TOPWOOD NEWSLETTER

May, 2017 - N° 2

EDITO

The Topwood Project started on April 1st, 2015 and has arrived already to its mid-term period. During the last week of March 2017 (from 27 to 31), the mid-term plenary meeting of the project took place at INRA Val de Loire, Orléans, France.

The representatives of the project from Madera plus, INRA, INTA, BOKU were present. Some external participants from INRA, the University of Orléans and the LABINTEX also attended the Seminar.

After the meeting of the coordination committee and a demonstration of the Embolitron II prototype (an automated pressure collar for measuring hydraulic vulnerability curves), the Topwood seminar took place on March 28. The following days were dedicated to specific work package and coordination committee meetings for discussing strategic tasks of the project, the planned International Associated Laboratory (Forestia) between INRA and INTA and to visit field trials where dendrometers are installed.

In this Newsletter, we present the program of the seminar "Wood phenotyping, from adaptation to production" and give a brief overview of selected presentations.

TOPWOOD SEMINAR

Wood phenotyping, from adaptation to production, *March 28, 2017*

General Introduction, P. Rozenberg (chairman).

WP1 Phenotyping Wood Quality

-Introduction, A. Martinez-Meier (chairman of the session)

-Development of NIRS calibration for microdensity, vulnerability to cavitation and ultrasonic method, A. Martinez-Meier and J.P. Charpentier

-Test of portable NIRS, J.P. Charpentier and E. Merlo

-Test/validation of ultrasonic method, E. Merlo

- Phenotypic plasticity of annual ring formation along an altitudinal gradient (Larix decidua), M. Escobar

WP2 Phenotyping wood functions

-Introduction, ongoing work, deliverables, G. Dalla-Salda (chairwoman of the session)

-Vulnerability to cavitation measurements, methods and comparisons, S. Rosner

-Definition and testing of an in-vivo Embolitron for cavitation inducement and ks recovery, M. E. Fernandez

-Development and test of an affordable automatic dendrometer for the measurement of the dynamics of wood formation, Conversion into "dynamic microdensity profiles", L. Pâques

-Adaptation of Douglas-fir to drought, T. Chauvin, A. Rousselle and A. Delétang

SUMMARY

WP3 Wood data integration and analysis

-Introduction, V. Segura (chairman of the session)

-Correlation of wood basic properties and wood hydraulic functions within and across species, J. Gyenge (presented by M.E. Fernandez)

-Benefit for the wood industry of early assessment of standing tree wood quality, modeling wood properties using portable tools with standing tree data for segregation at the tree and stand level for industry supply, E. Merlo.

WP1

Alejandro Martinez-Meier

"Development of NIRS calibration for microdensity, vulnerability to cavitation and ultrasonic methods."

Standing trees were measured with a portable ultrasonic device, then cut with a portable sawmill, and re-measured. The reference values of the module of elasticity and rupture were obtained as well as the microdensity profiles. In a next step, the NIRS spectrum will be obtained. The vulnerability to cavitation curves (VC) measured at INTA on Cypress and Eucalyptus (two species, viminalis and globulus) are the reference values for developing the VC NIRS calibrations. The same protocols were followed at INTA and INRA. The first results (models for VC prediction) are promising. However additional plant material is needed and will be incorporated into the analyses. The use of NIRS to analyze the capacity of discrimination between dead and alive trees after stress events is being carried out on: ponderosa pine, Douglas-fir and Cypress. These trees have already been phenotyped with microdensity profiles and the data is being analyzed in INTA Bariloche. The analysis will continue during the following secondments to France.


Ultrasonic measurements on a felled tree

Margarita Escobar-Sandoval

"Phenotypic plasticity of annual-ring formation along an altitudinal gradient (Larix decidua)." Margarita Escobar-Sandoval, Philippe Rozenberg and Luc Pâques

PhD thesis on a topic entitled "Mechanisms of adaptation of forest trees to climate change: local adaptation to environmental variations, dynamics of wood formation in relation to climate". In particular, the aim is to study phenotypic plasticity in the annual ring microdensity as a function of inter- and intra-annual climatic variations.


"Larch and pines mixed stands in the Alps"

WP2

Sabine Rosner

"Vulnerability to cavitation measurements, methods and comparisons."

Results of hydraulic experiments performed at BOKU, Vienna, in 2016, during the scientific stays of Guillermina Dalla-Salda, Esther Merlo and Tadeja Savi (Trieste, Italy) were


Topwood laboratory work at BOKU, Vienne, Austria

presented. The main objective of this secondment was the collection of reference data for the Embolitron. Different methods for constructing vulnerability to cavitation curves were presented and current controversies and results of different methods for a conifer (*Picea abies*) and two angiosperm species (*Acer campestre* and *Fagus sylvatica*) were discussed.

T. Chauvin, A. Rousselle and A. Delétang
"Adaptation of Douglas-fir to drought."

According to the IPCC scenarios, Douglas-fir planted in France will face warmer and dryer climatic conditions. Nevertheless, the Douglas-fir natural distribution covers a vast climatic variation. Therefore, we wonder whether there are provenances more adapted to drier conditions in other locations. Our preliminary results show that there is a significant but low between-provenance variation for the vulnerability to cavitation in the part of California tested. However, we need to deeper investigate this variability to determine whether it will be enough for Douglas-fir to adapt to the future climatic conditions.

Minutes from the Topwood meeting


A. Martinez-Meier is presenting during the seminar


Coordination committee meeting.


Social life of the Topwood participants.


A.Martinez-Meier and J.P. Charpentier during portable NIRS demonstration.


E. Merlo during her presentation in the Seminar

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