

Green Paper submission – Grasslanz Technology Ltd and AgResearch commercial

Executive summary

- Value creation and impact from R&D investment is created by the quality and mindset of the people involved.
- Quality and mindset are easily influenced by the environment in which people function.
- Currently New Zealand's R&D organisations are being run and managed by non-scientists - this is wrong and will never deliver the best from our science system.
- New Zealand needs leaders of our research institutes that are high-calibre principal scientists; respected and trusted and who can ensure the scarce R&D dollars are invested into the most appropriate capabilities to deliver against national economic, environmental, and societal goals.
- Impact from R&D investment must include commercial delivery and uptake if we want to see better outcomes achieved
- CRIs have few successful commercialisation examples, some one-offs but few that provide a sustained pathway
- The limited examples of closing the gap – also known as the 'valley of death' – which have facilitated greater interest and involvement from the private sector enabling a greater number of scientific discoveries to be commercialised needs to be expanded and championed.

Background

Grasslanz Technology Ltd is a wholly owned subsidiary of AgResearch. Grasslanz Technology is a plant and microbial technology provider. Grasslanz products are proprietary technologies traditionally delivered through seed (although this is changing) and end users are farmers. Grasslanz works with both a national and an international network of investors and research organisations to develop innovative new products. Grasslanz establishes alliances with companies to commercialise our products. Grassland also works closely with the AgResearch Commercialisation Manager and Programme and Partnership Managers to ensure a coordinated approach to commercialisation of technologies.

Shareholder intent for Grasslanz is to ensure that –

- (1) benefit is delivered to New Zealand through acquiring leading edge plant technologies for New Zealand farmers; and
- (2) the company is financially viable and delivers a profit.

Impact and commercialisation

The aim of the Green Paper is to create a modern, future-focussed research system for New Zealand, that is adaptable for a rapidly changing future, resilient to changes, and connected; to itself, to industry, to public sector users of research, and internationally. Such a system should reflect New Zealand's unique opportunities and challenges. An underlying message is the need to increase impact from the nation's investment in R&D. However, questions about how that might occur are largely ignored. The document focuses more on structure rather than on purpose and delivery – there are sections on priority setting, funding, institutions, workforce, infrastructure and mātauranga Māori, but nothing on how R&D investment can be used to make a difference to the nation's productivity, environment, or society. One questions whether this Green Paper exercise is more about 'shifting the deck chairs' yet again, rather than getting a better boat.

One significant way to ensure impact is to have an effective commercialisation pathway which encourages R&D and provides the skills required to ensure outputs from that R&D investment are delivered to those that can use them resulting in improved outcomes.

Addressing market failure

Government funding of R&D should primarily be aimed at priorities where there is market failure. This would mostly include H2 and H3 research but also H1 research which is ready for delivery but needs to negotiate the so called 'valley of death' to become a commercial reality. Commercial delivery of applied research to improve economic, social and environmental outcomes has been poorly managed and coordinated both within and across research entities, with one or two notable exceptions. A licensing model has been effective in delivering plants (cultivars) and microbial (bioprotectants) technologies in both the horticultural and pastoral sectors. However, the licensing process and management has very different for these two sectors. On the one hand this has been carried out as an activity within the research entity and in the other through a stand-alone wholly owned subsidiary. The later provides increased flexibility, opportunities for leverage, and speed to delivery but does require the research entity to 'let go' of a revenue stream so that it can be focused solely for ongoing commercial delivery investment.

Commercialisation considerations

The Green Paper refers to the Government's pre-seed fund and technology incubator programme and enquires whether further scaling up is needed. Current pre-seed and technology incubator funding is very limited. The mixed model can be optimised by allocating greater funding to a purpose fund to support the transitional stage between a scientific finding or prototype into a minimal viable product (MVP) or solution that is market ready. Closing that gap – also known as the 'valley of death' – will facilitate greater interest and involvement from the private sector enabling a greater number of scientific discoveries to be commercialised.

There is an opportunity to bridge the valley of death with larger and more targeted pre-seed funding for national priorities such as methane emissions reduction and climate

change adaptation. Picking the top 3 to 5 technologies and accelerating these with urgency and focus will give New Zealand a greater chance of halving its net greenhouse gas emissions by 50% by 2030.

Innovation Australia has established a \$2b commercialisation fund to bridge the “valley of death” to help early-stage research transition into commercial ventures. There are some useful ideas to consider from Innovation Australia’s commercialisation approach. An initiative to involve large national and international companies in commercialisation through a structured partnership model which can help to “pull” technologies into the market should also be considered. One such example is the US Plug and Play Tech Centre - www.plugandplaytechcenter.com.

In some cases, industry has not established the infrastructure or absorptive capacity for new product development or technology deployment e.g., green hydrogen technology. These are the types of market segment failures that institutions need to lead or co-lead with industry and push to pre-commercial readiness for industry to then lead. Tech transfer is often a slow, sophisticated burn and inevitably costs more and takes longer than expected. Too many technologies end up in the valley of death while industry weighs up the risks and costs and institutions struggle to bootstrap funding and, in some cases, maintain viable patent life.

In terms of workforce considerations, skill balance and ensuring NZ institutions have the micro and focused skills we need are critically important. We need a model for immigration that allows for migration and temporary workers with the right skills as we need them. For example, there is a scarcity of software engineers and systems integration specialists who can build systems to deploy in processing plants or in the field for precision farming.

The discussion document while recognising the need for R&D investment to make a meaningful and lasting impact does not address the methods of ‘cementing’ R&D outputs into permanent gains for society, the environment and the economy. The document talks about setting R&D priorities, methods of funding, and infrastructural issues but fails miserably to seek advice on how impact can be captured and delivered. Connections to industry are mentioned but never explored despite the fact that non-government investment in R&D is woefully below the average for OECD countries.

If there were to be a merging of CRIs then a possible model for improving impacts through commercial delivery of science discoveries and benefits would be through a centralised commercial ‘wing’ which then establishes joint ventures as P&FR has done with Zespri, and AgResearch/Grasslanz has done with PGG Wrightson Seeds in creating Grasslands Innovation Ltd and the unincorporated Endophyte Innovation; or start-ups such as Grasslanz has considered with Biopesticide NewCo. An important consideration here is to not create yet another bureaucracy, with excessive overhead costs, that coordinates these activities – whatever is created needs to be streamlined and focus on delivery and impact.

Leadership for success

New Zealand’s R&D community desperately requires visionary leadership which, with an eye to future, needs listens to both the scientist and society. Improving the impact

of New Zealand’s R&D investment will not be improved simply by changing structures and funding models but rather by the right people understanding the need and directing science to deliver against national priorities. It is the people that make the difference not the processes. Currently, the best scientists spend too much time applying for funding rather than delivering world class research that makes a lasting difference. Research has become prescribed, delivering to milestones (generally in the form of reports) but lacking inspiration and flexibility, and always with one eye on how to apply for the next tranche of funding to maintain employment. Scientists in our public research institutions need to be freed of the fear of losing their jobs if and when the funding runs out. That however does not mean that research institutions should be given large sums of funding for them to then set up their own application processes – simply shifting a national ‘lolly scramble’ for funding to an in-house process which can be equally frustrating and ineffective. Leading scientists directing science, while anathema to most government bureaucrats, is required but has been missing for over 25 years, to the nation’s detriment.

Influence of political drivers – past road maps that have been constructed

Politics must also be removed from setting R&D priorities. Nearly 5 years ago a Primary Sector Science Roadmap (Figure 1) was proposed through discussion between MPI and the science community. However, a change of government meant the ‘not invented here’ syndrome came into play, and it was relegated to the scrap heap and in time replaced with “Fit for a better world’ (Figure 2). Are either of these documents suitable for setting R&D priorities and direction? Have they been used for that purpose by government, research institutes or funding bodies?

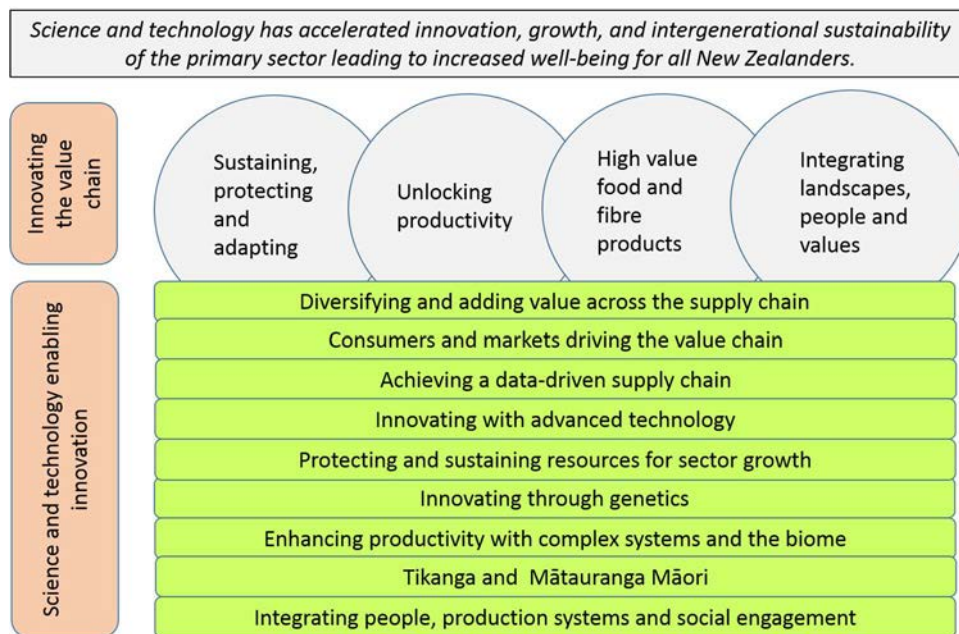


Figure 1. A direction for the future – the key areas of science needed to support, protect and grow the primary sector

This roadmap is designed to achieve, within a decade, ambitious targets for a more productive, sustainable and inclusive economy

Our primary sectors can lead across the three pillars of New Zealand's economic recovery to achieve these ambitious targets:



Productivity:

Add **\$44 billion** in export earnings over the next decade via a focus on creating value and building off the strong position of our core sectors.



Sustainability:

Play our part in New Zealand's journey to a low emissions economy, by reducing biogenic methane to **24–47 percent below** 2017 levels by 2050, including to 10 percent below 2017 levels by 2030, and by restoring New Zealand's freshwater to a healthy state within a generation.



Inclusiveness:

Employ **10 percent more** Kiwis from **all** walks of life in the primary sector by 2030 and 10,000 more New Zealanders in the primary sector workforce over the next four years.

Figure 2 – Fit for a better world

Both of these constructs have value and a combination of both would possibly create a valuable document. However, it is just a document and in itself will not improve the impact of our science system. Value creation and impact is created by the quality and mindset of the people involved. Quality and mindset are easily influenced by the environment in which people function. Currently we have R&D organisations being run and managed by non-scientists – this must change. Science organisations should be science-led. Top administrators (for finances, IT, HR, government affairs, infrastructure, strategy), the majority now non-scientists, have become the "leaders" in our CRIs. This is wrong and will never deliver the best from our science system. We need leaders in our research institutes that are high-calibre principal scientists, who are respected and trusted and can ensure the scarce R&D dollars are invested into the most appropriate capabilities to deliver against national economic, environmental, and societal goals.

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4 March 2022