

## Managing Eucalyptus Plantations under Global Changes

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<https://www.iufro.org/science/divisions/division-1/10000/10200/10201/>

Eucalypt plantations cover approximately 25 million hectares worldwide and are expanding rapidly to provide the raw material for wood, paper, and bio-fuel products as well as large amounts of firewood and charcoal for domestic uses. However, there is a need for the management of these plantations to adapt to imminent changes: Drought periods are predicted to increase in many regions; the cost of fertilizers is expected to go up; pests and diseases will become a major threat in the future; and, the replacement of large areas of pastures and crops by highly productive eucalypt plantations is likely to modify the carbon, water and nutrient cycles in tropical and subtropical landscapes, which will have ecological, economic and social consequences.



Participants of the post-conference tour in front of a 19-month-old coppice close to Castelnaudary (France) on 21 September 2018. Photo by Luo Jianzhong (China Eucalypt Research Centre)

Against this background, a conference on “Managing Eucalyptus Plantations under Global Changes” was held on 17-21 September 2018 in Montpellier, France. The conference, which was hosted by CIRAD and Isite Muse and co-sponsored by IUFRO Working Parties 1.02.01 and 2.08.03 Improvement and Culture of Eucalyptus attracted 218 participants from 33 countries. It was organized in three plenary sessions with the aim to promote interdisciplinary discussions between forest managers and researchers specialized in tree breeding, silviculture, forest pathology, as well as environmental and social issues.

### Ecosystem services

The first session addressed, among other things, the role and limitations of wood production for rural development and poverty reduction, recent advances in the field of wood properties, and the potential of eucalyptus species as a source of molecules for green chemistry. In addition, the potential of remote sensing combined with modelling approaches for assessing the environmental impact of eucalyptus plantations at a regional scale was highlighted.

### Abiotic changes

The second session provided insights into the response of eucalypt trees to contrasting availabilities of water, nutrients and atmospheric CO<sub>2</sub>. Several studies showed a very deep rooting in tropical soils (>10m depth), which can have a strong influence on the response of eucalypt trees to drought events. In this context, the potential of genomics and clonal composites to increase the tolerance of eucalypt plantations to abiotic stresses was especially pointed out.

### Biotic stresses

The third session focused on ways of addressing biotic stresses, which are the most striking threat to the sustainability of Eucalyptus plantations given the expanding frontiers of Eucalyptus pests. Advances in molecular techniques to understand pest introductions and pest complexes were presented as well as state-of-the-art biocontrol strategies in different contexts. Multiscale remote sensing of plant pathogens appeared as a promising tool for the management of Eucalyptus plantations.

### Conclusions

The conference pointed out the need for inter-disciplinary research and international collaboration to adapt the management of Eucalyptus plantations to rapid abiotic changes and expanding frontiers of Eucalyptus pests. Promising advances in molecular techniques as well as in remote sensing and modelling will contribute to improving the management practices in a context of global changes.

### Outlook

Proceedings are available online: [http://www.alphavisa.com/eucalyptus/2018/documents/Eucalyptus2018\\_book-of-abstracts\\_vf.pdf](http://www.alphavisa.com/eucalyptus/2018/documents/Eucalyptus2018_book-of-abstracts_vf.pdf). The most innovative studies presented at the conference will be published in a Special Issue of Forest Ecology and Management. The next meeting of IUFRO WP 2.08.03 will be held in Uruguay.

Meeting website: <https://eucalyptus2018.cirad.fr/>

Find the full unedited report here: <https://www.iufro.org/science/divisions/division-1/10000/10200/10201/activities/>