

## AGRICULTURE AND CLIMATE CHANGE

**“Agriculture and Climate Change” is a relevant research topic of DISTAL. It concerns the interaction between climate change, agricultural, forestry, livestock productions and services and the innovations for a resilient and mitigating agriculture. This topic includes mitigation, adaptation and modeling issues**

### Research aims



- Mitigation: promotion of new solutions reducing the impact of the productive processes on ecosystem services in a circular economy perspective
- Mitigation: promotion of agricultural and forestry techniques able to reduce CO<sub>2</sub> emissions and to sequester carbon
- Adaptation: evaluation of the effects of climate change on crop productions, cultural practices, soil functionality and degradation, insect diffusion and livestock health and welfare
- Adaptation: maintenance or improvement of qualitative characteristics of crop and livestock productions (resilient agriculture)
- Adaptation: design of buildings and systems suitable to assure an optimal indoor microclimate for crops, livestock productions and food processing
- Adaptation: study of the behavior of new, local and ancient genotypes suitable for the changed climatic conditions
- Modeling: study of past and current climate change on local and territorial scale, by environmental data and results of long-term field trials
- Modeling: improvement of models evaluating the effects of nitrogen on carbon and water balance, taking into account the interactions between CO<sub>2</sub> and climate change
- Modeling: studying the impact of climate change on farm productivity and income and on economic regional or national economic indicators

### Our Expertise

- Analysis of soil properties and functionality, of carbon emission from soils and carbon sequestration by soils
- Control of indigenous and exotic insects and effects of climate change on their community
- Analysis of plant physiological and productive responses to the changed climatic conditions and development of agronomic techniques optimizing the use of resources in crop productions
- Development of smart monitoring systems and integrated analysis models for environmental data
- Analysis of the genotype-environment relationships in plants and livestock species
- Development of systems for the urban cultivation (urban horticulture and green roofs)
- Dendro-ecological analysis and modeling of the response to climate change of forest growth and function
- Planning, design and recovery of farm, livestock and agroindustrial buildings, rural infrastructure and landscape as well as GIS multi-time and multilevel analyses of rural areas
- Analysis of agrometeorological and agroclimatological data
- Applied genetics and genomics for the development of selection and breeding programs for resilience in livestock and crop species





## Our main projects

### INTERNATIONAL

- GREAT LIFE: growing resilience agriculture – EU Life (2018-2022)
- SUSTAINOLIVE: Novel approaches to promote the SUSTAINability of OLIVE cultivation in the Mediterranean – PRIMA (2019-2022)
- AELCLIC: Adaptation of European Landscapes to Climate Change - Climate KIC pathfinder (2019)
- CliPS: Climate change and its effect on Pollination Services (2019)
- URBACLIM: urban agriculture – climate benefits compared with conventional food chains – Climate Kic (2017-2018)
- MARKTHEPIG: applied phenomics to identify biomarkers in pigs for new concepts in precision livestock farming - H2020 MSCA (2016-2018)
- SUSTURBANFOODS: integrated sustainability assessment of social and technological innovations towards urban food systems - H2020 MSCA (2016-2018)
- SMART ORCHARD e FRIENDLY FRUIT – Climate Kic (2018)
- Climate Change-R: Reduction of green house gases from agricultural systems of Emilia-Romagna - LIFE+ Environment Policy and Governance (2014-2016)
- MACSUR: Modelling European Agriculture with Climate Change for Food Security, JPI FACCE (2012-2015)
- EU CIRCE: climate change and impact research: the Mediterranean environment. Modeling the impact of climate change on Mediterranean forests - FP6 (2007-2011)

### NATIONAL

- PigPhenomics: Applied phenomics and genomics in pigs for the identification and use of new phenotypes in breeding plans – PRIN (2019-2022)
- Effects of climate change on the productivity and radiative forcing on Italian forests – PRIN (2013-2014)
- IC-FAR: evaluation of the uncertainty associated to the prediction of climate change on Italian herbaceous crops, by long-term observation and mathematical models, to support adaptation strategies – PRIN (2010-2013)

### REGIONAL

- Castani-co: the sequestration of carbon in chestnut orchard - PSR (2017-2020)
- SaveCO<sub>2</sub>: evaluation of carbon fluxes in agricultural land of Ferrara area and of Modena Apennines and sustainable strategies to favor carbon sequestration in soil organic matter - PSR (2017-2019)
- VINSACLIMA: evaluation of innovative strategies for the adaptability in vineyard and in wine cellar to the changed climatic conditions – PSR (2016-2019)
- GENBACCA: new genotypes tolerant to biotic and abiotic stress for a sustainable management of wine grape and industrial tomato – POR-FESR (2016-2018)

### Contact us

Department of Agricultural and Food Science, DISTAL  
Viale G. Fanin, 40-50  
40127, Bologna (Italy)

[distal.ricerca@unibo.it](mailto:distal.ricerca@unibo.it)  
[www.distal.unibo.it](http://www.distal.unibo.it)

