

TREE CONFERENCE RIGA 2023 AGENDA

1st Day, June 1, 2023

Time	Topic	Speaker
09:00 – 09:30	Registration	
09:30 – 09:45	Opening speech	John Parker (Chief Executive Officer, Arboricultural Association, UK)
09:45 – 09:50	Introduction of current affairs of the tree care industry in Latvia	(Latvian Arboriculture society, LV)
09:50 – 09:55	EAC and certification	Michal Zelenak (vice president of EAC)
10:00 – 10:45	Tree management in the UK: Challenges and opportunities	John Parker (Chief Executive Officer, Arboricultural Association, UK)
10:45 – 11:00	Coffee break	
11:00 – 11:30	Threes for trees: the 3:30:300 rule for greener and healthier cities	Dr. Cecil Konijnendijk (The Nature Based Solutions Institute; NL)
11:30 – 12:00	Trees - A lifespan approach	Jan Willem de Groot (Chief Executive Officer, Terra Nostra, NL)
12:00 – 13:00	Lunch	
13:00 – 13:20	New perspectives on bracing and cabling systems	Benoit de Reviers
13:20 – 13:50	Advanced Biomechanical Analysis of trees, case studies + future potential	Ondřej Kolařík and Jaroslava Smerdova (Adbian, CZ)
13:50 - 14:10	The importance of tree pollen research in Latvia	Aerobiologist Dr. geogr. Olga Sozinova (LV)
14:10 – 14:30	Coffee break	
14:30 – 15:15	A field guide to identification of tree roots	Kristin Moldestad (Mrs., Cand. agric. horticulture, ISA certified arborist, NO)
15:15 – 15:30	Tree mechanical stability under wind loading	Forest institute "Silava", researcher Dr.silv. Oskars Krišāns (LV)
15:30 – 16:00	Tree planting in urban areas	Michal Zelenak (SK)
16:00 - 16:30	1st day closing discussion	John Parker (UK), all speakers

2nd Day, June 2, 2023

Time	Topic	Speaker
09:00 - 09:15	Registration	
09:15 - 09:20	Opening speech	Āris Jansons, LSFRI "Silava" senior researcher
09:20 - 10:00	Future of intensive forestry: aesthetics and biodiversity in urban forests	Āris Jansons, LSFRI "Silava" senior researcher
10:00 - 10:40	Climate change and carbon in urban forests	Valters Samariks, LSFRI "Silava" research assistant
10:40 - 11:00	Coffee break	
11:00 - 11:40	Forest-ecosystem services-based management	Zane Lībiete, LSFRI "Silava" senior researcher
11:40 - 12:20	Identification of tree stress by remote sensing techniques	Endijs Bāders, LSFRI "Silava" researcher
12:20 - 13:20	Lunch	
13:20 - 14:00	Tree susceptibility to wind damage: results of static tree-pulling tests in Latvia	Oskars Krišāns, LSFRI "Silava" researcher
14:00 - 14:40	Living with beavers in urban areas	Kārlis Bičkovskis, LSFRI "Silava" research assistant
14:40 - 15:00	Coffee break	
15:00 - 15:40	Fire hazard in urban forests	Āris Jansons, LSFRI "Silava" senior researcher
15:40 - 16:20	Study course "Urban Forestry" in Latvia University of Life Sciences and Technologies	Roberts Čakšs, LSFRI "Silava" research assistant
16:20 - 17:00	2nd day closing discussion	Āris Jansons, LSFRI "Silava" senior researcher; all speakers

ABSTRACTS OF PRESENTATIONS

Cecil Konijnendijk

Threes for trees: the 3:30:300 rule for greener and healthier cities

The important contributions of urban trees and green spaces to for example, climate moderation and public health have been recognized. This paper discusses guidelines and norms that promote the benefits of viewing green, living amongst green, and having easy access to green spaces for recreational use. Having trees and other vegetation in sight from one's home, place of work, or school has important mental health and performance benefits. Local tree canopy cover is positively associated with cooling and other aspects of climate moderation. With public green spaces in proximity to one's home stimulates regular use of these areas and results in positive impacts on mental, physical, and social health. After analysing existing guidelines and rules for urban green space planning and provision, a new, comprehensive guideline was developed by the author in February 2021. This guideline, known as the '3:30:300 rule' for urban forestry, aims to provide equitable access to trees and green spaces and their benefits by setting the thresholds of having at least 3 well-established trees in view from every home, school, and place of work, no less than a 30% tree canopy in every neighbourhood; and no more than 300 m to the nearest public green space from every residence. Current implementation of this new guideline is discussed, as well as the advantages and disadvantages of using this evidence-based but also clear and simple rule.

Jan Willem de Groot

Trees – A Lifespan Approach

Still too often trees die prematurely or must be removed because of mechanical problems. The costly investment that has been done for these trees is thus nullified. If we want our new planted trees to be successful one day, we must plant them in the right conditions and give them the right tree management. In his presentation Jan Willem de Groot will focus on the importance of young tree management. Based on his experience in The Netherlands he will show how important and effective the pruning of young trees based on a predetermined plan is.

Kristin Moldestad

A field guide to identification of tree roots

Construction works and existing trees is a common and complex combination. The responsibility to oversee the protection and the wellbeing of trees involved in a construction project often falls on the arborist. When it comes to tree trunks and crowns, methods of identification and assessment are plenty and well known. This has not been the case for tree roots. The aim of our project has been to create a field guide for arborists to the identification of roots. My colleagues and I are often on construction sites to control that the correct procedures are followed on site to protect existing trees. When digging works has revealed tree roots it is not always obvious which tree the roots belong to. Roots can expand far beyond the tree crown, and they are covered in soil and dirt. This reoccurring challenge, and our arborist inclination to save trees sparked me and my colleague Olve Lundetræ to study roots we came across through our work more closely. We began to assess roots as they appeared in ditches and on building sites more systematically. Through the studies we learned that the roots are almost as different as the branches and the leaves. We found roots with beautiful colours, amazing patterns, strange bark, and structure, and some with a distinct smell. So far, we have identified roots from around forty different tree species. The roots are described with words and photographed. We hope but we hope that this information can help other arborists on site, and maybe give them the evidence they need to change the direction of a ditch or move a building some meters. The aim of this project is to present all our findings in a field guide.

Ondrej Kolarik and Jaroslava Smerdova

Adbian (Advanced Biomechanical Analysis) of trees, case studies + future potential

Urban trees provide a range of ecological benefits, including improving air quality, reducing urban heat island effects, and mitigating climate change. However, to make informed decisions about tree management, it is essential to have precise data on tree health and stability. In this presentation, we will discuss the value and irreplaceability of urban trees and the importance of precise data measurement when assessing tree stability. We will present case studies that demonstrate how the use of Adbian (Advanced Biomechanical Analysis), a software tool that calculates the biomechanical stability of trees using LiDAR scans and acoustic tomography, can change the decisions of tree removal. We will show how Adbian works in practice, including how to collect the necessary data using a smartphone, and how to use the software to make informed decisions about tree management. By demonstrating the practical applications of Adbian, we hope to inspire tree experts, arborists, and municipalities to adopt more data-driven approaches to tree management, preserving and enhancing the ecological benefits of urban trees for future generations.

Benoit de Reviers

New perspectives on bracing and cabling systems

Bracing and cabling systems are two solutions to prevent or consolidate the mechanical strength of a tree or one of its parts. The objective is to maintain the integrity of a tree, protect the surrounding property and/or people, and reduce the associated risks. However, these cabling and bracing systems require regular checks and the management of these inspections for releasing or replacing cabling systems have become unmanageable. This has become particularly complicated since the 1990s with the introduction of «non-invasive» systems, which appeared easy to install and less expensive than the «old systems». The solution of a system to limit the mobility of the branches must always be carefully considered, approaching each situation clinically. Modern mixed systems integrate drilling techniques with newer static but flexible systems by deploying newer materials. Also, a modern approach to risk assessment methods allows for objective risk assessment and a reduction in the number of systems deployed. The different bracing systems will be compared and critiqued, in order to understand their interests and limitations, and to raise the possibilities for further development. This presentation doesn't claim to be exhaustive or true, but simply aims to encourage some reflection on the advantages and disadvantages of each system, based on current scientific evidence and technical advances but also on my observations and experience. The singularity of each situation must push us to imagine new solutions in an evidence-based clinical approach.

Olga Sozinova

The importance of tree pollen research in Latvia

The pollen from different trees as birch, alder, hazel, willow, oak, yew, beech, elm (and others), cause respiratory allergy in about 15-20% of Latvian population. Noticeable percentage of sufferers have severe reactions and need forehanded therapy before the start of tree flowering. This is the main reason of so-called aerobiological forecasting modelling and, more detailed research of plant reaction to climatological and meteorological changes is the base for such modelling. Understanding of the relationship between tree-flowering mechanisms and meteorological factors allow to produce good-quality pollen forecasts. This study presents the results of birch pollen modelling because it is known as the most frequent allergen in Latvia and northern Europe. Based on the long-series data from Northern Europe relationship between meteorological factors and pollen concentration were defined. The ability of birch to accumulate the heat was tested and threshold for flowering start was calculated. Using statistical modelling procedure, diurnal variation of pollen concentration was successfully modelled, as well as possible next year total amount of pollen during the flowering season. We are continuously developing this direction in cooperation with Finnish Meteorological institute and current methodology already used in regional forecasting models as SILAM and COPERNICUS.

Oskars Krišāns

Tree mechanical stability under wind loading

Tree mechanical stability under wind loading. The effect of wind loading on trees can result in various responses ranging from nearly noticeable leaf waving to high frequency swaying and to internal wood damages that could lead to a fatal failure such as stem breakage or uprooting regardless of the growing environment. Tree resistance to wind loading is a function consisting of the wind force applied on the above-ground parts and the strength of resistance of stem and soil-root anchorage. This determines the limit of wind loading that a tree can bear, and thus the maximum wind speed that either stem or root system can resist. The presence of secondary disturbances, such as older mechanical damages either in roots or above-ground parts, pests, pathogens, water deficit or anthropogenic stresses can substantially decrease the mechanical stability of trees, leading to lower wind loads required to cause a fatal failure. This is of great importance to both urban (also peri-urban) and commercial forests, although the type of consequences differ between them. In commercial forests, wind can cause catastrophic damages to wood production, while in urban areas tree failure during strong winds is a serious threat to infrastructure, as well as to the health or lives of people. Therefore, the evaluation of mechanical stability of trees is of great importance for managing safe and pleasant surroundings in both residential and public areas of urbanized environments.

Oskars Krišāns

Tree susceptibility to wind damage: results of static tree-pulling tests in Latvia

During the last decades, the prevalence of wind disturbances has increased, causing substantial socio-economic and ecological impacts. Both frequency and magnitude of wind disturbances are amplified by the ongoing climate warming and heterogeneity of precipitation, under which some tree species might decline in both urban and peri-urban forests. Moreover, amplified severity of post-storm legacy effects is projected to decrease tree resistance to pathogens, pests and water deficit, increasing tree susceptibility to wind damage and resulting as a negative feedback loop. An insight into tree susceptibility to storms can be provided by the assessment of tree loading resistance via a static tree-pulling test. Since 2017, in total nearly 500 trees of Norway spruce, Scots pine, silver birch, common aspen, pedunculate oak and European beech have been tested destructively, acquiring information on the strength of soil-root anchorage and stem under various growing conditions. Considering also such aspects as – soil type and moisture content, as well as freezing of soil, presence of mechanical damages, invasion of pathogens, etc. Tree resistance to static loading differs among species and soil types, with oak and beech growing on moraine soils being the strongest. Spruce and pine on deep peat soils have lower resistance to static loading than on well drained mineral soils. Birch has explicit plasticity in adaptation to loading resistance on moist and less stable soils, implying a high potential in increasing wind resistance of stands under such conditions. The application of destructive testing on tree mechanical stability has provided valuable data that can be used in the evaluation of methods and thresholds typically applied in commercial tree stability assessments. This has a high potential in facilitating substantial improvements of non-destructive testing methods for estimation of tree wind resistance.

Āris Jansons

Future of intensive forestry: aesthetics and biodiversity in urban and peri-urban forests

Forests provide a variety of ecosystem services. Segregation at the landscape (forest massive) scale is commonly used to ensure the presence of these various services. Our presentation will focus on a different approach – integration of different management goals at a stand scale. We will demonstrate examples of climate-smart forestry, simultaneously considering both adaptation to climate change and climate change mitigation. Recommendations to ensure aesthetic value in forest management will be provided based on large-scale surveys in Latvia. Also, preservation of biodiversity elements will be discussed based on case studies at a stand scale, as well as results of green infrastructure development project.

Āris Jansons

Fire hazard in urban forests

Forest fires are increasingly more common across Europe, threatening properties and lives as well as causing environmental and economic damage. Fire prevention as well as post-fire management (to avoid damages from falling fire-affected trees) are essential to minimize potential negative effects. The presentation will cover the spatial and temporal distribution of forest fires in Latvia. We will briefly reflect on forest fire history, causes, and consequences of forest fires. Changes in fire occurrence and severity in future will be covered. Effect of fire on tree growth as well as indicators to predict post-fire survival of trees will be demonstrated based on long-term research in Latvia.

Roberts Čakšs

Urban Forestry: study course

Abstract of presentation: "Urban forestry" is a new study course at master`s level in Forest faculty of Latvia University of Life Sciences and Technologies. It is intended to deal with challenges in the management of urban, suburban and peri-urban forests. The maintenance and restoration of such territories, methods of public communication, and the application of remote sensing techniques are just a few of the subjects covered in this study course. Attendees of this study course will be introduced also in tracking forest fires, species inventories, and the quirks of mobility in urbanized and rural areas. It may occasionally appear that the forests in urbanized areas of Latvia are overgrown and, thus impenetrable or they are subjected to unreasonably intensive management. In this regard, urban, suburban and peri-urban forests should also be maintained to provide a satisfactory living environment, considering the high prevalence of such areas. In Baltic states, similarly to many other places, the ongoing urbanization causes a desire of individuals to live in suburbs. This study course involves the assessment of unique requirements of urban, suburban and peri-urban forests, as well as the management and planning approaches needed to preserve such areas as they are subjected to heavy anthropogenic impacts. Attendees will be provided with a thorough grasp of the challenges and opportunities regarding to managing urban, suburban and peri-urban forests via the skills and knowledge appropriate for running sustainable and healthy ecosystems in urban green areas.

Kārlis Bičkovskis

Living with beaver in urban areas

Beavers are known as ecosystem engineers because of their ability to create and maintain wetland ecosystems. Beavers occupy wide range of freshwater systems including ponds, streams, marches, rivers, lakes and drainage systems. Beavers are highly adaptable species and can modify many types of natural, cultivated and urban habitats to suit their needs. As urbanization continues to encroach upon natural habitats, beavers have increasingly been found in urban landscapes, presenting both opportunities and challenges. On the one hand, beavers can provide valuable ecosystem services in urban areas, such as reducing flood risk and improving water quality, and can be beneficial to climate change mitigation. On the other hand, their presence can also lead to conflicts with humans, leading to damage to property, trees, and infrastructure. It's important to address these conflicts through effective management strategies that balance the benefits and drawbacks of beaver presence in urban areas. This has led to the development of various management techniques to mitigate the negative effects of beaver activity, including fencing, water flow devices, and relocation. Overall, finding ways to coexist with beavers in urban areas can lead to more abundant and diverse ecosystems, while also addressing the need for naturalization of urban areas to support wildlife and biodiversity.

Zane Lībiete

Forest-ecosystem services-based management

The concept of ecosystem services has gained increasing attention in the recent decade, and it is being more and more frequently applied in various research and policy areas. In our region, forests are the most widespread terrestrial ecosystems. Apart from timber production, they provide a wide array of non-wood forest products and a broad range of services that are essential for human well-being, such as clean water, clean air, carbon sequestration, biodiversity conservation, and recreation. Ecosystem services-based management offers a more holistic approach to forest management, which seeks to optimize the delivery of multiple ecosystem services, while ensuring the sustainable use of forest resources. This approach involves the integration of ecological, social, and economic considerations into forest management planning and decision-making. The implementation of forest ecosystem services-based management requires a shift in mindset and a change in the way forest resources are valued and managed. It requires collaboration and engagement with a range of stakeholders, including forest owners, managers, users, policymakers and society. The presentation provides an overview of the main principles of ecosystem services-based forest management, gives examples and discusses most significant challenges of its implementation.

Valters Samariks

Climate change and carbon in urban forests

Forests are recognized as a major carbon storage in the long-term. The main carbon pools in the forest ecosystems are tree biomass, soils (especially organic soils), deadwood and litter, besides each of the pool is significant in the carbon cycle. Tree biomass is a large, dynamic, and manageable forest carbon pool, therefore forest management practices, in order to ensure carbon storage and other ecosystem services are essential, thus the (multifunctional) role of urban forests might become more significant. The presentation will focus on future climate change and species distribution prognoses and expected changes in occurrence of natural disturbances. Moreover, carbon has been widely studied in forest ecosystems, however only few studies have carried out research of old-growth forests, but in Latvia we have gathered significant amount of data and knowledge for Europe. The presentation indicates carbon stock differences of mature and old-growth (forests), as well as differences in annual carbon sequestration potential and an insight of organic soil carbon stock and greenhouse gas emissions.

Endijs Bādērs

Identification of tree stress by remote sensing techniques

Both urban and rural forests are increasingly experiencing climatic and biotic stress events, as well as random disturbances, some of which are outside the normal range. Under the most climate change scenarios, it is expected that there will be increase in events with extreme weather conditions, such as wind storms and/or droughts which will reflect with the difficulties of tree growth. Therefore, the identification of early signs of damages is important in the context of tree health. The study examines the use of remote sensing technologies to monitor tree health and to detect damages via the example of response of Norway spruce to simulated wind impact. The monitoring of tree vitality has been carried out during two vegetation seasons. The study found significant differences between control trees and bent trees, suggesting Norway spruce to have the ability to recover previous vitality within a two-year period. However, the study also points out the limitations and uncertainty of relying solely on remote sensing data for management decisions.