



IRRIGATION RESEARCH & EXTENSION COMMITTEE

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**The Commonwealth Governments
perspective of the life cycle analysis
of greenhouse gas emissions in the
maize industry**

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The Australian Government is responding to the challenges posed by global climate change and is committed to work in partnership with industry and science to address the two major challenges facing land managers in rural Australia:

1. How to build increased resilience into the land systems to adapt to the impacts of climate change.
2. How to manage greenhouse emissions in agriculture and forest systems for productivity, financial, and environmental benefit.

Key recommendations from industry concerning climate change were conveyed to the Commonwealth in 2003 from the Agriculture and Land Management Working Group chaired by the Chief Executive of the National Farmers Federation. Recommendations included:

- the need for research to improve the understanding of impacts and adaptations to climate change
- improved understanding of emissions management and sinks
- the continued engagement with industry
- practical carbon sequestration monitoring and accounting tools, incentives for abatement action, and
- integration with other NRM programs.

More recently in 2004 the Government announced three new programs "*Australian Climate Change Science Program, National Climate Change Adaptation Program and Greenhouse Action in Regional Australia Program*". A focus across all three programs is to understand the implications of climate change for land-managed and natural systems in Australia.

More specifically the *Greenhouse Action in Regional Australia Program* has the responsibility of meeting the major challenges as related to climate change and greenhouse gas emissions and abatement facing land managers in rural Australia. A major component of the program will be to develop policy for the management of greenhouse and climate change issues in regional Australia. A part of this program will also be to manage the research and development investment for greenhouse gas emissions analysis and abatement in agriculture, the impacts and adaptations of climate change in agriculture, and the delivery of targeted information to landholders through industry support networks.

Ultimately this program will provide policy advice for Government to assist rural Australia to manage greenhouse and climate change related issues for multiple benefits. The opportunity for land-managed systems to remain viable under future climate change scenarios will be largely related to the extent to which land-managed systems can adapt to this change, both in the short-term and over the longer time frame.

For the agriculture sector the greenhouse gases nitrous oxide (N₂O) and methane (CH₄) are the most important and contribute about 80% and 60% respectively of Australia's total emissions for these gases. Australian agriculture contributes approximately 20% of Australia's national total greenhouse gas emissions from on-farm activities.

At present there is little information available on greenhouse gas emissions from farming systems under Australian conditions. In particular the impact of crop or pasture variety or indeed soil management practice on greenhouse gas emissions is not clear. Therefore much remains to be done to identify farming systems that will result in the abatement of greenhouse gases without loss of productivity.

Greenhouse gas emissions represent a loss of valuable resources and include losses of nitrogen in the form of nitrous oxide from inefficient fertiliser– N utilisation by plants and the loss of methane from ruminant animals through inefficient feed conversion. Emission reductions are therefore likely to lead to multiple benefits, which can enhance the competitiveness of rural industries and the viability of regional communities as well as reducing the overall environmental impact from the agriculture sector. The agriculture sector has a vital role to play in collaboration with scientists and working with government to better understand and manage emissions from a range of farming systems.

Australian agriculture consists of over 140,000 individual enterprises covering more than 60% of Australia's landmass. The sector employs directly over 600,000 people, and is the life-blood of Australia's regional and rural communities. In order to maintain a reasonable level of food production, the sector is reliant upon the supply of regular and reliable rainfall together with access to competitive domestic and international markets. Through the *Climate Change in Rural and Regional Australia Program* the AGO is investigating opportunities for the agriculture sector to adapt to the impacts of climate change and will require solid input from the science community to provide robust data on both the long-term projections and the short-term variability of climate variables such as temperature and rainfall.

The Australian Government recognises the need to work with industry to provide multiple benefits in the management of greenhouse gas emissions from agriculture. To this end an industry partnerships component of the Greenhouse Action in Regional Australia Program called the Greenhouse Challenge Plus Program, is actively working with industry to identify the most appropriate ways to reduce greenhouse gas emissions without sacrificing productivity.

The way in which government, research bodies, growers and food manufacturers have worked together in the Riverina program "*Greenhouse Challenge for the Riverina Food Group*" demonstrates just how effective partnerships can be in achieving emissions reductions.

Greenhouse gas emissions are produced at all stages of a product's life cycle. The Maize life cycle project demonstrates the importance of measuring emissions from the entire production chain, including those generated pre-farm, on-farm and post-farm. Life cycle analysis of the greenhouse gas emissions along the supply chain has the potential to provide information that can identify those components of the supply chain that require more attention and research effort to obtain maximum abatement.

For the life cycle project 'maize to cornchips' targeting emissions reductions post farm, may deliver the best mitigation options that result in the highest reduction of greenhouse gas emissions. It should be clear however that by adopting improved N fertiliser practices (timing of application, slow release N- formulations, and amount of fertiliser- N applied) reductions of nitrous oxide emissions on-farm are possible and are likely to deliver environmental benefits without a loss in production efficiency.