

GLOBAL RESEARCH ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

INTEGRATIVE RESEARCH GROUP: Australia Country Update – 17,18 Jan 2023



National Climate Policy Updates

Climate Change Act 2022

- The Act enshrines in legislation Australia's greenhouse gas emissions reduction targets of a 43% reduction from 2005 levels by 2030 and net zero by 2050. The Act also requires the Minister for Climate Change to provide an annual statement on progress towards these targets to the Parliament, based upon advice from the Climate Change Authority.
- The role of the Climate Change Authority in providing expert advice and promoting accountability in climate policy has been reinvigorated. The Authority is now obliged to provide transparent advice on emissions reduction targets under the Paris agreement, and continues its existing functions of conducting research into climate change matters and reviewing the National Greenhouse and Energy Reporting System and Carbon Farming Initiative.

Re-engagement with international partnerships

- Australia has demonstrated its commitment to global climate action and to sharing our knowledge and experience with international partners by boosting our engagement in international climate and agriculture agreements.
- Recently joined agreements include the Global Methane Pledge, the Glasgow Breakthrough Agenda on Agriculture and the Forest and Climate Leaders Partnership.

Activities and Opportunities

CSIRO Australian Grains GHG Baseline and Mitigation Assessment

- CSIRO's assessment found that Australian grain production has very low GHG emissions intensity based on global comparisons, however, pathways to carbon neutrality remain challenging. In the context of recent disruptions to global food security, the joint meeting should consider the relative importance of pursuing carbon neutrality against lowering emissions intensity. Specifically, there is a risk that reducing production to lower overall emissions would shift production to regions with a higher GHG intensity production in order to meet global nutritional requirements.
- With adoption of better nitrogen application, improved regional rotations and an expected 50% uptake of Controlled Traffic Farming GHG emissions intensity could be further reduced by 15%. Under this scenario on-farm emissions would remain almost the same, total emissions would increase but be offset by higher production. Decarbonising farm inputs would further contribute to GHG reductions.

National Soil Carbon Innovation Challenge

- \$28.9m has been granted to eight recipients under round one of the National Soil Carbon Innovation Challenge to develop and demonstrate innovative soil organic carbon measurement technologies across a range of Australian agricultural landscapes and production systems, with an aim to improve the accessibility and reducing the cost of information and measurement tools for farmers and land managers

Activities and Opportunities

Rural Research and Development Corporations

- The Australian Government invests \$300m per year into the 15 Rural Research & Development Corporations, leveraging an additional \$500m from industry levy collections, to support RD&E into priority agricultural issues such as climate change
- The Grains Research and Development Corporation (GRDC) is the Commonwealth entity primarily responsible for planning, investing in and overseeing research, development and extension for Australia's 25 leviable grain crops. Their objective is to drive the discovery, development and delivery of world-class innovation to enhance the productivity, profitability and sustainability of Australian grain growers and benefit the industry and the wider community.
- The GRDC conducts and supports a number of activities, including those related to:
 - Greenhouse gas emissions and accounting
 - Precision farming techniques to reduce inputs
 - Fertiliser use
 - Soil carbon

Appendix 1 – list of relevant GRDC activities (and others)

Research topic	Project Description	Partners
GHG Emissions & Accounting	Development of a Common Approach to Sector-Level GHG Accounting for Australian Agriculture – Consultation Draft stage	Agricultural Innovation Australia (AIA), with 8 RDCs, CSIRO and DPIRD (WA)
	Know and Show – improving on farm greenhouse gas accounting	AIA, GRDC, other RDCs
	Greenhouse gas baseline and mitigation for cotton	CRDC, CSIRO
	Predicting nitrogen cycling and losses in Australian cropping systems – augmenting measurements to enhance modelling	GRDC, UQ
	Quantifying nitrogen losses and the effect on crop productivity and greenhouse gas emissions from the application of lime and sulphate of ammonia fertiliser under Western Australian farming systems	GRDC, UWA
	Northern Farming Systems – Integrating research solutions for improving profitability in summer dominated rainfall systems	GRDC, DAF (QLD), CSIRO
	Improving farming systems efficiency in southern NSW	GRDC, CSIRO
	Measuring GHG emissions in Western Australian farming systems to baseline and develop and evaluate management options to remain profitable under lower GHG emissions scenarios	GRDC, DPIRD (WA)
	Updating acidification rates, lime recommendations and extension aids to overcome soil acidity constraints to crop production in the southern region (measuring CO ₂ emissions from lime application)	GRDC, Uni of Adelaide
	Cool Soils Initiative	CSU, Food Agility CRC

Appendix 1 – list of relevant GRDC activities (and others)

Research topic	Project Description	Partners
Precision Farming Techniques	On-farm operations optimisation	GRDC (in procurement)
Fertiliser	Hydrogen to Ammonia Research and Development Project	GRDC, CSIRO
	Carryover of nitrogen after crop failure - Western Region case studies	GRDC, Laconik
	N banking strategies to manage variable and unpredictable nitrogen demand in the MRZ and LRZ of the Southern Region	GRDC, Birchip Cropping Group
	Future Farm Phase 2: Improving farmer confidence in targeted N management through automated sensing and decision support	GRDC, CRDC, CSIRO
	Increasing profit from N, P and K fertiliser inputs into the evolving cropping sequences in the Western Region	GRDC, Murdoch University
	ARC Research Hub for Smart Fertilisers	UniMelb
Soil Carbon	Option to increase soil organic carbon in grain production systems	GRDC (in procurement)
	Application of spaceborne-inspired hyperspectral imaging for soil carbon quantification	AgriFutures, Cloud Agronomics
	The Efficiency Factor of Soil Carbon Stock Auditing Methods	AgriFutures, USyd

Appendix 2 – list of National Soil Carbon Innovation Challenge (Development and Demonstration) grant recipients

Project Description	Grant Recipient
Fully integrated SOC measurement using CO2 flux, remote sensing and models	Agrimix Pty Ltd
Multi-Band SAR and Optics as a Novel Soil Carbon Measurement Technology	Agriprove Pty Ltd
Technology for lower cost & accurate Australia-wide soil carbon projects	Carbon Link Operations Pty Ltd
Commercialise Carbon Project device and data analysis software	Carbon Project Australia Pty Ltd
Kicking the \$3/Ha goal by fusing SOC samples with remote sensing/ML	Cloud Agronomics Pty Ltd
On-farm deployment of Hone Lab Red, a low-cost SOC measurement tool	Hone Carbon Pty Ltd
Rapid Assessment of Soil Parameters (RASP) to manage and quantify soil carbon	Sensorc Pty Ltd
Proximal and remote sensing for low-cost soil carbon stock estimation	University of Queensland