

# MoRST/MAF Joint Briefing

## Funding primary sector and food research and innovation

### EXECUTIVE SUMMARY

1. The government has signalled \$70 million per annum in new funding for primary and food sector research and innovation in its RS&T and Agriculture policy manifestos. These policy commitments represent the government's approach to dismantling the Fast Forward initiative.
2. MoRST and MAF are in agreement that for any additional investment to have significant future impact it will need to:
  - take a whole-of-value chain (encompassing education and skills development, R&D, product development, commercialisation, marketing and technology transfer) approach to driving sector growth;
  - be demand-led and prioritised in a partnership between industry with government taking a long-term view.
3. Any additional investments will build on the government's current investment portfolio. The government currently invests \$153 million per annum through Vote RS&T on primary industry and food research. Investments span food and fibre production to more consumer focused, value-added products like functional foods and biomaterials and support for firms. It also includes a suite existing of public-private partnerships with the primary sectors through the Research Consortia scheme and partnerships like Pastoral 21.
4. As this policy position is replicated in both the government's RS&T and Agriculture policy statements, further clarification is required from Ministers on how you wish to progress the design and implementation of this package. For example, the Minister for Agriculture has indicated that he wishes to see a single Budget bid for a "Primary Growth Partnership" prepared for the three initiatives and the scope expanded to encompass the Forest Industry Development Agenda.
5. Officials are seeking clarity from Ministers on:
  - the scope of this initiative – does it encompass a value chain approach and include the fibre producing industry sectors (forestry and wool)?
  - the ability to scale investment in this initiative in a multi-year rising investment profile.
  - A directive to progress the development of a joint MAF-MoRST Budget package.

**BACKGROUND**

6. The government’s RS&T and Agriculture policy commitments for primary and food sectors have a strong focus on research and innovation driven growth. The manifesto policy commitment is comprised of three key initiatives:

<b>NEW FUNDING FOR PRIMARY SECTOR RESEARCH</b>			
	2009–10 (\$m)	2010–11 (\$m)	20011–12 (\$m)
1. Establish an international centre for research into greenhouse gas emissions from livestock	20	20	20
2. Boost funding for primary sector and food research	25	25	25
3. Boost funding for research consortia in the primary and food sectors	25	25	25
<b>Total increase</b>	<b>70</b>	<b>70</b>	<b>70</b>

7. These policy commitments represent the government’s approach to dismantling the previous government’s Fast Forward capital investment fund partnership with the pastoral and food sectors. The Minister of Agriculture, Hon Carter met with the New Zealand Fast Forward Board and the Cornerstone Investors<sup>1</sup> in November/December 2008 and re–stated the government’s commitment to increased investment in pastoral and food sector innovation across the whole value chain (education and skills development and training; research and development; product development, commercialisation and technology transfer). At these meetings there was agreement that the underlying principles (see Annex One) of Fast Forward were sound.
8. Officials are in agreement that for government investments in primary and food sector research and innovation to have a significant impact on future economic and productivity growth:
- Investment needs to take a whole–of–value chain approach to sector development encompassing education, skills development and training, R&D, product development, commercialisation, marketing and technology transfer;
  - Investment needs to be demand led and the prioritisation, strategy and delivery processes led by a government – industry partnership.

<sup>1</sup> The Fast Forward Cornerstone Investors comprise Fonterra, Meat and Wool NZ, Zespri, Dairy NZ, Meat Industry Association and PGG Wrightson.

- Regardless of delivery mechanisms, an overarching strategy development process needs to set future-focused goals and targets which move sectors out of short-term focused ‘business-as-usual’ activities.
  - MAF and MoRST need to work together in a coordinated way to implement this joint RS&T and Agriculture policy commitment.
9. As this policy position is replicated in both the government’s RS&T and Agriculture policy statements, further clarification is required from Ministers on how you wish to progress the design and implementation of this package. The Minister of Agriculture has indicated that he would like to see a single Budget bid for a “Primary Growth Partnership” covering the three manifesto policy commitments.

#### CURRENT INVESTMENTS IN PASTORAL AND FOOD RESEARCH & INNOVATION

10. Any additional investments will build on the government’s current portfolio of primary and food research and innovation activity.
11. The government currently invests around \$153 million on Research, Science and Technology (RS&T) activity that supports sector growth. Investments span food and fibre production to more consumer oriented value-added products like functional foods and biomaterials development. Table Two provides an overview of current RS&T investment portfolios.

**TABLE TWO: RS&T PRIMARY SECTOR AND FOOD RESEARCH INVESTMENTS**

<b>Areas of Investment</b>	<b>Total investment (p.a)</b>
Sustainable Production Systems	\$35,150,986
Production Quality and Assurance	\$58,054,643
Innovative Foods	\$27,849,000
Targeted Biological Products and Services	\$32,616,434
<b>Total</b>	<b>\$153,671,063</b>

12. A proportion of this is co-invested in public-private partnerships with primary sector firms and industry-good organisations. Industry good organisations (Dairy New Zealand, Meat and Wool New Zealand et al) collect over \$90 million annually in commodity levies enabled under the Commodity Levies Act. The bulk of these funds are committed to research and innovation either in partnerships with public programmes or in stand-alone projects and programmes.

13. This total includes investments in the government's Research Consortia scheme. The primary purpose of research consortia is to increase end-user involvement in the prioritisation, co-investment and subsequent utilisation of R&D through large-scale public-private partnerships.
14. The government currently invests around \$30 million per annum in Research Consortia (11 out of 12 of which are primary industry focused). This is matched by a further \$30 million in private sector contributions (both cash and in-kind). Individual investments tend to be in the \$2-5 million range with government and industry co-funding the R&D and industry funding the commercialisation and scale up to market post-prototype stage. An overview of current and planned primary industry focused consortia, noting total investments and private sector partners is provided as Annex Two.
15. Other significant partnerships falling outside the ambit of the formal Consortia scheme include Pastoral 21. Pastoral 21 is pastoral industry-government partnership investment in forage, environmental management and animal health research. The investment is co-funded with contributions from Fonterra, DairyNZ and Meat and Wool New Zealand. The government's current pastoral research strategy was developed in partnership with industry and MAF and represents a useful model for investing in long-term, sector wide issues.
16. A wider range of innovation and technology transfer activities are supported through public-private partnerships involving sector and industry good organisations working with public programmes including Technology for Business Growth, the Sustainable Farming Fund and NZ Trade and Enterprise. These activities contribute to ensuring that the products of Research and Science are commercialised and applied to increasing productivity and environmental performance.

## **FURTHER INVESTMENT**

17. The government's joint RS&T and Agriculture manifesto policy commitment will provide a significant impetus to build on the current public and private investment that has been outlined in this paper.
18. A whole-of-value chain approach to sector development will accelerate the application of current knowledge and systems along with providing for current research and development issues and opportunities. A range of initiatives encompassing education, skills development and training, R&D, product development, commercialisation, marketing and technology transfer is anticipated.

19. The design of a package of initiatives that is demand led requires a prioritisation and strategy processes developed in partnership with sector and industry partners. The Minister of Agriculture has indicated an interim preference for either a government–industry governance council or a new type of consortium based model to provide for this prioritisation, investment decision and oversight.

#### EXPANDING THE SCOPE OF THIS PACKAGE

20. Cabinet agreed in 2004/05 that the Government should engage with the forest industry on a joint industry development process called the Forest Industry Development Agenda (FIDA). The high–level objectives for the FIDA are to ensure forestry can make its optimal contribution to New Zealand's sustainable development and play a key role in achieving New Zealand's environmental goals.
21. FIDA provides a means for government and industry to develop a strategic approach for the industry's future growth, including research and innovation. It has been running since April 2005, when the Government allocated \$18.2 million to the initiative through to June 2009 (although some funds have been carried forward beyond that time). Industry co–funding is required for some projects on a 75% (government): 25% (industry) basis. The topic areas are shown in the table below.

<b>TABLE THREE: FIDA FUNDING (\$ MILLION GST EXCL)</b>		
<b>Initiative Area</b>	<b>Government funds</b>	<b>Industry funds</b>
Market Access	1.2	0.4
Bio–energy	2.5	N/A
Labour and Skills	4.4	N/A
Excellence in Wood Design	2.1	0.7
Market Development	8.0	2.7

22. The Minister of Forestry, Hon Carter, has indicated his desire to extend the FIDA and to include the FIDA within his proposed Primary Growth Partnership budget package.

## AGENCY VIEWS

23. MoRST and MAF agree on over-arching principles and the need to work in partnership, and recognise that there is further work required to develop a detailed package of proposals for Ministers' consideration and direction.
24. Taking a whole of value-chain approach to sector growth will require existing mechanisms to be coordinated, scaled and prioritised accordingly. This would involve:
  - the introduction of a new government – sector governance body and robust strategy development process involving the Cornerstone Investors (and potentially representatives from offshore supply chain partners) to provide market-led, future-focused investment priority setting; and
  - coordination at both the strategic and operational levels between FRST, MAF, TEC and NZTE to mitigate the risk of fragmentation across multiple agencies.
25. The whole of value chain approach will involve a range of activity that spans research and science through to technology transfer. This range of activity will involve agencies taking responsibility for particular activity strands. Maintaining an overall package approach, rather than a series of separate initiatives, will ensure coordination and focus on providing value for expenditure.
26. Maximising the use of existing schemes and programmes, such as Research Consortia, Pastoral 21 and the Sustainable Farming Fund, to channel funds to activity targeting increasing innovation in the primary sector is one of the principles agreed with the Cornerstone Investors. However not all innovation activity anticipated will be research, and industry is also expected to contribute its own investment. Therefore with funding being drawn from a range of sources the government – industry partnership will need to coordinate investment.
27. There are a range of models available for appropriating this package; examples include:
  - The Plan of Action for Sustainable Land Management and Climate Change invests in research and technology transfer activities which are appropriated through Vote Agriculture and delivered in a cross agency approach;
  - Pastoral 21 is invested through Vote RS&T, building on the long-term base of existing research investments with a MAF-pastoral industry led strategy development process directing the research investment.

## ABILITY OF THE SYSTEM TO ABSORB PROPOSED LEVELS OF NEW INVESTMENT

28. The Investment levels in the primary and food sector research and innovation policy statements amount to a flat \$70 million per annum for the next three years, as opposed to a rising investment profile. In many cases, however,

additional capability is needed across the value chain in order to derive the maximum value from investment. Due to the capability building nature of much of what is required to drive sector growth (for example, recruiting additional researchers with expertise in livestock methanogens or investing to fill industry skills shortages in areas like food technology or on-farm technology transfer) a phased approach to investment could have greater long-term impact.

29. That is not to say that the primary and food sectors do not have the capacity to absorb any research funding, nor that capacity building is the only action required in the short term. However, a combination of dedicated capacity building now with research programmes ramping up over time could have a greater long-term impact.
30. Taking a phased approach does not need to affect the quantum of investment over time if a multi-year investment package is designed. There are also opportunities to investigate options around an operational funding – capital split. Officials are factoring these issues into the Budget case development process.

#### **INITIAL INVESTMENT OPPORTUNITIES**

31. The proliferation of sector engagement processes<sup>2</sup> which have been undertaken by a range of government agencies over the last few years have identified a number of industry endorsed research and innovation initiatives which could be progressed under this policy. Examples include:
  - MoRST is currently leading discussions with Fonterra, TEC, FRST, MED, Massey University and Plant and Food Research regarding the establishment of a Palmerston North Research and Education Cluster. This initiative has arisen out of the Food Innovation Network New Zealand (FINNZ) project being led by MED.
  - Sector and firm led strategy developments which identify priorities in their value chains where R&D can accelerate sector growth. One notable example is the implementation of the recent industry-developed Aquaculture Research Strategy. In addition, planning is underway to develop a Research Consortium between Zespri and IRL on a supply chain management partnership. Zespri have also expressed interest in accelerating research programmes to breed new commercial cultivars and explore the health and nutritional properties of kiwifruit, as well as more market-focused research around “model orchards” in offshore locations to further develop and support year-round supply of Zespri fruit.

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<sup>2</sup> Examples include: The Food and Beverage Taskforce, the continued development of the Food Innovation Network New Zealand (FINNZ) initiative and research prioritisation processes like the current development of the government's Food Research Roadmap.

## MEDIA IMPLICATIONS

32. There are no media implications.

## RECOMMENDATIONS

33. I recommend that you:

a.	<b>Direct</b> MoRST and MAF to develop a joint Budget package	Yes / No
b.	<b>Note</b> that that the Minister of Forestry would like an extension to the Forest Industry Development Agenda (FIDA) included within this Budget package	Yes / No
c.	<b>Confirm</b> whether Ministers wish to invest in a multi-year funding package with a rising investment profile.	Yes / No
d.	<b>Confirm</b> that the government wants to take a value-chain approach to investing in primary and food sector growth (incorporating investment in education, skills development and training, R&D, product development, commercialisation, market development and technology transfer).	Yes / No
e.	<b>Note</b> that if you choose to take a value-chain approach to investing officials will brief you on potential Vote appropriation options.	Yes / No

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## **ANNEX ONE: Key investment principles**

- Investments will be additional to current spending
- Partners will generally focus their investments on areas within their own interests
- Investment must have serious environmental intent and drive transformational change
- Medium to long term transformation activities will be a priority
- Investments should build on our existing comparative advantages and grow new activity from core capabilities
- Transaction costs should be minimised by using existing investment and institutional structures as far as possible;
- Priorities will be jointly developed by government and industry
- Transformational activities will have priority, keeping in mind that this often requires a medium to long-term view;
- Priority will be placed on building existing strong comparative advantages and catalysing new activities growing from New Zealand's core capabilities;
- Sustainability, whether of land, water, energy, or other resource use or embodied in product development, commercialisation or overall business model will be a priority.

## Annex Two: Current Investments in Primary Sector Research Consortia

Consortium	FRST Investment to Date (\$k)	Committed Funds (\$k)	IO Statement	Portfolio		Brief abstract	Partners
Ovita	\$24,880	\$10,375	Advanced Genomic Technologies: Sheep & Higher Value Traits for Industry	PQA	Production, Quality and Assurance	Improved ewe selection techniques for commercial breeding programmes—increasing competitiveness of the NZ sheep industry	AgResearch and Meat and Wool NZ
Pastoral Greenhouse Gas Research Consortium	\$7,305	\$10,100	Reducing Greenhouse Gas emissions from Pastoral Agriculture	SPS	Sustainable Production Systems	4,000 tonne per annum reduction in Greenhouse Gas emission	Fonterra Ltd, Meat and Wool NZ Ltd, Wrightson Ltd, DEEResearch, New Zealand Fertiliser Manufacturers Research Association Inc and DairyNZ
Seafood Innovations	\$7,933	\$7,500	Increased returns from the seafood industry	PQA	Production, Quality and Assurance	To optimise the value inherent in the seafood industries raw material to offset issues associated with declining quotas and limited fundamental scientific understating of its raw material. To improve returns to the seafood industry by improving the consistency and quality of the products currently produced as well as searching for commercially valuable food products, bio-chemicals, nutritional ingredients or biomaterials.	Plant and Food Research Crown Research Institute; Sanford Ltd; NIWA Crown Research Institute; Talley's Fisheries Ltd; Sealord Group Ltd ; Independent Fisheries Ltd; United Fisheries; Aotearoa Fisheries Ltd; Prepared Foods Ltd; OTD Ltd ; CRA8 Management
LactoPharma	\$12,253	\$2,288	The isolation, identification and characterisation of novel components from milk and colostrum with potential biomedical activity	NBP	Niche Biological Products and Services	New functional foods to be marketed as consumer products; New ingredients and nutraceuticals, with biomedical activity, for bone growth and treatment of inflammatory diseases and cancer; Fundamental research that will lead to new drugs that target osteoporosis, inflammatory diseases and cancer.	Fonterra, Auckland Uniservices Ltd
Meat & Wool (Johne's)	finalising contracting	\$8,731	Reduced Incidence of Johne's Disease	PQA	Production, Quality and Assurance	To control or eliminate and reduce incidence of Johne's Disease via adoption by the farming sector of cost effective herd/flock selection tools and management techniques. To develop a vaccine for JD which does not cross-react with Tb testing and has reduced side-effects. To identify a gene-marker (or markers) that identifies JD resistant animals.	Meat and Wool, DairyNZ and DeeResearch
Prevar	\$5,400	\$2,700	Novel Pipfruit Cultivars	INF	Innovative Foods	To create 18 clearly differentiated new apple and pear cultivars, integrating 'traditional high-value' fruit and plant traits and make them commercially available by 2012. To increase export revenue potential by \$54,000,000	Pipfruit New Zealand Inc., Apple and Pear Australia Ltd, Associated International Group of Nurseries and Plant and Food Research
Leather and Shoe Research Association LASRA	reviewing proposal	\$7,420	Novel attributes for hide and deerskin leathers for new target markets	NBP	Niche Biological Products and Services	To develop novel leathers with high tech attributes that will be adopted by leading leather goods manufacturers. To deliver at least four novel leather product options to industry, with the technology to support production. To stretch export earnings by at least \$40 million.	to be confirmed

Wood Quality Initiative	\$7,388		Resource Characterisation; Improved Structural Properties and Performance	PQA	Production, Quality and Assurance	To provide tree breeders with strong leads regarding priority wood traits which will lead to better wood for known uses and new materials and opportunities in future technologies and industries. The linking of the research on wood quality properties, performance and appearance with function and product development is aimed ultimately at adding and creating value and thus increasing the competitive advantage of the industry.	Weyerhaeuser USA; Forest and Wood Products Australia1; Pan Pac Ltd3; Tenon Ltd; Ernslaw One Ltd; Scion/CSIRO3; Windsor Engineering; Juken NZ; Nelson Forests; Jenkins; University of Canterbury; Radiata Pine Breeding Co; Norske Skog Ltd (several other small timbermills)
Structural Timber Innovation		\$5,766	Development of new, high value, manufactured wood products for export.	MAN	High Value Manufacturing Processes, Products and Materials	To investigate the strength, stiffness and ductility of modular structural building elements required to withstand seismic and non-seismic loads, understanding the materials and long-term behaviour of new large-span composite floor systems and developing new systems of very large span pre-stressed timber roof systems. This will lead by 2015 to exports of NZ\$100 million per annum and new NZ building of \$25 million.	Carter Holt Harvey, Nelson Pine Industries, Wesbeam, Building Research Association; Uniservices, University of Canterbury, Pine Manufacturers' Association
Radiata Pine Breeding	\$3,250	\$2,000	Superior Germoplasm; Superior genotypes	PQA	Production, Quality and Assurance	To develop superior germplasm of radiata pine and also to provide confidence in predicting its future performance. This will be achieved by identifying, developing and implementing breakthrough improvements in the wood properties, forest health, volume growth and product value dimensions of the existing radiata germplasm via developing improved seed and a rating system for this seed branded as GF Plus. National economic benefits are expected to accrue to the industry and the nation of at least \$300 million per annum from 2010, through increased growth, and enhancement of timber stiffness arising directly from the outcomes of this programme.	16 shareholders in the timber industry see WQI
Meat & Wool (Meat Biologics)	\$5,120		Prevention & Control of Iron Deficiency; Growth Factor Concentrates from Bovine & Ovine Plasma	INF; NBP	Innovative Foods; Niche Biological Products and Services	To improve iron bioavailability, promote iron utilisation in order to prevent and control anaemia and other iron insufficiency related conditions and promote the health attributes of meat-based products. To identify meat or meat co-product derived compounds that are of benefit in terms of use as supplements/nutraceuticals/functional foods or biotechnology ingredients and fine chemicals; growth factors derived from bovine and ovine blood, and micronutrients and potential bioactives associated with the red meat fraction. Specific targets are: anti-angiogenics; novel enzymes; immunomodulators; anti-arthritis and bone growth factors.	Meat and Wool, several Meat processing Companies
Pastoral Genomics	\$20,000	\$22,000		PQA	Production, Quality and Assurance	This programme represents the New Zealand pastoral industries' sole investment in pasture gene technology. A research consortium (Pastoral Genomics) has been formed between ViaLactia Biosciences (NZ) Ltd, Meat and Wool NZ, AgResearch and the Deer Industry NZ to invest in and manage research in pasture gene technology.	AgResearch and Grasslands innovation; Deer Industry NZ
<b>Summary</b>	<b>\$98,029</b>	<b>\$81,223</b>					