



Report on the 10th Hardwood Conference 2022

The 10th Hardwood Conference was successfully held at the University of Sopron between 12-14 October 2022, with personal participation.

<http://www.hardwood.uni-sopron.hu>

The traditionally biennial conference could only be held online last year after a postponement, but this year's 10th anniversary Hardwood Conference was held in offline form, with personal attendance. The event was organised by the University of Sopron, Wood K Plus (Austria), Mendel University in Brno and the Hungarian Wood Science Association (FATE). The conference attracted many researchers and PhD students from all over the world: with a total of 110 registered participants from 3 continents, 17 countries and of course many more interested people from the University of Sopron. As these numbers show, a large-scale and truly international conference was achieved having a good atmosphere. Among the attendees were also representatives of companies.



The welcome evening held on 11.10.2022 at the Lignum Visitors Centre also served as a pre-registration. The following two days, after the welcome speeches, the busy programme included 32 oral presentations and 28 poster presentations. The posters could be seen in the exhibition hall, also attracting many visitors during lunch and coffee breaks.



During the gala dinner, many good-mood professional discussions and networking took place. Finally, on Friday, a professional study tour followed, where we guided a busload of participants to Austria with the help of our Austrian organizing partner, Wood K Plus, Dr. Christian Hansmann. First, in Stockerau, we had the opportunity to visit the largest site of Frischeis GmbH (JAF Holz), the warehouse line, after introductory presentations and a guided tour. The second stop was Garten Tulln in the city Tulln an der Donau, where we could see outdoor applications of wood materials. We were particularly pleased that several students from the University of Sopron participated in the programmes and gave presentations at the conference.



Groups of conference participants on visits to Stockerau and Tulln

The papers and posters were published as a digital conference proceedings in English. Below we publish a foreword and the titles of the articles included in the proceedings. The full proceedings is available here for free:

[10th Hardwood Conference Proceedings](#)



On behalf of the Organising Committee, we would like to congratulate the presenters on the high quality presentations and thank you for the participation!

Prof. Dr. Róbert Németh

Dr. Miklós Bak

Dr. Máttyás Báder

Preface to the 10th Hardwood Conference

This is the 10th time we have been able to organize our Hardwood Conference in Sopron. During the past two decades, the European wood industry has faced many challenges, especially hardwood processing. I am confident that the results of our hardwood research community have helped in dealing with challenges and solving problems.

The abundant species richness of deciduous (hardwood) trees brings with it an extraordinary variety of wood materials. The description of material properties is a significant task in itself, and with the development of technologies and products, new properties must be investigated.

We find that deciduous wood materials from plantation forestry are increasingly becoming the focus of research. Tree breeding and wood utilization have developed into joint research work that goes hand in hand. In the proceedings, you can read a good number of articles on forest management, as well as on biological and technical topics. The chemistry of wood materials is also an "evergreen" topic for our conference. Without this discipline, it is difficult to imagine any significant scientific or industrial advance.

Hardwood forests and their managers also face great challenges. New pests have appeared, which worsen the condition of forests, and unfortunately the quality of wood. Due to the drier climate, the groundwater level decreased and some of the trees come under stress, which also affects their growth and thus the amount and quality of available wood.

Raw material supply chains are fundamentally damaged due to the crisis situations affecting Europe and the world. Our usual raw materials are either unavailable or only to a limited extent, and prices also show huge fluctuations (mainly increases), which presents challenges to the wood processing industry. In the future, it is expected that the availability of deciduous wood materials will be reduced, and competition with the energy sector will also intensify. We must substitute underused and underappreciated wooden materials and semi-finished products and new material-saving structures must be designed while maintaining the quality of the finished products. These challenges impose serious research tasks on scientists.

The conference provides an excellent platform for the exchange of ideas between young and more experienced researchers. The authors of the articles, including the speakers, are gratifyingly rich in young researchers, several of whom are still "only" students. We can therefore look to the future of wood industry research with confidence, because the "next generation" seems assured.

Finally, I would like to express my pleasure that we can hold our hardwood conference live again this time. Thank you for your interest in our conference and the significant number of submitted scientific articles!

Sopron, October 2022

Róbert Németh

Content

Keynote of the 10TH HARDWOOD CONFERENCE - Hardwood research in cooperation with industry

Session 1: Silvicultural aspects, structure and properties of hardwoods

Growing technology and genetic testing of newly-bred black locust cultivar candidates in Hungary: A review

Analysing surface geometry of selected hardwood species at different humidity levels

Structural characterisation of the variable impregnation of poplar wood

Green-oak building: characterisation of small-diameter logs from oak by non-destructive and destructive testing

Vertical changes in physical, chemical, and water properties of bark in the oak stands differing in age

Determination of starch content from milled oak wood (*Quercus robur* L.)

Selected mechanical and physical properties of cherry and walnut wood

Quality and price gain of European oak logs determined by visual and stress wave analysis

Poster Session

The effect of seasons and sticker thickness on *Acacia nilotica* (Sunt) wood drying in Wad Elnayal sawmill, Sinnar State, Sudan

Preliminary results of bark and straw acetylation

Bending test results of plantation poplar clones

Possible test procedure for analysing the influence of MC on wood surface geometry

Creep of heat-treated birch wood under long-term loading

Integrating wood into microbial fuel cell technology

Extractives content of wood *Sclerocarya birrea* and *Anogeissus leiocarpus* trees

Fungal resistance of *Fagus sylvatica* after different wood modification processes

Preliminary results of the investigations of lower quality oak lamellae with regard to their potential uses

Preliminary results of the visual assessment of boards made from low-quality oak logs

Comparative study of logging with harvester and chainsaw in poplar stands

Growth traits and wood quality of yellow poplar (*Liriodendron tulipifera* L.) as a fast-growing hardwood tree species

Effect of ring width on cell wall area in *Populus alba* L. juvenile wood

Combustion characteristics of green ash and box elder

Thermal modification of green ash and box elder

Analysis of some anatomical features of field elm (*Ulmus minor* Mill.)

Durability of *Castanea sativa* raised granary structures above ground in the North of Spain

Comparative study of mechanical wood scaling with harvester

Can the characteristics of the crown influence the stability of poplar trees?

Use of computed tomography to optimize log cutting

Horizon 2020 Project ASFORCLIC: a CZ – SE – DE – AT – SI – Cooperation in the field of forest climate-adaption & applications of lesser used tree species

Increasing the adhesion of core wood by chemical surface modification

Nail and screw withdrawal resistance of Scots pine and poplar wood

Potential of aged oak staves for small-sized furniture

Is the laser technology suitable for wood cutting?

Delignification experiments for the production of transparent wood

Oak (*Quercus* spp.) ratio preferences of oak lace bug (*Corythucha arcuata*) at the front line of its spread

The impact of inorganic compounds on archaeological and contemporary oak wood

Session 2: Durability, biodegradation and preservation

Antifungal properties of *Prunus serotina* Ehrh. extracts

A comparison of the wood decay abilities of common white-rot fungi from the Carpathian Basin

Can acetylation make hornbeam wood last? Results of -year-long field stake test

Phylogenetic analysis shows contrasting genetic diversity among various Armillarioid species in Pannonian forests

Session 3: Modification & functionalization

Dimensional stabilization of wood by using microporous silica-aerogel

Acetosolv-delignification and IPA-acetylation of beech wood veneer

Ammonia treated and mechanically densified beech wood (*Fagus sylvatica* L.): Fixation behaviour

Creep behaviour of densified European beech under constant climate

Acetylated Beech LVL: Anti-swelling-efficiency, leaching, and set recovery

Investigation of Poplar-Plywood impregnated with a mixture of sorbitol and citric acid (SorCA)

Microwave modification of blue gum (*Eucalyptus globulus*) logs for preservative treatment: Technical and cost analyses

Session 4: Machining & Manufacturing of hardwood

Study of the influence of basic process parameters on the roughness of surfaces during wood milling

Quantitative and qualitative analysis of strain near the cutting edge during high-speed machining of hardwood

Multiparametric cutting force prediction model for various wood species

Long-term plant-level scheduling with uncertainty in the plywood industry

Session 5: Hardwood in composites and engineered materials

Performance comparison of domino pin and domino connector fastened corner joints

Enhancing the internal bonding after boiling for particleboard made of recycled furniture

Numerical modeling of hardwood Glued Laminated Timber

Effect of specimen size and pressure on the bond quality of Poplar cross-laminated timber (CLT)

Superhydrophobic beech wood surfaces

Mycelium biocomposites from birch wood chips as future green materials

Impregnability tests of experimental Pannonia poplar based glued-laminated timber

Experimental investigations on structural reinforcement of two – directional oak-wood laminations by carbon and glass fibres

Self-locking of finger joints - Influence of density and moisture content