key stakeholders including industry, government and Māori and work with them to set research priorities that are well linked to the needs and potential of its end-users
- Maintain a balance of research that provides for both the near-term requirements of its sectors and demonstrates vision for their longer-term benefit
- Transfer technology and knowledge from domestic and international sources to key New Zealand stakeholders including industry, government and Māori
- Develop collaborative relationships with other CRIs, universities and other research institutions (within New Zealand and internationally) to form the best teams to deliver its core purpose
- Provide advice on matters of its expertise to the Crown
- Represent New Zealand's interests on behalf of the Crown through contribution to science diplomacy, international scientific issues and/or bodies as required
- Seek advice from scientific and user advisory panels to help to ensure the quality and relevance of its research
- Establish policies, practices and culture that optimise talent recruitment and retention
- Enable the innovation potential of Māori knowledge, resources and people
- Maintain its databases, collections and infrastructure and manage the scientific and research data it generates in a sustainable manner, providing appropriate access and maximising the reusability of data sets
- Seek shareholder consent for significant activity beyond its scope of operation.

This statement provides key guidance to the Plant & Food Research Board for developing its Statement of Corporate Intent, which sets out Plant & Food Research's strategy for delivering against its core purpose. Plant & Food Research's performance will be monitored against the outcomes and operating principles in this statement.

APPENDIX 2: POLICY AND PROCEDURE STATEMENTS

GOOD EMPLOYER POLICIES

Plant & Food Research recognizes that its reputation as a good employer is fundamental to its ability to attract, motivate and retain the people required for the achievement of its business objectives.

There is a strong commitment to fostering a work environment in which staff can reach their maximum potential. This will be fulfilled by:

- Continuing investment in the development of the knowledge, skills and abilities of staff at all levels
- Involving staff in the development and implementation of the organisation's strategies, policies and procedures
- Reinforcing the role and responsibilities of the organisation's leaders in promoting a workplace culture in which all staff are treated with fairness and respect
- The development and implementation of innovative and flexible employment practices that recognise the diverse and evolving composition and aspirations of our workforce
- Ensuring the health and safety and wellbeing of our people at work.

Plant & Food Research's Equal Employment Opportunities (EEO) programme aims to create an innovative and successful organisation by attracting and retaining high calibre staff from all possible sections of society. This will enhance our ability to develop successful relationships with a wider range of clients and ensure we fulfil a key aspect of our responsibilities as a good employer. This is critical, given the increasingly diverse nature of the organisation's workforce and the society and markets within which it operates.

The focus is on the removal of barriers to EEO for both existing and potential employees, and the development of a culture where EEO principles are an integral part of the decision-making process. There are increasing proportions of both women and minority ethnic groups within the organisation. Further progress will be achieved by ensuring that policies, procedures and actions reflect the key EEO principles of:

- Tolerance and respect for others
- Merit-based assessment of potential and existing staff
- Providing appropriately targeted development opportunities to support staff in achieving their full potential.

The organisation has an active programme for ensuring the health and safety of employees in the workplace. There is a strong focus on employee involvement through the National Health and Safety committee and local committees of each of our ten sites.

ACCOUNTING POLICIES

Plant & Food Research Plant & Food Research operates to generally accepted accounting principles endorsed by the New Zealand Society of Accountants. A statement of accounting policies is contained in Appendix 4.

DIVIDEND POLICY

The Board will notify the shareholding Ministers, within three months of the end of each financial year:

- The amount of dividend (if any) recommended to be distributed to the shareholders
- The percentage of tax-paid profits that the dividend represents
- The rationale and analysis used to determine the amount of dividend.

In determining surplus funds for distribution, the Board each year will give consideration to:

- The organisation's medium and long term capital investment requirements
- The organisation's projected profitability and cashflows
- The ongoing financial viability of the company, including its ability to repay debt
- The ability of the organisation to react to revenue shocks outside its control, and still maintain and enhance the capability of its people and facilities
- The obligations of the Directors under the Companies Act 1993 and other statutory requirements.

We are projecting over the Statement of Corporate Intent period that we will undertake significant property redevelopment of our major campus sites, and this development will require significant internal financing. Therefore we are not forecasting a dividend distribution over this period.

SIGNIFICANT TRANSACTIONS POLICY

The Board will obtain prior written consent of shareholding ministers for any transaction or series of transactions involving full or partial acquisition, disposal or modification of property (buildings, land and capital equipment) and other assets with a value equivalent to or greater than \$10 million or 20% of the company's total assets (prior to the transaction), whichever is the lesser.

The Board will also obtain prior written consent of shareholding Ministers for any transaction or series of transactions with a value equivalent to or greater than \$5 million or 30% of a company's total assets (prior to the transaction) involving:

- Acquisition, disposal or modification of an interest in a joint venture or partnership, or similar association
- Acquisition or disposal, in full or in part, of shares or interests in a subsidiary, external company or business unit
- Transactions that affect a company's ownership of a subsidiary or a subsidiary's ownership of another entity
- Other transactions that fall outside the scope of the definition of the company's core business or that may have a material effect on the company's science capabilities.

NATIONAL DATABASE AND COLLECTIONS ACCESS POLICY

Shareholding ministers will be advised of any disputes over access or use of any reference collection held by Plant & Food Research and ministers may appoint a person with relevant expertise to decide the matter. Any such decision will be binding on Plant & Food Research.

APPENDIX 3: MATTERS REQUIRED BY THE CROWN RESEARCH INSTITUTES ACT 1992

RATIO OF SHAREHOLDERS FUNDS TO TOTAL ASSETS

Plant & Food Research's target ratio of shareholders fund to total assets is as follows:

Year ended 30 June	2013	2014	2015
Equity ratio	0.73:1	0.73:1	0.73:1

Equity Ratio equals Shareholders' Funds divided by Total Assets.

ACTIVITIES WHERE SHAREHOLDER COMPENSATION IS REQUIRED

Where the Government wishes Plant & Food Research to undertake activities or assume obligations that will result in a reduction of the organisation's profit, or net worth in terms of investment in research, the Board will seek compensation sufficient to allow the organisation's position to be restored.

No requests for compensation are currently under consideration.

OTHER MATTERS SPECIFICALLY REQUESTED BY THE SHAREHOLDER

Section 16(3) of the Act requires Plant & Food Research to furnish an estimate of the current commercial value of the Crown's investment. The Board will conduct a review of the commercial value of the Company whenever it considers there to be a material change in the Crown's investment. A full valuation of the Company has not been undertaken since formation of the Crown Research Institutes on 1 July 1992. In the absence of a full valuation, the Board considers that the net asset position (or shareholders' funds) as at 30 June 2012 is a fair and reasonable proxy of the commercial value of the Group.

APPENDIX 4: ACCOUNTING POLICIES

1. REPORTING ENTITIES

The New Zealand Institute for Plant & Food Research Limited (the “Company” or “Plant & Food Research”) and its subsidiaries (the “Group”) is a Crown Research Institute governed by the Crown Research Institute Act 1992 and is a limited liability company incorporated and domiciled in New Zealand. The whole of the share capital is held by Ministers of the Crown on behalf of the New Zealand Government. The Company’s registered office is 120 Mt Albert Road, Sandringham, Auckland 1025.

The Group is primarily involved in research services on a fee-for-service basis.

The parent Company and the Group are designated as profit-oriented entities for financial reporting purposes.

These financial statements have been approved for issue by the Board of Directors on 23 August 2012.

2. BASIS OF PREPARATION

The financial statements are presented in New Zealand dollars (NZD), which is the Company’s functional and presentation currency. All financial information presented in New Zealand dollars has been rounded to the nearest thousand dollars (\$000).

The financial statements have been prepared under the historical cost convention, as modified by the revaluation of financial assets, and financial assets and financial liabilities (including derivative instruments) at fair value through profit or loss.

(A) STATEMENT OF COMPLIANCE

The financial statements are prepared in accordance with the requirements of the Crown Research Institutes Act 1992, the Public Finance Act 1989, the Companies Act 1993 and the Financial Reporting Act 1993.

The financial statements have also been prepared in accordance with New Zealand generally accepted accounting practice (NZ GAAP). They comply with New Zealand equivalents to International Financial Reporting Standards (NZ IFRS), and other Financial Reporting Standards, as appropriate for profit-oriented entities. They also comply with International Financial Reporting Standards (IFRS).

(B) USE OF ESTIMATES

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenue and expenses. Although these estimates are based on management’s knowledge of current events and actions that may be undertaken in the future, actual results may ultimately differ from estimates. It also requires management to exercise its judgement in the process of applying the Group’s accounting policies.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to estimates are recognised in the period in which the estimate is revised and in any future periods affected. Use of estimates and assumptions is disclosed further in note 3(X).

(C) STANDARDS AND INTERPRETATIONS ISSUED AND NOT YET ADOPTED

The following new standards and amendments to standards have been issued but are not yet effective and have not been adopted by the Group:

NZ IFRS 9 FINANCIAL INSTRUMENTS

Effective from 1 January 2015, NZ IFRS 9 will replace the multiple classification and measurement models in NZ IAS 39 Financial Instruments: Recognition and Measurement with a single model that has two classification categories: amortised cost and fair value.

The Group is yet to assess the full impact and when it will adopt NZ IFRS 9.

NZ IFRS 10 CONSOLIDATED FINANCIAL STATEMENTS

Effective from 1 January 2013, NZ IFRS 10 builds on existing principles by identifying the concept of control as the determining factor in whether an entity should be included within the consolidated financial statements. The Group expects there to be no material impact from the application of this standard.

NZ IFRS 11 JOINT VENTURES

Effective from 1 January 2013, NZ IFRS 11 makes a distinction between joint ventures and joint operations. The proposals require the accounting to reflect the contractual rights and obligations agreed by the parties. The option to apply the proportional consolidation method when accounting for jointly controlled entities has been removed. The Group is yet to assess the full impact and when it will adopt NZ IFRS 11.

NZ IFRS 12 DISCLOSURE OF INTERESTS IN OTHER ENTITIES

Effective from 1 January 2013, NZ IFRS 12 is a new standard on disclosure requirements for all forms of interests in other entities, including joint arrangements, associates, special purpose vehicles and other off balance sheet vehicles. The Group expects there to be no material impact from the application of this standard.

NZ IFRS 13 FAIR VALUE MEASUREMENT

Effective from 1 January 2013, NZ IFRS 13 defines fair value and sets out a single IFRS framework for measuring fair value and required disclosures about fair value measurements. The measurement and disclosure requirements of NZ IFRS 13 apply when other IFRS requires or permits the item to be measured at fair value (with limited exceptions). The Group expects there to be no material impact from the application of this standard.

3. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accounting policies set out below have been applied consistently to all periods presented in these financial statements.

(A) BASIS OF CONSOLIDATION

(I) SUBSIDIARIES

The consolidated financial statements of the Group include the parent entity, Plant & Food Research, and its controlled entities. Controlled entities include entities over which the Group has the power to govern financial and operating policies so as to obtain benefits from the activities of the entity. This power exists where the Group controls the majority voting power on the governing body or where such policies have been irreversibly predetermined by the Group or where the determination of such policies is unable to materially impact upon the level of potential ownership benefits that arise from the activities of the subsidiary. The financial statements of subsidiaries are included in the consolidated financial statements from the date which the Group obtains control and until such time as the Group ceases to control the entity.

Any changes in the Parent ownership interest that do not result in the loss of control are accounted for as equity transactions.

The Group measures the cost of a business combination as the aggregate of fair values, at the date of exchange, of assets given, liabilities incurred or assumed, in exchange for control of the subsidiary plus any costs directly attributable to the business combination.

Any excess of the cost of the business combination over the Group's interest in the net fair value of the identifiable assets, liabilities and contingent liabilities is recognised as goodwill. If the Group's interest in the net fair value of the identifiable assets, liabilities and contingent liabilities recognised exceeds the cost of the business combination, the difference will be recognised immediately in the Statement of Comprehensive Income.

The purchase method of accounting is used to prepare the consolidated financial statements of the Group. In preparing the consolidated financial statements, the effects of all transactions, balances and unrealised gains and losses on transactions between entities in the Group have been eliminated. The Group's investment in its subsidiaries is initially carried at cost in the Parent's financial statements subject to any write down arising from an annual impairment review.

The financial statements of controlled entities have been prepared for the same reporting period as the parent entity, using consistent accounting policies.

(II) ASSOCIATES

Associates are those entities over which the Group has significant influence, but not control, of the financial and operating policies.

Investments in associate companies have been accounted for using the equity method of accounting and are initially recognised at cost and the carrying amount is increased or decreased to recognise the Group's share of the surplus or deficit of the associate after the date of acquisition. The Group's share of the surplus or deficit of the associate is recognised in the Group's Statement of Comprehensive Income. Distributions received from an associate reduce the carrying amount of the investment.

If the Group's share of deficits of an associate equals or exceeds its interest in the associate, the Group discontinues recognising its share of further deficits. After the Group's interest is reduced

to zero, additional deficits are provided for, and a liability is recognised, only to the extent that the Group has incurred legal or constructive obligations or made payments on behalf of the associate. If the associate subsequently reports surpluses, the Group will resume recognising its share of those surpluses only after its share of the surpluses equals the share of the deficits not recognised.

The Group's share in the associate's surplus or deficits resulting from unrealised gains on transactions between the Group and its associates is eliminated.

(III) JOINT VENTURES

A joint venture is a contractual arrangement whereby two or more parties undertake an economic activity that is subject to joint control. The Group recognises its interest in jointly controlled entities using the equity method. The investment in a jointly controlled entity is initially recognised at cost and the carrying amount is increased or decreased to recognise the Group's share of the surplus or deficit of the jointly controlled entity after the date of acquisition. The Group's share of the profit or loss of the jointly controlled entity is recognised in the Group's Statement of Comprehensive Income.

(B) REVENUE

Revenue is recognised at the fair value of consideration received or receivable to the extent that it is probable, that economic benefits will flow to the Group. Revenue is shown net of GST, returns and discounts and after eliminating sales within the Group. The following specific recognition criteria must be met before revenue is recognised:

(I) CORE FUNDING

Core funding, from the Crown, was established 1 July 2011 and is recognised in the Statement of Comprehensive Income in the year it is received.

(II) CROWN-FUNDED RESEARCH CONTRACTS

Revenue from the Crown is recognised in the Statement of Comprehensive Income when the requirements under the funding agreement have been met.

(III) COMMERCIAL SCIENCE RESEARCH CONTRACTS

Sale of goods

Revenue from the sale of goods is recognised when the significant risks and rewards of ownership of the goods have passed to the buyer and the amount of revenue can be reliably measured. Risks and rewards are considered passed to the buyer at the time of delivery of the goods to the customer.

Sale of services

Research services are provided on a fixed-price contract, with contract terms generally ranging from less than a year to five years.

Revenue from a contract to provide services is recognised by reference to the stage of completion of the transaction, assessed on the basis of the actual service provided as a proportion of the total services to be provided. If circumstances arise that may change the extent of the progress toward completion, the estimates are revised. These revisions may result in increases or decreases in estimated revenues or costs and are reflected in income in the period in which the circumstances that give rise to the revision become known by management.

Royalties

Royalty revenue is recognised on an accrual basis in accordance with the substance of the relevant agreement.

(IV) OTHER INCOME

Rental income

Lease receipts under an operating lease are recognised as revenue on a straight-line basis over the lease term.

(V) DIVIDEND AND INTEREST REVENUE

Dividend revenue from investments is recognised when the shareholders' rights to receive payment have been established. Interest revenue is recognised on a time-proportion basis using the effective interest method.

(C) FOREIGN CURRENCY TRANSLATION

Foreign currency transactions are translated into New Zealand dollars using the exchange rates prevailing at the dates of the transactions, except when forward currency contracts have been taken out to cover short-term forward currency commitments. Where short-term forward currency contracts have been taken out, the transaction is translated at the rate contained in the contract. Foreign currency denominated monetary assets and liabilities are translated at the exchange rate prevailing at the period end. Foreign exchange gains or losses resulting from the settlement of such transactions and from the translation at balance date of foreign denominated monetary assets and liabilities are recognised in the Statement of Comprehensive Income, except when deferred in equity as qualifying cash flow hedges.

The results and balance sheets of all foreign operations that have a functional currency different from New Zealand dollars are translated into the presentation currency as follows:

- The assets and liabilities of foreign controlled entities are translated by applying the rate ruling at balance date and revenue and expense items are translated at the average rate calculated for the period. The exchange differences arising on the re translation are taken directly to equity in the foreign currency translation reserve.
- On consolidation, exchange differences arising from the translation of the net investment in foreign operations, and of borrowing and other currency instruments designated as hedges of such investments, are taken to shareholder's equity.

(D) BORROWING COSTS

Borrowing costs are recognised as an expense in the period in which they are incurred.

(E) CASH AND CASH EQUIVALENTS

Cash and cash equivalents include cash in hand, deposits held at call with banks, other short-term highly liquid investments with maturities of three months or less after balance date, that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value and bank overdrafts. Bank overdrafts are shown within borrowings in current liabilities in the Balance Sheet.

(F) TRADE AND OTHER RECEIVABLES

Trade receivables are recognised initially at fair value and subsequently measured at amortised cost using the effective interest method, less any provision for doubtful receivables.

Collectability of trade receivables is reviewed on an ongoing basis. Debts which are known to be uncollectible are written off when identified. A provision for doubtful receivables is established when there is objective evidence that the Group will not be able to collect all amounts due according to the original terms of receivables. The amount of the provision is the difference between the asset's carrying amount and the present value of the estimated future cash flows, discounted at the effective interest rate, if applicable. The amount of the provision is recognised in the Statement of Comprehensive Income.

When a trade receivable is uncollectible, it is written off against the provision if it has been provided for or immediately recognised in the Statement of Comprehensive Income if not. Any recoveries of trade receivables written off are credited against bad debts in the Statement of Comprehensive Income.

(G) INVENTORIES

Inventories held for distribution or consumption in the provision of services that are not supplied on a commercial basis are measured at the lower of cost and current replacement cost.

Inventories held for use in the production of goods and services on a commercial basis are stated at the lower of cost and net realisable value. Cost is determined using the first-in, first-out method and for both work in progress and finished goods include expenditure incurred in acquiring the inventories and bringing them to their existing location and condition. Net realisable value is the estimated selling price in the ordinary course of business, less applicable variable selling expenses.

Agricultural produce is valued at fair value less estimated selling costs.

The write down from cost to current replacement cost or net realisable value is recognised in the Statement of Comprehensive Income.

The profit contained in the intra -company sales of inventory has been eliminated on consolidation.

(H) PROPERTY, PLANT AND EQUIPMENT

The Group has four classes of property, plant and equipment:

- Land
- Buildings
- Plant and equipment
- Motor vehicles

Land is recorded at cost. All other property, plant and equipment is shown at cost or valuation, less accumulated depreciation and any accumulated impairment losses, except for assets transferred from the Crown. Property, plant and equipment transferred from the Crown have been included in the accounts at values established by independent valuers. All subsequent expenditure has been initially recorded at cost.

Cost includes expenditure that is directly attributable to the acquisition of the asset. Subsequent costs are included in the asset's carrying amount only when it is probable that future economic benefits or service potential associated with the asset will flow to the Group and the cost of the item can be measured reliably. All other costs are recognised in the Statement of Comprehensive Income when the expense is incurred. Where an asset is acquired at no cost, or for a nominal cost, it is recognised at fair value as at the date of acquisition. The Group constructs some items of plant for use in research. These have been brought into the accounts at the cost of direct labour and materials plus an appropriate proportion of direct overheads.

Land transferred to the Group cannot be freely traded. Section 30 of the Crown Research Institutes Act 1992 requires that prior to sale sections 40-42 of the Public Works Act 1981 be complied with. These sections require that land offered for sale must be offered to the original owner of that land or their successors. An arbitration clause is included to establish fair values for such offers.

Gains and losses on disposals are determined by comparing the proceeds with the carrying amount of the asset. Gains and losses on disposal are included in the Statement of Comprehensive Income.

(I) NON-CURRENT ASSETS HELD FOR SALE

Non-current assets are classified as assets held for sale when their carrying amount is to be recovered principally through a sale transaction and a sale is considered highly probable. They are stated at the lower of carrying amount and fair value less costs to sell if their carrying amount is to be recovered principally through a sale transaction rather than through continuing use and a sale is considered highly probable.

(I) DEPRECIATION

Depreciation on assets, except land, is calculated using the straight-line method, at rates calculated to allocate the asset's cost, less estimated residual value, over its estimated useful life. Leasehold improvements are depreciated over the shorter of the unexpired period of the lease and the estimated useful life of improvements.

The useful lives of major asset classes of property, plant and equipment have been estimated as follows:

→ Land	10 - 40 years
→ Buildings	10 - 100 years
→ Plant and equipment	3 - 10 years
→ Motor vehicles	3 - 10 years

The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at each financial year-end.

The assets' carrying value is written down immediately to its recoverable amount if the asset's carrying amount is greater than its estimated recoverable amount.

(J) INTANGIBLE ASSETS

(I) GOODWILL

Goodwill is initially measured at its cost, being the excess of acquisition cost over the Group's interest in the net fair value of the identifiable assets, liabilities and contingent liabilities. Goodwill on acquisition of subsidiaries is included in intangible assets by applying the purchase method. Goodwill on acquisition of associates is included in investments in associates by applying the equity method.

Goodwill arising in business combinations is not amortised. Instead, goodwill is tested for impairment annually. After initial recognition, the Group measures goodwill at cost less any accumulated impairment losses. An impairment loss recognised for goodwill will not be reversed in any subsequent period.

Goodwill is allocated to cash generating units for the purposes of impairment testing.

(II) SOFTWARE

The cost of software, databases and related items, either acquired or internally generated, is recognised as an expense when incurred, except for:

- The cost of software, databases and related items, either acquired or internally generated, which are unique and controlled by the Group, and that will probably generate measurable economic benefits exceeding costs beyond one year is capitalised as intangible assets.
- Costs associated with maintaining computer software are recognised as an expense when incurred.

The carrying value of software is amortised on a straight-line basis over its useful life. Amortisation begins when the asset is available for use and ceases at the date that the asset is derecognised. The amortisation charge for each period is recognised in the Statement of Comprehensive Income.

The useful lives and associated amortisation rates of major classes of intangible assets have been estimated as follows:

- Software 3 - 5 years

(III) TRADEMARKS AND LICENSES

The cost of acquired trademarks and licenses are capitalised as intangible assets where they will probably generate measurable economic benefits exceeding costs beyond one year. Trademarks and licenses have a finite useful life and are carried at cost less accumulated amortisation.

Amortisation is calculated using the straight-line method to allocate the cost over their estimated useful lives, which is between 10 and 15 years.

(IV) RESEARCH AND DEVELOPMENT

Research and development is the business of the Company. Most work is performed under contract for others, and in most cases intellectual property rights are retained. All research and development costs are expensed in the period they are incurred.

When a project reaches the stage where it will probably generate future measurable economic benefits exceeding development cost, development cost is recognised as an intangible asset. The asset is amortised from the commencement of commercial production of the product to which it relates, on a straight-line basis, over the period of expected benefit.

(K) INVESTMENTS AND OTHER FINANCIAL ASSETS

The Group classifies its investments by the following categories: financial assets at fair value through profit or loss, held-to-maturity investments, loans and receivables and available-for-sale financial assets. The classification depends on the purpose for which the investments were acquired. Management determines the classification of its investments at initial recognition and re-evaluates this designation at each reporting date.

Financial assets and liabilities are initially measured at fair value plus transaction costs unless they are carried at fair value through profit or loss, in which case the transaction costs are recognised in the Statement of Comprehensive Income.

Purchases and sales of financial assets are recognised on trade-date, the date on which the Group commits to purchase or sell the asset. Financial assets are derecognised when the rights to receive cash flows from the financial assets have expired or have been transferred and the Group has transferred substantially all the risks and rewards of ownership.

The fair value of financial instruments traded in active markets is based on quoted market prices at the balance sheet date. The quoted market price used is the current bid price.

The fair value of financial instruments that are not traded in an active market is determined using valuation techniques.

The Group uses a variety of methods and makes assumptions that are based on market conditions existing at each balance date. Quoted market prices or dealer quotes for similar instruments are used for long-term debt instruments held. Other techniques, such as estimated discounted cash flows, are used to determine fair value for the remaining financial instruments.

(I) FINANCIAL ASSETS AT FAIR VALUE THROUGH PROFIT OR LOSS

This category has two sub-categories: financial assets held for trading, and those designated at fair value through profit or loss at inception. A financial asset is classified in this category if acquired principally for the purpose of selling in the short term or if so designated by management.

Derivatives are also categorised as held for trading unless they are designated as hedges. Assets in this category are classified as current assets if they are either held for trading or are expected to be realised within 12 months of the balance sheet date. After initial recognition they are measured at their fair values. Gains or losses on remeasurement are recognised in the Statement of Comprehensive Income.

Financial assets in this category include derivatives, see note 3 (T).

(II) FINANCIAL ASSETS AT FAIR VALUE THROUGH EQUITY (AVAILABLE FOR SALE)

Financial assets at fair value through equity are those that are designated as fair value through equity or are not classified in any of the other categories.

This category encompasses:

- Investments that Plant & Food Research intends to hold long-term but which may be realised before maturity; and
- Shareholdings that Plant & Food Research holds for strategic purposes.

Plant & Food Research's investments in its subsidiary and associate companies are not included in this category as they are held at cost (as allowed by NZ IAS 27 Consolidated and Separate Financial Statements and NZ IAS 28 Investments in Associates) whereas this category is to be measured at fair value.

After initial recognition these investments are measured at their fair value. Gains and losses are recognised directly in equity except for impairment losses, which are recognised in the Statement of Comprehensive Income. In the event of impairment, any cumulative losses previously recognised in equity will be removed from equity and recognised in the Statement of Comprehensive Income even though the asset has not been derecognised. On de-recognition the cumulative gain or loss previously recognised in equity is recognised in the Statement of Comprehensive Income.

(III) LOANS AND RECEIVABLES

These are non derivative financial assets with fixed or determinable payments that are not quoted in an active market.

After initial recognition they are measured at amortised cost using the effective interest method. Gains and losses when the asset is impaired or derecognised are recognised in the Statement of Comprehensive Income. Loans and receivables are classified as "trade and other receivables" and "cash and short term deposits" in the Balance Sheet.

(L) IMPAIRMENT OF FINANCIAL ASSETS

At each balance sheet date the Group assesses whether there is any objective evidence that a financial asset or group of financial assets is impaired. Any impairment losses are recognised in the Statement of Comprehensive Income.

(M) IMPAIRMENT OF NON - FINANCIAL ASSETS

The carrying amounts of the Group's non-financial assets, other than inventories and deferred tax assets, are reviewed at each reporting date to determine whether there is an indication that an asset may be impaired. Where an indicator of impairment exists, or where annual impairment testing for an asset is required, the Group makes a formal estimate of the recoverable amount. Assets that have a finite useful life are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable.

An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. Value in use is depreciated replacement cost for an asset where the future economic benefits or service potential of the asset are not primarily dependent on the asset's ability to generate net cash flows and where the entity would, if deprived of the asset, replace its remaining future economic benefits or service potential.

For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows (cash-generating units). The value in use for cash-generating assets is the present value of expected future cash flows. An impairment loss is recognised in the Statement of Comprehensive Income. Non-financial assets that suffered impairment are reviewed for possible reversal of the impairment at each reporting date and this is recognised in the Statement of Comprehensive Income.

(N) TRADE PAYABLES

Trade payables are initially measured at fair value and subsequently measured at amortized cost using the effective interest method.

(O) PROVISIONS

Provisions are recognised when the Company has a present obligation (either legal or constructive), as a result of a past event, it is probable that an outflow of economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation. Provisions are not recognised for future operating losses.

Provisions are measured at the present value of management's best estimate of the expenditure required to settle the present obligation at the balance sheet date, the discount rate used to determine the present value reflects current market assessments of the time value of money and the risks specific to the liability. The increase in the provision due to the passage of time is recognised as an interest expense.

(P) EMPLOYEE BENEFITS

(I) WAGES AND SALARIES, ANNUAL LEAVE, SICK LEAVE AND OTHER BENEFITS

Provision is made for employee benefits accumulated as a result of employees rendering services up to balance date including related on-costs.

The benefits include wages and salaries, annual leave, sick leave, incentives and other benefits. The provision for employee benefits is measured at the remuneration rates expected to be paid when the liability is settled.

The Group recognises a liability for sick leave to the extent that absences in the coming year are expected to be greater than the sick leave entitlements earned in the coming year. The amount is calculated based on the unused sick leave entitlement that can be carried forward at balance date, to the extent that the Group anticipates it will be used by staff to cover those future absences.

The Group recognises a liability and an expense for bonuses where contractually obliged or where there is a past practice that has created a constructive obligation.

(II) LONG SERVICE LEAVE AND RETIREMENT LEAVE

Service leave and retirement leave entitlements are calculated based on the employee's entitlement and their current pay rate. The liability for long service leave is recognised in the provision for employee benefits and measured as the present value of expected future payments to be made in respect of services provided by employees up to the reporting date. Consideration is given to expected future wage and salary levels, experience of employee departures and periods of service.

Long term benefits expected to be settled within 12 months are classified as employee entitlements under current liabilities.

(III) PENSION AND POST RETIREMENT BENEFITS

The Group operates a defined contribution superannuation plan. A defined contribution plan is a pension plan under which the Group pays fixed contributions to a separate entity. The Group has no legal or constructive obligations to pay further contributions if the fund does not hold sufficient assets to pay all employees the benefits relating to employee service in the current and prior periods.

The Group's contributions made to defined contribution superannuation plans are recognised as an expense in the Statement of Comprehensive Income when they are due.

(IV) RESTRUCTURING

A provision for restructuring is recognised when the Company has approved a detailed and formal restructuring plan, and the restructuring either has commenced or has been announced publicly.

(Q) LEASES

The Company leases certain plant and equipment, land and buildings.

Finance leases, where the lessee is transferred substantially all the risks and benefits incidental to ownership of an asset, whether or not title is eventually transferred.

At the commencement of the lease term, the Group recognises finance leases as assets and liabilities in the Balance Sheet at the lower of the fair value of the leased item or the present value of the minimum lease payments. The amount recognised as an asset is depreciated over its useful life. If there is uncertainty as to whether the Group will obtain ownership at the end of the lease term, the asset is fully depreciated over the shorter of the lease term and its useful life.

Operating lease payments, where the lessors effectively retains substantially all the risks and benefits incidental to ownership of the leased item, are recognised as an expense in the Statement of Comprehensive Income on a straight line basis over the lease term.

(R) INCOME TAX

(I) CURRENT TAX

Income tax expense comprises both current tax and deferred tax, and is calculated using tax rates that have been enacted or substantially enacted by balance date. Current tax and deferred tax are charged or credited to the Statement of Comprehensive Income, except when they relate to items charged or credited directly to equity, in which case the tax is dealt with in equity. Current tax is the amount of income tax payable based on the taxable profit for the current year, plus any adjustments to income tax payable in respect of prior years.

(II) DEFERRED TAX

Deferred tax is the amount of income tax payable or recoverable in future periods in respect of temporary differences calculated using the liability method and unused tax losses. Deferred tax is not accounted for if it arises from initial recognition of goodwill or from initial recognition of an asset or liability in a transaction, other than a business combination, that at the time of the transaction affects neither accounting nor taxable profit or loss.

Deferred tax is recognised if it arises from investments in subsidiaries and associates, and interests in joint ventures, except where the company can control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future.

Deferred tax is measured using the tax rates (and laws) that have been enacted or substantively enacted by the balance sheet date and are expected to apply when the related deferred income tax asset is realised or the deferred income tax liability is settled. A deferred tax asset is recognised to the extent that it is probable that future taxable profits will be available against which the temporary differences can be utilised. Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the related tax benefit will be realised.

(S) GOODS & SERVICES TAX (GST)

The Statement of Comprehensive Income has been prepared so that all components are stated exclusive of GST. All items in the Balance Sheet are stated net of GST, with the exception of receivables and payables which include GST invoiced. Where GST is not recoverable as input tax then it is recognised as part of the related asset or expense. The net amount of GST recoverable from, or payable to, the Inland Revenue Department is included as part of receivables or payables in the Balance Sheet.

The net GST paid to, or received from the IRD, including the GST relating to investing and financing activities, is classified as an operating cash flow in the Cash Flow Statement.

Commitments and contingencies are disclosed exclusive of GST.

(T) DERIVATIVE FINANCIAL INSTRUMENTS

The Group enters into derivative transactions, principally interest rate swaps and forward currency contracts. The purpose of these transactions is to manage the interest rate and currency risk arising from the Group's operations. All derivative financial instruments are recognised in the Balance Sheet at their fair value. Changes in the fair value of derivative financial instruments are recognised either in the Statement of Comprehensive Income in equity depending on whether the derivative financial instrument qualifies for hedge accounting, and if so, whether it qualifies as a fair value hedge or cash flow hedge.

In accordance with its treasury policy, the Group does not hold or issue derivative financial instruments for trading purposes.

Interest rate swaps are accounted for at fair value through the Statement of Comprehensive Income. At each balance date interest rate swap derivative financial instruments are re-measured at their fair value with any changes in the fair value recognised immediately through the Statement of Comprehensive Income.

Changes in the fair values of forward currency contracts that are designated and qualify as cash flow hedges, to the extent that they are effective hedges, are recorded in equity. The gains and losses that are recognised in equity are transferred to the Statement of Comprehensive Income in the same period in which the hedged item affects earnings. On sale, expiry, or de-designation of a forward currency contract, the cumulative gains or losses are maintained in equity until such time

as the forecast transaction impacts earnings. If the forecast transaction is no longer expected to occur the cumulative gain or loss is transferred to the Statement of Comprehensive Income. The Group documents at inception of the transaction the relationship between hedging instruments and hedging items, as well as its risk management objective and strategy for undertaking various hedge transactions. The process includes linking all forward currency contract derivative financial instruments to specific firm commitments or forecast transactions. The Group also documents its assessment, both at the hedge inception and on an ongoing basis, of whether the forward currency derivative financial instruments used are highly effective.

(U) BORROWINGS

Borrowings are initially recognised at their fair value plus transition costs. After initial recognition all borrowings are measured at amortised cost using the effective interest method.

(V) EQUITY

Ordinary shares are classified as equity.

Incremental costs directly attributable to the issue of new shares are shown in equity as a deduction, net of tax, from the proceeds.

(W) BUDGET FIGURES

The budget figures are derived from the Statement of Corporate Intent as approved by the Board, and the Shareholder, at the beginning of the financial year. The budget figures have been prepared in accordance with NZ IFRS, using accounting policies that are consistent with those adopted by the Group for the preparation of these financial statements. The budget figures are unaudited.

(X) CRITICAL ACCOUNTING ESTIMATES AND ASSUMPTIONS

In preparing these financial statements the Group has made estimates and assumptions concerning the future. These estimates and assumptions may differ from the subsequent actual results. Estimates and assumptions are continually evaluated and are based on historical experience and other factors, including expectation of future events that are believed to be reasonable under the circumstances. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below:

(I) PROPERTY, PLANT AND EQUIPMENT USEFUL LIVES AND RESIDUAL VALUE

At each balance date the Group reviews the useful lives and residual values of its property, plant and equipment. Assessing the appropriateness of useful life and residual value estimates of property, plant and equipment requires the Group to consider a number of factors such as the physical condition of the asset, expected period of use of the asset by the Group, and expected disposal proceeds from the future sale of the asset.

An incorrect estimate of the useful life or the residual value will impact the depreciation expense recognised in the Statement of Comprehensive Income, and carrying amount of the asset in the Balance Sheet. The Group minimises the risk of this estimation uncertainty by physical inspection of assets, an asset replacement program, review of second hand market prices for similar assets and

an analysis of prior asset sales. The Group has not made significant changes to past assumptions concerning useful lives and residual values. The carrying amount of property, plant and equipment is disclosed in note 16.

(II) INVESTMENT IMPAIRMENT

The Parent annually performs an impairment review of its significant subsidiaries and associates. None of the subsidiaries or associates are actively traded in any market. The carrying amount of investments is disclosed in notes 18 to 20.

(III) RETIREMENT AND LONG SERVICE LEAVE

The present value of the retirement and long service leave obligations depend on a number of factors that are determined on an actuarial basis using a number of assumptions. Two key assumptions used in calculating this liability include the discount rate and the salary inflation factor. Any changes in these assumptions will impact on the carrying amount of the liability.

In determining the appropriate discount rate the Company considered the interest rates on New Zealand government bonds which have terms to maturity that match, as closely as possible, the estimated future cash outflows. The salary inflation factor has been determined after considering historical salary inflation patterns. A weighted average discount rate of 3.4% and a salary inflation factor of 3.3% were used.

If the discount rate were to differ by 1% from the Company's estimates, with all other factors held constant, the carrying amount of the liability would be an estimated \$35,000 higher/lower.

If the salary inflation factor were to differ by 1% from the Company's estimates, with all other factors held constant, the carrying amount of the liability would be an estimated \$2,000 higher/lower.

The carrying amounts of employee entitlements are disclosed in the Balance Sheet.

(Y) CRITICAL JUDGEMENTS IN APPLYING THE COMPANY'S ACCOUNTING POLICIES

Management has exercised the following critical judgement in applying the Company's accounting policies for the period ended 30 June 2012:

(I) LEASE CLASSIFICATION

Determining whether a lease agreement is a finance or an operating lease requires judgement as to whether the agreement transfers substantially all the risks and rewards of ownership to the Group. Judgement is required on various aspects that include, but are not limited to, the fair value of the leased asset, the economic life of the leased asset, whether or not to include renewal options in the lease term and determining an appropriate discount rate to calculate the present value of the minimum lease payments.

Classification as a finance lease means the asset is recognised in the Balance Sheet as property, plant and equipment, whereas for an operating lease no such asset is recognised. The Group has exercised its judgement on the appropriate classification of building and equipment leases and has determined all leases are operating leases.

(Z) DIVIDEND DISTRIBUTION

Dividend distribution to the company's shareholders is recognised as a liability in the Group's financial statements in the period in which the dividends are approved by the company's shareholders

APPENDIX 5: NON-FINANCIAL AND FINANCIAL MONITORING INDICATORS

<p>END-USER COLLABORATION: CRIs are expected to develop strong, long-term partnerships with industry, government and Māori, and to work with them to set research priorities that are well linked to the needs and potential of their end-users (generic operating principle in SCP).</p>
<p>Percentage and number of relevant funding partners and other end-users that have a high level of confidence in the CRI's ability to set research priorities, and the effectiveness of the collaboration or partnership (survey data). Annually</p>
<p>Total dollar value of revenue (in cash and in-kind), and dollar value subcontracted out to other organisations from each 'source category' per annum from rolling five years (administrative data). Quarterly</p>
<p>RESEARCH COLLABORATION: CRIs are expected to develop collaborative relationships with other CRIs, universities and other research institutions within New Zealand and internationally to form the best teams to deliver the CRI's core purpose (generic operating principle in SCP).</p>
<p>Percentage of relevant national and international research providers that have a high level of confidence in the CRI's ability to form the best teams to deliver on the CRI's outcomes (survey data). Annually</p>
<p>Number and percentage of joint scientific peer-reviewed publications and IP outputs with other New Zealand or international research institutions per annum (administrative data). Quarterly</p>
<p>TECHNOLOGY & KNOWLEDGE TRANSFER (SCIENCE RELEVANCE): CRIs are expected to transfer technology and knowledge from domestic and international sources to New Zealand industry, government and Māori (generic operating principle in SCP).</p>
<p>Total number and percentage of licensing deals of CRI-derived IP (including technologies, products and services) with New Zealand and international partners per annum (administrative data). Quarterly</p>
<p>Percentage of relevant end-users who have adopted knowledge and/or technology from CRIs (survey data). Annually</p>
<p>Percentage change in the number of requests and enquiries for the CRI's publicly available collections (administrative data). Quarterly</p>
<p>SCIENCE QUALITY: CRIs are expected to pursue excellence in all their activities (CRI Act).</p>
<p>Total number of international awards, invitations to participate on international committees, and editorial boards for the CRI's published papers, per annum. Annually</p>
<p>Average number of citations per CRI published paper. Quarterly</p>
<p>Proportion of published papers in the top 25 international journals relevant to the scope of the CRI (as outlined in the SCP) per annum. Annually</p>
<p>CORE FINANCIAL INDICATORS: CRIs are expected to focus on financial viability</p>
<p>Projected cashflow – the measure of forward looking. Quarterly</p>
<p>Operating margin – the profitability of the company per dollar of revenue. Quarterly</p>
<p>Profit per FTE – the ability of the company to generate a return from its staff. Quarterly</p>
<p>Revenue growth – the measure of whether the company is growing revenue. Quarterly</p>

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