CIAT

International Center for Tropical Agriculture
Since 1967 / Science to cultivate change

Towards a greener rice sector in Latin America & the Caribbean

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Paddy Rice Research Group Meeting EMBRAPA Clima Temperado, RS – Brazil 20-21 February, 2015

- Review on mitigation research in LAC

- Concept notes & proposals for multi-site/country experiments to include:

1. Comparisons among regions, climates and production systems;

2. Modelling of GHG emission from different systems;

3. Better understanding of the soil microbiology dynamics rice paddies.

Presentation structure

- Brazil decisions
- State-of-the-art on rice research in LAC
- Fundraising efforts
- Modelling
- Capacity building

State-of-the art of research on GHG mitigation in LAC

Chirinda et al. A review of climate change mitigation options for irrigated rice systems in Latin America and the Caribbean: **Key regional differences and the need for more research** (*manuscript in prep*)

Key observations:

- Intermittent drainage of irrigated rice fields reduces CH_4 emissions by **25-65%**.

- Focus on quantifying the potential of **tillage practices**, **variety choices**, and **nitrogen and straw** management to reduce GHG emissions

- Parametrization & validation of **mechanistic models** and other GHG calculators for LAC (i.e., DNDC)

Fundraising efforts

- Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC)
- Tinker foundation
- Embrapa-innovative market
- CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) - LAMNET

CCAC: Mitigation options to reduce CH_4 emissions in paddy rice

- **Stakeholder engagement** to ensure adoption of smart irrigation practices (SIPs)
- **Information** & **communication** on SIPs
- Building **financial resource base** for reducing CH_4 emissions
- Evaluating the **technical** & **economic** viability & **environmental** impact of SIPs
- **Build capacity** of relevant stakeholders to **implement** SIPs and take **policy actions**

Tinker foundation: Assessment of Greenhouse Gas Emissions from Rice Systems in Latin America (GreenRice)

- **Multi-site/country** experiments
- Estimating **baseline GHG emissions** & **exploring mitigation options**
- **Building the capacity** of regional partners **in GHG research**
- Inform the **designing** and **implementation** of Nationally Appropriate Mitigation Actions (**NAMA**s)

Innovative Mkt Embrapa: Validation of a novel water management strategy for Colombia and Brazil

- To evaluate two AWD treatments (**mild** and **severe AWD**) vs. **continuous flooding**

Treatments:

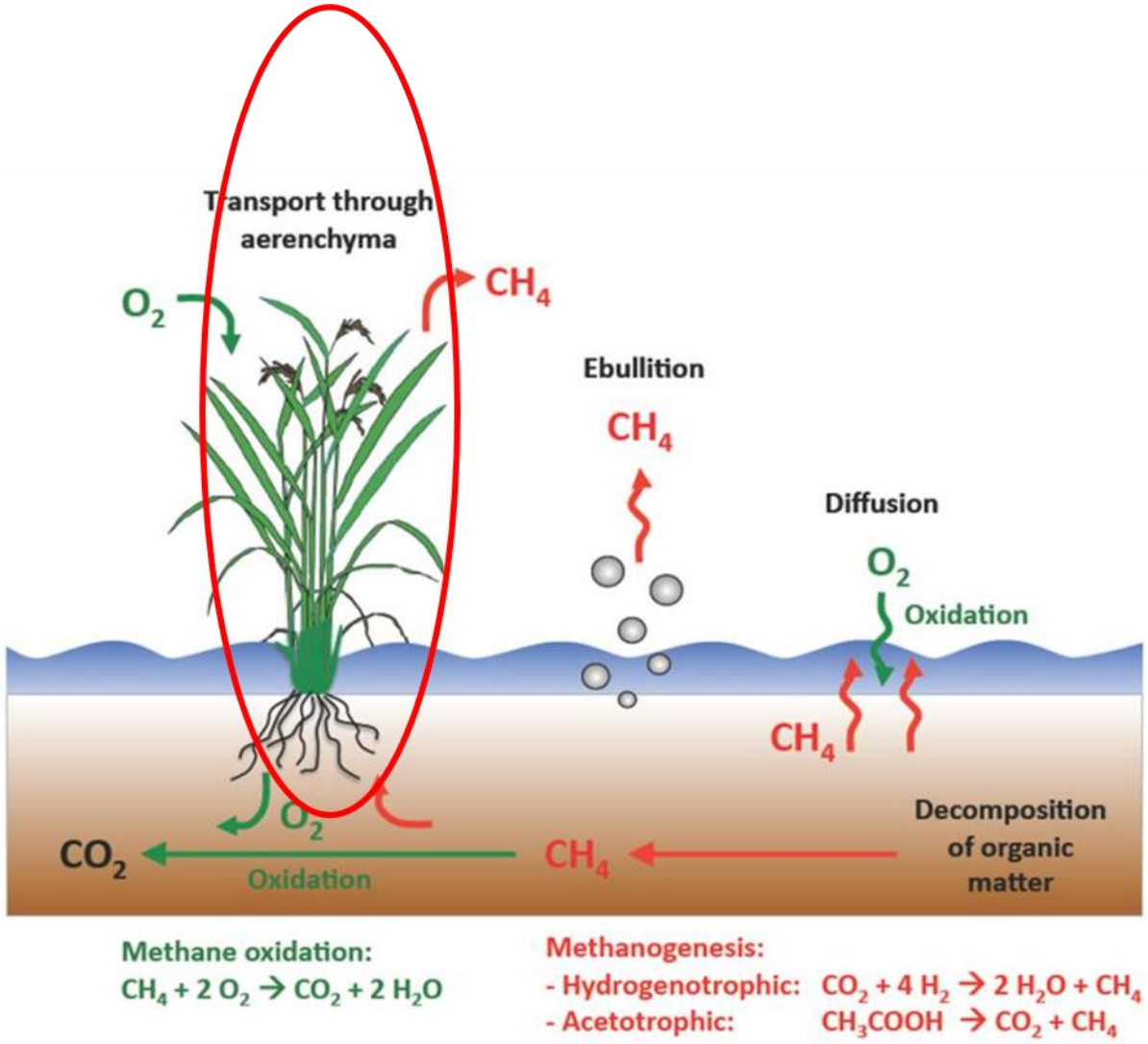
- **Mild AWD**: Water depth allowed to decrease to 15 cm below the soil surface before irrigation

- **Severe AWD**: Water depth allowed to decrease to 30 cm below the soil surface before irrigation

Modelling

- We are in contact with **Applied Geosolutions** (AG)
- AG are rewriting the **DNDC model** & will make the new code open source project for research use.
- Code will be available on the **GRA Modeling Platform** (http://gramp.org.uk/)
- Collaborate on the model **calibration** & **validation** developing **GHG offset protocols**.
- Joint fundraising efforts for **training** and **collaboration** workshops.

How else can we reduce GHG emissions?



Methodology

Tissue collection

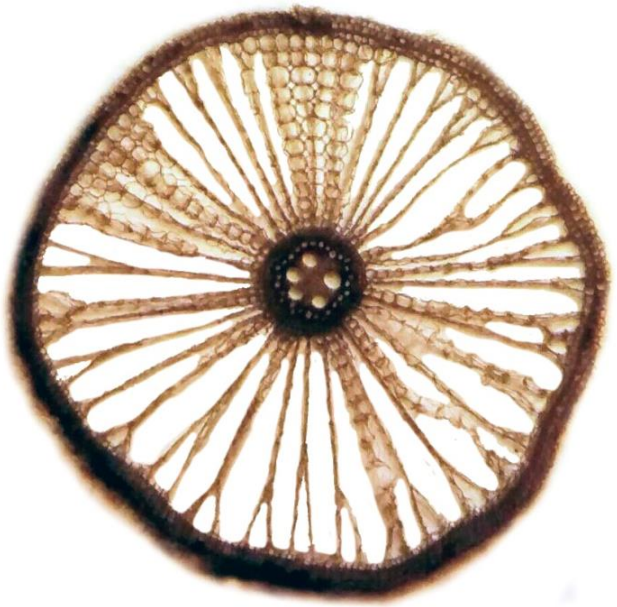
12 wild rice
5 cultivated

Plant tissue preparation

Tissue analysis

Data analysis

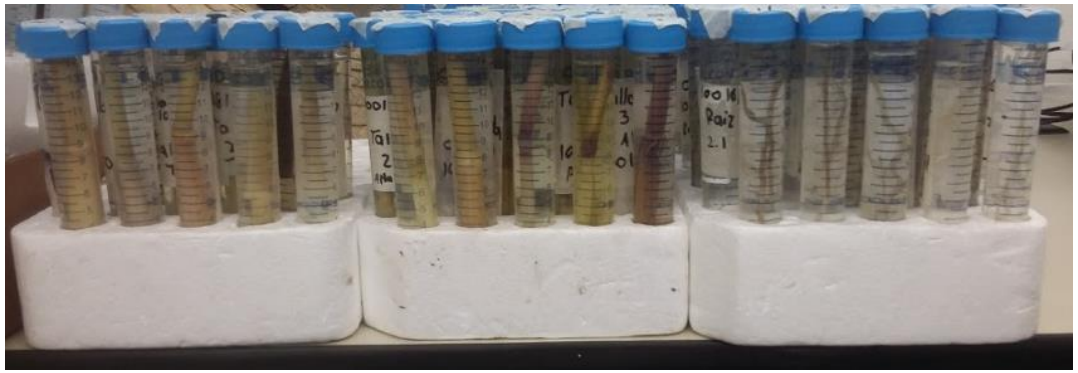
Preliminary results-cultivated varieties

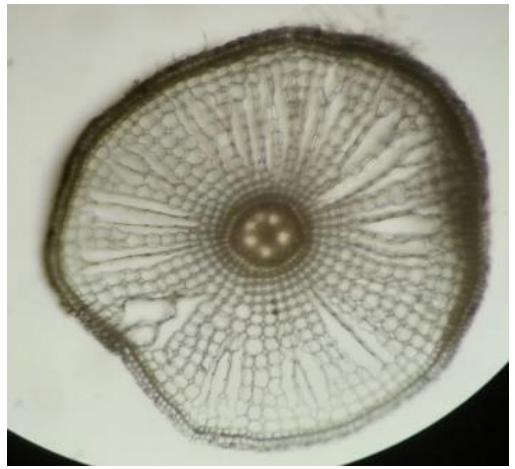


Variety	% Aerenchyma	Methane transmission
NIPPONBARE	43	?
TAICHUNG NATIVE	38	?
IR-59469	34	?
TEQUING	26	?
ORIZICA LLANOS	26	?

Varietal differences and effects on CH_4 emission

Methane transmission





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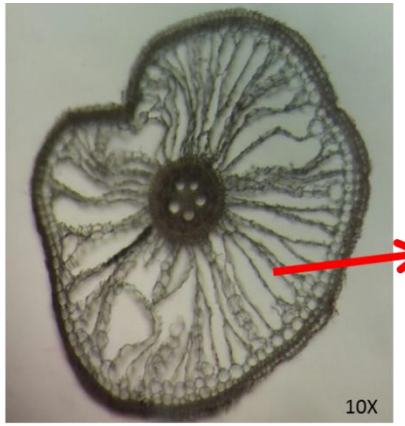
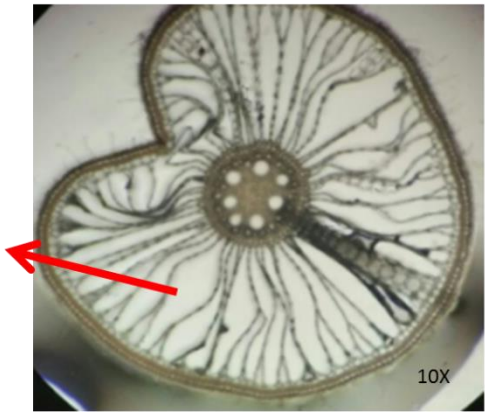


Aerenchyma



Portuguesa

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Innovation in measurements, modelling and policies (PhD students, research institutions and policy makers)