

SOIL

SOIL is a relevant topic of research activities at DISTAL. Specific and complementary skills of DISTAL experts working on SOIL topic **aim at preventing and enhancing agricultural and forest soils, as well as the sustainability of SOIL resource within the agro-environmental product supply chain**



OUR RESEARCH PRIORITIES

- Technological innovation of **products** for the improvement of **soil fertility** and **plant nutrition**
- **Field reuse and valorisation** of industrial **by-products and wastes** (circular economy)
- **Land suitability** for the improvement of the agri-food supply chains
- **Integrated monitoring approaches** to assess characteristics and functions of soil-plant-atmosphere system
- **Soil quality, resilience and health**, and their effects on food, and on human health
- Development of new agricultural practices and technologies **to reduce the decrease and degradation of agricultural and forest soils**
- **Cost and benefit** analysis of **ecosystem services** and **goods**
- **Soil protection** from pollutants and development of **sustainable remediation** techniques
- **Agroecological approaches** to promote soil biodiversity, quality, resilience and health
- New tools to foster the **provision of ecosystem services**
- **Carbon footprint** reduction (carbon sink, soil as renewable energy resource for rural facilities)



OUR EXPERTISE

- Bio-functional evaluation of soil and soil biological fertility through the study of physical, chemical, biochemical and biological soil properties
- **Dynamic of organic matter, nutrients, potential toxic elements, pollutants and moisture in soils**
- **Pedological survey** and **GIS representation, spatial** and geostatistic analysis, **geophysical** methods, soil digital mapping
- **Root-soil interactions**, nutrient uptake, tissue composition, and plant response mechanisms to (a)biotic stress in the agroecosystem
- Impact of agronomic techniques, chemical compounds and pollutants on **biodiversity** and **ecosystem services** of the soil **microbiota**
- Set up of methods for biochemical, agronomic and environmental evaluation of **fertilizers**
- Studies of **C and N cycles** in agricultural and forest soils
- **Functional biodiversity** of **Insects**, biological control and monitoring of the soil arthropodafauna
- **Microbiological survey** of plant product in relation to soil and crop management
- Economic evaluation of externalities and **costs-benefits** analysis of **ecosystem services** supply
- Land survey, multi-criteria analysis, representation and planning
- Design, management and dissemination of **agroecological strategies** in fruit woody systems
- Analysis and design of policies for the implementation of **ecosystem services**





SOIL@DISTAL IN NUMBERS



OUR MAIN PROJECTS

INTERNATIONAL

- GREEN4BLUE - GREENing the BLUE canals infrastructure of Reno basin to enhance ecosystems connectivity and services (LIFE18 2019-25)
- RM@Schools4.0 - EIT Raw Materials (2021-23)
- CONSOLE - CONTRACT Solutions for Effective and lasting delivery of agri-environmental-climate public goods by EU agriculture and forestry (H2020 2019-22)
- CRNS-GRS, Enhancing Agricultural Resilience and Water Security Using Cosmic Ray Neutron Sensor (2019-2024, founded by IAEA – FAO)
- MOSOM – Mapping Of Soil Organic Matter, Assessing and tracking changes in soil quality remotely (EIT FOOD, 2021-22)
- Sustainable fertilizer from beef slaughtering biogas digested sludge. Digested sludge upgrading and converting into a recognized fertilizer (EIT FOOD, 2021-22)
- PID2020-113900RB-I00: Multiplex Molecular Sensing and Dynamics Based on Plasmonic Effects Generated by Nanostructures. Ministerio de Ciencia e Innovación (Spain) (2021-23)

NATIONAL

- SWEET - "Impact of soil microorganisms on sunflower nectar yields" MIPAAF project (2022)

REGIONAL/AGREEMENT

- CASTAGNI PARLANTI – New technology for monitoring of carbon balance and health status of Chestnut grove for wood and fruit production (PSR Emilia Romagna 2019-22)
- TSECAAPPMO – Technological innovation and carbon sequestration for the management of state forest properties in the High Appennine of Modena (PSR Emilia Romagna 2019-22)
- AGRIFORESTER – Guidelines for the sustainable management, valorization of ecosystem services and soil carbon sequestration in the forests of Emilia Romagna region (PSR Emilia Romagna 2019-23)
- SuoBo – Silviculture and prevention of forest soils: carbon sequestration strategies (PSR Emilia-Romagna 2019-22)
- MERR – Rosa Romana supply chain. “Mela Rosa Romana” in Bologna Appennine: organization and valorization of quality supply chain in organic management (PSR Emilia-Romagna 2022-23)
- Determination of the volatile molecule profiles by GC/MS/SPME of urban sludges processed with Mild-wet-oxidation
- Fertilizing potentials of soil improvers and liming materials obtained from biodegradable by-products in fruit-growing, floriculture, cereal-growing and on soil fertility in the Emilia-Romagna Region (Herambiente s.p.a. 2019-22)
- Interaction of biodegradable and non-degradable plastics on soil fertility and functionality: comparison of mild-long term trials (Novamont spa)
- Study of potential of amendments and organic-based corrective agents obtained from biodegradable materials on extensive crops and soil fertility (HERAmbiente-Enomondo)
- Methodology for quali-quantitative assessment of chestnut wood and integrity of the historic rural landscape in Castel del Rio municipality (Cassa di Risparmio di Imola, 2022-23)
- Supporting soil and water management with geophysical methods and digital soil mapping (FINAPP srl, 2020-23)
- Fertilizing efficiency and main effects on soil of composted amendments in mild-term field trials (Consorzio Italiano Compostatori, 2022-24)

CONTACT US

Department of Agricultural and Food Sciences – DISTAL

Viale Fanin, 44 - 40127 Bologna (Italy)

distal.ricerca@unibo.it



www.distal.unibo.it