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AGRICULTURE & INNOVATION



EIP-AGRI Seminar Healthy soils for Europe: sustainable management through knowledge and practice

SEMINAR REPORT
13-14 April 2021

All seminar materials on the EIP-AGRI seminar 'Healthy soils for Europe: sustainable management through knowledge and practice' are available on the EIP-AGRI website: <https://ec.europa.eu/eip/agriculture/en/event/eip-agri-seminar-healthy-soils-europe-sustainable>



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Introduction

The EIP- AGRI Seminar 'Healthy soils for Europe: sustainable management through knowledge and practice' was held online on 13-14 April 2021. It brought together more than 140 participants involved in sustainable soil management practices, including farmers, foresters, researchers, advisers and others representing innovative projects working on solutions to enhance soil health throughout the European Union. This interactive event aimed to exchange practical solutions to soil health problems and to discuss what needs to be done, especially for farmers, to take them up.

The overarching goal of the proposed EU mission "Caring for soil is caring for life":

"By 2030, at least 75% of all soils in each EU country are healthy and are able to provide essential services that we depend on".

<http://ec.europa.eu/mission-soil>

Healthy soils are fundamental to the sustainable production of food, feed and fibre. In addition, they provide many other functions that contribute to human well-being such as water filtering, carbon sequestration, nutrient cycling and biodiversity conservation. Soil health is affected by unsustainable management practices including frequent tillage, which accelerates soil organic matter loss, incorrect use of agrochemicals leading to soil and water pollution or irrigation practices causing salinisation problems. These unsustainable practices are affecting about 60-70% of soils in Europe. Furthermore, climate change also affects soils in different ways. More frequent heavy rainfall and drought periods can increase erosion, nutrient and pollutant leaching, soil carbon losses and soil salinisation. On the positive side, practices improving soil health can mitigate or even reverse these negative effects, including the impacts of climate change.

The overall objective of the seminar was to **raise awareness and address soil management challenges and solutions to enhance soil health.**

The specific objectives of the seminar were to:

- ▶ Raise awareness of the importance of soil health and introduce various EU initiatives undertaken looking at soil health such as the Horizon 2020 EJP Soil, the proposed EU mission "Caring for soil is caring for life", the EU Soil Observatory, the European Soil Data Centre (ESDAC) and the Land Use/Land Cover Survey (LUCAS) soil monitoring system.
- ▶ Promote and build upon the results and outcomes of past EIP-AGRI networking activities such as Focus Groups and events on soil-related issues.
- ▶ Share experiences and good practices for soil health, identified by relevant projects, research activities and farmers.
- ▶ Identify synergies between different types of projects working on soil health and encourage further cooperation among participants through networking.
- ▶ Discuss challenges and solutions for soil health, identify what is needed to make these solutions operational for farmers, foresters and other land managers, and ensure they are widely used or adopted.

The event consisted of plenary sessions, followed by interactive debates in breakout sessions and smaller groups that offered the opportunity for the participants to have in-depth discussions. At the end of the seminar, it was also possible to join the "Opportunity Market" - a virtual forum, that enabled participants to exchange ideas about soil health and establish partnerships for future collaboration. The seminar followed the consolidated approach of EIP-AGRI events providing a platform for all the participants to express their views and learn from the experience of others as well as engage in fruitful discussions. During each session, participants actively exchanged ideas which are thoroughly reported in this final report.

Recordings of all presentations are available on the [EIP-AGRI event webpage](#).



Part I: Starting our journey together

Opening remarks by Nathalie Sauze-Vandevyver and Pandi Zdruli



The seminar was opened by **Nathalie Sauze-Vandevyver**, Director for Quality, Research & Innovation, Outreach – DG for Agriculture and Rural Development, European Commission, who emphasised the importance of soil health for EU agriculture and forestry. Although a key resource, 60-70% of soils in the EU are currently unhealthy, threatened by land degradation, pollution, or the effects of climate change. Fortunately, in recent years there has been a growing interest in soils from society, researchers, farmers, media and other stakeholders. Naturally, this recognition of soils as a vital resource for our lives is also reflected in EU policies and programmes. Since the current EIP-AGRI work programme is ending, Nathalie Sauze-Vandevyver highlighted the achievements of EIP-AGRI during the past seven years. These included inter alia the setting-up over 2000 Operational Groups and 200 multi-actor research projects under the Horizon 2020 programme, as well as mobilising more than 6400 experts participating in 120 European-level networking activities. Many of the above projects and events were related to soil health and soil management practices. Moreover, the European Commission (EC) pays particular attention to healthy soils under the European Green Deal, Biodiversity and Farm to Fork strategies that for example have set clear targets to reduce the use of chemical fertilisers and pesticides and promoting organic farming through the ambitious target to have 25% of all EU agriculture to be organic by 2030. Nathalie Sauze-Vandevyver also emphasised the important role of the proposed EU mission “Caring for soil is caring for life” and its innovative approach to enhance research in soil health by promoting soil-friendly practices based on agro-ecological principles and widely disseminating the results through Living Labs and Lighthouses. Finally, she explained that the new research and innovation programme Horizon Europe will pay particular attention to the topic of soil and ended her welcome address by saying: **“let us join forces for healthy soils in Europe”**.

“A European Green Deal: Striving to be the first climate-neutral continent. The European Green Deal is our plan to make the EU’s economy sustainable. We can do this by turning climate and environmental challenges into opportunities and making the transition just and inclusive for all.”

https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

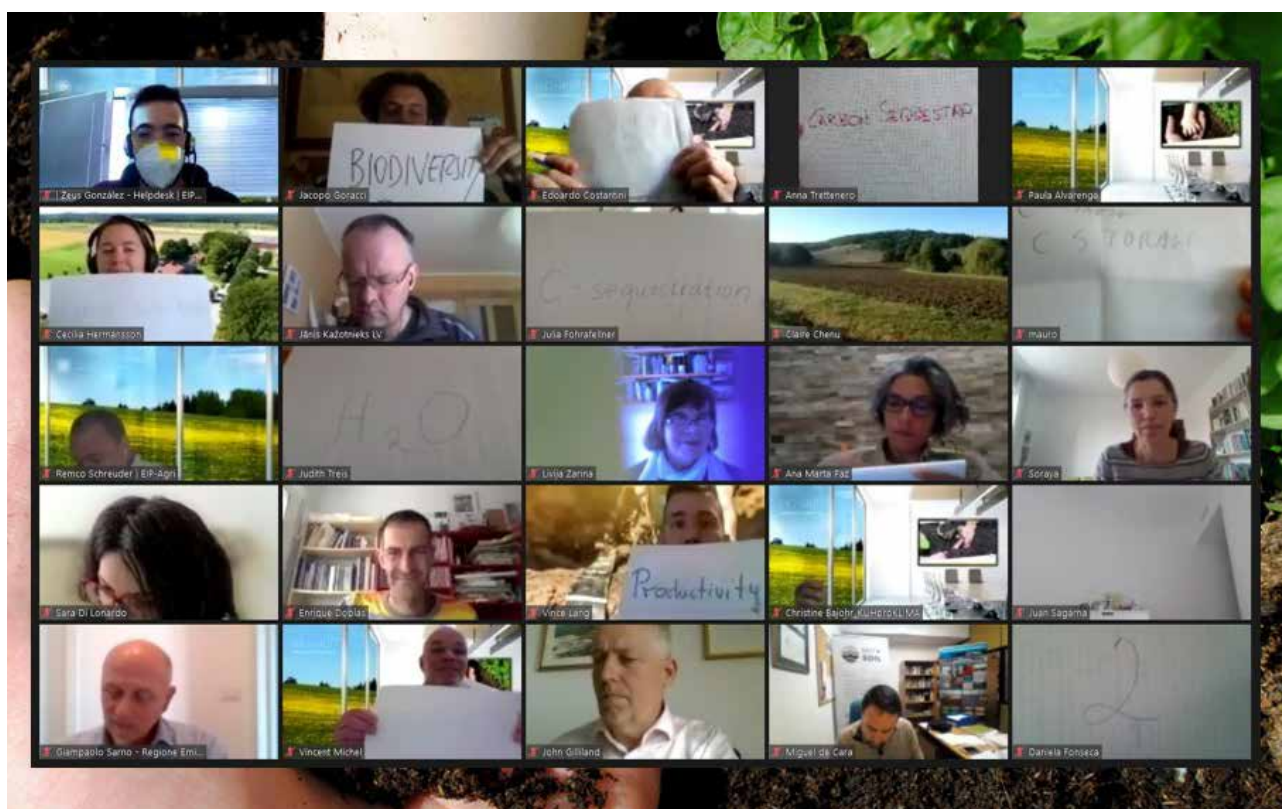


Pandi Zdruli, coordinating expert for the seminar, emphasised that soil is at the centre of all ecosystems. Furthermore, he stressed the importance of healthy soils to produce healthy food and protect biodiversity. What is more, soils could mitigate up to 25% of climate change impacts if they become a sink and not a source of carbon. However, soil formation is a very long process; hence damaged soils are not recoverable in the human life span. They are very fragile, and should be managed carefully to avoid degradation processes such as compaction and erosion, among others. He concluded that farmers and land users are at the centre of soil management, recognising that they also need to make a profit through farming, but that could be assured only through implementation of practices that promote soil health both in the short-, medium- and long-term.

Pandi Zdruli finalised his presentation explaining the three clusters of discussion topics for the seminar:

- i) productivity and nutrient cycling,
- ii) carbon sequestration,
- iii) soil water interface.

These clusters grouped together the outcomes of 8 EIP-AGRI Focus Groups (FG) and one EIP-AGRI workshop that dealt with soil issues. They also took into account the five soil functions (productivity, biodiversity, carbon sequestration, nutrient cycling and water storage and filtering) according to which all seminar discussions were structured.



Panel discussion with farmers and advisers involved in soil health initiatives.

The introductory session was followed by two panel discussions: the first one was composed of farmers and advisers working on practices to improve soil health addressing their needs to adopt practices to maintain or improve soil health, while the second panel included representatives from the EU and from regional initiatives aiming at improving soil health.

Speakers on the first panel were **Patricia Mora McGinity (Spain)** – adviser and involved in LIFE project 'LiveAdapt', **Christine Bajohr (Germany)** – farmer from Operational Group 'KUHproKLIMA', **Kylie Magner (Ireland)** – livestock farmer practicing regenerative agriculture, and **Geneviève Savigny (France)** – poultry farmer practicing agro-ecology on her farm.

This lively panel addressed the motivation to invest in soil health from the farmers' perspective. When **Kylie, Christine and Geneviève** were asked what challenges they face to maintain and improve soil health, they acknowledged the importance of soil for the farmer that is strongly related to improving the farm profitability and protection of the environment. *"We consider as very important the implementation of soil-friendly practices that protect biodiversity and increase the nutritional value of our healthy products but there is also an economical motivation to do this"*. They also mentioned that to encourage farmers to invest in soil health, support from researchers is needed. In addition, funding should be provided by public sources and not from the farmer alone for the on-farm research. They also supported the goal to make 25% of EU agriculture organic but mentioned that how this will become reality is still not clear.

Furthermore, they recognised that the soil is a living organism, and that soil health is possible only if it is based on the symbiosis between healthy plants and soil properties. *"Therefore, we have to invest in a healthy soil-water-plant ecosystem as all is connected. Besides, interactive living systems are very important and they could be enhanced through regenerative agriculture practices"*. **Kylie, Christine and Geneviève** concluded that results deriving from these soil-friendly practices are very encouraging. They are fully convinced that this is also the only way to become more resilient to climate change, to save our land and the planet for the future generations - it is possible if we promote soil health based on a holistic approach and by implementing agro-ecology principles.

All panellists pointed out the need for specific advisory services to support farmers investing in soil health; especially for guiding on-farm research and issues such as counselling farmers when converting from chemical to biological fertilisation. The establishment of a "bank of knowledge" as a platform to easily reach information was suggested. Furthermore, farmers need advice from qualified experts and advisers with a profound knowledge and understanding of soil health as well as of integrated farming systems.

As farm adviser, **Patricia** agreed that working closely with farmers is very important especially with soil issues that remain unknown for many farmers. For instance, soil salinity could increase in a farmer's land due to poor quality irrigation water, but they will not be aware of this until salinity has got to a certain level (in the following expert panel, the EU Soil Observatory was introduced as a useful tool for salinisation prevention). Finally, there is a need for training and knowledge-sharing to help farmers improve soil health but also to adapt to climate change impacts such as increased frequency of drought and floods.



Panel discussion with representatives from soil health initiatives

Panellists included **Teresa Pinto-Correia (Portugal)** – Mission Board for Soil Health and Food, **Claire Chenu (France)** – Coordinator of European Joint Programme on Soils (EJP-Soil), **Arwyn Jones (Italy)** – Joint Research Centre (JRC) in charge of EU Soil Observatory and **Sébastien Janssens (Belgium)** – B3W initiative, Flemish Land Agency.

Teresa Pinto-Correia as Vice-chair of the Mission Board for Soil health and food recalled the overarching goal of the proposed mission “Caring for soil is caring for life” to make at least 75% of the EU soils healthy or showing distinct signs of improvement by 2030. This should be adapted to the regional context and monitored by a set of 8 indicators that are selected according to pedo-climatic differences among EU regions. The mission proposes different actions including research based on a transdisciplinary approach. There is also a focus on well-structured and independent advisory services to improve soil literacy and to support soil policy. An important aspect of the mission are the networks of Living Labs and Lighthouses to be established in different regions as places where researchers can interact with farmers. Finally, she mentioned that the mission is also addressing the drivers of soil health and social innovations required to place farmers at the centre of the mission.

“Research results show that a long-term focus on sustainability is needed and farmers must have a better understanding of their farm’s performance including greenhouse gas emissions and carbon capture accounting”.

<https://www.sustainablefinance.hsbc.com/carbon-transition/towards-net-zero-in-uk-agriculture>

Claire Chenu described the EJP-Soil as a programme that provides the biggest source of funding for soil research, it also pays particular attention to knowledge transfer and policy development. The EJP-Soil started in February 2020 and will run for five years. The programme is co-funded by 24 EU countries and by the EC and its focus is on defining and promoting the climate-smart multifunctionality of soil functions in support of sustained crop productivity, improvement of soil health and climate change mitigation. In this context, collaboration with farmers is crucial and the concept of Living Labs will be very important to test the research results and their applicability. Finally, she emphasised that collaboration with EIP-AGRI will be very important for EJP-Soil.

Arwyn Jones provided information about the launch in December 2020 of the EU Soil Observatory that will become a dynamic and inclusive platform aiming to support dissemination of soil knowledge and data flows. He also described the role of the JRC as the in-house science component of the EC to provide support for policy development, including also the soil policy. Most importantly, the Green Deal has several strategies (Farm to Fork, Biodiversity) for which soil is the common element. In support of the Soil Mission, the JRC oversees also the European Soil Data Centre (ESDAC) as well as of the Land Use Land Cover Survey (LUCAS) soil monitoring system. Arwyn suggested that all Member States (MS) should also establish their own additional soil monitoring systems that have to be tailored according to their specific conditions.

Sébastien Janssens presented the new B3W initiative in Belgium (Flanders) aimed at advising farmers on better soil and water management. Besides the measures laid down in the N-Directive, the initiative will invest in incentivising and sensitising farmers and will motivate them to apply good practices specifically to increase nutrient efficiency and lower groundwater pollution with Phosphorous (P) and Nitrogen (N) deriving from excess use. To reach these goals, interaction between the farmers is key for success.

Questions and answers addressed the issues of thresholds of soil health indicators and the need for their design based on pedo-climatic zones and differences among the soil types of Europe. Another issue of interest was the establishment of Living Labs and the support farmers should receive for maintaining them in their farms as hubs of joint research and knowledge dissemination.



Part II: Interactive breakout sessions: Knowledge building based on results from EIP-AGRI Focus Groups

EIP-AGRI has paid particular attention to soil health inter alia through its networking events. These activities have covered a range of topics including soil carbon sequestration and soil organic matter dynamics, grazing for carbon, nutrient recycling, fertiliser efficiency, crop rotation and diversification, soil-borne diseases, salinisation and contamination. In addition, many innovative projects, including Operational Groups have addressed related questions across Europe. Hence, part II of the seminar was devoted to promoting findings and results of seven soil-related EIP-AGRI Focus Groups (FGs) and one EIP-AGRI workshop and to encouraging further collaboration on these topics.

This part was organised into three parallel breakout sessions to offer the possibility to all participants to express their views. The objective of the breakout sessions was to list current initiatives that addressed the knowledge gaps and innovation needs identified by the Focus Groups and workshop and to identify remaining ideas for research or innovative projects to build on their results. The breakout sessions were based on three clusters, namely: soil productivity and nutrient cycling; carbon sequestration in soils; and soil and water interface. All three clusters addressed simultaneously different soil functions.

Parallel breakout session 1: Soil productivity and nutrient cycling

The results of FG Nutrient Recycling were presented by **Hajdu Zoltán (Hungary)** – Soltub Ltd, FG soil-borne diseases results were presented by **Vincent Michel (Switzerland)** – Agroscope, and the outcomes of the workshop Cropping for the Future by **Edoardo Costantini (Italy)**. The reports of these FGs and of the workshop are available on the EIP-AGRI website. Each breakout session also included a presentation of a relevant practical case study. These were derived from research projects, Operational Groups, or national farm-focused projects. Case studies were presented by **Marco Giacomazzi (Italy)** – Horizon 2020 project Nutri2Cycle regarding nutrient recycling, **Anna Pollak (Austria)** – Operational Group 'Alternative methods for wireworm control in potatoes', and **Annette Vibeke Vestergaard (Denmark)** – Danish national project 'Healthy soil for optimised growth'.



The main outcome of the discussions was that **soil productivity and nutrient cycling are closely related and affect each other in many ways**. A productive farming system is based on the soil's inherent physical, chemical and biological properties and on a well-designed crop nutrition system that takes into consideration the eco-physiological crop needs and a balanced nutrient system. To be functional, the system must be integrated and able to enhance ecosystem services of the soil. Furthermore, management practices such as those based on conservation agriculture (CA) principles - including reduced or no till, cover and/or catch crops and rotations - are paramount for a well-functioning sustainable farming system that can provide good yields and maintain soil health. Nonetheless, there is no "one-size-fits-all" strategy and management options should be tailored to local conditions. It was reported for instance that no-till does not work the same way for different soil types and could be difficult to implement, especially in the dry areas. Particular attention should be devoted to knowledge transfer and research. Additional efforts should be made also to better explore the nexus between biomass growth and crop productivity, development, and wider use of biofertilisers as well as new sources of nutrients (such as human sludge). What is more, the use of green manures and cover crops may pose risks regarding soilborne diseases therefore these aspects should be further explored.

Parallel breakout session 2: Carbon sequestration in soils

In this session, the results of FG Soil Organic Matter were presented by **Gottlieb Basch (Portugal)** – University of Évora, FG Carbon storage in arable farms was presented by **Iñigo Virto (Spain)** – Public University of Navarra, and FG Grazing for Carbon by **Claudia Cordovil (Portugal)** – University of Lisbon. In addition, three relevant case studies were also presented by **Ana Fonseca (Portugal)** – Soil Organic Matter Operational Group 'ECOMONTADO XXI, **Eliisa Malin (Finland)** – Carbon storage in arable farms - Carbon Action project, and **Christine Bajohr (Germany)** – Grazing for Carbon Operational Group 'Grassland'.

**"Grain for man,
straw for soil"**

Brazilian saying
mentioned by Gottlieb Basch

The main outcomes showed that a **twofold strategy** should be applied to **enhance carbon sequestration in the soil: add organic matter and conserve soil carbon**. Throughout Europe, there are distinct differences regarding soil organic carbon (SOC) stocks. For instance, in the Mediterranean part of Europe due to the climate conditions that accelerate mineralisation of soil organic matter (SOM), about 75% of soils have less than 1% SOC that is far less compared with Northern Europe. Therefore, management practices that keep or increase SOC in the soil, such as mulching, chopping straw, green fertilisation with legume crops, composts and manure applications should be applied. Moreover, the need for developing affordable ways of monitoring SOC so that farmers can assess and monitor best practices themselves was strongly emphasised. It was also mentioned that external sources of soil carbon like manure and other residues are important, but the most important is keeping living organic matter in the ground; therefore, the potential of cover and catch crops to sequester carbon is key and should be better studied. In addition, there is a big knowledge gap regarding the role of soil biota on the processes that capture carbon in soils.



Recommendation, farmers needs

- 1. **tailor made products** the N-P-K ratio according to crop needs,
- 2. quantification of the **nutrient use efficiency (NUE)**,
- 3. **avoiding the spread of organic contaminants** impact on soil health and food safety,
- 4. **standardisation of the environmental impact assessment, LCA and modelling methodologies,**
- 5. **improve the consumer and farmers acceptance** by investigating the whole food value chain,
- 6. **precision application** by remote control systems and sensors,

How was this done?

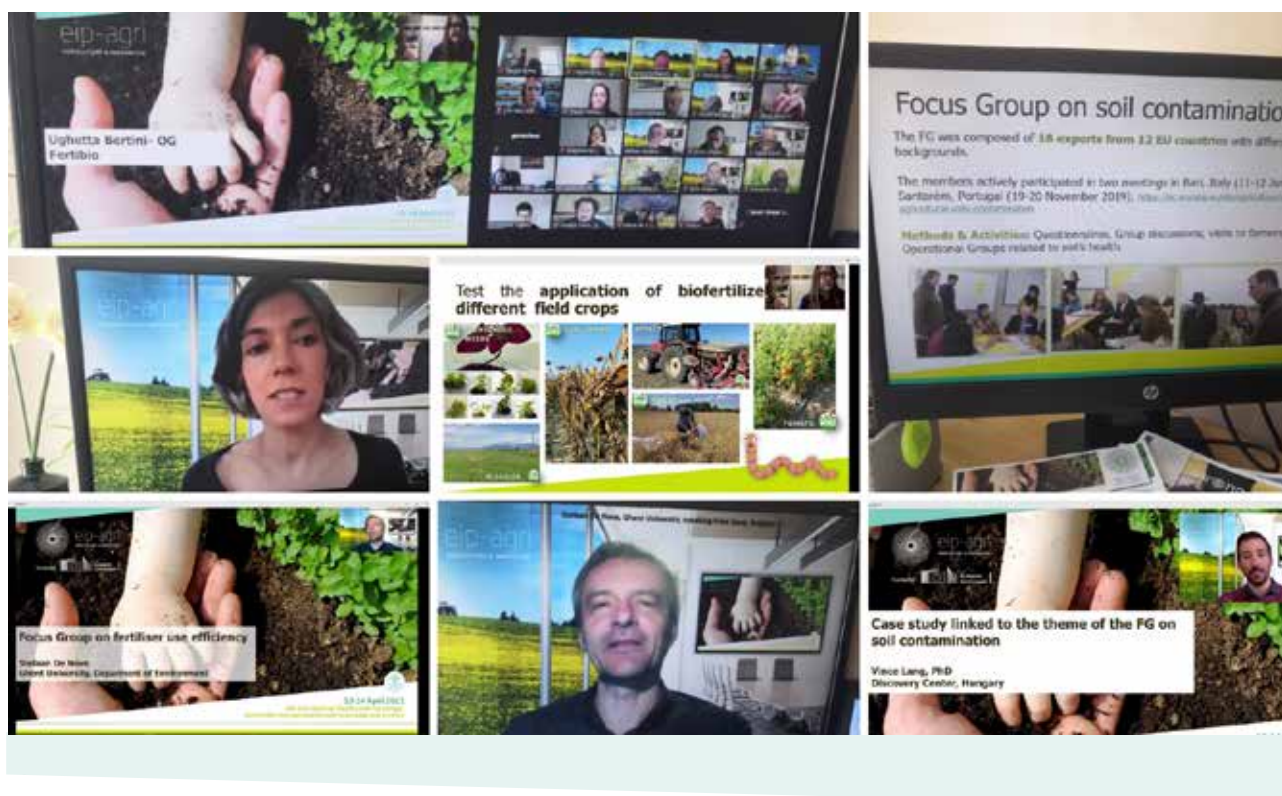
Two meetings, in Alicante (2014) and Harleem (2015)
20 experts and 4 facilitators from 13 countries
First meeting: Problems defined and tasks distributed (mini-papers)

Parallel breakout session 3: Soil and water interface

included presentations of the results of FG Soil salinisation by **Ana Marta Paz (Portugal)** – INIAV, FG Soil contamination by **Paula Alvarenga (Portugal)** – University of Lisbon, and FG Fertiliser efficiency by **Stefaan De Neve (Belgium)** – University of Ghent. Case studies were also presented including by **Stephan Jung (Germany)** – on the Operational Group 'Desalination of greenhouse floors by halophytes', **Vince Lang (Hungary)** – on the Operational Group 'Development of field soil test methods and rational cultivation techniques to reduce soil degradation', and **Ughetta Bertini (Italy)** – on the Operational Group 'FERTIBIO',.

The main outcomes were that **soil and water are closely interconnected and have a profound effect on the soil ecosystem**. Fertiliser efficiency for instance is strongly influenced by soil moisture content. The same holds true for soil salinity affected by poor quality irrigation water or for salt control through leaching. Contamination is very sensitive to soil water interface too. The conclusion was that nutrients should be used at the right time and in the right amount, bio-fertilisers could be an environmentally friendly source of nutrients, halophytes or salt tolerant crops could be used in saline areas and soil test methods should be developed for soil monitoring to keep soil degradation under control. Furthermore, precision agriculture could reduce pollution problems as it can optimise fertilisation and the application of agrochemicals. Additionally, the hazard of plastics as a soil pollutant is not sufficiently explored and the potential of polluted soils to produce non-food crops to bio-remediate the soil and create new sources of income for farmers needs further investigations. Finally, the development of easy-to-use and affordable salinity monitoring systems to raise awareness amongst farmers of this problem remains unsolved.

Day 1 of the seminar ended in a plenary session where the outcomes from all the breakout sessions were presented. The key ideas to build on Focus Groups and Workshop results that were produced during the discussions of the breakout sessions of the first day can be found in [Annex 1](#).



Part III: Recap & inspiration



The second day started with a short summary of the discussions and outcomes of the first day, followed by the presentation by **Marta Pérez Soba** from the EC Joint Research Centre who introduced the results of an analysis dealing with the impacts of farming practices that can reduce the use of fertilisers. The outcomes of the analysis provide guidance for reaching the Farm to Fork targets to reduce by 2030 nutrient losses by 50% and chemical fertiliser use by 20%. Marta described the methodology of the research that included the assessment of the results of five fertiliser strategies, namely organic fertilisation, green manure, enhanced efficiency fertilisers, nitrification inhibitors, and low ammonia efficient techniques based on hundreds of field experiments from many countries around the world. Results show the positive effects of organic fertilisation both on the soil, crop yields and nitrogen efficiency, however, attention should be paid to trade-offs with air pollution, nitric oxide and greenhouse gas emissions.

The presentation by Marta was followed by several questions, many of them related to the use of organic fertilisers as direct input to increase the soil organic carbon content. However, at the same time they stimulate the activity of microorganisms in the soil, increasing soil CO₂ emissions due to their respiration and the mineralisation of soil organic matter. Moreover, when organic fertilisers are compared to no fertilisation there is also a stimulating effect on soil CO₂ emissions from crop root respiration. The conclusion is that soil organic carbon stock could increase only when the input of organic carbon (in this case organic fertilisers) exceeds the carbon loss with soil respiration (including all types of soil CO₂ emissions). Moreover, this process depends on the types and rates of applied organic fertilisers and local environmental conditions including soil temperature, amount and frequency of rainfall as well as soil characteristics (e.g., texture, organic matter content and porosity). Therefore, it is important to develop best management practices to maximise carbon sequestration and to minimise soil CO₂ emissions from agricultural soils. In addition, it is necessary to evaluate the long-term carbon flux dynamics to understand the movement of carbon into and out of an agro-ecosystem.

Inspirational speakers

Marta's presentation was followed by three inspirational speakers. The first was **Vesna Čuček (Slovenia)**, who showed Slovenian examples of soil health restoration with organic and biodynamic agriculture through a video presentation from a family farm that is applying biodynamic approach to soil health. The farm grows vegetables, strawberries and livestock farming by promoting soil health and increasing soil organic matter. No-till in greenhouses has been implemented for 20 years. Furthermore, an example of soil amelioration was demonstrated as a good remedy to improve soil health through biodynamic technology.

The next inspiration farmer was **João Coimbra (Portugal)** who showed his experience on keeping soil healthy on a Portuguese maize farm that has been using no-till farming and direct seeding for more than 20 years in a monoculture system. João agreed that direct seeding may provide lower yields compared to conventional farming, but the benefits for soil health are relevant as he increased SOM from 0.5% to 3% in only 20 years through implementation of no-till and cover crops. His main goal is to reduce nitrogen application in maize production that is now 12 kg N for 1 ton of maize compared to 22 kg in the past and the goal is to further reduce N application to 10 kg. This has enormous environmental benefits and it will also lower production costs for the farmer. He collaborates closely with research institutions and universities that do research in his farm. João also implements precision agriculture that leads to a reduced use of fertilisers and increased soil health. He concluded by saying that farmers need to conduct frequent soil sampling on their farms and check soil health on a regular basis to assess the effects of the agronomic practices they adopt on soil health.

Mateusz Ciasnocha (Poland) shared his experience from the Polish Ciasnocha family farms that are implementing practices to capture carbon in soils and improve soil health. Despite the farms being situated on some of the best soils in Poland, soil health was poor due to previous management practices. Therefore, from 2004, they decided to switch from conventional cereal production to regenerative agriculture that is based on cover crops, minimum tillage, permanent grassland and agro-forestry. Other techniques included re-seeding and avoiding compaction. Finally, Mateusz emphasised that farmers need to make a profit and apart from the crops they produce they should be financially re-warded for keeping carbon into the soil. However, there are still several questions that need to be addressed. They could be summarised as how much carbon can be removed and stored in the soil and for how long; what are the best practices for soil carbon sequestration; how do those get measured and verified; what policy is needed, if any, to ensure that farmers see benefits of their implemented best practices.

“Farming cannot be green when farmers are in red”. Mateusz Ciasnocha

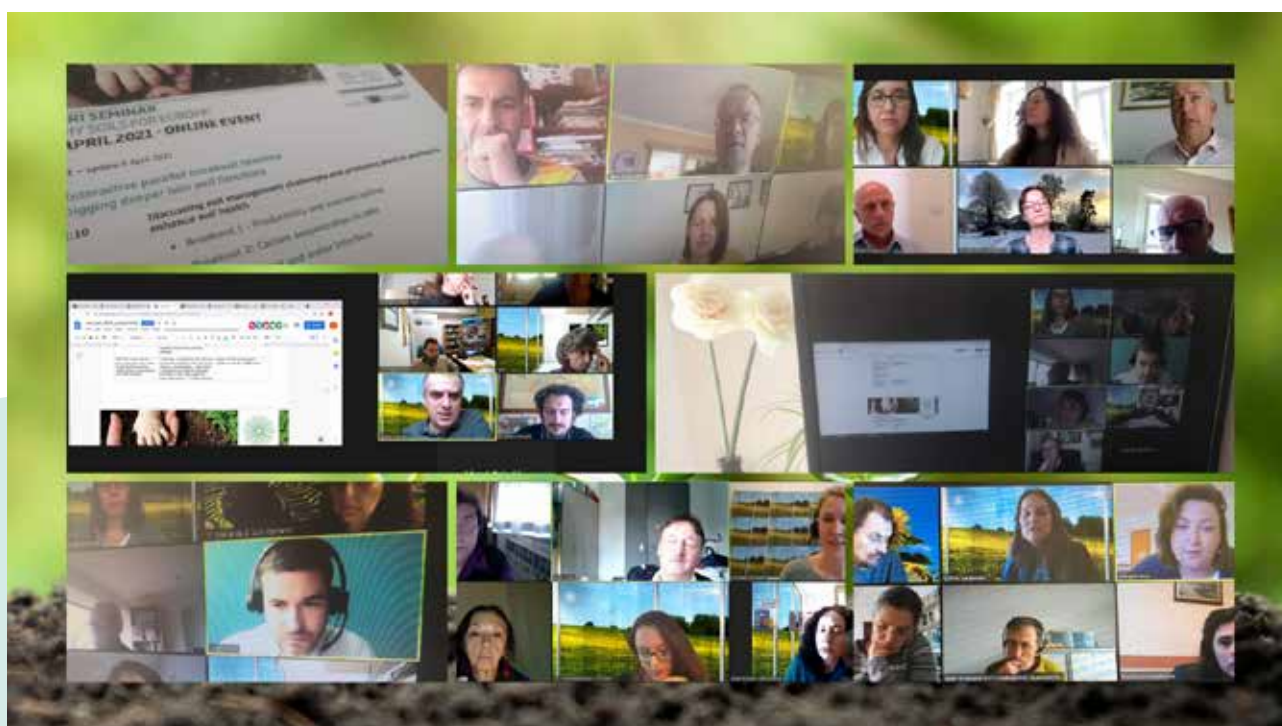
After the presentations, participants posed several questions to the speakers. Discussions concentrated on the practical aspects of implementing conservation agriculture principles, in particular no-till and direct seeding. Management of fungus and insects on legumes was addressed to Vesna who explained that the use of biodynamic preparations has given very good results. Participants congratulated João for his results but recommended that soil monitoring should not be done only on the topsoil but also at deeper soil layers. The issue however is that sampling and laboratory analyses are expensive and not every farmer can afford them. An advantage mentioned by João was that if a good soil fertility sampling is done, it will be reflected in the reduced amount of fertilisers saving costs for the farmer. Only by using Variable Rate Technology (VRT) such as precision agriculture is it possible to reduce up to 20% fertilisers without losing production. Mateusz explained that drainage is a problem for their farm but it is managed through various canals. However, given climate change effects, they need to change from present drainage water management practices to holistic water management; a new approach that should consider climate variability. This is reflected already on their farm, because despite being in a relatively wet region of Poland, they are also experiencing periods of drought. Mateusz emphasised that the carbon market is still weak but is growing and this will be an added value for farmers who implement conservation agriculture to enhance carbon sequestration.



Introducing soil functions

After the presentation of inspirational experiences, **Pandi Zdruli** introduced the topic of the next round of breakout sessions which were aimed at discussing good practices to foster soil functions and the challenges for their adoption at farm level. All soil functions are interconnected and influence each other, this seminar focused on the following five: productivity, biodiversity, carbon sequestration, nutrient cycling and water storage and filtering. They all have a great impact on soil health described as the capacity of the soil to function as a vital living ecosystem to sustain plants, animals, and humans. Therefore, to maintain soil health at least four principles must be implemented. They include minimum disturbance and maximising soil cover, biodiversity and living roots.

This introduction was followed by an example presented by **Janjo de Haan (The Netherlands)**, a researcher from Wageningen University who introduced the results of a Dutch project within which an experiment was conducted to assess soil health in different soil types (sandy, light clay and reclaimed peat). The goal was to define soil indicators for soil functions and their applicability as well as define management options based on long-term experiments. Management options included reduced tillage and application of compost. Results showed that there are trade-offs to consider when these management options are applied but the overall environmental gains overcome the negative effects.



Part IV: Interactive parallel breakout sessions – digging deeper in soil functions.

The last breakout session of the seminar was organised in a similar way as on the previous day focusing on **soil management challenges and practical solutions to enhance soil health**. Participants were subdivided again in three parallel breakout sessions (**Productivity and nutrient cycling, Carbon sequestration and Soil and water interface**), but discussions focused on the five selected soil functions (**productivity, biodiversity, carbon sequestration, nutrient cycling and water storage and filtering**) and how they influence each other. Concretely, participants had to discuss good management practices that promote soil functions and the challenges for their adoption at farm level. As previously mentioned, soil functions are closely interrelated and affect each other in various ways, therefore a distinct division between them is not possible. This was reflected often during the seminar discussions. [Annex 2](#) reports the most important outcomes in a concise manner.

The seminar recommended some of the most prominent best management practices to promote soil health. They are described as milestones of soil health principles: minimum soil disturbance, maximising soil cover and living roots, protecting biodiversity both above and below ground, increasing carbon sequestration, efficient use of water both for irrigated and rainfed systems, avoiding salinisation and contamination, keeping erosion under control, efficient use of fertilisers and pesticides and promotion of organic fertilisation and biofertilisers. Furthermore, wherever possible, promotion of agro-forestry, organic farming, precision agriculture and agro-ecology will greatly benefit soil health and will offer farmers sustainable yields in the medium and long term.

The remaining main outcomes could be summarised as follows:

- ▶ Soil health monitoring should be based on simple, rapid and easy-to-use methods for farmers. Farmers alone could not afford all the analytical costs.
- ▶ Farmers need a holistic and a systems-based approach both in terms of soil health and agriculture production. In the words of John Gilliland: "Often people talk "at" us, and not "with" us as farmers. We need an inclusive engagement".
- ▶ How could a farmer measure the carbon stocks in his/her soil? Research should help with simple and quick methods to estimate carbon sequestration. Choosing a carbon measurement methodology that suits the needs of the farm and instils confidence in the farmer is critical, as investment decisions should be made based on these data.
- ▶ Farmers who implement conservation practices and store carbon in their soils should be rewarded in financial terms for carbon quotas.
- ▶ Land tenure has a strong impact on soil health, farmers who do not own the land, may be less careful about implementing best management practices.
- ▶ Living Labs, Lighthouses and demonstration farms are crucially important to transfer knowledge and test the practices.
- ▶ Soil literacy is very important, working with schools and training centres should be promoted to increase awareness for soil health.
- ▶ Soil knowledge should be disseminated among farmers through farmer discussion groups and farm visit days.
- ▶ Advisers should be able to help farmers in a concrete manner and convey research results in an easy and pragmatic way towards real problem-solving of sustainable crop production and soil health enhancement.

Part V: Opening the door to the future

Part V was devoted to knowledge sharing and networking among the participants who had the opportunity to communicate and exchange ideas in relation to soil health. A digital platform called the “Opportunity Market” was provided for participants to share their questions and their proposals for collaboration or further discussion. The innovative ideas collected in the breakout sessions of the first day served as inspiration for participants to provide discussion topics or collaboration ideas (see [Annex 3](#)). Then participants could move to virtual rooms to meet and discuss the ideas they proposed in the Opportunity Market. This led to an excellent way of communicating and establishing contacts for future research and innovative projects, especially in the context of the forthcoming Horizon Europe - the EU’s key funding programme for research and innovation. Participants also exchanged publications, websites dealing with soils, outcomes from other projects and events and new technological advancements.

There was a discussion in one of the rooms on composting, where the problem of microplastics was raised. This discussion was in line with another one on waste recycling to produce fertilisers where it was mentioned that social acceptance of the produced fertiliser was an issue due to pollutants contained in waste. A participant pointed out that the pollution hazard could be overcome by using blockchain systems to trace the sources of waste.

Some other participants who were interested in creating demonstration farms to disseminate good practices gathered in another meeting room. One of the participants emphasised that farmers would be willing to implement good practices only when they are convinced that farming profitability will also increase. Another one pointed out the importance of quick and affordable measurement tools to empower farmers to foster behavioural change and adapt good practices to their local conditions. It was mentioned that the [FarmDemo](#) platform provides guidelines on how to create demonstration farms. Other outcomes pointed out the potential of using polluted and marginal soils to produce non-food industrial crops or their potential for agroforestry.





The seminar was closed by **Kerstin Rosenow**, Head of unit 'Research & Innovation', DG Agriculture and Rural Development, European Commission who pointed out that the outcomes of the seminar discussions confirm that there is a need for context-specific and targeted support and collaboration and exchange between farmers and researchers. This remains a key aspect for EIP-AGRI which will continue during the coming years offering opportunities to exchange knowledge and experiences to foster innovation in the EU agriculture and forestry sectors.

All presentations, both in pdf and videoformat and background documents are available on the EIP-AGRI website: <https://ec.europa.eu/eip/agriculture/en/event/eip-agri-seminar-healthy-soils-europe-sustainable>



Annex 1. Key ideas to build up on Focus Groups and Workshop results that were produced during the discussions of the breakout sessions of the first day

Breakout session ideas

Here we have collected all the ideas gathered from the 9 breakout sessions

EIP-AGRI SERVICE POINT APR 06, 2021 06:10PM

B01 | nutrient recycling

Idea group 5

Nutrient, biomass & mineral up-cycling, production of Biomass on site and show OGs as tools for farmers so they can bring the ideas on site

Idea of group 6: develop better understanding on compaction level of soil and appropriate indicators, better understanding on how much water is needed

Developing more soil life instead of fertilizers and technology, bringing soil microorganisms would build the resilience of the soil, making it able to work by itself and requiring less inputs and human intervention. To do so data needs to be created, analyzed and transferred.

Idea of group 4: Closing nutrient loops by recycling human manure for on-farm use (issues -collection methods, pathogens, GHG emissions, up-scaling dry toilets, pathogens treatment, medicine, antibiotics)

Example: "Aurin" , a "clean" urine-based fertiliser with permission for horticulture in Switzerland – ANONYMOUS

New product standard available DIN SPEC 91421:2020-12 Quality assurance of recycling products from dry toilets for use in horticulture <https://www.beuth.de/de/technische-regel/din-spec-91421/330937272> (download for free) (Franzi Häfner, IGZ) – ANONYMOUS

Speed and balance of uptake of nutrients in the spring are a problem, more research and monitoring needed. Connect to local conditions, involve farmers.

Idea of group 1: On-site biomass production for C-sequestration, while also recovering and circulating nutrients within the farm itself.

B01 | soil-borne diseases

Smart Farming

Approaches like smart farming help farmers reduce the excessive use of irrigation water and resulting excess soil moisture soil moisture - a condition that favours the growth of soil pathogens like fungi.

The control of soil moisture is really important to prevent such pathogens from affecting the soil and crops.

Characterize the host status of soil-borne pathogens and nematodes for vegetable and arable crops as well as for green manure and biofumigant crops.

Increasing organic farming (is used to handle soil-borne disease), sustainable soil management, or applying their techniques/principles.

Biofumigation.

Wireworms.

Soil-borne Fusarium.

Use of green manures in crop rotation.

B01 | cropping for the future

Increase the knowledge among all soil stakeholders and even among consumers given the complexity of the systems, of the solutions, need for a multiperspective and systems thinking. Flow and popularise the knowledge, develop the available knowledge to different contexts. Time was identified as a strong limiting factor.

Group 6

There is no strategy that fits all regions, so we need customised practices (adapted to local conditions). Collect available information and fill the knowledge gaps

Idea 4

need for tools for farmers to measure soil health. Need to develop more regenerative agriculture that is economically viable for farmers. Important to have a network of Lighthouse farm to cover different areas
Soil organic matter and its relevance
need to have regional strategies to communicate to policy makers
- to have policies locally adapted

Idea 1

OGs and creating / sharing the knowledge that is available - time is needed for that. OGs are a good tool to adapt the knowledge locally

Increase the knowledge among all soil stakeholders and even among consumers given the complexity of the systems, of the solutions, need for a multiperspective and systems thinking. Flow and popularise the knowledge, develop the available knowledge to different contexts. Time was identified as a strong limit. So that knowledge needs to be made easily available to practitioners: knowledge that is relevant (to their context), accurate and validated (by experts). – ANONYMOUS

Idea 2

Group 2
network of different associations related to soil health, to help the initiatives to better disseminate the results and connect to each other
training of the trainers (advisers) because there are knowledge gaps that need to be further fed with new knowledge (give access to most recent knowledge)

Group 3

Farmer friendly tools to improve soil health and step by step approach for farmers (some are not so open to big changes) and we need to reach all the farmers. Also translation into farmers' language. Biological assessment on soil quality

B02 | SOM content in Mediterranean regions

Cover crops -

a project in Southern ES found that they really increased the water infiltration

Microorganisms and their role in the soil

biochar

Group 3

Carbon above the surface - build a partnership for H2020 focusing on roots and microroganisms; water conservation + the role of microorganism in soil

a partnership to look for indigenous crops that have drought surviving capacities and/or water conservation capacities, and the role of micro organisms in these soils, how they influence plant protection – ANONYMOUS

to know also more on carbon sequesting/ som producing capacity of different root systems – ANONYMOUS

it would also be interesting to explore possibilities to change root:shoot ratios of green manure/cover crops (focus on root biomass and root exudates stimulation) by association with certain microorganisms – ANONYMOUS

Group 4

scientists know how to measure, evaluate etc but farmers don't have yet the real knowledge about this and we strongly advocate advisory services to transfer knowledge on this. We need to reach farmers effectively - decision support for farmers. Precision agriculture or sensors that can give real idea to farmers can be really beneficial. The CAP revisions need to put something in practice to help farmers change their practices -policy incentives

Group 2

demonstration fields are mandatory so that we have good results and so that farmers using the results; research and innovation are important but we need to invite farmers to make use of them

Weeds - incorporate or not?

Cover crops, different types, suppressing loss of OM
Mixed system can be really useful to have sheep among olive groves

reter água na paisagem/keep the water in the landscape. By green manuring; working the soil in "curvas de nível"; prevent erosion of the soil; create areas of biodiversity in 15% of the farms of intensive or superintensive farming, create bushy or tree edges; maintain the water lines with high vegetation; keep the leftovers of the crops in the soil, make the intercrop/grass between trees 80% of the area; plant trees and permanent crops respecting the slope (parallel to the slope); in slopes make a line of shrubs/not tiled line

B02 | Carbon storage in arable farms

Group 6: Consider all soil functions together (system perspective) and trade-offs, within the particular environmental conditions

Group 7

- * How to find actual local adaptations to increase SOC by making them attractive to the actual users (farmers)?
- * Different soils need different goals.
- * Farmers don't want to be dustbin (biodegradable waste need to be composted and compost with nutrients reused wisely) we need win-win situation solutions!

Group 6

closing nutrient cycles → waste based soil conditioners from cities to rural arable farms (if nearby a city) if quality is ensured!!!!
Finding a balance between C input from soil amendments and nutrient input (to not exceed e.g. P)

Group 6

- 1) Develop financial incentives for on-farm C-sequestration (C budgets)
- 2) Carbon preservation should be financially supported as well, by means of engaging farmers in good agricultural practices,

including proper utilization of soil improvers as compost, and training them on the importance of organic matter

include in the new CAP farmers payment according on how they budget the farm SOM, meaning that only those farmers receive subsidy who have a positive carbon balance – ANONYMOUS

Group 6

Farmer cooperations! e.g. Carbon Action Platform develops and researches ways of accelerating soil carbon sequestration and verifying the results scientifically. More income and resilience for farmer, developing methods to measure the carbon sequestration and finding ways to find a price to carbon.

Group 5

Looking at the rewarding systems for vegetable farmers, how to make this work. How to motivate farmers to increase the carbon storage.

Group 4

- developing educational tools, monitoring tools
- potential for carbon sequestration
- cost for farmers in carbon sequestrations
- access to organic material for farmers, the effect on the soil and the management on the farm.

Group 3

What story do we tell the farmers?
Looking for the optimum combination (mix) of the 3 main strategies, depending on local circumstances
What is the desired OM and how can we support the farmer in calculating his carbon balance taking into account his own conditions & measures. Which decomposition rates of SOM to be assumed

integrate different available technologies – ANONYMOUS

Group 2, idea 2: develop appropriate training for farmers and for advisers on C storage practices

Group 2:

develop/show more examples of new practices and techniques on C storage for farmers

Keep the soil green to pump the C from air to soil.

Proper crop rotation, crop mixes not mono-crops, crops with deep roots to transport C as deep as possible.

Group 1

*Alternative agricultural practices for carbon. Good example from Italy to be studied further. --> More scientific approach is needed on how do biodynamic farming increase carbon?

* Not look at only carbon sequestration, but in broader way. It is important to "produce" carbon on-farm, rather than importing carbon (through manure, compost, ...) from outside the farm.

* We need educational videos for farmers

reter água na paisagem/ keep the water in the landscape

do not turn the soil when working the soil

1- **green manuring (adubação verde) grow a crop and cut it and leave it in the soil**

2- to improve soil regeneration use and create "efficient organisms" (using a mix of yeast, soil, sugar/molasses, milk) that one will use in winter or early spring (In Portugal) diluted with water in the soil.

B02 | grazing for carbon

Looking for affordable ways of attaining soil baseline data.

Each farmer to have own data in an affordable way

Affordable solutions to have baseline data

Look for smart proxy indicators

Integrating ideas for individual farms

Fixing N

Rotational grazing and undersowing bare soils for growth after crop harvest.

Alleviating soil compaction

Integrate ideas for individual farms/climates/soil type/rainfall

Measuring the dry matter content in the grass

Rotational grazing

use the raw leftovers of industries (such as Olive oil industries leftovers are being burned when they can be used) to make compost or other fertilizers

B03 | soil salinisation

testing also instruments to monitor plant status

Testing instruments to help farmers to recognize the salinity of their soils (optical tools)

salinity and toxic elements – ANONYMOUS

Electromagnetic induction sensors can help to know the salinity gradient along the soils profile – ANA PAZ

salinity and sodicity – ANA PAZ

maria.speranza@unibo.it - Wireless Sensor Network (WSN) can monitor soil and water salinity, as experienced by LIFE AGROWETLANDS II project (www.lifeagrowetland2.eu) – ANONYMOUS

Increase knowledge on soil salinity at farm level

BO 3 | soil contamination

Gr 4

Legal issues in organic transition.

Gr 2

One new contaminant is plastics in the soil, they are very abundant but we don't know much about them yet. They pose a lot of issues and even more in the future. They may already be in groundwater - the problem is really deep

Gr 3

We need to think about which crops to use in contaminated soils. If a crop is not used for consumption, it can be used for energy production for instance. But farmers need income and this is really important to keep in mind.

Phytoremediation is the process to look into in this case (<http://www.cpeo.org/techtree/ttdescript/phytrem.htm#:~:text=Phytoremediation%20is%20a%20bioremediation%20process,Rhizosphere%20biodegradation>). There are crops that can be used for cleaning contaminated soils and their biomass could be used for purposes other than human consumption. – ANONYMOUS

Gr 3

Parameters that should be controlled in soils (contamination load) - pH is very important but total contamination load and the extractable level also need to be assessed.

Gr 4

Heavy metal contamination in soils - sewage sludge is not used anymore due to heavy metals. Compost could be in the same situation as it may accumulate metals: contradiction to previous session - how to deal with that? There are contradictions in several issues. More circular practices are needed (e.g. use green manure within the farm).

Gr 4

Plastic - how it can affect soil, mainly from previous years (in irrigation techniques).

Gr 3

Precision agric. and organic farming are great ways to reduce soil contamination but better is to work on prevention. The quality of products needs to be evaluated, more important in circular agric.

Group 2

FGs - they have a pretty large topic and in the end they have very general results and they identify interesting problems but don't go so deep into them. It would be interesting to have the FGs following each other

Gr 1

Use sewage to increase OM in soil and reuse waste - be careful on what's in it; over time they can build on the contaminants and can be counterproductive; need to do it in a safe way.

Use of plant protection products - precision farming can reduce the use of this and so contaminants in the soil - it needs to be economically viable. Affordable solutions for farmers are needed. Need to test and exchange so that solutions are taken up by farmers

Group 3

What crops can be used in heavy contaminated soils for remediation purposes? Need to be profitable but safe (not for consumption) as f.e. energy crops. What can be recommended to farmers? Income is important!

from 2022 the new fertilizer regulation 1069/2019 EC will introduce the manure trading possibility within and from 3rd countries. As there is not available a quality standard for different fertilizer products is a risk of introducing organic and non organic contaminants including antimicrobial resistance impacting soil – ANONYMOUS

B03 | fertiliser efficiency

Smart farming

Use data and tool for understanding the precise needs of plants for specific nutrients. Scientific models for the fertilization of various crops already exist, and can be fed with data from soil and plant tissue analyses. In this way, farmers can avoid excessive use of fertilizers and minimize their use to the extent possible.

Group 1

looking into soil improvers and not only into fertilisers to give more attention to compost etc. that fosters soil life and serves as activators

Group 6

Pattern of the nutrient release of the fertilisers (incl slurry/manure) is important as well as understanding how much is potentially released from soil, depending on the soil properties and conditions on site (incl soil moisture content). There is also need to work with organic matter in soil and also carbon neutrality. P is key in the future!

Farmers and advisors are not used to international cooperation at farmer/advisor level, this should be supported to take a step further. – ANONYMOUS

Group 5

The use of tools for fertilization according to soil health. To provide tools for advisers and decision makers. And the knowledge when to use them. We need to distinguish the tools we can use in the laboratory and on the farm. They are different tools, but hard to know about the physical parameters and thresholds for decision.

Precise liming for Brandenburg (ph-bb.com) The approach average particle diameter sensing in the field as a basis for efficient fertilizing - I uploaded a slide. We feel this method is relevant for all EU as basis for continuously variable fertilizing algorithms to overcome oversimplified soil type classifications - and thus to come to more effective fertilizing. On this basis, we are developing continuous algorithms for calculating application maps - at present "just" for liming, but for other fertilizers in future as well. We are able to calculate texture maps calibrated to lab analyses.

Group3

How to close the nutrient cycle with no farm waste. How to design a farm (or regional/local) farming system utilizing all farm assets.

Group3

The effect of climate change on fertilizer use efficiency. The current knowledge is based on other climatical conditions.

Group 2, idea 2

Develop ways to sensitise farmers and to showcase sustainable practices on fertiliser use

Group 2, idea 1

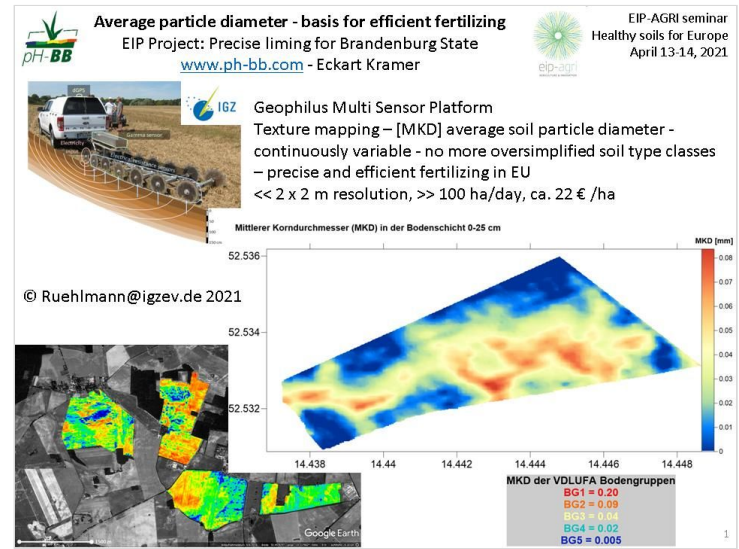
need to develop accurate calculation tools for farmers

Group 1: Research and information on soil biology

+ apps & tools for monitoring and soil assessment for farmers (promotion)

Average particle diameter - basis for efficient fertilizing

Basis for continuously variable algorithms - approach to overcome oversimplified soil type classifications



Group 4

exploring different sources of fertilizer like biochar that can be used as filter to keep nutrient in the soils.

Use of chestnut to create compost

the biggest change is to learn from the good practices from other farm.

issues of dissemination that can use demo farms

<https://ec.europa.eu/eip/agriculture/en/find-connect/projects/compostaggio-situ-la-tutela-la-valorizzazione-e-la>

Annex 2. Summarised outcome results of breakout sessions: main relevant projects

Soil function: Productivity

Selected projects	Good practices	Challenges for adoption	Promoted soil functions
Lighthouse in Northern Ireland: improved soil management and carbon-smart farming regulated pH in the soil and increased grassland productivity from 4 t/ha to 7-11 t/ha	Control pH and grassland management. Goal: carbon neutrality	Incentives: increased productivity/economic aspects; increased feed quality/quantity - quicker growth of cattle	<ul style="list-style-type: none"> • Biodiversity • Carbon sequestration • Water filtering
Lighthouse farm - traditional farming with ploughing vs. conservation farming with reduced tillage / clay and sandy soil	No-till, mulching, straw management, conservation agriculture	Incentives: Economic output, system becomes resilient with time Barriers: Farmers often look at productivity, soil health comes after	<ul style="list-style-type: none"> • Water filtering • Carbon sequestration
Conservation agriculture and agro-ecological principles of sustainable farming	Organic matter amendments, cover crops, compost, biochar	Incentives: Positive financial return Barriers: Difficulties in application and incorporation of amendments, availability, contaminations in products, leaching of nutrients to water	<ul style="list-style-type: none"> • All functions
Irrigation project and their relevance to soil health	Irrigation control, water quality for irrigation, maintain organic matter, structure, prevent salinisation	Incentives: Adequate irrigation to the specific pedo-climatic conditions to keep/improve the soil productivity in the longer term Barriers: High cost of pressurised irrigation systems	<ul style="list-style-type: none"> • Water storage • Water filtering
Project to increase production of dry matter (DM) for livestock demand	Organic applications of slurry, farmyard manure, rotational grazing, 30% annual reseeding mix leys and whole farm sward lifting over a 5-year period. Precision agriculture	Incentives: Measure DM based on the crop type, soil type and soil fertility Barriers: little knowledge about economic and ecological effects of precision farming technologies	<ul style="list-style-type: none"> • Carbon sequestration • Biodiversity

Soil function: Biodiversity

Selected projects	Good practices	Challenges for adoption	Promoted soil functions
Grand Farm Austria https://grandfarm.at/grand-garten-research/?lang=en	Earthworm composting Conservation agriculture	Incentives: Financial support Barriers: Higher costs	<ul style="list-style-type: none"> • Carbon sequestration
GIEE MSV & GIEE SCV in France (ADAF) http://www.adaf26.org/	Reduced tillage, OM additions, cover crops	Incentives: Economic output Barriers: Unwillingness to change	<ul style="list-style-type: none"> • Water filtering • Carbon sequestration
H2020 SoildiverAgro http://soildiveragro.eu/	Use of biofertilisers and biostimulants	Incentives: Subsidies to farmers Barriers: traditional practices are difficult to change. Lack of training. Initial investment in machinery/technology	<ul style="list-style-type: none"> • All functions
KUHproKLIMA Permanent grasslands and multispecies swards	Permanent grasslands and multispecies swards	Incentives: Good soil quality through the rich microfauna diversity, stable grassland yields, no need for additional fertiliser Barriers: Issues with soil biodiversity (nematodes, pests)	<ul style="list-style-type: none"> • Water filtering • Carbon sequestration
Soil4Life https://soil4life.eu/	Conservation agriculture	Incentives: Farmers should be informed about the long-term advantages of preserving biodiversity Barriers: Lack of know how	<ul style="list-style-type: none"> • All functions
SEFerSol https://www.facebook.com/Sefersol/?ref=page_internal	Easy to use soil biodiversity tests	Incentives: Make basic knowledge easily available Barriers: Reduce practices negatively affecting biodiversity	<ul style="list-style-type: none"> • Carbon sequestration • Productivity • Water filtering

Soil function: Carbon sequestration

Selected projects	Good practices	Challenges for adoption	Promoted soil functions
<p>H2020 Diverfarming: crop diversification http://www.diverfarming.eu/index.php/en/project-2</p>	<p>Crop rotations, cover crops, crop diversification</p>	<p>Incentives: Increased carbon in the soil, increased soil fertility Barriers: Farmers reluctant to change</p>	<ul style="list-style-type: none"> • Productivity • Nutrient cycling • Water storage
<p>Demeter project in Flanders https://h2020-demeter.eu/about-demeter/</p>	<p>Digital transformation of Europe's agri-food sector through the rapid adoption of advanced IoT technologies, data science and smart farming</p>	<p>Incentives: Better target economic incentives and policies to adopt the best suited practices to capture carbon in soil Barriers: Soil analysis could be costly for farmers</p>	<ul style="list-style-type: none"> • Productivity • Nutrient cycling • Biodiversity
<p>ECOMONTADO project in Portugal https://inovacao.rederural.gov.pt/2/227-ecomontado-xxi-a-agroecologia-aplicada-ao-design-do-montado-novo</p>	<p>Terrain modifications to infiltrate runoff water in soils to increase biomass production in Mediterranean areas</p>	<p>Incentives: Financial support to farmers Barriers: Lack of adapted machinery, not so efficient in some soil conditions (sandy soils)</p>	<ul style="list-style-type: none"> • Water storage and filtering • Productivity • Biodiversity • Nutrient cycling

Soil function: Nutrient cycling

Selected projects	Good practices	Challenges for adoption	Promoted soil functions
<p>LIFE AGRICLOSE https://agriclose.eu</p>	<p>Local fertilisation Bringing livestock and agriculture closer together</p>	<p>Incentives: Target research objectives on real farm needs and conditions Barriers: Social acceptance (and technical issues) for alternative fertilising products</p>	<ul style="list-style-type: none"> • Carbon sequestration
<p>H2020 Circular Agronomics https://circularagronomics.eu</p>	<p>Good management of carbon, nitrogen, phosphorus and potassium in agriculture to maintain a fertile and healthy soil and allow adequate plant growth and development</p>	<p>Incentives: Increased economic opportunities Barriers: Difficult to manage, knowledge intensive</p>	<ul style="list-style-type: none"> • Water filtering • Carbon sequestration

H2020 Agromix https://agromixproject.eu/	Regenerative practices such as mixed farming and agroforestry	Incentives: Less external inputs; reuse of organic residues by composting Barriers: Lack of tools, skills and machinery	<ul style="list-style-type: none"> All functions
H2020 Rustica https://particula-group.com/horizon-2020-project-rustica/#https://particula-group.com/#!/up	Technical solution to convert organic residues from the fruit and vegetable sector into novel bio-based fertiliser products of high quality	Incentives: Need for external inputs and funding Barriers: Need to make routine soil analyses	<ul style="list-style-type: none"> All functions
SUSTAINOLIVE project https://sustainolive.eu/?lang=it	Sustainable management of olive groves, use of wastewater treatment sludges to fertilise the soil	Incentives: Develop of easy and quick tests to measure quality of the sludges Barriers: Lack of knowledge, quality tests are expensive	<ul style="list-style-type: none"> Productivity Carbon sequestration

Soil function: Water storage and filtering

Selected projects	Good practices	Challenges for adoption	Promoted soil functions
Sefersoil	Avoid soil compaction	Incentives: farmer access to new technologies, economic incentives to apply amendments, reduced cost of irrigation Barriers: relate mostly with economic costs and lack of adequate machinery to implement new technologies	<ul style="list-style-type: none"> Productivity Carbon sequestration Biodiversity
	Agroforestry: hedges can filter pollutants		
Ecomontado Operational Group	Terrain modelling using the keyhole system		
	Conservation agriculture		
H2020 Diverfarming	Cover crops		
	Substitute mineral fertilisers by organic ones		
	New techniques of slurry application		

Annex 3. Main offers and needs identified in the Opportunity Market

EIP-AGRI seminar's opportunity market

At the opportunity market you can offer something (ORANGE color) or you can ask for something (GREEN color). Click on the pink + at the right bottom to add your offer/ request.

EIP-AGRI SERVICE POINT APR 06, 2021 03:51PM

Vesna: The region where I come from: nature, farms, people, products, ...in a brochure which we have prepared within an EU project Explore and enjoy



Explore and Enjoy | Savinja Valley Region and Krapina-Zagorje County

explore_and_enjoy_katalog015_eng.pdf
PDF document
WWW.FARMTOURISM.SI

Tips for you holidays on farms in beautiful, diverse natural surrounding in Slovenia, where 60 % of land are forests, and 37% Natura 2000. Excellent brochure with inspiring photos of nature and farms. Recommendation from Vesna. If you need more info or suggestions , contact us.

[Link for a video, 3 min](#)



MY WAY OF COUNTRYSIDE HOLIDAYS.
#ifeelsLOVEnia
#myway

turisticne_kmetije_ang_2020_ponatis_1.pdf
PDF document
WWW.FARMTOURISM.SI

a cross-country exchange (WS or seminar) with strong practitioners' involvement on contract solutions for the provision of environmental public goods - including those with private funding, but also bottom-up with farmers and other private actors collaborating

We will be happy to share our experience in researching farming systems in the field of organic farming. (catch crops, no-till, reduced till, weed management)

Institute of Agricultural Resources and Economics (AREI)
livija.zarina@arei.lv

*Vesna Čuček from Slovenia, we are very interested, please send us link if you have videos...written infos for farmers :
vesna.cucek@ce.kgzs.si – ANONYMOUS*

EJP SOIL programme

the EJP SOIL is developing a number of activities to go towards climate-smart sustainable agricultural soil management. We have performed a series of stocktakes (e.g. on fertilisation

guidelines, on soil challenges on management options) and are performing new ones (on soil quality indicators). We implement research projects and have a training and capacity building and a science policy interface. Visit us at www.ejpsol.eu

Dissemination of research results/farmer's experiences

Hello, further dissemination of results, good practices/techniques to ALL farmers is very important. What are your experiences? What do we need: trials in the field, broad communication, factsheets, I think very practical information is important, that is backed by experiences on real farms. Thank you very much. sebastien.janssens@vlm.be

I agree. Disseminating the results of each operational group in English is very important. Luca Bechini – LUCABECHINI

Vesna from Slovenia: Yes, I agree, It is important that you have videos presenting results on farms and more information written, but not too much in scientific details, so that farmers can understand practical value. Also it is important that information are disseminated to advisers..., because we - advisers can distribute this to others. Take a look at this video, last minutes specially... from 6th minute to 10th minute ...how to...

<https://www.bing.com/videos/search?q=farm+%c4%8derneli%c4%8d&&view=detail&mid=03A0E411090BEAADE2C803A0E411090BEAADE2C8&&FORM=VRDGAR&ru=%2Fvideos%2Fsearch%3Fq%3Dfarm%2520%25C4%258Derneli%25C4%258D%26qs%3Dn%26form%3DQBVR%26sp%3D-1%26pq%3Dfarm%2520%25C4%258Derneli%25C4%258D%26sc%3D2-13%26sk%3D%26cvid%3DIE572A06840346F3A31A0BADC1B4E9CD>

– ANONYMOUS

Ripping instead of plugging on biodynamic farm Černelič Slovenia, 3 minute video from spring 2021

Recomendation by Vesna from Slovenia

kmetija Černelič ripanje - Bing video

Ripanje - podrahljavanje in zračenje zemlje z IMT 539 Deluxe 2021

BING



Collaboration on HORIZON-CL6-2021-FARM2FORK-01-08: Uncovering lock-ins and levers to encourage farmers to move to and stay in climate-neutral and sustainable food production systems: from experiments to systemic mechanisms

Is anybody planning a project for this call? We would be interested to connect and work with farmer networks or research institutions! We have a lot of experience in networking, innovations support and knowledge transfer! My contact is marit.chadid@agrathaer.de

Links for organic farm Černelič, biodynamic agriculture

[Photo and Video Report of the recultivation of a ruined Parcel](#), with links for biodiverse green manure mixtures

[Regeneration-of-compacted-soil-Cernelic-farm.pdf \(gov.si\)](#)

[Description of regeneration of compacted soil, increasing SOM](#)

Photo-and-video-regeneration-of-soilCernelic-farm.pdf

PDF document

WWW.GOV.SI

Sustainable soil management in vineyards starts from the pre-plantation earthworks

If someone is interested in sharing experiences about earth works before tree plantation contact the OG prosit at www.goprosit.it or see <http://www.resolve-organic.eu/>.

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journal homepage: www.elsevier.com/locate/jenvman

Research article

Effects of soil erosion on agro-ecosystem services and soil functions: A multidisciplinary study in nineteen organically farmed European and Turkish vineyards

Edoardo A.C. Costantini^{a,*}, Maurizio Castaldini^a, Maria Paz Diago^b, Brice Giffard^c, Alessandra Lagomarsino^d, Hans-Josef Schroers^e, Simone Priori^f, Giuseppe Valboa^g, Alessandro Elio Agnelli^h, Erhan Akçaⁱ, Lorenzo D'Avino^j, Emma Fulchin^k, Elena Gagnari^l, Mehmet Erdem Kiraz^m, Matej Knapičⁿ, Radojko Pelengić^o, Sergio Pellegrini^p, Rita Perria^q, Sergio Puccioni^r, Sauro Simoni^s, Semih Tangolar^t, Javier Tardaguila^u, Nadia Vignozzi^v, Alessandra Zombardo^w

^a CRE-A-AA, Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria, Research Centre for Agriculture and Environment, Italy
^b CRE-A-DC, Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria, Research Centre for Plant Protection and Certification, Italy
^c CRE-A-VE, Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria, Research Center for Viticulture and Enology, Italy
^d Bordeaux Sciences Agro, UMR, Bordeaux, Gers, France
^e Vitinov-ADEBA, France
^f Instituto de Ciencias de la Vid y del Vino (University of La Rioja, CSIC, Gobierno de La Rioja), Spain
^g Çukurova University, Faculty of Agriculture, Department of Horticulture, Turkey
^h Ahiyaman University School of Technical Sciences, Turkey
ⁱ Ahiyaman Horticultural Research Station, Turkey
^j Agricultural Institute of Slovenia, Ljubljana, Slovenia

ARTICLE INFO ABSTRACT

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PADLET DRIVE

Cornell Soil Health Laboratory

The Cornell Soil Health Testing Laboratory is the home of the Comprehensive Assessment of Soil Health (CASH): The Comprehensive Assessment of Soil Health is designed for farmers, gardeners, agricultural service providers, landscape managers and researchers who want to go beyond simply testing the nutrient levels of their soils.

CORNELL



Carbon Farming market

are we ready for establishing a carbon farming market in EU?

I work with agroforestry, intercropping and urban farming solutions and i am interested to join proposals with others interested in HORIZON EUROPE calls

my email is bbg@plen.ku.dk (University of Copenhagen, Denmark)

Share experiences of inspiring examples. We have seen quite a few very nice examples, throughout Europe. Would be nice to share these experiences cross border, looking for opportunities and good ideas

h.brinks@delphy.nl

Vitality from soil to stomach, PhD Jens Otto Anderson, from Denmark, cucumber test shows how vitality depends from the type of agriculture production. In the lecture you can find out the relation to human vitality.

Recommendation from Vesna, Slovenia

cucumber test dr. jens otto andersen - Bing

BING



Looking forward to listening to this later. Thank you
— MAGNERS FARM

NoTill, biochar and controlled drainage in Latvia

We are offering farmers to test and see how NoTill works in Latvia. There are 8 farms in the project since 2019. We have test plots of 200ha converted into NoTill after long years of conventional cultivation. In spite we are just 2 years in the project, 6 out of 8 project farmers have bought their own NoTill seed drills, which significantly shows the great interest and the evidence of sustainability of NoTill in Latvia.

Contact janis.kazotnieks@llkc.lv for details or visit project webpage <http://craftlife.lv/en/>

Craft Life - Klimata atbildīga lauksaimniecība Latvijā

Agriculture is one of the main sources of greenhouse gas (GHG) emissions in Latvia, accounting for 24% of the country's total GHG emissions. Latvia is the country with the second highest share of agricultural GHG emissions in the European Union.

CRAFTLIFE



Hello Luca, The use of cover crops is very important, for incorporation extra C in the soil and for avoiding nutrient leaching. Do you have specific information about the use of a mix of cover crops ? In Belgium, the use of cover crops after maize is difficult : harvesting maïs (for whole plant ensilage) middle to end september. Which cover crops can develop enough in colder periods ? Is the choice of "early-maize" (harvesting early september) a complementary approach ? Thank you very much.
sebastien.janssens@vlm.be — ANONYMOUS

EIP projekt in Germany: Soil Box The Soil Box-Soil science as the basis of agriculture is a learning tool for farmers.

[EIP-Agrar: project details call 2 \(eip-agrar-sh.de\)](http://eip-agrar-sh.de)

I could tell more about this project:

cketelhodt@lksh.de

Anybody working on human excreta - We developed a German fertilizer product standard DIN SPEC

"Quality assurance of recycling products from dry toilets for use in horticulture" <https://www.beuth.de/en/technical-rule/din-spec-91421/330937272>

https://www.igzev.de/portfolio_type/portfolio-franziska_haefner/

Concerning the call Horizon-CL6-2021 Biodiv-01-013 Breeding for resilience: focus on root-based traits. If anyone is involved in a consortium for this call, I would like to get in contact.
soraya.franca@biobestgroup.com

Keyline

Do you work or know projects about Keyline?

Can we share experiences?

anafonseca@uevora.pt

My project is <http://www.ecomontadoxxi.uevora.pt/>

Many thanks!

Ecomontado XXI | A Agroecologia aplicada ao design do Montado Novo

Implementação de uma nova prática de gestão florestal com vista à recuperação do ecossistema montado, utilizando técnicas de restauro dos ecossistemas resultantes dos conceitos de Permacultura e Agroecologia

UEVORA



Formadores:
Catarina Diniz
Engenharia Agrónoma,
Mestrado em Agricultura
biológica, Agricultura e
conservação,
Carlos Simões
Agricultor e consultor

Período:
2006
(2006 até 31-12-2018)

Organização:
Projeto Solo Nas Áreas
Locais: Montado do Fregal
do Meio, Montado do Neop

Also interested! – MAGNERS FARM

very interested! patriciamora@innogestiona.es – ANONYMOUS

Hi, I'm at the meadow! – ANONYMOUS

Ok, but they are discussing another thing! – ANONYMOUS

Can we go to the yard? – ANONYMOUS

Ok, I wil, try the meadow again sorry! – ANONYMOUS

We are scientists monitoring the effects of keyline (and other regenerative agriculture) projects on Mediterranean soils- I can connect you with the farmer responsible of these interventions.
You can reach us at pilar.andres@creaf.uab.es – ANONYMOUS

COOPERATION

I'm open to cooperate. I'm very interested in join/build lighthouses. My topics are: agroforestry, beef cattle, direct market, agroecology.

My contact: Marcin Wójcik

oikoskrzywa@gmail.com



Tools for farmers for soil health measurement

Looking for reliable soil measuring for farmers

From Kylie hello@magnersfarm.com

Have a look and the VESS: visual assessment of soil structure
– ANONYMOUS

<https://www.youtube.com/watch?v=BWUeERE-wJw> and
<https://www.youtube.com/watch?v=bWCDBT2sEVs> and other
sites – ANONYMOUS

we use the soilmentor-app from vidacycle in our project (it's actually from UK) www.kuhproklima.de – ANONYMOUS

Any experiences of community-led local approaches on nutrient recycling or soil improvement (involving more than one farm)?

I am looking for ideas, speakers and cases for an upcoming ENRD Thematic Group meeting on local, territorial, community led and owned initiatives to promote sustainable land management practices. All ideas welcome at greendeal@enrd.eu or laura.jalasjoki@enrd.eu

The European Green Deal and Rural Areas - The European Network for Rural Development (ENRD) - European Commission



file/headeredgpng_enheader_edg.png

The European Green Deal and rural areas

is the new sub-theme of the broader ENRD thematic work on 'Greening the Rural Economy'. The dedicated Thematic Group (TG) will operate from September 2020 until July 2021 as a stakeholder driven platform to exchange on the role of the European Green Deal (EGD).

THE EUROPEAN NETWORK FOR RURAL DEVELOPMENT (ENRD) - EUROPEAN COMMISSION

We are developing a typology of "organic wastes" especially composts and digestates as organic fertilisers.
claire.chenu@inrae.fr – ANONYMOUS

And I forgot to add : this is also developed in a territorial context : the Plaine de Versailles, in association with farmers. How to use local "organic wastes" for amending and fertilizing soils contact my colleague sabine.houot@inrae.fr – ANONYMOUS

Effects of soil management options on soil functions

I presented this morning our work on effects of soil management options on soil functions. We are planning to continue this work and are happy to share our methodology and work together to do this on EU-level. We have a first publication (yet in Dutch only) on last years results.

janjo.dehaan@wur.nl

I would be very interested in your publication, Janjo. Could you send it? Thank you. Luca Bechini, luca.bechini@unimi.it

– LUCABECHINI

Orientations on soil carbon for CAP Strategic Plans

This factsheet provides lessons learnt from the 2014-2020 Rural Development Programmes and ideas for the CAP Strategic Plans. https://enrd.ec.europa.eu/publications/sequestering-carbon-soil-and-retaining-soil-carbon-stores-orientations-cap-strategic_en

Sequestering carbon in soil and retaining soil carbon stores - Orientations for CAP Strategic Plans - The European Network for Rural Development (ENRD) - European Commission

Sequestering carbon in soil and retaining soil carbon stores - Orientations for CAP Strategic Plans

THE EUROPEAN NETWORK FOR RURAL DEVELOPMENT (ENRD) - EUROPEAN COMMISSION



Tea bags for science

Did someone already used the protocol teabag for science to measure effects of soil management on OM decomposition ? amandine.faury@adaf26.org

Yes we are doing it. Please contact claire.chneu@inrae.fr
– ANONYMOUS

Hello, we also did it to compare agricultural, forest and re-forested land in semi-arid Mediterranean conditions: inigo.virto@unavarra.es – ANONYMOUS

Yes we are doing it at farmers plots. Please contact Sophie BOULANGER-JOIMEL and claire.chenu@inrae.fr – ANONYMOUS

yes, I know. I have started an experiment in both forest and pasture ecosystems that are going to be modified for their destination (dam construction). sara.dilonardo@cnr.it
– ANONYMOUS

Please send me the protocol for this test. vesna.cucek@ce.kgzs.si
– ANONYMOUS

HUMUVATION

We have an interesting EIP-Agri project to store carbon and realize a economic interesting crop rotation at the **same** time. Please ask us! Regards Judith. www.humuvation.de

The logo for Humuvation features the word "humuvation" in a lowercase, rounded, green font. A single green leaf is positioned above the letter 'u'. Below the logo, the German text "Humusaufbau innovativ gestalten" is written in a clean, black, sans-serif font.

Humusaufbau innovativ gestalten

I'm interested in your results, especially the combination of carbon storage and economic interesting crop rotations – ANONYMOUS

Take a look at Camena Samen company catalogue - from Germany <https://www.camena-samen.de/>, we used their mixtures for humus production,, excellent results. Vesna from Slovenia – ANONYMOUS

Brix

Hello, I am measuring Brix on vegetables in order to assess product quality. I have many questions regarding this method, the referential, and how to interpret them. Did someone already worked with Brix ?

amandine.faury@adaf26.org

Anybody working on short food supply chains, we would very interested in you contacting us. We are creating a large SFSC community in the www.Smartchain-h2020.eu project

patriciamora@innogestiona.es

Yes within the Agriculture Advisory Service within the Chamber we work with many farms, which sell products directly...so we as advisors support short chains a lot. As our farms are small in average...6.9 hectares. Vesna from Slovenia, vesna.cucek@ce.kgzs.si
– ANONYMOUS

Agricultural soil remediation options

I think we need more investigation in "agricultural soil remediation options" and we need to transfer this knowledge to farmers. If a farmer has a contaminated soil, what can he do? What if it is a vineyard? What if he produces annual crops?

If someone is interested in partnerships:

Paula Alvarenga (School of Agriculture, University of Lisbon)

(palvarenga@isa.ulisboa.pt)

Hi Paula! we have had very succesfull experience with biorremediation of soil polluted with HTF from solar plants. we would be interested in participating in new research projects on soil remediation patriciamora@innogestiona.es – ANONYMOUS

Project about WWTP sludge HM reduction using fly ash from biomass energy plants: Life ICIRBUS www.icirbus.eu

patriciamora@innogestiona.es

Experimental platform applying agroecological principles in practice <https://www.ppaehansbeke.be/en/> The Proefplatform Agro-ecologie Hansbeke (PPAE Hansbeke) offers opportunities for specific experiments and projects. koen.willekens@ilvo.vlaanderen.be

Projects on conservation agriculture, market gardening on living soil, and agroforestry in France.

We are a small association (ADAF) located in south east of France. We facilitate farmers group, we organize events and farmers training, and we run R&D project on pilot farms, evaluating these agroecological cropping systems on different parameters. We are always open to new collaborations. We are also looking each year for expert and farmers to provide farmers trainings in agroecology, and for farms to visit. Feel free to contact us : contact@adaf26.org

We can also help you organizing field trips in our pilot farms.

Association Drômoise d'Agroforesterie - Pour une gestion participative des ressources agricoles et naturelles de nos territoires

Créé en 2015, l'Association Drômoise d'Agroforesterie est un espace ressource, de conseils, de formation et d'accompagnement de projets en agroforesterie et agroécologie. Par l'échange et l'innovation, l'association aide à repenser la production agricole en s'inspirant des mécanismes naturels et des interactions du vivant.

ADAF26



intéressée à savoir ce que vous faites. J'ai encadré une thèse sur le stockage de C en agroforesterie (R. Cardinael) claire.chenu@inrae.fr – ANONYMOUS

We would like to talk about biowaste composting and connected problems.

Alberto Confalonieri (confalonieri@compost.it) and Antonino Testa (antonino.testa@unina.it)

H2020 SoildiverAgro

<http://soildiveragro.eu/>

Discussion and demonstration of how the proper management of soil biodiversity can enhance soil health and sustain high yields. Join us in our community to exchange experiences:

<http://soildiveragro.eu/stakeholders/>

interested Zoltán Hajdu soltub@soltub.hu – ANONYMOUS

H2020 Diverfarming

www.diverfarming.eu

Discussion and demonstration of how crop diversification can enhance soil health. Join us in our community to exchange experiences:

<http://www.diverfarming.eu/index.php/en/home-be-a-diverfarmer>

interested Zoltán Hajdu soltub@soltub.hu – ANONYMOUS

Wanted to be part of lighthouses/living labs

Regeneration of intensively (many times fumigated) managed soils of Mediterranean greenhouses in South Spain, by means of recycling of plant residues and green manures, Keeping profitability and soil suppressiveness to diseases. Microbiological and productivity approaches.

Miguel: franciscom.cara@juntadeandalucia.es

interested Zoltán Hajdu soltub@soltub.hu – ANONYMOUS

Closing the nutrient loops

The H2020 Nutri2Cycle project can give help in finding technologies and methods in nutrient recycling, details http://www.soltub.hu/?en_nutri2cycle-h2020-project,43 Zoltán Hajdu soltub@soltub.hu

SEFerSol Project

We have been experimenting different practices in vegetable production in a 10-year project, with the objectives of improving soil fertility and weed management. Summary in English and German is available on our website, and all of our documents, in French are there too. Feel free to contact me if interested!

Margot Roux

<https://polemaraichage.com/experimentations/sefersol/documentation-sefersol/>

Hello Margot, I have heard about your project that I found really inspiring for our project with Maraîchage sur Sol Vivant. Maybe we could exchange on results of our projects and collaborate ? We are organizing technical days and farmers training for instance.
amandine.fauray@adaf26.org – ANONYMOUS

Bonjour, Improving soil quality in regions with intensive vegetable cropping is important but difficult. Also, we were talking yesterday about installing plots on farms (as a part of a field, with less of more N), in order to detect differences in crop-quality and NO₃-residue. Soil quality and low residues are the objectives of our new B3W-advise service. Maybe we can exchange ideas on both challenges, and how to realise better results. Also in mind, the possible ways for further dissemination of results to all farmers. Thank you. (In french, no problem, may be even better than english). Sebastien.janssens@vlm.be. – ANONYMOUS

Thank you for contacting me, here is my email address : margot.roux@educagri.fr and I will get in touch with you !
– ANONYMOUS

Connecting advisors to boost interactive innovation in agriculture & forestry

i2connect project team is working to fuel the competencies of advisors and their organisations to engage and support farmers and foresters in interactive innovation processes. Innovation is a key factor in continual adaptation to the various and sometimes contradictory challenges and in taking advantage of new opportunities. In i2connect we are creating a support network and a networking culture among advisors facilitating innovation processes in European agriculture and forestry

i2connect - Home

i2connect project team is working to fuel the competencies of advisors and their organisations to engage and support farmers and foresters in interactive innovation processes. Innovation is a key factor in continual adaptation to the various and sometimes contradictory challenges and in taking advantage of new opportunities.

I2CONNECT

i2connect
INTERACTIVE INNOVATION

Cover crop enthusiastic group

We are an active and enthusiastic Operational Group working on cover crops in Northern Italy (<https://www.covercrop.it>), with four farmers, a farmers association and a University. We have built two prototypes (one to carry out cover crop planting together with other field operations, e.g. slurry distribution; another one for cover crop mechanical termination). We are also studying various winter and summer cover crops in rotation with maize and wheat.

We look for contacts with other groups in Europe, operating on conservation agriculture and cover crops, to exchange ideas and practices. We have a small budget to travel, and would like to visit a group in Europe when the restrictions will be lifted. For contacts: Luca Bechini, luca.bechini@unimi.it



IRET-CNR (Research Institute on Terrestrial Ecosystems of the Italian National Research Council)

We are a group of researchers working complementary. We have labs to perform a large number of analytical determinations on various matrices (soil, substrate and biomass) to study the chemical, biochemical, molecular, biotechnological, mineralogical and pedological aspects of the soil-organisms-atmosphere system. Regarding soil, we can also perform analysis to understand physical protection of organic carbon in soil (soil C sequestration). Finally, we have started working on (micro)plastics detection in soil/water and related biological issues.

P.S. We have EU project on C fluxes [ICOS] and on use of microbial consortia in agriculture [an PRIMA EU project recently founded]. We are interest in joining or building consortia for Horizon Europe calls.

Feel free to contact us!

Sara Di Lonardo (sara.dilonardo@cnr.it; in particular, I work mainly on compost, biochar, and byproducts to be use as amendment/fertilizer/improver or peat substitute in horticulture sector in circular economy prospective, on microplastic detection, and on LCA).

Part of our labs here:

https://www.iret.cnr.it/images/laboratori_speciali/dinamiche_suolo_en.pdf

https://www.iret.cnr.it/images/infrastrutture/plasma_freddo_en.pdf

Farmer (organic olive tree for olive oil production), researcher and business developer in South Spain with projects in other countries and different crops would love to be part on any initiative regarding soil regeneration, biodiversity enhancement, mixed and alternative harvesting, ...targeting efficiency, sustainability and new farming generation: sonsoles@alberizas.com

European Carbon Farmers - developing carbon payments mechanisms for farmers

European Carbon Farmers is on the mission of putting farmers at the centre of climate change mitigation and adaptation efforts in a profitable way.

Learn more about us here: <https://bit.ly/3a9YkPi>

European Carbon Farmers | Main Page

European Carbon Farmers is introducing in Poland agricultural carbon payment scheme for additional greenhouse gas emission reductions. Together with us, you can diversify the income of your farm, while simultaneously entering the avantgarde of the European farming community ready for the agricultural emissions reduction regulations, which are entering into force soon.

EUROPEANCARBONFARMERS



Spanish cooperatives are trying to mobilize livestock residues treated with biodigestion and composting towards the fertilizers market and to monitor the CO2 sequestration for future payments through CAP or CO2 certificates market sagarna@agroalimentarias.coop – ANONYMOUS

CARBON FARMING: We are planning to develop projects on CONSERVATION AGRICULTURE and permanent grasslands related SOC sequestration capacity evaluation, going in the direction of building a locally scaled ACCOUNTING SCHEME for C seq (identification of the best fitting models for accounting, etc...), in order to develop Tier3-level indicators for accounting carbon credits. So, we would be interested in exchanging with your experience: how did you implemented the CC payments at a national scale.. Open for an exchange! ERSAF contact: gemma.chiaffarelli@ersaf.lombardia.it – ANONYMOUS

Definitions of soil quality related to soil type and climate

If farmers will improve soil quality, we need defined parameters. Is there an on-going/new project about this issue, I would like to join.

BR Annette avv@seges.dk

New projects with regenerative farming?

I would like to participate in EU-project about Reg. farming and effects to C-sequestration and soil quality.

BR Annette: avv@seges.dk

interested too Zoltán Hajdu soltub@soltub.hu – ANONYMOUS

Hello, I am interesting in meeting and collaborate migote1@hotmail.com – ANONYMOUS

Spanish cooperatives are trying to mobilize livestock residues treated with biodigestion and composting towards the fertilizers market and to monitor the CO2 sequestration for future payments through CAP or CO2 certificates market sagarna@agroalimentarias.coop – ANONYMOUS

we are monitoring the effects on soil biodiversity and C sequestration ability in cow farms shifting towards regenerative management in the Balearic islands (Spain). We are also expanding our cooperation with farmers to the Peninsula pilar.andres@creaf.uab.es – ANONYMOUS

interested to, Vesna from Slovenia, vesna.cucek@ce.kgzs.si – ANONYMOUS

EJP SOIL has a call on agroecological - regenerative agric systems for multifunctional soils. Project is in development and they will search for farmers with whom to collaborate – ANONYMOUS

4RETURNS: Regeneration SOil degraded.

Regeneration of almond soils

<https://4retornos.es/>

<https://www.alvelal.net/>

migote1@hotmail.com



Fact sheets for soil diagnosis/simple tests

link:

https://sp.landbrugsinfo.dk/Afrapportering/innovation/2020/Sider/pm_20_4580_Faktaark_nemme_metoder_tjekke_jorden_s_sundhed.pdf?download=true

Incl. videos. You are welcome to get back:

BR Annette: avv@seges.dk

SP.LANDBRUGSINFO.DK

Soil quality method

I am looking for a method, not too expensive, for the application in the practice. Validated for one, or better several, European countries. Similar to the soil health test of the Cornell

University (<https://soilhealth.cals.cornell.edu/>). The price for the basic test is 70 US\$, the standard test is 110 US\$.
vincent.michel@agroscope.admin.ch

thanks for the link to Cornell publication – ANONYMOUS

Thank you for the link to the Cornell method, very interesting.
Luca Bechini luca.bechini@unimi.it – LUCABECHINI

I do recommend the VESS (visual observation of soil structure).
Demonstrations on Youtube and docs on internet – ANONYMOUS

Understanding microplastics inputs into soil, accumulation, and translocation into surface waters on scales relevant for mitigation strategies at the nexus of soil and water protection. Method: at the farm and river catchment scale - combining sample analysis and modelling approaches

elke.brande@thuenen.de

Hi Elke. We are working on this topic too! Sara Di Lonardo
sara.dilonardo@cnr.it (IRET-CNR, Italy) – ANONYMOUS

dear elke, are also working on microplastics, in particular on their effect on soil biodiversity, nutrient cycling and plant physiology.
tanja.mimmo@unibz.it – ANONYMOUS

Farmer led Climate Smart Farming in Ireland

EIP Innovation funds seven farmers to work out their Net Carbon Footprint of their farm businesses

<https://www.agriland.co.uk/farming-news/ni-farmers-team-up-to-launch-innovative-carbon-project/>

If it is not only for Ireland, I would be happy to be part. I have an olive tree farm in South Spain. sonsoles@alberizas.com
– ANONYMOUS

The benefits of Multispecies Swards on soils and animals

The Heartland Project is a Marie Curie funded project, carried out at the Devenish Lands at Dowth in partnership with WUR and UCD. Five PhD students work on this Living Lab measuring the benefit of four different sward types on soils, beef animals and sheep

<https://www.heartlandproject.eu/heartland>

The Global Network of Lighthouse Farms

For the last three years our farm has been delighted to be a member of the Global Network of Lighthouse farms. Please see link below

<https://www.lighthousefarmnetwork.com/lighthouse-farms/lands-at-dowth>



interested Zoltán Hajdu soltub@soltub.hu – ANONYMOUS

Operational Groups and more project

We are a farmer organization settle in Italy, we have managed several projects on spreading innovation among italian farmers. Here are a few OG that we have carried out:

-<https://fertibio.ciatoscana.eu/>

-<https://campiconnessi.ciatoscana.eu/>

-<https://geoevo.ciatoscana.eu/>

We are interested in further collaboration at any level national and european.

Here are my contacts: c.righini@cia.it

interested Zoltán Hajdu soltub@soltub.hu – ANONYMOUS

We are at IRET-CNR (Sesto Fiorentino, Italy), interested to collaborate on agriculture innovation. We can provide lab tools to perform a large number of analytical determinations on various matrices (soil, substrate, and biomass) to study the chemical, biochemical, molecular, biotechnological, mineralogical and pedological aspects of the soil-organisms-atmosphere system. We can also perform analysis to understand physical protection of organic carbon in soil (soil C sequestration). Sara Di Lonardo, IRET-CNR, sara.dilonardo@cnr.it

https://www.iret.cnr.it/images/laboratori_speciali/dinamiche_suolo_en.pdf

https://www.iret.cnr.it/images/infrastrutture/plasma_freddo_en.pdf – ANONYMOUS

We would be interested in discussing cooperation as well -
Mateusz Ciasnocha. – ANONYMOUS

Maria Speranza (maria.speranza@unibo.it) and the LIFE AGROWETLANDS II project (www.lifeagrowetlands2.eu) are interested in your experience, in order to spread innovation among farmers – ANONYMOUS

At the soil ecology lab of the CREAM (<http://www.cream.cat/>), we are cooperating with several groups of Spanish farmers shifting from conventional towards sustainable management. We monitor the effects of their practices on soil biodiversity, functional diversity, soil C sequestration and soil functions. We also help to include them into wider farmer networks of to facilitate knowledge exchange of successful experiences. ... and we struggle to raise funds to support the (up to now) still costly analyses. We will be happy to find a way to cooperate with your operational groups. pilar.andres@creaf.uab.es – ANONYMOUS

Soil adaptation lab

Complete functional biodiversity analyses including carbon stocks and performance, resilience, and much more!

Please contact us for more information:

p.andres@creaf.uab.cat

e.doblas@creaf.uab.cat

CREAF

Her research is focused on soil ecology and biodiversity. From a basic research approach, she studies the biodiversity and environmental functions of the soil food webs. Using an applied approach, she is looking for biological indicators of soil quality and also works in soil restoration.



CREAF

Partnering in Horizont Europe and LIFE project proposals in nutrient management, carbon farming, GHG emission Zoltán Hajdu soltub@soltub.hu

Fertilizer regulation impact on soil health

We are looking for partners interested in the national level application of the new fertilizers regulation 1069/2019 EC Zoltán Hajdu soltub@soltub.hu

Interesting topic, although I don't know the details about 1069/2019 EC. Is there a relation to biostimulants?

– ANONYMOUS

Collaboration in Horizon Europe (HE) call

I plan to collaborate in the HE call with research focus on agroforestry, intercropping, protein crops and its effects on soil functions

we are interested in Horizont Europe Zoltán Hajdu soltub@soltub.hu – ANONYMOUS

*We are interested to collaborate on these topics. We can provide lab tools and soil and biomass analysis also to understand physical protection of organic carbon in soil (soil C sequestration). Sara Di Lonardo, IRET-CNR, sara.dilonardo@cnr.it
https://www.iret.cnr.it/images/laboratori_speciali/dinamiche_suolo_en.pdf
https://www.iret.cnr.it/images/infrastrutture/plasma_freddo_en.pdf* – ANONYMOUS

Also we are interested to collaborate on these topics. <https://www.arei.lv> (livija.zarina@arei.lv) – ANONYMOUS

Incentivising farmers not only to do soil sampling, but also to make analysis available, e.g. for benchmarking at regional level. How could such a tool look like and who would be interested to work on that topic - a bit in line with citizen science, but here it would be farmers' science.

tania.runge@thuener.de

Also interested! – MAGNERS FARM

SoilCare interactive mapping tool

We are developing a mapping tool that identifies the best possible crop and land-use combinations for each climate and socio-economic system in Europe. The tool combines a land use model with a biophysical one. Users can also simulate the effects of policies. For each soil-improving cropping system we are developing maps showing where it is suitable and relevant.

<https://soilcare-project.eu/>

jmills@glos.ac.uk

We are looking at collaborative and/or result-based contract solutions for carbon sequestration in CONSOLE project and would like to have further exchanges on that topic - maybe organising a webinar next year?!

tania.runge@thuener.de

There will be a project within EJP SOIL on fair and functional incentive systems for soil ecosystem services including SOC sequestration. We could organise a webinar end of 2021 on that

– ANONYMOUS

Tool for improved fertiliser efficiency

We have developed a tool for **decisions on variable rate nitrogen application**, to achieve **improved fertiliser efficiency** and **reduced environmental losses**. The tool is currently applied in an EIP-AGRI Operational Group in Italy

(<https://www.consensi.bio/index.html>). We are interested in further developing the tool. Please contact us if interested!

luca.bechini@unimi.it

adrian.kinner-smith@severnriverstrust.com

I am in the process of developing a program with an agriculture college that is a focus Hub for Dairy farms in the Region. They provide data on the pasture growth rates, rotation lengths on a paddock graze system, in-calf rates for a Autumn block calving system. I am currently sourcing funding to extend on this data in measuring the whole farm soil Carbon %, tonnes of carbon per Ha, pH, total nutrient load of the farm soil bulk density, organic

matter nitrogen response rate and cation exchange capacity. The whole idea is to measure how many cubic metres of rainfalls per Ha, what the water holding capacity is for % carbon found, how much water is available to the plant in the root zone, what deep rooted plants can be introduced to increase the available water for the plant. I would also like to measure how much water is taken up through evapotranspiration to grow 1kg/DM per Ha. If I can secure funding I would like to share the results with EIP-Agri and would like to obtain ideas and further information from the Seminar group of participants

GreenSupplyChain DIH (<https://www.greensupplychain.gr/>) is a Digital Innovation Hub aiming at supporting the formation of a "green supply chain" for a **sustainable, fair, healthy and environmental-friendly** food system. GreenSupplyChain is establishing an agroecology Living Lab in Greece and has access to a network of Greek farms applying agroecology practices, focusing also on improving soil health through the use of organic compost (using waste from the farm), cover crops etc. Feel free to contact us at info@greensupplychain.gr

Very interested! patriciamora@innogestiona.es – ANONYMOUS

How can we manage silvopasture & mixed farming systems aimed at soil health? How can we fertilize arable land (for food and fodder, not for grassland or pasture) in a farm circular economy for pasture-based models? Are crop rotation, cover crops and catch crops enough for this purpose?

jacopogoracci@hotmail.com

LIFE GAIA Sense - Make use of existing resources

There are various projects that work on soil health from various aspects, with LIFE GAIA Sense being one of them (www.lifegaiasense.eu).

It would be useful to find a way to engage partners from such projects & other initiatives so that all relevant activities are recorded and hopefully applied in other contexts as well (regions, etc.)

Elena Maestri

Our main Regional project on agroecological concepts - biochar + microorganisms
[FERTILIAS](#)

Elena Maestri - Univ. Parma Two EU projects dealing with agroecological approaches

sustainolive.eu
simbaproject.eu

Best4Soil Network

This European network offers the possibility to connect persons working on the topic of soil health. We have actually more than 3500 persons registered and can send them information. For example if you are looking for practitioners, advisers or researchers, we can send them your request.

info@best4soil.eu
www.best4soil.eu



Hi, I'd be interested in talking with you. Are you available? I'm Margot Roux – ANONYMOUS

Yes, I am Vincent Michel, one of the partners of Best4Soil. You can contact me here or then using my email address vincent.michel@agroscope.admin.ch – ANONYMOUS

Soil contamination by pesticides

Soil contamination by pesticides and its extent is unknown at EU level.

Even organochlorines still detected. We have data at national level (Greece).

If you would like to discuss this issue please contact: e.karassali@bpi.gr

LIFE AGROWETLANDS II - LIFE15 ENV/IT/000423 - www.lifeagrowetlands2.eu

Precision agriculture represents a crucial instrument for the sustainability of agriculture in the coming years. The Project LIFE AGROWETLANDS II developed a DSS that is broadly applicable to support irrigation management on saline soils. You can download the Layman's Report here below. maria.speranza@unibo.it mauro.defeudis2@unibo.it



With the contribution of LIFE
Programme 2014-2020 of the EU
LIFE AGROWETLANDS II
LIFE15 ENV/IT/000423



LIFE AGROWETLANDS II

II Progetto LIFE AGROWETLANDS II in sintesi

LIFE AGROWETLANDS II Project in brief

LAYMAN'S REPORT

Layman_Agrowetlands_web

PDF document

PADLET DRIVE

I would like to have information about portable tool to measure SOC levels in soil and other soil indicators

As a farmer I would also like this - would be great to have something more accurate than just my eyes! – ANONYMOUS

I ask for a new network of our soil protection associations for at least two reasons: to spread agroecological ideas (no-tillage, agroforestry, cover crops and soil diagnosis tools for farmers) and to ask for financial incentives for on-farm C-sequestration. Francesco da Schio (fr.daschio@gmail.com)

<http://agremso3il.eu/>

LIFE AgRemSO3il:

Agrochemical remediation of farm soils by combining solarization and ozonation techniques

Pesticide residues in farm soils are a "silent" problem. Is anybody worried about that?

fulgencio.contreras@carm.es

Yes I am. As we still find residues of pesticides that are banned from the market already for years, such as DDT h.brinks@delphy.nl

– ANONYMOUS

Unfortunately I will not be able to join tomorrow. I met some very interesting people, and my group is open to collaboration on many of the topics discussed today, just contact me!

We might need some help to find the right frame (on european level) and funding for that idea. I would be happy to get in contact with someone who is able to provide more information. Please contact Christine Bajohr (info@kuhproklima.de)

Hallo Christine! Ich arbeite für eine Innovationsagentur. Ich fand deinen Vortrag zum eurem EIP Projekt sehr spannend. Wir haben ein EIP Projekt im Bereich Silagequalität durchgeführt. Aber auch im Bereich Bodenschutz sind wir aktiv und würden das Thema gern in einem neuen Projekt gemeinsam mit Landwirten angehen.

– ANONYMOUS

Wir haben auch Erfahrungen in der Planung und Beantragung verschiedener EU Fördertöpfe. Mein Kontakt ist folgender: marit.chadid@agrathaer.de – ANONYMOUS

We have an idea how to get more people (especially farmers) involved to follow a more regenerative pathway. A few weeks ago we started working on the concept.

I would be able to help sonsoles@alberizas.com – ANONYMOUS

We are a local organization in France working with farmers on conservation agriculture and agroforestry. We are interested for collaboration. amandine.fauray@adaf26.org – ANONYMOUS

It might be interesting to link such an initiative to value chain partners, can help t develop a business model for farmers h.brinks@delphy.nl – ANONYMOUS

Do not forget that soil , including soil health is a gift for us, as the water and air. We are not just standing on it, but living from it.

Bravo! Vesna – ANONYMOUS

I HAVE A QUESTION TO ASK.

I would like to join projects with regenerative farming and CA. BR Annette: avv@seges.dk – ANONYMOUS

presently not in a specific project but interested in Conseravtiona griculture and regenerative (not organic at the moment) farming. anna.trette@gmail.com – ANONYMOUS

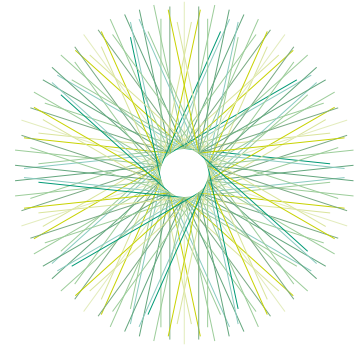
I HAVE SOMETHING TO OFFER.

The key question of future agriculture is the question: How do we increase and stabilize the carbon content and thus the vitality of our soils? peter.kulle@mfpa.de – ANONYMOUS

Maria Speranza Bologna, Italy (maria.speranza@unibo.it) - The LIFE AGROWETLANDS II Project - LIFE15 ENV/IT/000423 (www.lifeagrowetlands2.eu) worked on water and soil salinity management in salinized agrowetlands areas, close to the North Adriatic coast (Ravenna, Italy). Experiments and monitoring activities carried out during the project, showed that: 1) Irrigation in summer months exerts a significant salinity mitigation effect for the upper layers of the groundwater and, consequently, also for the soil. 2) Irrigation is not practiced in the dry winter periods, in support of the natural winter leaching. In order to counteract the salinization of the soils, winter irrigation could be effective on the clayey soils of this area, even if of much lower intensity than summer irrigation. – ANONYMOUS

Maria Speranza, Bologna - Italy (maria.speranza@unibo.it). - Results obtained by LIFE AGROWETLANDS II Project on agricultural soil salinity mitigation, highlighted the importance of the period when irrigation is carried out and, in particular, the importance of early irrigation for summer crops, even in May, when the young plant tolerates environmental stress less easily. The project also highlighted that, for the purpose of more effective removal of salts from the soil in areas subject to salinization, it would be useful to operate modest winter irrigations that are added to the leaching action due to rainfall of the period. These results have policy implications on the regional disciplinary for the production of corn and other summer crops, as well as on the regulations and the organization of the activities of the "Consorzi di Bonifica". In Emilia-Romagna region (Italy), for example, irrigation interventions usually start from the second half of June, but mitigation and management of soil salinization in coastal agricultural areas require rules "ad hoc", different from the usual ones. – ANONYMOUS





eip-agri
AGRICULTURE & INNOVATION



The European Innovation Partnership 'Agricultural Productivity and Sustainability' (EIP-AGRI) is one of five EIPs launched by the European Commission in a bid to promote rapid modernisation by stepping up innovation efforts.

The **EIP-AGRI** aims to catalyse the innovation process in the **agricultural and forestry sectors** by bringing **research and practice closer together** – in research and innovation projects as well as through the EIP-AGRI network.

EIPs aim to streamline, simplify and better coordinate existing instruments and initiatives and complement them with actions where necessary. Two specific funding sources are particularly important for the EIP-AGRI:

- the EU Research and Innovation framework, Horizon 2020 and Horizon Europe,
- the EU Rural Development Policy under the CAP.



funded by  European Commission



Join the EIP-AGRI network &
register via www.eip-agri.eu

servicepoint@eip-agri.eu | +32 2 543 73 48 | Koning Albert II laan 15 | Conscience Building | 1210 Brussels | Belgium