
Statement of Corporate Intent

2018/19 – 2022/23







Driving prosperity by transforming agriculture

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Chair and Chief Executive overview

Agriculture, and the export products produced, is the backbone of the New Zealand economy, and the value of those exports continues to grow.

In the year to 30 June 2018 it is expected to generate export earnings of over \$25 billion through dairy, meat and wool alone. The lift in value of these products is contributing to the overall expected export earnings of \$42.2 billion from the wider primary industries sector, which employs over 140,000 people.

To support that success in the future, innovative science is needed. There has been no time in recent decades that will prove more critical for research to play a role than now. We must use our considerable scientific capability to realise opportunities and counter the challenges which threaten New Zealand's economy and regional prosperity.

AgResearch, as the Crown Research Institute (CRI) primarily charged with engaging the pastoral, agri-food, agri-technology and environmental stakeholders with thought-leading scientific options, is fully engaged in both creating new opportunities and providing options. We are working hard to build on and refine current practices to grow the economic contribution that the sector makes, and improve its environmental performance.

This Statement of Corporate Intent outlines the framework for the research we will undertake in the coming five-year window of 2018/19 – 2022/23, which we have designed through close engagement with these stakeholders and our national and international collaborators.

We are acutely aware of the Government's priorities – improving New Zealand's environmental performance, demonstrating international leadership in areas like livestock greenhouse gas emissions, refining the

Emissions Trading Scheme, adapting to climate change, and building regional economic prosperity. We see a clear role for our science to assist in all of those areas.

We continue to support the Government's action plan through various mechanisms including the new Climate Change Commission, High Value Nutrition Science Challenges, research-based support tools like Overseer and Farmax, and hosting the Our Land and Water national science challenge.

Our integrated research approach sees us working directly with land-owners as they consider their choices for best land use in the future. In particular, we see this through our growing Māori agribusiness sector engagement, and the early success of our collaborative programmes including that which we recently celebrated with Te Tumu Paeroa.

To ensure we continue to meet these challenges, our science must be agile and adaptable. This document reflects our new Science Plan which more clearly articulates our focus on the two prongs of developing sustainable farms systems and practices, and the creation of high value food and bio-based products.

Together the new Science Plan and this Statement of Corporate Intent outline how AgResearch intends to deliver our strategic goals, and how this leverages international relationships and collaborations. These are helping define detailed future workforce planning, a project currently underway in conjunction with other CRIs.

We are pleased that the recent review by the Ministry of Business, Innovation and Employment (MBIE) into investment mechanisms for the important area of farm systems and environment research has resulted in positive discussions to date. We are continuing these conversations in order to progress this critical issue.

The evolution of consumers' preference and new technologies are creating new opportunities for New Zealand's food and fibre sectors.

We are seeing leading businesses investing much more actively in areas like animal welfare, novel farm systems, and technologies that greatly enhance environmental sustainability and new food products.

At AgResearch we have evolved our focus to ensure our research is supporting and enabling

those preferences, and therefore the economic success of New Zealand's exporters.

As we work through that bigger picture, we continue to deliver our world-class research, and as outlined in this document, we have many exciting projects underway. That includes our two significant building programmes in Lincoln and Palmerston North, where we have designed best-practice collaborative work spaces in partnership with two of our closest university partners – Lincoln and Massey.

These important buildings are the catalyst for our new ways of working, both across our own organisation and in conjunction with our key partners.

We look forward to reporting on progress and the significant impact our work will have for New Zealand and the world.



Dr Paul Reynolds
Acting Chair,
AgResearch

A stylized signature of Dr Paul Reynolds in white ink.



Tom Richardson
Chief Executive,
AgResearch

A stylized signature of Tom Richardson in white ink.



Our strategic direction

AgResearch's purpose is to drive New Zealand's prosperity by transforming agriculture. By working with stakeholders and the wider sector it has developed a clear strategy to achieve that.

There are two key focus areas in AgResearch: on-farm and off-farm science. But in essence it is much broader. AgResearch's capability allows touch points right across the agricultural value chain which, when the thinking is applied from a consumer-centred point of view, ensures the research AgResearch delivers drives the best economic outcome and impacts for New Zealand.

The strategy is to provide that integrated support. AgResearch works in all areas from soil health to forage development, animal welfare to food processor support, food safety and bio product development – connected and linked, enabling those in

the agricultural sector to have the confidence that the research to support new sustainable systems and practices has taken into account the way the end product will be developed and how the consumer will view that value chain.

Without the end product and the willing consumer, the agricultural chain has no purpose. AgResearch's integrated strategic approach connects the dots to ensure the end result is economic prosperity for New Zealand's agricultural sector, and therefore supports the country's wider economic success.

Driving prosperity by transforming agriculture

Impact

Increasing the value of New Zealand's exports, while enhancing our environment and regional prosperity by optimising land use.

smartest and
most sustainable
farming systems

Our consumer-
centred science drives
the world's...

most sought-
after food and
bio products

Our Value Proposition

Partner to identify the innovation that is needed, and use the collective expertise to create value for New Zealand.





The AgResearch Science Plan

Putting our strategies in action.

Our Science Plan has been overhauled this year with the aim of breaking down the siloed approach within research, to provide an outcome and objective-focused framework. The change and redefinition of research focus demonstrates AgResearch's adaptability and agility against a backdrop of changing priorities for the community and the new Government's priorities.

The outcomes it will drive our research towards are clear. New Zealand wants:

- Protected, enhanced and sustained natural resources
- Agile, resilient and adaptive social and biological systems
- Profitable and sustainable land-based rural enterprises
- Added-value foods and bio-based products that meet consumer needs

We know New Zealand is well placed to transform current food production systems to meet these needs. It falls to AgResearch to enable this transformation through providing the scientific advances that will support these new systems. These scientific advances take time, therefore our Science Plan must meet New Zealand's short, medium and long term needs.

The Science Plan is constructed to meet the needs of a New Zealand food production sector utilising the world-class research capability across AgResearch's four science groups – Animal Science, Food and Bio-based Products, Farm Systems and Environment, and Forage Science.

It must take into account the 'value web' – where is the end product going and where has it come from? We must work back from what the consumer wants and what the final product of the agricultural chain becomes.

Animals and forages are not the end points to boosting New Zealand's prosperity, but they have input. Understanding that and knowing how AgResearch science can play its part is how we will succeed. From soil scientists to food safety researchers, AgResearch has the science capability to apply critical thinking right across the value chain.

As with our current Science Plan, the refreshed version will be used to guide the science that we will do, our internal investment, and reinforce the behaviours we will need to deliver our vision. It will be embedded with the principals of kaitiakitanga, which reflects our focus on Vision Mātauranga.

The objectives outlined here will form the framework of measurements for our programme of work.





Driving revenue through research

About one quarter of AgResearch's research is funded solely by industry and commercial partners. These critical relationships enable our scientists to work on specific industry needs and to address challenges particular to the businesses which support agricultural prosperity.

This is not just research that local industry seeks, but also includes larger collaborations with international partners and other research organisations. Our role is to create a unique commercial advantage for our clients, with our innovative research and internationally recognised thought-leadership.

Working closely with these partners gives us insight to their specific approach to market opportunities and issues, meaning our research is tailored to their needs.

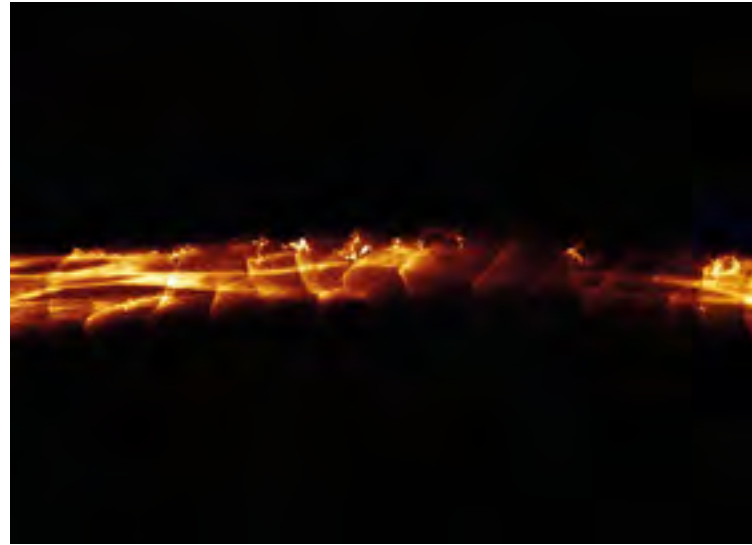
The contractual obligations which come with this commercial work often means we are unable to discuss the research until the final product has made it to market, and, with some contracts, we are sometimes unable to share our involvement publicly at all.

Growing this area of our research portfolio is important for AgResearch as the revenue this work generates allows us to reinvest in our organisation and our scientists, and to be able to do so without absolute reliance

on Government funding. We also work hard to ensure AgResearch benefits from licensing fees and royalties our science generates, which in turn provide an enduring, success-based income stream that allows us to re-invest in science.

Our Partnerships and Programmes team is the critical link here, connecting our scientists to industry clients while ensuring relevant intellectual property is identified, captured, maintained and best leveraged for AgResearch's benefit.

Attracting commercial clientele of this nature reaffirms our position as world-leaders in our ultimate areas of focus; creating smarter, sustainable farming systems and the world's most sought-after food and bio products.



Curly hair

AgResearch worked with Japan's Kao Corporation cosmetics company to learn more about what makes human hair curly. Using merino wool, the curvature of wool was measured before it was stained and transferred to a confocal microscope to reveal the curl's cell structure. With the global hair care market estimated to be worth over \$85 billion, this discovery could contribute to the design of novel hair products.

Infant milk formula

It has long been recognised that there are differences between human milk and infant formulas which lead to differences in health and nutrition for the neonate. Our study with Bright Dairy and Food Company looked at similarities and differences in the profiles of human milk and infant formula. Our findings identified some aspects of conserved function between bovine and human milks which contribute to the effectiveness of modern infant formula as a substitute for human milk.

Facial filters

To help combat the increasing concern about air quality, AgResearch worked with fibre innovation company Lanaco to develop innovative pollution masks that protect the everyday health of users. Using natural wool, the technology traps harmful substances before the users breathe them in, as well as being easy to breathe through. Lanaco's products include a range of masks by Auckland firm Healthy Breath working with leading fashion designer Karen Walker.



Strategic Science Investment Funding

AgResearch uses its assigned contribution from the Strategic Science Investment Fund (SSIF) to explore and innovate new systems, practices, process and products right across the agricultural value chain.

Our research priorities enable us to deliver integrated solutions; we can target consumer and market needs by developing food production systems that generate foods that are high quality, ethically and sustainably produced, nutritious and support health and wellbeing.

Each year we receive \$38.4m SSIF funding through two defined platforms – AgriFood Production (\$26.4m) and Premium Agri-Foods, Products and Services (\$12m).

This funding is allocated to projects across our four science groups, and as the new Science Plan is implemented, a natural alignment with its objectives will be clearly aligned to each project within our broader programme of work. Separately we receive \$470,000 to host and manage the Margot Forde Germplasm Centre as a Nationally Significant Database and Collection.

Our research is aligned to our two strategic drivers, and therefore the work we undertake will fall under one of two areas – to improve the way land is used through smarter, sustainable, integrated systems, or to add value to the agricultural chain as a high value food or bio product.

Our scientists are focused on delivering to these two strategic drivers by excelling in their specialist fields, while working closely with their colleagues and peers across the organisation, the sector and with other collaborators. The ability to excel in these specialist areas while working across a mature matrix structure across four campuses is our point-of-difference, and ensures our research is world-renowned.

Across the next five financial years, the projects outlined will enable AgResearch to deliver to its Statement of Core Purpose, and drive New Zealand's prosperity by transforming agriculture.





Animal Science

Our scientists find ways to improve the nutrition, health and welfare of livestock for efficient and sustainable animal production. With expertise in the parasitic and infectious diseases of pastoral livestock, we understand the necessary processes behind healthy, productive and efficient ruminant livestock.

The Animal Science group encompasses a wide range of disciplines, with the purpose of improving the nutrition, health, quality traits and reproductive performance of animals to achieve efficient and sustainable animal production, and delivery of high quality animal products. We use a broad range of nutrition, physiology and genomics-based research tools to improve economically important traits such as survival, growth rate, health, fecundity, meat and milk production (yield and quality) and disease resistance while minimising environmental impact and use of chemicals in ruminant livestock production.

Our teams have recognised expertise in the parasitic and infectious diseases of pastoral livestock, animal genomics, ruminant nutrition and animal physiology including reproduction and microbiology behind healthy, productive and efficient ruminant livestock.

Our research covers the spectrum of fundamental to applied science that focuses on high quality science-driven research. We have access to fully-equipped dairy, sheep and beef farms with modern facilities for on-farm animal trials, and fully equipped animal facilities for more detailed trials for small and large ruminants, including the NZ Ruminant Methane Measurement Centre. Our laboratory facilities are well appointed to support the range of research undertaken.

Our Animal Science teams:

- Animal Nutrition & Physiology
- Animal Health
- Rumen Microbiology
- Animal Genomics
- GenomNZ
- Animal Reproduction
- Animal Welfare



Animal Science SSIF Project highlights FY19

Project

Animal welfare for market success

Scope

We aim to reduce specific areas of welfare risk to New Zealand's animal-based economy and to provide knowledge that can be used to guide farming practices, maintain freedom to operate, improve market success and ultimately enhance animal welfare on New Zealand farms.

This programme comprises a mix of fundamental H3 horizon research that will maintain our world-leading understanding of animal welfare and build capability to address shorter term industry issues as they arise. The outcomes from this research will have a long-term impact, providing guidance and management recommendations for producers and processors on best practice and highlighting potential areas of welfare risk. The research generated by this project will also

assist Ministry of Primary Industries to develop standards and regulations. By engaging widely and disseminating the research results nationally and internationally, we will strengthen New Zealand's reputation in animal welfare here and abroad.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Ministry for Primary Industries, Dairy NZ, NZ Poultry Industry

FY19 funding:

\$1,232,000

Project timeline:

Project

Bringing the best of genetic evaluation to the New Zealand agricultural industry

Scope

This programme will provide science leadership, key capability and novel technology developments to support genetic gain in national herds and flocks. This will be achieved by providing access to a resource flock, providing availability of all existing data and phenotypes.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Beef and Lamb NZ Genetics (BLG), Focus Genetics, Landcorp and the Wagyu breeding programme underpinning First Light Foods

FY19 funding:

\$800,000

Project timeline:

2013 – 2019

Project

Ruminant nutrition

Scope

We will use a multidisciplinary approach, employing state-of-the-art knowledge and technologies, to gain an integrated understanding of feed-microbiome-animal processes and interactions in early life. This is where pregnant animals and their offspring, as well as artificially-reared neonates, are at the highest risk of adverse outcomes and suboptimal development and programming in New Zealand's farming systems.

Our research will identify key factors and mechanisms that meet the nutritional requirements of pregnancy, the physiological and production implications for the dam and the survival, health and growth of her offspring. The role of feed-microbiome-animal interactions in the survival, health and growth of artificially-reared young ruminants and their future performance will be evaluated. The efficiency of rumen function will also be investigated, further building upon our

significant global reference databases, such as the Hungate1000 and Global Rumen Census. This knowledge will allow new technologies and management recommendations to be developed. We will grow national and international collaborations and strategic industry partnerships to accelerate delivery of science outcomes for the dairy and red meat pastoral industries.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Beef and Lamb NZ, Parkinson Estate (PhD), Dairy NZ

FY19 funding:

\$1,100,000

Project timeline:

2015 – 2022

Project

Animal health

Scope

This programme of work is designed to develop information and technology for use by farmers that will result in resilient farms that have low chemical inputs and superior animal welfare.

The projects cover a wide range of livestock health issues – from undertaking research to identify new biopesticides against ticks, to continuing the vaccine development pipeline that is aimed at significantly reducing anthelmintic and antibiotic use.

The outcomes we are expecting will enable New Zealand farmers to sustainably meet

market needs, where consumers and regulators require the use of less drugs, while at the same time maintaining a high level of animal welfare.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Beef and Lamb NZ, Landcorp, Polybatics, Ministry for Social Development

FY19 funding:

\$2,176,335

Project timeline:

2015 – 2019

Project

Dairy reproduction

Scope

The overarching objective of this work is to improve the profitability of the red meat and dairy sectors. We will do this by identifying and understanding key reproductive processes driving reproductive efficiency and developing both management solutions to improve reproductive efficiency and precision breeding techniques to accelerate genetic gain.

The project is part of a wider programme of work that includes the sheep reproductive research and gene editing work housed within the SSIF Reproduction project. This dairy cattle project includes work carried out in the MBIE/DairyNZ partnership program 'Pillars of a competitive and responsible dairy system'. The aim of this work is to develop strategies to improve reproductive performance

in dairy cattle through understanding the underlying causes of poor fertility and using this knowledge to improve reproductive management.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Dairy NZ, Ministry for Business, Innovation and Employment, CRV Ambreed, Max-Planck Institute for Molecular Genetics, LIC, Animal Breeding Services

FY19 funding:

\$1,625,207

Project timeline:

2015 – 2020



Forage Science

The group's goal is to increase the resilience of pasture-based agriculture by improving the performance of forages within pastures. This is being achieved through the application of genetics, investigation of management approaches, and the discovery of microbes for biocontrol of pasture pests.

Research activities are focused on delivery of impacts for the pastoral sector and that includes increasing genetic gain by integrating across genomics, genetics, phenomics and germplasm resources, and focusing the forage improvement pipeline on pre-breeding/trait discovery, genomic selection and GM forages.

Our research also ensures we increase our understanding of soil biology to develop new practices and products which will enhance pasture production and the nutrient and water use efficiency of forages. It will also allow us to investigate the biology of interactions between endophytes and their hosts to discover or to develop novel endophytic microbial species.

Another key role of the group's work is to increase our understanding of new and existing biosecurity threats (weeds, pests and diseases) to develop new or improved mitigation and management options and policy advice.

Our Forage Science teams:

- Forage Genetics
- Soil Biology
- Plant Functional Biology
- Plant-Fungal Interactions
- Biocontrol & Biosecurity
- Plant Biotechnology



Forage Science SSIF Project highlights FY19

Project

Better border security

Scope

The vision of the Better Border Biosecurity (B3) research collaboration is to be a world-leading source of science-based solutions for border biosecurity challenges by 2022, supporting and protecting the competitiveness of export industries and unique terrestrial ecosystems.

The strategic priority of B3 is to add value to New Zealand's biosecurity system through research. The goal of B3 is to develop new knowledge, tools and approaches to ensure that harmful organisms are excluded to, and implemented by key end-users and stakeholders.

By 2022, the major disease, weed and pest species of threat to New Zealand will be better known, their risk quantified and optimal points for intervention defined both off-shore and at the New Zealand border.

Novel analytical and modelling systems will be available for defining levels of risk posed by the various threats and models will be available for assessing their likely impacts should they establish. This will enable significantly improved prioritisation of biosecurity responses to potential incursions.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Ministry for Primary Industries, Environmental Protection Authority, Dairy NZ, Department of Conservation, Forest Owners Association

FY19 funding:

\$1,977,000

Project timeline:

2012 – 2019

Project

High Metabolic Energy forage commercialisation

Scope

High Metabolisable Energy (HME) forages contain a genetic modification (GM) technology that enhances photosynthesis by 20%, leading to 50% increased plant growth rates. This technology has already been validated in the field in soy bean and in the glasshouse in five plant species. HME forages also contain increased foliar lipids (increased from 3.5% to 7%), leading to 10% increased metabolisable energy and improved nutritional quality. The increased metabolisable energy (ME) is carried through during the ensiling process meaning an increased value of silage and bialage.

The potential benefits of HME forages in a pastoral grazing system have been assessed via a multidisciplinary approach using biophysical modelling, various in-vitro assays and growth room testing. They include potential increased farm revenues of \$900 per ha for dairy and for sheep and beef, a reduction in the total nitrogen load on pasture of 6-7% (resulting in reduced nitrate leaching and reduced nitrous oxide emissions), and a 15-23% reduction in methane emissions.

The plants have a measured 9% increase in actual water use efficiency which should improve responses to drought. Due to success in the Ministry of Business, Innovation and Employment (MBIE) Endeavour funding application in 2016, where AgResearch was awarded \$10M over 5 years and industry stakeholders committed significant co-funding, the Company is now in a position to fully implement the 2015 HME Forages Business Plan scientific programme.

There are now two parallel and closely interrelated programmes. The MBIE and

Industry co-funding will progress four lines of HME ryegrass to US-based field trials and animal nutrition trials. These trials will assist the industry to determine if New Zealand-based field and animal nutrition trials will occur from 2021 by building a data package of information to help define the value proposition for New Zealand. The SSIF supported programme will now shift the emphasis it has had over the last 2 years (of gearing up for overseas field trials), to now preparing commercial-ready HME forages for New Zealand-based field and animal nutrition trials scheduled for the spring of 2021. The SSIF programme will also progress a second technology that enables the enhancement of plant root systems.

This has been designed to be dovetailed with the HME technology and act synergistically to improve overall plant performance. Packaging this new technology with HME will extend patent life to 2035, adding an additional six years onto the potential licensing revenues (and increasing the opportunity for industry to gain a return on investment).

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Dairy NZ, PGG Wrightson, Grasslands Technology Ltd, Ministry for Business, Innovation and Employment

FY19 funding:

\$1,900,000

Project timeline:

2013 – 2019

Project

Epichloë endophytes for the future farm

Scope

This project aligns fully with Pasture Endophyte Innovation (EI), a commercial project that is funded by Endophyte Innovation EI (a joint venture between Grasslanz Technology and PGG Wrightson Seeds) that directs research towards the discovery and commercialisation of Epichloë endophytes for safe durable forage resistance against insects. This SSIF programme aims to discover new Epichloë endophytes. It will also undertake the fundamental research required to achieve stretch goals in endophyte utility by resolving issues associated with endophyte transmission and the discovery and regulation of novel bioactive endophyte secondary metabolites.

Lastly, the impact of endophytes on plant development, where we are seeking to evaluate the role of the plant shoot apical meristem (SAM) in coordinating the growth and development of the endophyte during the lifecycle of the host plant, will be investigated. These aims are interlinked and collectively seek to accelerate development of next generation pasture Epichloë endophytes that target insect pests above and below ground, and in particular, major pests (e.g. grass grub)

not currently controlled by commercial strains. This project will provide strategies to solve the globally-important issue of endophyte seed transmission during seed production and storage, a solution to which is a key priority for all the major players in the seed industry. Together these objectives will improve pasture productivity and resilience by both reducing insect predation and improving plant access to water and nutrients through healthier root systems. Commercialisation of new endophytes and technologies will proceed through a fully functional pipeline that progresses seamlessly through EI under the leadership of Grasslanz Technology.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Seed and livestock industry, farmers and breeders

FY19 funding:

\$2,000,000

Project timeline:

2013 – 2022

Project

Weed ecology and management in pastures and forage crops

Scope

This project will provide the scientific basis for developing long-term cost-effective management of weeds in sheep and beef pastures, dairy pastures and dairy support forage cropping systems in New Zealand.

It will achieve this through novel population and bio-economic/farm system modelling and empirical research, with a focus on herbaceous weeds including key groups such as the thistles, grasses and buttercups.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Foundation for Arable Research, Regional councils, Dairy NZ, Crown Research Institutes, Ministry for Primary Industries, Agrichemical companies, Ravensdown

FY19 funding:

\$1,222,000

Project timeline:

2012 – 2020

Project

Climate change and the pastoral sector – impacts and adaptation

Scope

This programme of work will see us provide forewarning of the impacts of climate change on soil, plant, animal interactions in pastoral agriculture and to develop adaptations that will enable agriculture to ameliorate or take advantage of the changing environment.

This activity includes future-proofing key technologies (e.g. nitrogen fixation and biological control systems) so they remain effective under climate change.

Furthermore, the work aims to provide the information necessary for decision makers (farm, regional, national scales) to make

informed choices in areas where the timescale and the nature of the activity mean they may be influenced by climate change.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Lincoln University, BOC, Ministry for Primary Industries, Ministry for the Environment

FY19 funding:

\$740,000

Project timeline:

2015 – 2022

Project

Map and Zap

Scope

A recent study led by AgResearch concluded from available research that the known costs of weeds to New Zealand agriculture was at least \$1.685 billion a year, but that the true cost from all weeds was likely to be much higher. Environmentally-friendly tools are being urgently sought for the early control of these weeds.

This project will involve mounting specialist cameras on the drone or UAV (Unmanned Aerial Vehicle) that can first identify weeds based on their unique chemical signatures and how they reflect light, and precisely map their locations using GPS. From there, smart spraying (rather than systemic and non-targeted use of chemicals), or the right kind

of laser mounted on the drone could hone in and damage the weed. Suitable laser technology already exists and is extremely accurate. Progressing this technology for this purpose would be successful and could also avoid damaging the useful plants around the weed.

Key stakeholders and partners:

University of Auckland, University of Michigan, Redfern Solutions Limited

FY19 funding:

\$1,000,000 from Ministry of Business, Innovation and Employment

Project timeline:

2017 – 2020





Farm Systems and Environment

We find mitigations for environmental impacts and climate change. We improve dairy, beef, lamb and deer production systems through innovative research on soil and water management, pasture fertilisation and farm nutrients, which reduces negative impacts on critical ecosystems.

The Farm Systems and Environment Group is concerned with improving production systems through innovative research to create more profitable and sustainable farms and agribusiness.

Collectively, our research provides the capacity to understand complex interconnected agricultural issues of interest to both the industry and the public. Our work includes increasing the understanding of how to reduce nutrient losses to water and greenhouse gas emissions from farming systems.

Our Farm Systems and Environment teams:

- Farm Systems
- Environmental Research
- Environmental Sciences
- Modelling
- People and Agriculture



Farm Systems and Environment SSIF Project highlights FY19

Project

Hitting targets for deer industry profitability

Scope

The primary objective of this project is to assist the New Zealand deer industry to achieve its aspirational targets for improvements in animal performance and on-farm profitability, as espoused in its Productivity Improvement Programme (now embedded in the Passion-2-Profit PGP project), over the next 10-year period, by providing science-based outputs to improve productivity outcomes.

SIF Platform:

Agri-Food Production

Key stakeholders and partners:

DEEResearch, Landcorp, Deer Industry NZ, Alliance Group, Passion to Profit Programme

FY19 funding:

\$1,333,000

Project timeline:

2012 – 2022

Project

Digital agriculture

Scope

The overall objective is to test whether biological and environmental variability can be harnessed using digital agriculture technologies to produce food more sustainably and enhance the resilience of the agricultural value chain (with a more volatile climate and more demanding consumer base). We will address this by starting to establish a long-term digital agriculture platform, beginning with 'Use Cases' (with SSIF support).

These Use Cases will demonstrate the potential value of digital technologies to the sector, while simultaneously developing capability within the organisation.

This will position AgResearch as a leader in the adoption of digital technologies to create value for pastoral agriculture.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Broad industry application

FY19 funding:

\$1,000,000

Project timeline:

2017 – 2019

Project

Forages for reduced nitrate leaching

Scope

This project supports the DairyNZ-led programme 'Forages for reduced nitrate leaching' (FRNL). The research target within this programme is to reduce nitrate leaching losses from dairy, arable, beef/sheep and mixed farm businesses by 20% from current levels by delivering (by 2020) proven, adoptable pasture and forage crop options for end-users in all of these industries.

Farmers are proficient at managing pastures and crops, and capable of implementing change in their forage base/crop rotation. Forages offer a realistic path toward meeting the twin challenges of increasing productivity while reducing environmental impact. Overall, the FRNL programme will provide new scientific knowledge for forage options that reduce animal urinary nitrogen (N) excretion, sustain high levels of production, assimilate more N from soil to reduce leachable nitrate loads, optimise forage crop phases of arable rotations, and are readily integrated into farming systems.

FY18 marks the fourth year of the FRNL programme which runs between October 2013 and September 2019. Solutions will be delivered to create nutrient load 'headroom' in freshwater catchments which can then facilitate sustainable economic development in the end-user industries. AgResearch's contribution to RA2 is now complete and the ongoing focus in RA1 is model development and reporting of the experimental data collected in previous years. Thereafter, the focus is on model development and testing.

SSIF Platform:

Agri-Food Production

Key stakeholders and partners:

Dairy NZ, Beef and Lamb NZ

FY19 funding:

\$263,450

Project timeline:

2013 – 2019





Food and Bio-based Products

Our science has a strong focus on agri-food and bio products and agri-technologies, to support the development of a new generation of livestock and plant-derived products.

Our breadth of expertise sees us working in areas ranging from new foods to fashion. The role of the Food and Bio-based Products group is to create the knowledge and tools to develop high value foods, ingredients and products from pastoral-based agriculture.

We focus on the production and supply of high-value premium consumer goods that are the end result of the agricultural value chain, with the outputs tailored to global market and consumer preferences.

We provide the underpinning research and development capabilities for a diverse range of consumer materials from meat and dairy foods, wool carpets and fabric, health and beauty products, as well as to the development tools and machinery to support these industries.

Our Food and Bio-based Products teams:

- Dairy Foods
- Food Assurance and Meat Quality
- Food Nutrition and Health
- Proteins and Biomaterials
- Textiles



Food and Bio-based Products SSIF Project highlights FY19

Project

Meat Futures – profiting from global food trends

Scope

Today's food industries face increasing challenges around exporting products into both existing and new markets. Meat Futures seeks to provide research outcomes that will enable New Zealand's red meat industry to minimize the impact of increasing non-tariff trade barriers and capitalise on opportunities created by ever-changing market requirements and global food trends.

The global economic and political power shift to the east is creating huge demand and opportunity for the development of high quality, safe products tailored to meet Asian consumer preferences. This is resulting in greater expectations of safety, quality, integrity and traceability of food by consumers. This demand is driving culturally different and more stringent global food regulations with stricter policies in terms of food safety,

ethical and quality standards, monitoring, tracking and sanctions. More people want the best and can afford to buy it. The opportunity for New Zealand is to differentiate itself from alternative proteins and meat.

SSIF Platform:

Premium Agri-Foods, Products and Services

Key stakeholders and partners:

Rezare Systems, Auckland University of Technology and Otago PhD Studentships, Meat Industry Association Partnership Programme and IIF

FY19 funding:

\$1,262,000

Project timeline:

2015 – 2022

Project

Unlocking value from the whole carcass

Scope

Red meat proteins and co-products are a rich resource that can be captured for wider application and higher value for New Zealand in foods beyond traditional whole meat formats. Unlocking Value from the Whole Carcass aims to maximise the value for New Zealand red meat through a whole-of-carcass approach, where nothing is wasted and every part of the carcass is originally utilised in consumer products.

This will be achieved through transformational research that will overcome current science knowledge and technical barriers to enable the development of new high-value ingredients with proven functionality and benefits.

SSIF Platform:

Premium Agri-Foods, Products and Services

Key stakeholders and partners:

AFFCO, ANZCO, Alliance, Taranaki Bio Extracts, Auckland University of Technology, Biomolecular Interaction Centre/ University of Canterbury, University of Waikato

FY19 funding:

\$1,154,000

Project timeline:

2013 – 2021

Project

Integrated wool science

Scope

This project is a balanced portfolio of research aimed at delivering short to long term outputs of strategic importance within the established wool industries and emerging sectors seeking new high value uses for wool and its proteins. Research objectives will deliver science outcomes from longer term, potentially transformational fundamental science, through to shorter term agile and responsive applied science of “here and now” strategic importance to industry.

The objectives align to recommendations within the Textiles and Bio Products (TBBP) Roadmap to ensure New Zealand wool is competitive in the areas of sustainability, fitness for market, new products and processes, personal and health care, and intrinsic benefits. Elements of Objective 3 are linked financially to the National Science Challenge, Science for Technological Innovation, while elements of fundamental research in Objective 1

around fibre traits of whole fibre, whole fibre constituents or proteinaceous mixes from deconstructed wool are aligned to the MBIE research partnership, New Uses for Wool.

SSIF Platform:

Premium Agri-Foods, Products and Services

Key stakeholders and partners:

Unilever, Proctor and Gamble, Kao Corporation, John Marshall, Australian Wool Innovation, National Science challenge, Texus Fibres, Cavalier Bremworth Carpets Ltd, Godfrey-Hirst Carpets Ltd, Interweave, Designer Textiles, Chemcolour, Armadillo Merino, John Marshall

FY19 funding:

\$2,000,000

Project timeline:

2013 – 2022

Project

Food provenance and assurance

Scope

Food Provenance and Assurance covers research from “fork-back-to-farm” to ensure that New Zealand’s exports are safe, of superior quality, ethically produced, have defensible provenance and produced in ways that are attractive to consumers and underpins the “New Zealand Brand”.

This includes food safety, milk quality as well as opportunities to create value through New Zealand provenance and protecting country of origin.

SSIF Platform:

Premium Agri-Foods, Products and Services

Key stakeholders and partners:

Meat Industry Association Partnership Programme, Ministry for Primary Industries, New Zealand Food Safety Science and Research Centre, Catalyst China Network

FY19 funding:

\$1,000,000

Project timeline:

2014 – 2020

Project

Food nutrition project

(aligned to High Value Nutrition National Science Challenge)

Scope

The aim of the Food Nutrition SSIF project is to carry out research that is distinct from, but complementary to, the National Science Challenge High-Value Nutrition (NSC HVN).

It specifically aims to determine cause and effect of food-health relationships pre-clinically by defining their underlying biomarkers and mechanisms of action in relation to gastrointestinal interactions in two key areas; to improve brain development and function in early life, and to improve functional resilience (cognition, stress, mobility) with ageing.

SSIF Platform:

Premium Agri-Foods, Products and Services

Key stakeholders and partners:

PSAF and Yashili, Bright Dairy Foods, HVN Challenge, Fonterra, University of Auckland, a2 Milk Company, Grasslanz, Dairy Goat Co-operative, ANZCO

FY19 funding:

\$1,895,000

Project timeline:

2014 – 2022



Building our future

AgResearch is part way through implementing a significant infrastructure programme which will change the way its researchers work and collaborate with key partners.

At the heart of this organisational transformation is the construction of two new facilities at a combined cost of \$133m; one in Lincoln and the other in Palmerston North. These facilities are each jointly owned by AgResearch and the two universities it is partnering with.

Smaller regional research centres will be maintained at Ruakura and Invermay focusing on regional science issues such as land use, water use and farm systems. Around 200 AgResearch employees will relocate to the new Palmerston North and Lincoln campuses as construction of facilities completes in 2019-2020.

Development of these science 'hubs' brings together science capability internally and across the sector, allowing for a more effective and collaborative approach to tackling national science issues.

This is part of a broader approach to collaborative research. AgResearch is already part of two virtual communities – Blic Innovation and FoodHQ – which play key roles as brokers to the larger partnerships. These two organisations present as the front-door for companies wanting to utilise a range of research services without the complexity of multiple arrangements. Blic Innovation offers a channel into land-based research from AgResearch, Lincoln University,

DairyNZ, Plant and Food Research and Manaaki Whenua. In Palmerston North the organisation Food HQ is the conduit for food and beverage-based science, with partners that include AgResearch, Massey University, Plant and Food Research, Fonterra, ESR, Cawthron Institute, Riddet Institute, BCC, Palmerston North City Council and the Manawatu District Council.

The Hub concept has been embraced by the wider agri-sector, with PGG Wrightson moving one of its teams to a new building currently under construction on AgResearch land on its Lincoln campus. This desire for industry to be physically close to the research that supports it is a key indicator of the future success of the Hub concept. The growth of these partnership organisations will therefore be well supported by the physical collaborations AgResearch has embarked on with Lincoln University and Massey University.

In Lincoln, the Lincoln University AgResearch Joint Facility will begin construction this year and will provide the two owners with a state-of-the-art work space, purpose built to create open, collaboration working arrangements. With industry partner DairyNZ as a key corporate tenant, this new facility leads the way for new collaborative opportunities in the sector.



Lincoln University and AgResearch Joint Facility Lincoln



Food Science Facility Palmerston North

In Palmerston North the new Food Science Facility will bring together food science capability from Riddet Institute partners, AgResearch and Massey University, in a new purpose built food science facility on Massey University grounds.

This new facility brings together leading expertise in food composition, structure and digestion, food processing and preparation, and human health and nutrition, including notably world-leading capability in gastrointestinal biology.

It is anticipated that this co-location of food science talent will provide the food industry with direct access to world class scientists

and innovators in one location, and form a strengthened focal point for food science in New Zealand.

Both new facilities will embrace new ways of working, with activity based work spaces providing new opportunities for growing collaborations and building on partnership relationships.

This links directly to our Statement of Core Purpose, which asks AgResearch to enhance the value, productivity and profitability of New Zealand's pastoral, agri-food and agri-technology sector value chains to contribute to economic growth and beneficial environmental and social outcomes for New Zealand.

Taking our research to the world

AgResearch partners with organisations around the world to carry out a wide range of research programmes. These span the breadth of AgResearch's scientific capability and reinforce the success of global relationships.

266

Collaborations

57

Countries

51

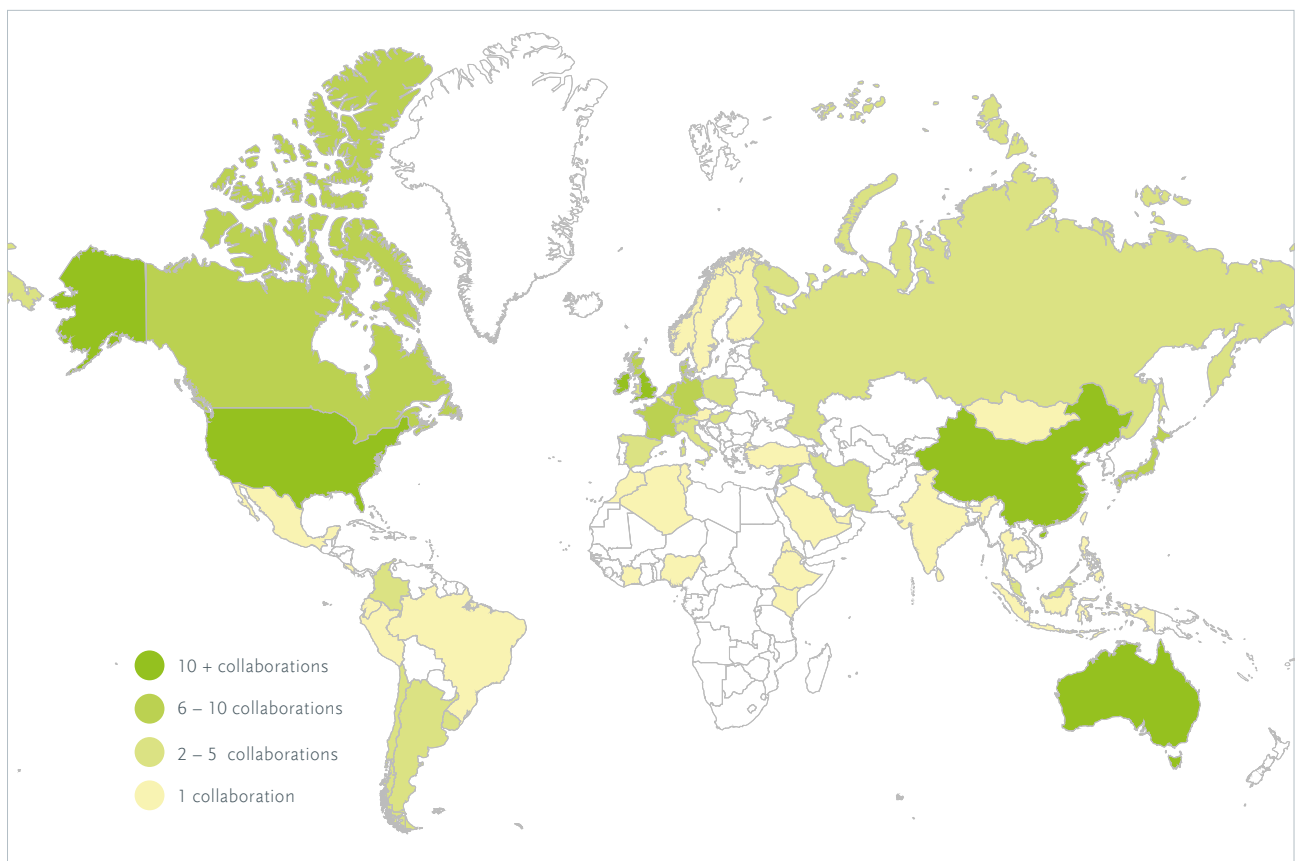
Collaborations
with USA

30

Collaborations
with China

30

Collaborations
Australia



Countries we collaborate with, in alphabetical order:

Algeria, Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Costa Rica, Cote d'Ivoire, Denmark, Ecuador, England, Eritrea, Ethiopia, Finland, France, Germany, Hong Kong, Hungary, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Kenya, Malaysia, Mexico, Mongolia, Morocco,

Netherlands, Nigeria, Norway, Peru, Philippines, Poland, Russia, Saudi Arabia, Scotland, Singapore, Spain, Sri Lanka, Sweden, Switzerland, Syria, Taiwan, Thailand, Tunisia, Turkey, United Arab Emirates, United States of America, Uruguay, Wales



Margot Forde Forage Germplasm Centre New Zealand

The Margot Forde Germplasm Centre is New Zealand's national gene-bank of grassland plants and also hosts the New Zealand Indigenous Flora Seed Bank. Plant germplasm consists of seeds of genetically diverse plant populations that are conserved for use in plant breeding and to ensure the survival of groups of plants. The roles of the Centre are to obtain germplasm, to conserve it, replenish it and distribute it for research and product development.

Collections

Collections provide the foundation for pasture, turf and soil conservation, plant breeding and research in New Zealand, as well as the conservation of New Zealand's indigenous species. They also have important international conservation roles.

The grassland collections are very important because New Zealand's export economy is based predominantly on pasture, and almost all pasture plants are native to other countries. Pasture species must be changed as problems arise, e.g. new pests, climate change, etc. The Germplasm Centre thus provides the biological economy with insurance against future problems arising from environmental changes.

Plant introduction and germplasm collection are important parts of the work of the Centre. In recent years, collecting expeditions have been sent to areas of special relevance to New Zealand.

Databases

A database is maintained of all seed holdings and samples issued.

The public part of this database is available on the Internet. Seeds from this part of the collection are freely available to bona fide researchers worldwide. Associated research includes DNA analysis to maximise the conservation of genetic diversity and to identify useful wild species that can be crossed with economic species.

Endangered Species Seed-bank

The Centre hosts the New Zealand Indigenous Flora Seed Bank on behalf of the NZ Plant Conservation Network. This is a collection of seeds of populations of native species that are endangered in the wild. By storing seeds, these populations can be conserved for long periods and the seeds provide insurance against future loss in their native habitats.

The Centre holds seeds from about
100 countries
representing 2,500 species from 500 genera and over 70 plant families.

The collection includes over
140,000 seed samples
stored at 0°C and 30% relative humidity (RH) to prolong viability.

Under these conditions, grass seeds will live for
20-30 years
and legumes
20-50 years.

Seed stocks are replenished using specialised facilities.

For longer-term storage, lower temperatures (-20°C) are used and this requires very dry seed.



Māori Agribusiness

At AgResearch we recognise that our partners are distinctive because their whakapapa, values and ownership structures propel Māori businesses towards something different – a supply chain (including the farm and the consumer) that is based on shared principles (hereafter referred to as a ‘shared principles value chain’); Whakapapa, Rangatiratanga, Kaitiakitanga, Whanaungatanga and Manaakitanga.

This is a novel, uniquely Aotearoa business ethos that aims to move Māori Agribusinesses beyond business as usual, while at the same time building opportunity for New Zealand at large. As AgResearch innovates alongside Māori partners developing new indigenous fibre and meat values-based supply chains, we have formed three key Māori Agribusiness research themes to underpin their R&D needs.

Māori Agribusiness Research Themes:

- decision making
- resource use
- value chain.

Increasing numbers of our Māori Agribusiness partners are asking AgResearch to co-develop research and development projects that will help them extend their business operations and interests beyond production into processing and marketing.

Not unlike many New Zealand farmers, our partners have identified that they want ownership of product from the paddock to the plate, to have a direct relationship with their national and international customers and to increase the transparency within the supply chain, therefore spreading the risk and the wealth.

But where we at AgResearch add value is recognising that unique to Māori Agribusinesses are their aims to produce food and engage with the whenua in a way that is in keeping with cultural values, that maintains and even restores health and mauri to their land and waters and to be able to leverage the value of the ‘Māori Story’ from their product.

This is an exciting area of development and we look forward to growing our partnerships and connection with the Māori Agribusiness sector.



Māori Agribusiness Project highlight FY19

Project

Te Maru Ataata

Scope

Utilising the Poutama engagement framework and AgInform farm system model to broaden the shadow of collective influence across fragmented Māori land blocks.

The goal is to make significant and lasting impacts for Māori through building the capacity of landowners and trustees to enhance resource stewardship and unlock the potential of their whenua-based assets.

Investment area:

Vision Mātauranga Capability Fund

Key stakeholders and partners:

Te Tumu Paeroa, MBIE

FY19 funding:

\$207,000

Project timeline:

2014 – 2022

Vision Mātauranga

“To unlock the innovation potential of Māori knowledge, resources and people to assist New Zealanders to create a better future.”

He nui whakaharaha te mahi a AgResearch ki te whakatutuki i ngā whakakitenga mātauranga ki te motu nei, ko te matua kia tautoko ai i ngā huatau tiketike, i te oranga whenua me ngā whāinga taumata angitu o te mātauranga iwi tiketike.

Ki te whakatutukitia, kia toru ngā kaupapa mātua hei pou whirinaki kia taea ai ngā kōwhiringa auaha te whakataki:

- tāria te raukaha kia whakatutukitia te whakawhiti whakaaro, te whakawhiti rangahau me Ngāi Māori
- whakawhanaketia ngā tātai hononga ki a Ngāi Māori
- whakawhanaketia ngā rautaki rangahau kia whai i ngā hiahia nō Ngāi Māori.

Ko tō mātou wero kia kāpia te anga kōrerorero nō te rāngai ahuhenua nei ki a Ngāi Māori, kia whakawhanaketia hoki ngā hononga motuhake.

Kia tika ai ngā hononga ki a Ngāi Māori, mā mātou anō ngā whāinga o Ngāi Māori e whai. E mate kāinga tahi, e rua kāinga rua.

Ka whai a AgResearch i te mātauranga me ngā pūkenga o te ahuhenua Māori ki te whakapuakihia nā te mahi whakaako, nā te whaiaro whanaketanga.

E ai ki te whakataukī, Mā ngā pakiaka tū ai te Kāhikatea i te uru”, ki te tākaia ngā kōeke katoa o tō tātou whakahaerenga e ngā tautokotanga tika, ka kitea ngā hua papai nō tātou.

AgResearch has a significant part to play in the delivery of Vision Mātauranga to New Zealand, particularly in the support of its indigenous innovation, environmental sustainability and indigenous knowledge growth goals.

To achieve this, three priorities have been identified to better enable the delivery of opportunities for innovation;

- build capacity to engage with and deliver research outputs to Māori
- develop meaningful relationships with Māori
- develop research programmes that meet the needs of Māori.

Our challenge is to bridge a communication gap between Māori and the sector and to develop long term relationships.

It means a re-focusing of the way we partner with Māori entities – ways that are more in-tune with the way Māori make decisions. Two strategies are better than one.

We are ensuring that AgResearch has the knowledge and skills to deliver on AgResearch’s Māori specific impacts through learning and development initiatives.

As the Māori proverb, ‘With the right roots, the Kāhikatea can withstand the storm’ explains, if we wrap ourselves with the right support at every level of the organisation we will have impact and visibility.



Our people

Successful delivery of our research outcomes can only be achieved by ensuring that we have the right science capability at the right time.

AgResearch has a strategic priority to support workforce planning, talent management (including succession management and retention planning) to ensure that our future science knowledge and experience meets emerging science priorities. We are not alone in recognising these challenges, and a collaborative approach is being taken by the seven Crown Research Institutes who will develop a report to be delivered to the Minister of Research, Science and Innovation by 30 September 2018.

AgResearch's own workforce planning process includes a rolling capability assessment model, the identification of key people and critical roles, the development of a robust succession planning and retention strategy and the execution of a development programme which supports our high potential people and our emerging talent. The latter will ensure the enhanced capability of these groups to ensure that there is growth opportunity when more complex roles present themselves.

AgResearch staff:

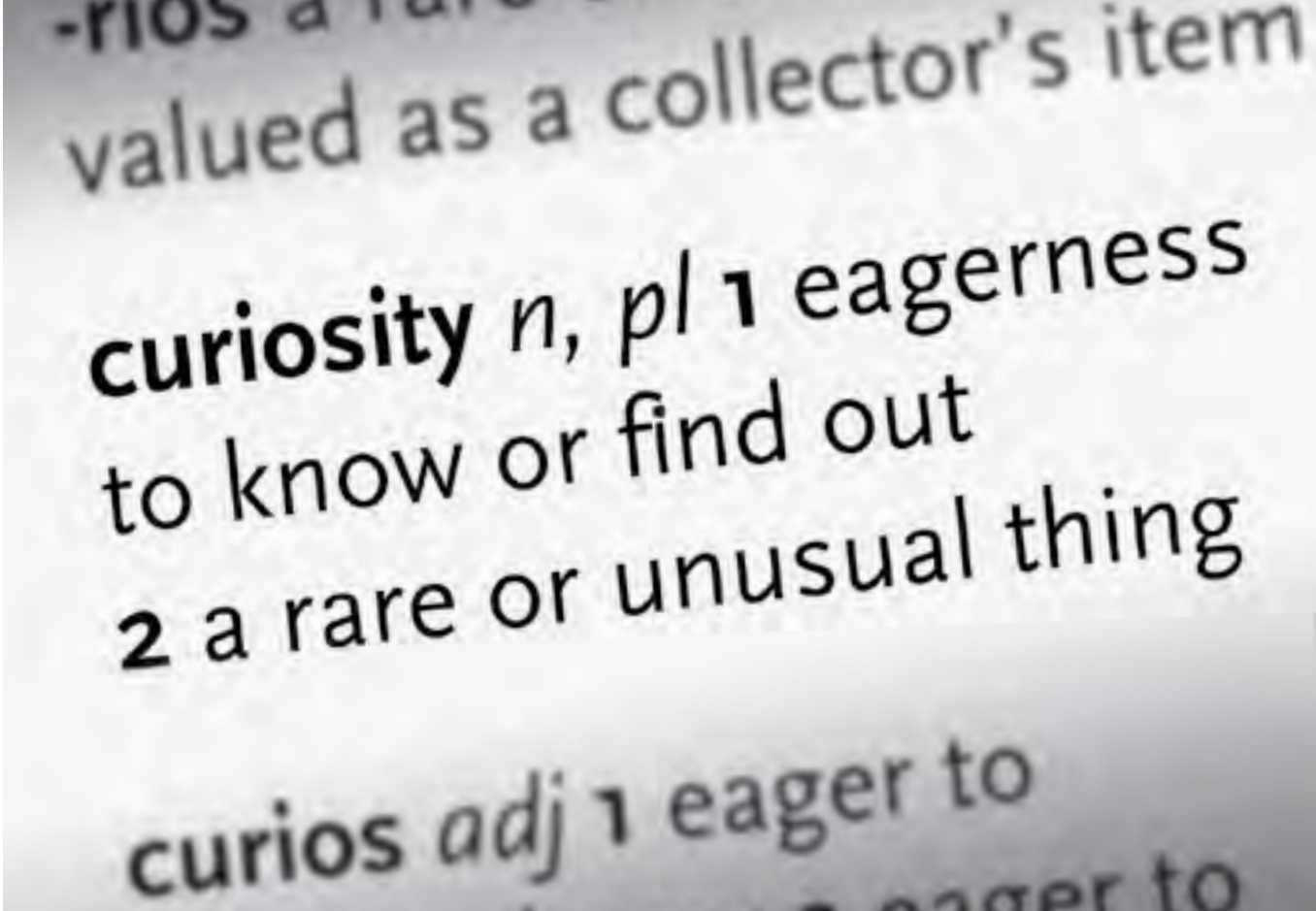
340  Female

295  Male

Our Values

Our Values represent the attributes that are innate to those who will drive the success of our organisation.

 <p>Professionalism - WHAKARANGATIRA - We do what's right.</p>	 <p>Collaboration - MAHITANI - We leverage collective expertise.</p>	 <p>Quality - MĀTAI WHETŪ - We commit to excellence.</p>	 <p>Innovation - ĀTA MĀTAI - We stimulate curiosity.</p>	 <p>Customer Focus - MĀTAI - We deliver responsive, impactful solutions.</p>	 <p>Thought Leadership - ĀTA - We inspire transformational change.</p>
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Curiosity Fund

The Curiosity Fund is one of the mechanisms by which AgResearch invests its Strategic Science Investment Fund. The Fund is intended to be a seed fund to enable AgResearch science staff to explore and investigate inquisitive ideas and thoughts that could lead to change (impact) and/or innovation that helps build AgResearch and its stakeholder's futures.

Twenty projects of up to \$40,000 each are available with funds to be spent in the financial year for which it is awarded. As of FY19, additional funds called Curiosity Plus will be available for projects which are investigating discovery, 'riskier' science questions.

These will be larger awards and may be spent over two financial years. Any AgResearch science staff member may apply. Researchers up to and including R7 level, technicians and non-science staff can apply for the main fund and as of FY19, R7, R8 and R9 Scientists can apply for Curiosity Plus. Collaborative proposals are strongly encouraged.

This fund supports and encourages innovation - from the exploration and investigation of an idea, concept, thought, or technique that may lead to the creation of a new solution, product, way of doing something, and potentially lead to the harnessing of innovation and/or impact.

Outreach

Telling the AgResearch story

Without a comprehensive programme of storytelling, the benefits of AgResearch's impactful science cannot be widely appreciated or easily linked to the success of New Zealand Inc.

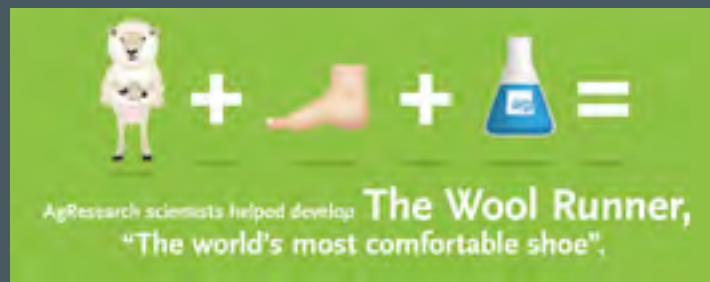
Through their work our scientists are ambassadors for this organisation and their innovations and collaborations spark other relationships and work programmes.

To support them we host, display and trumpet our science through public-facing events and information portals, most significantly those which align best with our two key strategic pillars of reshaping New Zealand's agricultural future with smart, sustainable systems and creating high value food and bio products.

The outcomes of this work is measured by six-monthly market research to determine growth in public understanding of AgResearch's significance to the agricultural sector and therefore, the success of this country's economy.

- 1 Public Awareness Campaigns. Educating New Zealand on the impacts of AgResearch science projects. Media channels include web, social media and cinema advertising.

- 2 Science New Zealand – 25 years of CRI's event, Wellington. Over 30,000 people attended during the 3 day event.
- 3 South Island Dairying Development Centre (SIDDC) Open Day. Over 200 students from Canterbury attended this event.
- 4 Breeders day at Invermay Campus. Approximately 80 breeders attended this open day.
- 5 Year 13 Open day. In conjunction with DairyNZ, Waikato University and LIC. Around 40 Year 13 students were shown agricultural science in action.
- 6 National Fieldays, Mystery Creek. Profiling our science to over 133,000 people over four days.





Financial results 2018 – 2023

The financial results show modest growth throughout the forecast period. The following table shows the operating revenue from FY2018 through to FY2024, to show the normalised position following the build programmes.

At a surplus-before-tax level the group is forecasting losses through to FY2022 as it completes its campus developments and works through the relocation of staff as part of FFP. From there nominal surpluses are projected.

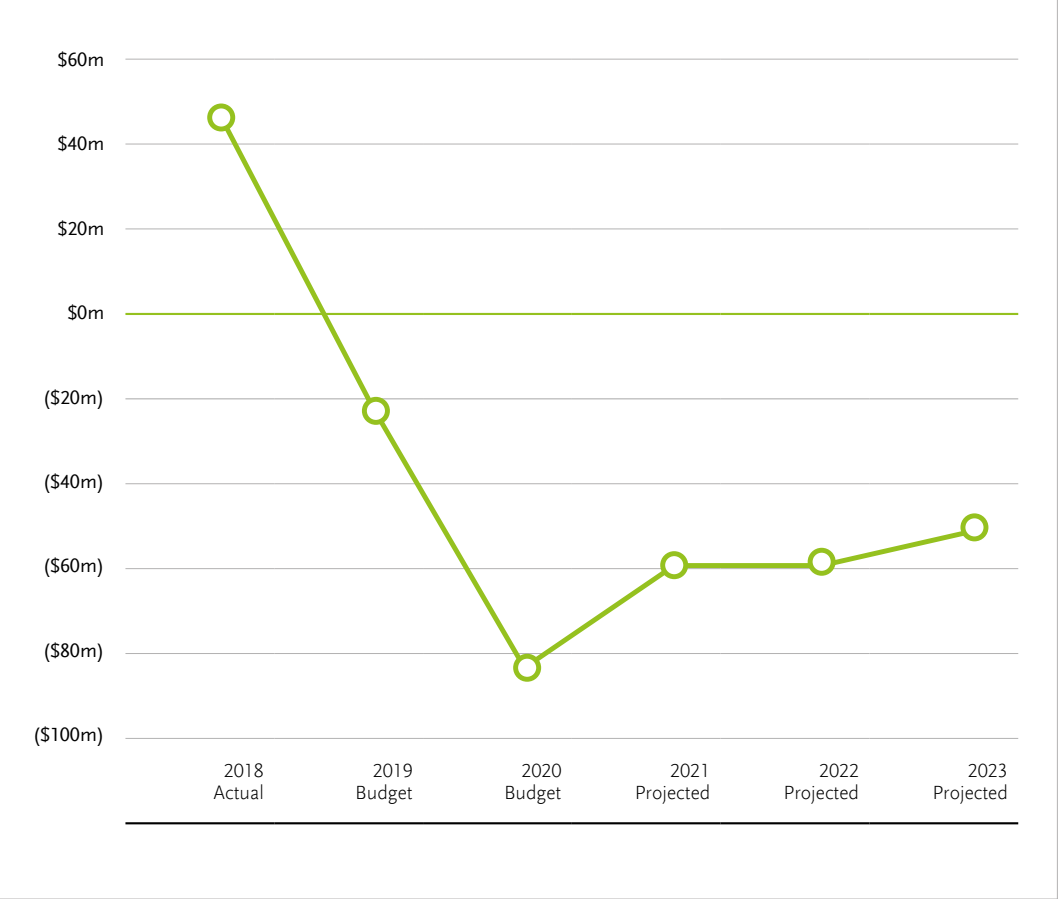
Overview of projected financial performance for the 6 years ended 30 June 2024

	2018 Actual \$000s	2019 Budget \$000s	2020 Projected \$000s	2021 Projected \$000s	2022 Projected \$000s	2023 Projected \$000s
Operating revenue	144,061	150,392	155,385	158,312	165,466	170,984
EBITDA	7,446	11,529	10,980	10,955	13,408	19,307
Surplus (deficit) before tax	(1,837)	(3,089)	(12,732)	(6,841)	(2,854)	3,209
Total Equity	249,019	246,794	237,628	232,702	230,647	232,957

Financial Performance Indicators

Financial year Type	2018 Actual	2019 Budget	2020 Projected	2021 Projected	2022 Projected	2023 Projected
Cashflow						
Net cash flow from operating activities	16,016	3,219	6,857	7,605	10,247	16,443
Net cash flow from investing activities	(28,943)	(72,824)	(66,446)	15,876	(10,189)	(9,274)
Net cash flow from financing activities	200	23,789	59,588	(23,481)	(59)	(7,169)
Effect of exchange rate changes						
Total net cash flow	(12,727)	(45,815)	0	0	(0)	0
Cash at the beginning of the year	59,043	46,315	500	500	500	500
Cash at the end of the year	46,315	500	500	500	500	500
Ratios						
Operating Margin	(1.5%)	0.5%	(0.6%)	(0.1%)	1.5%	4.9%
Operating Margin per FTE	(3.3)	1.0	(1.4)	(0.3)	3.8	12.6
Revenue Growth	(2.8%)	4.4%	3.3%	1.9%	4.5%	3.3%
Quick Ratio	1.7	0.9	0.8	0.9	0.9	0.9
Interest Coverage	1.1	1.0	(0.5)	(0.1)	1.0	3.7
Operating Margin Volatility (FC/TC)	25.6%	28.5%	26.3%	27.7%	37.0%	32.8%
Forecasting Risk %						
Adjusted Return on Equity	(0.7%)	(1.5%)	(6.6%)	(3.7%)	(1.6%)	1.8%
Capital Renewal						
Equity Ratio	81.8%	75.4%	61.0%	64.7%	64.4%	65.7%

Net Cash/(Debt) Position



Non-financial targets 2018 – 2023

Core Operating Indicators

ID	Indicator	Definition	FY19 target	FY17 result
G.1	End user collaboration	Revenue per FTE from commercial sources	\$84.30k	\$90.0k
G.2	Research collaboration	Publications with collaborators (Percentage of publications with a) only AgResearch authors, b) with other New Zealand authors, c) with international authors or d) with a combination of New Zealand and international authors).	a) 14% b) 39% c) 26% d) 21%	14% 39% 26% 21%
G.3	Technology & knowledge transfer	Commercial reports per scientist FTE.	1	2.6
G.4	Science quality	Impact of scientific publications. (The average value of 2-year citations per document for scientific journals assessed by SCImago in which AgResearch staff published during the year, weighted by the number of AgResearch publications in each journal. The reference figure is for the 2014 calendar year).	2.7	2.6
G.5	Financial indicator	Revenue per FTE, based on average FTEs over the year.	\$225.76k	\$235k

AgResearch-specific indicators of End-User Engagement and Science Relevance

ID	Indicator	Definition	FY19 target	FY17 result
1.1	External Stakeholder Engagement	Consistent implementation of agreed Stakeholder Services Plans.	Achieved	-
1.2		Stakeholder Relationship measure – “Very Good” or “Better” satisfaction rating	>60%	53%
1.3		Satisfaction with our Service – “Very Good” or “Better” satisfaction rating	>70%	68%
1.4		Dealing with Us – “Preference to Work” rating	>60%	57%
1.5		Familiarity with our Capability – “Very Familiar” rating	>40%	25%
1.6		Contribution to Stakeholder Strategy – “Good or “Better” rating	>90%	83%
1.7	Internal Stakeholder Engagement	Consistent implementation of agreed Science Service / Interaction Plan.	Achieved	-
1.8	Stakeholder Knowledge	Secure a 2 per cent annual increase of responses that identify “AgResearch” to the market research question: “who is responsible for improving New Zealand’s agriculture through science and technology?”	9%	7%
1.9	Revenue from stakeholders	a) total revenue; b) total net science revenue; c) commercial revenue; d) IP revenue; e) international revenue; f) Māori revenue	a) \$145.39m b) \$107.50m c) \$54.29m d) \$9.79m e) \$4.10m f) \$0.29m	a) \$146.01m b) \$104.1m c) \$44.39m d) \$10.46m e) \$1.8m f) \$0.393m

AgResearch-specific Operating Indicator of Delivery to Vision Mātauranga

ID	Indicator	Definition	FY19 target	FY17 result
2.1	Collaboration with Māori	Cultivate collaboration to support Māori agribusiness by co-developing funding proposals with stakeholders.	6	-

AgResearch-specific workforce indicators

ID	Indicator	Definition	FY19 target	FY17 result
3.1	Staff engagement	Increase Engagement Index (EI) by 5 points.	70	61
3.2	Health & Safety	No notifiable injuries and <2 notifiable events.	0 <2	0
3.3		Employee perception of Health and Safety within AgResearch increases in the engagement survey questions, with >75 weighted mean score.	>75	75.6

AgResearch-specific financial performance

ID	Indicator	Definition	FY19 target	FY17 result
4.1	Financial Target	Operating Profit budget achieved.	Achieved	Achieved

Miscellaneous items

AgResearch's accounting policies

AgResearch's financial statements are prepared in accordance with the requirements of the Companies Act 1993, the Financial Reporting Act 2013, the Crown Research Institutes Act 1992, the Public Finance Act 1989 and Generally Accepted Accounting Practice in New Zealand (NZ GAAP). The financial statements, including the financial information presented in this Statement of Corporate Intent, comply with the New Zealand Equivalents to International Financial Reporting Standards (NZ IFRS) and other applicable financial reporting standards as appropriate. A full Statement of Accounting Policies is provided on AgResearch's website at www.agresearch.co.nz. There have been no material changes in accounting policies since the 2017 Annual Report.

Principles in determining the annual dividend, if any

The Company's policy is that it will return surplus cash to shareholders in the form of a dividend when no sound investment opportunities (including reinvestment, commercialisation, capital expenditure and the retention of important capabilities) exist.

It is forecast that no dividends will be paid in the year ending 30 June 2019.

Information to be provided to the Shareholding Ministers during the financial year

AgResearch provides Shareholding Ministers with the following documents and information throughout the year:

Quarterly Reports

These include:

- Financial statements
- Comparisons with budgets and comments on financial activities for the quarter
- Comment on research achievements and comparisons of such achievements with business plans.

Half-Year Report

This includes:

- Unaudited financial statements and notes (including accounting policies) for the half year, within two months of the half year
- Comparative figures for the corresponding period of the previous financial year
- Commentary on operations and overall performance for the period
- A statement of responsibility
- A statement that the CRI has operated during the period in accordance with the principles set out in Section 5 of the Crown Research Institutes Act 1992 and the Companies Act 1993
- Commentary on progress towards achieving annual performance targets (financial and non-financial).

Annual Report

An Annual Report of the operations of AgResearch is delivered to the Shareholding Ministers within three months of the end of each financial year. In it, the Board sets out:

- Audited consolidated financial statements for the financial year, consisting of:
 - A report of the operations of AgResearch and its subsidiaries
 - Statements of financial position, comprehensive income and cashflows, including budget (as established at the beginning of the year in the SCI); and
 - Statements of commitments, contingent liabilities, accounting policies and such other statements as may be necessary to show the financial results of the operations of AgResearch and its subsidiaries during the financial year and their financial position at the end of the period
- Comparative information for the previous financial period
- The auditors' report on these financial statements
- A statement of responsibility
- A report on AgResearch's performance as a good employer

- A corporate social responsibility report
- A report against financial and non-financial performance indicator targets set in the SCI
- A response to any direction given by the Shareholding Ministers.
- 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.

The Annual Report will comply with the annual reporting provisions in Part V of the Public Finance Act 1989, Section 17 of the Crown Research Institutes Act 1992 and the Companies Act 1993.

Procedures to be followed before any member of the group subscribes for, purchases, or otherwise acquires shares in any company or other organisation

As required by section 13(1)(d) of the Crown Research Institutes Act 1992, AgResearch will not acquire:

- Shares that give it substantial influence in or over a company
- An interest in any partnership, joint venture, or other association of persons, or
- An interest in a company other than in its shares, except after written notice to the shareholding Ministers.

The Board will obtain prior written consent from Shareholding Ministers for any transaction or series of transactions involving a 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. The Board will obtain prior written consent for any transaction or series of transactions with a value equivalent to or greater than \$5 million involving:

- The acquisition or disposal, in full or in part, of shares or interests in a subsidiary, external company or business unit
- Transactions that affect a company's ownership of a subsidiary or a subsidiary's ownership of another entity (provided that transactions which include "drag-along" clauses that compel AgResearch to sell interests at a future date at the direction of the investors shall be valued at the time of the investment transaction), and

The Board will advise Shareholding Ministers in writing before entering into any transaction related to property and commercialisation activities below this threshold in accordance with notice requirements agreed between the Ministers and AgResearch from time to time.

Activities for which the board seeks compensation from the Crown

At the date of this SCI, no compensation has been sought from the Government.

Current commercial value of AgResearch

The Board's estimate of the current commercial value of the Group is approximately \$230 million. This value is based solely on the forecasted Group equity position determined under NZ GAAP which the Board considers is a reasonable approximation of the commercial value. The Board note that the Group revalues its land, land improvements and buildings every three years, or more frequently where market and other factors indicate their stated book value may not reflect their current fair value. AgResearch does not revalue its intangible property rights.





Partner to identify the innovation that is needed, and use the collective expertise to create value for New Zealand.

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