SUBMISSION ON

Science System Advisory Group Consultation on Phase One Report

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To: Science System Advisory Group
Name of Submitter: Horticulture New Zealand
Supported by: Vegetables New Zealand, Summerfruit New Zealand, New Zealand Apples and Pears, Citrus New Zealand

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Horticulture™ New Zealand
Ahumāra Kai Aotearoa

OVERVIEW

Submission structure

1. Part 1: HortNZ's Role
2. Part 2: Submission
   Responses to phase one questions

Our submission

Horticulture New Zealand (HortNZ) thanks the Science System Advisory Group for the opportunity to submit on the consultation questions for the phase 1 report. We welcome any opportunity the continue to work with Science System Advisory Group and to discuss our submission.

The details of HortNZ's submission and decisions we are seeking are set out in our submission below.

PART 1

HortNZ's Role

Background to HortNZ

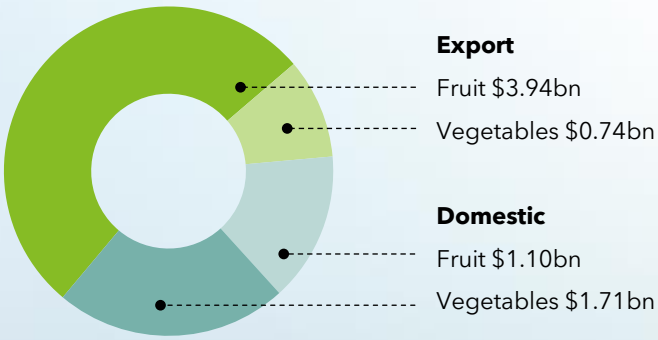
HortNZ represents the interests of approximately 4,200 commercial fruit and vegetable growers in New Zealand who grow around 100 different fruits and vegetables. The horticultural sector provides over 40,000 jobs.

There are approximately 80,000 hectares of land in New Zealand producing fruit and vegetables for domestic consumers and supplying our global trading partners with high quality food.

It is not just the direct economic benefits associated with horticultural production that are important. Horticulture production provides a platform for long term prosperity for communities, supports the growth of knowledge-intensive agri-tech and suppliers along the supply chain; and plays a key role in helping to achieve New Zealand's climate change objectives.

The horticulture sector plays an important role in food security for New Zealanders. Over 80% of vegetables grown are for the domestic market and many varieties of fruits are grown to serve the domestic market.

HortNZ's purpose is to create an enduring environment where growers thrive. This is done through shaping sector strategy, proactively influencing policy, telling the horticulture storage, translating sector-wide change and facilitating grower connections.



Industry value $7.48bn

Total exports $4.67bn

Total domestic $2.81bn

Source: Stats NZ and MPI

PART 2

Submission

1. The Science, Innovation and Technology System

1.1. Vision for the future

The future envisaged for a publicly supported science, innovation and technology system should be one that enables New Zealand to develop a low emission, resilient economy to support the long-term health and wellbeing of the country and its people.

To this end, future research and innovation into plant breeding, plant growing systems, environmental mitigations, lower energy transportation and robotics are all critical to supporting a lower emission, diversified and knowledge-based primary sector, underpinned by a strong horticulture sector that will continue to increase in importance to the national economy and regional economies.

1.2. Opportunities, challenges, and barriers

1.2.1. SOCIETY BENEFITS FROM HORTICULTURAL RESEARCH

The horticulture sector can play an important role in supporting, testing, and shaping research, technology, and innovation. However, the main benefits of the expansion of horticulture are for the health of future generations, the environment, future businesses, and the economy. In fact, new technologies may not be currently economically viable for existing horticulture businesses, and the future expansion of horticulture may not be to the benefit of existing horticulture businesses.

1.2.2. CLIMATE DISRUPTION IS THREATENING GLOBAL FOOD SECURITY

New Zealand is likely to face lesser climate disruption than many other nations and will remain well placed to continue to prosper as a food producing and food exporting nation.

A challenge of the wider primary sector is continuing to provide domestic food security and increase export earnings within changing environmental limits. Further land use diversification to horticulture presents New Zealand an opportunity to produce greater quantities of highly nutritious food to support societal health, with lesser impacts on greenhouse gas emissions and biodiversity.

1.2.3. LEVERAGE OFF GLOBAL RESEARCH

New Zealand needs to leverage more off global research. This may be through research collaboration, but also through actively choosing not to repeat research and development undertaken elsewhere. A greater commitment to leveraging off global research would be beneficial for government decision making and effectiveness.

A freshwater example where this has not happened is the development of farm-scale nutrient management models (such as Overseer[1]) and the development of various catchment-scale water quality models (such as CLUES[2]). In both cases, time and money could have been saved by promoting the use of models that had already been developed in Australia, such as APSIM[3] and eWater Source[4]. NZ research institutions reinventing the wheel in water quality and hydrological modelling has undermined progress in the implementation of workable freshwater policy; is contributing to negative environmental and economic effects; and is a barrier to climate change mitigation and adaptation.

A further example is the regulatory approval processes for registering new agrichemicals for pest and disease management in New Zealand. The highly skilled regulatory teams involved continue to insist on requiring trials to support the registration of new chemicals to be conducted in New Zealand rather than trust the results of trials conducted in other countries. This protectionist, "keep it in New Zealand" approach is potentially having perverse consequences for our environment. It creates barriers to New Zealand growers' access to newer crop protection tools that have fewer environmental impacts than the older, broad-spectrum crop protection products that are already available.

1.3. What principles should underpin the design of a science, innovation, and technology system for New Zealand?

1.3.1. END-USER FOCUS

Research priorities should be focussed on the challenges New Zealanders are facing now and those we will face in the future. Identifying and prioritising these challenges requires direct and ongoing input from the people facing them in addition to researchers and government officials.

1.3.2. CROSS-GOVERNMENT & MULTI-SECTORAL ALIGNMENT

Some government departments have developed roadmaps that should be considered in research commissioning and prioritisation processes. One example would be MPI's 'Fit for a Better World' that sets out a roadmap for the food and fibre sector to lead the way to a more sustainable economy[5]. Aligned with 'Fit for a Better World' is the Aotearoa Horticulture Action Plan[6], which is a joint action plan developed and implemented by a partnership between industry, government, Māori, and science sectors.

1.3.3. ENHANCING NATIONAL AND REGIONAL RESILIENCE

The national research system has an important role to play in supporting New Zealand and its regions to thrive in a changing world. For example, strong research support across the full breadth of horticultural industries situated across the country would enhance the country's overall resilience by providing opportunities for economic and export diversification, domestic food security, optimised sustainability, and rural employment.

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[1] https://www.overseer.org.nz
[2] https://niwa.co.nz/freshwater/clues-catchment-land-use-environmental-sustainability-model
[3] https://www.apsim.info
[4] https://ewater.org.au/products/ewater-source
[5] Primary sector roadmap to boost export earnings | NZ Government (mpi.govt.nz)
[6] https://www.hortnz.co.nz/about-us/aotearoa-horticulture-action-plan/

1.3.4. INCLUSIVITY

To provide smaller-scale industries the opportunity to benefit from research that can help them grow, these end-users need to be included in discussions alongside the larger, more established, and more connected industries. While these smaller end-user groups have less resource to invest in research than their larger counterparts, appropriate research-support could assist them to become more important contributors to New Zealand's regional communities and economy in the future.

1.3.5. REGIONALISATION

Across the country, there are differing regional challenges and opportunities. A prioritisation process that was heavily Wellington-based would be unlikely to serve the needs of all the country.

One concept that was explored by MBIE in the previous consultation was the establishment and funding of regional Māori research hubs within a national research system. HortNZ supports this approach as it could provide a much-needed framework to encourage and enhance the integration of mātauranga Māori into all research. Regional Māori hubs also make sense from a horticultural perspective as a lot of horticultural research is region-specific and enhanced connectivity with iwi in important horticultural regions would be beneficial for all. For example, the vegetable sector has been collaborating with Ngāti Te Ata, Ngāti Tamaho and Ngāti Tiipa on Te Ahikawariki, a Pukekohe Vegetable Industry Centre of Excellence.

1.3.6. STABILITY

Many of the issues that horticulture and New Zealand are facing are long term and multifactorial in nature. To effectively meet these challenges requires a body of multidisciplinary understanding to be developed over years and decades. This is not achieved if funding is channelled into portfolios of disconnected, short- or medium-term projects. The stability to make incremental advances in knowledge and technologies also needs to be supported by a research system that is not frequently disrupted by changing research priorities or the withdrawal of funds after five years.

1.3.7. AGILITY

A set of rigid priorities and inflexible research commissioning processes would obstruct the ability of any research system to assist New Zealand to meet unexpected challenges or benefit from unexpected opportunities and discoveries. Alongside supporting the long-term increase of knowledge in key areas sufficient flexibility should be built-in to the system to enable end-users to have timely access to research outcomes in novel areas.

1.3.8. COST-EFFECTIVENESS

Wide consultation is vital for identifying the most appropriate priorities, strategies and allocating the available funding. However, there is a need to avoid over-engineering the research management process as this would risk it becoming self-supporting, time-consuming for individuals, and expensive for the New Zealand public. As an example, the cost-effectiveness of the highly polished marketing collateral within the National Science Challenge is questionable. While undeniably beautiful, it is hard to see how those

publicity materials in themselves have contributed to advancing scientific understanding in this country. When money is tight, careful thought should be given to how it is used.

2. Public Research Organisations

2.1. Building strong research teams through collaboration

The research system needs to support government research organisations, including Crown Research Institutes, to prioritise interorganisational collaboration, efficiency, and transparency. Closer integration between public research organisations would certainly foster an interdisciplinary approach to research and knowledge exchange.

For this approach to work, the corresponding research funding system must not force research organisations to compete for financial survival, and governance structures must include representation from diverse stakeholders such as industry, academia, and government.

2.2. Public-private partnerships

Public research organisations should primarily focus on generating public goods that benefit society. However, to drive innovation and economic growth, the public research system would need to fully engage with industry through collaborative, co-funded research programmes and technology transfer agreements.

This approach requires careful thought to be given to how best to manage intellectual property generated through research in ways that balance innovation incentives with societal benefits.

2.3. Sharing resources for advanced technologies

New Zealand could benefit from an advanced technology research system that pooled technology resources and personnel across multiple organisations. Under this model, publicly funded research institutes would be part of a single system with resources distributed across the system in the most effective and efficient way. This would also enhance efficiency and prevent duplication of resources within different organisations, which is currently a frequent occurrence. To provide stability, a commitment to fund any collaborative science organisation is needed for the long term (i.e., 10+ years).

2.4. Maintaining key expertise

Maintenance of key fundamental science expertise in the country is an example of a core function that is being lost in the primary industry sectors as current experts retire and no-one else holds such detailed New Zealand-relevant knowledge. While individually these key knowledge holders might not align with any single research priority, nor be the source of widely cited scientific publications, nonetheless their scientific and industry knowledge underpins multiple areas of research and operations. Creating publicly funded positions for some of these key roles that need not be tied to any single organisation would recognise the value of the knowledge held by these individuals and help to create a career pathway, enabling better succession.

3. The Innovation System

Leveraging innovation and technology can enhance New Zealand's economic competitiveness across key industry sectors. Strengthening connections between research institutions, industry, and international networks is crucial. This requires a revised approach emphasising collaboration, diversity, and agility.

An innovation-focused policy organization could support research and development projects, facilitate industry-research partnerships, promote technology commercialisation and entrepreneurship, and advocate for supportive policy environments.

Additionally, existing support mechanisms should evolve to be more responsive to industry needs, while continually evaluating and adapting to changing conditions and technologies.

4. Contestable Research

To enhance transparency and alignment with national priorities, separating MBIE's policy functions from contestable funding decisions could be beneficial.

Prioritisation of research investment should involve consultation with stakeholders and expert assessment, considering factors like societal relevance and strategic importance, particularly in areas like Pacific research strategy.

New Zealand should develop research expertise in areas aligned with its priorities, including sustainable agriculture and food systems.

Investment in Māori research priorities should be determined through genuine engagement and partnership.

Effective checks and balances, such as peer review processes and transparent decision-making, are essential to ensure the integrity and efficiency of scientific endeavours across diverse fields.

5. Government's Research Needs

5.1. New Zealand needs more than mission-led research

The full breadth of the national research system needs to effectively deliver research across multiple horizons from 'blue-sky' investigator-led research to 'mission-led' collaborative research, to highly focussed research questions for a specific end-user. Not all these horizons are likely to fit under a single set of national research priorities.

Nonetheless, prioritising research of national importance at the system level would inform the design of the most appropriate frameworks for research funding structures and institutions. It would also provide transparency around funding decisions. However, to ensure that New Zealand's publicly funded research remains relevant to its end-users, any prioritisation process must be consultative in nature with active participation from industry end-users at all stages.

5.2. We don't know what we don't know

'Emerging risks and opportunities' could be included as a standing item on the list of whole-of-system priorities. There is a need to maintain enough agility within the system to ensure that stakeholders and end-users can rapidly access research outputs that support them to meet the challenges of emerging risks and to embrace new opportunities, some of which may not fall under current areas of prioritisation.

5.3. Government is a public service

Therefore, end users should be involved in in identifying national research priorities and the processes for setting strategies and funding decision making also helps to ensure that the research conducted is of high relevance and grounded in practical realities. There are existing collaborations that demonstrate the strength of this approach.

One good example is the Better Border Biosecurity (B3) collaboration[7]. This highly active collaboration, consisting of four Crown Research Institutes and a university, has been providing quality research outputs to support government and industry in the prevention and management of plant biosecurity issues for over 17 years. The B3 collaboration is focussed on an area of national priority (biosecurity) and takes a mission-led approach with industry and government stakeholders represented at both the governance and science advisory levels. The collaboration develops 5-year strategies that are aligned with government strategies and industry roadmaps and engages in annual cycles of project and portfolio assessment.

Other examples of highly effective research and industry collaborations include the New Zealand Agricultural Greenhouse Gas Research Centre[8], the Bioresource Processing Alliance[9], and the New Zealand Food Safety Science & Research Centre[10] that has an industry advisory group and industry task forces.

5.4. All research must be quality assured

Peer-review is a fundamental tenet of science. If anything, this is doubly important for research that government may use to inform regulations.

[7] Home - B3 | Science Solutions for Better Border Biosecurity (b3nz.org.nz)
[8] Global Research Alliance | New Zealand Agricultural Greenhouse Gas Research Centre (nzagrc.org.nz)
[9] ABOUT US | Bioresource Processing
[10] Our People | NZFSSRC