National Centre for Rural Greenhouse Gas Research

NSW DPI AND UNIVERSITY OF NEW ENGLAND

The issue

Agriculture is responsible for 16 percent of Australia's greenhouse gas emissions. As such, it is the second largest greenhouse gas emitter, behind stationary energy (50 per cent).

Increases in greenhouse gases in the atmosphere are causing climate changes, which in turn impact on agriculture and other primary industries.

Reducing emissions, as part of an international approach, is expected to reduce the severity of climate change impacts in Australia. All NSW primary industry sectors have a role to play in reducing emissions. Research is required to enhance available options.

However successful we are in reducing emissions, some climate change is inevitable because of the lag in the effects of greenhouse gases already in the atmosphere. Primary industries must therefore adapt to those inevitable changes. Research is needed to quantify the expected biophysical and socio-economic changes, and develop response strategies.

The response

The National Centre for Rural Greenhouse Gas Research is a new joint initiative between NSW Department of Primary Industries (DPI) and the University of New England (UNE) to provide solutions to the challenges posed to primary industries by climate change, and to take advantage of the opportunities that climate change presents. The Centre is based at UNE, Armidale, with activities undertaken throughout NSW. The centre has also established extensive national and international collaborative links.

Current projects

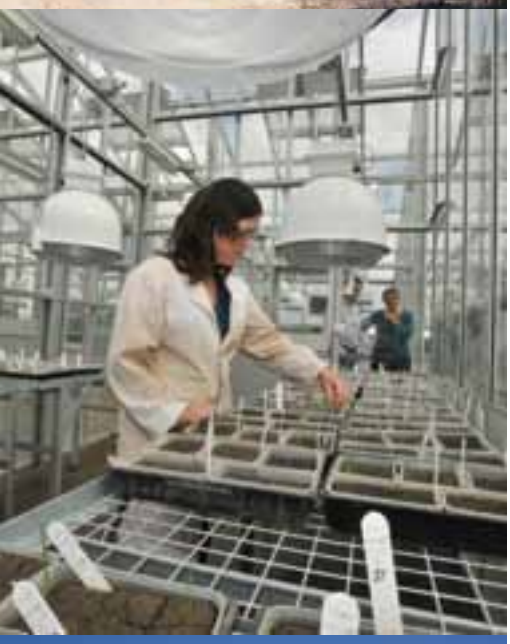
The Centre is undertaking research and delivering solutions on a range of key issues – including reducing emissions of methane from ruminant livestock, and nitrous oxide from cropping soils; increasing carbon sequestration in agricultural and forestry systems; managing risk associated with seasonal climate variability; and developing technologies for second generation biofuels from woody biomass.

The Centre will also educate and inform primary producers about the projected impacts of climate change and the challenges and opportunities it poses, as well as informing the debate on key policy issues, such as emission trading.

UNE
UNIVERSITY OF NEW ENGLAND

NSW DEPARTMENT OF PRIMARY INDUSTRIES

www.une.edu.au/piic www.dpi.nsw.gov.au



Research priorities

Research priorities for the National Centre for Rural Greenhouse Gas Research can be summarised as follows.

Assessing the impacts of climate change

Better understanding the likely impact of climate change on key primary industries, at the regional level, through:

- scenario modelling of regional impacts of climate change;
- development of a Geographic Information System (GIS)-based tool for assessing the risk of climate change;
- decision support systems to assist primary industries to cope with climate variability;
- assessment of the coping range of key systems to determine likely impacts of projected changes in climate extremes and the effectiveness of adaptation strategies;
- assessment of the socio-economic impacts of climate change.

Climate change mitigation

Developing options for primary industries to mitigate emissions through:

- reducing emissions (e.g. methane from livestock and nitrous oxide from cropping soils);
- sequestering carbon (e.g. strategic inclusion of woody plants in agricultural systems, management of soil organic matter in cropping and grazing lands, application of biochar);
- substituting bioenergy for fossil fuels (e.g. methane from animal wastes, or biomass from forestry residues);
- developing the supporting science to facilitate emissions trading (e.g. low cost measurement techniques for key greenhouse gases; models for greenhouse gas accounting; decision support systems to assist primary producers to assess alternative mitigation options).

In developing agricultural and forestry systems to help mitigate climate change, the Centre will consider three key criteria:

1. life-cycle greenhouse gas and energy balance to ensure systems deliver net benefits;
2. sustainability of production systems, including broader impacts on the environment; and
3. adaptation capacity of new systems.

Climate change adaptation

Developing capacity for the primary industry sector to adapt to climate change and, where possible, take advantage of any opportunities that arise, through:

- developing resilient agricultural and forestry production systems with increased capacity to cope with: elevated atmospheric CO_2; increased climate variability and more extreme events; changes in climate parameters; and indirect impacts (e.g. fire, pests and diseases) anticipated under climate change;
- researching sustainable management of natural systems, to ensure that they are both ecologically healthy and economically productive under the predicted impacts of climate change.

Contact **Professor Annette Cowie**
Director

National Centre for
Rural Greenhouse Gas Research

Phone: 02 6773 3924
Fax: 02 6773 3238
Email: annette.cowie@une.edu.au