Statement of Corporate Intent

2015/16 – 2019/20
Presented to the House of Representatives pursuant to Section 39 of the Public Finance Act 1989
THE IMPACT OF OUR SCIENCE WILL BE MEASURED THROUGH THE INDUSTRY SECTORS THAT OUR WORK UNDERPINS. THESE INDUSTRIES MAKE A SIGNIFICANT CONTRIBUTION TO OUR NATIONAL WEALTH AND WELLBEING, WITH THE ANNUAL TURNOVER IN THE HORTICULTURE, WINE, ARABLE AND SEAFOOD INDUSTRIES EXCEEDING $10 BILLION. THE WIDER FOOD AND BEVERAGE SECTOR ACCOUNTS FOR ABOUT 10% OF NEW ZEALAND’S GDP AND NEARLY HALF OF TOTAL EXPORTS.

Peter Landon-Lane
CEO, The New Zealand Institute for Plant & Food Research Ltd
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FOREWORD

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

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

Our research is helping to increase the contribution from the plant and marine-based food sectors, particularly through growth in exports. Exports of fresh and processed horticultural products grew to reach a total of $3.9 billion in the year ending June 2014, 8% of total merchandise exports. On top of this, exports of honey increased 29% to $187 million and exports of horticultural machinery were $76 million. Seafood exports, currently valued at $1.5 billion annually, are also continuing to increase.

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 in building New Zealand’s competitive advantage for the future.
OVERVIEW

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

OUR CONTEXT

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 exports in the horticulture, wine, arable and seafood industries are worth more than $5 billion. The wider food and beverage sector accounts for about 10% of GDP and nearly half of New Zealand’s exports. Key industries we work with in the primary sector have set ambitious growth targets for 2020 that our research will help to realise, ultimately increasing their contribution to New Zealand’s GDP through increased export returns.
OUR SCIENCE STRATEGIC FOCUS

Our science strategy is focused on delivering growth, performance and resilience for New Zealand through:

1. Better cultivars faster™
2. Residue-free pest and disease control
3. More sustainable and profitable systems
4. Proprietary foods with premium prices
5. Sustainable premium seafood and marine products.

Science delivered through these five areas enhances the value and productivity of the primary industry through sectors that make an important contribution to New Zealand’s economy. Our research and innovation generate premium products and processes, technologies to protect and enhance market access, and systems to sustain sector growth, efficiency and resilience.

We take a strategic approach to our investments in research, with the aim of maximising the impact of our research for New Zealand and considering factors – such as the expected scale of impact, time until impact, and the probability of success – across all sources of funding – including Core Funding, New Zealand Government contestable funding, and commercial funding.

The allocation of resources for research in the coming period will be similar to that in the current period.

OUR BUSINESS STRATEGIC FOCUS

Strategic focus areas of our business are:

1. Sectors and customers — growing the value and volume of our customer base
2. Engagement — partnering for success
3. Science for impact — optimising science quality and building the best teams
4. Organisational excellence — enhancing our performance
5. Ways of working — creating inspiring workplaces and work styles
6. Financial performance — sustaining profitability to create flexibility.
Figure 1: Plant & Food Research’s outcome areas and strategic focus areas.
SECTORS AND CUSTOMERS — GROWING THE VALUE AND VOLUME OF OUR CUSTOMER BASE

Our science enhances the value and productivity of the primary industry through sectors that make an important contribution to New Zealand’s economy, including kiwifruit, seafood, wine, pipfruit, avocados, summerfruit, berryfruit, potatoes, vegetables, onions, consumer & health, honey & hive, mixed cropping, biosecurity and environment.

To achieve the link between desired impacts and research outcomes, we need strong partnerships with our national and international clients and stakeholders. Together we will create long-term plans based on a shared view of the market and science, work collaboratively to convert those plans to tangible actions and jointly review and manage progress. These activities will support growth in our key industries, increasing profitability and thereby allowing greater investment in science and technology.

Te Rāranga Ahumāra is our partnering approach with Māori to deliver on Vision Mātauranga. There are opportunities right across our key outcome areas and sector focus, as well as activities specific to Māori, that will increase economic growth and enable Māori to pursue their economic, environmental, cultural and spiritual aspirations. In the coming period we will be increasing our investment in capability building and research in this area.

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 and relevant international science collaborations.

In 2015/16 we will:

→ Continue to develop joint strategic plans with our sectors that will lead to an increase revenue from New Zealand commercial customers of 15% (from $32.6 million to $37.4 million)
→ Convert interest from new customers into contracted projects resulting in $2.7 million from new customers
→ Grow our relationships with business-ready Māori organisations so that the value of science involving Māori increases by 33% from $2 million to $3 million
→ Build on our international platforms so that 15% of our revenue originates from offshore.

ENGAGEMENT — 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. We are also committed to communicating science and its role in delivering innovation and building our economy to all New Zealanders. Key strategic priorities in this area include building our brand, technology transfer, and digital engagement.
In 2015/16 we will:

→ Strengthen our partnerships with some of our largest clients through joint appointments and secondments
→ Actively manage our brand by obtaining feedback through client surveys and an active communication programme
→ Initiate work to explore the digital dimensions of technology transfer.

**SCIENCE FOR IMPACT — OPTIMISING SCIENCE QUALITY AND BUILDING THE BEST TEAMS**

We regularly review our science through our established annual programme of science reviews, and through the work of our Science Advisory Panel. We also regularly audit our capability to ensure we have the best skills to deliver high quality and relevant science. The National Science Challenges and Hubs are opportunities to strengthen research collaborations further, to integrate our activities to enhance their efficiency, and to deliver top quality, internationally benchmarked science.

To ensure we have sufficient early stage, highly innovative science, we have a discrete “Future Science” portfolio for research projects with a potential impact in longer-term planning horizons, and which test and develop innovative new science ideas, platforms and capability.

We will continue to strengthen systems and culture that recognise and support the pursuit of robust, innovative and creative science while building the necessary capability to sustain scientific discoveries that will deliver impact to our sectors now and in the future.

In 2015/16 we will:

→ Grow our science capacity by investing $10 million in a portfolio of Future Science projects
→ Maintain our support for the National Science Challenges, Hubs and KiwiNet through the provision of senior staff time in governance roles and through alignment of our activities with those of these collaborations
→ Continue our programme of external reviews of our science led by our Chief Scientist and Science Advisory Panel.

**ORGANISATIONAL EXCELLENCE — ENHANCING OUR PERFORMANCE**

Plant & Food Research has a strong and enduring commitment to continual improvement across all our business system areas. We seek to reach beyond complying with legislative requirements and to set high performance goals across areas, including people and asset management. We view a safe workplace as a reflection of a positive culture characterised by a high degree of pride in the work we do, and by respect and consideration for others.

We are continuing to apply high standards to Biosafety Compliance through a range of policies and through the establishment of a dedicated Biosafety Compliance Manager and consultative groups. These include a widely representative Biosafety Committee and CIMS framework to deal with any incidents.

Productivity gains will allow projected growth in revenue over the next five years to be achieved without increasing overall staff numbers, with increases in high priority areas being offset by reductions in lower priority areas.
In 2015/16 we will:

→ Continue our workplace health & safety programme, leading to further improvements in our health & safety measures and the maintenance of our tertiary-level standard in the ACC Workplace Safety Management Programme
→ Continue our focus on biosafety through the replacement of aging facilities and equipment and the further development of operational controls
→ Increase revenue per science FTE by 8% (from $212,000 to $228,000) by holding staff numbers, and increase productivity by increasing the ratio of scientists to technologists.

WAYS OF WORKING — CREATING INSPIRING WORKPLACES AND WORK STYLES

Significant capital expenditure is underway to upgrade or replace aging laboratories, containment facilities and buildings, including at our Mt Albert, Te Puke and Nelson sites. We will continue to participate actively in developments at the Palmerston North and Lincoln sites based on a hub vision and site master plan shared with other organisations at those campuses.

We will fund the redevelopment of our facilities from retained earnings, the sale of non-strategic assets and in the later years of the plan, debt.

Our Ways of Working initiative is creating inspiring workplaces, information and technology solutions to support and enable great science, and work styles that enhance collaboration and increase our innovative capacity.

In 2015/16 we will:

→ Move into the redeveloped Cunningham building on the Mt Albert Campus and begin the redevelopment work on the Hamilton building
→ Continue working with the Port of Nelson on a new facility in Nelson
→ Roll out new IT infrastructure solutions to support or Ways of Working programme, including the doubling of wireless connectivity across sites and an upgrade of collaboration and communications tools
→ Improve the resilience of our systems and data by having dual data centres operational by June 2016.

FINANCIAL RESILIENCE — SUSTAINING PROFITABILITY TO CREATE FLEXIBILITY

Over the five-year period of this Statement of Corporate Intent, the projection is for growth in commercial science revenue, growth in royalty income as the kiwifruit industry recovers from the PsA disease incursion, and continued cost containment and productivity measures. Overall profitability will continue to increase over the five-year period.

In 2015/16 we will:

→ Grow revenue 8% (from $124 million to $134 million)
→ Grow operating profit (EBITDA) 30% (from $10 million to $13 million).
OUR ROLE

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 available online http://www.plantandfood.co.nz/file/pfr-scp.pdf.

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

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.
OUR CONTEXT

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.

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 food and beverage sector contributes about 10% of New Zealand’s GDP, and (at $23 billion per annum) nearly half of New Zealand’s total exports
→ The horticulture industry has a turnover of $6.6 billion per annum, with a strategy to grow to $10 billion by 2020. Exports reached a total of $3.9 billion in 2014
→ The wine sector has a turnover of $1.91 billion per annum, of which exports were $1.17 billion
→ With a farm gate value of $1.5 billion per annum, the arable sector is a key contributor to the wider food and beverage sector, and mixed cropping systems make important contributions to the profitability and sustainability of dairy and other livestock production systems
→ Seafood industry exports are $1.5 billion per annum, with the aims of doubling 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 strong growth in New Zealand food and beverage exports led by markets in Asia, ongoing fiscal restraint, and modest growth in both public and private sector investment in research in New Zealand and elsewhere.

Key markets for the food industry sectors we support will continue along current trends. Rising incomes in Asia continue to be a major driver of New Zealand’s export growth, and markets in Asia will continue to increase their share of New Zealand exports. Recent and projected improvements in market access will be important factors in this. Exports to more mature markets in Europe, Japan and the USA will still be important and will vary with local and global supply and demand factors.

Global consumer and market trends continue to influence the value and volume of New Zealand food and beverage exports. To help our sectors to meet current and increased demand for exports, we deliver research to maximise export opportunities, improve productivity, increase sustainable resource use, and protect New Zealand from biological risk.
Delivering impact in these areas continues to be a major driver for our strategy, research activities, investment decisions, and industry and Government interactions.

We will work closely with industry to prioritise resources for existing and new markets. We expect increased demand for research in areas such as market access, new cultivar development and consumer and sensory science. 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.

Our plans to build engagement with iwi, hapū, tribal incorporations and other organisations to support their aspirations with relevant science, technology and commercial knowledge, are delivering success.

Recent biosecurity and food safety threats have highlighted the importance of our bioprotection and sustainable production research to ensure the resilience of our industries. Pest and disease threats are always present and food industries around the world face the challenge of feeding growing populations with a lighter environmental footprint.

Within the kiwifruit industry there is continuing confidence in the recovery from the impact of the Psa disease incursion, backed by new orchard management practices and new cultivars that are less susceptible to Psa and deliver higher yields.

Internationally, Plant & Food Research is increasing its activities in ways that directly support our New Zealand stakeholders. We will continue to build and participate in strong international research collaborations in programmes relevant to our Core Purpose. We will also continue to grow our research collaborations and commercial research contracting in countries with which New Zealand has strong economic ties and interests, including Australia, China and Southeast Asia.

Collaboration with research and industry partners through New Zealand’s National Science Challenges will be an important focus for us in the future, particularly through participation in High Value Nutrition, New Zealand’s Biological Heritage, and Our Land and Water. We will continue to engage with and support the work of Callaghan Innovation as well as the hub-based collaborations FoodHQ® in Palmerston North and the one at the Lincoln campus. The KiwiNet partnership is a valuable means of accessing connections with businesses, investors, collaborators and commercialisation expertise to help to turn our technologies and expertise into innovative products and services.

Plant & Food Research will continue to access leading international science and resources, and 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 research consortia in areas of relevance for our science and for New Zealand.
OUR STRATEGY ROADMAP

A sustainable business delivering science that maximises opportunities to enhance New Zealand’s economic, environmental and social prosperity

Valued by our stakeholders and admired by our peers for the quality and impact of our science

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

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<th>PROTECT &amp; ENHANCE</th>
<th>SUSTAIN GROWTH</th>
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<td>Better cultivars faster™</td>
<td>Proprietary, premium foods and beverages</td>
<td>Residue-free pest &amp; disease control</td>
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<td>Growth in export value and volume from production of PFR-bred cultivars</td>
<td>Growth in export value and volume of whole foods and ingredients based on fruits, vegetables and grains</td>
<td>Sustainable and profitable production systems</td>
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<tr>
<td>Growth in export value and volume of premium seafood and marine products</td>
<td>Enhanced international competitiveness and environmental quality through pest and disease management solutions</td>
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<td>Seafood production</td>
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<td>Biological control agents</td>
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<td>Growth in export value and volume of whole foods and ingredients based on fruits, vegetables and grains</td>
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STATEMENT OF CORPORATE INTENT 2015/16-2019/20
THE NEW ZEALAND INSTITUTE FOR PLANT & FOOD RESEARCH LIMITED

A HEALTHY BUSINESS

Sectors & customers
- Growth in value and volume of customer base

Engagement
- Enhanced engagement with our stakeholders

Science for impact
- Enhanced performance through establishment of best teams from across company and beyond

Organisational excellence
- Enhanced performance through best practice approaches to people and assets

Ways of working
- Enhanced performance through best practice use of technology, workplace and workstyles

Financial performance
- Enhanced profitability and financial performance

Existing business growth
Client relationship management
Investing in science and capability
Health & safety
Our people
Growing revenue

New business development
Building our brand
Science reviews and Science Advisory Panel
Managing risk
Our technology
Sustaining profitability

Te Rāranga Ahumāra
Technology transfer
Intellectual assets, databases & collections
Productivity & efficiency
Our workplace

Internationalisation
Digital engagement
Hubs, National Science Challenges and other collaborations
Enhanced engagement with our stakeholders
Enhanced performance through best practice approaches to people and assets
Enhanced performance through best practice use of technology, workplace and workstyles
Enhanced profitability and financial performance

Science reviews
Science Advisory Panel
Intellectual assets, databases & collections
Hubs, National Science Challenges and other collaborations
Proportion of critical steps delivered – a set of 52 critical steps that describe value created for all our key sectors and customers through research delivered across our five outcome areas. These steps identify the delivery of impact to our industry stakeholders. Collectively, they provide a detailed evaluation of our progress to impact on an annual basis generated from all revenue sources.

Annually

Total PFR impact assessment
3-yearly

Impact case studies
Annually
## CURRENT SITUATION AND VISION

We invest in five science strategic focus areas for industry that drive our science strategies, resource allocation and performance assessment. Investments are focused on delivering science in the following areas:

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<th>Better cultivars faster™</th>
<th>Residue-free pest and disease control</th>
<th>More sustainable and profitable systems</th>
<th>Proprietary foods with premium prices</th>
<th>Sustainable premium seafood and marine products</th>
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<tr>
<td>An evolving platform of breeding tools delivering cultivars, against industry-agreed development targets and concepts.</td>
<td>Progress towards the development of new tools and systems for biologically based pest and disease control. Steps towards new cultivars with targeted pest and disease resistance. Progress towards the development of new 'safe' disinfestation technologies. Improved biosecurity risk assessments, detection technologies, optimised surveillance approaches and new tools for response and eradication.</td>
<td>Progress towards the development of practices, tools and technologies to guide sustainable horticulture and agriculture. Extending and refining pan-sector modelling platforms (e.g. APSIM). New scientific understanding underpinning farming within limits, including productivity, profitability, environmental constraints and regulatory/compliance frameworks.</td>
<td>In-market consumer insights, alongside in depth knowledge of product attributes to guide development/placement of premium New Zealand foods for export markets. Progress towards the development of new tools and technologies developed to deliver premium food products effectively to export markets.</td>
<td>Progress towards new harvest and postharvest technologies to support higher-value seafood products. Steps towards the development of new technologies to support extended shelf-life and food safety. Understanding and responding to consumer preferences for seafood and seafood-based products. Progress towards the development of extraction technologies with maximum value capture and minimised wastage to produce novel high-value products.</td>
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This science generates impacts for our key sectors (kiwifruit, seafood, wine, pipfruit, avocado, summerfruit, berryfruit, potato, vegetable, onion, consumer & health, honey & hive, mixed cropping, biosecurity, environment) from the application of new knowledge, products, practices and technologies.
We use a comprehensive framework for research investment and portfolio management to determine the research programmes in which we will invest and for which we will seek funding, across the outcome areas on which we focus and the sectors with which we work. The goals of this framework are to optimise the allocation of the resources available to us and to maximise the impact of our research for the benefit of New Zealand.

As all our research is involved in 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 strategy follows six key principles:

1. 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
2. Transparent – research areas will be evaluated on a set of criteria that will be communicated to the relevant stakeholders effectively
3. Flexible – Plant & Food Research will be able to adapt and respond to changing conditions and priorities
4. Transactional efficiency
5. Encouraging collaboration – among research and industry, and between researchers
6. Monitoring and Evaluation – to assess the extent to which Plant & Food Research is delivering research outputs and impacts that align with the high-level outcomes defined 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.

Appendix 1 sets out the sector impact targets and critical steps for each of the high-level outcome areas in our Statement of Core Purpose.

**KEY ACTIVITIES**

- Critical steps to delivering impact for our sectors from across our five science strategic focus areas and all revenue sources are outlined in Appendix 1
- Investment of Core funding in a portfolio of projects that supports the delivery of impact for our sectors [Table 1].
Table 1: Core funding investment mapped by Government budget output expense categories – sector-aligned, Future Science and National Science Challenge (NSC)-aligned research activities.

<table>
<thead>
<tr>
<th>Biological Industries</th>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary industry productivity and sustainability</td>
<td>Research</td>
<td>$29,169,734</td>
</tr>
<tr>
<td></td>
<td>NSC: High value nutrition</td>
<td>$500,000</td>
</tr>
<tr>
<td></td>
<td>NSC: New Zealand’s biological heritage</td>
<td>$1,655,593</td>
</tr>
<tr>
<td></td>
<td>NSC: Our land and water</td>
<td>$2,065,778</td>
</tr>
<tr>
<td>High value food and biological products and processes</td>
<td>Research</td>
<td>$2,949,695</td>
</tr>
<tr>
<td></td>
<td>NSC: High value nutrition</td>
<td>$1,500,000</td>
</tr>
<tr>
<td></td>
<td>NSC: New Zealand’s biological heritage</td>
<td>$500,000</td>
</tr>
<tr>
<td></td>
<td>NSC: Our land and water</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>NSC: Resilience to nature’s challenges</td>
<td>-</td>
</tr>
<tr>
<td>Environmental Research</td>
<td>Research</td>
<td>$544,360</td>
</tr>
<tr>
<td>Land and fresh water (including terrestrial ecosystems)</td>
<td>NSC: High value nutrition</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>NSC: New Zealand’s biological heritage</td>
<td>$1,536,114</td>
</tr>
<tr>
<td></td>
<td>NSC: Our land and water</td>
<td>$2,303,697</td>
</tr>
<tr>
<td>Category</td>
<td>Collections and Databases</td>
<td>$378,008</td>
</tr>
<tr>
<td>Category</td>
<td>Total</td>
<td>$43,102,978</td>
</tr>
</tbody>
</table>
PERFORMANCE TARGETS

85% of critical steps to impact delivered by 30 June 2016. **Annually.**

Total Plant & Food Research impact assessment. **3-yearly** (a baseline for this metric will be set during the 2015/16 financial year).

Nine impact case studies. **Annually.**
SECTORS AND CUSTOMERS — GROWING THE VALUE AND VOLUME OF OUR CUSTOMER BASE
OUR CUSTOMERS

Our science generates impacts for our key sectors:

→ Kiwifruit
→ Seafood
→ Wine
→ Pipfruit
→ Avocado
→ Summerfruit
→ Berryfruit
→ Potatoe
→ Vegetable
→ Onion
→ Consumer & health
→ Honey & hive
→ Mixed cropping
→ Biosecurity
→ Environment.

Sector-aligned research constitutes 80% of our research portfolio. It is based on joint investment and dialogue with the sectors and key stakeholders, defined in our Statement of Core Purpose, towards agreed outcomes and impacts. The focus of this category is the outcome areas in Plant & Food Research’s Statement of Core Purpose, and industry and sector strategies, and areas in which we have the necessary capability to meet industry and sector needs. We also invest in pan-sector research platforms that exploit opportunities and address needs that span multiple sectors. These platforms include consumer & health, farming within limits and enabling technologies.

In the past year (2014/15), detailed road maps of sector impact targets, supported by critical steps along the way to these impacts, have guided monitoring and evaluation activities. Our targets are derived from the strategies and targets of the relevant industry/sector organisations and firms, so our research is fully part of the achievement of their strategies.

EXISTING BUSINESS GROWTH

CURRENT SITUATION AND VISION

To achieve the link between desired impacts and research outcomes, we need strong partnerships with our national and international clients and stakeholders. Our aim is to have close relationships with our partners so that we:

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

Along with our industry partners, we are part of a constantly evolving global economy. Change is ongoing, driven by global markets (for example, the rise of China) and by technological advances. A number of the sectors with which we work at Plant & Food Research are benefiting, particularly the food and beverage sector. New Zealand’s exports are becoming more diverse, with emerging strengths in processed foods, high technology manufacturing and a range of commercial services. Our export mix is considerably more diverse today than in the past. Foods and beverages remain the heart of New Zealand’s exports, with our primary industry base becoming increasingly diversified through high growth, high-value fruit, vegetable and seafood products.

Our role is to deliver R&D that supports the growth of our key industries, increasing profitability by reducing costs or adding value. Our scientists are working on both sides of this equation to demonstrate the return on investment (ROI) of R&D on the one hand helping to fight industry issues like Psa disease in kiwifruit, the tomato potato psyllid (TPP) in potatoes, biennial bearing in avocados and the high cost of vineyard management; and on the other hand revolutionising the way the world fishes, understanding the health benefits of New Zealand berryfruits, and developing new and novel fruit cultivars.

Ultimately whether we’re delivering new cultivars from our breeding programmes, protecting crops from pests and diseases, increasing sustainability or adding value through food innovation, our drive remains the same – the success of our industry partners.

**KEY ACTIVITIES**

- Develop strategic plans jointly with industry sectors and peak industry bodies to contribute to their growth aspirations and targets, with the aim of doubling the value of food exports by that sector through innovation
- Develop impact roadmaps with each sector, charting the timeline of initiatives and critical steps required from R&D and industry implementation to meet future growth targets
- Leverage Government investment initiatives (such as the Primary Growth Partnership, MBIE Partnership Funding, etc.) to accelerate R&D in order to reach those goals (e.g. in wine, seafood, avocados, pipfruit, forage brassicas)
- Leverage Plant & Food Research Core Funding to focus industry R&D on growth in price premiums and valuable offshore export markets
- Work with emerging sectors to develop a stronger export focus and to build increased R&D investment to create premium, added value products (e.g. avocados, onions)
- Deepen partnerships with existing strong partners through joint appointments to key leadership roles (e.g. kiwifruit) to create more synergies
- Encourage greater staff engagement with commercial customers and refocusing of science targets towards impact for industry.

Against a background of no significant growth in MBIE funding, we are attracting significantly more revenue from our existing commercial domestic customers. The average annual growth rate for this commercial New Zealand revenue growth over the Business Plan period from 2015/16 to 2019/20 will be significant, at 7%. This is in line with the growth rate achieved in recent years.
PERFORMANCE TARGETS

Contracted revenue from New Zealand commercial customers is $37.4 million, an increase from $32.6 million in 2014/15. Annually.

Revenue per FTE from commercial sources is $40,000–$45,000. Quarterly.

NEW BUSINESS DEVELOPMENT

CURRENT SITUATION AND VISION

In addition to our work to deepen our relationships with our existing clients, we are actively engaged in increasing our impact by building new relationships with organisations who are not currently our clients.

Our five science strategic focus areas offer the potential to create substantial value for a wider range of organisations. In some cases the pathway to value creation is clear, but in other cases substantial work is required to understand market demands, to determine how our science can meet those demands and to identify which organisations have the resources and appetite to work with us to develop and apply the science to deliver impact and create value.

Some of these potential new clients are New Zealand-based organisations, while others are international organisations with a connection to New Zealand.

KEY ACTIVITIES

→ Identify high potential and high impact industry sectors and customers for whom we believe we can create value within the scope of our Statement of Core Purpose
→ Develop and implement engagement plans for the identified sectors and customers.

To support this activity we have created an internal Growth Fund as part of our overall science investment portfolio, to support innovation and commercialisation initiatives that will ensure impact is delivered from investments in research for our sectors. In 2015/16 we will establish a portfolio of projects within this fund.

PERFORMANCE TARGETS

Revenue from new customers is $2.7 million in 2015/16. Annually.
TE RÄRANGA AHUMÄRA

CURRENT SITUATION AND VISION

HE KAI KEI AKU RINGA
HE KAI MO TE ORA
HE KAI MO TE AO

Food from our hands, food for health, food for the world.

Investment in research that will benefit Māori spans our five outcome-oriented research portfolios and delivers value to a range of Māori business interests. Te Rāranga Ahumāra is our strategy for contributing to the economic, social and environmental aspirations of Māori.

Our refreshed strategy is guiding our efforts to support the growth of Māori enterprises through Māori-relevant science and innovation in food and related areas.

We have identified three goals that address economic, environmental and social/cultural needs to create greater impact with Māori:

→ Introduce new technologies to business-ready Māori enterprises to grow the value and productivity of their assets
→ Develop new approaches to utilise taonga Māori to create new Māori business opportunities in food
→ Increase understanding of Research, Science and Technology (RS&T) opportunities for Māori customers and embed understanding of Māori throughout Plant & Food Research.

Strategic partnership agreements with key groups have been established to support these goals:

→ Wakatū Incorporation, with significant investments in seafood, wine, pipfruit, hops and processed foods through its Kono and Tohu brands
→ Tūhono Whenua, developing new fruit crop initiatives and land conversions
→ Te Tumu Paeroa, to develop new land use suitability methodology.

KEY ACTIVITIES

Ongoing activities include:

→ Grow new contract R&D with business-ready Māori organisations, Government and other funders
→ Increase the connection of our existing sector-based activity with business-ready Māori organisations and enterprises so they have greater direct impact for them
→ Increase Māori participation in science through fellowships and studentships to grow a new generation of rangatahi who are connected with science
Support the Government’s regional economic growth initiative by concentrating our activity in three regions: (1) top of the South Island (Marlborough, Nelson, Motueka), to contribute to the development of Māori land holdings and businesses in high-value seafood, wine, fruit crops and processed food products; (2) North Island East Coast (East Cape, Bay of Plenty, Hawke’s Bay), to develop seafood, horticulture and vegetable food opportunities; and (3) Northland, to develop seafood, horticulture and opportunities from manuka.

New initiatives in 2015/16 include:

- Develop further strategic relationships with key Māori representative groups in food and regional economic growth
- Extend the Nuku ki te Puku Māori food innovation network in partnership with Callaghan Innovation to grow innovation in Māori food businesses
- Appoint a new senior Māori researcher
- Expand membership of our Te Rāranga Ahumāra oversight team, through inclusion of General Managers of Science, to enable increased engagement with Māori decision makers and deployment of resources
- Invest Core Funding in Māori initiatives
- Increase Māori scholarships and internships to grow the number of young Māori in Plant & Food Research and to build science knowledge in rangitahi.

**PERFORMANCE TARGETS**

By 2018, the value of our science involving Māori is $10 million per annum. **Annually.**

As a step towards this, the 2015/16 target for the value of our science involving Māori is $3 million per annum. This represents $1 million per annum growth over the current 2014/15 value.

**INTERNATIONALISATION**

**CURRENT SITUATION AND VISION**

Plant & Food Research will continue to have a strong international dimension to its activities. The New Zealand sectors and enterprises we support compete in international markets and many have global aspirations. In addition, science is highly connected internationally and this is increasing.

So to best deliver on our Core Purpose, we need to operate internationally as well as in New Zealand.

Our international activities are focused on four key objectives:

1. Providing in-market and behind-borders support for New Zealand companies, industries and licensees
2. Providing access to world-leading science capabilities
3. Commercialising intellectual property to realise value where the New Zealand industry does not have capacity to do so, and in ways that create opportunities for New Zealand
4. Directly supporting the New Zealand Government’s interests and priorities.
These objectives shape our strategies and activities 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 AND 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 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 on which we focus.

We continue to expand our engagement with China, building on our long-standing research relationships with institutes there. The initiatives involve research collaboration that directly supports New Zealand businesses in that market, creates opportunities for New Zealand businesses, and supports the New Zealand’s Government’s China strategy.

Singapore is emerging as a focus for food innovation research in the region. We will continue established links and exchanges with research organisations in other countries, principally Japan and the Republic of Korea.

Our involvement in the New Zealand Government’s foreign aid programme will be mainly in Asia and the Pacific Island states, reflecting the Government’s priorities.
KEY ACTIVITIES

→ Support our licensees as they build offshore production bases for key varieties, in order to provide year-round product supply to retailers
→ Build the scope and scale of projects operating through the recently developed joint laboratories in China
→ Grow our support for the Ministry of Foreign Affairs and Trade (MFAT)’s international development programme.

PERFORMANCE TARGETS

By 2020, we receive 25% of our revenue from offshore. Annually.

As a step towards this, the 2015/16 target for the value of our offshore revenue is 15%. 
ENGAGEMENT – PARTNERING FOR SUCCESS
CLIENT RELATIONSHIP MANAGEMENT

CURRENT SITUATION AND VISION

Our aim is to have close relationships with our clients so that we can develop strong partnerships that convert research into the desired impacts. Our approach is people-based, with cross-functional teams working with clients to understand their needs and develop science programmes to meet those needs. This is aided by the geographic spread of our organisations, with sites in most of the key growing regions in New Zealand.

We work to align our interactions with clients to the nature of the relationships. For large, complex and long-term relationships, we often use formal governance structures designed both to oversee the work being undertaken and also to ensure that the relationship is healthy and growing. For smaller clients, who prefer a single point of contact, we have dedicated account managers.

In the 2014/15 financial year, we implemented new Customer Relationship Management (CRM) software aimed at improving the ability of our customer-facing staff to access all the relevant information about a client rapidly and hence improve our responsiveness to clients.

In all cases, our aim is to grow understanding, trust and value creation.

KEY ACTIVITIES

In the 2015/16 financial year, we will focus on consolidating the gains made in prior years:

→ Strengthen our partnerships with some of our largest clients through joint appointments and secondments

→ Continue to develop our CRM through a series of planned enhancements and an ongoing effort to lift data quality.

PERFORMANCE TARGETS

Outperform CRI average for Overall satisfaction and Satisfaction with accessing knowledge or technology. 2-yearly survey data.

Achieve specific stakeholder sentiment in the following key band: Likelihood to recommend: 80–90%. 2-yearly survey data.

BUILDING OUR BRAND

CURRENT SITUATION AND VISION

During 2013/14 and 2014/15 we explored key areas of customer sentiment toward the overall Plant & Food Research brand. This work has used customer and internal survey data to help to determine the role our brand plays in engaging stakeholders and staff and ultimately in the value of our brand to the Shareholder. Our research has focused on:
The reasons customers choose Plant & Food Research
Perceptions of Plant & Food Research’s affordability versus those of other potential research providers
The core traits recognised by customers and staff as forming Plant & Food Research’s brand personality
Plant & Food Research’s relative brand strength compared with those of other New Zealand companies.

Our research has shown that customers perceive a range of potential options and partners for their R&D investment and are choosing Plant & Food Research based on well-defined perceptions of our capability and the quality of existing relationships.

In addition, there is a clear, stable perception amongst both staff and stakeholder groups of the key elements of Plant & Food Research’s brand personality. Themes common across both groups include Professional, Expert, Collaborative and Connected.

External advice tells us that the overall set of words selected in the survey reflect a highly positive perception of Plant & Food Research as “competent, trusted and knowledgeable”. Benchmarking against other New Zealand companies shows customer willingness to promote Plant & Food Research is as high, or higher, than that recorded by a large number of well-known New Zealand-based consumer brands.

Our vision is to enhance our understanding of the Plant & Food Research brand further and to leverage that knowledge in marketing and customer engagement activities. We believe this activity will help us to connect more closely with clients, to deepen relationships, and to enhance customer engagement and willingness to invest.

KEY ACTIVITIES

In 2015/16 we will continue to explore customer perceptions of our brand through quantitative and qualitative research, with a view to strengthening the connection between our brand and the innovation outcomes sought by client sectors.

- Repeat our established set of brand questions in the MBIE-led CRI stakeholder survey
- Engage directly with key partners to develop a qualitative view of the functional and emotional values our brand represents to them.

PERFORMANCE TARGETS

Achieve 90% positive brand perception in top 10 brand personality traits as selected by stakeholders in the MBIE survey. 2-yearly survey data.

Customers surveyed recognise Plant & Food Research’s market and sector knowledge as a key driver in their decisions to engage with Plant & Food Research. Establish benchmark in 2015/16, 2-yearly survey data.
TECHNOLOGY TRANSFER

CURRENT SITUATION AND VISION

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.

KEY ACTIVITIES

→ Plan for technology transfer when designing research projects
→ Actively license products and technology that flow from our research.

PERFORMANCE TARGETS

Commercial reports per scientist FTE is 0.71–0.75. Quarterly.

DIGITAL ENGAGEMENT

CURRENT SITUATION AND VISION

The world is going digital and our stakeholders are no exception to that trend. Over the last few years we have developed a significant web presence through both our website and social media channels. Our focus to date had been on communicating the impact of our science. In the future we expect to see digital channels becoming an increasingly important vehicle for technology transfer, not just for communication.

KEY ACTIVITIES

→ Initiate work exploring the digital dimensions of technology transfer.

PERFORMANCE TARGETS

Narrative on our progress towards embedding a digital dimension to support our technology transfer activities. Annually.

Indicators to quantify progress are currently under development.
SCIENCE FOR IMPACT – OPTIMISING SCIENCE QUALITY AND BUILDING THE BEST TEAMS
INVESTING IN FUTURE SCIENCE AND CAPABILITY

CURRENT SITUATION AND VISION

While our research portfolio is principally sector-aligned, we invest 20–25% of our Core Funding in Future Science, which supports 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 science capability.

Fundamental science continues to provide the new ideas and capabilities that our sectors will require in the future. As well as Future Science, some basic research is also supported by the sectors. In total, Plant & Food Research investment in basic science is in the order of 28% of total science investment.

In response to recommendations from a review of the Future Science portfolio by our Science Advisory Panel, we are moving to a targeted Request for Proposals process to better align capability development with the strategic goals of the organisation. In addition, we will develop a communication plan for Future Science to better transfer knowledge to sector-aligned research and to publicise the value created by fundamental research to our sectors and stakeholders.

With revenue from the Crown expected to remain static over the next 5 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 will also access capability through collaboration with national and international partners, particularly where they have established strengths in areas of common interest.

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 optimally. This goal is supported by ongoing programmes targeted at promising science students.

KEY ACTIVITIES

→ Invest $10.033 million of Core funding in a portfolio of Future Science projects, with a focus on data management and digital agriculture

→ Undertake an audit of our science capabilities and use the findings to identify capability gaps that need filling through building new teams or collaborations. New capability will be resourced through targeted investments from Future Science.
PERFORMANCE TARGETS

Impact of scientific publications calculated using the mean citation score (SciMago index) for journals in which PFR papers are published is 2.8–2.9. Annually.

Number of international awards is 10–15; invitations for international committees are 7–12; invitations for editorial boards are 5–10. Annually.

Percentage of stakeholders confident that PFR has the ability to put together the most appropriate research teams outperforms the CRI average. 2-yearly survey data.

NATIONAL SCIENCE CHALLENGES, HUBS, AND OTHER COLLABORATIONS

CURRENT SITUATION AND VISION

New Zealand’s National Science Challenges are an important focus for us. We participate actively in the Challenges and coordinate and align relevant resources and activities within the scope of our Statement of Core Purpose. Plant & Food Research is playing a leading role in three of the ten Challenges (High Value Nutrition, New Zealand’s Biological Heritage, and Our Land and Water) and is a participant in most of the other Challenges (including Aging Well, A Better Start, Healthier Lives, Sustainable Seas and Science for Technological Innovation). Table 1 (page 20) outlines the alignment of Core funding with National Science Challenges that relate to our Core Purpose. We have representation at General Manager level on Governance and Research Committees in High Value Nutrition, New Zealand’s Biological Heritage, and Our Land and Water.

We will continue to work with and support the work of Callaghan Innovation. We have technologies and capabilities that, individually or in combination with other technologies, are relevant to the high value manufacturing sectors and industries on which Callaghan Innovation focuses. We are contributing to several of the National Technology Networks Callaghan Innovation is establishing, such as those for food and sensing.

A third collaboration priority in this planning period will be the hub-based collaborations FoodHQ® in Palmerston North, and the one at the Lincoln campus. The focus areas of these two hubs are complementary to each other, and well aligned with Plant & Food Research’s strategy and Statement of Core Purpose. We will continue to play a leading role in the governance, development and operation of these collaborations. During this planning period we expect further progress in discussions on investment in common or complementary infrastructure and facilities. FoodHQ® is already established and in its first two years has achieved good results, with new industry clients and new members joining. Planning for the proposed Lincoln Hub is well advanced and we expect implementation will commence soon.

The KiwiNet partnership will continue to be a valuable means of accessing connections with businesses, investors, collaborators and commercialisation expertise, to help to turn our technologies and expertise into innovative products and services. We are increasingly using Kiwinet to showcase IP and technologies available for commercialisation or for use with other technologies.
Plant & Food Research will continue 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 research consortia in areas of relevance for our science and for New Zealand.

**KEY ACTIVITIES**

→ Maintain our support for the National Science Challenges, Hubs and KiwiNet through the provision of senior staff time in governance roles and through alignment of our activities with those of these collaborations

→ Complete a strategy review of our approach to collaborations, including a comparison with the approach taken by other research organisations who are part of internationally recognised hubs and clusters.

**PERFORMANCE TARGETS**

Publications with collaborators (% International/New Zealand and CRI) are 70–80%. *Quarterly.*

**SCIENCE REVIEWS AND SCIENCE ADVISORY PANEL**

**CURRENT SITUATION AND VISION**

We will continue our annual programme of science reviews to assess matters such as science quality, performance and strategy, relationships with commercial opportunities, and future needs in selected science areas. We will use internal and external reviewers, including members of our Science Advisory Panel. The Panel’s current members are:

→ Prof. Marston Conder, University of Auckland (Chair)
→ Prof. Cathie Martin, John Innes Centre, United Kingdom
→ Prof. Ernst van den Ende, Plant Research International/Wageningen University, The Netherlands
→ Prof. Alistair Robertson, formerly of CSIRO, Australia.

**KEY ACTIVITIES**

→ The Panel will continue to provide advice and foresight to the Board on Plant & Food Research’s science quality, strategy, and involvement in and uptake of new international developments through joint strategy days with the Board and participation in science reviews of selected science areas.

**PERFORMANCE TARGETS**

Four science reviews by 30 June 2016. *Annually.*
INTELLECTUAL ASSETS, DATABASES AND COLLECTIONS

CURRENT SITUATION AND VISION

Our policy for management of intellectual assets is published on our website (http://www.plantandfood.co.nz/page/about-us/our-views-intellectual-property/).

The policy is based on the following principles:

→ Plant & Food Research aims to manage its intellectual assets strategically to achieve optimal impact for its partners and industries, and will strive to select the most appropriate method of technology transfer to achieve this on a case by case basis

→ Plant & Food Research supports a collaborative approach to research, development and commercialisation to create greater impact

→ When developing intellectual property in collaboration with others, Plant & Food Research will work with these partners to identify the party that is best placed to manage the IP and to develop the full scope of the technology and its potential utilisation

→ Plant & Food Research seeks to ensure that dealings and agreements with other parties appropriately preserve and protect IP, and provide a sound governance framework for IP decision making

→ Where appropriate, Plant & Food Research will retain sufficient IP access rights to enable the conduct of further research in accordance with our Core Purpose

→ Where intellectual assets are anticipated to generate commercial returns, an equitable return from the commercial exploitation of those assets should be expected

→ Plant & Food Research will enforce its IP and contractual rights in a manner consistent with our Core Purpose and roles within the innovation system

→ In managing its intellectual assets, Plant & Food Research aims to respect the Treaty of Waitangi and all relevant government policies and international protocols, including respecting the IP rights of others

→ Plant & Food Research acknowledges the international movement towards publication in open access journals and will support the stance of our funding bodies in relation to this

→ Plant & Food Research supports the aims of NZGOAL and where appropriate will make copyright and non-copyright works available on open terms.
A key aspect in the management of intellectual assets is the identification and tracking of assets. We are extending the processes we have successfully developed for plant materials and patentable inventions to cover other forms of intellectual assets.

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.

**KEY ACTIVITIES**

→ Expand the identification and tracking of intellectual assets beyond patentable inventions and plant materials though intellectual asset workshops and audits
→ Implement policies, practices and activities for the databases and reference collections in which Plant & Food Research has an interest (Appendix 3).

**PERFORMANCE TARGETS**

Number of patents granted is 10–12 per annum. *Annually.*

Number of new licences is 10–12 per annum. *Annually.*

Number of trademarks registered is 0–2 per annum. *Annually.*

Number of Plant Variety Rights granted in New Zealand is 5–7 per annum. *Annually.*

Number of Plant Variety Rights granted overseas is 5–7 per annum. *Annually.*

Requests for database collections are 10–20 per annum. *Annually.*
ORGANISATIONAL EXCELLENCE – ENHANCING OUR PERFORMANCE
HEALTH & SAFETY

CURRENT SITUATION AND VISION

Plant & Food Research has a strong and enduring commitment to continual improvement in workplace health & safety. We seek to reach beyond compliance with legislative requirements to a point where our people regard a commitment to safety as fundamental to all that we do. In short, we view a safe workplace as a reflection of a positive culture characterised by a high degree of pride in the work we do, and respect and consideration for others.

Across the organisation, there is ownership of and adherence at all levels to ongoing improvements to our health and safety practices. The active involvement and support from Senior Management and the Board in driving safety awareness is critical.

KEY ACTIVITIES

→ Continue to identify and mitigate health & safety risks across all aspects of our business through an effective accident and incident reporting system and via employee representatives at regular meetings of the National Health & Safety Committee and local site committees
→ Maintain our focus on potential hazards within our laboratories and on orchards, farms and at sea, where there are particular risks associated with working with machinery and equipment
→ Give high priority to contractor management, in particular those operating in our field research network and on the various building construction projects underway, most notably at the Mount Albert Research Centre
→ Increase the profile of health & safety through focused management of safety risks wherever these are identified, improved reporting and follow up of incidents, trend analysis, and near-miss reporting
→ Provide the Board, Senior Management and the wider staff with the information, insights and resources they need to fulfil their responsibilities with confidence.

PERFORMANCE TARGETS

Tertiary-level standard in the ACC Workplace Safety Management Programme maintained. **Annually.**

No injuries falling within the definition of serious harm. **Annually.**

Downward trends in injuries requiring medical treatment or lost time. **Annually.**

Workplace survey results indicating that, on average, all staff agree that they view health & safety as a priority and consider they are provided with the tools and information they need to be safe. **2-yearly survey data.**
COMPLIANCE

CURRENT SITUATION AND VISION

We are continuing to apply high standards to Biosafety Compliance through a range of policies and through the establishment of a dedicated Biosafety Compliance Manager and consultative groups, including a widely representative Biosafety Committee and CIMS framework to deal with any incidents.

KEY ACTIVITIES

→ Continue to improve and replace aging containment facility infrastructure or equipment in physical containment facilities, including prioritisation of capital expenditure on new equipment, to ensure we can meet compliance requirements
→ Further develop and improve internal operational controls, including procedures and record keeping
→ Expand training for staff and contractors.

PERFORMANCE TARGETS

Narrative on our progress in this area will be provided. Annually.

Indicators to quantify progress are currently under development.

PRODUCTIVITY/EFFICIENCY

CURRENT SITUATION AND VISION

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.

KEY ACTIVITIES

→ Enhance the productivity of our science teams further by continuing to decrease the ratio of scientists to technologists. This ratio has reduced from approximately 1.4:1 in 2009/10 to 1.15:1 in 2014/15. We intend to reduce the ratio further to 1:1 by 2017/18. As well, further capital investment will be required in science equipment to replace obsolete equipment and to achieve further gains in productivity and efficiency.
PERFORMANCE TARGETS

Revenue per science FTE has increased from the current $212,000 per FTE to $269,000 per FTE by 2019/20. In 2015/16 revenue is $228,000/science FTE. Annually.

Scientist to technologist ratio is less than 1.15:1. Annually.

Science staff numbers are held at 580–585 in 2015/16. Annually.
WAYS OF WORKING – CREATING INSPIRING WORKPLACES AND WORKSTYLES
OUR PEOPLE

CURRENT SITUATION AND VISION

The major redevelopment and modernisation of our Mount Albert Research Centre headquarters that is now underway is being guided by a set of principles and objectives that capture the way we aspire to work. Collectively known as Ways of Working, our future workplaces will be shared and open, with consistent designs throughout. They will provide a choice of tools and technologies that allow people to work efficiently and perform at their best within environments that provide a safe and secure home base. Overall, our vision is for inspiring workplaces, technologies and work styles that enable us to deliver high impact science.

While the initial focus is on the Mount Albert redevelopment, the Ways of Working principles will be applied as we undertake new developments at other Plant & Food Research sites, including new facilities planned for Nelson in 2015, and at Lincoln as part of the hub initiative.

More generally, we will continue to 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.

Plant & Food Research takes its responsibilities as a Good Employer seriously. We take pride in our increasingly diverse and multicultural workforce and regard it as a strength as we develop and expand our international activities. Our flexible work arrangements recognise the seasonal nature of many of our research programmes and the fact that many of our staff balance their work and family responsibilities. Overall, our goal is to promote a culture where people work to their best and are recognised accordingly.

Our Good Employer policies are outlined in Appendix 3.

KEY ACTIVITIES

→ Evolve our Ways of Working change programme to ensure we transition into our new work environments effectively and, in doing so, gain the full benefits of the Ways of Working strategy and our investment. The programme integrates the development of the new work areas with the introduction of enabling technologies and the support we provide people as they accustom themselves to the new work settings. It builds upon the strongly established leadership programme, with the insights and learning provided through this programme being highly relevant to the Ways of Working and for the successful implementation of change.

→ Involve people in the development of their new work environments. A work style profiles initiative has seen a cross-section of our people identify the work settings, tools and
technologies needed for optimal performance in open, shared environments. Effective communication is promoted through a network of staff representatives.

- Develop leadership capability at all levels in the organisation through our leadership programme, as a major element in a range of integrated initiatives for identifying and developing our next generation of leaders. This is important, as a significant number of our current leaders are expected to retire during the next decade.

- Give high priority to supporting new team leaders through our Team Leader and team development programmes, acknowledging the key role that Team Leaders have in the planning and review of work and, more generally, in supporting high engagement among team members.

- Support the ongoing development of our senior leaders through a collaborative initiative with the New Zealand Leadership Institute and other Crown Research Institutes, focusing on the leadership mindset.

- Ensure we develop capability in priority areas and provide successors for current leaders through highly effective recruitment and selection processes. With relatively low turnover among our scientists, it is vital that we regard every vacancy as an opportunity to recruit a future leader. This is enabled and supported by a well-developed internal recruitment capability, strong links to the universities, and a positive employment brand.

- Secure and retain the talented individuals required to safeguard our future capacity, by offering a strong value proposition and competitive remuneration.

### PERFORMANCE TARGETS

Engagement across the organisation continues to meet or exceed the sector benchmark across all sections of the survey. Continued ability to recruit and retain the people who are critical for our future success. **2-yearly survey data.**

Impact and value of our investment in leadership development via improvements that leaders achieve through 360-degree capability surveys conducted prior to and one year after participating in a programme, confirming the proportion of leaders with clear strengths and whose strengths define them as great leaders. **2-yearly survey data.**

Tailored surveys will measure satisfaction with the new work environments and the success of the Ways of Working programme. **Annual survey data.**

### OUR WORKPLACE

### CURRENT SITUATION AND VISION

Our physical footprint and its effective functioning are key to the delivery of our mission through our people. In the last 12 months we have committed considerable resources to planning and delivering a refreshed physical presence for our organisation, to ensure that it enables and enhances the performance of our people as well as their wellbeing. As outlined above, ‘our people’ initiatives and ‘our workplace’ initiatives are integrated in our Ways of Working strategy.

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 the 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.

**KEY ACTIVITIES**

→ Mt Albert Campus Redevelopment.

This investment is being staged over the next two years to optimise financial flexibility, and will be financed initially by cash surpluses and proceeds from the disposal of non-strategic land and buildings. In the later stages of the programme we will also use some debt funding.

The key project stages and milestones are as follows:

<table>
<thead>
<tr>
<th>Task</th>
<th>Completion Date</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary design</td>
<td>Completed</td>
<td>Completed</td>
</tr>
<tr>
<td>Developed design</td>
<td>Completed</td>
<td>Completed</td>
</tr>
<tr>
<td>Detailed design</td>
<td>Completed</td>
<td>Completed</td>
</tr>
<tr>
<td>Award main contractor contract</td>
<td>Completed</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction complete</td>
<td>June 2017</td>
<td>Started</td>
</tr>
</tbody>
</table>

→ Nelson Campus Redevelopment.

The proposed new development involves a 2100m² building consisting of laboratories and general offices on land owned by the Port of Nelson, adjacent to our existing finfish aquaculture facility and seafood industry partners. The new building will replace our existing leased premises in Nelson. These premises have a low seismic rating and the owner (Nelson City Council) has advised that it is not in a position to upgrade them at the present time.

A Memorandum of Understanding is in place whereby Port of Nelson will design, build and lease back to us the facility. Port of Nelson is planning to develop the proposed site area from a low-value log storage area into a science and technology Seafood Precinct, and they are actively discussing opportunities with other relevant research, education and industry organisations.

**PERFORMANCE TARGET**

Progress against key project milestones. **Annually by narrative.**
OUR TECHNOLOGY

CURRENT SITUATION AND VISION

Over the next three years we will be making significant investments in our IT infrastructure to improve the resilience of Information and Communications Technology (ICT) services and protect our data to support and enable high quality science. These projects will enable three categories of ICT services, Disaster Response, Business Critical, Remaining Services, to be restored following a major event.

The new Ways of Working environment being created at Mt Albert will enable greater staff mobility and feature spaces designed to encourage collaboration through content sharing and presentation, with:

→ Wireless connectivity in conjunction with portable computing devices
→ Video conferencing (VC) tools to extend collaboration to research partners, customers and government agencies
→ Video conferencing with content sharing from desktops and laptops as well as from dedicated VC suites and meeting rooms
→ Large monitors in collaboration/meeting spaces.

Investments are planned to upgrade the technology platform delivering intranet, document management and records management services. Office productivity applications and unified communications systems are being upgraded to deliver a revamped intranet for internal communications, improved search capability for documents and intranet content, enhanced connectivity for multiple device types both onsite and remotely, the ability to connect securely with external partners for easier collaboration, new functionality maximised across a common release of software solutions, and support for wider information management strategies, including Public Records Act compliance.

Multi-year programmes of work will continue to organise science data in structured database applications. These solutions include commercially developed software and in-house development to improve accessibility and use of data sets, and to secure and protect valuable digital assets. Opportunities to use externally hosted services (“cloud services”) for both science and non-science workloads will be explored as alternatives to building internal systems.

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. Initiatives to support this responsibility include the development of improved systems for information management, and alignment of data management policies and procedures with those of the wider research sector.
KEY ACTIVITIES

→ Complete the implementation of IT infrastructure solutions to protect systems and data
→ Support increased staff mobility by expanding wireless connectivity across sites
→ Upgrade collaboration and communication tools.

PERFORMANCE TARGETS

Dual Data Centres operational by June 2016. **Annually narrative.**

Wireless access coverage doubled by June 2016. **Annually narrative.**

MS Office/SharePoint/Lync services upgraded to later versions by June 2016. **Annually narrative.**
FINANCIAL PERFORMANCE
- SUSTAINING PROFITABILITY TO CREATE FLEXIBILITY
CURRENT SITUATION AND VISION

For the five years ending 30 June 2020, we are projecting similar revenue growth as last year’s Business Plan (2014/15), assuming a continuation of the generally positive economic environment. Our view is built on a strong revenue pipeline and track record over the last two years. Our projections for Core Funding remain flat and MBIE funding is projected to be lower than in previous plans, while commercial research revenue continues to grow strongly. We have increased the royalty revenue outlook, in particular because of an improving kiwifruit sector and sales projections for the ‘Zesy002’ [commonly called Gold3 and marketed as Zespri® SunGold Kiwifruit] cultivar.

Balancing these positive revenue projections is an increase in our direct costs, as we have experienced significant pressure on these project costs in the past two years of revenue growth. We have updated our Business Plan projections based on recent cost trend information. In general, we are finding that our growing commercial revenues over the last two years are driving higher direct costs than we had anticipated in prior Business Plans.

This adjustment results in lower growth in profitability over the planning period, compared with that in the current Business Plan. For the next year ending June 2016, this Business Plan is currently indicating Earnings Before Interest, Depreciation and Tax (EBITDA) of $13.1 million, $2.3 million less than projected in last year’s Business Plan for this year. Slightly higher revenues are more than offset by higher direct science costs and science staff costs.

KEY ACTIVITIES

This document outlines a series of activities across our five science strategic focus areas and six business strategic focus areas that will deliver value to our customers while meeting our financial targets. We have initiatives to increase business for our existing customers, to identify new customers in New Zealand and other countries, to deliver research to support growth in the economy that will support Māori aspirations, to build our brand and digital engagement with our customers, to enhance our collaborations through the National Science Challenges and research hubs and centres, to extend our capability in key areas, to continue momentum in our Ways of Working initiatives and to evolve our culture. With these, we will make good progress towards our vision of being a world-leading, sustainable business recognised and valued for innovation and science excellence.

PERFORMANCE TARGETS

Revenue per FTE is $155,000–160,000. Quarterly.

Revenue is 8% (from $124 million to $134 million). Annually.

Operating profit (EBITDA) is 30% (from $10 million to $13 million). Annually.
OUR DASHBOARD – 2015/16 AT A GLANCE

KEY PERFORMANCE INDICATORS

OUTCOME AREAS

STRATEGIC FOCUS

INCCREASE VALUE

PROTECT & ENHANCE

SUSTAIN GROWTH

Better cultivars faster™

Proprietary, premium foods and beverages

Sustainable, premium seafood and marine products

Residue-free pest & disease control

Sustainable and profitable production systems

Proportion of critical steps delivered – a set of 52 critical steps that describe value created for all our key sectors and customers through research delivered across our five outcome areas. These steps identify the delivery of impact to our industry stakeholders. Collectively, they provide a detailed evaluation of our progress to impact on an annual basis generated from all revenue sources.

85% delivered
Annually

Total PFR impact assessment
Benchmark established
3-yearly

Impact case studies
≥ 9
Annually

KEY: = Target = Reporting Frequency
## A HEALTHY BUSINESS

<table>
<thead>
<tr>
<th>Sectors &amp; customers</th>
<th>Engagement</th>
<th>Science for impact</th>
<th>Organisational excellence</th>
<th>Ways of working</th>
<th>Financial performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract revenue from new customers</td>
<td>$2.7M</td>
<td>Annually</td>
<td>Commercial reports per scientist FTE</td>
<td>0.71–0.75</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Value of science involving Māori</td>
<td>$3M</td>
<td>Annually</td>
<td>Digital engagement</td>
<td>Narrative</td>
<td>Annually</td>
</tr>
<tr>
<td>Revenue per FTE from commercial sources</td>
<td>$40–65K</td>
<td>Quarterly</td>
<td>Percentage of stakeholders: Satisfied with their experience of accessing knowledge or technology from PFR</td>
<td>&gt; CRI average</td>
<td>2-yearly survey</td>
</tr>
<tr>
<td>Offshore revenue</td>
<td>15%</td>
<td>Annually</td>
<td>Percentage of stakeholders: Likely to recommend PFR</td>
<td>80–90%</td>
<td>2-yearly survey</td>
</tr>
<tr>
<td>Revenue per FTE from commercial sources</td>
<td>$40–65K</td>
<td>Quarterly</td>
<td>Percentage of stakeholders: Likely to recommend PFR</td>
<td>80–90%</td>
<td>2-yearly survey</td>
</tr>
</tbody>
</table>

- **Percentage of stakeholders:** Satisfied with their experience of accessing knowledge or technology from PFR:
  - > CRI average
  - 2-yearly survey

- **Science reviews:**
  - 4
  - Annually

- **Number of international awards, invitations for international committees, invitations for editorial boards:**
  - 10–15, 7–12, 5–10
  - Annually

- **Requests for database collections:**
  - 10–20
  - Annually

- **Science staff numbers:**
  - 580–585
  - Annually

- **ACC Workplace Safety Management Programme status:**
  - Tertiary
  - Annually
APPENDIX 1:
CRITICAL STEPS TO IMPACT 2015/16

OUTCOME AREA 1

INCREASE THE VALUE OF THE HORTICULTURAL, ARABLE, SEAFOOD AND FOOD AND BEVERAGE SECTORS TO THE NEW ZEALAND ECONOMY THROUGH THE DEVELOPMENT OF HIGH VALUE PRODUCTS AND PROCESSES THAT MEET CURRENT AND FUTURE GLOBAL MARKET NEEDS
STRATEGIC FOCUS AREA: BETTER CULTIVARS FASTER™

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 AREA 1

Strategic Focus Area: Better Cultivars Faster™

<table>
<thead>
<tr>
<th>Sector Impact Targets</th>
<th>Plant &amp; Food Research Themes</th>
<th>Critical Steps 2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2025 novel berryfruit cultivars differentiated by increased production efficiency, superior sustainability and unique traits are contributing to increased returns of more than $11M p.a. and reducing pest and disease management costs by more than $5M p.a.</td>
<td>Cultivar development, including wide hybridisation and marker assisted selection</td>
<td>Large-scale commercial trials are established of a new machine-harvest raspberry selection with improved health-related properties, complementing 'Wakefield' production in the Pacific North West USA</td>
</tr>
<tr>
<td>By 2020 new wheat cultivars will be yielding 20 t/ha; the New Zealand dairy, poultry and pork industries are using only New Zealand-grown grain and increasing metabolisable energy production by 20% using supplementary feed from annual crops; and exports of high value seeds will have increased by 50% to $250M p.a.</td>
<td>Breeding tools and germplasm maintenance, characterisation and development, and genotyping by sequencing peas and cereals; further incorporation of advanced breeding technologies into brassicas to achieve herbicide-tolerant cultivars and disease resistance</td>
<td>Advanced breeding lines with potentially durable resistance against diseases of wheat, barley and oats have been evaluated in trials for effectiveness and performance, contributing to the development of fit-for-purpose cultivars with greater potential to achieve 20 t/ha through reduced effects of disease pressure on yield and quality</td>
</tr>
</tbody>
</table>

CONTINUED OVERLEAF
<table>
<thead>
<tr>
<th>Sector Impact Targets</th>
<th>Plant &amp; Food Research Themes</th>
<th>Critical Steps 2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2030 delivery of improved green, gold, and red kiwifruit cultivars, a new kiwiberry and a health-based cultivar, will result in an annual return from proprietary cultivars of up to $2.5B</td>
<td>New cultivar development&lt;br&gt;Neutralising the impact of Psa disease&lt;br&gt;Protecting against and managing pests and diseases&lt;br&gt;Optimising production systems and supply chain&lt;br&gt;Consumer and health research</td>
<td>Data on the impact of Psa on ‘Zesy002’ (Gold3) has guided the Commercial Programme Stage Leaders on whether a gold contingency cultivar must be accelerated to Stage 3 to meet the Horizon 2 target, optimising the commercial programme by clarifying the priority and specifics for a future gold concept</td>
</tr>
<tr>
<td>By 2022 new and novel ornamental cultivars will be contributing to the ornamental sector’s target of up to $400M p.a. by 2025</td>
<td>New genomic and breeding tools&lt;br&gt;Developing rapid clonal propagation and production systems for faster delivery of elite clones</td>
<td>Cryotherapy has been used to remove known virus infections from plants of at least two ornamental genera and at least one berryfruit variety, generating high health material for industry</td>
</tr>
<tr>
<td>By 2022 new premium pipfruit cultivars delivering differentiated and diverse products will contribute up to $60M new revenue towards the pipfruit sector’s goal of $1B by 2022</td>
<td>Conventional and fast breeding of new apple and pear cultivars&lt;br&gt;Breeding tools and germplasm: germplasm maintenance, characterisation and development, and genotyping by sequencing&lt;br&gt;Genetics and breeding for improved consumer appeal: carotenogenesis, anthocyanin accumulation and flavour discovery&lt;br&gt;Genetics and breeding for improved productivity through pest and disease management, new rootstocks, and durable resistance</td>
<td>The ‘Robusta 5’ source of European canker resistance has been mapped and marker assisted selection validated, increasing selection efficiency for this difficult-to-phenotype trait in apple</td>
</tr>
<tr>
<td>By 2018 Plant &amp; Food Research potato cultivars will account for 10% and 25% of the New Zealand processing and fresh markets, worth $73M p.a. and $36M p.a. respectively, with a new specialty market generating up to $3M p.a. in new export revenue</td>
<td>Potato breeding targeting productivity, pest and disease resistances and value-adding processing attributes for food and non-food products&lt;br&gt;Applying molecular and genome breeding tools and population-based understanding of genetic and environmental variances to integrate key traits&lt;br&gt;Accessing and utilising the potato resources of the International Potato Centre to extend germplasm diversity&lt;br&gt;Providing a secure and pathogen-free pipeline of potato materials for evaluation in domestic and global markets&lt;br&gt;Identifying, collecting and conserving tāewa potato lines in tissue culture and disease-free</td>
<td>At least two new PFR-bred potato cultivars, integrating essential sector-targeted characteristics, have been licensed for the processing or table segments, increasing product diversity and enhancing compatibility between raw material and processing system requirements&lt;br&gt;A partnership between PFR and Māori potato sector stakeholders has been developed, enabling R&amp;D that will support strategic economic targets, including the development of novel products from material of cultural significance, and cultivars that suit the modern palate while retaining cultural continuity</td>
</tr>
<tr>
<td>By 2020 plantings of at least three new apricot cultivars for Asian markets will have reached 280 ha and be contributing up to $10M p.a. in new industry revenue</td>
<td>Maintaining and evaluating germplasm</td>
<td></td>
</tr>
</tbody>
</table>
STRATEGIC FOCUS AREA: Proprietary Foods with Premium Prices

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 AREA 1

Strategic Focus Area: Proprietary Foods with Premium Prices

<table>
<thead>
<tr>
<th>Sector Impact Targets</th>
<th>Plant &amp; Food Research Themes</th>
<th>Critical Steps 2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2018 new storage protocols enabling premium products to reach distant markets will be contributing up to $20M p.a. towards the avocado sector’s target of $184M p.a. export value by 2020</td>
<td>Inventory management – operating procedures for inventory management</td>
<td>Minimum quality standards have been established for fruit in low O2 and/or low temperature shipping and communicated to NZ Avocado, supporting the development of an integrated export supply chain</td>
</tr>
<tr>
<td>By 2025, new understanding of the effects of production systems and genetics on key consumer-driven traits will result in 95% of New Zealand’s bread being made with New Zealand-sourced grains, and wheat exports to Asia exceeding 200,000 t</td>
<td>Understanding the different gluten intolerance-related epitopes in Plant &amp; Food Research proprietary wheat lines Understanding the effects of crop management and baking technology on gluten intolerance</td>
<td>Coeliac peptide screening protocols have been developed and used to test advanced wheat lines for gluten intolerance-related epitopes, enabling breeders to target consumer-driven traits related to wheat products</td>
</tr>
</tbody>
</table>

CONTINUED OVERLEAF
### Sector Impact Targets

| By 2017 at least two New Zealand companies within the consumer and health sector will be each exporting one food product and/or food ingredient with functional benefits that contribute to health | Consumer and health research | One fruit (and/or ingredient) with demonstrated efficacy for inflammation prevention and management has been explored by the industry for its potential to generate $80M p.a. in export revenue by 2020. Segmentation of Chinese consumers based on texture preferences has been established and shared with key industry partners, enabling food product development teams to target food texture to consumer preferences in Asian markets. Three NZ companies have trialled production of high value functional foods or ingredients with validated efficacy in modulating appetite control, contributing to the NZ food industry’s export growth target of $325M by 2017.

- By 2017 at least two New Zealand companies within the consumer and health sector will be each exporting one food product and/or food ingredient with functional benefits that contribute to health.
- By 2018 berry-based, functional food products with scientific evidence of efficacy will be generating additional export revenue of up to $25M p.a.
- By 2020 new supply chain systems for new and existing cultivars will be predicting supply chain performance, reducing quality variation and extending supplies of premium quality kiwifruit, maintaining and increasing market access and increasing revenue by up to $175M p.a.
- By 2022 quality systems and supply chain management will be delivering premium products with enhanced flavour and texture that contribute up to $40M towards the pipfruit sector’s goal of $1B by 2022.

### Plant & Food Research Themes

| Knowledge of the contribution of whole berry fruits and ingredients to health and well-being, e.g. in inflammation, sports recovery, mental acuity, immunity, satiety and digestive health | New cultivar development Consumer and health research | Knowledge of the relative utility of ‘general’ versus ‘specific’ health and well-being claims has been communicated to key industry stakeholders, supporting consumer-relevant nutrition and health marketing for functional foods.

- Knowledge of the relative utility of ‘general’ versus ‘specific’ health and well-being claims has been communicated to key industry stakeholders, supporting consumer-relevant nutrition and health marketing for functional foods.

### Critical Steps 2015/16

| Knowledge of the bioactive synergy of fruits (incl. a berryfruit and/or ingredient) has been evaluated for inflammation control in vitro and in an airway inflammation animal model, supporting functional food development by food industry partners. | New cultivar development Protecting against and managing pests and diseases Optimising production systems and supply chain | New pre- and postharvest systems have been developed and shared with Zespri Group Ltd, improving the consistency and taste of new cultivars.

- New pre- and postharvest systems have been developed and shared with Zespri Group Ltd, improving the consistency and taste of new cultivars.

| Systems for increasing the tolerance of apples to a non-optimal cool chain have been delivered to the industry for incorporation into supply chain guidelines, enabling new export markets to be developed. | Understanding flavour and texture traits for target markets Enhanced taste: new taste and texture standards, and technologies, for supplying fruits to Asia with enhanced eating quality Developing supply chains for target markets | Systems for increasing the tolerance of apples to a non-optimal cool chain have been delivered to the industry for incorporation into supply chain guidelines, enabling new export markets to be developed.
By 2018 Plant & Food Research potato cultivars with enhanced processing and consumer traits, and new potato food and end-use products, including secondary metabolite-derived products, will account for 10% of the processing sector ($73M p.a.) and stimulate the development of a new specialty market worth $3M p.a.

| Understanding consumer preference for flavour |
| Managing the impact of processing on nutritional and textural quality of potato products |
| Developing and commercialising new convenience foods with enhanced nutritional value |
| Understanding secondary metabolite development |

Key components associated with potato flavour profiles have been identified using flavour-focused metabolic analysis and consumer sensory science, and communicated to the potato breeding programme, supporting the selection of new potato cultivars based on taste.

High-value product concepts from potato have been developed and communicated to key industry partners, supporting high value nutrition product development.

By 2022 new technologies enabling sea freight of truss tomatoes and capsicums will have been implemented by at least one exporter to open new markets in Asia, increasing export returns by up to $50M p.a.

| Systems to enable export by sea freight for high-value covered crops to new markets |
| Strategies for assessing chilling sensitivity in solanaceous fruits have been reported to the industry, enabling commercial cultivars suitable for sea freight to be selected more rapidly |

By 2023 sales of wine will have increased to up to $2.34B p.a. by maintaining the freshness of existing New Zealand-branded styles and developing new and innovative styles of wine for new consumers.

| Establishing the roles of terroir, seasonality, viticultural practices and harvest technologies on wine style |
| Viticultural and winemaking tools to develop new wine styles |
| Identifying key components of aroma, flavour and mouthfeel that define sensory quality for target markets |
| Establishing a Vitis genetic resource for genetic studies and undertaking trait inheritance research |

Predictive relationships between Sauvignon blanc juice metabolites and the aroma/flavour potential of the corresponding wine have been established and shared with industry partners, maintaining the freshness of existing NZ wine styles.

New tools, including a prototype juice index, have been developed and used by the NZ wine industry, enabling them to manipulate flavour at harvest and in the vineyard, producing new and distinct flavour styles for Sauvignon blanc.

Understanding of the effects of sensory and non-sensory factors on wine style has been communicated to industry partners, supporting the development of new and innovative NZ wines.
STRATEGIC FOCUS AREA: Sustainable, Premium Seafood and Marine Products

ADOPTION INDICATORS

→ Seafood- and marine-based industries in New Zealand and offshore use Plant & Food Research science and technologies to generate premium seafood and/or marine products

IMPACT INDICATORS

→ Growth in export volume and value of premium seafood and marine products

OUTCOME AREA 1

Strategic Focus Area: Sustainable, Premium Seafood and Marine Products

<table>
<thead>
<tr>
<th>Sector Impact Targets</th>
<th>Plant &amp; Food Research Themes</th>
<th>Critical Steps 2015/16</th>
</tr>
</thead>
</table>
| By 2030 new production, harvest on-board handling technologies will be adopted for use by the New Zealand seafood industry, increasing the value of sustainably produced premium seafood products by at least $500M p.a. | Improved culture and husbandry technologies for new and existing species  
New selective harvest technologies  
New production systems, including wild fisheries enhancement and aquaculture | Techniques for producing post-metamorphic juveniles of two key NZ finfish species have been described, enabling the industry to assess their potential for finfish aquaculture |
| By 2025 an understanding of consumer, sensory and nutritional aspects of selected seafood species will lead to new exports of safe, premium seafood products, contributing to the industry’s target of new exports of $1.5B p.a. | Understanding and responding to consumer preferences for seafood and seafood-based products  
Understanding properties of seafood products  
Understanding and managing risks to food safety | A freezing and frozen storage regime has proven effective for controlling Vibrio vulnificus in oysters, enabling industry to adopt a new microbial control strategy for this high value shellfish |
| By 2025 optimised extraction technologies for unique marine extracts with proven applications as ingredients and biomaterials will support export growth of $80M p.a. | Understanding and control of raw materials, including composition and molecular structure  
Development of new processes to optimise extraction of target compounds  
Understanding function and format and their impacts on product quality and efficacy | At least one new or modified process for a marine biological extract has been tested at factory scale [in industry, in collaboration with a commercial partner] and a prototype product produced |
OUTCOME AREA 2

PROTECT AND ENHANCE MARKET ACCESS IN NEW ZEALAND’S HORTICULTURAL AND ARABLE SECTORS

STRATEGIC FOCUS AREA: Residue-free pest and disease control

ADOPTION INDICATORS

- New Zealand industry and central Government uses 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 which 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
- NZ’s environmental quality enhanced by minimising pest and disease incursions, managing pests and diseases, and reducing risks associated with pest management technologies

<table>
<thead>
<tr>
<th>OUTCOME AREA 2</th>
<th>Strategic Focus Area: Residue-free pest and disease control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sector Impact Targets</strong></td>
<td><strong>Plant &amp; Food Research Themes</strong></td>
</tr>
<tr>
<td>By 2020 disease management on orchard and/or postharvest will be reducing pesticide use in orchards, maintaining fruit quality, and retaining or increasing market access, contributing up to $5M p.a. additional revenue to the avocado sector</td>
<td>Integrated pest and disease management systems</td>
</tr>
</tbody>
</table>

CONTINUED OVERLEAF
<table>
<thead>
<tr>
<th>Sector Impact Targets</th>
<th>Plant &amp; Food Research Themes</th>
<th>Critical Steps 2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2020 integrated pest and disease technologies will contribute to wheat yields of 20 t/ha and exports of high value seeds to increase by 50% to $250M p.a.</td>
<td>Molecular tools for improving club root resistance in brassicas and peas</td>
<td>The design of sustainable disease management for cereal crops has been informed by determining the resistance status of key barley cultivars to two diseases (<em>Ramularia</em> and <em>Rhynchosporium</em>), characterising the NZ populations of key cereal rusts and determining the resistance status of the wheat pathogen <em>Zymoseptoria tritici</em> to fungicides currently used in NZ, with results communicated to the Foundation for Arable Research. The effect of different habitats within cropping land on the abundance and diversity of key beneficial insects, including pollinators, has been determined and results communicated to the industry for incorporation into best-practice systems</td>
</tr>
<tr>
<td></td>
<td>Introduction of multiple disease resistance in cereals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintaining a disease- and pest-free rotation, understanding the role of weeds in the system</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aphid detection and forecasting in cereals</td>
<td></td>
</tr>
<tr>
<td>By 2018 ecological understanding and new integrated control options for pests and diseases, leaving nil or low pesticide residues, will maintain market access for new and existing kiwifruit cultivars and enable the industry to respond in the event of new biosecurity incursions, protecting $1.56B p.a. of exports</td>
<td>New cultivar development</td>
<td>Biocontrol agents for Psa control have been tested in field trials as a basis for maximising biological control in cultivars and a Psa model and in planta inoculum biology have been used to propose improved control methods for Psa to the industry. Fungal isolates have been identified for cicada control as a basis for maximising biological control in cultivars, and offshore pests and disease risks have been identified and proof-of-concept for one new fumigant has been completed, helping to manage market access and biosecurity risks</td>
</tr>
<tr>
<td></td>
<td>Neutralising the impact of Psa disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protecting against and managing pests and diseases</td>
<td></td>
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</tr>
</tbody>
</table>
By 2022 enhanced market access through new sustainable pest and disease management technologies and systems will contribute up to $200M of new revenue towards the pipfruit sector’s goal of $1B by 2022

| Controlling apple diseases | Understanding durable disease resistance | A low toxicity postharvest treatment (ethyl formate) for use against a wide range of pests of pipfruit has been evaluated, including an assessment of fruit quality following treatment, and potential for further development has been discussed with the pipfruit industry |
| Enhanced biocontrol of market access pests | Developing semiochemicals and deeper understanding of ecological interactions for new biological control agents | New knowledge on improved on-orchard control of pipfruit diseases, including European canker, *Venturia inaequalis*, *Neofabraea alba* and *Elsinoe pyri*, has been developed, leading to the communication to the industry of targeted management approaches for control |
| Enhancing market access through new pest and disease technologies | Systems-based approaches to pest risk management | The basis for new biologically based tools has been developed and discussed with the industry, including the Sterile Insect Technique for codling moth, on-orchard controls for Oriental Fruit Moth and Fuller’s rose weevil, a new semiochemical control system for an apple pest (e.g. apple leafcurling midge), a biological control programme for *Mastrus ridens* in different regions, and the risks and benefits of importing *Heringia calcarata* for the biological control of woolly apple aphid |

By 2025 IPM programmes for potato pests and diseases, including tomato potato psyllid/Candidatus Liberibacter solanacearum (TPP/CLso), will be saving up to $25M p.a. on pesticides and production opportunity costs

| Developing and maintaining CLso-infected and non-infected TPP | Designing tools for managing TPP/CLso | Trials to assess the impact of timing of TPP feeding on psyllid yellows and potato yield have been completed and results have been communicated to the industry, informing TPP management strategies, especially around critical intervention points |
| Developing and supporting the adoption of management options for controlling TPP/CLso | Developing and refining tools for managing other critical pests and diseases | |
| Developing and supporting the adoption of a regionally based Integrated Pest Management (IPM) approach | |

By 2025 disease management on orchard and/or postharvest will be reducing pesticide use in orchards, maintaining summerfruit quality and retaining or increasing market access, contributing up to $30M p.a. in new industry revenue

| Enhancing market access through new pest and disease technologies | Monitoring and managing pest and disease populations | New chemicals with potential to replace use of copper fungicides for integrated management of bacterial canker of cherry have been evaluated, and the results have been used to plan the next stages of programme development |
| Systems-based approaches to pest risk management | |

CONTINUED OVERLEAF
<table>
<thead>
<tr>
<th>Sector Impact Targets</th>
<th>Plant &amp; Food Research Themes</th>
<th>Critical Steps 2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2020 at least one alternative management strategy for a pest or disease in glasshouse crops will be enhancing market access and increasing export returns by up to $5M p.a., while practices that reduce chemical use in at least one process vegetable crop will be saving growers of that crop at least $1M p.a.</td>
<td>Developing integrated pest and disease management systems for an export-focused process vegetable crop and/or covered crop, and ensuring the sustainability and resilience of IPM systems for vegetables in the face of invasive pests and diseases with the potential to affect multiple crops</td>
<td>Key soil-borne pathogen issues affecting pea growers have been determined, leading to a discussion with the industry to determine future R&amp;D priorities. Biological approaches for managing covered crops pests have been progressed by evaluating the efficacy in the laboratory of a generalist predator on a range of pest prey (e.g. TPP, thrips, whitefly) and economically important host plants, and results have been disseminated to the industry through field days and workshops</td>
</tr>
<tr>
<td>By 2021 grape growers will be using web-based decision tools to better manage bunch rot diseases, reducing mitigation costs by up to $1.6–5.6M p.a. and maintaining residue-free status</td>
<td>Developing enhanced and new bunch rot disease control tools and practices from new knowledge of vineyard pathogen biology, ecology, host genetics and vineyard microbiology. Understanding the life cycle and epidemiology of second-tier fungal diseases and developing growing practices to manage their effects</td>
<td>A botrytis decision support tool has been introduced to vineyard managers and workers at grower field days and workshops, resulting in 15% uptake into vineyards during botrytis-risk seasons</td>
</tr>
<tr>
<td>From 2016 new tools to increase the average lifespan of vineyards from 25 to 35 years will be implemented, and preparedness plans to protect the national vineyard from imminent pest and disease threats will be in place</td>
<td>Control systems for existing terminal disease vectors and new surveillance systems for potential pest incursions. Cost-effective management practices for terminal diseases such as grapevine leafroll and trunk disease. Producing rootstocks with attributes that reduce the cost of grape production and contribute to vine longevity</td>
<td>A tool to survey large numbers of grapevines for disease-causing agents has been trialled and is available to guide the industry’s response to such a biosecurity incursion</td>
</tr>
</tbody>
</table>
OUTCOME AREA 3

SUSTAIN GROWTH IN THE HORTICULTURAL, ARABLE, SEAFOOD AND FOOD AND BEVERAGE SECTORS, DRIVING ONGOING EFFICIENCY GAINS WITH THE DEVELOPMENT OF ENVIRONMENTALLY RESILIENT PRODUCTION SYSTEMS

STRATEGIC FOCUS AREA: More sustainable and profitable 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 AREA 3

Strategic Focus Area: More sustainable and profitable systems

<table>
<thead>
<tr>
<th>Sector Impact Targets</th>
<th>Plant &amp; Food Research Themes</th>
<th>Critical Steps 2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2018 new production systems to address irregular bearing and poor pollination in avocado crops will be contributing up to $116M p.a. of value to the sector</td>
<td>Understanding environmental, nutritional and genetic effects on irregular bearing, floral development and return bloom</td>
<td>Key environmental and nutritional triggers for irregular bearing have been identified and implications for crop management explored through industry workshops and field events, increasing the capacity of the industry to better manage yields</td>
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<td></td>
<td>Enhancing pollination through knowledge of pollination systems and the role of pollinators and pollenisers</td>
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<td></td>
<td>Sustainable production systems to optimise yields and increase orchard profits</td>
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</table>

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<table>
<thead>
<tr>
<th>Sector Impact Targets</th>
<th>Plant &amp; Food Research Themes</th>
<th>Critical Steps 2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2025 more efficient and profitable production systems will enable wheat yields</td>
<td>Understanding aspects of crop physiology, leading to higher grain and dry matter yields in</td>
<td>Water use and water stress responses of early autumn-sown wheat crops have been</td>
</tr>
<tr>
<td>of 20 t/ha; the New Zealand dairy, poultry and pork industries will be using only</td>
<td>grain and forage crops</td>
<td>quantified and the APSIM wheat model improved and validated, enabling land managers</td>
</tr>
<tr>
<td>New Zealand-grown grain; and exports of high value seeds will increase by 50% to</td>
<td>Efficient use of water and nutrients, leading to improved crop performance while</td>
<td>and regulators to better predict water use and canopy responses to water shortage for</td>
</tr>
<tr>
<td>$250M p.a.</td>
<td>minimising environmental impacts</td>
<td>early autumn-sown crops</td>
</tr>
<tr>
<td></td>
<td>Improving the interactions between arable and dairy production systems, to optimise the</td>
<td>The effects of nitrogen (N) availability on water uptake and use by forage brassica</td>
</tr>
<tr>
<td></td>
<td>use of nutrients</td>
<td>crops have been determined and used to improve the brassica crop model, supporting the</td>
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<tr>
<td></td>
<td></td>
<td>development of industry best-practice recommendations that optimise water use</td>
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<td></td>
<td>efficiency of forage crops under different conditions of N fertility</td>
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<td></td>
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</tr>
<tr>
<td>By 2020 new environmental models and technologies for kiwifruit production will</td>
<td>New cultivar development</td>
<td>Vine management techniques based upon vine cropping behaviour in new cultivars i.e.</td>
</tr>
<tr>
<td>increase productivity towards $130K/ha, based on 30,000 trays per ha, with optimised</td>
<td>Neutralising the impact of Psa disease</td>
<td>‘Zesy002’ (Gold 3), ‘Zesh004’ (Green 14) that enable a reliable supply of fruit meeting</td>
</tr>
<tr>
<td>fruit dry matter</td>
<td>Optimising production systems and supply chains</td>
<td>flavour criteria in key export markets have been developed, enabling Zespri to</td>
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<tr>
<td></td>
<td></td>
<td>determine wood type and crop load that will achieve optimum size and flavour profiles</td>
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<tr>
<td></td>
<td></td>
<td>in Gold3 and Green14 kiwifruit</td>
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<tr>
<td>By 2022 integrated research programmes will increase the amount of Class 1 onions</td>
<td>Maintain germplasm for yield and disease research</td>
<td>Image analysis has been proven as a tool for capturing information about the growth of</td>
</tr>
<tr>
<td>exported by 10%, increasing returns by $6M</td>
<td>Maximising yield of Class 1 onions</td>
<td>an onion crop and the amount of variability of bulb size and quality has been tested</td>
</tr>
<tr>
<td></td>
<td>Sustainable pest and disease management for increasing Class 1 onions</td>
<td>under controlled conditions and demonstrated to industry partners, generating support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for its application within the supply chain</td>
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<tr>
<td></td>
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</tr>
<tr>
<td>By 2022 improved orchard productivity and profitability will contribute up to $150M</td>
<td>Understanding water and carbon dynamics in the root zone</td>
<td>The effects of new nursery tree design and propagation systems that accelerate young</td>
</tr>
<tr>
<td>new revenue towards the pipfruit sector’s goal of $1B by 2022</td>
<td>Optimising rootstock resilience and vigour</td>
<td>tree growth, canopy development and dry matter accumulation have been quantified to</td>
</tr>
<tr>
<td></td>
<td>Developing technologies to manipulate growth allocation and dry matter utilisation to</td>
<td>provide establishment-phase technologies for use in new pipfruit ‘super-orchard’</td>
</tr>
<tr>
<td></td>
<td>enhance yield and fruit quality of apples and pears</td>
<td>systems design concepts and demonstrated to the industry and potential commercial</td>
</tr>
<tr>
<td></td>
<td>Increasing orchard profitability through increased interception and utilisation of sunlight</td>
<td>partners</td>
</tr>
<tr>
<td></td>
<td>energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Developing customised production technologies for NZ-bred, new cultivars</td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>By 2025 best management practices, including cultivar choice and management of seed quality, will enable the production potential of Plant &amp; Food Research cultivars to be realised, contributing to the potato sector’s target of increasing grower profitability by $1500/ha (12% increase on 2013 profitability)</td>
<td>Understanding and quantifying yield-limiting factors, and refining tools for their mitigation</td>
<td>Abiotic and biotic factors contributing to the potato yield gap have been identified through field surveys and reviewed with the industry, enabling the magnitude of existing losses to be quantified and new research priorities to be identified</td>
</tr>
<tr>
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</tr>
<tr>
<td>By 2020 new management practices and tools will have enabled productivity and efficiency gains in at least two field-grown vegetable crops, increasing export returns by $10M p.a.</td>
<td>Enhancing crop productivity and quality in export field vegetables</td>
<td>'Quick test' approaches that support grower-based N management decisions have been validated in at least two exported, field vegetable crops, and communicated to growers, enabling profitability to be optimised, risks of N losses to be minimised, and the use of good management practices to be demonstrated</td>
</tr>
<tr>
<td>From 2018 the wine industry will be using predictive models to produce more reliable and consistent harvests, maintaining New Zealand wine’s price premium by actively managing supply/demand, and saving up to $1M–2M p.a. in yield management costs</td>
<td>Predicting yield potential at regional and sub-regional levels to guide timely and cost-effective management</td>
<td>Effects of temperature on timing and extent of inflorescence initiation have been quantified and modelled for Sauvignon blanc in Marlborough, and information has been delivered to the industry, improving crop management</td>
</tr>
<tr>
<td>Knowledge of land use, land use change and management effects on soil health, ecosystem services, productivity and profitability of farming enterprises is informing land use management and policy</td>
<td>Developing management practices to improve productivity and efficiency of resource use within environmental limits</td>
<td>Improved and practical methodology for predicting soil N mineralisation has been developed and validated for cropping soils and made available in tools for growers, rural professionals and regulators, improving fertiliser N forecasting</td>
</tr>
<tr>
<td></td>
<td>Developing practices to inform policy and management to improve soil quality and integrity and ensure delivery of ecosystem services from natural capital</td>
<td>Practical application of enhanced farming practices to improve productivity and profitability are delivering value to the carrot, dairy and environmental aspects of extensive farming practices</td>
</tr>
<tr>
<td></td>
<td>Quantification of natural capital stocks and valuation of ecosystem services</td>
<td>Basic framework and initial derivation of values populating the Matrix of Good Management for Environment Canterbury and other regulatory authorities delivered for inclusion into the regulatory procedures</td>
</tr>
</tbody>
</table>
## APPENDIX 2: MBIE GENERIC INDICATORS

### INDICATORS

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Report Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>End-user collaboration</td>
<td>Revenue per FTE from commercial sources</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Research collaboration</td>
<td>Publications with collaborators</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Technology and knowledge transfer</td>
<td>Commercial reports per scientist FTE</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Science quality</td>
<td>Impact of scientific publications</td>
<td>Annually</td>
</tr>
<tr>
<td>Financial indicator</td>
<td>Revenue per FTE</td>
<td>Quarterly</td>
</tr>
</tbody>
</table>

### TARGETS FOR 2015/16

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>2011/12</th>
<th>2012/13</th>
<th>2013/14</th>
<th>Target 2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>End-user collaboration</td>
<td>Revenue per FTE from commercial sources (in $000s)</td>
<td>36.9</td>
<td>37.3</td>
<td>39.9</td>
<td>40–45</td>
</tr>
<tr>
<td>Research collaboration</td>
<td>% international/New Zealand and CRI</td>
<td>68%</td>
<td>68%</td>
<td>79%</td>
<td>70–80%</td>
</tr>
<tr>
<td>Technology and knowledge transfer</td>
<td>Commercial reports per scientist FTE</td>
<td>0.71</td>
<td>0.75</td>
<td>0.73</td>
<td>0.71–0.75</td>
</tr>
<tr>
<td>Science quality</td>
<td>Impact of scientific publications</td>
<td>2.81</td>
<td>2.82</td>
<td>2.88</td>
<td>2.8–2.9</td>
</tr>
<tr>
<td>Financial indicator</td>
<td>Revenue per FTE (in 000s)</td>
<td>148</td>
<td>150</td>
<td>150</td>
<td>155–160</td>
</tr>
</tbody>
</table>
APPENDIX 3:
POLICY AND PROCEDURE STATEMENTS

GOOD EMPLOYER POLICIES

Plant & Food Research recognises 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 at each of our ten national sites.
ACCOUNTING POLICIES

A summary of our accounting policies is included in our Annual Report. The current Annual Report can be found on our external website:
http://www.plantandfood.co.nz/page/about-us/publications

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 shareholding Ministers
→ The percentage of tax-paid profits that the dividend represents
→ The rationale and analysis used to determine the amount of the 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.

With the projected increase in profitability and completion of the redevelopment of our Mt Albert campus in the course of this planning period, we are projecting the ability to pay dividends to the Shareholder starting from 2017/18. Before making a decision on payment of a dividend, the Board will consider the above factors and consult with the Shareholder.

SIGNIFICANT TRANSACTIONS POLICY

The Board will obtain the 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 the 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 4: MATTERS REQUIRED BY THE CROWN RESEARCH INSTITUTES ACT 1992

RATIO OF SHAREHOLDERS FUNDS TO TOTAL ASSETS

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

<table>
<thead>
<tr>
<th>Year ended 30 June</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity ratio</td>
<td>0.75:1</td>
<td>0.71:1</td>
<td>0.70:1</td>
</tr>
</tbody>
</table>

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 has reviewed estimates of the commercial value of the Company using several valuation methodologies for two scenarios:

1. The value of the Company as a going concern whose purpose continues to be similar to the current Statement of Core Purpose
2. The break-up value of the Company’s principal assets.

The Board considers the going concern scenario to be the most relevant to the Shareholder for the commercial value estimate. This estimate produced a valuation range of $50 to $90 million. The Company’s current net asset position ($82 million) lies within this range.

The Board therefore considers that the Company’s net total asset position is a fair and reasonable estimate of the commercial value of the Group.