GROWING INNOVATIVE INDUSTRIES
IN NEW ZEALAND

Agritech Industry Transformation Plan

JUNE 2023

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Ministry for Primary Industries
Manatū Ahu Matua

This document lays out a refreshed Agritech ITP, underpinned by a new vision, purpose, action plan, and outcomes framework. This ITP continues to be centred around a strong partnership of government and industry.

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Te Kāwanatanga o Aotearoa
New Zealand Government

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MINISTERIAL FOREWORD

Accelerating the growth and productivity of our agritech sector plays a key role in achieving Government's economic strategy to move New Zealand to a high-wage, low-emissions, and resilient economy. The Industry Transformation Plans are recognised as an important aspect of this strategy to unleash the potential of New Zealand businesses. In particular, the agritech industry's growth is expected to lead to increased agritech exports, combined with higher productivity and reduced emissions in our food and fibre sectors.

Agritech has the unique opportunity of providing solutions that concurrently improve productivity and sustainability. It can provide the ability to produce more food and fibre products and lower environmental inputs. This value proposition places the agritech sector at the heart of how we can think about the relationship between productivity and sustainability, particularly how productivity can be more holistic and consider benefits and costs beyond those that are monetary.

A thriving agritech sector will see high-wages, more jobs, lower-emissions, and have spillover benefits to other key sectors. For example, the 2022 Agritech Insights Report published an average wage in the sector of around $94,000, which is significantly higher than New Zealand's average wage. These high-wage, knowledge-intensive jobs found in the agritech sector are key to New Zealand's future.

On the whole, the agritech sector is poised for growth. This will be seen in the sector growing in its own right, but also in its increased and critical contribution to the food and fibre industries of New Zealand. This latter role will be particularly important in solving global challenges such as labour shortages, food security, emissions reduction, and adapting to the impacts of climate change.

Agritech serves as a key driver for shifting New Zealand's food and fibre industries to a more productive future, and is also central to driving better environmental outcomes (including emissions reduction) both domestically and across export markets.

To support Government's role in implementing the Agritech Industry Transformation Plan, we have committed a total of $16.4 million. We have already seen over two years of collaborative action across industry and Government in delivering this work. We look forward to continuing to build this partnership in order to grow New Zealand's agritech sector to a globally recognised agritech sector that creates solutions for a better world.

Hon Damien O'Connor
Minister of Agriculture

Hon Barbara Edmonds
Minister for Economic Development

INDUSTRY FOREWORD

The last two years delivered some hard-won growth in the agritech industry in and from New Zealand. Despite difficult trade conditions, we witnessed organic growth and acquisitions by our mature businesses and the emergence of many more start-up businesses. Globally, agritech remains the sought for answer to many of the world's food and climate challenges. The conditions are primed for further progress by the sector in response and contribution to these challenges.

Whilst the private sector will be the proof point of that progress, it is the partnership with Government that enables a shared examination of our national comparative advantages and challenges, co-design a development strategy, and collaborate to further improve conditions for growth and well-being. This refreshed Agritech Industry Transformation Plan is the next step in that process.

AgriTechNZ is pleased to have partnered with the Government's multi-agency, joined-up industry strategy, the Agritech Industry Transformation Plan. We have worked hard to engage and represent the many voices across our industry and will continue to do so.

In the industry, there is a growing sense of shared identity and connected prospects. We are a small and isolated market that can only thrive by embracing what it might mean to be a smart ecosystem. At AgriTechNZ we champion strengthening ecosystem citizenship behaviours which encourage and leverage collaborative approaches, collective action and indirect social exchanges (such as the behaviour of paying it forward and supporting the development of others in the industry). Across our Executive Council, Industry Reference Groups and AITP Industry Steering Group we witness individuals and their organisations leaning into the work that will benefit all.

We are confident in the aspiration to grow the contribution to New Zealand's economy to $8 billion by 2030. Perhaps more importantly, we are committed to the impact our agritech businesses can make globally and domestically to sustainable food production and environmental services. This isn't just an opportunity; it is a responsibility.

We are pleased with the start made in the Agritech Industry Transformation Plan to date, glad that the momentum will continue to build, and committed to the shared work that will be required to seed even greater progress.

Bridgit Hawkins
Chair of AgriTechNZ
Co-Chair, Agritech Industry Transformation Plan Steering Group

The ITP and the Agritech Industry

WHAT IS THE AGRITECH INDUSTRY TRANSFORMATION PLAN?

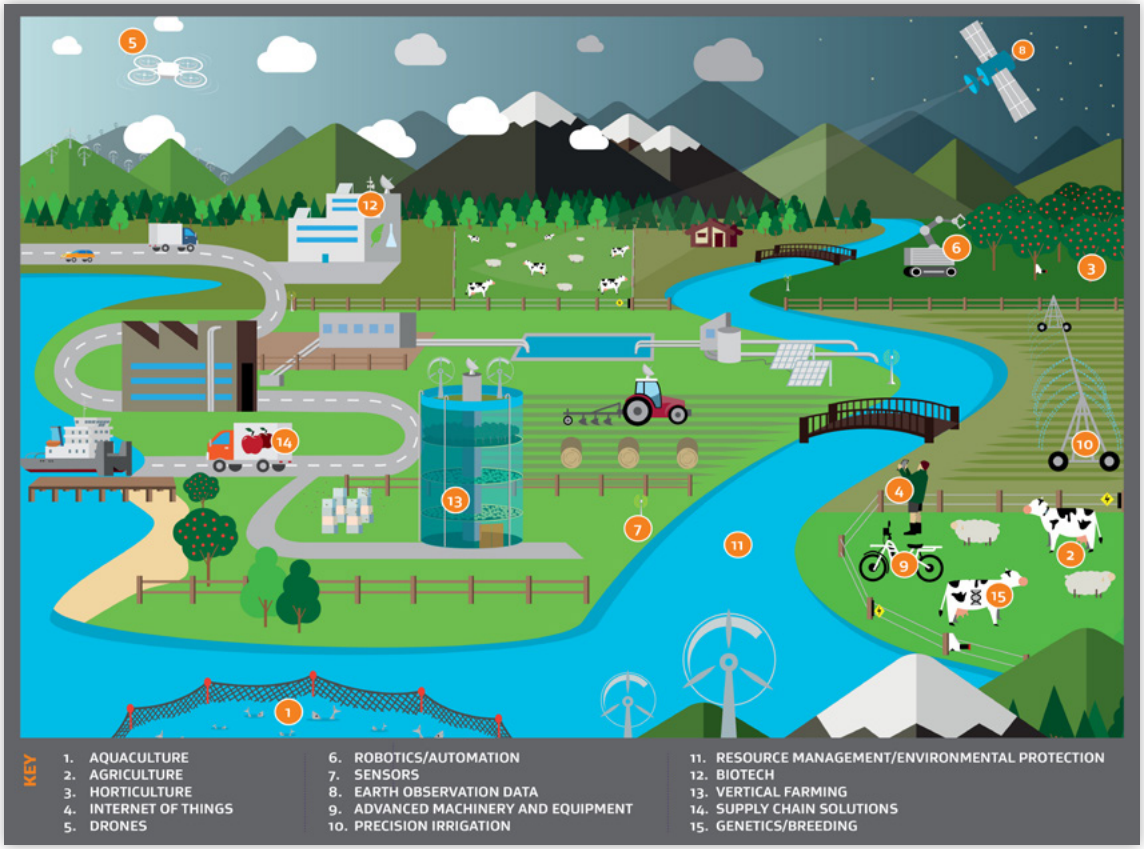
The Agritech Industry Transformation Plan (ITP) was launched in July 2020 and set out the steps that government and industry would take to accelerate the growth of New Zealand's agritech sector. New Zealand's agritech sector has historically been a significant contributor to increasing the sustainability and productivity of our food and fibre sectors. It is grounded in strong innovation and New Zealand's excellence in food and fibre production. The ITP seeks to grow the agritech sector into an economic driver in its own right. This builds on the opportunity presented by a high-value sector with a strong regional presence and potential for growth.

DEFINING AGRITECH:

We use the term 'agritech' broadly. For the purposes of this document, the 'agritech' sector refers to manufacturing, biotech, and digital-based technology companies that are creating product, service, intellectual property (IP) and value chain solutions for the agriculture, horticulture, aquaculture, apiculture, and seafood sectors[1], with the aim of improving yield, efficiency, profitability, sustainability, reliability, quality, or adding any other kind of value.

1 Forestry is excluded because forestry and wood processing is the focus of another dedicated ITP.

Figure 1 – Agritech's broad applicability



The ITP is now two years into its implementation. It is timely to refresh its intent and actions to ensure our efforts are correctly focused to support the agritech sector's growth as intended, and are clear to see and understand. This document is structured in the following way:

- Part 1 sets out the ITP's refreshed vision of the agritech sector and an overview of the first ITP's progress to date, including notable achievements and lessons learned.
- Part 2 confirms the ITP's refreshed plan for continuing the growth of the agritech sector by laying out the focus areas and actions under these key areas that government and industry will progress.
- Part 3 proposes a set of measures and indicators that will guide the evaluation of the ITP's implementation going forward.

This ITP is one of eight that have been launched under the Government's Industry Strategy. Each ITP aims to work in partnership between government, industries, unions, and Māori to lift the productivity and performance of those sectors. Each of these ITPs is separately developed and implemented, but is closely aligned across the broader programme of ITPs. Particularly relevant to the Agritech ITP are the ITPs working respectively with Advanced Manufacturing, Food and Beverage, Fisheries, and Digital Technologies. This is due to agritech's unique position in combining advanced technology and direct application into the food and fibres sectors. In refreshing the Agritech ITP, officials have worked to ensure close alignment, particularly with other relevant ITPs.

Through Budget 2020, the Government committed $11.4 million to support the Agritech ITP. This has been further supplemented by $5 million through Budget 2022, which ensures that the ITP's implementation is funded until the end of June 2024. To refresh this ITP, we engaged with a number of key stakeholders across the agritech ecosystem aiming to understand the sector's views on the ITP, its progress to date, and where they considered further action or focus is required. ■

A GLOBALLY-ORIENTED, SMART AGRITECH ECOSYSTEM

Transforming the agritech sector

The Agritech ITP was launched with the intention of scaling up the agritech sector, building on its existing high-value proposition, rather than fundamentally shifting the nature of the sector. This remains the case – the agritech sector's productivity and existing growth are already strong. The ITP seeks to unlock the sector's potential as an economic driver in its own right and to speed up this process.

To focus on what the ITP seeks to achieve and how, we have refined the ITP's vision and purpose in line with stakeholder feedback and government priorities:

VISION:

A globally recognised agritech sector creating solutions for a better world.

PURPOSE:

Accelerate the growth and success of the New Zealand agritech sector, growing its contribution to the New Zealand economy to $8 billion by 2030.[2]

The agritech sector's growth has continued in the past two years

While a comprehensive view of the sector is yet to come through the ITP's work on a comprehensive firm survey and data-matching work, a series of reports published by the Technology Investment Network (TIN) detail a number of statistics based on a limited number of the sector's firms. TIN profiles 131 of over 500 agritech firms in New Zealand, with detailed insights about the sector's larger firms. The 2022 Agritech Insights Report noted:

- The largest 22 agritech firms had combined revenues of $1.6 billion, including exports of $814.9 million. This builds off a 5-year compound annual growth rate of 14.6 percent. These firms employed 5,389 people, with 3,910 employees in New Zealand. Employees have average wages of $94,956 per annum and produce average revenue per person of $296,197.
- The number of deals and total value of investment in the sector continues to grow, with 2021 seeing $15.4m of investment across 11 deals, compared to around $4-7m worth of deals from 2015-2020.
- The agritech sector is a strong contributor to our regional economic development. The Waikato region is home to the highest concentration of agritech companies, with over $1 billion of revenue. Most other large agritech companies are in Tauranga and Auckland, but there is a strong pipeline of earlier stage companies found across all regions.

A globally focused domestically connected sector for the benefit of New Zealand

In refreshing the ITP, we have heard clearly from stakeholders that our aim should be for global recognition and collaboration, rather than competition. In realising this aim we should continue the close connections between our agritech sector and food and fibre industry. This decision recognises that New Zealand's agritech sector will ultimately be small in the global context but can provide world-leading solutions to the issues of the food and fibre industry, while delivering high-value work across New Zealand. It further recognises that our path to success will be through collaboration – both within New Zealand's agritech sector and with its international partners. Finally, this shift recognises that the path to growth for the agritech sector must be rooted in a strong mutually beneficial relationship with our food and fibre sectors intertwined with a global focus.

2 This builds off a current estimated agritech sector of $2-3 billion. The assumptions for this estimate are set out below in **Measuring the agritech sector**.

The ITP aims to develop a smart agritech innovation ecosystem that attracts international attention and investment. This means moving towards reduced duplication of efforts across the sector, and further that the sector collaborates strategically, rather than competes internally, for its overall benefit. Collaborating with international partners will be key to ensure the international success that we have outlined as important to the sector's overall success.

A key contributor to this aim, and a driver for investment interest, is for New Zealand to be a test-bed for developing and trialling agritech with clear pathways to customer acquisition and scaled deployment.

The ITP's vision is domestically rooted and globally oriented. To be an internationally successful sector, the agritech sector needs to target international opportunities for global relevance. In turn, the agritech sector's increased scale and global relevance will benefit Aotearoa New Zealand's food and fibre sectors either directly, because agritech solutions are developed and trialled in New Zealand in partnership with these industries or indirectly, as export opportunities adapt in turn for domestic use if a thriving agritech sector exists.

Without global relevance, our agritech sector would be limited to adapting international solutions rather than creating new ones. To create world-leading agritech solutions, our agritech sector must look to globally relevant issues with market demands that enables scaling.

This international focus entails being a global sector – meaning that investment will come from domestic and international sources. In growing the agritech sector, the ITP must build a compelling case for agritech businesses to develop, scale and remain connected to New Zealand. This will ensure the benefits of our agritech industry's growth are retained here. This will be achieved through building on our comparative advantage of off-seasonality to major markets in the Northern Hemisphere and developing a smart innovation ecosystem. This includes pull-factors such as proximity, access, and connection to New Zealand farmers and growers willing to trial technology, broader testing facilities to develop and progress agritech solutions, the sector's connections to the research, science, and innovation system, and the availability of skilled labour.

The relationship between agritech and the primary industries

New Zealand's agritech and primary industries are symbiotically linked through shared aims, interests, and challenges. New Zealand's agritech expertise is rooted in our strong food and fibres sectors and the agritech sector's proximity to them. This is a recognised comparative advantage that the sector trades on internationally and therefore must continue fostering. Both sectors are faced with the difficult task of servicing international markets from a globally isolated position – collaboration within and between the sectors will better enable them to compete globally.

New Zealand's and the world's food and fibre sectors face significant challenges such as adapting to climate change, increasing demand for demonstrated environmentally sustainable food and fibre products, reducing emissions and water inputs while increasing outputs, labour supply uncertainty, and increasing regulatory requirements. In order to lead the world in meeting and overcoming these challenges, our food and fibre sectors need a strong agritech sector to create and scale solutions, developed in New Zealand and scaled in the global market. A globally relevant agritech sector will therefore enable New Zealand to contribute solutions to domestic and global food and fibre challenges, creating mutual benefit to both the growing agritech sector and the food and fibre sector being provided with solutions to its key challenges.

Agritech has the unique opportunity of providing solutions that concurrently improve productivity and sustainability. It can create solutions to increase food and fibre output with reduced environmental inputs. This value proposition places the agritech sector at the heart of how we can think about the relationship between productivity and sustainability, particularly how our conception of productivity can be more holistic beyond just monetary considerations.

Growth in our agritech sector will benefit our food and fibre industries – through unlocking access to agritech they could otherwise not, and through reduced costs enabled by production of solutions at scale. The growth for New Zealand's food and fibres sectors, as set out in the *Fit for a Better World* roadmap, will be difficult to achieve without a world-leading and globally relevant agritech sector.

In particular, New Zealand's agritech will be key to addressing the challenges that climate change presents to our, and the world's, food and fibre sectors. This includes mitigation by reducing emissions, as well as adaptation to the effects of climate change. Through this contribution, the agritech sector has the potential for further significant spillover benefits to our economy.

THE ITP'S DELIVERY TO DATE

A focus and success of the ITP has been building a strong partnership with the agritech industry. We have also made progress towards distinguishing agritech as an industry and export sector in its own right, rather than only a service sector to our primary industries, building the sector's reputation domestically and internationally. Beyond this, the ITP has focused on better understanding the issues and opportunities facing the sector, then starting to pilot and explore solutions to these issues that can now be scaled up for further impact.

Farm2050 trials

Farm2050 is a global pilot for on-farm technologies to provide rigorous independently verified evidence for their efficacy. The ITP has funded Farm2050 trials through $850,000 of funding. These trials aim to identify, validate and demonstrate at scale promising disruptive technologies in nutrient management and water contamination, using a global approach to leverage year-round seasonality to speed up the process of proving technologies.

These trials are currently focused on pasture-based dairy in collaboration with agritech investors, farmers, researchers and start-up companies. Three New Zealand-based firms are participating in these trials: CropX, Pastoral Robotics, and Eko360.

These trials are an opportunity for New Zealand agritech to participate in international research activities as well as demonstrate our agritech capabilities to a global research, investment, and primary industry audience. Their aims are also highly relevant to New Zealand's environmental goals and provide opportunities to bring potentially world-leading solutions to market sooner for domestic New Zealand users. The ITP's investment in Farm2050 has allowed us to progress these trials relatively quickly.

Launched as a pilot in 2021 the NZ Trial Programme carried out an international call for applications followed by an expert committee selecting five start-ups (3 NZ and 2 US) to participate. Key criteria included the potential to have meaningful impact on nutrient management challenges and for the trials to add clear value to the company's development.

The Trial Programme is seeking to address key problems in the development of nutrient management technologies:

- Address the prohibitive costs for early-stage companies to access the high level of scientific resources required to complete robust multi-year trials.
- Attract internationally relevant technologies from other crops and farming systems to prioritise and focus on NZ's pastoral farming opportunity.
- Provide independent scientifically validated data that companies can use to help secure investment, partnerships and customers.
- The requirement that a full solution to the nutrient management problem will require numerous proven, easy to manage and implement, technologies to operate cohesively together.
- Connection to international trial opportunities that NZ companies can access to incorporate counter-seasonal trialling and international customer acquisition.

Finistere Aotearoa Fund

The ITP delivered a high impact project by launching the Finistere Aotearoa Fund in April 2021. Its value is up to NZ$40 million, with half each of this investment coming from New Zealand Growth Capital Partners (NZGCP) and Finistere Ventures. This work is part of NZGCP's Elevate Venture Fund aimed at filling the Series A and B capital gap in New Zealand.

The Finistere Aotearoa Fund has provided further investment options into New Zealand's agritech sector. The fund's full value will be of significant size relative to venture capital that is currently invested into agritech in New Zealand.[3] We consider there remains plenty more work to be done in improving the availability of suitable investment for the agritech sector.

ACCELERATING THE GROWTH AND CONNECTIONS OF THE HORTICULTURE TECHNOLOGY SECTOR

The Horticulture Technology Catalyst (the Catalyst) aims to develop New Zealand's horticulture technology sector to a high-growth, innovative industry cluster by increasing the sector's international connections, growing industry talent, and increasing collaboration and relationships across the horticulture sector.

The Catalyst seeks to address the issues that horticulture technology firms face in scaling up to be globally relevant. In particular, firms in our horticulture technology sector have a relatively small (compared to international markets) and fragmented horticulture industry to support. Therefore there are few opportunities for horticulture technology firms to achieve domestic scale (agglomerated sectors like kiwifruit being an exception). The Catalyst seeks to overcome this issue through building domestic alignment and access to international connections and partnerships, access to skilled labour, and the overall critical mass for New Zealand's horticulture technology sector to become a successful and self-sustaining sector.

Why focus on horticulture technology?

Horticulture is a significant and growing part of New Zealand's economy, having over doubled its export revenues since 2010. This growth is expected to continue and reflects global horticulture growth. The domestic and global market demand for horticulture technological innovations is therefore strong and increasing. Western Growers, a significant American horticulture player, aims to automate 50 percent of their horticulture harvesting by 2030.

This demand presents the opportunity to develop these technologies in New Zealand to simultaneously increase the size of our horticulture technology sector and benefit our domestic horticulture industry through close proximity to this technology sector.

While the Catalyst is currently proposed to focus on the horticulture technology sector, its focus could extend to either more subsectors of agritech or the entire sector. Focusing its efforts to horticulture technology initially will enable it to build the connections and momentum that are required for its success, before considering whether to extend its scope to other sectors for a broader impact.

Measuring the agritech sector

A challenge facing New Zealand's agritech sector is its measurement. There is no consistent measurement of the sector's firms and its contribution to the economy, directly through exports or indirectly through improvements to the primary sectors.

One estimate of the sector's exports placed these up to $1.2 billion, though this estimate should be treated with caution due to it relying on exports of agritech for pastoral farming. The Technology Investment Network (TIN) Agritech Insights Report 2022 noted that the sector's 22 largest firms alone had revenues of $1.6 billion, including exports of $814.9 million.

We estimate there are in excess of 500 agritech firms in New Zealand, and that the sector's true revenue is likely in the order of $2-3 billion.

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3 As noted above, the 2022 TIN Agritech Insights Report reported that in 2021, the agritech sector saw 11 deals worth a total of $15.4 million, which was a significant increase on previous years' investment levels

To improve our measurement of the sector, the ITP has:

- co-sponsored a series of three Agritech Insights Reports by TIN to provide a baseline source of data and profile for the largest firms in the sector; and
- published a taxonomy of the agritech sector and conducted a survey of agritech firms to collect a variety of information, with the aim of linking this survey into existing business data held by Stats NZ. This builds the foundations for consistent, robust, and ongoing measurement of the agritech sector.

Each of these projects provides a different view of the agritech sector's size and profile, improving our overall understanding of the sector. However, it is clear there is significant work left to do in growing our understanding of the agritech sector. We aim to publish deeper and broader Agritech sector data and analysis from the 2023 Agritech TIN report with baseline and additional key metrics to measure growth and other industry variables.

The NZ Agritech Story, Powered by Place

In support of the sector's identity and storytelling, the ITP has developed the NZ Agritech Story, *Powered by Place*. This is a resource that tells a compelling story of the New Zealand agritech sector for domestic and international audiences through collateral for use by the sector. The ITP's success in developing and using Powered by Place has been noted in international engagements beyond its target markets as an indicator of the ambition and unified approach of New Zealand in targeting international export opportunities for its agritech sector.

Improving business support for agritech companies

The ITP addresses a gap in the support government provides to businesses across their lifespan. In particular, the ITP has improved support for companies to scale up and internationalise earlier in their lifecycle.

Below are a few highlights of ITP initiatives. ■

NZ STORY UK ACTIVATION:

New Zealand Trade and Enterprise (NZTE) used *Powered by Place* in the United Kingdom (UK) in a campaign about New Zealand's innovative agritech companies. The campaign aimed to build awareness and preference for New Zealand agritech solutions in the UK.

The campaign featured content from 13 New Zealand companies. Videos and articles were structured around four content pillar themes: sustainability, efficiency, measurement, and animal productivity.

UK farmers were highly engaged with campaign content and NZTE was able to grow its database of farmer contacts by 43%. The number of farmers who associate NZ with agritech grew from 14% in 2021 in 21% in 2022, only behind the UK. Further, 57% of farmers agreed that New Zealand makes efficient products that help them get a production advantage – an increase of 40 percentage points.

The ITP is planning a second market activation for the UK in 2023 to convert the strong brand preference into commercial outcomes and sales for the involved companies. ■

LATAM ACCELERATOR PROGRAMME:

To support New Zealand agritech companies to scale quickly into international markets, the ITP ran a regional Accelerator programme for nine agritech companies targeting Latin America. The accelerator programme was delivered by Brazilian innovation agency AgTech Garage with support from NZTE's in-market team. The participating companies were provided with support through webinars, mentorships, and matchmaking. Key to the programme's success was AgTech Garage's network across investors, farmers, R&D institutes, universities, world leading multi-nationals, and strategic agribusiness partners throughout Latin America.

The programme showcased a potential model to approach international ecosystems and introduce companies into those environments, encouraging them to earlier consider international markets and paths into these. The programme benefitted from having a "boots-on-the-ground" in-market delivery team. This hands-on innovative approach also improved the in-market perception of New Zealand firms. ■

INTERNATIONAL SHOWCASES:

Callaghan Innovation and NZTE worked together in creating showcases for NZ agritech companies to interact with international experts. These showcases created introductions and opportunities for NZ agritech companies with leading grower groups in Australia, Latin America, and North America. This has enabled early-stage and scaling businesses to access a network of engaged growers for testing technology, with the ultimate aim to generate improved agritech sector R&D, product development, innovation, and commercial outcomes.

One New Zealand firm, Hectre, has commenced an on-orchard trial of its orchard management software with the large Chilean grower Copefrut, as a direct outcome of these showcases. ■

AGRITECH SUPPORT EXPLORER:

Businesses can find it challenging and complex to find the right funding and advice to support their growth. These supports can sit across a number of different organisations. Callaghan Innovation has launched the Agritech Support Explorer www.agritechsupportexplorer.govt.nz – to help businesses navigate the rapidly evolving funding and support landscape. The Explorer provides easy-to-access information, tailored to specific needs, in response to a few simple questions. ■

ACTION PLAN TO ACCELERATE THE AGRITECH SECTOR'S GROWTH

Context

The ITP aims to accelerate and enhance the agritech sector's growth. We expect that the sector will continue to grow in terms of its companies, but also through its ecosystem maturing, such as in an increase in the number and maturity of services, ancillary actors, funding mechanisms, and overall connections that support the agritech sector. Our aim through the ITP is to speed up this process and to more deliberately direct this growth in line with the aspirations of industry, Māori, and government. Our action plan is the mechanism to achieve this aim.

The refreshed ITP aims to build on our successes and progress to date and focus our efforts to achieve the greatest impact for the sector. In refreshing the ITP's action plan, we have moved away from a structure of workstreams with specific agency leads to focus areas with multiple responsible actors in each area. This recognises the cross-cutting nature of work across each focus area while better encouraging collaboration across the ITP's delivery partners. Our reshaped six focus areas for the refreshed ITP are:

- Enabling company growth by ensuring business capability services are provided consistently and well
- Building skills for diversity and growth and ensuring effective coordination between industry and the education sector
- Enabling a smart innovation ecosystem through collaboration that attracts international interest
- Increased Māori interests and participation that ensure Māori aspirations are realised
- Building a supporting and patient investment environment suited for agritech
- Increasing global connections for growth to build a globally connected sector.

This action plan lays out our current view of the ITP's actions until mid-2024. There may be shifts in priorities and different opportunities for effort or investment may arise over this time.

FOCUS AREA 1: ENABLING COMPANY GROWTH

Enabling companies to scale up quickly and successfully is a critical enabler for achieving the aims of the Agritech ITP. While New Zealand agritech firms have traditionally been strong in product creation and innovation, a step-change in the success of the sector will require a higher number of companies successfully exporting at scale. Success in globally-based company growth needs stronger dynamic business capabilities across the sector. This may include the understanding of IP, capital, talent, supply chains, market validation, manufacturing, channels to market, capacity, and how to scale up a business across all of these aspects.

The Agritech ITP will continue to grow business capabilities by continuing and expanding collaborative work across NZTE and Callaghan Innovation (and others as appropriate), addressing gaps in business capability support in the current environment. This includes:

- **Scale for Global Growth:** NZTE and Callaghan Innovation will work together to run further cohorts of a programme developed in the first phase of the ITP. The Scale for Global Growth programme aims to help New Zealand agritech companies think and scale globally earlier in their growth journey through a team of experts with strong experience in building and scaling globally successful businesses. This includes developing a full programme and a tailored modular approach.
- **Global Opportunities:** NZTE is working to ensure that New Zealand agritech firms are provided with the support that increases their awareness of and capability to seize opportunities in markets overseas, including tailoring their products to those markets. This awareness and capability is key to the growth of a globally-focused agritech sector.
- **International immersion programmes:** Callaghan Innovation will build opportunities for agritech firms to validate their products, build knowledge, and connect to early adopters overseas. These visits will be timed with international events.

- **Global Signals:** Callaghan Innovation will expand the Global Signals service designed under the ITP's first phase, which aims to help New Zealand agritech companies monitor and interpret early market signals. This will enable these companies to innovate ahead of the curve by predicting where market disruptions may occur or may be possible through their own innovation. This service includes a newsletter, workshops, and a tailored offering for more detailed support.
- **Agritech Support Explorer:** Callaghan Innovation have launched a tool to help agritech companies navigate over 130 private and public funding and support mechanisms offered in New Zealand. This website will be maintained and updated to ensure timely and correct information.

FOCUS AREA 2: BUILDING SKILLS FOR DIVERSITY AND GROWTH

The agritech sector requires a unique overlap of skillsets: technical skills such as engineering, data science, and software coding, but also an ability to understand and apply these skills in the context of the biological systems that the agritech sector works on. These technical skills are in strong demand across the world.

While agritech can face the difficulty of finding specialised workers with skills across technical areas (e.g., engineering, data science) and farming/biological systems, it also presents the opportunity to find workers from either area and provide applied learning to teach them the other skills required. We are seeing encouraging developments in the tertiary sector responding to demand for agritech-specific skills, such as through the University of Otago's newly provided Agriculture Innovation major. However, more work is required to ensure the sector can access and develop the skills required for its growth.

In conducting this work, the ITP will work towards encouraging and increasing diversity and inclusion within the agritech sector. This will include taking account of existing work across government and industry, such as the Employment Strategy and its enabling Employment Action Plans, and work already underway through the Digital Technologies ITP in this area.

For the next phase, we are putting the focus on understanding skill needs to inform building a skill pipeline for the sector. This includes:

- **Understanding skill requirements and how to address these:** Across industry and government, the ITP will work to develop a strategic view of the agritech sector's future skill requirements and the opportunities, barriers, and challenges that the sector faces in accessing these skills. This may include the level of employees needed to support a sector of the size that the ITP aims to grow.
- **Collaborative industry approaches:** Encouraging and exploring collaboration between industry and educators, for example, to increase applied learning and the industry-readiness of workers coming through the tertiary education system through the work of the Workforce Development Councils (WDCs) or new tertiary degrees relevant to agritech.

FOCUS AREA 3: ENABLING A SMART INNOVATION ECOSYSTEM

A key enabler for the success of New Zealand's agritech sector will be its ability to work together as a smart innovation ecosystem. As outlined earlier, this means ensuring greater alignment across the sector to reduce duplication and that the sector collaborates strategically, rather than competes internally, for its overall benefit. Collaborating with international partners is also key to ensuring international success, and the sector's overall success.

The ITP aims to ensure New Zealand can seize its advantage of being a 'test-bed' for agritech development, through our counterseasonal position to the northern hemisphere. This counterseasonality creates the unique opportunity for agritech businesses and investors to double their growing and testing times. Capturing this advantage will require clear pathways from developing and trialling technologies, through to customer acquisition and scaled deployment domestically and internationally.

Concerted effort will be needed across several areas that contribute to our ecosystem, which are laid out below. Underpinning the ITP is collaboration and alignment across the sector – a key principle for the ITP to progress.

Improving collaboration across the agritech sector

Across the ITP's work, we will actively look for opportunities to encourage and strengthen collaboration, including:

- **Industry & Science Partnership Models:** Callaghan Innovation is working to encourage stronger connections and partnerships between industry and science sector participants, with the overarching goal of increasing the speed and relevance of commercialisation activities. This includes building on existing work with winegrowers and apple growers, as well as considering further sectors for acceleration.

Improving the underpinning infrastructure for the agritech sector

The agritech sector's growth must be enabled by the appropriate 'building blocks' to underpin it. This includes physical infrastructure (e.g., internet connectivity and research facilities) and soft infrastructure (e.g., human capital, institutions, and regulations). Through the ITP's implementation to date, we have identified two areas to speed up the development of agritech solutions:

- **Access to trialling and testing facilities:** The ITP will, taking account of lessons learned through our hosting of Farm 2050 nutrient trials, explore options to develop a broader programme of testing and trialling that increases the number and speed of agritech solutions. This could be through new or refocused funding and effort, targeted (e.g., for climate change-related technologies) or at a system level. This work will include examining international models such as 'smart farms' to trial technologies through strong connectivity and highly skilled staffing.
- **Market signals for the value of agritech solutions:** Investment in the development and testing of agritech solutions could be improved through clearer market signals on the need for and value of solutions. Effort and investment could be incentivised through clear information of what solutions end-users need and what they are willing to pay. In turn, this will provide investors with a clear view of the potential returns and market size for agritech solutions. The ITP will explore mechanisms to achieve this type of clear investment signaling, in conjunction with improving access to trialling and testing facilities for developing these solutions.

Beyond these two streams of work, the ITP will further explore options to improve the sector's underpinning infrastructure where projects could be strategically valuable. For example, this could include work on the connectivity of productive land to enable remote technologies or analysing existing data collection from satellite and on-farm technologies that could be better utilised across the system.

Inputting to Te Ara Paerangi – Future Pathways

Agritech companies are keen to see a stronger flow of IP and research out from the science system, as well as stronger consideration of global issues and needs in relevant research. These issues have been identified as key to the success of a globally-focused agritech sector. Ensuring that IP is commercialised will better enable returns on the investments of science in New Zealand, while also strengthening the investment propositions of agritech businesses. At the same time, ensuring that research and resulting IP is relevant to domestic and global issues will further support these outcomes.

The ITP will work with industry to ensure the agritech sector's views are accounted for through the ongoing review of New Zealand's science system, Te Ara Paerangi – Future Pathways. This will include coordinating across the broader programme of ITPs to ensure the views of innovative industries are accounted for more broadly.

Ensuring data interoperability in New Zealand's primary sector

There is a lack of data interoperability and data openness across agritech offerings, which limits uptake of agritech and can impede innovation. On top of this, regional and international inconsistency in measurement and reporting requirements also inhibits new agritech product development.

Government and industry are partnering through a range of projects to create the conditions for digital integration across the food and fibre sector. Our aspirational state is of an integrated digital food and fibre sector driven by single-capture, multi-use data that can be shared seamlessly and securely to protect our environment, increase our productivity, and strengthen our economy.

In practice, this will mean we will have created the conditions for a digital ecosystem in which a food and fibre producer can choose their preferred technology to manage their farm planning, and share it with their other chosen digital tools.

This work has included and will continue to build on:

- A Geospatial Interoperability Working Group which has developed minimum-viable-product specifications for farm boundaries, as well as on-farm hazards, planned versus actual activities such as fertiliser sprays, and land cover elements such forests and riparian planting
- A proof-of-concept project within the horticulture sector aimed at highlighting the barriers to and value of data sharing along the value chain
- Progressing work on enabling a digital identity framework through encrypted, verifiable credentials and decentralised identifiers
- A process to begin the standardisation of key farming data
- The scoping of Link Aotearoa, which will be a regularly-maintained and updated public repository of standardised farming data (to act as a guide to the agritech sector when developing products and solutions).

The Data Interoperability Working Group, a collaborative partnership between industry organisations, Crown Research Institutes and central and regional government, will continue to lead this work.

FOCUS AREA 4: INCREASED MĀORI INTERESTS AND PARTICIPATION

This focus area aims to ensure that the growth of the agritech sector is inclusive and sees benefit across all of New Zealand, with a particular focus on realising Māori aspirations. The Māori economy is strongly focused on the primary industries, so there is an opportunity and an obligation to ensure that the benefit of the agritech sector's growth is strongly felt in the sectors where Māori have significant interests.

In the immediate term, we are co-designing initiatives under this focus area with a Māori Advisory Group. In doing so, the ITP aims to bolster the roles of Māori as creators of agritech businesses, users of technology, and kaitiaki of whenua.

To enable this, the ITP will:

- Provide opportunities for Māori to participate in domestic and international events with a strong agritech focus, to increase their knowledge and connections.
- Increase opportunities for partnership between Māori agribusinesses and agritech businesses, and indigenous-to-indigenous ventures. Identify future-focused Māori agribusinesses and collectives interested in utilising technology and facilitate connections with domestic and international agritech businesses.
- Provide employment opportunities to encourage more Māori into agritech careers.
- Promoting Māori excellence in the agritech sector.

Developing a robust work programme will require ongoing discussions with a range of Māori stakeholders across the primary sector. This acknowledges the varied and different roles and perspectives that Māori play in relation to agritech, and our intention to reflect and weave in Māori aspirations from these different roles throughout the ITP's actions and outcomes.

Acknowledging the strong connection between Māori and their whenua, the Māori Economic Resilience Strategy recognises the Agritech ITP as an enabler of future economic prosperity, resilience and whānau wellbeing.

FOCUS AREA 5: BUILDING A SUPPORTING AND PATIENT INVESTMENT ENVIRONMENT

Where there are robust and investable propositions with scalable paths to market, investment for agritech companies can usually be found. However, some companies (such as those with higher up-front capital intensity and in particular, manufacturing companies) are less likely to find investment easily.

On the whole, there is a lack of 'patient' capital – that is, investment that expects returns over a longer timeframe than some venture capital may be comfortable with. Further, while investment may be available in the research, seed, and early stages, its settings may not necessarily be attuned to the growth of an internationally focused sector and supporting businesses through the commercialisation pipeline.

Attracting and retaining smart capital investment and capability to the New Zealand agritech ecosystem is critical to the establishment, growth, and longer-term sustainable success of our agritech companies. This will require New Zealand to continue developing and promoting high-quality investment opportunities for capital providers.

For this phase of the ITP, we are proposing several targeted actions to address specific gaps or opportunities in the investment landscape.

Harnessing the Business Growth Fund

In May 2022, the Government announced the investment of $100 million into a Business Growth Fund, aiming to help fill a gap in the capital market for small and medium sized enterprises (SMEs) that require growth capital not available through current market providers. This Fund will go some way to address the issue of patient capital that the agritech industry has identified. We therefore consider there is an opportunity to work with banks and other parts of government to ensure the settings of this Fund will work for and encourage the growth of the agritech industry.

Incentivising capital investment in New Zealand

The high cost of capital in New Zealand, particularly relative to the rest of the Organisation for Economic Co-operation and Development (OECD), has been identified as a barrier for investment into technologies and equipment through the Advanced Manufacturing and Food and Beverage ITPs. These high costs of capital reduce productive investment and capital stock because fewer investments will generate the required hurdle rate of return for businesses. This high cost of capital impacts the manufacturing-based agritech businesses, particularly at their early and scale-up stages.

Incentivising capital investment is noted as being key to the growth of a number of innovative and productive industries in New Zealand, such as agritech and manufacturing. In recognition of this issue, government is developing advice across the programme of ITPs to explore options in incentivising greater capital investment across a number of sectors.

Assessing the settings of institutional investments

Government makes significant investments into a variety of early-stage, research, and development areas that are highly relevant to agritech, such through the Ministry for Primary Industries' (MPI) Sustainable Food and Fibres Futures (SFF Futures) and science investment funds held by the Ministry of Business, Innovation and Employment (MBIE). Industry has affirmed that, compared internationally, government support for many early-stage research and development activities is strong, particularly for activities related to the primary industries.

However, the settings of some funding sources have been noted as potentially restraining growth for a globally oriented agritech sector. In particular, these funds tend to assess investments through a lens of 'benefit to New Zealand' that may be limited to direct benefits to domestic food and fibre sectors, rather than a broader consideration of economic benefit (such as jobs and exports in the agritech industry). These settings may also prevent growth in agritech focused on sectors that are small in New Zealand but large globally (e.g., wheat and citrus). To ensure that New Zealand is able to capture the maximum benefit from its investments in this area, the ITP will explore options to progress reviewing criteria in relevant funds with a broader, more holistic definition of "benefit to New Zealand" in mind.

In this work, it should be noted that total public good will still drive what benefit looks like. This means that while the ITP acknowledges and encourages the role of international connectivity and exporting, the ITP's focus is on growing a flourishing agritech sector in New Zealand, rather than seeing the ultimate benefits of this support be felt overseas.

Investment attraction

While the overall availability for investment in the agritech sector is deemed good by companies and investors (given the right investable proposition), we must continue an active role in attracting investment. This is particularly the case for 'smart' capital that will benefit the sector through talent and international connections. The ITP work will be in alignment with and support the overall NZ Inc direction outlined in the Investment Attraction Strategy led by MBIE. The ITP will explore the development of joint actions under the ITP and the Investment Action Strategy, such as for a feasibility study for company-to-company or greenfields investment into New Zealand's agritech sector.

FOCUS AREA 6: INCREASING GLOBAL CONNECTIONS FOR GROWTH

A global outlook is key to the growth and success of New Zealand's agritech sector. The ITP ultimately aims to grow the agritech sector and the companies that it comprises. This growth will be constrained without awareness of and capability to understand the international opportunities for exporting agritech at scale, as well as the connections that allow companies to seize upon these opportunities. These connections and the broader understanding of international markets that they bring are needed to ensure that the products being developed by our agritech firms are fit-for-purpose for the markets that they are targeting.

With international travel resuming, the ITP has already sent missions to Australia for Hort Connections and WineTech, and to the UK and Ireland to attend the National Ploughing Championships and the Agritech Summit in London. This focus area further builds on the ITP's progress to continue building international connections. We are also building global connections through major events in New Zealand – such as by supporting the Oceania 2035 Agri-Food Tech Summit and the National Fieldays.

Our actions for this phase of the ITP builds off our work to date:

- NZTE will further activate the NZ Agritech Story in the UK in a more extensive campaign, building on their 2021 UK Story Activation Campaign.
- The ITP will support a limited number of high-value international events and/or the attendance of events by New Zealand agritech firms.
- The ITP aims to continue to test and expand new and more deliberate ways of connecting New Zealand agritech firms and innovative international partners. This includes supporting NZTE to build and maintain international partnerships for the sector, and ensuring greater coordination across NZ Inc.
- NZTE will run a further accelerator programme for New Zealand agritech firms, building on their previous experience with Hatch and AgTech Garage, to help companies identify international markets, build robust value propositions, and find international mentors in support of their aspirations.

Trans-Tasman and other international collaborations

There is a significant opportunity to collaborate more strongly across the New Zealand and Australian agritech sectors, recognising that each of Australia's and New Zealand's agritech sectors are relatively small, on a global scale, but recognised for strong innovation capabilities. By working together, the sectors can attract international recognition and investment to the region as a whole, rather than competing and risking the division of scarce international attention. The ITP will support this collaboration, such as through the Australia New Zealand Agritech Council established in 2019.

The ITP will further explore other opportunities for international collaboration for example, with the UK, enabled by the recently ratified NZ-UK Free Trade Agreement. ■

Measuring the ITP's progress

Our proposed outcomes framework

Feedback from stakeholders has been consistent that it should be clear exactly what the ITP is aimed at achieving and how we will measure this. As we note in Section 1, our measurement of the agritech sector has improved since the ITP's initial launch, but remains imperfect and subject to further work.

Below, we lay out our aspirations for the agritech sector, acting as outcomes of the ITP. Underneath each aspiration, we have a set of indicators to measure these outcomes. As we grow our understanding of the sector, we will better understand what measurement is possible, available, needs to be changed, or does not currently exist. ■

OUTCOME

A flourishing system of agritech companies starting, growing, and scaling up, with overall growth in sector revenues and exports

- Continued year-on-year growth in company revenues
- Continued growth in exports
- An increase in the number, and size, of companies in the sector
- Increased productivity within the agritech sector
- Increased productivity and sustainability in the primary sector, from using agritech.

OUTCOME

A diverse agritech workforce that easily fills high-paying and high-value jobs, which enables company growth

- Increased number of jobs (continued or greater year-on-year growth)
- Maintained or increased average wages (as these are already high)
- Qualitative improvements in the connections between the tertiary sector and the agritech industry
- Increased diversity and inclusion in the agritech sector.

OUTCOME
A smart and highly connected ecosystem

- Increased domestic collaboration
- Reduced duplication and increased alignment of efforts across the ecosystem.

OUTCOME
Strong underlying infrastructure that enables a successful sector

- Increased IP transfer from the RSI system into agritech companies, and therefore a higher level of IP ownership in agritech companies
- Improved connectivity of productive land, enabling the testing and use of agritech across New Zealand
- An increase in the number and availability of 'smart farms' that enable the testing of agritech solutions.

OUTCOME
Māori have strong and holistic participation in the agritech sector, have their aspirations for the sector realised, and benefit from the sector directly and in their primary sector interests

- Benefits for Māori land through the use of agritech, for example through unlocking otherwise unproductive land, by increasing overall productivity, or increased resilience in the face of climate change
- Higher levels of Māori participation at all levels in the agritech sector.

OUTCOME
The agritech investment landscape is comprised of a deep and diverse set of offerings that enables and encourages agritech companies to start up, scale, and expand

- A higher number of investment deals
- Higher overall investment figures (total size of deals)
- Increased average deal size
- Increased number/types of 'smart capital' investors for the sector.

OUTCOME
The agritech sector is highly aware of international markets, attuned to opportunities in these markets, and able to execute on seizing these opportunities, enabled by cohesive government support

- More international agritech connections and collaborations
- Improvements in the tailoring of agritech products for international markets.

Te Kāwanatanga o Aotearoa
New Zealand Government

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