GLOBAL RESEARCH ALLIANCE
Croplands Research Group

NEWSLETTER Nº3, September 2019

1. Cropland Research Group GRA Co-Chairs message

This CRG Newsletter is full of interesting activities carried out by the group that makes croplands more resilient and able to cope with climate change. The first section highlights potential of agroecology to mitigate and adapt to climate change while the second deals with the global nitrogen challenge by showing the co-benefits from strategic interventions

The main aims of the European Missions as a way to foster rural sustainability through innovation development linked to the fulfilment of the Sustainable Development Goals linked to climate change is also part of this newsletter.

The recent publication of the book “Agroforestry for Sustainable Agriculture” that includes authors from 4 continents is also presented. We hope you enjoy reading.

The last section deals with the use of prescribed burning to reduce the incidence of mega-forest fires risk in areas that can be extensively used by livestock and therefore reducing greenhouse gases emissions.

Finally, we are pleased to announce that the planning for our annual Croplands Research Group meeting on 14th November is now underway, and you can register here. The meeting will be held alongside the ASA-CSSA-SSSA scientific conference in San Antonio, Texas, USA. We hope to see you there!

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

2. The potential of agroecology related measures in mitigating and adapting to the effects of climate change

As we all know, biodiversity is one of the key elements in keeping the farming environment in a balanced and sustainable condition, for a long period of time. Towards the end of the 1980s and in the 1990s environmental experts of Hungary experienced a measurable decline of biodiversity, of which a significant part was highly related to intensive agricultural cultivation. Also, as the regime changed after 1989 and Producer Associations – cultivating hundreds of hectares in a performance-oriented manner – fell apart and agricultural lands became prioritized, another problem came to light: lack of cultivation and land abandonment, which gave free pathway to the spread of invasive alien species through the passing decades.

In order to incentivize farmers to change their practices to a more environmental-friendly type of cultivation, as well as keeping up cultivation, the National Agri-environmental Programme (NAEP) was launched in 2002. This was an incentive funding for farmers who could (and still can) participate in the Programme on a voluntary basis. NAEP was based on Governmental Decision no. 2253/1999 and had a budget of 2.5 billion HUF (approximately 8.117 million USD). It also laid down the basic principles of all the subsequent agri-environment-climate measures (AECM). It established the professional division of horizontal schemes and zonal schemes.

Horizontal schemes consist of generally applicable environmental-friendly cultivation practices and they can be applied accordingly to any land utilisation category throughout the country.

Zonal schemes are based on a special territorial delimitation and consist of more site-specific cultivation commitments than that of the horizontal schemes. They also provide higher funding rates. In 2002 these zonal schemes were based on the so-called Vulnerable Natural Areas (later on many of these territories have become part of the Natura 2000 network and after going through a professional revision and completion they have become the High Nature Value Areas).

In 2002 the following schemes were available for farmers: i) Basic agri-environmental programme (horizontal); ii) Integrated cultivation scheme (horizontal); iii) Ecological farming scheme (horizontal); iv) Grassland scheme (horizontal); v) Wetland habitat scheme (horizontal);vi) Vulnerable Natural Areas scheme (zonal).

NAEP also included (and the subsequent AECMS still include) professional training for farmers. The commitment period was/is 5 years. Support was/is paid annually per hectare under the above mentioned schemes/commitments.

On 1st May 2004, Hungary joined the EU, from this point on AECMs were adjusted to the related union funding criteria. Hungary started to diversify both the horizontal and zonal schemes, and at the start of each EU programming period puts the commitments under a professional revision, in order to adjust them to the current environmental conditions. As we have experienced, our agri-environmental funding programme (which runs continuously from 2002 on) slowed down the loss of biodiversity in the rather intensive cultures, as well as halted and in a few cases even reversed in case of the zonal, more specific schemes.

Source: Ms. Adrienn GYENES (Hungarian Chamber of Agriculture/NAK) gyenes.adrienn@nak.hu

3. GHG mitigation in the news. The global nitrogen challenge: highlighting co-benefits from strategic interventions

Increases in yield and nutritional quality of agricultural products resulting from the application of exogenous nitrogen have been nothing short of revolutionary. Since the invention of the Haber-Bosch process nearly 100 years ago, nitrogen has directly contributed to the availability of more and better quality food, with concomitant improvements in human health and well-being. Despite benefits of nitrogen to food production and quality, its use in an efficient manner has proven difficult, if not impossible. Typically, less than half of applied nitrogen is recovered in

intensive agricultural production systems, implying a significant transfer of N to non-target ecosystems. Challenges in the efficient use of N emanate from the complexity associated with the many forms of nitrogen in the environment, coupled with attributes of common agricultural production systems and their management.

In a recent issue of Earth's Future (August 2019), Houlton et al. used a Strengths, Weaknesses, Opportunities, and Threats Analysis to review current understanding of scalable opportunities with the greatest potential to restore balance to the global nitrogen cycle. The analysis identified numerous co-benefits (strengths) from five strategic interventions, some of which have direct application to decreasing greenhouse gas emissions from agricultural lands. Interventions included: i) Rapidly improving nitrogen-use efficiency for food, fiber, and fuel production; ii) Getting nitrogen where it is needed most; iii) Removing nitrogen pollution from the environment; iv) Reducing food waste; v) Encouraging diets with low nitrogen footprints.

Full access to the review article is available here.

Source: Mark Liebig (United States Department of Agriculture, Agricultural Research Service).

4. European Union missions to reach rural sustainability through innovation development

European Union has established five missions to foster sustainability across Europe linked to the Sustainable Development Goals. Three of the missions can be related with climate change and the GRA main aims: i) Adaptation to climate change, including societal transformation, ii) Climate neutral and smart cities and iii) Soil health and food. These missions should be able to gather all existing last research findings and expertise to foster implementation at field level. They should be (i) inspirational, (ii) have a clear direction with targeted, measurable and time-bound goals, (iii) ambitious but realistic research and innovation actions, (iv) cross-disciplinary, cross-sectorial, cross-actor innovations and finally (v) drive multiple bottom-up solutions. Some of the main challenges of these missions are climate, biodiversity, circularity, health, social and demographic change (including rural) and governance for sustainability. With regard to the climate challenges they aim at reducing greenhouse gas emissions and successful adaptation of ecosystems and production systems as well as rural, coastal and urban areas to climate change and the sustainable and circular management and use of natural resources through the establishment of governance models enabling sustainability

More information here.

Source: María Rosa Mosquera-Losada (University of Santiago de Compostela, Spain).

5. Agroforestry for sustainable agriculture

The book "Agroforestry for Sustainable Agriculture" has been launched to better understand the use of woody perennials, including trees and shrubs, in agricultural and forestry systems. Main sections of the book include the main agroforestry practice types, the ecosystem services and products they provide. A specific section was allocated to tropical agroforestry due to the importance of agroforestry in tropical areas. The book is a comprehensive review of the effectiveness of particular agroforestry practices, from riparian forest buffers and filter strips, windbreaks and contour buffers to alley cropping, silvopasture and forest farming. This book also deals with the current research on ecosystem services delivered by agroforestry, from promoting biodiversity and soil health to water quality and management and assesses research on best practice in tree planting and management as well as optimising agroforestry products, from timber and nuts to bioenergy within a climate change context.

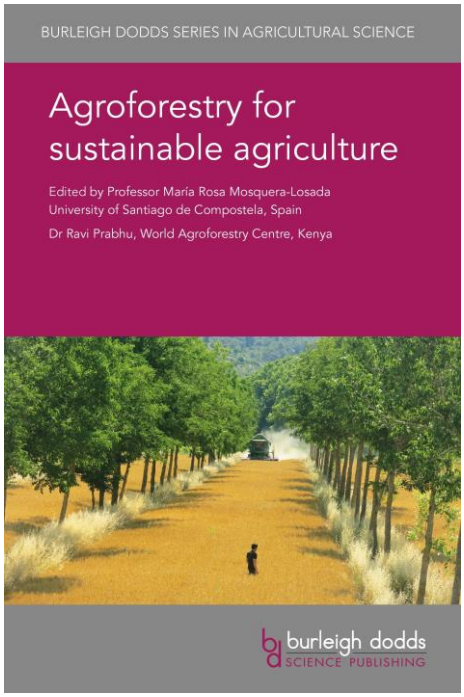

Figure 1: Cover of the book "Agroforestry for sustainable agriculture".

More information here.

Source: María Rosa Mosquera-Losada (University of Santiago de Compostela, Spain).

6. From tradition to cutting-edge tools to create resilient landscapes in a global change scenario: the OPEN2PRESERVE project

As in many other regions of the planet, mountain areas in southern Europe are immersed in deep transformations related to changes in the land use and the climate. Land abandonment and the relaxation of extensive grazing practices are leading to a loss of landscape mosaicism and habitat diversity, and to a severe homogenization and accumulation of fuels in the landscape. Consequently, the risk of forest fires of high severity (mega-fires, out of the extinction capacity of firefighters) is very high and is aggravated by the increasingly frequent heat waves and droughts occurring in the Mediterranean region.

The European project OPEN2PRESERVE (SOE2/P5/E0804) was conceived to offer a sustainable solution to this problem in the SUDOE region. The project, which was approved in the second call of the Interreg SUDOE program (2014-2020) with a FEDER budget of 1,726,000 euros, encompasses 13 regional partners of South France (CNRS-GEODE, SEPO, CA64), Spain (UPNA, USC, UAB, CSIC, INTIA, Pau Costa, CMAOT, CTC) and Portugal (UTAD ,IPB). The consortium has a complementary and multidisciplinary formation and is constituted by forest scientists and technicians, firefighters, shepherds and livestock breeders, plant and soil ecologists, economists and environmental stakeholders. This human capital is put together with the purpose to develop a sustainable land management model that helps to decrease the risk of forest mega-fires and guarantees the preservation of the valuable ecosystem services associated to mountain open spaces. The model is based on the combination of technical fires and targeted grazing to emulate the pyric herbivorism that originated the historical landscapes. First human populations observed, repeated and improved these practices to the purpose of consolidate multipurpose, mosaic landscapes. The combined practices were inherited through generations until the last century, where they collapsed. Despite in the last decades the use of prescribed fire and targeted grazing for environmental purposes has improved technically, the knowledge has evolved separately (fire specialists are uneasy with pastoral grazing tools and vice versa). This project is an opportunity to benefit from the formative complementarity and experience of the partners and their location in the territory in order to, through three fundamental issues -combined practices of technical fire and targeted herbivorism, use of

cutting-edge technologies and pioneering valuation proposals-, achieve the economic sustainability and long-term viability of the management model.

Figure 2: Some pictures of the pilot experiences established under the framework of the Open2preserve project.

Source: Dra. Rosa Maria Canals - Open2preserve project leader (Universidad Pública de Navarra; Spain).

7. Upcoming events

13th Brazilian Meeting on Humic Substances and Natural Organic Matter

The 13th Brazilian Meeting on Humic Substances and Natural Organic Matter will be held in Maceio city, Alagoas State, Brazil during 28th – 31st October 2020. In this meeting several topics related with Soil Organic Matter (SOM) and their crucial role for agriculture and environment will be discussed such as relevant structural aspects in situations of soil carbon sequestration,

including no-tillage areas and integrated crop-livestock-forest systems in Brazil. More information here.

9th Annual Seminar of the Animal Task Force

The 9th Annual Seminar of the Animal Task Force (ATF) "Towards a climate smart European livestock farming" will be held in Brussels, Belgium on 6th November 2019. The seminar aims to contribute to: i) engage a dialogue with various stakeholders; ii) address how research and innovation can support the livestock sector; iii) provide input to European research and innovation agendas and to public policies to secure Europe's role as a leading global provider of safe and healthy animal-derived products; iv) support knowledge development and innovation; v) foster ownership by farmers and industries. More information here.

ASA-CSSA-SSSA: Embracing the Digital Environment

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 here.

11th Annual Global Research Alliance Croplands Research Group Meeting

The 11th annual Croplands Research Group (CRG) meeting will be held in San Antonio, Texas, USA on 14 November 2019 at the at the Marriott Riverwalk Hotel. This year's annual meeting will seek to engage participants in planning focused activities aligned with the GRA Strategic Plan, 2021-2025. Additionally, updates from active networks and country-led research efforts will be shared during the meeting. Online registration for CRG members is due by 11st October 2019 here.

3rd Symposium on Climate Change Adaptation in Africa

The 3rd Symposium on Climate Change Adaptation in Africa will take place in Nairobi, Kenya, Africa during 23rd-24th January 2020. The aims of the Symposium are: i) to provide research institutions, universities, NGOs and enterprises from Africa and those working in Africa with an opportunity to display and present their works in the field of climate change adaptation; ii) to

foster the exchange of information, ideas and experiences acquired in the execution of climate change adaptation projects, especially successful initiatives and good practice across the African continent; iii) to discuss methodological approaches and experiences deriving from case studies and projects, which aim to show how climate change adaptation may be implemented in practice; iv) to network the participants and provide a platform so they can explore possibilities for cooperation. More information here.

3rd Latin American Symposium on Climate Change Adaptation

The 3rd Latin American Symposium on Climate Change Adaptation will take place in Puebla, Mexico during 5th – 6th March 2020. The Symposium will be a truly interdisciplinary event, mobilizing scholars, practitioners and members of governmental agencies, undertaking research and/or executing climate change projects in Latin America. More information here.

14th European Farming Systems Conference

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.

5th European Agroforestry Conference

The 5th edition of the European Conference on Agroforestry will be held in Nuoro, Sardinia, Italy during 18th - 20th May 2020. The conference will bring together worldwide researchers, practitioners, policy-makers, public authorities to discuss the role of research and innovation in agroforestry towards the development of a sustainable European Bioeconomy, while exploring its potential in fostering environmental, economic and social prosperity. More information here.

28th General Meeting of the European Grassland Federation

The 28th General meeting of European Grassland Federation (EGF) will be hosted by the University of Helsinki in Helsinki, Finland during 22nd – 25th June 2020. The meeting will give delegates the first hand opportunity to see and experience how today's state-of-the-art practices in grassland and ruminant production are utilised in Finland to produce milk and beef products that have been ranked as one of the highest quality products in the world. The meeting will be also the stage for you to represent and hear about the recent advances and novel approaches in grassland research. More information here.

71st Annual Meeting of the European Federation of Animal Science

The 71st Annual Meeting of the European Federation of Animal Science will be held in Porto, Portugal during 31st August – 4th September 2020. The program of this annual meeting will cover various areas of knowledge, such as nutrition, genetics, physiology, animal health and welfare, livestock farming systems, precision livestock farming, insect production and use, cattle, horse pig, sheep and goat production. 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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