MAF Climate Change Technology Transfer Plan for Action 2010 – 2015

South Island (SI) Meat and Fibre Sector Workshop
15 February 2010
Lincoln

1 Status of this document

This document reflects the contribution of the workshop attendees and is not the confirmed opinion of MAF or any sector/industry organisation.

2 Introductions

Attendees were asked to provide two to three points about themselves that would help others understand the perspective they were bringing to the workshop.

Annie Perkins (Professional facilitator, Groundwork Associates) has enjoyed working in extension in New Zealand for 15 years at AgResearch and Environment Waikato (EW) and consulting in sustainable agriculture. “I have a lot of interest in farmer-to-farmer learning and extending science effectively i.e. two way transfer of information.

Janine Lowe (Marketing and Communications Assistant at Groundwork Associates) is a recent graduate from the University of Waikato with a Bachelor of Management Studies degree and is interested in sustainability and organics.

Robyn Dynes (AgResearch) leads the farm systems team and is working in a technology transfer area with Tom Fraser with 10 farmer focus groups (four sheep and beef, two deer and four dairy). She has been working with farmers for the last 12 months to help build their understanding of GHGs and climate change. “We have encountered a wide range of views from farmers on climate change [and there is] a long way to go in terms of building their understanding of climate change.” Robyn has led some science in the climate change area: farm systems, analysis and modelling. She has a vested interest in climate change because a substantial amount of research revenue is tagged to address climate change issues.

Gary Walton (Meat and Wool NZ) was recently appointed as the national extension and uptake manager and is responsible for getting messages out to farmers. “I came to basically look after the sheep and beef farmers’ perspective and add value where I can.”

Al Ross (Wool Partners, commercial company formed less than a year ago, an integrated supply chain for NZ wool) has dual roles as an Asian and technical manager. His role covers a huge range of areas including environment and sustainability work. He said that they were developing a farm assurance programme, life cycle assessments and data sets. “How do we present [our climate change response] off shore and how do we build that into our local technical marketing to keep trying to position NZ wool in the international marketplace?”

Dave Maslen (NZ Merino Company, half owned by NZ merino growers and PGG Wrightson) said that his role was to help retail brands become more successful at selling wool and/or wool garments. His role involves running research and development projects to help brand partners get more traction and gain success. He believes that, regardless of our position on climate change, the topic is a concern for NZ’s competitors in both wool and synthetics. People buying our products want to know how NZ industry is going to adapt to climate change and minimise its impact.

Graham Clarke (Organic farmer from South Otago) is happy to accept climate change is occurring because in 1990 they had 105 million stock units and now they have 96 million. He said they have done their bit for emissions reduction and wants the profits. “I think everyone in this room would recognise that nothing can emit more than it consumes. I hope that we can change the approach; we should do all the carbon consumption via photosynthesis, the primary driver of fairly long grasses.”

Alan McDermott (ANZCO foods, Agricultural Manager) Alan's role encompasses "anything that becomes a problem for anybody else, be that the customers in the marketplace or the farmer. Has a focus on risk management via achieving resilience in agricultural systems and businesses.

Don McKenzie (Arid farmer, sheep) stated that he has a reputation as the ultimate cynic.

Daryn Jemmett (Environmental Manager for Silver Fern Farms) started his role in September 2009. As an environmental and sustainability scientist, his role is technology transfer within the company to promote environmental sustainability to Silver Fern Farms. "98% of our product goes overseas, which is a huge risk in terms of our farmers' products. We need to know they are following best practice."

Jon Manhire (Agribusiness Group) has been involved with the design and delivery of technology transfer for 20 years. He is currently leading an Argos project looking at different farming systems (sheep and beef, dairy, high country, kiwifruit) involving about 100 farmers. The project is looking at the economic, social and environmental impacts of different farming systems and how they've performed under different environmental shocks and pressures. He has also worked on projects developing response to markets i.e. the Nielsen project and development issues.

Jeanette Maxwell (National Vice-chair of the Meat and Fibre section of Federated Farmers) came because her company wants to focus on risk management. They are looking for best practice and good information transfer. Their main aim would be to get some good goals; risk management is the main thing but it's important that the goals aren't locked into legislation. There needs to be openness and flexibility e.g. room to move with the science.

Tom Fraser (Farm systems group at AgResearch) has been working with four of the cluster groups in GHG and climate change for nearly 12 months. "The first meetings were a real struggle [as they wanted proof that climate change is happening] but when they got into risk management and best practice, they got more engaged."

Katherine McCusker (MAF Senior Policy Analyst – Technology Transfer, Climate Change) is keen to see the wool industry succeed, meaning sheep and beef succeeds. "With a good and pragmatic approach, things that can be done on the ground at farm level."

David Stevens (Farm systems group at AgResearch) has worked with sheep, beef and deer, beef development and extension for 25 years. He has also done a bit of modelling on mitigation and lamb survival in a changing climate.

Marie Casey (PGG Wrightson Dunedin farm consultant) has a background in research and has worked with focus farms (deer and sheep and beef) and sustainable farm projects. She thinks her perspective is slightly more pragmatic, "If the market says this is where we need to be then we have to get our farmers there regardless of whether we look at climate change or not". There is confusion with climate change and weather because weather happens in a shorter term than climate change happens.

3 Background

3.1 Overview of MAF CCTT Plan for Action

An introduction to the strategic framework and background to the plan was provided at each of the workshops by either Katherine McCusker or Annie Perkins. This summary reflects information provided across all workshops, in addition to the supplied background paper (see Appendix A), so that all sectors benefit from the same information.

3.1.1 Origins of the draft plan for action

The draft plan's themes and targets were developed at a high level by a research and technology transfer group. They were then worked through on a cross-sector basis through the Climate Change Technology Transfer Subgroup (CCTTSG). The plan is a living document and there will be continuing opportunity for feedback. Priorities will change as the plan is worked through with or by the sectors and/or as more information comes through from scientific or political sources, nationally and internationally.

3.1.2 Purpose of the plan and today's workshop

Through developing the plan to an implementation level, MAF wants to determine how to sensibly invest government funding to help farmers develop sustainable and resilient businesses. This goal is valuable regardless of the continuing scientific debate about climate change or political developments.

MAF is particularly interested in:

- Setting meaningful targets which help business sustainability.
- Determining what practical information needs to be delivered to farmers and how;
- Determining how to best integrate government and industry action within and across sectors.

MAF will be using the information from this workshop series to take action from March 2010 onward and has $9.5 million available to support climate change technology transfer over the next five years. Some actions highlighted through this process may be supported from this fund; others from alternative sources, such as industry or industry/government partnerships. Others may evolve into Sustainable Farming Fund projects. MAF expects that initially action (and funding) will focus on raising general awareness rather than implementation of specific technologies.

It is likely that different sectors will use the plan in different ways. As an example, the dairy sector has already set its targets and is awaiting Board sign off. Other sectors aren't in that position. MAF is flexible about time and is interested in taking advice from the sectors about priorities.

3.2 Discussion following the background session

Questions re credibility of IPCC stance, reality of climate change and need for climate change focused strategy.

- There is more robust data that the IPCC report should have referred to than it did.
- The climate has always been changing and there's a large amount of evidence suggesting that man's activity is a contributing factor.
- There will be uncertainty (about NIWA data) as new data comes up but in terms of long term forecasting their data is a lot more robust.
- Regardless of whether the cause is man-made or natural, we're going to face increasing variability, the ETS and international obligations; so we have to position ourselves for that. It's more about what we need to do to stay in our market and/or where do we need to position NZ for market opportunities
- It's about risk management – whether it be from the political scene or climatic crises. That language [climate change] belongs in the political arena [but at an on-farm level] it's about best practice and risk management.
- Our farms are reasonably resilient to a one off event (drought/flood). Where are the opportunities to build components into different technology transfer or quality assurance schemes and make sure we're well positioned for the future?
- It's about working across industries to leverage benefits of existing good practice.

Progress in the dairy sector

- Their plan over the next two to three years is to increase awareness, in terms of what does a change in climate mean, not just in terms of climate variability but price volatility. The following years will be more about the GHG and what you can do in farmer systems.

Inclusion/relevance of methane in GHG theme

- Nitrous oxide and C02 were covered in other themes, so in the arable workshop we didn't work on GHG theme.
- Part of sustainability is nothing to do with pastures; it's about economic sustainability. We need to be able to say methane doesn't matter; it's different to fossil derived C02.

4 The workshop process

4.1 Step 1: Assessment of relevance and usefulness of targets and themes

- The first two columns of each table in Section 5 were provided to the workshop. These had been developed through earlier MAF workshop processes (see Section 3.1.1 and Appendix A).
- The CCTTSG was aware that some themes and targets may be more relevant to some sectors than others. Defining areas of relevance/focus was the first stage of the workshop process.
- Attendees worked in small groups to assess the relevance of themes and usefulness and relevance of targets on a scale of **0 (not relevant/useful) to 5 (very relevant/useful)**
- The full list of themes presented was:
  - Capability and capacity
  - Efficient use of resources: water
  - Efficient use of resources: energy
  - Nutrient management
  - Greenhouse gases including methane
  - Resilience to extreme weather events
  - Soil management
  - Carbon sinks
  - Emissions trading scheme (ETS) impacts
  - Sustainable systems

This document only contains tables relating to those themes which workshop attendees considered relevant to the sector.

4.2 Step 2: Gap analysis and definition of actions, timeframes and priorities

Each group was then asked:

- Whether there was anything missing from the supplied target, or whether they would suggest making any changes to it?
- How would they amend the target?
- What specific actions would be needed to reach the target, especially for this sector?
- When would action need to take place (1 to 2 years or 3 to 5 years)
- What was the priority for this target (0 = low to 5 = very high)? Some groups chose to prioritise actions rather than targets.

In amending or developing targets the groups were asked to aim for SMART targets, i.e. targets that were:

- Specific
- Measurable
- Achievable
- Realistic
- With a Timeframe

4.3 Step 3: Review and summary of key messages/issues

At the end of the day attendees were asked to reflect on key messages/issues raised during the workshop.

5 CCTT Plan for Action: SI Meat and Fibre Sector themes and targets

Groundwork has done its best to make these tables faithfully reflect the workshop experience. However to ensure suggested actions have been captured in the right place for subsequent analysis across sectors, some interpretative changes have been made during the editing process. Significant interpretative changes have been indicated by square brackets [ ] surrounding text. Some amended/new targets did not conform to the SMART model but Groundwork has not tried to correct this.

Capacity and capability	**Targets**	**How relevant is this topic/theme to this sector? (0-5)**	**How useful and relevant are the targets? (0-5)**	**Who assessed this theme?**
Goals for climate change technology transfer are ambitious and will not be achieved with current capability. There is an urgent need for skills and experience to support land managers in moving toward more sustainable land use systems. These skills and experience are in short supply - they must be developed now. This requires a financial commitment to employ, educate and up skill the right people with the right skills. The technological solutions to management of climate change issues are limited in number and efficacy. It is critical that in a country the size of New Zealand all climate change technology transfer is aligned toward common goals. This includes primary sector and government funded programmes.	A. Develop the required capability to achieve the sector-specific targets by 2015. B. Increase alignment of sector and public investment on extension to deliver the knowledge required to achieve the desired outcomes in climate change and sustainable land management. C. In partnership with the sectors, develop a programme to up-skill people so they can provide advice/support to advancing issues of adaptation and sustainability. D. Have the right people trained in the right areas at the right time. E. Have climate change integrated into tertiary and vocational land based courses by 2015. F. Provide opportunities for land managers to up-skill themselves on climate change and sustainability issues so they can increase their business resilience and profitability by 2015. G. Provide learning opportunities specifically for Iwi/Maori to increase awareness encourage the uptake of new knowledge and foster Maori innovation in climate change and sustainable land management.	1	Targets E-G are okay.	

Capacity and capability					
Is anything missing from the targets? Would you change anything in the targets?	**How would you amend the targets?**	**Specific actions, especially for this sector, to reach the [amended] targets.**	**Action done (yrs)**		**Priority (0-5)**
			1-2	**5**	
Target A: Develop the required capability to achieve the sector specific targets by 2015 – okay for dairy, no hope for sheep and beef unless there is a specific development. Identify: ▪ Where the skills are in the industry now. ▪ What skills are needed e.g. technology layer skills or understanding climate change science or nutrient management? Money and funding targets need to be specific: ▪ Current model for funding doesn't work. ▪ Job security. Some of the current targets are better suited to other sectors. ▪ Meat and fibre have big distances and there is less extension capacity. Strategies that reach people and tap learning and behaviour change. Average age of a farmer in New Zealand is 56.	A. Increase networks: ▪ Cooperation with Regional Councils ▪ Agribusiness: consultants, fertiliser, retail, farmer groups. ▪ Teaching ▪ Vets Amended target B	i. Less one-to-one technology transfer. Move with the use of technology e.g. Facebook, Twitter.	√	√	5
	B. Lack of facilitators, job security and consistency. Amended target C	i. Set up specialist MAF unit to link with networks to facilitate the transfer of knowledge etc. and up-skilling facilitation.	√		5
	C. Less is more! Take in small steps and develop long term relationships. Realise it may never end. Amended target F	i. Link capability to the 'what can we do?' message to create pull and provide top information for both farmers and agribusinesses. ii. Train the trainer and carry through to schools.	√	√	5
	D. Future proofing/succession. Encourage training in the basics of climate and climate change with education providers. Amended target E	i. Lobby education providers to ensure climate basics are taught (and maybe mitigation technologies etc.)	√	√	5

Efficient use of resources - Water	Targets	How relevant is this topic/theme to this sector? (0-5)	How useful and relevant are the targets? (0-5)	Who assessed this theme?
Water efficiency is a key issue for New Zealand in areas where water is considered to be constrained in availability for the primary sector. These are mostly traditional summer dry areas such as the east coast of both islands. Availability of water has also become an important issue in areas such as the Waikato. As rainfall becomes increasingly variable, and temperatures and evapo-transpiration increase, water efficiency will need to improve just to maintain current levels of production. Improving water use efficiency benefits both the environment and the water user.	A. Ensure land managers have the necessary incentives, information and technologies to improve the efficiency of water use	2 Near opportunity 4-5 (water foot printing)	4+	Al Ross Dave Maslen Robyn Dynes
	B. Increase land managers' resilience to drought by providing information about efficient use of rainfall and irrigation, case studies and decision-support tools.		5	
	C. Support water efficiency measures such as greater strategic development and use of water storage.		4	
	D. Align relevant action plan targets with the target determined by the Primary Sector Water Partnership: i.e. 80 per cent of extracted water used by the sector will be under a self management approach to meet benchmarks[1] of water efficiency by 2016.		4	

[1] Benchmarks set under the Primary Sector Water Partnership

Efficient use of resources - Water					
Is anything missing from the targets? Would you change anything in the targets?	**How would you amend the targets?**	**Specific actions, especially for this sector, to reach the [amended] targets.**	**Action done (yrs)**		**Priority (0-5)**
			1-2	**5**	
Water quality Ensure 80% dry land managers have information and knowledge to use water efficiently Models to estimate water foot-printing for typical jam in each sector by production system.	A. [Amended target] Ensure land managers are aware of the incentives, information and have the technology to improve the efficiency of water use.	i. Identify and quantify incentives	2	2	5
		ii. Identify and quantify technology	2		5
		iii. Identify and quantify information	2		5
		iv. Develop communications program	1/Ongoing		5
	B. [No change?] Increase land managers' resilience to drought by providing information about efficient use of rainfall and irrigation, case studies and decision-support tools.	[Captured in actions for A?]			3
	C. [No change] Support water efficiency measures such as greater strategic development and use of water storage.	i. Primary Water Partnership strategy?	?		1
	D. [New target] Develop water efficiency measures information, and support.	i. [Establish models to estimate] water foot-printing [for typical jam in each sector by production system]. ii. Strategies for improvement iii. Communication program	1/Ongoing		2
	E. [New target] Optimise use of natural water.	i. Tools and knowledge to maximise use - rainfall package. ii. Management = feed grown	Immediate/Ongoing		4

Greenhouse gases (GHG) including methane	Targets	How relevant is this topic/theme to this sector? (0-5)	How useful and relevant are the targets? (0-5)	Who assessed this theme?
The CCTT Plan for Action requires land managers and those advising them to understand a new area – that of greenhouse gases (GHGs). This includes new terminology, where the GHGs come from, how to estimate them for their farms, how to mitigate them to reduce cost and new benchmarks. GHG emissions for agriculture can only be measured experimentally while emissions at farm, regional or national scale are estimated. Ruminants produce methane as part of their normal digestive process. As a GHG methane is 21 times more potent than carbon dioxide when you compare their heat-absorbing abilities over a hundred years. Technologies and practices to reduce emissions are likely to come out of research that: ▪ Deals with the quality and type of feed ▪ Modifies the composition of the bugs that produce methane in the rumen ▪ Modifies farm systems We currently do not have the technologies available to extend to farmers to significantly reduce methane production. Initially the action plan will look at increasing farmers understanding of how increasing feed efficiency will decrease methane per unit of product and improve profitability.Getting away from that dichotomy between farming and forestry. Oliver octopus – multiple objective modelling. Using the model to put options in front of people to give more outputs while meeting other objectives.	A. Ensure the common language of GHGs is understood and widely used by land managers by 2015. B. Provide information to 80% of land managers on GHGs, where they come from and how to estimate them for their business by 2015. C. Establish benchmarks for GHGs for different farming systems by 2015. D. Demonstrate GHG scenarios and options on focus, research and monitor farms and other properties providing industry leadership by 2012.	5	4 5 5 No rating	Robyn Dynes Dave Maslen Gary Walton Al Ross

Greenhouse gases (GHG) including methane					
Is anything missing from the targets? Would you change anything in the targets?	**How would you amend the targets?**	**Specific actions, especially for this sector, to reach the [amended] targets.**	**Action done (yrs)**		**Priority (0-5)**
			1-2	**5**	
	A. [No change] Ensure the common language of GHGs is understood and widely used by land managers by 2015.	i. Access and communication of 'best available' information. ▪ Information provided must be balanced and factual and include the global perspective. ▪ Develop and define mitigation strategies.	√ Immediate start/ Ongoing		2
	B. [No change] Provide information to 80% of the land managers on GHG, where they come from, their fate, and how to estimate them for their business by 2015.	i. Develop a tool to help land managers to estimate GHG emissions.	√ Immediate start		4
	C. [No change] Establish benchmarks for GHGs for different farming systems by 2015.	i. Need a single agreed methodology for GHG calculation including allocation methodology.	√ Immediate start		5 (bench mark)
	D. [Amended target] Demonstrate GHG scenarios on focus, research and monitor farms and any other relevant forum providing industry leadership by 2012.	i. Land managers are aware that methane is part of a natural cycle, and of the scientific knowledge and doubt of its consequences for the environment.	√ Immediate start/ Ongoing		3
	E. [New target] Profile business implications and opportunities for New Zealand farmers as a result of efficiency gains and market demand.	i. Work with businesses.	√ Immediate start/ Ongoing		1

Resilience to extreme weather events	Targets	How relevant is this topic/theme to this sector? (0-5)	How useful and relevant are the targets? (0-5)	Who assessed this theme?
Adaptation to climate change is likely to benefit from experience gained in reaction to extreme climate events, specifically by implementing proactive climate change risk management plans. Climate change in New Zealand will increase the frequency of extreme weather events, challenging the resilience of many of our land based businesses.	A. Provide tools, knowledge and skills so land managers can make well informed timely decisions.	3-5. Rating depends on how extreme. Location is very relevant. How much resilience do our farmers have already? Farmers can handle one drought, but three droughts in a row would be a challenge.	Redundant, covered in C, D, and E.	Katherine McCusker David Marshall Marie Casey
	B. Provide tools so that land managers can increase farm profitability and their resilience to the impacts of a changing climate.		Redundant, covered in C, D, and E.	
	C. Identify a suite of practices, technologies and tools to adapt to a changing climate and manage risk from extreme weather events by 2013.		4	
	D. Provide demonstrations of why increased resilience is needed and the benefits of increased resilience to the farming operation.		4	
	E. Increase investment analysis skills and tools to future proof major on-farm investments.		2	

Resilience to extreme weather events					
Is anything missing from the targets? Would you change anything in the targets?	**How would you amend the targets?**	**Specific actions, especially for this sector, to reach the [amended] targets.**	**Action done (yrs)**		**Priority (0-5)**
			1-2	**5**	
Extreme = repeated or outside of district normality. Have farmer targets here and then agribusiness. We also have: – regional councils – science – central government Have short-term and long-term goals – e.g. Emergency plans vs. development/planning of infrastructure vs. new farm systems. Continue to provide readily accessible resources and processes that we have already developed e.g. drought/flood/snow responses.	Delete Targets A and B.				
	A. [New target] Create awareness to farmers, agribusinesses, and Regional Councils to provide ready accessible information and tools currently available for managing extreme weather events by 2012.	i. Develop information portals, gather information, and group this. Link to other websites e.g. NIWA.	1		5
		ii. Use all of the current industry/sector networks to create awareness little and often and provide links from other websites e.g. Regional Council websites and sector websites.	1-2		5
		iii. Identify any gaps in knowledge, processes, and tools. Review and update.		2-3	5
	B. [New target] Encourage uptake of risk management planning on the farm/within businesses.	i. Include risk management in vocational training; Massey/Lincoln courses; monitor and focus farm (deer) programmes; Young Farmers; Federated Farmers.	1-2		5
		ii. Include risk management in vocational training; Industry quality assurance programmes	1		5
		iii. Include risk management in vocational training; Insurance companies, banks, and Regional Councils.			5

Soil management	Targets	How relevant is this topic/theme to this sector? (0-5)	How useful and relevant are the targets? (0-5)	Who assessed this theme?
Soils underpin our land based systems. Soils physically anchor plants, support livestock, provide a source of water and nutrients and regulate emissions to air and water. They are supported by an extensive biological system that aerates the soil and cycles nutrients and organic matter. When soils are water logged, compacted, lack aeration, or contain too much nitrogen they are more likely to lose nitrogen to the atmosphere as nitrous oxide. Soils are both a source and store of carbon. Most soil carbon is locked up. However unless we alter our management practices, more of this carbon may be released into the atmosphere, as temperatures and mineralization rates increase. By increasing the amount of carbon locked in the soil, land managers can benefit from: ▪ Increased water holding capacity and infiltration rates ▪ Improved soil structure, less erosion and more ability to cope with compaction ▪ Improved nutrient cycling and cation exchange rates With increased frequency of drought, high rainfall events and high wind the risk of soil loss increases in the arable, outdoor vegetable and pastoral sectors increases. Greater uptake by land managers of current best management practices would increase the resilience to extreme weather events and reduce soil loss. Forestry experiences major issues with soil/sediment loss during and immediately after harvest.	A. Implement changes in soil management to build more resilient rural businesses. B. Increase the uptake by land managers of Code of Practices and best management practices. Work on this theme links to a number of other programmes including the Forestry and Horticultural Code of Practices, Hill Country Erosion and Regional Council work.	5 All other issues hinge off soil management.	2. A, not smart. Industry doesn't know what to do to make it better. There are limits but no definitive codes of practice. Not measurable, no timeframe, no definition of resilience. 3. B, not smart, implicit to have a code etc. Nutrient management is a subset of soil management. Sounds nice, important, but not what to do or how to get there. No one size fits all due to wide-ranging soil types.	Don McKenzie Daryn Jemmett Graham Clarke Alan McDermott

Soil management					
Is anything missing from the targets? Would you change anything in the targets?	**How would you amend the targets?**	**Specific actions, especially for this sector, to reach the [amended] targets.**	**Action done (yrs)**		**Priority (0-5)**
			1-2	**5**	
Have no code of practice to achieve soil management. Develop codes. Soil and water conservation boards – regional knowledge. Rebuild knowledge base – regional councils responding to rules rather than reality on the ground. Tell the good stories – what are the good things people are doing? Sustainable nutrient budgeting?	A. [Replaces old Target A] Develop regional/soil specific best management practices for soil management (chemistry, physics, biology, global processes) by 2015.	i. Determine the carbon states of our soils.	√		5
		ii. Establish regional soil conservation advisory service by 2012.	√		
		iii. Support producers to improve soil carbon levels based on their measurements.		√	
		iv. Have all farmers measure carbon levels in soil every 2 years by 2015.		√	
	B. [Replaces old Target B] Provide soil science education for producers on soil biology, physics, and chemistry. They can [then] ask the right questions to advisors.	i. Get farmers interested in soil science – create demand. ii. Get the Prime Minister interested in soil science – provide funding. iii. Soil science capability development through care funding increase.	√		5

Soil management					
Is anything missing from the targets? Would you change anything in the targets?	**How would you amend the targets?**	**Specific actions, especially for this sector, to reach the [amended] targets.**	**Action done (yrs)**		**Priority (0-5)**
			1-2	**5**	
	C. [New target] Ensure public understands the role of soil in global processes by 2012. Communicate to the public and policy about the role of soils in global processes (climate control).	i. Identify one or two eminent science communicators who can lead the public, our customers, and producers in soils and global processes.	√		3.5
		ii. Identify different communicator channels to current e.g. meat companies cf. meat and wool, fertiliser companies	√		3.5
		iii. Dozens of respected communicators re: soil, global processes, sustainability, working with producers, public, and markets.		√	3.5
		iv. Graham Sait – Nutritech solutions. Very good communicator, good to talk to PM i.e. John Key.		√	3.5
	D. [New target] Get soils included in ETS!	MAF to write submission on ETS policy by the end of this week including soil.			5

Emissions Trading Scheme (ETS) impacts	Targets	How relevant is this topic/theme to this sector? (0-5)	How useful and relevant are the targets? (0-5)	Who assessed this theme?
The ETS is the price-based mechanism for GHGs and is a key part of overall climate change policy. It involves all significant GHGs and all sectors.	A. All foresters and farm foresters able to make informed decisions on ETS by? (Date dependant on legislation). B. Give all land managers the opportunity to be aware of ETS understand their obligations and make informed decisions by? (Date dependant on legislation).	5	1. A, forest is only a very small part of the balance sheet in a sheep and beef system. 5. B, not well written, needs to be the first target.	Tom Fraser Jeanette Maxwell Jon Manhire

Emissions Trading Scheme (ETS) impacts					
Is anything missing from the targets? Would you change anything in the targets?	**How would you amend the targets?**	**Specific actions, especially for this sector, to reach the [amended] targets.**	**Action done (yrs)**		**Priority (0-5)**
			1-2	**5**	
Shelter belts don't count currently. People don't understand why there is no credit for growing grass. Examples: ▪ Animal converts to carbon to methane, which is 21 times more potent. ▪ Only paying for methane but no credit for growing grass. ▪ Farmers don't know where they stand. ▪ Messages aren't clear.	A. [Amended target] Government to provide firm, sound communication and policy understanding ASAP on ETS and its implications to the sheep and beef farmers.	i. Precondition for action in this theme.			5
	B. [Amended target] Farmers individually need to understand the implications of ETS on their business and options for the future.	i. Have a calculator that farmers can use to calculate their emissions and the risk of different actions.	But not before target A.		5
		ii. Develop local farm models showing ETS/financials and differing scenarios/mitigations.			5
	C. [New target shifted to action under B]				
	D. [New target] Standardise processor/point of obligation throughout the industry.	i. MAF, MIA, and the fibre industry should develop systems [to standardise processor/point of obligation throughout the industry].	1/Ongoing	√	5

Sustainable systems	Targets	How relevant is this topic/theme to this sector? (0-5)	How useful and relevant are the targets? (0-5)	Who assessed this theme?
Farming systems have changed enormously over the last 50 years and will continue to do so in the future. The average New Zealand land based business has increased in size, complexity and has to meet increased demands from markets and regulation. To adapt to a changing climate and/or to reduce GHG emissions our land managers will need to further up skill their management skills. To do this they will need good information on system options including integrating different land use options, changes in stock/crop policies, management systems and financial returns. This includes the interaction between soil, plants and animals in a system that is economically, environmentally and socially sustainable.	A. Provide appropriate tools and information to land managers so they can make informed decisions at a property or catchment level.	4+ Environmentally /economically socially sustainable. Integrating theme.	1. Understand where their own farm business is going and where they fit against the triple bottom line. Sheep and beef are very complex. Working on the more extreme land values. Meet the individual needs – individual variation.	Jon Manhire Jeanette Maxwell Tom Fraser

Sustainable systems					
Is anything missing from the targets? Would you change anything in the targets?	**How would you amend the targets?**	**Specific actions, especially for this sector, to reach the [amended] targets.**	**Action done (yrs)**		**Priority (0-5)**
			1-2	**5**	
	A. [New target] Build an understanding of the policy makers to complexity of sheep and beef farming. No simple approaches are relevant.	i. We need to educate the policy makers/researchers. Uniquely individual farming systems – due to "corner" farming.	Current to 1 year.		5
	B. [New target] Look for target percentage. "Narrowcast" the message. Identify farming groups. Stewardship – promotional. Target 60% of sheep and beef farmers	i. Build networks and awareness e.g. link with farm stewardship programmes.	1 year/ Ongoing policies		4
	C. [new target] Develop a tool checklist. What is the most important issue? What knowledge do they need to go forward?	i. Improve systems/gain change. ii. Implications (Strengths, weaknesses, opportunities and threats (SWOT)). iii. Farmers identify their specific priorities so they can focus their resources on them.	1-2 years		4
	D. [New target] Link with other theme areas for specific individual strategies (an output of 3).	i. This will need solutions and sub-targets. Timeframes will be reliant on other themes. Already a lot of information out there – share this!	1-2 years		4

Biosecurity					
Is anything missing from the targets? Would you change anything in the targets?	**How would you amend the targets?**	**Specific actions, especially for this sector, to reach the [amended] targets.**	**Action done (yrs)**		**Priority (0-5)**
			1-2	**5**	
New topic, new targets.	A. Establish a biosecurity risk and mitigation strategy	i. Identify pests/diseases/weeds that are likely to invade ii. How to control to avoid survival? iii. Which 'pests' are likely to survive?			
	B. Establish a robust risk process	i. How might we live with these pests if they establish? ii. Which crops/enterprises should we operate? iii. What are the highest risk arrival vectors? iv. Establish monitoring systems for our extensive sheep and beef farms			

6 Key take home messages

At the end of the workshop, attendees were asked to consider what actions crossed themes and what key messages had emerged from the day.

Benchmarking

- Informative and objective benchmarking is critical
- Need to know where a property was to start with to measure [change/approach] and decide whether or not it was successful.

Funding

- Industry wide issue
- Competitive/fractured funding model (science, levies, companies) doesn't help.
- "It's the government that cares about [ETS] not us and really they should be funding it…unless they can come up with something really clear about why we should bother changing.
- If the government wants this ongoing they are going to have to pay for people to be put into it and hold it all together.
- Meat and wool has to work with AgResearch but also with stock and station firms. There's whole host of people who can actually network properly to get this message out as quickly and efficiently as possible. No one partner in the whole industry can afford to get to all farmers in one hit.

Barriers to uptake/action

- Need clarity on policy before you can plan responses.
- Farming harder and more competitive than it was, so people hold onto information as competitive advantage. Still more open than big business.
- Sector complexity (dealing with five meat processing companies versus two in the dairy sector). Dairy farmers don't compete with each other because they all get paid $x amount per/kilogram of milk solids whether they supply today, tomorrow or in three months time. The sheep and beef farmer is competing with the local market and neighbour.
- Anything required from processors must be done on a collective agreement or else there could be a procurement war. Farmers will just choose another processor if demands from current processor become too high. Farmers and processors need to stand together.

Selling/packaging the message

- Keep it simple; sometimes farmers just want to know "what they can **do** on their farm."
- Technology transfer needs to address "what does it mean for me?"
- Messages need to be packaged in several ways to have impact e.g. biophysical, economic, labour etc.
- You don't reach 100% of the farmers with any idea. So we need to package products and messages in different ways to reach different types of farmers.
- Sheep and beef systems are very complex so you really need to have resources for farmers to be able to understand their own issues and tailor their responses to their specific conditions
- Contextualise message/extension for regions.
- Recognising that what we do in New Zealand in the sheep industry doesn't make a blind of difference but there's a whole bunch of good stuff that will happen on my farm if I do things different and better - that's the motivator.
- Communicate the concept in words that mean more. climate change emotive, vague, hard to buy into.
- If you can see the benefit it's easy, if it's not so visual it's very hard
- We need a balance between presenting scientific research well (maintaining integrity/not losing too much context) with making the message relevant to farmers.
- There are some areas that can be responded to now with for example the adoption of best management practices (BMP) without trying to address the complexity of the policy.

Targeting information/extension delivery

- Do we try and target everyone or is there a certain group that's more responsive to these things and maybe put resources into that, that's a triaging stage
- Current sector estimates indicate we get to 15 to 20% of sheep and beef farmers. Trickle down from the top 15% does happen but it's slow.
- How much effort do you put in to get to the bottom 30%?
  - If not reaching them it [suggests that either the delivery mechanism isn't as it might be, or the message isn't worth delivering or is not understood. If the message is important and farmers can see the connection of what they do, uptake won't be an issue.
  - Don't spend 50% of your budget trying to get to that 30%. If you need to legislate against them.

ETS issues

- The meat companies don't have much of a carbon footprint but the farmers do. Putting the point of obligation at the processing end doesn't mean that the farmers are actually going to do anything.
- There's been too much emphasis on transaction costs rather than actual change. The politics doesn't care about the environment or the global implications, it just cares about looking good.

Market issues

- At the moment we're generating a lot of information that can hang us in our markets; it would be good to have more packaging around that information that helps us be more defensive in the market place. (Al Ross)
- MAF is having life cycle analyses done in various industries at the moment and that process is being managed very carefully in terms of communication strategies with stakeholders and customers. (Alan McDermott)
- If you look at a simple comparison e.g. UK and US versus New Zealand we actually come out the worst because although they may not have done the study the same way and ours may be a very rigorous process, in the market place our carbon footprint is bigger than the others.

Appendix A

Climate Change Technology Transfer – Plan for Action 2010 – 2015

What is the purpose of this action plan?

New Zealand depends greatly on our climate and land resources, or 'natural capital.' The primary sectors generate wealth and also contribute greatly to social and cultural values. To sustain New Zealand's economic prosperity and quality of life, the sectors recognise the need to adapt to climate change and mitigate GHGs.

The expected impacts of climate change and associated climate warming and increased incidence of extreme weather events will expose many sectors of the economy (particularly the rural sectors) to increased risk and new opportunities. New Zealand farming and forestry practices will need to change to adapt to climate change. The right information will need to be packaged and delivered in the right way at the right time to help implement changes effectively at a national, regional, catchment, community and individual farm level.

To this end MAF has proposed a Climate Change Technology Transfer Plan for Action to provide land managers[2] with sufficient information, technologies and systems to enable and encourage the adoption of land management practices that help to:

- Reduce total GHG emissions, improve the efficiency of resource use and minimise the liabilities;
- Adapt to a changing climate; and
- Take advantage of new business opportunities relating to climate change.

The defined purpose of the action plan is:

To promote more resilient land based businesses by supporting and co-ordinating sector and government initiatives and providing up to date, relevant information on climate change to land managers and their advisers.

Its goals are to:

- Ensure New Zealand land managers and their advisers have the necessary information and technologies to adapt to, manage or mitigate the impacts of climate change at both the farm and regional/community level.
- Achieve demonstrable improvements in understanding and implementation of available technologies that address climate change and sustainability issues by the primary sector.
- Ensure that land based businesses can make informed decisions for their businesses that improve their financial viability and sustainability.
- Identify the drivers of change to increase uptake and ensure investment is well targeted.

[2] Throughout this document the term land managers have been used as a generic term that includes farmers, foresters, growers and agri-business advisors and Maori.

How will the action plan achieve this purpose?

The primary sectors have seen the need to work collectively to achieve their climate change adaption goals. This document outlines the sector's overarching action plan to address the impacts of climate change in the future. The action plan already builds on the specific initiatives of the various sub-sectors and will continue to look for opportunities to leverage existing activity as more specific actions and targets are developed.

The approach aims to achieve by:

- Undertaking a stock take of information and technology transfer activities funded by government on topics that relate to climate change.
- Reviewing extension activities being undertaken by sectors and other groups.
- Remaining aware of science projects and programmes that will deliver outcomes of value to farmers.
- Identifying the key needs of farmers and land managers.
- Developing information and technology plans to deliver these outcomes to farmers.
- Working in partnership with central and regional government.
- Providing active engagement with land managers so they can make better informed decisions.

What activities will be within the action plan's scope?

The action plan will cover all **land based** industries: dairy, sheep, beef, deer, arable, horticulture, forestry, farm forestry, pigs, and poultry.

Activities of organisations that directly influence land owners (land based industry organisations, rural professionals & advisors, supply companies and processors and those that provide training for the rural sectors) are also within scope.

GHG emissions and activities that are under direct control of land managers will be included in the plan's scope.

Excluded from scope are emissions and activities that are beyond the farm gate including processing of primary products, except when processing occurs on farm or is a vertically integrated operation (e.g. a horticultural pack house or winery).

How is the action plan being developed?

To help develop the action plan, MAF established a Climate Change Technology Transfer Sub-Group (CCTTSG) which represents the following sectors/organisations:

- Arable (Foundation for Arable Research)
- Dairy (Dairy NZ)
- Federated Farmers
- Forestry
- Fertiliser (Fertiliser Manufacturers Research Association)
- Horticulture (HortNZ) and NZ Winegrowers
- Sheep and Beef (Meat and Wool NZ)
- Iwi/Maori
- Local Government New Zealand
- Ministry of Agriculture and Forestry MAF

Other horticultural sectors and the Pork and Poultry Industries are not specifically represented on the CCTTSG but are still contributing to the development of this action plan.

The CCTTSG reports to MAF's Research, Innovation & Technology Transfer Working Group (RITTWG) which is part of a wider climate change programme.

In March 2008, a CCTSG workshop started a process which determined a number of common (cross-sector) themes and targets for the action plan. The next stage is for the various primary industry sectors to examine these themes and determine sector-specific actions, targets and priorities. This will be done through a series of workshops and meetings between now and February 2010.

As sector/partner strategies are developed and the action plan gains momentum, the targets will be refreshed and updated. Sector specific actions and targets will be defined on a short-term (1 to 2 year) and long-term (5 year) basis. From the CCTTSG's perspective, priorities for short-term action are likely to be:

- Integrating climate change issues into existing extension and training programmes
- adapting existing tools to respond to climate change management options
- monitor, focus, demonstration farms and forests
- workshops, conferences, field days
- web based information and tools
- sector publications
- rural media
- individual farm plans e.g. Land Environment Plans and risk management plans
- DVDs, interactive games, case studies and fact sheets