LIVESTOCK RESEARCH GROUP

newsletter

GLOBAL RESEARCH ALLIANCE ON AGRICULTURAL GREENHOUSE GASES

July 2017

Update from the Co-Chairs

Welcome to the July 2017 edition of the Livestock Research Group's newsletter.

USDA's Acting Chief Scientist, Dr Ann Bartuska, remarked at the recent Livestock Research Group (LRG) meeting how much the group has grown in subject area and expertise. She described this as *"crucial given the importance of livestock's role in our food systems, [alongside] the need to increase production – both the amount and nutritional quality – sustainably"*.

Livestock greenhouse gas emissions now account for 62% of all agricultural emissions (FAOSTAT). With 92 countries including livestock emissions in their Nationally Determined Contributions (NDCs) under the Paris Agreement, the sector's contribution to climate change is becoming a global priority. This was borne out in Washington D.C. at the LRG meeting – our biggest gathering yet, attracting over 60 participants including from nearly 30 countries and all of our major international and regional partners.

Countries are clearly committed to finding ways to understand and manage livestock emissions but, as Dr Bartuska noted, they also need to meet food security and development objectives (and to support their livestock sectors to adapt to a changing climate). At the same time, the systems they have for tracking livestock emissions do not always enable them to capture the links between productivity improvements and mitigation outcomes.

The LRG has become a place where these very complex issues can be discussed and countries' experiences shared. Collaboration between countries and partners is now the norm for finding ways forwards – whether that be achieving research gains, translating science into on-farm outcomes, or overcoming barriers to improving the way livestock emissions are estimated. This is a powerful feature of the group, and the wider Alliance, and one that we are very proud of.

We hope you enjoy this edition – showcasing some of the ways we have been working together recently.

Harry and Martin

This month's newsletter brings you:

Next LRG meeting: April/May 2018

The LRG will next meet in Ho Chi Minh City, Vietnam, in April or May 2018. More information will be circulated in due course but if you have any questions, please email LRG-enquiry@nzagrc.org.nz.

Global Research Alliance advances flagship research programmes on: enteric methane, soil carbon, paddy rice and greenhouse gas inventories

The Alliance Council has approved the development of four flagship programmes as a way of defining research priorities and attracting resourcing:

1. Enteric fermentation
2. Agricultural greenhouse gas inventories
3. Soil carbon sequestration
4. Water management in rice production

Taskforces have been established to design research activities that will be implemented under each flagship. These taskforces are guided by a set of principles that will help shape the activities:

- **Unique Alliance added value:** drawing on the knowledge and expertise across the Alliance's partners and 48 member countries
- **Inclusive and relevant:** giving opportunities for all Alliance members to be engaged in some way in the flagship and to benefit from some/all of the flagship's activities
- **Solution-focused:** demonstrating a clear link to the development and implementation of mitigation practices and technologies across a range of countries
- **Multi-faceted:** recognizing that mitigation is linked with and often driven by co-benefits for improved livelihoods, food security and adaptation
- **Build capacity and capability** of Alliance member countries
- **Supplement and support existing efforts:** adding value to existing activities and increasing the scope and depth of future activities

Detailed proposals for each flagship will be presented to the Alliance Council for endorsement at its annual meeting in August 2017 in Japan.

Implementation of the flagships will require resources. The Alliance Secretariat is leading a parallel process to explore options for Alliance 'joint programming'. Joint programming will enable members to collectively contribute to the resourcing of Alliance activities, including the flagships.

What does this mean for the LRG's work?
The flagships on enteric fermentation, agricultural greenhouse gas inventories and soil carbon sequestration are directly relevant to the LRG's work.

Enteric fermentation flagship
Enteric methane is the biggest source of direct global greenhouse gas emissions from livestock. Emissions per animal vary widely depending on the species, feed and productivity, presenting a significant challenge for estimating greenhouse gas emissions from herd to national scales. However, this variability also presents an opportunity to mitigate those emissions by improving the selection and breeding of animals; improving and changing feeds and the rumen microbiome; improving animal health care and resilience; and increasing the productivity of animals and farm systems.

The enteric fermentation flagship is focused on three themes:

a) Develop and advance new solutions for reducing enteric methane emissions
b) Improve the quantification of livestock emissions from farm to national scales
c) Identify, test and implement mitigation solutions that can reduce emissions and support local and national development goals

Harry Clark, LRG Co-chair, is leading the taskforce to develop this flagship and has a process underway to identify projects for inclusion in each of the above three themes. For more on the flagship or to participate in the taskforce, contact Harry Clark.

Agricultural greenhouse gas inventories flagship
The Paris Agreement increases countries' obligations to report on greenhouse gas emissions and progress against Nationally

Determined Contributions (NDCs). Greenhouse gas inventories will play a central role in this, however countries need support to increase their capacity in this area and to overcome barriers to improving their inventories.

The inventories flagship encompasses four broad themes:

a) Enhance the inventory structure, e.g. regional and source-specific guidance for developing advanced (Tier 2+) inventories
b) Build capability, e.g. targeted technical training to improve emission factors; analysis of current methodologies for estimating emissions
c) Acquisition and administration of data, e.g. incorporation of improved estimates in emissions databases; national and regional research projects that validate existing measurements
d) Demonstrating mitigation in NDCs, e.g. providing targeted support for countries to use improved inventory methods to include mitigation in NDCs

Much of the LRG's capability building programme is centred on supporting countries to develop and enhance their livestock greenhouse gas inventories (see page 5). This is because many countries use simple (Tier 1) methods for estimating livestock emissions, yet these are unable to capture a country's unique circumstances or trends over time other than changes in total animal numbers. More advanced inventory methods require more detailed data but capture country-specific production systems. Crucially, they also reflect changes in emissions that result from improvements in the productivity and efficiency of those systems over time.

Members of the LRG are involved in the inventory taskforce and are helping manage any potential for overlap between LRG inventory activities, the enteric fermentation flagship and the inventory flagship.

For more on the inventory flagship or to participate in the taskforce, contact its lead authors Brian McConkey, Canada and Andrea Pickering, New Zealand.

Soil carbon flagship

Close to half of all agricultural soils are estimated to be degraded. Erosion generates huge losses of soil carbon annually and carries costs of US$110-200 billion in fertilizer to replace lost nutrients. Soil carbon sequestration is a readily available, low cost mitigation. In addition, restoring degraded soils by increasing soil organic matter (and therefore soil carbon) provides adaptation to climate change and improves productivity.

The Alliance's soil carbon flagship targets ambitious changes in agricultural practices that would restore and enhance soil carbon and soil health. It aims to deliver an online, collaborative knowledge hub, including:

- A decision support toolbox: e.g. maps of soil carbon sequestration potential; implications of sequestration practices for yields/drought tolerance
- Enabling methods to certify soil carbon sequestration: e.g. tiered methodologies for measuring, reporting and verifying soil organic carbon; handbooks and guidelines
- Creating an enabling environment for adopting solutions: e.g. regional stakeholder workshops

The knowledge hub will help facilitate the development of national and regional soil carbon sequestration projects, with shared data, methods and models. It will help connect funders with projects, as well as linking with existing international initiatives on soil carbon, e.g. FAO Global Soils Partnership. A FONTAGRO/PROCISUR initiative introducing legumes to eight Latin American countries would also be connected.

Members of the LRG are participating in the soil carbon flagship to ensure the role of livestock in the soil carbon cycle and the soil microbiome is recognized. For more on the soil carbon flagship or to participate in the taskforce, contact its lead author Jean-Francois Soussana.

Dispatches from the Livestock Research Group meeting

The LRG held its 2017 meeting in Washington D.C. from 10-12 April, hosted by the United States. Over 60 people attended the recent meeting – including from 28 countries and 10 of the LRG's international and regional partner organisations. The following is a summary of the meeting's main outcomes.

Research networks and collaboration

Identifying opportunities for research collaboration was a major theme of the meeting. Working groups helped advance the Alliance's planned Enteric Fermentation Flagship, as well as the Inventories and Soil Carbon Flagships (see pages 2-3). This included brainstorming projects for inclusion in the flagships and ways to align those projects with possible resourcing. The LRG's research networks were highly engaged in the development of the flagships, and also provided an update on recent achievements (see table).

Several networks have been successful in securing resourcing from the recent European funding round known as 'ERA-GAS' (see below and also Manure Management Network side bar on page 5). This will help spur further momentum within the networks.

Members of the Rumen Microbial Genomics Network have received funding for 'RumenPredict', a project that will generate data to link rumen microbiome information to host genetics and phenotype and to develop feed-based mitigation strategies. This work will build on and enhance knowledge from previous LRG projects, including the Global Rumen Census and the Hungate 1000, as well as the Network's existing 'RumenStability' and 'RumenMine' projects.

'METHLAB' is another ERA-GAS funded project that brings together LRG countries. This project aims to refine on-farm lactic acid bacteria (LAB) technologies to include a methane-reducing benefit. These technologies (e.g. direct-fed microbial supplements, silage inoculants) are currently used to increase production and improve animal health.

LRG research network achievements

Animal Health Network	• Peer reviewed paper in *Environmental Research*, 'Challenges and priorities for modelling livestock health and pathogens in the context of climate change' (doi: 10.1016/j.envres.2016.07.033)
Animal Selection, Genetics & Genomics Network	• Published a review of proxy methods for estimating enteric CH_4 in dairy cows (in *Journal of Dairy Science*, doi: 10.3168/jds.2016-12030) • Contributed to the development of a multi-country dataset to estimate heritability of CH_4 emissions in dairy cows • Published a practice brief on ruminant genetics (jointly with CCAFS and the Global Alliance on Climate Smart Agriculture)
Feed & Nutrition Network	• Two major reviews in *Animal Feed Science & Technology* of experimental methods to improve research practices - Design, implementation and interpretation of in vitro batch culture experiments to assess enteric methane mitigation in ruminants – a review (doi: http://dx.doi.org/10.1016/j.anifeedsci.2016.03.016) - Review of current *in vivo* measurement techniques for quantifying enteric methane emissions from ruminants (doi: http://dx.doi.org/10.1016/j.anifeedsci.2016.05.018) • Good progress with the GLOBAL NETWORK project, set up to collate and analyse methane emission and mitigation data for ruminants. Two separate databases have been developed: - Mitigation: consists of 1,800 experimental treatment means from 410 publications and aims to summarise and recommend science-based enteric methane mitigation options to stakeholders - Prediction: consists of individual animal data and aims to develop robust enteric methane prediction models for various ruminant species and nutritional, animal and farm management scenarios
Manure Management Network	• See side bar on page 5
Rumen Microbial Genomics Network	• Creation of a replica of the LRG's Hungate 1000 cultures, to be held in IBERS and made available to scientists on demand • RumenMine – a database tool for mining the Hungate 1000 cultures

Resourcing the LRG's ambitions

The meeting heard from the Alliance Special Representative, Hayden Montgomery, that the proposed flagships will be a valuable means of focusing attention on research priorities and identifying possible funding opportunities, including via Alliance joint programming. Martin Scholten reported that the European Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI) is working to set up an International Research Consortium (funding model) on soil in collaboration with the 4 per 1000 initiative. It is also developing its Implementation Plan for 2018-2020 – an opportunity to align LRG research priorities, including via the flagships.

Capability building

The meeting agreed that helping countries move towards Tier 2 inventories and designing improved measurement, reporting and verification (MRV) systems for livestock greenhouse gases remains the top priority for LRG capability building efforts. The last 12 months have seen delivery of high impact capability building, including:

- Development of an MRV white paper (see page 8)
- Publication of a brochure outlining the benefits of advanced inventories for livestock emissions
- Regional workshops and technical training to improve livestock greenhouse gas inventories in South and South East Asia
- Peer review of Tier 2 inventories

Many of these activities were jointly undertaken with CCAFS, the CGIAR's Research Program on Climate Change, Agriculture and Food Security, as well as the FAO and World Bank.

LRG members were keen to see activities like these continue into the 2017/18 year, including further inventory training in Asia, outreach in Africa, and global implementation of some of the recommendations from the MRV white paper. Members also requested an extension of this capability building focus to providing support to countries to develop the scientific underpinnings for livestock 'NAMAs'[1].

But the LRG's efforts haven't only been focused on inventory and MRV issues. A flagship capability building project, '*Reducing enteric methane for improving food security and livelihoods*' concluded earlier in 2017. This project, led in partnership with FAO and with funding from the UN's Climate and Clean Air Coalition and the New Zealand Government, has helped identify regionally appropriate interventions that can reduce emissions and support livestock development. Thirteen countries across South Asia, Sub-Saharan East Africa and South America have been involved and funding for a second phase has been confirmed.

The popular LRG and Sustainable Agriculture Initiative Platform guide on 'Reducing greenhouse gas emissions from livestock: best practice and emerging options' was translated into Spanish and French this year and work is underway to explore its translation into Mandarin. The LRG also published two new case studies on reducing on-farm emissions intensity, on dairying in Sri Lanka and beef farming in Canada.

The meeting also received an update on progress with the BEEF CARBON project involving 2,000 farmers across France, Ireland, Italy and Spain voluntarily aiming to reduce the greenhouse gas footprint of beef production by 15% in four years.

[1] A NAMA is a Nationally Appropriate Mitigation Action, taken under the UN Framework on Climate Change. It refers to any action that reduces emissions in a developing country, that is prepared under the umbrella of a national governmental initiative.

Meet the new coordinators of the Manure Management Network

We are delighted to announce that China has agreed to lead the Manure Management Network, with support from the Netherlands and the US. This role has previously been undertaken by the Netherlands together with Vietnam, and latterly by France.

The Manure Management Network's main aim is to identify management practices to reduce methane and nitrous oxide emissions from livestock manure and improve the efficiency of nutrient use. The new coordination team includes:

Dr Dong Hongmin *is Professor and Deputy Director General of the Institute of Environment and Sustainable Development in Agriculture at the Chinese Academy of Agricultural Sciences. Dong's research focuses on the livestock environment, manure management, and greenhouse gas emissions and mitigation.*

Dr Julio Mosquera Losada *is a research scientist at Wageningen Livestock Research in the Netherlands. He is experienced in the development and use of measurement methods and strategies to measure agricultural greenhouse gas emissions.*

Dr April Leyton *is a research scientist with USDA Agricultural Research Service in Kimberly, Idaho. Her research focuses on the environmental footprint of dairy production including emissions from manure storage and land application of manures, as well as N and P cycling in integrated livestock cropping systems.*

In the coming months, the leadership team will connect with the network community, reinvigorating its agenda and ambitions, reviewing existing manure management practices, identifying new opportunities for collaboration and organizing a network meeting in Asia in 2018.

This leadership announcement is well timed, coinciding with the announcement of funding for a 3-year joint project between members of the Manure Management Network and the Feed and Nutrition Network on 'Capturing Effects of Diet on Emissions from Ruminant Systems' (CEDERS).

If you would like to be part of the Manure Management Network, please contact any of its new coordinators: donghongmin@caas.cn; julio.mosquera@wur.nl; april.leytem@ars.usda.gov

Delegates at the 2017 LRG meeting at USDA's National Institute of Food and Agriculture headquarters in Washington D.C.

Intergovernmental Panel on Climate Change

Andy Reisinger, New Zealand's LRG representative and member of the IPCC Bureau, outlined opportunities for the LRG to contribute to upcoming IPCC activities. During the next five years, the IPCC will publish several major reports of relevance to livestock greenhouse gas emissions. LRG members can make a direct contribution to this work by:

- Nominating authors and expert reviewers
- Increasing the availability and relevance of literature, e.g. publishing research on the impact of productivity gains on mitigation, as well as publishing regional and targeted literature reviews, particularly to ensure non-English language publications are accessible to IPCC authors
- Communicating informally with IPCC lead authors

The IPCC has a strong preference for journal-based publications that have been through the normal scientific peer review process. While the IPCC can use "grey literature" (e.g. an Alliance published document), it is always best if it has been published with a publisher and gone through its own peer review process.

The table specifies the IPCC reports and the cut-off date for publications to be considered by the IPCC in preparing its reports.

Due	Title / scope	Indicative cut-off date for publications to be considered in producing the IPCC report
Sept 2018	Global Warming of 1.5°C: an IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty	• Submitted to scientific journal or available as draft technical report – by 1 November 2017 • Accepted by scientific journal or published as technical report – by 15 May 2018
May 2019	Methodology Report to refine the 2006 IPCC Guidelines for National Greenhouse Gas Inventories	• Submitted to scientific journal or available as draft technical report – by March 2018 • Accepted by scientific journal or published as technical report – by June 2018
Sept 2019	Climate Change and Land: an IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems	• Submitted to scientific journal or available as draft technical report – by September 2018 • Accepted by scientific journal or published as technical report – by February 2019
2022	6th Assessment Report, covering: • April 2021: Physical science basis of climate change (Working Group I) • July 2021: Mitigation of climate change (Working Group III) • October 2021: Impacts, adaptation and vulnerability to climate change (Working Group II) • April 2022: Synthesis across the three Working Groups and Special Reports	For Working Group III: Mitigation • Submitted to scientific journal or available as draft technical report – by April 2020 • Accepted by scientific journal or published as technical report – by October 2020

New platform on sustainable livestock production in Latin America and the Caribbean

Producing more milk and meat with a lighter environmental footprint is the aim of a new regional research platform launched at the Livestock Research Group meeting in April 2017.

The 'Sustainable Livestock Production Platform: Greater Productivity with Lower Greenhouse Gas Emissions' is anticipated to benefit over 1,000 researchers, extension workers, students, producer organizations and decision-makers in Latin America and the Caribbean.

Fifteen countries have initially come together in the platform to promote the advancement of agriculture in the region through innovation, climate change mitigation and adaptation, sustainable intensification and linkages to markets. The platform builds on wide-ranging regional cooperation on livestock greenhouse gas emissions since 2007 and aims to:

- Coordinate research and development
- Facilitate knowledge sharing
- Strengthen the capacities of participating countries and institutions to address the challenge of sustainable intensification
- Share good practice policy design for the livestock sector
- Jointly mobilize resources from within participating institutions, as well as supporting them to submit joint bids to external funding sources

Development of a three-year action plan is underway, along with a knowledge management and communications strategy. The platform will be coordinated by the Tropical Agricultural Research and Higher Education Center (CATIE), supported by FONTAGRO, the Global Research Alliance and the New Zealand Government.

"A coordinated regional agenda on researching the effect of greenhouse gas emissions on livestock production will enable countries to be more effective, share experiences in their own languages, and better reach farmers and decision-makers", Hayden Montgomery, Global Research Alliance Special Representative, said.

Guidance for reporting greenhouse gas emissions and mitigation in the livestock sector

GLOBAL RESEARCH ALLIANCE ON AGRICULTURAL GREENHOUSE GASES

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security CCAFS

As countries begin to implement the Paris Agreement on climate change, many countries need to improve systems to track mitigation in the livestock sector.

In their Intended Nationally Determined Contributions (NDCs) to the Paris Agreement, 92 developing countries mentioned livestock-related emissions, and 48 of the 92 explicitly mentioned intentions to reduce emissions from livestock-related sources such as enteric fermentation, manure management and biogas, and grasslands and silvo-pastoral systems. But how do countries plan to document reduced emissions?

The Paris Agreement requires countries to submit national greenhouse gas inventory reports, information on implementation and achievement of NDCs, account for their NDCs, and climate finance requires reliable estimates. Countries have monitoring, reporting and verification (MRV) systems to meet these requirements, but many MRV systems lack completeness, consistency, accuracy or transparency. While no global, one-size-fits-all livestock MRV system is possible, and countries and projects have flexibility in how they shape their MRV systems, all MRV systems must be scientifically robust, feasible, and relevant to their context and policy goals.

Greenhouse gas emissions from livestock are significant – and growing. 119 countries have indicated they intend to reduce emissions in the sector. But how will they measure emissions and mitigation?

As of February 2017, only five developing countries have MRV methods in place that can measure emission reductions in livestock resulting from changes in agricultural management practices or increases in productivity, found researcher Andreas Wilkes of UNIQUE Forestry and Land Use in 'Monitoring, reporting and verification of greenhouse gas emissions from livestock: current practices and opportunities for improvement', an Info Note published by the LRG and CCAFS in May 2017.

Given the pressing need for improved livestock MRV systems, the LRG, CCAFS, UNIQUE Forestry and Land Use, and the FAO – with support from the New Zealand Government, the United States Agency for International Development, and the World Bank – are studying opportunities for improved MRV systems to enable developing countries to meet their mitigation goals. Key findings and recommendations are available in this Info Note; and a full report in English, French, and Spanish is expected later in 2017.

This article is an excerpt of a CCAFS blogpost, reproduced with the kind permission of its author, Julianna White. You can read the full post and download the Info Note here.

Partner Update:
Highlights from CCAFS

CCAFS is the CGIAR's Research Program on Climate Change, Agriculture and Food Security. Its research aims to develop and scale up agricultural practices and policies that are adaptive to climate change, reduce greenhouse gas emissions and increase farmers' resilience. Over 200 scientists working in five regions of the developing world are part of the CCAFS program. CCAFS is an important partner for the LRG, with many shared priorities.

Highlights from CCAFS low emissions agriculture work program

CCAFS has published an Info Note on the development of livestock 'NAMAs' (see footnote on page 5) in Colombia and Costa Rica. These NAMAs seek to transform livestock production by increasing production levels and improving the carbon balance. They are working with the International Center for Tropical Agriculture (CIAT) on 'Livestock Plus', a project aimed at sustainably intensifying livestock production based on the use of improved forages.

CCAFS hosted a seminar on 'Science to Deliver Adaptation and Mitigation in East African Agriculture', at the CGIAR's International Livestock Research Institute (ILRI) in Kenya on 30 May 2017. Greenhouse gas emissions from livestock production are the largest source of agricultural emissions in East Africa. The seminar discussed opportunities for mitigation in the region, as well as policy and engagement, the underpinning science, and partnerships for impact.

A reminder to readers that CCAFS' SAMPLES program has published a guide to field measurement of GHG sources and sinks in book form (hard copy or freely downloadable e-book). The guide is intended to inform the field measurements of agricultural GHG sources and sinks, especially to assess low emissions development options in smallholder agriculture in tropical developing countries. It can be used to support improved emissions factors for country inventories, to assess the mitigation impacts of projects, or as methods for scientific studies. It includes a chapter on enteric methane emissions from livestock. Download the e-book here.

Other recent livestock-related publications from CCAFS include:

- Byrnes RC, Nùñez J, Arenas L, Rao I, Trujillo C, Alvarez C, Arango J, Rasche F, Chirinda N. 2017. Biological nitrification inhibition by Brachiaria grasses mitigates soil nitrous oxide emissions from bovine urine patches. *Soil Biology & Biochemistry*. 107: 156-163. https://doi.org/10.1016/j.soilbio.2016.12.029
- Latawieca AE, Strassburga BBN, Silva D, Alves-Pinto HN, Feltran-Barbieri R, Castroa A, et al. 2017. Improving land management in Brazil: A perspective from producers. *Agriculture, Ecosystems and Environment*. 240: 276-286. http://dx.doi.org/10.1016/j.agee.2017.01.043
- Vetter SH, Sapkota TB, Hillier J, Stirling CM, Macdiarmid JI, Aleksandrowicz L, Green R, Joy EJM, Dangour PD, Smith P. Greenhouse gas emissions from agricultural food production to supply Indian diets: Implications for climate change mitigation. Agriculture, Ecosystems & Environment. 237:234–241. https://dx.doi.org/10.1016/j.agee.2016.12.024
- Smith P, Nayak D, Linthorst G, Peters D, Bucquet C, van Vuuren DP, et al. 2016. Science-based GHG emissions targets for agriculture and forestry commodities. Ecofys Consultancy http://www.ecofys.com/files/files/ecofys-uni-aberdeen-pbl-2016-science-targets-agriculture-forestry.pdf
- Subbarao et al Genetic mitigation strategies to tackle agricultural GHG emissions: The case for biological nitrification inhibition technology. https://doi.org/10.1016/j.plantsci.2017.05.004

International fellowship opportunities

LEARN Awards (sponsored by the New Zealand Government)

LEARN is an awards scheme sponsored by the New Zealand Government to build international capability in livestock emissions research. It is part of New Zealand's support for the Global Research Alliance on Agricultural Greenhouse Gases.

LEARN is focused on:

- Supporting technical staff and scientists from developing countries and Alliance member countries to work alongside New Zealand colleagues
- Sharing knowledge on livestock greenhouse gas emissions measurement, modeling and mitigation practices to increase the level of scientific skills and technological capabilities internationally
- Supporting strategic research and capability building activities that align with the priorities of the Alliance as well as relevant New Zealand science priorities
- Advancing common research interests between countries and building enduring relationships

There are four LEARN awards offered:

- Co-funded PhD Scholarship
- Postdoctoral Fellowship
- Technical Training Award
- Global Research Alliance Senior Scientist (GRASS) Award

All applications must be developed in close collaboration with a New Zealand research institution. For more information, please see www.livestockemissions.net

Co-operative Research Programme on Biological Resources Management for Sustainable Agricultural Systems (sponsored by the OECD)

The OECD's Co-operative Research Programme (CRP) has launched a funding round for research fellowships and international conferences in 2018. The CRP supports work on the sustainable use of natural resources in agriculture, fisheries, food production and forestry, and research into new technologies in these areas. The aim of the research fellowships is to strengthen the international exchange of ideas and increase international mobility and co-operation between scientists working in these areas.

Applications are invited from research scientists working in agriculture, forestry or fisheries and who would like to conduct research projects abroad in another member country of the CRP. Applicants must be nationals or residents from one of the 24 countries participating in the programme.

All applications for CRP funding need to be relevant to one or more of the following three research themes:

- Theme 1: Managing natural capital for the future
- Theme 2: Managing risks in a connected world
- Theme 3: Transformational technologies and innovation

The deadline for submitting applications is Sunday 10 September 2017, midnight (Paris time).

For more information, please see www.oecd.org/tad/crp/crp-research-fellowships-and-conference-sponsorship.htm

Upcoming events

FAO annual conference

This year will be the 40th Conference of the FAO – the sovereign governing body of the organisation. Member nations (of which there are 194), organisations and associate members are usually represented at this event by Agriculture Ministers.

Date: 3–8 July 2017
Location: Rome, Italy
Website: http://www.fao.org/about/meetings/conference/c2017/en/

World Agricultural Forum Conference

The World Agricultural Forum brings together leaders from the agricultural sector with policy makers and influencers. This year's conference theme is 'Solving the triple challenge to agriculture – trade, new technologies and food security'.

Date: 6–7 July 2017
Location: Singapore
Website: http://worldagforum.com/world2017Singapore.htm

Global Research Alliance Council meeting

The Alliance Council will meet next in Japan. The LRG will be represented at the Council meeting by its co-chairs. Please note that all Alliance member countries are individually represented at the Council, along with representatives from Alliance partners.

Date: 28 August–1 September 2017
Location: Tsukuba, Japan
Contact: secretariat@globalresearchalliance.org

JIRCAS-NARO International Symposium on Agricultural Greenhouse Gas Mitigation

In conjunction with the Alliance Council meeting, the Japan International Research Center for Agricultural Sciences (JIRCAS) and the National Agricultural and Food Research Organization (NARO) are hosting an international symposium. This forum will enable an exchange of research results from studies into reducing agricultural greenhouse gas emissions while sustaining production in Asian countries. It will also discuss the direction of future research and ways to strengthen collaboration within the framework of the Alliance.

Date: 31 August 2017
Location: Tsukuba, Japan
Contact: secretariat@globalresearchalliance.org

Global Research Alliance Paddy Rice Research Group meeting

The 8th meeting of the Alliance's Paddy Rice Research Group is also taking place in the margins of the Council meeting.

Date: 2 September 2017
Location: Tsukuba, Japan
Contact: secretariat@globalresearchalliance.org

6th International Symposium on Soil Organic Matter

Rothamstead Research is hosting this year's Soil Organic Matter (SOM) International Symposium, which is focused on 'Health soils for sustainable agriculture: the role of SOM'. Registrations are now open and the deadline for submitting abstracts is 16 July 2017.

Date: 3–7 September 2017
Location: Harpenden, United Kingdom
Website: www.som2017.org

17th International RAMIRAN Conference

RAMIRAN "Recycling of Agricultural, Municipal and Industrial Residues in Agriculture Network" is holding its biennial conference, this year focused on 'Sustainable utilisation of manures and residue resources in agriculture'.

Date: 4–6 September 2017
Location: Wexford, Ireland
Website: www.ramiran2017.com

Global Research Alliance Croplands Research Group meeting

The 9th meeting of the Alliance's Croplands Research Group is taking place in the margins of the International SOM Symposium.

Date: 8–9 September 2017
Location: Harpenden, United Kingdom
Contact: secretariat@globalresearchalliance.org

3rd LRG inventory development workshop for South East Asia

This regional LRG workshop is the third in a series for select South East Asian countries to take stock of progress towards Tier 2 inventories for livestock greenhouse gas emissions. It will also include a technical training component focusing on QA/QC.

Date: 11–12 September 2017
Location: Bangkok, Thailand
Email: LRG-enquiry@nzagrc.org.nz

3rd Conference of Greenhouse Gas Emissions in Animal Agriculture Production Systems of Latin America (GALA 2017)

Uruguay's National Institute for Agricultural Research (INIA) is organising GALA 2017, which will share scientific progress, knowledge and experiences of countries in the region in combating climate change and adapting agricultural systems to its effects. Registrations are now open, with an early bird rate available until 7 August. The deadline for submitting abstracts is 10 July 2017.

Date: 4–6 October 2017
Location: Colonia, Uruguay
Website: www.conferenciagala2017.uy/

Upcoming events continued

FAO Committee on World Food Security and launch of joint Alliance/World Farmers Organisation fellowships

The theme of the 44th session of the FAO Committee on World Food Security (CFS) is 'Making a difference in food security and nutrition'. The Alliance expects to launch a joint study tour programme and scientist-farmer fellowship scheme with the World Farmers Organisation in the margins of the CFS.

Date: 9–13 October 2017
Location: Rome, Italy
Contact: secretariat@globalresearchalliance.org

Climate-Smart Agriculture 2017: Global Science Conference

The fourth Global Science Conference on Climate Smart Agriculture (CSA) has the theme of 'Catalysing local innovations and action to accelerate scaling up of CSA. The previous event took place in 2015.

Date: 28–30 November 2017
Location: Johannesburg, South Africa
Website: http://csa2017.nepad.org/en/#

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