# Personnel submission by Dion Mundy to Te Ara Paerangi - Future Pathways Green Paper

Kia ora. I would like to start by acknowledging the opportunity to engage in this discussion process and to provide my insights and observations. I value the ability to contribute to the process of redesigning our science system as I understand that when the CRI's were formed staff had no input into the process. I have found this process both engaging and interesting and there are a number of people showing concern for both the system and the people who make up the current process.

## Section 1: Contact information

**Dion Mundy**
Senior Scientist

Plant & Food Research
Rangahau Ahumāra Kai

Privacy - 9(2)(a)

**W:** www.plantandfood.co.nz
The New Zealand Institute for Plant and Food Research Limited
http://orcid.org/0000-0003-3260-0820

**Postal Address:** Plant & Food Research
PO Box 845, Blenheim 7240, New Zealand
**Physical Address:** Plant & Food Research
85 Budge Street, Blenheim 7201, New Zealand

A smart green future.
Together.

## Section 2: Submitter information

I have 24 years of experience working within Plant and Food Research and its predecessor HortResearch. I have also had exposure to the New Zealand Science sector when my family planted grapes and blackcurrants in 1978 following MAF's detection of potatoes cyst nematode in the main crop of my family's market gardening operation. At the same time what was then known as Lincoln College was investigating grapes as a new crop for the region. Last November Lincoln University celebrated 50 years of grapes at the site and 25 years of a research winery for students and staff. This history of science

supporting new industries and providing growers with new options allowing them to compete internationally is a slow and critical process. When I joined HortResearch disease work on grapes was limited and it was seen as a "minor horticulture crop" bundled in with other fruits to secure funding. Today it is hard to measure the impact of science on the wine industry as so many of the research projects undertaken have become industry best practice. Many do not remember the old days of clean cultivated vines without cover crops, dense canopies with calendar spraying and the many other practices that have changed. It is with this context of a long and successful history of science supporting economic growth that I submit my suggestions and ideas on improving the system.

## Section 3: Research Priorities

1. While I agree it is beneficial to have a few things we all aim for and agree to fund long-term requiring considerable resourcing , setting these priorities needs to be a true joint discussion that is reviewed over time and does not result in continued swings and changes. The result being long term planning and long term funding which is aligned to long term science mahi.
2. However, my experience has shown we need to have the ability to do research for the greater good of New Zealand that may not be the current flavour of the month or indeed may be many years ahead of current needs. A balance between what is needed for New Zealand's best interests and what is needed for an individual researcher's personal growth and development may be one way to achieve this. A number of times I have had heard people talk about researchers needing 10% of the time just to sit and think in a CRI rather than a constant drive to be fully funded under the current companies model.
3. Currently we seem to have a lot of administration to set priorities but not a great mechanism to determine if we have managed to deliver on them or learn when we have or have not done so. Often the delivery is after the project has finished and researchers are then forced to follow the next research proposal. There is a lack of debriefing or opportunity to point out the things that could have been done better and this may affect the next funding bid.
4. When prioritisations swing, it can be hard for individuals to also swing and become totally different researchers. As pointed out earlier this does not seem to be coordinated at government level eg in the past we have had a swing away from doing soil science and people leaving science to

be a service station owner. Currently the swing seems to be away from H2 science which stops the pipeline from flowing to end users. We need a good mix and good balancing.

### Section 4: Te Tiriti, mātauranga Māori, and Māori aspirations

While I have little skill in this area I have two observations.

1. Engagement is required and should be part of a long-term relationship that is adequately resourced. If the science sector wants to honour Te Tiriti O Waitangi then both sides of the relationship need to be resourced in order to hold meetings, engage and form relationships. These relationships need to be resourced long-term, not on a contractual or one project at a time basis.
2. Our relationships with Māori are best built in the regions with local iwi. We should not expect Māori to have to travel to one of a few science hubs in main centres to engage with researchers about issues which are meaningful to them. While I agree experts may come from such places to become part of the team, they should be introduced by trusted locals and required to do great science which is of benefit to all.

### Section 5: Funding

Funding will continue to be the main way government can change the direction and pace of research in New Zealand. It is important to ensure any changes to the system have the desired affect and are not just reshuffling the cards or using different buzz words in research proposals. Here are some observations:

1. Regarding a base funding for research institutions:
   A) Any grant would need to be inflation adjusted to be effective or it will shrink over time.
   B) At University of California Davis and the USDA unit attached I have seen a two-tier system of researchers. Those with base funding and those who have short term contracts per project. These are not post docs but are often researchers that spend their life going from project to project within the system if and when funding is granted. They may be on only a one year contract even when the project is funded past that. Trying to buy a house or plan anything long-term becomes impossible. We have similar long-term short contract researchers in New Zealand universities and I do not want to see the same thing spread to our other research institutions.
   Pricing for industry projects could become very difficult if researchers are involved in one project with government agencies and then must

pay a premium to invest in further research not covered by base funding. This mechanism has the potential to drive research away from CRI's that were originally set up to bridge the gap between pure academic research within universities and Industry need. We need that bridge of good science ensure to New Zealand industry is world-leading.

2. Funding cycles are short, highly competitive and wasteful. We cannot flip a switch and suddenly have 20 new fully trained experts in a subject that with any luck gets funded for five years but then has a total change of direction requiring new skills, experience and knowledge. Science takes time and so does developing people and relationships (both nationally and internationally). Relationship building and maintenance requires investment, time and resources from both parties. Exchanges between researchers are often developed by individuals as these are the people who hold the relationships. If we want to make sure that the New Zealand research and innovation system makes the most of international research and applies it for the good of New Zealand, these relationships need to have adequate investment.

## Section 6: Institutions

With regard to institutions I have a few suggestions:

1. Make sure the regions are represented. Many of our primary industries are regional and if we want industry to invest in research and innovation we need our researchers interacting with them on a local level so relationships and ideas develop that benefit both parties and New Zealand as a whole. The same logic holds for building relationships that allow a true mātauranga Māori co-design of science programmes as discussed above.
2. Joining things together does not always deliver promised efficiencies and cost savings. It also does not always remove completion but can instead take it from outside the institution to inside. IT systems and other infrastructure often does not talk to what was in place in each organisation and hence time, money and ongoing disruption can be the result as well as the feeling that staff are far from the people that are deciding how the institution is run. As a result of a need to keep teams small and effective, more layers of management are created often resulting in additional meetings and non-science time for people who were originally appointed for the research skills they could contribute to the organisation.

3. Having some balance of good public science and making some money is important for science organisations. If we could all just spend our time on whatever we wanted then the government funding lever would not have the ability to change focus. However, when the balance tips in favour of profit-making the risk is a short-term grab for cash is always the issue of the day and the underpinning work is not done to fill the pipeline for later need. The constant writing of client reports and not having the time or resources to publish is not great for career development and has led some to become consultants so that they might receive the money without the institutional over heads.
4. The Green paper talks about universities and CRIs but does not focus on the other regional research providers which are now under one umbrella - Te Pūkenga – New Zealand Institute of Skills and Technology. For all degree courses these institutes conduct research, are based in the regions with good connections with local iwi and make ideal hubs for aligned researchers. In Marlborough we have PFR, Nelson Marlborough Institute of Technology Ltd (NMIT) and New Zealand Winegrowers on campus, working together for the betterment of New Zealand. This is a hub model that could be used much more widely.
5. Large institutions that have skill centres and large capex investment to support regional interactions are important. Having some duplication in the system is also important. We have already seen the disruption to services as a result of events such as the Christchurch earthquakes and the closing of Auckland facilities during Covid lock downs. It is important to have good connections between these hubs and I consider the regions are the spokes enabling the wheels of research to turn.
6. Another important thing to remember when making any changes to the system or projects is succession planning and the potential loss of intuitional knowledge. Who holds the data and how? Are there guidelines on best practice so this can be in place at the start of a project? These need to be in place across the science sector. Such planning is especially important when dealing with the data of iwi.
7. Institutions are made up of people so no matter what is decided it is the people who will need to be considered if changes are to be successful.

**He aha te mea nui o te ao**
What is the most important thing in the world?
**He tangata, he tangata, he tangata**
It is the people, it is the people, it is the people
*Maori proverb*

## Section 7: Research workforce

A couple of ideas on our workforce

1. We need to equip our researchers to be out in our primary schools showing children that science can be a great career. When the child is inspired they are more likely to give the "hard" STEM subjects a go. Having judged science fairs for most of my time in Marlborough, the joy of questioning and exploring the world around them seems to get knocked out of the child once they get to high school and need to choose subjects that will get them a job. If students are good at biology then they are pushed to be a doctor or a vet, with little discussion on how they might have a job working with industry, research institutions, local or national government as researchers.
2. Universities could and should offer postgraduates a professional course if they plan to have a career in research. The skills of bid writing, project management, report writing, listening and engaging with clients, communication of science to the public or the press are essential. The forestry school at University of Canterbury produces students with a range of skills to work in the industry. We don't have a school of "researcher" that produces rounded students to survive the research environment.
3. One method to promote a career in research might be to allow researchers to maintain service records across institutions in the same way teachers have a record of service regardless of which schools they work in. If I could have worked in industry and returned to my job or even spend a year at a University on a project or upskilling without losing my entitlements I would likely be more flexible in collaborative interactions
4. We also need to hear the needs of industry. The wine industry has a lot of well-trained researchers that now work in industry and are good at feeding back to active researchers. The opportunity to gain insights and knowledge by working directly with the industry should be encouraged. However, currently if researchers move to industry they stop publishing. Coming back can be very hard to both get funding and apply the learning. It does not help that industry also often pays better without the need to continually look for funding.

## Section 8: Research infrastructure

1. It may be possible to have shared infrastructure and develop some truly international facilities in New Zealand. The important consideration is the

ongoing maintenance, governance and cost of administration for infrastructure. In the past, some facilities have been underutilised as researchers found it too expensive to have experiments run at spaces when you were from another organisation. Also issues with timing of use and deciding who gets to go first and who has to wait have arisen. A good long term capex plan is needed with some flexibility for urgent replacements or items that have become available and can quickly advance science delivery.

2. In the 24 years I have been a researcher, the capex limits in my company have not changed from "items over $2000 must come from CAPEX". I have been told this is an IRD figure that relates to how items accounted for. A very simple way to reduce paper work and time-wasting would be to increase this limit so items used in projects and budgeted for could be purchased. Currently I can spend 60k on sequencing but not buy a device to check the DNA quality which costs $2050 when I have the budget for both. A simple accounting change to allow for increased inflation pressure of equipment costs would also be useful.
3. Systems for infrastructure need to be fit for purpose, of a suitable scale and supportive of research leaving people with the time and energy to do their work. The current PFR CAPEX system generally works well and should be looked at as an example of what can be done.
4. Use of common platforms or technologies such as tools for GPS would be useful to allow better sharing of data and interactions. In the current age of large data sets, work between CRIs has been undertaken to provide data formatting systems but this could be extended to improve the ability of future users to benefit from data already collected. Data management needs to be well documented and resourced - not a tag on at the end of a project.

## Closing comments

We are all looking for a system that meets New Zealand's science needs both now and in the future. A system that contains and encourages diversity of people and ideas while working to provide all New Zealanders with a standard of living we can be proud of. The current system is old and the environment today's researchers work in has changed – hence a review is needed. Many of the systems in place have allowed great science to be done and the country has benefitted. I look forward to encouraging the next generation to see science as a career with a future. Again, I thank you for the opportunity to contribute to this

process. Real success will come from partnerships between all stakeholders in the betterment of our research and innovation sector.

I am more than happy to discuss any of the points or suggests raised here.

Yours faithfully Dion Mundy