



European
Commission

AGRI RESEARCH FACTSHEET SOILS

Why do research and innovation on soils matter?

Research is crucial to better understand, monitor and measure the specific effects of agricultural and forestry activities on soils and their various productive and ecosystems functions. Additional knowledge is needed on long-term processes of soil formation, on soil fertility and other above-mentioned functions and how to improve their delivery by optimising soil biological, chemical and physical properties. Designing ways to increase soil carbon content, enhance soil biodiversity and reduce soil erosion is highly crucial for food security. New avenues for soil and crop management are emerging from an increased understanding of the

‘soil-food web’, the complex interactions between plants and soils which support water and nutrient uptake by plants or increase resistance against pests and diseases. Knowledge and tools developed through research and innovation can serve to further develop soil enhancing production systems and enhance the role of livestock in soil management. Research efforts serve to enhance the function of soils as carbon and nitrogen sinks, thereby supporting the role of agriculture and forestry in mitigation of greenhouse gas emissions, combating desertification and land degradation.

Soil research and innovation under Horizon 2020 challenge 2 (SC2)



27

Projects or expected grants



199 M€

EU contribution 2014-2020



320

Participations in selected projects

Key themes

Soil functions – soil water resources
–assessment tools – soil-improving cropping systems – cooperation.

JUNE 2019 UPDATE

Agriculture
and Rural
Development

Soil innovation under EIP-AGRI activities

Focus groups

Moving from source to sink in arable farming
 Soil organic matter content in Mediterranean regions
 Nutrient recycling
 Integrated pest management for soil-borne diseases
 Soil salinisation
 Protecting agricultural soils from contamination

bit.ly/2liN3f5
bit.ly/2GkClZ7
bit.ly/2FRWz8W
bit.ly/2IfNoiK
bit.ly/2QFEtNb
bit.ly/2WeXw25

Operational groups (OG) examples

GASCOGN'INNOV will provide winegrowers with a soil diagnosis tool to improve their cropping systems through better soil management (2016-2021)

bit.ly/2HSq2JF
bit.ly/2uuYjTW

Horizon 2020 SC2 collaborative projects - Soils

MA = Multi-actor

iSQAPER ^{MA}

www.isqaper-project.eu

Total cost: 6.9 M€
 EC contribution: 5.4 M€
 Coordinator: Wageningen University
 May 2015 – Apr. 2020

iSQAPER deals with the interplay between agricultural land management and soil quality and functions. It will develop an interactive 'soil quality assessment tool' for agricultural land users that integrates newly derived process understanding and accounts for the impact of agricultural land use and management on soil properties and functions, and related ecosystem services. For this purpose, over 30 long-term experimental field trials in the EU and China will be analysed to derive regulating principles for integration in the tool.

LANDMARK ^{MA}

landmark2020.eu

Total cost: 5.3 M€
 EC contribution: 5 M€
 Coordinator: Wageningen University
 May 2015 – Oct. 2019

LANDMARK deals with the sustainable management of land and soil in Europe. It builds on the concept that soils are a finite resource that provides a range of ecosystem services known as "soil functions". Functions relating to agriculture include: primary productivity, water regulation & purification, carbon-sequestration and regulation, habitat for biodiversity and nutrient provision & cycling.

SOILCARE ^{MA}

www.soilcare-project.eu

Total cost: 7.6 M€
 EC contribution: 7 M€
 Coordinator: Wageningen University
 Mar. 2016 – Feb. 2021

SOILCARE aims to identify and evaluate promising soil-improving cropping systems and agronomic techniques increasing profitability and sustainability across scales in Europe. It will develop an interactive tool for end-users to identify and prioritize suitable soil-improving cropping systems anywhere in Europe.

DIVERFARMING ^{MA}

www.diverfarming.eu

Total cost: 10.5 M€
 EC contribution: 10 M€
 Coordinator: U. Politecnica de Cartagena
 May 2017 – Apr. 2022

With the long-term objective to increase diversification and biodiversity in Europe and to foster sustainable development of the bioeconomy, Diverfarming will develop and deploy innovative farming and agribusiness strategies. Diverfarming will increase the long-term resilience, sustainability and economic revenues of agriculture across the EU by assessing the real benefits and minimising the limitations, barriers and drawbacks of diversified cropping systems under low-input agronomic practices, and by adapting and optimising the organisation of downstream value chains.

<p>DiverIMPACTS ^{MA} www.diverimpacts.net Total cost: 11.2 M€ EC contribution: 10 M€ Coordinator: INRA Jun. 2017 – May 2022</p>	<p>DiverIMPACTS seeks to achieve the full potential of diversification of cropping systems for improved productivity, delivery of ecosystem services and resource-efficient and sustainable value chains. It will assess the performance of crop diversification through rotation, intercropping and multiple cropping. It will also provide rural actors with key enablers and innovations that will help removing existing barriers and ensure the uptake of crop diversification benefits at farm, value chain and territorial levels.</p>
<p>FAIRWAY ^{MA} www.fairway-project.eu Total cost: 5 M€ EC contribution: 5 M€ Coordinator: Wageningen Research Jun. 2017 – May 2021</p>	<p>The objective of FAIRWAY is to review policy, governance and farm water management approaches to protect drinking water resources in the EU and to identify and further develop innovative measures and governance approaches which will simultaneously increase the sustainability of agriculture.</p>
<p>WATERPROTECT ^{MA} water-protect.eu Total cost: 5 M€ EC contribution: 5 M€ Coordinator: Vlaamse Instelling voor Technologisch Onderzoek Jun. 2017 – May 2020</p>	<p>WATERPROTECT aims to contribute to effective uptake and realisation of management practices and mitigation measures to protect drinking water resources. It will create an integrative multi-actor participatory framework including innovative instruments that enable actors to monitor, finance and effectively implement these practices and measures.</p>
<p>CIRCASA www.circasa-project.eu Total cost: 3,9 M€ EC contribution: 2,5 M€ Coordinator: INRA Nov. 2017 – Oct. 2020</p>	<p>CIRCASA aims to strengthen the coordination and synergies in European and global research on Soil Organic Carbon (SOC) sequestration in agricultural soils. Its activities will lead to an improved understanding and scientific basis on agricultural soil carbon sequestration and its potential for climate change mitigation and adaptation, helping to target ambitious practices required to preserve and enhance SOC. CIRCASA will favour a more structured approach by preparing an International Research Consortium (IRC). It will deliver significant outcomes for the implementation of the UN Sustainable Development Goals (SDGs) and of the Paris agreement (COP21, 4 per 1000 voluntary initiative) of the UN Framework Convention on Climate Change (UNFCCC).</p>
<p>SHui www.shui-eu.org Total cost: 5.5 M€ EC contribution: 4.8 M€ Coordinator: Agencia estatal consejo superior de investigaciones científicas Sep. 2018 – Aug. 2022</p>	<p>SHui is conceived as a network integrating long-term experiments of its 19 academic and SME partners across different environmental conditions and cropping systems in the EU and China. It provides a platform for research on soil-water resources management under water scarce conditions, to understand better the linkages between agricultural soil hydrology and sustainability and for a systematic assessment of adaptation and mitigation methods.</p>
<p>BEST4SOIL ^{MA} bit.ly/2ww4G7A Total cost: 2 M€ EC contribution: 2 M€ Coordinator: DELPHY BV Oct. 2018 – Sep. 2022</p>	<p>The BEST4SOIL project will build a community of practice network across Europe by inter-connecting growers, advisers, educators and researchers. Through this network, knowledge ready for practice on 4 best practices for the control of soil borne diseases (compost/organic amendments; green manures/cover crops; anaerobic soil disinfection; bio-solarisation) will be promoted. The information will be freely accessible and highly comprehensible to guarantee a smooth knowledge transfer from research to practice.</p>

EXCALIBUR^{MA}bit.ly/2JUrz3r

Total cost: 7 M€

EC contribution: 7 M€

Coordinator: CREA

June 2019 – May 2024

Excalibur plans to deepen the knowledge on soil biodiversity dynamics and its synergistic effects with prebiotic and probiotic approaches in horticulture. New multifunctional soil microbial inoculants and bio-effectors will be tested on three model crops (e.g. tomato, apple, strawberry) to enhance the positive roles of native biodiversity across Europe. Moreover, the project will develop a comprehensive strategy of soil management including models and technical tools improving the effectiveness of biocontrol and biofertilization practices in agriculture.

SIEUSOILbit.ly/2Z4zsjX

Total cost: 6.8 M€

EC contribution: 5 M€

Coordinator: Aristotelio

Panepistimio Thessalonikis

June 2019 – May 2022

Sino-EU Soil Observatory for intelligent Land Use Management (SIEUSOIL), is designing and testing a shared China-EU Web Observatory platform that will provide Open Linked Data to monitor status and threats of soil and assist in decision making for sustainable support of agro-ecosystem functions.

SoildiverAgro^{MA}bit.ly/311MAIt

Total cost: 7 M€

EC contribution: 7 M€

Coordinator: University of

Vigo

June 2019 – May 2024

SoildiverAgro aims to enhance the adoption of new management practices and cropping systems that enhance soil genetic and functional biodiversity to reduce the use of external inputs while increasing crop production and quality, the delivery of ecosystem services and the EU agricultural stability and resilience. The project will analyse farming systems and test innovative methods and practices in various pedoclimatic regions.

Many projects on **integrated ecological approaches** or **public goods** also address soil functionalities.



Interesting activities under other Horizon 2020 sections

Many other parts of Horizon 2020 include interesting activities on soil.

Marie- Skłodowska Curie Actions support individual fellowships, innovative training networks and Research and innovation staff exchange. Examples include:

- **PROTINUS**, which works on new standard in imaging, analysing, modelling and predicting the interactions between soil structure and soil functions (EC contribution: 1.45 M€, May 2015 - Dec. 2018, bit.ly/2pPM8Ly).
- **GLMODAT**, which works on new integrated modelling approaches for nutrient and phosphorus runoff (EC contribution: 0.15 M€, Jan. 2019 - Aug. 2021, bit.ly/2GoQYGT)
- **the European research council** (bit.ly/2pSCPuC);
- **the SME instrument** (bit.ly/2uyJY8H);
- Horizon 2020's **Societal challenge 5** on climate action and environment (bit.ly/2ldfSd1).

In the pipeline – 6 projects to start under 2019 H2020 SC2 calls (75 M€)

European Joint Programme on agricultural soil management	(1 project, 40 M€ + 40 M€ Member State co-funding)
Sustainable Intensification in Africa:	
Scope A: African Farming Systems, sustainable intensification pathways ^{MA}	(4 projects, 30 M€)
Scope B: Soil system for Africa	(1 project, 5 M€)

Funding opportunities - Open H2020 SC2 calls for 2020 (48 M€)

SFS-01-2020 - Biodiversity in action: across farmland and the value chain	(3 projects, 18 M€)
SFS-21-2020 - Emerging challenges for soil management:	
A. (2020): Soil biodiversity assessment	(1 project, 7 M€)
B. (2020): Use of plastic in agriculture ^{MA}	(1 project, 7 M€)
LC-SFS-22-2020 - Forest soils Research and Innovation Action	(1 project, 10 M€)
SFS-40-2020 - Healthy soils for healthy food production ^{MA}	(1 project, 5 M€)
FNR-04-2020 - Towards a European research and innovation roadmap on soils and land management ^{MA}	(1 project, 1 M€)

Soils: a major international issue

Soils are object of increased political attention at European Union and global levels. The United Nations declared 2015 the International Year of Soils. By the end of the year, the scientific community proclaimed that 2015-2024 would be the International Decade of Soils. This decade will serve to continue the efforts made during the International Year of Soils.

A number of important initiatives on soils are linking science with policy at global level. The **Global Soil Partnership**¹ led by FAO and its regional nodes is one of them. Soils are also important within the Agenda 2030 and the **Sustainable Development Goals**. During the Paris COP 21 meeting on climate change, France launched the international “4% Initiative: soils for food security and climate”.

¹ <http://www.fao.org/global-soil-partnership/en/>

² <https://esdac.jrc.ec.europa.eu/projects/lucas>

The European Commission provides funding for research that should contribute to these international initiatives. At the same time, the European Commission is trying to increase the evidence base for soil management with dedicated research initiatives like the European Joint Programme on agricultural soil management or the CIRCASA project which should help move towards the creation of an International Research Consortium.



The European Commission also supports developments of the LUCAS survey ([bit.ly/314rzNn](https://esdac.jrc.ec.europa.eu/projects/lucas)) and its soil sampling part². For the first time, the LUCAS survey 2018 will include soil biodiversity analysis, bulk density, visual assessment of erosion and measurement of thickness of organic horizon in organic-rich soil.





