17-21 September 2018,

Le Corum, Montpellier - France

# Eucalyptus 2018

## Managing *Eucalyptus* plantations under global changes

# Abstracts Book

# Studying ecophysiological patterns to improve the management of high-productivity Eucalypt plantations: the EUCFLUX project

Joannès Guillemot *† [1,2], Guerric Le Maire [1,3], Clayton Alvares [4], Jarbas Borges [5], José Otávio Brito [6], Raul Chaves [5], Marco Aurélio Figura [7], Guilherme Luiz De Jesus [8], Fernando Leite [8], Rodolfo Loos [9], Gabriela Moreira [10], Vinícius Silva [11], James Stahl [7], Jean-Paul Laclau [1,12], Yann Nouvellon [1,2], José Luiz Stape [4,12], Otávio Camargo Campoe [12,13]

[1] UMR EcoSols (Univ Montpellier, Cirad, Inra, IRD, Montpellier SupAgro) – CIRAD – 34060 Montpellier, France
[2] Universidade de São Paulo (ESALQ) – Piracicaba, Brazil
[3] UNICAMP (NIPE) – Campinas, Brazil
[4] Suzano Forestry Technology (Suzano Forestry Technology) – Itapetininga, Brazil
[5] Duratex Forest Technology (Duratex Forest Technology) – Rod. Mal. Rondon, Km 323 – 17120-000 – Agudos, SP, Brazil
[6] Forestry Science and Research Institute (IPEF) – Piracicaba, Brazil
[7] Klabin Forest Research (Klabin Forest Research) – Telêmaco Borba, Brazil
[8] Cenibra (Cenibra) – SP, Brazil
[9] Fibria Technology Center (Fibria Technology Center) – Rodovia Aracruz-Barra do Riacho, s/nº, Km 25, Aracruz, ES, Brazil
[10] International Paper (International Paper) – SP, Brazil
[11] Eldorado Brasil Celulose (Eldorado Brasil Celulose) – Três Lagoas, Brazil
[12] São Paulo State University (School of Agricultural Sciences) – Botucatu, SP, Brazil
[13] Federal University of Santa Catarina (UFSC) – Curitibanos, Brazil

Global climatic changes may deeply affect the functioning of *Eucalyptus* plantations, especially through the increase in frequency and duration of droughts and storms. However, the long-term responses of trees to the interactions of the different changing environmental factors remain largely unknown. It is therefore crucial to gain knowledge on the drivers of *Eucalyptus* productivity, carbon (C) allocation and resource-use efficiency in order to ensure a sustained productivity. These data are key to improve the productivity of Eucalyptus plantations and reduce their impacts on natural resources towards sustainable management. Building on the innovative results obtained in its first phase (2007-2017), the second phase of the EUCFLUX project, initiated in 2018, aims to enhance our knowledge on Eucalypt plantations functioning at various spatiotemporal scales. The EUCFLUX study site is located on a commercial clonal plantation of *ca* 260 ha in the state of São Paulo, Brazil. The project will specifically 1) quantify the fluxes of energy, C and water along a complete rotation (7 years) using the Eddy Covariance technique, girth inventories, litter and C content surveys and flux chambers; and

*Speaker
†Corresponding author: joannes.guillemot@cirad.fr

assess the effects of forest plantations on soil water availability down to 10m and water table 2) use high-resolution dendrometers and anatomical analyses to study the determinism of growth and C allocation 3) combine field data, high resolution remote sensing and ecophysiological modelling to upscale our knowledge of Eucalypt functioning from site to regional scales and 4) compare the functional responses of more than 16 Eucalypt genotypes (clonal and seed-origin) in a common-environment field trial, in order to evaluate the generality of the results obtained on the main clone, but also to evaluate how different are the functional responses of coppice and planted Eucalypt trees. This poster will describe the EUCFLUX project and discuss how it can help designing new adaptive management guidelines.

**Keywords:** Ecophysiology, Eddy covariance, water use, remote sensing, ecophysiological modelling, carbon allocation, sustained productivity