



SUSTAINABILITY SCIENCE DOCTORAL PROGRAMME

Lab Rotation – School of Agriculture; Instituto Superior de Agronomia (ISA-ULisboa)

LEAF

LEAF - Linking Landscape, Environment, Agriculture and Food Research Unit

LEAF is uniquely positioned to develop original research on topics covering the whole agro-food chain, interlinking micro-to-macro scales, from cells and microorganisms to food systems and landscapes. LEAF research contributes to develop knowledge and to promote effective solutions to respond to the need to increase food production and quality attentive to conservation and efficient use of natural resources, contributing for the sustainable development and national competitiveness rooted in territorial approaches. To meet these challenges, LEAF research bridges scientific fields of Agricultural Engineering, Natural Resources and Environment, Animal Science, Food Science, Landscape Architecture and Biology and is organized in three Research Groups: Resources Management & Landscape Architecture, Plant Science & Crop Production, and Food & Feed. At national level a transversal focus is given to “Vines and Wine” and “Olives and Olive Oil” and at the international level the “Tropical Agriculture and Food Value Chains” stands out. Global issues are also tackled in the “Blue and Green Infrastructures” thematic line.



CEF - Forest Research Centre

CEF develops research on issues dealing with forests, agro-forestry systems semi-natural areas, and forest-based industrial chains. The centre is organized in four research groups “ForEco: Forest ecology”, “ForProtect: Protection, Restoration & Services in Forests and Agroecosystems”, “ForChange: Forest ecosystem management under global change” and “ForTec: Forest products and biorefineries. CEF shares the EU Forest 2020 vision of forests and semi-natural areas as vital, productive and multifunctional ecosystems, contributing to sustainable development and human well-being, in a healthy environment. CEF is committed to an international perspective on research issues and fosters a diverse academic community. Most of the experimental research is located in Portugal, but it extends to the Mediterranean region and to tropical and sub-tropical regions and encompasses global approaches.

SESSION PLAN

***Rationale:** Vines and wine are an emblematic research and teaching topic at ISA. Sustainable development of a competitive and resilient viticultural sector stands as the most unifying cross-cutting thematic line of the LEAF research unit, gathering scientific competences of its three Research Groups research groups. To meet its goals, a wide-ranging infrastructure dedicated to this scientific area exists at ISA, including experimental vineyards and winery, specialized laboratories of chemistry, biology, microbiology, quantitative genetics, sensory oenological analysis, as well as support facilities for waste treatment and subproducts valorisation. This transversality and complementarity of this research area illustrates the diversity of the research developed at ISA and was selected to guide the Laboratory Rotation session in this school.*

Programme; Friday, 19 March 2021 (*draft; under construction*)

- 16h30 | LEAF and CEF research units in a nutshell: presentation of main goals and illustrative ongoing projects. *Isabel Sousa (LEAF) and José Calvão Borges (CEF)*
- Sustainable Vines and Wine research @ ISA
 - 17h00 | Grapevine breeding: autochthonous varieties (“castas”), quantification of genetic variability, yield and quality gains, and germplasm conservation. *Elsa Gonçalves and Antero Martins*
 - 17h40 | Arbuscular mycorrhizal symbiosis in abiotic stress tolerance and grape quality. *Amaia Nogales*
 - 18h00 | “Smart Viticulture” in the oldest vine under production in Lisbon, precision viticulture and the “Vinbot” robot. *Miguel Costa, Gonçalo Vitorino and Carlos Lopes*
 - 18h45 | Micro-vinification and vinification technologies and oenological impact. Valorisation of vine and wine by-products with a circular bio-economy perspective. *Sofia Catarino and Jorge Ricardo*
 - 19h10 | Sustainable cork oak “Montados” for sustainable cork stoppers. *Margarida Tomé*
 - 19h30 | Water Footprint Sustainability in vines and wineries. *Gonçalo Caleia Rodrigues*
- Wrap-up

Contact: *Luís Goulão*

Speakers' short bios



Isabel Sousa, PhD in Food Science from Nottingham University UK, associate professor with habilitation in Food Engineering at ISA/ULisboa. Head of the LEAF (Linking Landscape Environment Agriculture and Food) research centre. Pioneered the studies on Food Texture and Rheology in Portugal and set up the Food Rheology and Cereal Technology Labs to support research in these areas. Coordinator of the teaching areas in the Industry interface, her work is related with sustainability and efficiency, involved in projects with the Industry, by incorporating functional ingredients, from industry by-products and underexplored food sources, in staple foods, with strong impact on consumer's wellbeing. With more than 80 ISI publications and several book chapters in Applied Food Rheology and Functional Foods. Expert evaluator for: i) the Eurostar/Eureka Secretariat; ii) the Research Executive Agency of EU and iii) the Danish Agency for Science Technology and Innovation.



José G. Borges, Ph.D. in Forest Sciences (U. Minnesota), associate professor at the School of Agriculture (ISA), ULisboa and coordinator of its Forest Research Centre (CEF). Coordinator of IUFRO Unit 4.04.04 Sustainable forest management scheduling and of the Erasmus Mundus Joint Master Degree Mediterranean Forestry and Natural Resources Management. Over 25 years of research experience, acted as PI or as coordinator of the participation of ISA in several national and international projects. Co-authored over 100 international peer-reviewed publications.



Amaia Nogales is assistant researcher at ISA and is specialized on the use of arbuscular mycorrhiza in agriculture and in bio-restoration projects. Her main research topic is currently focused on the recovery of mycorrhizal diversity in vineyard soils and on the study of mycorrhiza-induced heat stress tolerance in grapevines.



J. Miguel Costa is professor and researcher at ISA, University of Lisbon. JMC is an Agronomist (UTAD), with a MSc. in Sustainable Agriculture and Horticulture from (ISA, UL), and a Ph.D. awarded by the Wageningen University on "Plant Ecology and Resource Conservation" focused on plant propagation. He teaches Viticulture and Horticultural Production Systems and his research is focused on grapevine stress response, crop phenotyping based on thermography, sustainable water use in viticulture and horticulture. Since 2020, he is coordinator of LEAF's thematic line "Grapevine and Wine".



Carlos Lopes is an Associate Professor at the Instituto Superior de Agronomia/Universidade de Lisboa, with the teaching activity centered on the area of Viticulture. He has a Degree in Agricultural Engineering by the University of Évora; a Master of Sciences in Plant Production, and a Ph.D. and Habilitation in Agronomic Engineering by the Instituto Superior de Agronomia/Universidade Técnica de Lisboa. Since 2018 he is the Director of the Master in Viticulture and Oenology Engineering. Within the research unit LEAF, he has coordinate the thematic line "Sustainable grape and wine production" from 2015 to 2019. The research activity is focused on vine ecophysiology, vineyard irrigation and cover cropping and precision viticulture. He has developed and participated in several national and international research projects in the areas of grapevine deficit irrigation, sustainable viticulture, climate

change and precision viticulture. In addition, he has been responsible for several protocols with grapegrowers companies.



Jorge Ricardo da Silva, Full Professor of Enology/Food Science and Engineering, Departamento de Ciências e Engenharia de Biosistemas (DCEB), Instituto Superior de Agronomia (ISA), University of Lisbon. Coordinator of the PhD in Food Science and Engineering at ISA/University of Lisbon. Representative in Portugal of the Vinifera EuroMaster – Master of the Sciences of Viticulture and Enology (2nd Cycle), program involving several European Universities. The main scientific area of research and expertise is the phenolic compounds in grapes and wines in respect to the ageing of wines and wine technology in general. Other scientific areas of interest are the new enological practices, wine-finishing treatments, oak wood in enology, and effects of viticulture practices in grape and wine composition and sensory profile.



Sofia Catarino (SC) is professor and researcher in Instituto Superior de Agronomia, University of Lisbon. She obtained a M.Sc. in Viticulture and Enology, University of Porto, and a Ph.D. in Food Engineering, University of Lisbon, with a thesis on the occurrence of contaminant metals in wines. SC teaches and coordinates Enology related courses at masters' degree, e.g. in the Vinifera Euromaster. Her research is focused on wine chemistry, analytical chemistry, wine quality and authenticity. SC has integrated several R&D projects in Enology and Viticulture, coordinated a project on wine authenticity, and authored more than 70 papers including book chapters, peer-reviewed articles and proceedings. SC has the professional title of Enologist, is responsible for the Enology section (council of professional activities) of the Portuguese Enology and Viticulture Society, board member of an association of Enology laboratories (ALABE), member of the expert groups on Analytical Methods and Enology (OIV Portuguese commission), and member of the sensory panel of a certifying entity. SC combines a research background in Enology with deep understanding of the issues facing grape and wine producers.



Margarida Tomé coordinates the Forest Ecosystem Management under Global Change Group (ForChange) of the ISA/ULisboa Forest Research Centre (CEF) that has the aim to develop scientifically sound methods for Atlantic and Mediterranean forest ecosystem management. The group has a strong focus on the transfer of knowledge to end-users by developing technological applications that integrate and make useful the research results. Planted forests, with exotic or native tree species, have been an important research topic of the group. At present the focus is on the conversion to more complex forests and resilient landscapes. She has been strongly involved with the European Forest Institute and the International Union of Forestry Research Organizations (IUFRO).



Gonçalo Caleia Rodrigues holds the following academic degrees: Bachelor in Environmental Engineering (2007) from Instituto Superior de Agronomia / University of Lisbon (ISA – ULisboa), Portugal; Doctor of Philosophy in Biosystems Engineering (2013) from ISA – ULisboa; Post-grad in Management from Nova School of Business and Economics, Portugal. He currently is Assistant Professor (2019 -) at ISA – ULisboa, where he teaches courses at the Bachelor level in general agriculture and machinery. He has participated in many projects in the areas of irrigation management, precision irrigation, climate change impacts, and technology dissemination and adoption. He participated as a speaker in several conferences, congresses and seminars, and published several scientific and technical papers and book chapters, mainly in the areas of irrigated agriculture.