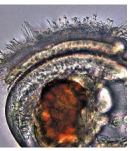




# Agri-Gate

News from the Primary Growth Partnership

Ministry for Primary Industries
Manatū Ahu Matua

ISSUE 24 | DECEMBER 2015

## Michael's Desk

This edition of Agri-gate marks my last as Acting Director of the PGP. In February 2016 we welcome back Justine Gilliland, who'll be re-joining the team from maternity leave as Director Investment Programmes. This is a newly created role, responsible for overseeing the Ministry for Primary Industries' investment programmes, which will of course include the PGP, and others such as the Sustainable Farming Fund and the Irrigation Acceleration Fund.

In my almost eight months on the PGP team, I've been impressed by the commitment shown by the PGP team, Joanna Perry and the independent Investment Advisory Panel (IAP), and our industry partners and others towards innovating, growing New Zealand's economy and making a real difference for our primary industries and those working in it.

In my view, it has been a very successful year across the PGP. Earlier in the year the Office of the Auditor-General released its assurance report, as part of its independent performance audit of the PGP. The OAG's overall finding is that MPI is administering the PGP effectively, which is positive assurance.

Also during 2015, we've seen two new PGP programmes officially start, Targeting New Wealth with High Health and Passion2Profit; the SPATnz programme opened a new purpose-built hatchery to selectively breed Greenshell™ mussels; and in a world-first, remote control technology in a forest harvester was successfully demonstrated in Nelson by the Steepland Harvesting programme.

PGP programmes continued to receive external recognition. For example, Farm$^{IQ}$ picked up a Wellington Business Award in the "Discovering Gold" category for R&D projects; Precision Seafood Harvesting was named as a finalist in the Seaweb Seafood Champion Awards and took out the Innovation & Technology Award at the South Canterbury Chamber of Commerce Business Excellence Awards. And, Fonterra's Research and Development Centre picked up the Innovation Excellence in Research Award at the New Zealand Innovators Awards for the "Milk fingerprinting" technology, enabled by the Transforming the Dairy Value Chain PGP programme. These are just a few of the examples of PGP successes during the year.

The first of December marked the date when the Crown's investment share in new PGP programmes shifted from 50 percent to 40 percent. It's important to note that the minimum amount that industry needs to co-invest in new PGP programmes hasn't changed – this is still $500 000 over the lifetime of the programme, so $71 500 per year for a seven year programme.

This edition of Agri-gate marks our last one for the year, and we'll be taking a short break until February.

Meanwhile, I'd like to wish all of you a safe and relaxing Christmas and New Year with friends and family. I'd also like to thank the PGP team here at MPI, the IAP and all of our programme partners for your support and help along the way, and for welcoming me into the wider PGP "family".

Michael Jamieson
Acting Director PGP

ISSN (online) 2350-3289

NEXT

## From the Chair

It's that time of year again and time to reflect on the year that has been.

I won't reiterate everything that Michael has said in his column. I think he has nicely summed up some of the highlights of the year. However, there are a couple of things that I would like to highlight, which are things personal to me.

First of all our PGP Expo in October. Standing back and looking at what both the individual programmes and the portfolio as a whole has achieved already is, I believe, fantastic. I feel both proud and humbled to have been a part of it.

The second thing is my observation about the continued personal commitment of all of those involved for the betterment of Aotearoa – with of course some commercial gain as well. And on that note, I'd like to give a personal thank you to Michael Jamieson who took on the role of Acting Director of the PGP during Justine's maternity leave. Michael has put his heart and soul into making a difference and his commercial background and innovative thinking has, in my view, added some real value.

As I'm sure all of you have come to realise, I can't write a column without a passing thought for us all to think about. And this month it's about scanning the environment and ensuring we all know what is going on in "our space". I guess, I'm saying this particularly with an Investment Advisory Panel member's hat on. I do encourage everyone who is submitting a proposal, or presenting a quarterly report or annual plan to their programme steering group to consider the wider environment and what "the competition" is doing either here in New Zealand or overseas. That knowledge can, in my view, only help us all to be more effective in leveraging our investment.

And on that note, I wish all of our readers, programme partners, MPI's PGP team, and my fellow panel members as much of a good break as you can all take, and I look forward to a new year of PGP development.

Joanna Perry
Chair, Investment Advisory Panel

## Programme Spotlight

# Investing in our future

### Investing in our future – how the PGP is fostering our next generation of primary industry superstars

There's often talk about New Zealand being a small player on the world stage, but our ability to innovate and commercialise remains our competitive advantage and our ability to fuel growth.

Take for example 1882, when the first ship carrying a load of frozen New Zealand lamb left the shores of Dunedin, destined for London. This marked a notch in our history as a nation of innovators, who looked for value-added activities and who adopted technology early.

More than 133 years later, this hasn't changed. New Zealand is still punching above its weight, and our primary industries are continuing to thrive, but we need to ensure this is sustainable in the long-term, by investing in our future.

"Ensuring the sustainability of our primary industries is a core aim of the PGP – and an important part of this is enabling opportunities for some of our youngest and brightest minds, and attracting them to a career in the primary industries," says Michael Jamieson, Acting Director PGP at the Ministry for Primary industries (MPI).

"Many PGP programmes are doing just that, by providing opportunities for undergraduate and post graduate students," he says. "But it's a two-way thing. Not only are PGP programmes helping these students to further their educations and learn valuable practical and theoretical skills, the programmes themselves are benefiting from their knowledge, enthusiasm and expertise."

#### It's in the genes

The Transforming the Dairy Value Chain programme is developing new products, increasing on-farm productivity, reducing environmental impacts and improving agricultural education. It has 58 students involved in the programme, including 25 studying their PhD's and 8 studying their Masters degrees.

Some of the PhD students are involved in cutting-edge research into genetics in the national dairy herd, which is being undertaken by programme partner, Livestock Improvement Corporation (LIC).

One of those students, Mel Hayr, who was born and raised in Auckland, is completing her PhD degree at Iowa State University, one of the world's top universities for studying animal breeding and genetics.


PhD student Mel Hayr

"Like many in New Zealand, farming has been an important part of my family's history and I wanted to pursue a career in the dairy industry," says Mel. "I was fortunate to get a job in the research and development team at LIC from 2009, until 2011 when I received the LIC Doctoral Studentship to complete by Masters and PhD degrees."

Mel's PhD research focuses on novel ways of using information on natural genetic variants to improve knowledge of the underlying biological mechanisms that are behind important dairy cattle traits. The aim is to increase the accuracy of selecting bulls for mating.

"Our dataset of genetic information built up through the PGP programme is one of the largest livestock datasets in the world," says Mel. "It has extensive records on genetic variants, as well as reliable records on a large number of cows and bulls that represent a variety of different traits.

"It's very exciting to be part of the group exploring this wealth of data and finding ways to use it that will benefit New Zealand and advance our scientific knowledge."

Chad Harland, who completed a Masters of Science in Biochemistry in 2008, is also involved in the Transforming the Dairy Value Chain programme.

"I've started my PhD in Animal Genomics in the research group of Professor Michel Georges, a world-leading expert in this field at the University of Liege in Belgium," says Chad.


**Chad Harland speaks at a conference about the biology of genomes.**

"There, my focus has been on understanding changes that have occured in the genome of an animal that can't be found in its parents. These changes to the genome are known to cause a wide range of genetic disorders, which can impact on cattle health and, therefore, a farmer's herd."

Chad's work has already helped LIC to develop genetic tests that screen for the embryonic variants that can cause issues in dairy cattle, so they can be correctly managed to minimise genetic disorders and drive improvements. This includes increasing the fertility of the national dairy herd and reducing the amount of artificial insemination required.

"This programme has provided the chance to work on world-class datasets that are specific to New Zealand, and allow us to address the issues that directly affect New Zealand's dairy industry," says Chad.

"It'll keep New Zealand at the forefront of new science and technology that offers tangible benefits for our country," he says.

## Photographic proof

Tommy Cushnahan is a Massey University PhD student currently involved with the Pioneering to Precision PGP programme, led by Ravensdown. This programme is seeking to improve fertiliser practice on hill country farms through remote aircraft sensing of the nutrient status of farms, and precision application of fertiliser. This work is a far cry from his background in designing and constructing golf courses.

**Tommy Cushnahan gathering ground information using cutting-edge hyperspectral technology.**

"This PGP programme has made my PhD possible," says Tommy. "It's also providing me with the opportunity to use new, novel and modern technology, and get into the agriculture industry."

Tommy's work involves a mixture of data collection, analysis and a good mix of practical work using cutting-edge hyperspectral technology originally developed by NASA.

"This technology enables us to take aerial photographs of a farm which shows a range of light spectrums that the naked eye can't see," explains Tommy. "These light spectrums provide a lot of information about the vegetation on farms, including nutrient status.

"We also take measurements on the ground at 400 points on each of the farms involved in our trials. Combining and analysing this data allows us to extrapolate and interpolate the different properties of the vegetation on the entire farms, such as Nitrogen content."

It's a very involved and complex process, which can have its challenges.

"It's like picking up a very large newspaper with the pages mixed up. To find an article with the information you need takes a lot of sifting and sorting past the parts you don't," says Tommy.

Pip McVeagh, who's studying a PhD at Massey University, is also involved in the Pioneering to Precision programme.

"My part of the puzzle involves looking at the relationship between pasture and what's going on in the soil, to determine the nutrient status," says Pip. "Higher pasture production uses more nutrients, so we want to see how much we need to put back on."

**Pip McVeagh, a Massey University PhD student looking at the relationship between pasture and soil in Pioneering to Precision programme.**

"I've worked on beef and sheep farms and been involved in precision agriculture for a few years, so I have a personal interest in the programme."

Sue Chok, who has a background in environmental engineering, is involved in important work that feeds into and complements the programme.

"My work focuses on the application of fertiliser on farms, in particular how to apply fertiliser on a farm at different rates depending on where it's needed," says Sue.

**Sue Chok getting ready for an aerial spreading trial using collectors (pictured to the left/right) on the ground to help determine fertiliser distribution rates.**

"It involves calibrating equipment and making improvements to the aerial spreading technology, as well as computer modelling and programming."

"This PGP programme has really opened my eyes, and given me a real appreciation of all of background work involved in agriculture and how each part works together," says Sue.

**Collectors used to help determine fertiliser distribution rates (photo courtesy of Ravensdown).**

Tommy, Sue, Pip and the other students involved in the Ravensdown Pioneering to Precision programme are integral in increasing the programme's understanding of how to convert remote-sensed data into data that can be incorporated into a precision fertiliser application system.

"We work with a passionate team interested in success," says Sue. "It's great working on something that's applicable to the real world."

"Fertiliser is one of the biggest expenses for farmers, and the programme will enable them to make better use of their fertiliser at less cost," says Pip.

"It just blows my mind about all of the possibilities of our work," adds Tommy. "I can't speak highly enough of the people involved in the programme. Our work will dramatically enhance farming practices in New Zealand, which will be good for farmers, New Zealand and our economy."

## Planting the seeds

The Seed and Nutritional Technology Development programme, led by PGG Wrightson Seeds Ltd and Grasslanz Technology Ltd, has a commitment to fostering interest in research from secondary and tertiary students.

The programme is working with three students, but has involved up to ten of them since it started in 2013.

Derek Woodfield, General Manager Research & Development at PGG Wrightson Seeds Ltd, says the programme's goal is to provide students with hands-on experience in scientific activities and foster their interest in science.

"Our PGP programme collaborates with the Universal College of Learning (UCOL) to host students in their final year of their National Diploma in Science," says Derek. "Our goal is to provide the students with the work experience required to enter the scientific workforce."

Each student is placed in the Seed and Nutritional Technology Development PGP programme for 300 contact hours, which counts towards credits for their diplomas. Their time is spent with AgResearch, which provides scientific and research services for much of the programme.

The programme has hosted eight UCOL students to date, of which AgResearch has employed five of them for a further 400 hours as part of their summer student programme. One of the UCOL students has also gained permanent employment in AgResearch. This summer AgResearch is also hosting a student from Massey University as part of the PGP programme.

The programme has also recently hosted its first Year 10 student from Freyberg High School in Palmerston North, who's involved in a project involving forages to help control facial eczema in animals.

"The involvement of students in the programme has been mutually beneficial, and they've been very active and productive members of the research team," says Derek.

"They've acquired a thorough understanding of working in a Crown Research Institute and developed long-lasting relationships.

"The PGP is enabling long-term innovation and growth in our primary industries," says Michael Jamieson.

"To help ensure New Zealand's future prosperity, we need to invest in the development of new products, services and technology, and we must extend ourselves beyond high quality ingredients, using insights from markets and consumers to build and innovate our business models through to the final customer or consumer.

**Derek Woodfield, General Manager Research & Development at PGG Wrightson Seeds Ltd.**

"We also need to ensure we have the right knowledge and skills in our future workforce in order to grow our industry sustainably – economically, environmentally and socially – and stay connected across these spheres with rural and urban participants, which is no easy task.

"We can do this by fostering and growing the knowledge and skills of our younger generations to give them, and our primary industries, the best chance of success."

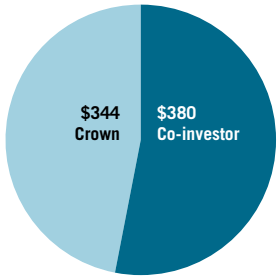
# Overview of Primary Growth Partnership Investment

| Sector | Programme Name and Co-investor | Total Crown and co-investor investment $ million | Sector total $ million | Estimated benefits $ million (per annum) |
|---|---|---|---|---|
| **Wool** | NZ Sheep Industry Transformation (NZSTX) NZ Merino | 34 | $34 | 250 |
| **Dairy** | Transforming the Dairy Value Chain<br>Dairy NZ/Fonterra | 170 | | 2700 |
| | New Dairy Products and Value Chains<br>Whai Hua Limited Partnership | 3 | $174 | 9 |
| **Fishing & Aquaculture** | Shellfish – The Next Generation<br>Shellfish Production and Technology NZ (SPATnz) | 26 | | 81 |
| | Precision Seafood Harvesting<br>Precision Seafood Harvesting (PSH) | 48 | $74 | 44 |
| **Meat** | FoodPlus – Redefining Meat Horizons ANZCO | 77 | | 630 |
| | Marbled Grass-fed Beef<br>Grass-fed Wagyu Ltd | 23 | | 80 |
| | Red Meat Profit Partnership<br>Red Meat Profit Partnership (RMPP) | 64 | | 194 |
| | Integrated Value Chain for Red Meat<br>FarmIQ | 151 | | 1100 |
| | Targeting New Wealth with High Health | 25 | | TBA |
| | NZ Deer Industry Passion2Profit | 15 | $356 | TBA |
| **Pastoral** | A New Vision for Pastoral Agriculture<br>PGG Wrightson Seeds | 15 | | 200 |
| | ClearView Innovations<br>Ballance AgriNutrients | 20 | | 348 |
| | Precision Application of Fertiliser in Hill Country<br>Ravensdown Fertiliser Co-op Ltd | 10 | $44 | 120 |
| **Bee Keeping** | High Performance Manuka Plantations<br>Manuka Research Partnership (NZ) Ltd (MRPL) | 3 | $3 | 1200 |
| **Forestry** | Innovative Steep-land Tree Harvesting<br>Future Forests Research (FFR) | 7 | | 100 |
| | Use of Fumigants for Log and Wood Product Exports<br>Stakeholders in Methyl Bromide Reduction (STIMBR) | 2.6<br>(actual cost) | | TBA |
| | From Stump to Pump Phase 1 (feasibility study)<br>Norske Skog Tasman Ltd (NSTL)/Z Energy | 3.6<br>(actual cost) | $13 | TBA |
| **Viticulture** | Lifestyle Wines New Zealand Winegrowers | 17 | $17 | 285 |
| **Horticulture** | NZ Avocados Go Global<br>Avocado Industry Council | 9 | $9 | 210 |
| **Total** | | | $724 | |

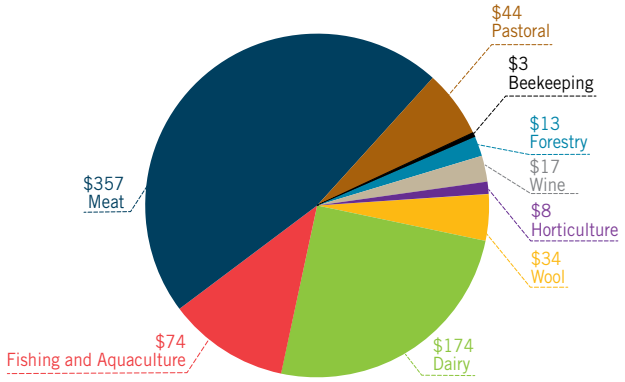
Please note that the figures in this table have been rounded.Therefore the total Crown and co-investor investment for each sector may differ to the sum of the individual programmes.

As at 30 November 2015, there were 18 programmes underway and two completed.

**Crown/co-investor committed investment (in millions)**




**Crown/co-investor committed investment by sector (in millions)**
Total $724 million




Total government funding paid to programmes as at 30 November 2015 was $170.7 million.