

NEWSLETTER N°2, June 2019

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1. Cropland Research Group GRA Co-Chairs message

We do hope you enjoy the current newsletter where relevant events such as REMEDIA and Forest-Europe represent excellent examples of science activities focused on climate change mitigation and adaptation with policy implications. The Spanish Scientific Network REMEDIA for mitigation of greenhouse gas (GHG) emissions in the agroforestry sector was joined by high level representatives from INIA (Agrarian Research National Institute), the Spanish Ministry, national GRA representatives, and GACSA to discuss the development of tools and monitoring approaches for GHG mitigation practices. The Forest Europe initiative launched their report with relevant recommendations to foster agroforestry to mitigate and adapt to climate change.

Results of relevant examples linked to sustainable coffee production practices included long-term experiments focused on addressing climate change related issues.

Finally, we are pleased to announce that the planning for our annual Croplands Research Group meeting on 14 November is now underway, and more information will be provided shortly. The meeting will be held alongside the ASA-CSSA-SSSA scientific conference in San Antonio, Texas USA. To register for this conference see the item under upcoming events later in this newsletter. We hope to see you there!

Source:

Croplands Research Group Co-Chairs Team, Rosa Mosquera, Ladislau Martin-Neto, Mark Liebig.

2. REMEDIA

REMEDIA is a scientific network for mitigation of greenhouse gas (GHG) emissions in the agroforestry sector created in Spain in 2011. The main REMEDIA objectives are: i) to serve as a framework to articulate national initiatives with existing international initiatives ([Global Research Alliance](#), [FACCE JPI](#), [ICOS](#), [LTER](#)...), ii) to involve socioeconomic agents, iii) to promote holistic studies within the research area of the GHG mitigation in the agroforestry sector, iv) to promote consensus and cohesion in the language applied to the area of GHG mitigation in the agroforestry sector, v) to identify and propose scientific actions sustained over time for an adequate understanding of different mitigation measures, as well as explore the compatibility with adaptation to climate change, vi) to promote the exchange of information between groups and the creation of a metadata base on different research outputs in Spain and vi) to promote relations with other existing scientific networks.



Figure 1: Some pictures taken during the VII Workshop REMEDIA in Lugo, Spain, 27-28 March 2019.

REMEDIA includes 150 researchers from all over Spain, with some of the members representing the Intergovernmental Panel on Climate Change (IPCC). REMEDIA members meet annually to hold a workshop in which the latest scientific advances in the area of GHG mitigation in the agroforestry sector are presented. The last workshop took place in Lugo, Spain during 27th – 28th March 2019. The title of the workshop was “[Agroforestry Systems as a Solution to Climate Change](#)” and included sessions about mitigation of GHG in livestock, agricultural and forest systems within the framework of the agroforestry systems. The keynote speakers of the workshop were Ladislau Martin-Neto from EMBRAPA, Brazil (“[Evaluation of Integrated Crop-Livestock-Forest Systems and Soil Carbon Dynamics in Brazil](#)”), Cristina Arias-Navarro from INRA, France (“[International Soil Carbon sequestration research: H2020 CIRCASA](#)”) and Allison M. Chatrchyan from the Cornell University, USA ([Cornell's climate smart farming: helping farmers to adapt to and mitigate climate change](#)). The next REMEDIA workshop will take place in the Mediterranean area of Spain in April 2020. More information about the workshop will be available very soon in the REMEDIA [website](#) and [blog](#).

Please follow REMEDIA through its [website](#) and [blog](#). REMEDIA is also in [Facebook](#), [Twitter](#) and [Instagram](#).

Source: Nuria Ferreiro-Domínguez, University of Santiago de Compostela, Spain.

3. COFFEE AGROFORESTRY SYSTEMS IN CENTRAL AMERICA

In Central America the production of coffee with high technology systems has implied an increase of the yield for farmers who produce coffee under the best conditions. In recent decades, yields have been tripled or quadrupled, affecting some ecological processes, such as the nutrient recycling, the food chain, and other environmental services.

The use of high technology systems has been questioned by various sectors, including financial entities, scientific groups, environmentalists and even final consumers due to: i) high prices of synthetic inputs together with the variable coffee prices that have created greater economic vulnerability, even for successful producers, ii) inappropriate application of the high technology model to small-scale coffee farmers with limited resources, iii) concern for climate change and loss of biodiversity by eliminating and simplifying shade in coffee plantations, and iv) elevated use of pesticides and fertilizers that have caused soil degradation and contamination of the environment in river basins.

Several actions were carried out by the coffee producers to reduce costs by facilitating their access to special markets and diversifying their income. In this context, the Tropical Agricultural Research and Higher Education Center (CATIE) has carried out studies to identify ecological processes and interactions that can be the basis for the development of a sustainable coffee production. Improved performance of these processes will allow for the designing of systems that use ecological efficiencies to reduce costs, improve quality and generate additional income.

In 2000, the CATIE established two long-term experiments with the objective of increasing basic knowledge for the promotion of sustainable coffee production and filling important information gaps on agroecological interactions and productivity. One of the experiments was established in Turrialba, Costa Rica (low humid area) and the other in Masatepe, Nicaragua (low dry area).

These experiments, with the collaboration of different national and international institutions, have supported the development of multiple studies (more than 36 undergraduate, postgraduate and postdoctoral theses) in topics such as fertility and life in the soil, production, ecosystems services, diseases and pests, etc. Each experiment compares the evolution of different coffee production systems (e.g., full sun, systems with different types of trees and with conventional and organic management at different levels). The behavior of different varieties of coffee is also evaluated. For example, in Costa Rica, Caturra, Costa Rica 95, F1 Hybrids (Central America and Millennium) are evaluated, while in Nicaragua the varieties evaluated are Catrenic, Pacas, CARO, PARO and the F1 Hybrids.

The experiment in Nicaragua, established 15 years ago, and the experiment in Costa Rica, established 19 years ago, are unique experiments that continuously generate a diverse stream of important data for use by scientists, technicians, students and policy makers.

For more information please contact Elias de Melo Virginio Filho, Coordinator of the Costa Rica experiment (eliasdem@catie.ac.cr) and Norvin Sepúlveda, Coordinator of the Nicaragua experiment (nsepulveda@catie.ac.cr).

Source: Elias de Melo Virginio Filho and Norvin Sepúlveda, Tropical Agricultural Research and Higher Education Center (CATIE).

4. FOREST EUROPE

Agroforestry represents one of the climate change adaptation measures, contributing to restoration of degraded land, preventing forest fires while providing livelihood and food security for people. The main agroforestry practices include silvoarable agroforestry, riparian buffer strips, silvopasture, forest farming, and homegardens. Currently, agroforestry is only applied in less than 10 % of agricultural land in Europe.

FOREST EUROPE (Ministerial Conference on the Protection of Forests in Europe) is the pan-European voluntary high-level political process for dialogue and cooperation on forest policies in Europe. FOREST EUROPE Work Programme for 2016-2020 includes a specific activity focused on sharing agroforestry expertise and experiences to foster climate change adaptation.

The Ministry of Agriculture of Hungary hosted a joint Forest Europe and FAO Workshop “Understanding the contribution of Agroforestry to landscape resilience in Europe” in Hungary on 9-10 October 2018. The workshop sought to put into practice the Madrid Ministerial Resolution 2 Protection of forests in changing environments. Approximately 80 people attended this highly successful workshop, which was considered a milestone in European agroforestry.

As output of the Workshop, FOREST EUROPE published the conclusions report, ‘Understanding the Contribution of Agroforestry to Landscape Resilience in Europe: How can policy foster agroforestry towards climate change adaptation?’ in March 2019. The report highlights recommendations for (i) strengthening inter-sectoral cooperation and coordination in the field of agroforestry, (ii) strengthening policy and legal framework in agroforestry, (iii) strengthening communication and promotion of agroforestry at all levels, and (iv) strengthening research and innovation, education and training in agroforestry at all levels.

Event’s site: <https://foresteurope.org/event/13961/>

Source: Mercedes Rois, European Forest Institute, Finland.

5. Projects on climate change

5.1 CLIMA TREE project

The LIFE CLIMATREE project (July 2015 - June 2020) aims to contribute towards the development of a novel methodology and an innovative tool for the quantification of carbon storage in permanent tree-crops.

The primary objectives of LIFE CLIMATREE are:

- To improve and update carbon sink accounting within the European Union through the inclusion of tree-crop capacity. An improved estimation of the carbon sink could support mitigation actions at local, regional and European levels.
- To estimate the socioeconomic benefit arising from carbon storage.
- To contribute to the design and efficacy of European Union’s environmental and climate policy and legislation. In particular, methodology developed by LIFE CLIMATREE will contribute to designing effective coupled climate-agricultural policies. In this way, LIFE

CLIMATREE will contribute to sustainable development and to the achievement of the objectives and targets of the Europe 2020 Strategy and of relevant Union environment and climate strategies and plans.

- To act as a catalyst for, and promote, the integration and mainstreaming of carbon sink objective into Agricultural Sector and its Stakeholders and Decision makers (Common Agricultural Policy, the relevant national public authorities and farmer's communities).
- To provide a more accurate baseline for carbon sink, and to improve the knowledge base for monitoring and evaluation of effective climate change mitigation actions and measures.
- To contribute towards the design of agricultural and environmental policies at the micro level and to provide a tool for supporting the evaluation of investments related to tree crops.
- To support LULUCF reporting and its inclusion to European Climate Policies and targets.

One of the project's key outputs is the development of a carbon removal algorithm and its online access within a free e-tool application. The e-tool calculates the annual balance of CO₂ in cropland, in the Mediterranean region, taking into account biomass change, soil C dynamics, the use of fertilizers and pesticides, as well as agricultural practices (in terms of energy consumption). The output is reported in tons of CO₂ for each one of these factors.



Figure 2: E-tool developed by the LIFE CLIMATREE project to calculate the annually balance of CO₂ in cropland.

The model estimates CO₂ captured in cropland based on the tree and root growth, the soil's absorption capacity, and management practices (e.g., pruning, soil vegetation). Results are

illustrated graphically and in raw form, yearly for a 50 year period, in tons of CO₂, for each compartment.

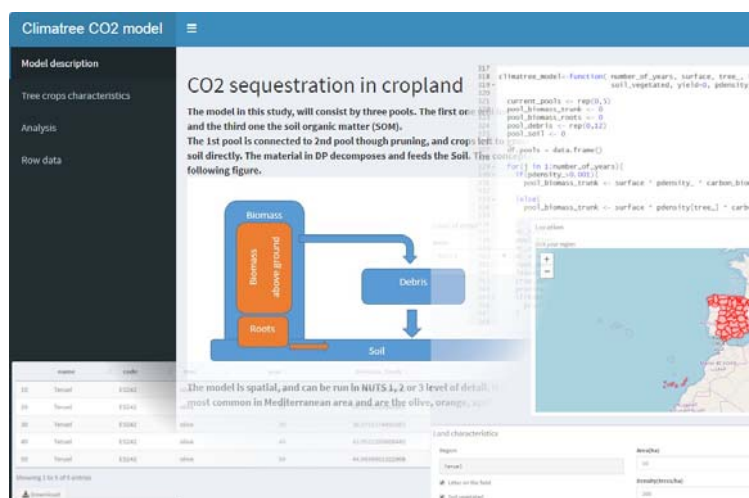


Figure 3: Picture of the CLIMATREE CO₂ model.

The output in both cases is tree specific and depends on the region of interest, the area and the density considered, and the yield. The e-tool is expected to be available online by the end of July 2019 within the project's official [website](#).

For more information please contact Prof. Kostas Bithas (Project Coordinator), www.uehr.gr, email: kbithas@eesd.gr

Source: Prof. Dr. Kostas Bithas, Panteion University, Athens, Greece.

5.2 HYDROUSA project

The European program [HYDROUSA](#) is part of the Horizon 2020 program, which is the European Union's main funding instrument for research and development. The coordinator of the program is the National Technical University of Athens and a total of 27 organizations from different European countries. The program has a total budget of € 12 million and is one of Europe's largest and most competitive research projects. It is part of the European Union's cyclical economy programs for the rational management of water resources through the recovery of non-conventional water sources, materials and energy.

HYDROUSA aims to develop, optimize and demonstrate innovative and low-cost systems to manage non-conventional water in Mediterranean areas. This includes the management of sewage, rainwater, groundwater, seawater and atmospheric humidity. Their management is aimed at increasing the water reserves of the Mediterranean regions, which are facing significant water scarcity problems as well as the recovery of valuable materials and energy from the wastewater. The use of good quality non-conventional water will increase agricultural

production and encourage the economic activity of the Mediterranean regions affected by water scarcity. HYDROUSA aims to close all water cycles locally, exploiting resources and promoting the idea of decentralized water management. Six demonstration sites are implemented in the three islands of Lesvos, Tinos and Mykonos.

In Lesvos, a nature-based wastewater treatment system will be developed in Antissa, which will be fully integrated into the local environment. This system will produce water rich in nutrients (nitrogen and phosphorus) which will be suitable for crop irrigation. Using the treated water, specific trees, shrubs and crops will be irrigated (olives, pomegranates, laurel) as well as high nutritional products (herbs) and herbs (lavender, sage, oregano, thyme). The aim is to channel these products to rural cooperatives as well as to familiarize farmers with the use of recovered water. Tinos will develop an innovative, low-cost desalination system based on the principles of evaporation and condensation combined with a greenhouse for the production of tropical crops. Water circles within an ecotourism unit (rain water collection system, water vapor condensation system, wetland wastewater treatment system, crop irrigation) will be examined. The aim is to make ecotourism units a form of alternative tourism with facilities that are self-sufficient in terms of water, energy and food supply. In Mykonos, units for the collection, treatment and valorisation of rainwater and runoff will be developed. The water after treatment will be available for irrigation of oregano and local crops.

During the course of the project, project dissemination activities will be addressed to the stakeholders and will include seminars in rural cooperatives, municipalities, public workshops, interactive workshops, publications and presentations, events, etc. Finally, the program's objective HYDROUSA is the direct interaction with the citizens, which will be achieved through the organization of summer schools, the creation of information and information points for the citizens.

Source: Anastasia Pantera, Agricultural University of Athens, Greece.

6. Call for Fellowship Opportunities – CLIFF-GRADS

The CLIFF-GRADS program is seeking expressions of interest from CCAFS and GRA scientists who are leading research projects and would like to host a PhD student for short-term (4-6 month) research in these projects in 2020. Eligible projects must contribute to one or more of the following themes:

- 1) measurement and mitigation of agricultural greenhouse gas emissions or carbon storage in agricultural systems relevant to developing countries, including in the context of enhancing food security;

- 2) quantification and mitigation of greenhouse gas emissions from reduced food loss in high emission supply chains (e.g. dairy, beef, vegetables, fruits) in developing countries, including estimation of costs and constraints to mitigation.

CLIFF-GRADS is a joint initiative of the CGIAR Research Program on Climate Change Agriculture and Food Security (CCAFS) Low Emissions Development Theme and the Global Research Alliance on Agricultural Greenhouse Gases (GRA).

The CLIFF-GRADS program provides grants for students from developing countries currently enrolled in PhD programs to undertake short-term research in association with advanced research institutes on topics related to measurement and mitigation of greenhouse gas emissions or carbon storage in agricultural systems and quantification of greenhouse gas emissions and mitigation potential from reduced food loss.

Researchers should contact CLIFFGRADS@globalresearchalliance.org for the more details on the project and hosting requirements, and for a copy of the project expression of interest form.

Deadline for expressions of interest: 15 July 2019

6. Upcoming events

9th Annual Council Meeting of the Global Research Alliance

The 9th annual council meeting of the Global Research Alliance (GRA) will take place during 6th - 7th October 2019 in Bali, Indonesia. The Council meeting is open to nominated GRA Country representatives, GRA Partners and the Co-Chairs of the Research Group. The achievements and ambitions of the Research Groups is one of the main topics at the annual meeting. More information about the Council meeting will be provided as soon as this is available [here](#).

5th Global Science Conference on Climate-Smart Agriculture

The 5th Global Science Conference on Climate-Smart Agriculture “Transforming Food Systems under a Changing Climate” will take place in Bali, Indonesia during 8th -10th October 2019. The conference will aim to achieve the following objectives: i) to mobilize the knowledge needed for food systems transformation under climate change and ii) to catalyze the partnerships needed for transformation, bringing together all key stakeholders, from scientists, policy makers, investors and farmers. More information can be found [here](#).

7th International Symposium on Soil Organic Matter

The 7th International Symposium on Soil Organic Matter (SOM) will take place in Adelaide, Australia 6-11 October 2019. The conference theme, “*Soil Organic Matter in a Stressed World*” has the dual objectives of better understanding and quantifying the functions that SOM sustains in both natural and managed systems, and understanding the stressors that impact on both its stability and its ability to continue to deliver these key ecosystem functions. Visit the conference website to learn more. <http://www.som2019.org/>

ASA-CSSA-SSSA: Embracing the Digital Environment & GRA Croplands Research Group Annual Meeting

The conference “ASA-CSSA-SSSA: Embracing the Digital Environment” will take place in San Antonio, Texas, USA from 10th to 13th November 2019. The conference aims include embracing the use of sensor technology, communications networks, satellite imagery, drones, machine learning, as well as gathering data more frequently and accurately, the digital environment can enable producers, CCAs, consultants, and researchers to reduce input costs, increase food production, and improve environmental quality. The digital environment also allows for enhanced data dissemination, opening new avenues for enhanced (agro)ecosystems globally. More information can be found [here](#). **On 14th November, we will hold the 11th annual Croplands Research Group meeting** in the same location. Additional information, including registration details, will be made available soon from the GRA Secretariat.

2nd Agroecology Europe Forum

The 2nd Agroecology Europe Forum, will take place will take place in Heraklion, Crete, Greece, Europe during 26th – 28th September 2019. The overall objective of the Congress is to answer the following questions: What should be the Common Agricultural Policy (CAP) in the future for promoting agroecology? Which local practices and policies exist in Europe that support access to land for young and first generation farmers? Which traditional and new knowledge is available on soil restoration and biodiversity enhancements?. More information [here](#).

14th European Farming Systems Conference (IFSA – European Group)

The 14th European Farming Systems Conference (IFSA – European Group) will be held in the University of Évora, Portugal, and hosted by the Institute of Mediterranean Agricultural and Environmental Sciences during 20th – 26th March 2020. The main focus of this years’ Conference will be Farming Systems Facing Climate Change and Resource Challenges. More information [here](#).

This is your newsletter! If there's anything you think should be included, please send suggestions to mrosa.mosquera.losada@usc.es for the next issue

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