

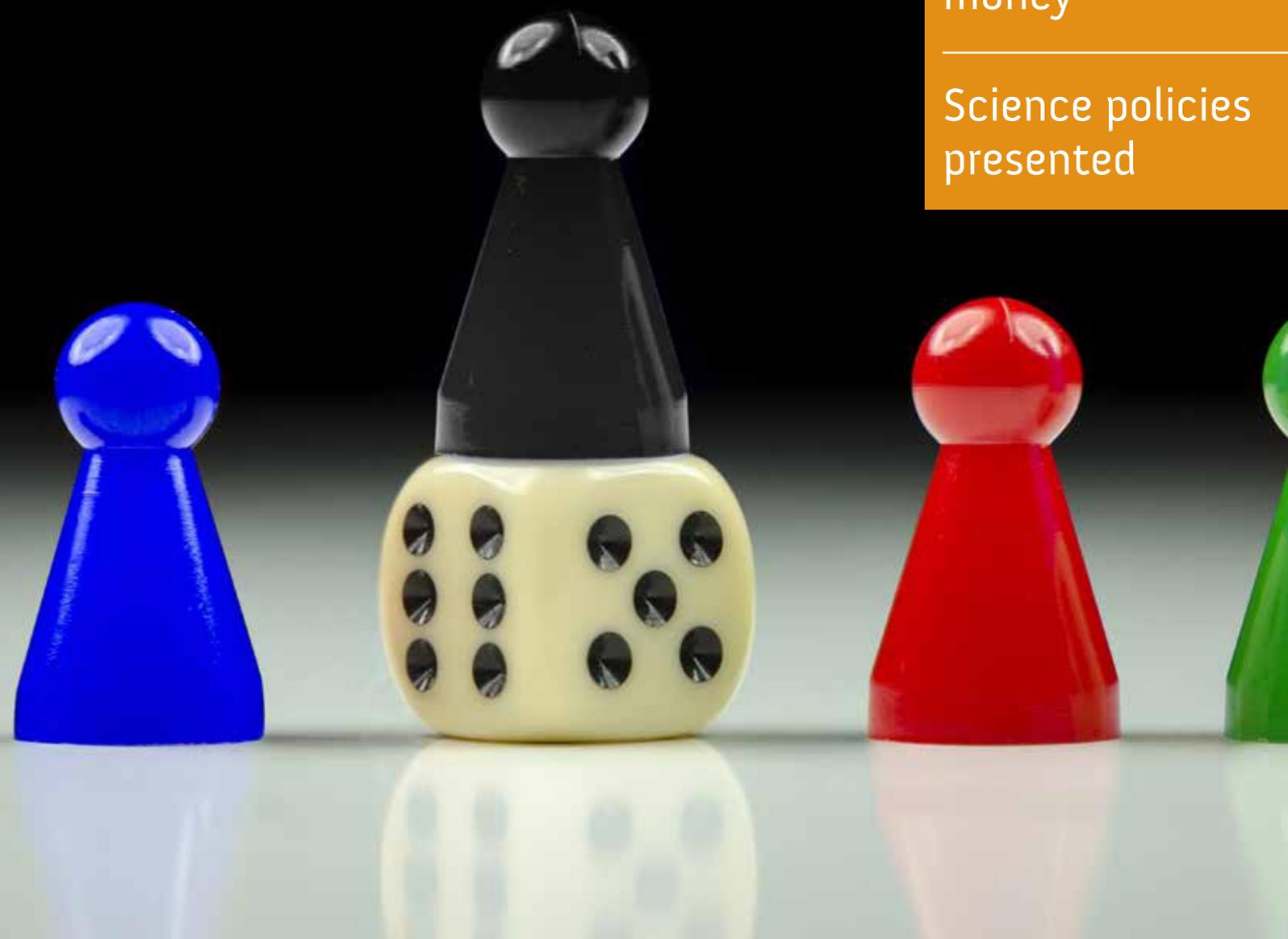
AgScience

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Notes from our retiring president

I AM PLEASED to report that the combined Canterbury Forum and Political Forum at Lincoln last month was a great success. The local branch pulled together a powerful line-up of speakers to address the topic of science in a post-truth era. I was encouraged to hear from Sir Peter Gluckman of the growing network of departmental science advisers embedded in policy-making agencies at many levels of government. All the speakers emphasised the value of robust science for decision-making in both the public and private sectors and expressed a desire for “more and better” data for decision-making, but we were reminded of the reality of science as a contributor to, not an arbiter of, decisions that must be made with (usually) imperfect knowledge. One troubling consequence of the post-modern paradigm appears to be that nobody is regarded as independent and objective. As a result there are now many layers of review processes within both suppliers and purchasers of research, no doubt escalating the overhead costs and chipping away at our historically very efficient research community. Of course the other key

hindrance to efficiency is the complex funding landscape, with high over-subscription and low success rates – this was a key question put to the politicians in the afternoon session.

The political forum was a lively exchange, as you might expect. Our representatives cannot seem to help themselves resorting to parliamentary banter, which I daresay does not endear them to a well-educated audience. I noted that Primary Industries Minister Nathan Guy commented on the importance of accountability to taxpayers to explain the current model of research management. The implication that our sector might be considered wasteful must be of concern to us. My overall impression was that the distinction between the major parties is stark, which in itself does not bode well for continuity in a sector that has to play the long game. For me, the big rocks that government policy needs to shift include:

1. Increasing the quantity and at the same time getting accurate data on private sector investment in research;
2. Simplifying the investment pool landscape

to regain researcher efficiency; and
 3. Stabilising the critical capabilities in public-sector science that can consistently deliver to public-good needs, respond to fast-emerging issues and ensure seamless capability succession.

I'd like to acknowledge the financial support of Plant and Food Research, Ravensdown, and the Bio-Protection CORE in backing the Institute to hold this combined forum, and also recognise the in-kind sponsorship of the Foundation for Arable Research to allow Anna Heslop to report on it in a timely fashion for the benefit of members. Thanks also to Jon Hickford and John Hampton for chairing the morning forum and to Stephen Goldson for mediating the political forum.

And with that, I sign off as your outgoing president and welcome Jill Stanley to the role. You will hear from her in the next *AgScience* introduction.

– Mike Dodd

Immediate Past President NZIAHS


POLITICAL FORUM

The New Zealand Institute of Agricultural and Horticultural Science put three key questions to political party representatives at the Forum at the Lincoln Event Centre last month. The answers – edited and condensed to meet the space constraints of our magazine – are reported on the next three pages.

The vexed matter of money

THE NZIAHS QUESTION:

Is it the best use of our scientists' skills having them spend so much time trying to obtain funds from a now very fragmented research funding system when the success rate is so low?

RICHARD PROSSER (NEW ZEALAND FIRST)

No, of course not – scientists should be involved in doing science. When you have a competitive environment for research and research dollars, inevitably you are going to have competition when what we really need to be fostering is collaboration. We need to have the best brains in the country working together towards the same goal rather than scrabbling against each other for crumbs from a pie that is too small to begin with.

EUGENIE SAGE (GREEN PARTY)

The redundancies and loss of about 80 jobs at AgResearch show what is wrong with our science funding system, when scientists are chasing grants all the time and priorities change. People who thought they had long-term careers in science suddenly were made redundant and a lot of scientific and technical expertise was lost from the organisation.

The Greens have some issues with Crown Research Institute structures, the way they primarily are commercially orientated, the difficulties in getting access to some research and the uncertainty this creates for the organisation.

There needs to be a significant increase in core funding for CRIs to provide stability of research and enable people to have secure longer-term careers. The Callaghan Fund is focussed on technological innovation and we need to get much more funding back into core funding of CRIs.

MEGAN WOODS (LABOUR PARTY)

Before I was a politician I worked at Crop & Food and Plant & Food Research and had to write the business cases for many competitive

funding applications. I say unequivocally no, this is not a good use of scientists' time. Stability of funding for the CRIs is critical so that the strategic science investments can be made for long-term science.

One of my concerns is the way quite a large proportion of core funding for CRIs has been mapped into the National Science Challenges. One of the great things I remember about core funding from working in a CRI was that we knew there was a place for new ideas and for new ideas to be funded and put within the strategic framework of both the industry and the institute for implementation. I am keen to look at the balance – I think the National Science Challenges have some really positive aspects but I want to check we haven't eaten away at the objective of ensuring the stability of funding.

We do need some competitive elements in the way we allocate research funding but we want to make sure we are getting the best science to examine the questions that are put up for researching. What we need is a science policy that has levers that drives collaboration so we are encouraging teams of people across institutions to put in joint applications for some of that funding.

NATHAN GUY (NATIONAL PARTY)

National has invested almost \$1.6 billion in science and I am delighted we are making this significant investment. A big part of it is focussed on the primary sector. I acknowledge those in this room are turning the primary sector wheels with science and making our economy go even faster and adding value.

In terms of the red tape, the bureaucracy and the demands of filling in applications to get your funding – well, as a Minister acting on behalf of taxpayers we want to ensure there is a rigorous process when people apply for government funding. If you have got ideas for streamlining the process while still ensuring the transparency and the accountability which is hugely important for taxpayers, then I am all ears. But it is the way of the world. 🗣️



Primary Industries Minister Nathan Guy calls for ideas on streamlining the accountability system.

PhDs and stable science careers

THE NZIAHS QUESTION:

How will you provide job security for specialists in nationally important science areas of agriculture (especially pastoral agriculture) in a highly competitive environment?

STEPHEN GOLDSON (CHAIR)

I would like to comment on this. There is a problem if you specialise. Getting a PhD in a highly specialised area can be risky if the jobs are insecure, so the question is what to do about it?



RICHARD PROSSER (NEW ZEALAND FIRST)

There are two aspects to this – one obviously is more money; the other is a more stable environment. We have a specific policy to increase government funding for research and development to 2% of GDP and to encourage business to match this through tax incentives.

To create an environment where people have stability of employment, the way the Crown Research Institutes are

arranged and a competitive model is not the optimum way forward. I don't know that going back to the old days of the DSIR is not the answer either, but perhaps there is some middle ground to take the benefits from both and put them together to form a larger nationally focussed science establishment where everybody is working collaboratively to the better good of New Zealand Inc, including the agriculture and horticulture sectors. This organisation would retain institutional knowledge because it allows good brains to work together and perhaps cross over between projects and disciplines. And people could call on experts from other areas of the scientific establishment without feeling they are giving away secrets, letting the team down or losing their competitive edge because there essentially wouldn't be a competitive edge.

We need a fresh look at how the science establishment is organised and structured and some of the priorities. It could result in an amalgamation but we must have a collaborative approach that gives stable and secure employment and enables people to work together. And more money should be put into it.

EUGENIE SAGE (GREEN PARTY)

I would be very interested in your feedback on whether a fundamental reform of the CRIs would achieve greater collaboration. The National Science Challenges are supposed to promote this. But reduced funding meant AgResearch people who were working on greenhouse gas research or on forage species were made redundant because innovative food products became a priority.

That is why core funding is critical for job security and stability. Government investment in core scientific research determines whether there is stability in jobs. Do we want a complete upheaval by completing re-casting the CRIs or can that model be amended to provide more funding certainty?



MEGAN WOOD (LABOUR PARTY)

One of the things Labour has identified in talking with people in the science community is the mid-career gap. There is still a need for more support at the post-doctoral level when people finish their degrees. We are committed to putting more funding into mid-career post-doctoral careers.

We also need a cultural shift to encourage people to embark on PhD's without thinking they will necessarily have an academic career in a university or a CRI. Working in industry should not be seen as a failed academic pathway for someone with a PhD. In Germany and other countries industry is more involved with students than here as they go through their doctoral studies. This is something we are looking at exploring because several of our industries could benefit from more inhouse scientific knowledge and people with academic expertise.

Another issue relates to people around 18 or 19 who are enrolling for undergraduate courses and making decisions about their future pathways. How can they be encouraged into plant breeding, for example, where there are shortages of skilled people?



NATHAN GUY (NATIONAL PARTY)

I concur with many of Megan's comments. Lincoln's numbers have

been going up – you have about 1,500 graduates here involved in the primary sector in some way and your PhD student numbers are growing. But I don't think we should be too concerned if a PhD student heads off to work in industry.

We spent a long time working on the Primary Sector Science Roadmap. This shows the Government is investing \$428 million in the primary sector science base research and industry is investing around \$266 million – so this is a \$700 million investment across the primary sector. When you unpick this document, there is a lot of collaboration between government and industry, so I don't think we should be too alarmed if PhD students are snaffled up by industry. Ultimately this is great for New Zealand Inc. Attracting more people into the primary sector is one of the big challenges. ☒

Building the skills we need

THE NZIAHS QUESTION:

How will you work to improve the tertiary sector funding to focus on graduates who are skilled, willing to be employed in enduring careers and who will add value to New Zealand's rapidly changing land-based industries rather than focus on numbers of students?

RICHARD PROSSER (NEW ZEALAND FIRST)

Part of our tertiary education policy is to match the time students put into their learning with the debt system. If graduates stay and work in New Zealand in the field for which they have gained their qualifications, we will repay their student loan on a year-by-year basis. This will provide an incentive for people to study science and technology and remain in the country. Many of them will obviously become established and – if we have reorganised the sector to ensure long-term career prospects – they are far more likely to stay.

We are also looking at retaining and siting research institutes and facilities in areas where they need to be rather than relocating to major centres. And we would outsource and relocate other government departments to the regions, providing more critical mass for communities that might be considered too provincial from some people's perspective. This would make lifestyle and living options in areas where those institutes are based more attractive.

EUGENIE SAGE (GREEN PARTY)

We would restore postgraduate students' access to the student allowance which has been cut under this Government to ensure more students go on to do this work. More broadly, the question is about sustainability. We haven't had enough investment and focus from the Government to ensure our land, water and coastal sea management is sustainable. The Primary Growth Partnership has hundreds of millions of dollars but the Sustainable Farming Fund is only \$10 million annually. For agriculture to thrive, it must focus on adding value to the products we export and to reducing our greenhouse emissions and environmental footprint in terms of water quality. The Primary Growth Partnership must shift to research and on-farm work to improve or reduce our footprint. Only by making the 100% Pure New Zealand brand real and giving it integrity – as Ireland is doing with its Origin Green scheme – can we add value to our products and help lift wages to encourage people to stay here. So we have to focus much more on sustainability and put that first in the agri-food industry.

MEGAN WOODS (LABOUR PARTY)

When we were last in government we set up the Tertiary Education Commission to provide strategic advice to the Government on how best to fit tertiary education into meeting the wider needs of the economy and the country. It is not doing this now and needs an overhaul to restore it to do what it was meant to do and identify gaps and needs in education. Anticipating which workforce requirements will have to be met ties in with our work around the future of work, knowing that 65% of five-year-olds entering high school now will do a job that doesn't exist today.

We are a country of 4-5 million people with many universities. I am not advocating we get back to the University of New Zealand but I am advocating Centres of Excellence and specialisation and developing expertise in certain fields – particularly at the research and graduate level.

At the core of this question is that young people are making decisions about subjects far before they think about careers. We must

revolutionise the careers service in our schools and ensure young people are making decisions that will equip them for a very changed workforce where jobs available today cease to exist.

NATHAN GUY (NATIONAL PARTY)

A report we released two years ago, People Power, showed that about 350,000 people are currently employed in the primary sector. This will grow another 50,000 by 2025 which means government and industry must do more to promote the primary sector.

So what have we done? Across government we are much more connected than previously. The Ministry for Primary Industries, the Ministry of Education, the New Zealand Qualifications Authority are looped in, so across the whole of government we are more aligned and have a bit of a strategy that is starting to work in attracting our youngest and brightest into the primary sector. We've got 150 ambassadors, such as Dr William Rolleston who has been videoed with Sir David Fagan, Richie McCaw, Rob and Sonia Waddell – iconic New Zealanders who are going into classrooms and talking about the importance of the primary sector and their back story of hard work and getting ahead in life.

We are refreshing the documentation – a lot of it is now available online – so when a student walks into the careers adviser's office to express interest in the primary sector, the information is up-to-date and gets some buy-in and excites them.

I am also proud of the Government's ensuring tertiary subsidies are pitched towards agriculture and horticulture, because the numbers had softened a bit. 📌

Editor's Note:

The Government announced an increase in the Sustainability Farming Fund on September 11. Details are recorded in the AgScience blog (agscienceblog.wordpress.com).

What the parties plan for agricultural and horticultural science

Representatives from five political parties were invited to discuss their policies on agricultural and horticultural science at the Political Forum in Lincoln last month.

Here's an edited account of what they said...



NATHAN GUY
NATIONAL PARTY

THE GOVERNMENT IS investing \$1.6 billion in science across New Zealand, which will be about 1% of GDP at 2020. The challenge is to do more. In about 1984 we had 70 million sheep. Now we've got about 28 million. We are producing the same amount of sheep meat as we did when we had more than twice as many sheep thanks to science – animal genetics, plant genetics, animal husbandry. To anyone involved in science, particularly in agriculture whether it's pasture or animal genetics – well done for this achievement.

To take these products to market, we need free-trade access. Just this week (in mid-August) we were talking about 52% of our export products going to markets through free trade agreements. We have set a target of 90% by 2030. But many of the political parties here today are against TPP 11, which is worth about \$250 million a year. I'm proud National is one of the few political parties open to trade liberalisation from which money flows back into communities up and down the country and back inside the orchard and farm gates.

Thinking specifically about science, we are investing a huge amount in work to do with biological emissions. The Pastoral Greenhouse Gas Consortium located in Palmerston North is leading the world on this. And this government established the Global Research Alliance – 47 countries are now partnering with us. I'm trying to get a breakthrough on biological emissions from animals. It could be a bolus or a vaccine – those two are looking pretty good – or it might be animal or pasture genetics. But there is no way the National Party is going to throw our biological emissions and farmers into the Emissions Trading Scheme ahead of solutions from research because that will slow down the productive part of the New Zealand economy and make us less competitive internationally. That's why we are investing so heavily in science related to biological emissions.

I'm proud, too, of this Government's investment in water-storage projects because of its relevance to climate change. You store water in winter months and utilise it in summer months and I can't believe a water tax is being proposed. Labour should come out before the election and say exactly what the price of water would be under their policy.

Yes, we have environmental challenges. That's why we are investing in the National Science Challenges, Land and Water Science Challenges and in the Primary Growth Partnership, working with fertiliser companies to ensure we are using science in precision agriculture and applying nutrients at the right time and in the right place.

Finally, the Government has a policy to make New Zealand predator-free by 2050 and is making a big investment with industry in TB control aimed at ensuring our livestock are free of TB by 2026. New Zealand First wants to do away with 1080 poison funding but this would crucify the primary sector. We are investing \$60 million

a year in TB control, about \$24 million of this – 40% – invested by the Government. All industry players are signed up and playing their part as well in biosecurity to do with 1080.



MEGAN WOODS
LABOUR PARTY

LABOUR WOULD REINTRODUCE the R&D tax credit we introduced at the end of our last term in government and was scrapped by the Key Government before it could show its worth. We believe a tax credit scheme is critical for increasing private-sector investment in research and development. From my work experience with small- to medium-sized companies I know about the complexities and difficulties of applying for funds from a grant scheme. The immense benefits that R&D tax credits can bring include shifting the culture within businesses in favour of greater investment in R&D. That is something we need to do more of in this country.

We need to be aspirational in lifting the public science spend. It's not just about saying businesses should invest more; we also need to increase our public science spend to at least match the countries against which we measure ourselves.

Besides funding, some recommendations from the Crown Research Institute Taskforce have yet to be implemented. This certainly needs to be done. But for me the fundamental message from the taskforce report was the need to have more stability around funding for long-term strategic science decisions to be made. We must ensure policy is true to that intent and that we pursue that goal.

We also need to review the Performance Based Research Fund, which was meant to encourage a greater focus of academic institutions on research. Institutions must maintain a research focus but we must make sure the fund is fit for purpose. Experience overseas suggests there are only so many rounds we can do before the return becomes scant. And when you put a funding instrument in front of an incredibly smart workforce, they are bound to work out quickly how to game it.

Labour is absolutely committed to having an emphasis on science, technology, engineering and mathematics but if New Zealand is to be a truly innovative country, capable of capitalising on our great science, a wider focus is needed. The humanities and critical thinking can't be divorced from the science which will shape important and critical public policy on the issues we must address over the coming years and decades.

Labour puts a great store on science in addressing climate issues. We need to better understand the biological process of climate change and think about how we account for long-run versus short-run guesses. And we need to be thinking about sequestering carbon and the role played by our soils. Science, not policy expediency, must lead

these discussions. This is something we are absolutely committed to.

But science and research has other roles and knowledge for knowledge sake is still important. Blue skies research – the kind for which no business case can be written immediately – underpins many great innovations and we must allow the freedom to create knowledge without knowing where it is headed.



RICHARD PROSSER
NEW ZEALAND FIRST

NEW ZEALAND FIRST regards primary industries of paramount importance and are fully committed to maintaining past success and building on it.

We would end land sales to foreigners. Only people who are citizens or permanent residents would be allowed to purchase farm or residential land. We want to end foreign-owned vertical integration in primary industries and ensure value adding is done in this country rather than exporting unprocessed or barely processed commodities for value to be added elsewhere.

We want to review the Resource Management Act to boost the heartland. We have offered several times to sit down with the Government and talk through potential RMA reforms, provided race-based separatist aspects are removed.

On water we oppose any form of volumetric charge being applied to properly consented water takes. We hold that water is a Commons and belongs to no-one – every citizen has a joint and equal share in it. Access to the Commons must be without impost. The consenting process should enable people to apply for and take and use water, provided the use does not diminish the ability of others to exercise their right of access to it.

We would apply a royalty but only on water exported in the form of water.

To boost the rural infrastructure, we would investigate establishing a specific rural desk within the Ministry for Primary Industries or setting up a Department of Rural Affairs. Legislation and other matters with an effect across the country would be looked at from a specific rural perspective, including infrastructure, road, rail, internet, and power.

We would consider using Landcorp to investigate other models of share milking and share farming. Technology is resulting in fewer people farming bigger areas of ground, bringing the family farm under threat. Share farming might encourage young people into the industry and perhaps provide another pathway towards farm ownership.

We would look at reintroducing the farm cadet scheme along with other apprenticeships.

We want to refine the Recognised Seasonal Employer scheme, because seasonal workers are needed in most of the primary industries from time to time. We know we can't deploy everyone on the dole to primary-sector jobs because many of them are incapable of being re-trained. But thousands of people are capable and willing and can be trained. Helping them to be mobile so they can follow seasonal work through the country, without losing their home base, would benefit them and the industry and cost less than keeping them on the dole.

We would review monetary policy in terms of the way the dollar is regulated. Singapore maintains a managed float so the level of the currency is maintained to benefit exporters the most.

Overseer should be reviewed to see if it can be made fit for purpose across all land and soil types or usage sites. It is a nutrient-management tool that is being used as a regulatory tool, for which it was never designed. We are stuck with it but can improve it.

We would protect our world-class Land Use Capability farmland from development. Some areas – around Pukekohe for example – are the only places in the country where certain crops can be grown all year round. We can't afford to cover this land with concrete and tarmac and must find ways of allowing the growth of urban areas around this land without covering it. Otherwise we will lose food security and become reliant on imports.



EUGENIE SAGE
GREEN PARTY

A CORE FOCUS of the Green manifesto is on water, climate and sustainability, without which we will have no thriving primary sector in the longer term because brands which enable us to sell our food and fibre products overseas will be undermined. Consumers want to know the food they are buying is safe, produced by animals that are treated well, and does not come from an area where the environment is being degraded.

A major increase in the nitrate pollution of rivers and aquifers has resulted from the agricultural intensification that is being heightened by irrigation, particularly in Canterbury. Cleaning up our waterways needs much stronger investment in science and research. Riparian planting will reduce sediment inflows and phosphorus but does little to reduce nitrate contamination. We therefore need to invest much more in the research that makes us understand our natural systems.

Climate change has made the eastern South and North Island more prone to drought and resulted in more intense weather events and massive flooding. We need to better understand those natural hazards and their impact on the farming community and do more mapping so we are using land to grow the crops best suited to the land and microclimate.

Science obviously has a key role in better understanding our natural environment to reduce human impacts on it. Our science strategy calls for much more investment in ecosystem research, looking for benefits that nature provides but which GDP statistics don't recognise.

Improving the regulatory framework for water requires much stronger bottom-line limits. Scientists agreed on what those limits should be for the National Policy Statement on Freshwater, but they were changed by Environment Minister Nick Smith.

We need to act on climate change and meet our Paris Agreement commitments, which requires a better understanding of how we should change our emissions profile, particularly for biological emissions. Agriculture must be brought into the Emissions Trading Scheme. A two-basket approach would look at nitrous oxide, because of its much greater impacts, while continuing the research being done on methane without expecting science and research to provide silver-bullet technological solutions.

Climate change opens enormous opportunities to invest much more on public transport, making it easier to travel by bus and bike, and to send freight by rail.

Landcorp, as New Zealand's biggest farmer, has a key role to play by being a model farm for sustainability initiatives and the Government needs to get strategic about our cellular agricultural potential, producing moo-less milk and meat. *continued on page 8*



NICOLA GLENJARMAN
THE OPPORTUNITIES PARTY

WE DON'T HAVE direct policy about research and development but we do have two important policies around freshwater – polluter pays and a water market.

Polluters paying is not agriculture versus urban environment – it is everybody. The United Nations in the Rio Accord in 1992 was very clear in stating it was a government's responsibility to use policy as an instrument to reduce environmental problems and the policy should be focused on polluter pays.

Under our policy a national limit for nitrates would be set across the country. Limits below this could be set in catchments and sub-catchments in consultations involving local people, stakeholders and iwi, so communities could stick with the national limit or go below it. Breaching the limit would incur financial penalties; the equivalent money would be paid back to those who come under it. The purpose is to make land use fit for purpose, not to take money from the industry.

We would use Overseer to set the limit. It is a good but not perfect modelling programme so we would invest more than \$1 million in

getting it as far forward as possible.

Regarding the water market, we would not set an arbitrary price for water but commercial entities would pay for their water through a tender, as is done in the Murray-Darling Basin. This would be done at a catchment and regional level, so buyers on the West Coast might pay nothing for water but the price might be high in Canterbury during the dry season. The money raised would be put back into initiatives to improve the quality of our waterways.

But first, we would need to discuss ownership and find out who the water belongs to, then pay Maori for it if necessary.

With climate change, New Zealand hasn't internalised costs but has allowed carbon credits to be bought from the Ukraine and Russia. These are junk credits and we have basically given money to fraudsters. If we are going to have carbon credits, the system needs to be about New Zealand and internalised, so we want to see the replanting of eroded landscapes throughout the country. About a million hectares of this can be done, providing a future opportunity for our young people – they will have something to enjoy or to use as an economic bonus.

We base our plans on research and development and have spent years developing these policies. Science is important to us and we need you more now than ever. 🗳️

Questions from the floor bring funding, collaboration and GM under the microscope



QUESTION:

Since former Science Minister Simon Upton reformed the science system and proposed the initial investment, aspirationally rising to 0.8% of GDP, it has stubbornly stuck around an average of 0.55%. My question to the political party representatives is how much their investment in science and research would amount to in 2020 as a percentage of GDP?

NICOLA GLENJARMAN (THE OPPORTUNITY PARTY)

I can't put a dollar figure on it because many projects will pop up in relation to water and climate change that we would have to fund. But our party policies are based on evidence and scientists are the key.

RICHARD PROSSER (NEW ZEALAND FIRST)

I don't have a dollar figure either because I don't know what the GDP is going to be in 2020. But we do have a policy of increasing R&D funding to 2% of whatever GDP is and tax incentives to encourage business to match it, so provided the incentives are set right and industry picks them up, it will be 4%.

EUGENIE SAGE (GREEN PARTY)

We don't have a number in our policy. But initiatives such as a water tax would free up revenue to invest more in science and we need to make this investment to provide assistance with policy and with research-based solutions.

MEGAN WOODS (LABOUR PARTY)

We need to be benchmarking ourselves to OECD countries of similar size – Finland, Israel, Denmark, Singapore. Our calculations suggest our R&D tax credits would stimulate an extra \$1.5 billion worth of research and development. This would be a private-sector spend. But there is no doubt we must set a benchmark and work towards reaching it because we are not spending enough. I think 1% of GDP is probably about right and it needs to be benchmarked to a growing GDP.

NATHAN GUY (NATIONAL PARTY)

I have pulled off a graph from the Ministry of Business, Innovation and Employment's scientific projections to 2025. It indicates that at current spending we should be getting to 1% of GDP a bit before 2020. But in terms of the size of GDP at that time, no one quite knows the answer to that.

QUESTION:

I welcome the politicians talking about a more collaborative approach to science and asked how institutions would have to be changed to reflect this, after operating under a competitive system over the past 20 years. How are we going to change that to enable a collaborative model to work?

NICOLA GLENJARMAN (THE OPPORTUNITY PARTY)

Some strong collaborations are already going on. We would support them. Lincoln is a real Centre of Excellence and I believe this can happen with universities throughout the country. We've got agricultural and animal husbandry-based universities in the North Island and we need to be working together. This will reduce costs, once we all are working in the same direction and in the same way. Stakeholders need to be involved and the farming community needs to work with our scientists to produce the best science-based evidence, and those projects are also happening, especially here in Canterbury.

RICHARD PROSSER (NEW ZEALAND FIRST)

I don't think it would be too difficult if we start with a review and a philosophy that says we want scientists doing science rather than anything else. A culture built up over 20 years has focused on the financial competitive model. We should start by saying we want to have something that is outcome based. I'm not sure of the structure needed to achieve this but we should look at what has worked well in the past and have a review that includes all stakeholders, most importantly scientists themselves, who are best placed to tell us what kind of working environment they need to produce the results they want to achieve for the good of the nation. Then we can come up with a structure that fits the philosophy and works for the scientists and those who are relying on the outcomes.

EUGENIE SAGE (GREEN PARTY)

I would agree with much of that because I ask whether the CRI model needs a fundamental structural overhaul or whether it only needs tweaking. The discussion should start with the community to get widespread input. A critical part of any reform will be increased core funding to ensure CRIs are not having to compete for money with other agencies, universities and the like because constant competing sets up a whole culture which affects cooperation between individuals and institutions. So increasing the core funding and looking at structures are the best way of delivering more cooperation

and there needs to be cross-party agreement on what is done so we don't get a major change next time the government changes.

MEGAN WOODS (LABOUR PARTY)

We can look at the institutions having to change or the funding levers having to change, because there's nothing like a funding lever to change behaviour. The National Science Challenges tries to encourage collaboration among universities and CRIs but some things need to be tweaked to ensure we truly have a collaborative model. The University Centre of Research Excellence money also brings the nation's best together in collaborations. We need a funding system to ensure money can flow seamlessly between CRIs and universities to build expertise across both these bodies and we must avoid getting caught in the administrative nightmare of overheads.

NATHAN GUY (NATIONAL PARTY)

I believe you will shortly have probably the best model here in Lincoln with the Lincoln Hub that is under way. The Government is investing \$85 million on a project costing about \$200 million. I highlight this as a collaborative model because the Lincoln Hub is going to engage and cross-pollinate with industry. In the past a lot of science has been done but is it practicable and easily implemented on farms or orchards? The Lincoln Hub is going to involve industry and government working closely together making sure the investment is really going to drive the primary sector.

QUESTION:

Much has been said about industry and blue skies research. But what do panellists think should be the role for government funding in terms of public good?

NATHAN GUY (NATIONAL PARTY)

Quite a bit of the science investment is a public good. Some of it benefits private interests. We covered that when we talked about PhD students getting snaffled up by industry. I don't think that's a bad thing. Some political parties propose many more new taxes but these will stifle the New Zealand economy and probably will slow down innovation as well. The challenge implied by the questions asked here today is that scientists want long-term certainty. The way to get long-term certainty is by having positive economic growth and good stewardship of government finances.

MEGAN WOODS (LABOUR PARTY)

Public good in science is a critical question and we must think about it beyond investing just in science. It is also about our tertiary education sector. None of us disputes there is a demonstrable public good from giving every citizen a secondary education. Labour thinks this should extend through to tertiary education as well. The more educated we are, the better off is the country. Investment in science also makes us a better country. There is going to be private spill-over but there is no perfect or pure public good in the world.

EUGENIE SAGE (GREEN PARTY)

The private sector is capturing all the benefits from some of the commercial contracts with the CRIs. The results of aquaculture research by NIWA, for example, weren't available for all those involved because they were provided to a client. If we are going to have a better knowledge economy, we must recognise the public good of investing in science. The

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Minister [Guy Nathan] opposes a water tax, but the environmental costs of farming mean we are subsidising dairy expansion. We need to put a price on common resources used for private good. Deciding where the balance falls between private and public is critical to other policy questions as well as in science.

RICHARD PROSSER (NEW ZEALAND FIRST)

The simple answer to the question is that public good science should be funded to the extent necessary. Abraham Lincoln said it is the purpose of government to do for the people those things which the people cannot do for themselves. If fiscal and regulatory policy settings help private enterprise and there is a public-good spin-off, well and good. There are some things private enterprise won't do on its own because there isn't an immediate tangible benefit. New Zealand First supports the Primary Growth Partnership programme, which to an extent is an example of government investing public-good money in programmes that will have commercial outcomes from which the whole nation will benefit. The problem we have with it is that the taxpayer doesn't get a fair share of the intellectual property.

QUESTION:

Will the political parties collaborate, after the election, support science and will back farmers' work in cleaning up the waterways?

NICOLA GLENJARMAN (THE OPPORTUNITY PARTY)

Of course we will back collaboration and we will be looking forward to making those collaborations work. We've always stated we are not partisan, we will work with anyone who takes on our policies.

RICHARD PROSSER (NEW ZEALAND FIRST)

The short answer is yes, obviously. One of the biggest challenges facing politicians is to bridge the gulf of understanding between what is actually happening on the land and what the general urban public believe is happening. I have seen the fencing, riparian planting, bridges and culverts that have already been done, the wetlands that have been created, all done on farmers' own initiative at their own cost. There is a wide lack of appreciation and understanding that this has been done. We need to make it known and we need to make sure we are supporting it. Once politicians of all flavours have walked the paddocks and seen what's going on, they will be more willing to collaborate.

EUGENIE SAGE (GREEN PARTY)

It has been the Green Party that has pushed for cross-party collaboration on climate, establishing a group in Parliament on which all seven parties are represented to try to and get some cross-party agreement on climate policy. In terms of water, farming leaders have said they support swimmable rivers but making this meaningful requires a timeline and a commitment to other measures like a stronger regulatory framework and a tax on the commercial use of water. When Department of Conservation land is used for commercial tourism, concessions are paid to the Department of Conservation to recognise the use of a public asset – conservation land – for private gain. It should be the same with water by applying a tax to promote increased efficiency and regulatory measures to ensure we clean up our rivers. Waterways are continuing to degrade, despite farmers' riparian planting and improved land management. Their efforts have not been enough, given the intensity and the scale of intensive farming.

MEGAN WOOD (LABOUR PARTY)

The kerfuffle over what a Labour water charge would be was precisely because we said we wanted to set it in collaboration with a range of people, including farmers. Our intention was always to have that conversation and bring farmers to the table because some fantastic work has been going on by a number of farmers.

NATHAN GUY (NATIONAL PARTY)

Labour on one hand says it wants to invest in long-term science for the primary sector, but would review a programme of partnership between the Government and industry, the Primary Growth Partnership. Investment in the PGP on behalf of farmers is made so that ultimately they can do more on-farm to have a better environmental outcome. On the topic of working in partnership, we are already doing that. I was heartened to see primary-sector leaders have come together and made a fantastic commitment to make our rivers, lakes and streams swimmable for their children and their grandchildren. They are prepared to partner with government. We are the only political party that will partner with the primary sector on their challenges.

QUESTION:

How can science leadership build, now that science administration has been absorbed within the ministry – Business, Innovation and Employment – with a name which indicates objectives contrary to those discussed at the forum and does not include the word "science".

NATHAN GUY (NATIONAL PARTY)

When the Cabinet pulled together a whole lot of parts within our government to form the MBIE, we had a long discussion about where science sits and whether science should be in the name. Very simply, acronyms get formed in government, and people commonly refer to the Ministry of Business Innovation and Employment as MBIE. Even though "science" is not in the ministry's name, science plays a significant part in what it does. So does immigration – if you are talking to an immigration audience they would probably ask why "immigration" isn't in the ministry's name.

MEGAN WOODS (LABOUR PARTY)

Science has been subsumed into a much bigger organisation. I compare that with the system when we had FRST and MoRST [the Foundation for Research, Science and Technology and Ministry of Research, Science and Technology]. They were dedicated to the policy and funding of science. We have lost some of their focus. "Innovation" is in the ministry's name and innovation is an important part of our future but innovation is only a sub-set of science. To have "innovation" in the name but not "science" shows the Government's lack of understanding about the role of science in innovation and research in our economy. The Government has done some good things by appointing science advisers in some departments. I would like to build on that and have chief scientists assigned to other departments to give science greater prominence.

There is potential to do something special around a Parliamentary Commissioner for Science in the same way we've done with the Parliamentary Commissioner for the Environment.

EUGENIE SAGE (GREEN PARTY)

The MBIE has become Stephen Joyce's empire and things disappear into it without trace. Science needs to have its own stand-alone

agency, perhaps going back to the MoRST and FRST model.

RICHARD PROSSER (NEW ZEALAND FIRST)

The reality is that new administrations look at departmental structures and responsibilities. I imagine the next amalgamation of parties to form a government, however it is shaped, will probably do that too. I rather like the name Ministry of Science and Technology. Perhaps that is something to look at.

NICOLA GLENJARMAN (THE OPPORTUNITY PARTY)

I don't know that the names are relevant but science certainly is the thing that is relevant. We need an organisation based on that and separated from business. Although the two can work together closely they are not the same thing. As far as leadership goes, we need to bring through young scientists who will lead us tomorrow because it's about the next generation. But unless we create a New Zealand in which they want to stay, we are not going to keep them, so providing leadership opportunities for the next generation of scientists is the key.

QUESTION:

Is New Zealand missing the boat with genetic technologies, noting the breakthrough with gene editing of human embryos to remove genetic defects. When it comes to pest eradication, crop yields and so on, the cutting-edge science is happening somewhere else. Is there any intention to try and reopen the discussion in an evidence-based way to develop genetic technologies and how they can be used the New Zealand?

MEGAN WOODS (LABOUR PARTY)

Labour has no plans to change our position for a range of reasons. One concern is our ability to trade and to market our goods internationally as GE free.

NATHAN GUY (NATIONAL PARTY)

On the back of a High Court ruling, we had to change the regulations and first we consulted with people in the primary sector. Some are very keen; others, mainly those involved in the food supply chain, are concerned and wary. The challenge is always about how you bring New Zealanders on board. Politicians are well aware of this. Ultimately it could lead to better long-term sustainability and biodiversity for our environment.

RICHARD PROSSER (NEW ZEALAND FIRST)

We certainly need to have a discussion because too much public opinion is shaped by a lack of real understanding of GM. Our policy has generally been to proceed with caution – keep it in the lab until it is proven safe. There are certainly some advantages in New Zealand being regarded as a food-producing country that doesn't produce genetically modified crops. But a great deal of genetic science doesn't involve food and needs to be done here. It's the kind of high-tech industry the country needs to encourage. So we must educate people – for example – about gene editing that makes ryegrass more drought-resistant and how this differs from the Frankenstein stuff that puts spider genes into tomatoes and we end up with three-eyed fish.

EUGENIE SAGE (GREEN PARTY)

We rely on being GE-free to market much of our produce overseas. When Nick Smith [Minister for the Environment] wanted to change the Resource Management Act to allow him to over-ride local councils' ability to declare GE-free areas, there was huge pushback from horticulturalists who recognise the value of being GE-free internationally. Any change in policy on these new technologies needs something robust like a Royal Commission that is independent and objective, conducts wide public consultation and comes up with recommendations. 🗣️

New members We welcome

Jung Cho (Auckland)
Michelle Taylor (Waikato)
Nicolette Niemann (Bay of Plenty)
Marya Hashmatt (Manawatu)
Jaspreet Singh Sidhu (Manawatu)
Emily Smith (Manawatu)
Kemas Zakki (Manawatu)
Anna Heslop (Canterbury)
Balins Robertson (Canterbury)

Corporate members

- AGMARDT
- AgResearch
- Ballance Agri-Nutrients
- Catalyst R&D
- Plant & Food Research
- DairyNZ
- Federated Farmers of New Zealand
- Horticulture New Zealand
- Lincoln University
- Massey University
- PGG Wrightson Seeds
- Ravensdown Fertiliser Co-op
- Zespri International

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ISSN 1175-3927 (Print) ISSN 2253-5675 (Online)