



How do trees adapt to a changing environment?

220408 Functional Tree Biology

This subject provides a broad understanding of functional tree biology. Modern forest science, ecology and management relies on tools and models based on functional parameters of trees, e.g. in forest growth modelling, estimating water use by forests, assessing risks by environmental extremes, quantifying carbon sequestration by forests. Masters level forest scientists are expected to adequately and critically interpret such scenarios and outputs, a task that can only be achieved by the fundamental understanding of how the main forest resource - trees - work.

Topics covered

- Fundamental processes of tree life and primary production - photosynthesis, respiration, nutrition
- Water relations and water use of trees
- Primary and secondary metabolism of trees
- Principles of tree-environment interactions (ecophysiology)
- Strategies used by trees to withstand adverse environmental conditions (stress physiology)
- The structure of trees in relation to associated functional aspects (growth, wood formation, water and nutrient uptake, environmental interactions)
- Overview of methods to measure the life functions of trees

Course co-ordinators

- Assoc Prof Michael Tausz
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- Dr Stefan Arndt
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From Top: Field work at the Pink Lakes (Murray Sunset National Park, Vic); Measuring transpiration of *Eucalyptus nitens* at the Creswick Campus; Determination of aboveground biomass in a *Eucalyptus globulus* plantation; Collecting phloem sap from *Eucalyptus* clones near Boort, Vic.



2009 study dates and locations

- Intensive teaching from March 30 to April 9 at Creswick Campus
- Study materials available from early March via the Learning Management System.

Teaching plan

- This subject will be taught in a combination of lectures, practical experiments in glasshouses and in the field and 2-3 hours per day of private study.
- In the first week we will learn basic principles of ecophysiology in lectures and practical demonstrations in the laboratory
- In the second week we will work in small groups on specific research questions by analysing data from a short drought stress experiment. The evaluated data will be presented in short oral presentations at the end of the course and in a written assignment.

Student costs, travel and accommodation

- Estimated accommodation costs for 2 weeks in Creswick (\$150)

Enrolment options

- This subject is normally offered through the Master of Forest Ecosystem Science but is available to students from other courses subject to their Course Coordinator's approval.
- The subject may also be taken as an individual subject through the University's Community Access Program (CAP). This may be in assessed or non-assessed mode. For further information see:
<http://www.unimelb.edu.au/community/access/>

Further Information

Information about this subject and the Master of Forest Ecosystem Science is available at:
<http://www.forests.unimelb.edu.au>



From Top: Measuring leaf water potential; Extracting xylem sap from a eucalypt branch; Measuring photosynthesis in a eucalypt sapling near Creswick; Collecting leaf samples from a *Eucalyptus globulus* branch.