



BIOSECURITY AND SURVEILLANCE OF QUARANTINE PESTS OF TREES IN FORESTS AND CITIES



September 8-10, 2025

VENUE:

NOVA SBE, Carcavelos Campus
Rua da Holanda, no. 1,
2775-405 Carcavelos, Portugal

Explore innovative approaches to urban tree health
and forest pest surveillance.

- Biosecurity strategies in urban settings
- NPPO practices and challenges
- New tools for pest detection
- Species resistance and vulnerability
- Stakeholder involvement
- Education and awareness
- Policy frameworks for urban biosecurity

This publication is based upon work from COST Action Safeguarding European urban trees and forests through improved biosecurity, CA20132, supported by COST (European Cooperation in Science and Technology).

COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.

www.cost.eu



Editors: Johanna Witzell, Dmitrii Musolin, Helena Bragança

Cover: Yasin Korkmaz & Abdülkadir Korkmaz

2025

How to cite:

Witzell, J., Musolin, D., Bragança, H. (eds.). Book of Abstracts: Biosecurity and Surveillance for Quarantine Pests of Trees in Forests and Cities', Joint Meeting of COST Action "Urban Tree Guard" (CA20132) and European and Mediterranean Plant Protection Organization, Carcavelos, Portugal, September 8-10, 2025, 70 p.

Scientific Committee

Johanna Witzell - Linnaeus University, Sweden

Dmitrii Musolin – EPPPO - European and Mediterranean Plant Protection Organization, France

Helena Bragança - INIAV - National Institute for Agrarian and Veterinary Research, Portugal

Luís Bonifácio - INIAV - National Institute for Agrarian and Veterinary Research, Portugal

Diana Marčiulynienė - Department of Forest Protection and Game Management, Institute of Forestry, LAMMC, Lithuania

Ilija Đorđević - Department of Spatial Regulation, GIS and Forest Policy, Institute of Forestry, Serbia

Local Organizer

Helena Bragança - INIAV - National Institute for Agrarian and Veterinary Research, Portugal

Ana Cristina Silva - INIAV - National Institute for Agrarian and Veterinary Research, Portugal

Conference programme

Monday, September 8th

08:00	Registration, Meet & Greet		
08:30	Opening - Local hosts: Dra Patrícia Inácio (vice President INIAV IP.) and Dra Margarida Oliveira (President of Green-IT ITQB); Dmitrii Musolin (EPPO), Johanna Witzell (COST Action UB3Guard)		
Session I - Surveillance and monitoring - strategies, regulations and experiences			
09:00	Dmitrii Musolin	EPPO	Regional and international cooperation in surveillance of quarantine pests of trees in forests
09:15	Tomasz Kaluski	European Food Safety Authority	Optimising plant pest surveys for broadleaved trees: Application of EFSA guidelines and tools
09:30	Maria Mirazchiyska	European Commission	EU legal framework and the recent developments in plant health surveillance
09:45	Joan Webber	Forest Research	Forest surveillance for quarantine pests: is there a divergence between regulation and science?
10:00	Ferenc Lakatos	FAO REUFIS/University of Sopron	Capacity building for forest invasive species surveillance – the REUFIS (Forest Invasive Species Network for Europe and Central Asia) initiative
10:15	Susanne Raum	Technical University of Munich	The growing threat of urban tree pests and diseases – Impacts, risk awareness, and action
10:30	Benno Augustinus	Swiss federal Research Institute WSL	Optimising surveillance for multiple quarantine forest pests using a bioeconomic model
10:45 Coffee break			
11:15	Luís Bonifácio	INIAV	Quarantine forest species surveillance in Portugal

Biosecurity and Surveillance for Quarantine Pests of Trees in Forests and Cities
(Carcavelos, Portugal, September 8-10, 2025)

11:30	Dinka Matosevic	Croatian Forest Research Institute	Surveillance of quarantine forest pests in Croatia: analysis of practice and challenges
11:45	Tom McDonald	Department of Agriculture Food and the Marine	Forest health surveillance in Ireland
12:00	Francis Maire	Francis Maire Arboriste Conseil	Feedback from French experience with canker stain (<i>Ceratocystis platani</i>)
12:15	Paula Catusińska	State Plant Health and Seed Inspection Service	Poland's preparedness for plant biosecurity threats: The role of simulation exercises on <i>Agilus planipennis</i>
12:25 Lunch break			
Session II - Tools and methods in biosecurity			
14:00	Diana Marčiulygienė	Lithuanian Research Centre for Agriculture and Forestry	WG2: Synthesizing Research and Scanning Horizons for Urban Tree Health
14:20	Nicolas Meurisse	Bioeconomy Science Institute	Early detection of exotic pests across urban and forest environments - integrating risk-based surveillance systems in New Zealand
14:40	Alain Roques	INRAE	PORTRAP SORE 2021-2024: A trapping network using generic lures for early detection of non-native xylophagous species at ports-of-entry in France
15:00	Eckehard Brockerhoff	Swiss Federal Research Institute WSL	Role of birds as predators of non-native and native pests of urban trees
15:20	Marta Betka	Poznań University of Life Sciences	The green wedge system of Poznan: An urban planning vision ahead of its time
15:35	Guitton Noah	Telespazio	Synthetic data augmentation for tree pest detection in aerial imagery

Biosecurity and Surveillance for Quarantine Pests of Trees in Forests and Cities
(Carcavelos, Portugal, September 8-10, 2025)

15:45	Katie Parker	Forestry Commission	Proof of concept: Trapping for early detection of quarantine <i>Agrilus</i> species in Great Britain
16:00 Coffee break			
16:30	17:15	Panel discussion	

Tuesday, September 9th

Session III - Decision support for biosecurity			
08:30	Mariella Marzano et al.	Forest Research	Urban Tree Guard: WG 1 - Identification
09:00	Hervé Jactel	INRAE	Prototype decision making tool tree planted in cities
09:15	Matteo Latini	Universita' degli Studi della Toscana	New challenges in monitoring tree health and invasive pathogens in urban environments and support decision
09:30	Matteo Marchioro	University of Padua	Know them to stop them! The first world database on bio-ecology and distribution of Scolytinae
09:45	Marie Grosdidier	INRAE	Improving pinewood nematode monitoring in France based on risk analysis
10:00	Alberto, Santini	CNR	The invasion framework helps the management of the spread of canker stain disease of plane trees
10:15	Daiva Burokiene	Nature Research Centre, Laboratory of Plant Pathology	Two targets in one shot – entomopathogens against insect pests and plant pathogens
10:25	Johan Östberg	Nature Based Solutions Institute	Presentation of FREE3 CIG
10:40	Ana Cristina Silva	INIAV	UB3 Guardians – Card and Quiz Game for Education on Urban Tree Pests and Diseases

Biosecurity and Surveillance for Quarantine Pests of Trees in Forests and Cities
(Carcavelos, Portugal, September 8-10, 2025)

10:50 - 11:15	Coffee break
Excursion, Lunch at 13:00	
COST dinner 19:00, bus back to Carcavelos 22:30 or 23:00	

Wednesday, September 10th

September 10th			
Session IV - Pests and pathogens in urban settings			
09:30	Roeland Samson	University of Antwerp	Pest resilient urban green areas – The story of the dying tree
10:00	Steve Woodward	Isparta University of Applied Sciences	The status of <i>Ceratocystis platani</i> in Türkiye: Spread beyond Istanbul
10:20	Jason Sumner-Kalkun	Forest Research	Management of <i>Ips typographus</i> in the UK
10:35	Talor Whitham	University of Reading, Forest Research	Safeguarding against Pine Wilt Disease: Monitoring pine-associated nematodes and their beetle vectors in Great Britain
10:50	Yasin Korkmaz	University of Freiburg	Impact of leaf miner moth infestation on fungal community composition in Horse Chestnut leaves
11:00	Iva Franic	WSL	FUNURB project
11:15 Coffee break			
11:45	Artemis Rumbou	Humboldt University Berlin	Birch pollen virome: fungal and plant viruses co-infecting urban trees in Berlin
12:00	Tamara Corcobado	Austrian Research Centre for Forests (BFW)	Artificial inoculations of <i>Dothistroma septosporum</i> and <i>D. pini</i> on urban pines: A comparative study of disease progression and physiological changes

Biosecurity and Surveillance for Quarantine Pests of Trees in Forests and Cities
(Carcavelos, Portugal, September 8-10, 2025)

12:15	Kathrin Blumenstein	University of Freiburg	Dothistroma Needle Blight on non-native pines in Central Europe: Emerging pathogen risks for urban and native forests
12:30	Katarzyna Sikora	Forest Research Institute	Biotic and abiotic Damage to oaks in forest and urban habitats: A comparative study
12:40	H. Tuğba Doğmuş-Lehtijärvi	Isparta University of Applied Sciences	Possible causes of shoot dieback of <i>Juniperus excelsa</i> in Western Türkiye
12:50 Lunch break			
14:15	Ilija Đorđević	Institute of Forestry	Mapping of urban forest managers in protected areas in Serbia
14:30	Milica Zlatkovic	Institute of Lowland Forestry and Environment (ILFE)	<i>Diplodia seriata</i> is a "silent killer" of <i>Quercus robur</i> trees after replanting in Novi Sad, Serbia
14:45	Natália Nunes	IFCN, IP-RAM	Presence of <i>Rhynchophorus ferrugineus</i> in the city of Porto Santo island: phytosanitary assessment and georeferencing of <i>Phoenix canariensis</i>
15:00	Carmen Romeralo	Institute of Forest Sciences	Isolation and pathogenicity of Oomycetes from recreational and control sites in Spanish national parks
15:15	Nadejda Mocreac	Technical University of Moldova	The evolution and impact of invasive insects and phytopathogens in urban ecosystems in the republic of Moldova
15:30	Break		
15:45	Discussion - Future collaborations, ongoing and planned proposals and papers		
16:30	Summary and closing the meeting		

Abstracts

Biosecurity and Surveillance for Quarantine Pests of Trees in Forests and Cities
(Carcavelos, Portugal, September 8-10, 2025)

Session I

Surveillance and monitoring

– strategies, regulations and experiences

Regional and international cooperation in surveillance of quarantine pests of trees in forests

Musolin, D.

European and Mediterranean Plant Protection Organization, Paris, France

Abstract

The European and Mediterranean Plant Protection Organization (EPPO) is an intergovernmental organization established in 1951. As one of ten Regional Plant Protection Organizations (RPPOs) under the International Plant Protection Convention (IPPC), EPPO supports 52 member countries in strengthening regional cooperation in plant health. It works closely with National Plant Protection Organizations (NPPOs) to develop guidance and harmonized standards.

In the field of plant quarantine, EPPO manages an early warning system (Alert List), conducts Pest Risk Analysis (PRA) for emerging threats, recommends pests for regulation in the EPPO region, and develops regional standards—especially in diagnostics and phytosanitary measures.

EPPO operates within the framework of the IPPC, a global treaty ratified by 185 contracting parties, which aims to protect plants and ecosystems from the spread of pests. The IPPC adopts International Standards for Phytosanitary Measures (ISPMs) to support coordinated pest prevention and surveillance worldwide.

Several ISPMs form the foundation for surveillance of forest pests. ISPM 6 (Surveillance) outlines requirements for national surveillance systems. Other relevant ISPMs include ISPM 8 (Determination of pest status in an area), 17 (Pest reporting), 19 (Guidelines on regulated pest lists), 29 (Recognition of pest-free areas), and 36 (Integrated measures for plants for planting).

EPPO has also developed standards directly relevant to the surveillance of forest pests. PM 1/2 lists A1 and A2 quarantine pests recommended for regulation in the EPPO region. The PM 7 series contains diagnostic protocols for specific pests (e.g. *Anoplophora* spp., *Agrilus planipennis*), while the PM 9 series provides official control guidance, including surveillance components (e.g. *Thaumetopoea pityocampa*, *Dendrolimus sibiricus*).

The importance of international cooperation and harmonized standards in forest pest surveillance will be discussed.

Optimising plant pest surveys for broadleaved trees: Application of EFSA guidelines and tools

Kaluski, T.

European Food Safety Authority, Parma, Italy

Abstract

Effective surveillance of regulated pests in broadleaved trees is critical for their early detection and containment across both forest and urban environments in Europe. This urgency is amplified by the increased risk of introducing new plant pests due to rapid globalisation and international trade, as well as the importance of broadleaved trees in adapting to climate change. To address the complexity and resource-intensive nature of planning such surveys, the European Food Safety Authority (EFSA) has developed comprehensive guidelines and specialized tools to support Member States in designing and optimizing plant pest surveys for broadleaved tree hosts.

This presentation introduces the practical application of EFSA's crop-based survey approach, specifically tailored for broadleaved trees, with the aim to optimize survey efforts by coordinating the simultaneous detection of multiple regulated pests. Central to this methodology are two key tools: RiPEST and OptiPest. RiPEST enables users to design risk-based surveys and calculate statistically sound sample sizes for multiple pests affecting broadleaved trees, adapting to diverse epidemiological contexts such as urban parks and natural forests. Building on this, OptiPest provides an algorithm to further optimize surveys by grouping different pests based on shared characteristics like optimal sampling periods, inspection units, and sampling matrices. This optimization leads to a reduction in field visits and allows for the reuse of collected sampling matrices, significantly enhancing efficiency in pest detection efforts.

By leveraging these EFSA guidelines and tools, Member States can more effectively plan and prepare their multi-pest surveys, ensuring compliance with EU plant health regulations and bolstering biosecurity and ecological preservation efforts for broadleaved trees.

EU legal framework and recent developments in plant health surveillance

Mirazchiyska, M.

European Commission, Health and Food Safety Directorate-General, Crisis Management in Food, Animals and Plants, Plant health, Brussels, Belgium

Abstract

The EU regulatory framework (Regulation (EU) 2016/2031) places considerable emphasis on comprehensive surveillance strategy for plant pests as part of crisis preparedness, with the aim to safeguard European agriculture, horticulture, and the environment. This strategy prioritises early detection and rapid response to plant pests outbreaks by implementing risk-based surveys and multiannual survey programmes for all EU quarantine pests, spanning 5-10 years.

Member States are mandated to conduct robust annual surveys for the 20 EU priority pests, which are designated based on their severe potential economic, environmental, or social impact. Special regulatory measures are set out for a number of forestry pests. Member States' survey campaigns are further supported by the European Food Safety Authority, which provides guidance, training and tools for designing surveys and optimising survey efforts.

The use of advanced technologies, such as remote sensing, could enhance surveillance effectiveness and help improve resource allocation. Training programmes, such as Better Training for Safer Food courses equip professionals with the necessary skills to implement these new techniques effectively.

The coordinated approach on pest surveillance ensures that the EU remains well-prepared to address emerging plant health challenges.

Forest surveillance for quarantine pests: is there a divergence between regulation and science?

Webber, J.

Forest Research, Farnham, Surrey, UK

Abstract

Examples of pests and pathogens moved from their native range and introduced into new geographical regions are well documented, and the likelihood of this occurrence has become much more frequent over the past 50 years aided by the huge growth in global trade and increased consumer wealth. To counter introductions, plant health measures usually rely on prior identification of high-risk organisms allied with inspection to intercept them, and surveillance to ensure their continued absence. However, there are drawbacks to this approach. In their native range, pests and pathogens associated with co-evolved hosts may be cryptic and cause little damage - therefore they remain undetected. And even if they are known in their native range, the threat they could pose if introduced into new ecosystems is hard to predict. Additionally, it can take decades to discover a new high-risk pest following an introduction, due to the challenge of detection when undertaking surveillance in heterogeneous natural environments such as forests, or because unexpected combinations of hosts and new pests/pathogen emerge over time. Scientific advances now also allow researchers to use metagenomic tools to explore what microbes exist in air, soil or water, leading to findings of DNA signatures of both unknown or regulated pathogens but often in the absence of any infected host plants or disease symptoms. This raises a question of what can be considered native or introduced and what constitutes a pest-free area, creating significant dilemmas for regulators on how to respond to such findings.

Capacity building for forest invasive species surveillance – the REUFIS (Forest Invasive Species Network for Europe and Central Asia) initiative

Lakatos, F.¹, Winkler, N.², Sathyapala, S.³

¹ University of Sopron, REUFIS, Hungary

² FAO Regional Office REU, Budapest, Hungary

³ FAO HQ, Rome, Italy

Abstract

Forest invasive species (FIS) are a growing threat to biodiversity, forest health, and ecosystem services in Europe and Central Asia. Climate change, global trade, and land-use changes have accelerated their spread, often overwhelming existing national surveillance and response capacities. The absence of coordinated detection and response mechanisms in several countries in the region further compounds the problem.

REUFIS is a network Facilitated by FAO to share information and experiences and coordinate forest invasive species capacity building activities and programmes within the region and beyond. Activities to identify strategic actions for building capacity, improving coordination, and integrating early warning and contingency planning into national and regional forest protection systems will be presented.

Background information are based on a regional assessment implemented across the region including consultations with the regional authorities related to forest health, capacity assessments, and reviews of existing surveillance and phytosanitary frameworks. Case studies of effective early detection systems and contingency plans and rapid response mechanisms were also examined.

Findings reveal significant disparities in surveillance capacities and preparedness levels across the region. While some countries have advanced monitoring systems and contingency plans, many others face limitations in staffing, diagnostic infrastructure, data collections and sharing, and risk communication. Regional cooperation remains fragmented. However, examples from selected countries show that early warning systems—when linked to trained personnel, risk mapping, and rapid response mechanisms—can significantly reduce FIS impacts.

In conclusion, strengthening regional and national capacity for FIS surveillance requires a multi-level approach. Early warning systems and pre-agreed contingency plans are essential components to detect, communicate, and respond to incursions before they cause widespread damage. Regional platforms, both at the national and international level, should facilitate knowledge exchange, joint simulation exercises, and coordinated responses. Co-operation with existing institutions (e.g., EPPO) and running activities (e.g., COST Actions) are indispensable.

The growing threat of urban tree pests and diseases – Impacts, risk awareness, and action

Raum, S.¹, Pauleit, S.¹, Egerer, M.²

¹Chair of Strategy Landscape Planning and Management/Technical University of Munich, Emil-Ramann-Str. 6, 85354 Freising, Germany

²Chair of Urban Productive Ecosystems/Technical University of Munich, Hans Carl-von-Carlowitz-Platz 2, 85354 Freising, Germany

Abstract

Urban trees and forests are increasingly threatened by tree pests and diseases, especially accidentally introduced non-native ones, requiring urgent action. Yet relatively little is known about the exact nature by which tree pests and diseases may be affecting urban environments. There is a similar paucity regarding risk awareness and knowledge of the different urban stakeholders of this growing threat and how these might respond to it.

The objective of the study was to gain a better understanding of the impacts of urban tree pests and diseases, stakeholder risk awareness and the actions taken.

A systematic review of the empirical evidence on the impacts of urban tree insect pests and diseases worldwide was produced using bibliographic databases. An online survey was conducted among different key stakeholder groups associated with urban trees and forests in Germany. Relevant regulations, policies, and guidance on urban trees at the local city level were assessed.

Out of 100 studies, 95 reveal environmental impacts (tree damage, mortality, reduced growth, changes in tree function); 35 social impacts (aesthetics, human health, safety); and 24 economic impacts (costs of pest management, economic losses). 75.8 % of the 186 survey respondents consider urban tree pests/diseases a severe problem, and 51.1 % report high knowledge of tree pests/diseases. We found a lack of knowledge of certain reportable quarantine pests/diseases (e.g., canker stain of plane, emerald ash borer, *Xylella*) and pest/disease management options (e.g., manual treatment methods). The most widely used pest remedial measures are improvements of tree living conditions (60.8 %) and purchases of plants from certified or trusted local sources (59.7 %). In the city of Munich, neither policies, guidelines, nor programmes have considered tree pests, indicating a lack of awareness of this growing threat.

Conclusions: The findings will inform the development of future activities to prevent or reduce the spread of tree pests/diseases in urban areas.

Enhancing urban tree biosecurity: A policy and legislative analysis with a focus on EU frameworks

Birben, Ü.

Çankırı Karatekin University, Faculty of Forestry, Çankırı, Türkiye

Abstract

Background: Urban trees are increasingly threatened by quarantine pests, impacting ecological stability and urban well-being. Effective biosecurity is crucial, yet existing policy frameworks, including those at the European Union (EU) level, often face challenges in adapting to the complexities of urban environments, revealing gaps in proactive measures, coordination, and enforcement.

Objectives: This study critically analyzes current policy and decision-making frameworks for urban tree biosecurity, with a specific emphasis on the EU legislative landscape. It aims to identify strengths, weaknesses, and gaps in EU directives, regulations, and supporting mechanisms, and to propose evidence-based recommendations for enhancing policy coherence, effectiveness, and adaptability to protect urban green infrastructure within EU member states and candidate countries.

Methods: A qualitative policy analysis methodology will be employed. This will involve a comprehensive review of key EU plant health legislation (e.g., Regulation (EU) 2016/2031 - Plant Health Law), relevant EU strategies (e.g., EU Biodiversity Strategy, Green Deal initiatives), and national transpositions of these frameworks. Comparative analysis of regulatory approaches across selected EU member states and case studies will highlight practical implementation challenges and successes in the context of urban tree biosecurity.

Results: The analysis is expected to identify specific deficiencies within the EU framework and its national implementation concerning urban environments, such as in early detection/rapid response protocols for urban-specific pathways, funding allocation for urban surveillance, and the integration of biosecurity into EU urban planning and green infrastructure policies. Anticipated outcomes include identifying best-practice policy elements from EU and national contexts, innovative governance models suitable for urban settings, and strategies for strengthening stakeholder collaboration and public engagement in biosecurity in line with EU principles.

Conclusions: This research will offer valuable insights for EU policymakers, national authorities, urban planners, and National Plant Protection Organizations (NPPOs) operating within the EU context. Findings will support the development of more resilient, proactive policy frameworks, enhancing urban tree biosecurity and contributing to sustainable urban development against escalating pest threats, consistent with EU environmental and biosecurity objectives.

Optimising surveillance for multiple quarantine forest pests using a bioeconomic model

Augustinus, B.A.¹, Epanchin-Niell, R.S.², Queloz, V.¹, Brockerhoff, E.G.¹

¹Swiss Federal Research Institute WSL, Switzerland

²University of Maryland, USA

Abstract

We designed surveillance schemes for multiple forest pests, addressing the following key questions: (i) What is the optimal total yearly investment? (ii) How should resources be allocated across pests? and (iii) At which locations should surveillance efforts be focused? To answer these questions for a surveillance programme targeting six priority quarantine and two quarantine forest pests in Switzerland, we employed a bioeconomic model.

The model optimizes the type, number, and placement of survey sites by considering variation in the likelihood of introduction, detectability, and spread rates across locations. It includes high-resolution trade data, host tree distributions in urban and forest areas, human population density, likely eradication costs, and pest-specific biological traits.

The model provided an estimate for optimal annual investment and generated species- and site-specific survey investment. For two pests (the longhorn beetles *Anoplophora glabripennis* and *Anoplophora chinensis*), the model determined that trapping surveys are economically unjustified. For these two pests, the high chances of detection by members of the public and low spread rates decreased the benefit of formal monitoring. Instead, encouraging detections by citizens by raising awareness would be more cost-effective. The model recommended focusing surveillance efforts in areas with high introduction risks and for species with low detectability by members of the public and rapid spread. We compare the model outputs to simpler heuristic approaches and discuss the advantages and limitations of using a bioeconomic framework for designing risk-based pest surveillance programmes.

Quarantine forest species surveillance in Portugal

Bonifácio, L.

INIAV - National Institute for Agrarian and Veterinary Research, Quinta do Marquês, Oeiras, Portugal

Abstract

The Portuguese official list of forest quarantine species includes dozens of Insects, fungi, bacteria and nematodes, with thousands of samples being analysed each year at referenced laboratories. The presentation will show the full list of species and sampling volume, with special emphasis to and the bacteria (*Xylella fastidiosa*) and Pinewood nematode – PWN (*Bursaphelenchus xylophilus*), since Portugal is the only European country where PWN is present.

Surveillance of quarantine forest pests in Croatia: analysis of practice and challenges

Matošević, D., Zorić, N., Jukić, A., Krcivoj, T., Cvetković, F., Marijanović, A.

Croatian Forest Research Institute, Jastrebarsko, Croatia

Abstract

Surveillance of quarantine forest pests is one of the main priorities of forest health monitoring programme in Croatia. In this presentation we will concentrate on the methodologies and equipment used for surveillance of forest pests in Croatia. This incorporates traditional approaches, such as visual inspections, trapping, morphological and molecular analyses, conforming to the EFSA and EPPO guidelines. New methods and technologies are also used: small aerial vehicles or drones equipped with multispectral, hyperspectral and thermal sensors which provide a better insight into forest health and damage where pests can be monitored over larger areas. Specific tools as LAMP essays are also used as early detection tool for quarantine forest pests. Long term experience and results from the last 10 years of surveillance can serve as a foundation for the development of targeted strategies and informed decision-making for future surveillance programs, enabling the prevention of introduction and spread of quarantine forest pests and continued protection of forest ecosystems in Croatia.

Forest Health Surveillance in Ireland

McDonald, T.

Department of Agriculture, Food and the Marine, Ireland.

Abstract

Ireland does not have the range of forest pests and diseases found on the European continent and overall has relatively good forest health status. Ireland has Protected Zone status, recognised in European Union Plant Health legislation, for a range of harmful forestry organisms which are present in other EU Member States but are not present in Ireland. To justify Ireland's Protected Zone status, the Forestry Inspectorate of the Department of Agriculture, Food and the Marine is required to conduct annual national forest health surveillance and submits reports annually to European Commission. In fulfilment of this requirement and for general forest health monitoring purposes, a network of observation points, pheromone traps, bait logs and sampling points distributed around the country in public and private forests, ports and forest nurseries. None of the forestry Protected Zone species, bark beetles in particular have ever been found as part of this surveillance. However, the non-European bark beetle *Pseudips mexicanus* was found in pheromone traps in Ireland in 2023 and in 2024.

Feedback from French experience with cancer stain (*Ceratocystis platani*)

Maire, F.

Dendro Patho Formation Production (DPFP), Chemin de Canet, Viens, France

Abstract

Canker stain disease caused by *Ceratocystis platani* is a serious threat for plane tree (*Platanus* sp.) populations. The fungus reaches all *Platanus* species, and can cause significant damages on urban and natural populations of plane tree. In France, the disease has killed hundreds of thousands of planes trees since the end of World War II. On the Canal du Midi, since 2006, year of introduction of the disease, it was cut 30,000 plane trees out of the 42,000 that shaded the Canal. The Parc de la Tête d'Or in Lyon has lost half of its plane in 20 years. The mains vectors are human activities connected to infected tools, water and beetles. *Ceratocystis platani* is a quarantine organism in Europe and outbreak management is complex and very expensive.

The aim of this presentation is to share the French experience regarding the management of the disease and the methods used. We will discuss the text of the law in force and the existing documents to help manage this scourge.

For now, there is no curative methods, only prophylactic actions can prevent or limit the spread of the disease.

It is necessary to alert countries, not yet affected by the disease, to implement preventive measures like prohibiting the importation of plane tree species from infected countries, and make it mandatory to disinfect tools when working on or near plane trees.

Poland's Preparedness for Plant Biosecurity Threats: The Role of Simulation Exercises on *Agrilus planipennis*

Całusińska, P.¹, Stepnowska, A.¹, Olejniczak, A.²

¹ State Plant Health and Seed Inspection Service (SPHSIS), Warszawa, Poland

² Institute of Plant Protection – National Research Institute (IPP – NRI), Warszawa, Poland

Abstract

Agrilus planipennis (emerald ash borer) is a beetle from the *Buprestidae* family and is listed as a priority quarantine pest in the European Union. It poses a serious threat to ash trees in both urban and forest environments. Although the species has not yet been detected in Poland, its confirmed presence in neighboring countries highlights the need for effective preparedness and risk mitigation strategies.

As part of the national phytosanitary preparedness system, the State Plant Health and Seed Inspection Service (Polish National Plant Protection Organisation) organized a series of simulation exercises, addressing the potential introduction and spread of *Agrilus planipennis* in Poland. The exercises were conducted at both the central and regional levels, involving field inspectors, laboratories, and relevant partner institutions. The simulation scenarios included detection of a pest outbreak, diagnostic procedures, establishment of infested zones, implementation of official control measures, and communication with national and local stakeholders.

Simulation exercises are recognized as a key preparedness tool within the European Union. According to Regulation (EU) 2016/2031 on protective measures against plant pests, each Member State is required to conduct simulation exercises to test the functioning of their contingency plans. These exercises help verify coordination mechanisms, assess response capabilities, and strengthen operational readiness for emerging phytosanitary threats.

This poster outlines the scope, methodology, and outcomes of the exercises carried out in Poland. The initiative contributes to building a robust national response framework and aligns with EU-wide efforts to enhance plant biosecurity. It also provides valuable insights into practical implementation of contingency planning and risk communication in a real-world institutional context.

Session II

Tools and methods in biosecurity

Synthesizing research and scanning horizons for urban tree health

Marčiulynienė, D.¹, Franić, I., Prospero, S., Branco, M., de Groot, M., Aday Kaya, A. G., Akyol, S., Augustinus, B., Avtzis, D., Bełka, M., Beram, C., Birben, Ü., Blagojević, J., Blumenstein, K., Bragança, H., Brockerhoff, E., Burokienė, D., Cleary, M., Corcobado, T., Čepukoit, D., Davydenko, K., Diez, J. J., Đorđević, I., Drenkhan, R., Drenkhan-Maaten, T., Dvořák, M., Economou, A., Ipekdağ, K., Ghelardini, L., Grigorov, B., Hysa, A., Hoppe, B., Jürisoo, L., Kacprzyk, M., Kavallieratos, N. G., Klavina, D., Korkmaz, Y., Köpke, K., Krajter, S., Koç, M., Lehtijärvi, H. T. D., Lehtijärvi, A., Luchi, N., Maire, F., Matošević, D., Matsiakh, I., McCarthy, N., Mocreac, N., Morales-Rodriguez, C., Oskay, F., Papazova, I., Paletto, A., Paraschiv, M., Pavlović, L., Romeralo, C., Samson, R., Santini, A., Sellami, D., Silva, A. C., Sotirovski, K., Soulioti, N., Stein, F., Terhonen, E.L., Topalidou, E., Vannini, A., Vettraino, A. M., Vuletić, D., Weiss, M., Woodward, S., Zlatković, M., Witzell, J., Jactel, H.

¹ Lithuanian Research Centre for Agriculture and Forestry, Institute of Forestry, Kaunas; Lithuania

Abstract

Cities are often the initial hotspots for the introduction of new pests, with potentially severe consequences for urban and natural ecosystems. To mitigate these risks, effective, applicable, and socially acceptable methods and tools are essential. Yet, a comprehensive overview of such methods, especially in urban contexts, has been lacking.

Working Group 2 (WG2) of COST Action CA20132 *Urban Tree Guard* addressed this gap through two complementary efforts. First, we conducted a systematic review of methods targeting 20 priority pests from the EPPO A1 and A2 lists, covering detection, identification, monitoring, management, and eradication. Our analysis revealed a significant increase in the number of method records over time, particularly for management approaches. Research effort was unevenly distributed, with substantially more studies conducted in the non-native range than in the native range of target pests. These findings show that current efforts have been largely reactive, with most attention given to management in non-native ranges, while prevention, early detection, and rapid response remain underrepresented. Second, WG2 initiated Horizon Scanning to identify promising technologies and approaches for future applications in urban biosecurity. Following a workshop in Poznań, 18 candidate methods were collected and are currently being scored by experts according to Technology Readiness Level (TRL) and urban applicability. This process will result in a co-authored publication that recommends a shortlist of the most promising urban biosecurity innovations.

Taken together, review and horizon scanning provide a robust evidence base to support practitioners, citizens, and policymakers in strengthening urban biosecurity and safeguarding green spaces.

Early detection of exotic pests across urban and forest environments – integrating risk-based surveillance systems in New Zealand

Meurisse, N.

Bioeconomy Science Institute (previously Scion, the New Zealand Forest Research Institute), Rotorua, New Zealand

Abstract

Background: Trees—across natural forests and plantations, urban and amenity plantings, and other landscapes—face growing threats from invasive pests and pathogens. Despite strong pre-border and border biosecurity measures, new incursions are detected each year. Early detection at high-risk sites is essential to prevent establishment and spread.

Objectives: Traditionally focused within production forests, the approach to tree pest surveillance in New Zealand has evolved into a risk-based model. Rather than concentrating solely within forests, surveillance now targets high-risk entry points associated with import pathways and traveller movements. This presentation outlines two complementary national surveillance programmes currently operating in New Zealand: the *High-Risk Site Surveillance (HRSS)* and *Forest Biosecurity Surveillance (FBS)* systems. HRSS targets pests that could affect all trees and woody species across all environments, while FBS focuses on protecting commercial plantation species.

Methods: HRSS and FBS allocate surveillance effort using two complementary models:

- A common pest entry and establishment risk model, which maps the relative likelihood of introductions across sites and pathways.
- A surveillance optimisation model, used primarily in FBS, which allocates resources based on risk while factoring in cost, logistics, and survey feasibility.

Results: Both programmes improve early detection capacity across all tree types by focusing on high-risk urban and peri-urban locations. Surveillance is prioritised at sites where exotic pests are most likely to arrive, such as ports, transitional facilities, car yards, and other urban environments.

Conclusions: HRSS and FBS represent a modern, risk-based approach to forest and tree biosecurity. They also complement traditional *Forest Health Assessments*, still conducted within plantations, to monitor tree condition and detect emerging threats. Collectively, these systems provide a layered defence and offer transferable insights for other countries facing similar biosecurity challenges.

PORTRAP SORE 2021-2024: A trapping network using generic lures for early detection of non-native xylophagous species at ports-of-entry in France

Roques. A.¹, Saintonge. F.-X.², Barnouin, T.³, Auger-Rozenberg, M.-A.¹

¹ INRAE, Unité de Recherches Zoologie Forestière, Orléans, France

² Département santé des Forêts, Orléans, France

³ Office National de Forêts, Laboratoire National d'Entomologie Forestière, Quillan, France

Abstract

Due to globalization and renewed trade routes, insect invaders are increasingly consisting of “emergent” species, which have never been observed before in areas other than their native ones, and thus often not included in the quarantine lists. The use of traps baited with blends expected to provide a generic attractiveness at genus or insect family level may enhance the possibilities to detect such unpredicted species at arrival. Since 2021, the National French project PORTRAP SORE deployed traps baited with a blend including 10 pheromones of Cerambycidae in 29 sites considered as potential ports-of-entry in the country. The traps were additionally implemented with ethanol and (-) α -pinene, two plant volatiles known to have a generic attractiveness for bark and ambrosia beetles. The trapping design consisted in a pair of black and green traps installed in the port and a similar pair placed in nearby wooden areas located within a radius of 1 km from the port.

Overall the 2021-2024 period, a total of 28 non-native species were detected, of which three intercepted for the first time in Europe. Species included eight Cerambycidae, 12 Curculionidae, four Bostrychidae, two Dryophthoridae, one Anthribidae and one Zopheridae. While only 11 non-native species were trapped for 510 individuals in 2021, these numbers increased to 18 species for 1503 individuals in 2024. In 2024, non-native xylophagous species have been intercepted in 24 of the 29 surveyed sites, with a maximum of eight species on the Corsican port of Bastia. Most species did not move outside the port of arrival but the trapping network allowed to follow the dispersal within the country of the cerambycid *Xylotrechus stebbingi* and the ambrosia beetle *Xylosandrus crassiusculus*, both likely vectored by domestic ornamental trade. The recurrent captures of eight of the aforementioned beetles has led to an ongoing categorization by phytosanitary services.

Role of birds as predators of non-native and native pests of urban trees

Basile, M.¹, Augustinus, B.A.¹, Cornejo, C.¹, Tschumi, M.², **Brockerhoff, E.G.**¹

¹ Swiss Federal Research Institute WSL, Birmensdorf, Zurich, Switzerland

² Swiss Ornithological Institute, Sempach, Lucerne, Switzerland

Abstract

Background: Insectivorous birds may contribute to urban tree biosecurity by feeding on non-native (and native) insect pests of trees, potentially also reducing the likelihood of establishment of new pests.

Objectives: Our objectives were to study bird species composition and abundance in relation to gradients of urban tree cover, as well as the potential role of insectivorous birds in mitigating impacts of non-native tree pests.

Methods: We studied birds in three Swiss cities at replicated sites with tree cover ranging from industrial/commercial areas with low tree cover, to residential areas with intermediate tree cover, parks/cemeteries with high tree cover, and semi-natural peri-urban forests with high tree cover. We assessed insectivory of birds by determining predation rates of horse chestnut leaf miners as well as caterpillar mimics placed in trees. In addition, we used high-throughput DNA detection to identify prey species in faecal samples obtained from birds captured by mist-netting in urban and peri-urban areas.

Results: Tree cover and tree species composition significantly influenced bird diversity and insectivory, and urban tree cover levels >30% were found to be beneficial for both parameters. Faecal samples from birds revealed 259 zOTUs comprising 221 species, of which 13 were non-native invasive species, including the stink bug *Halyomorpha halys*, the lady beetle *Harmonia axyridis*, and the spotted-wing drosophila *Drosophila suzukii*. We found 70% fewer invasive species in forest samples and 27% more in urban samples than what was expected by chance, indicating proportionally higher levels of predation of birds on invasive species in urban areas than in forests.

Conclusions: The influence of native tree cover in particular has the potential to increase the insectivory function delivered by birds, with expected benefits for non-native insect control. We show that bird insectivory in urban habitats may mitigate the negative effects of invasive species.

The green wedges system of Poznań: An urban planning vision ahead of its time

Bełka, M.

Poznań University of Life Sciences, Faculty of Forestry and Wood Technology,
Forest Entomology and Pathology Department, Poznań, Poland

Abstract

The green wedges of Poznań constitute a unique urban planning concept developed by Władysław Czarnecki in collaboration with Adam Wodziczko between 1930 and 1934. They represent one of the few realisations in Poland and Europe of the “green city” ideal. The plan foresaw sufficient green space for a future population of 600,000, although at the time the city had fewer than 300,000 inhabitants. Designed as a ring-and-wedge system, the layout links inner-city parks with suburban forests, with the wedges converging at the city centre and interconnected by three concentric green belts.

The first belt was created on the site of the medieval city walls, fragmented by the dense fabric of the Old Town. The second transformed the inner line of former Prussian forts, including the citadel, into green areas. The third developed around the outer line of forts. The wedges extend into the surrounding landscape, connecting the city to three Natura 2000 sites (“Dolina Cybiny”, “Dolina Samicy”, “Biedrusko”), as well as to Rogalin Landscape Park, Wielkopolska National Park, and the buffer zone of the Zielonka Forest. The design also incorporated the natural valleys of the Warta, Bogdanka, and Cybina rivers, alongside lakes Maltańskie, Rusałka, Strzeszyńskie, and Kierskie.

The scheme’s primary aims were to safeguard water resources, establish ventilation corridors, enhance residents’ quality of life, and provide accessible recreational spaces. Walking and cycling trails, and originally also bridle paths, were designated. While most areas are forested, the system also includes meadows, pastures, cemeteries, and allotment gardens. Today, Poznań’s green wedges remain largely intact, though their condition varies across the city.

Synthetic Data Augmentation for Tree Pest Detection in Aerial Imagery

Gutton, N., Pagot, E., Samalens, J.-C.

Telespazio, France

Abstract

The European Union Horizon Europe Research Programme funds the FORSAID project (under grant n°101134200), which aims to leverage innovative technologies to improve the surveillance of alien and quarantine pests of trees. Remote sensing, combined with artificial intelligence, offers strong potential for the early detection and classification of tree damage. However, deep learning models typically require large volumes of human-labeled data, which in our case is both limited and unbalanced, with diseased tree instances notably underrepresented. Our work explores the effectiveness of generative methods to augment and balance a dataset dedicated to the detection of three stages of Pine Wood Nematode damage on drone imagery. We aim to improve the model's generalization capacity for detection on new imagery from different forest landscapes in France and Portugal. To this end, we curated a benchmark dataset of annotated orthoimages containing healthy, diseased, and dead pine trees. We developed generative pipelines combining GANs, diffusion models, and image blending techniques to synthesize realistic tree instances. Healthy trees in orthoimages were delineated and replaced with synthetic damaged versions within existing scenes. These methods simultaneously increased dataset diversity and addressed class imbalance. We evaluated their impact by comparing object detection model performance with and without synthetic data.

Proof of concept: Trapping for early detection of quarantine *Agrilus* species in Great Britain

Parker, K., Williams, D.

Forestry Commission, UK

Abstract

Forestry Commission completed an *Agrilus* trapping trial in England during 2024 to evaluate resource and design. Green sticky prism traps were deployed at 35 sites across England in close proximity to firewood importers/distributors, ports and harbours, with traps placed in the canopy of host broadleaved tree species. The target *Agrilus* species for early detection are *A. planipennis* (emerald ash borer), *A. anxius* (bronze birch borer), *A. bilineatus* and *A. fleischeri*; these quarantine organisms are not present in the UK. This study tested the trap design and implementation by aiming to capture species of *Agrilus* present in the UK as a proof of concept. Results from the preliminary year of the FC *Agrilus* trapping network proved to be very insightful and demonstrated that the deployment of green sticky prism traps in tree canopies was a relatively straightforward and effective surveillance approach for *Agrilus* beetles. The capture of 138 *Agrilus* beetles, representing seven *Agrilus* species is quite an achievement, considering that there are currently only 11 known species in the UK. A repeat survey has commenced in 2025 to further inform future trapping programme design, and ongoing literary review is used to further refine these early detection methods.

Session III

Decision support for biosecurity

Prototype decision-making tool for choosing tree species to plant in cities

Jactel, H. ¹, Lebert, L. ^{1,2}

¹ INRAE, umr biogeco, 33612 Cestas, France

² Université Laval, Québec, Canada

Abstract

Background: Urban forests are widely recognised for the many services they provide to citizens, including thermal comfort, pollution reduction, amenities and biodiversity. However, not all tree species contribute equally to people's well-being. They also vary in terms of their resistance to the many stresses present in urban environments and are more or less easy to plant and maintain. It is therefore necessary to help urban forest managers identify tree species that offer the best compromise between the services they provide and the constraints of tolerance and management.

Objectives: The main objective of the study was to develop a proof of concept for a user-friendly decision-making tool capable of integrating a set of criteria related to ecosystem service provision, disservices, stress tolerance and management constraints for common tree species in Europe, and to combine them in order to identify those that should be prioritised for planting in cities.

Methods: We have identified the 40 tree species most frequently planted in major French cities. For each species, we documented 38 criteria corresponding to ecosystem services (pollution control, carbon storage, heat mitigation, water runoff control, human well-being, biodiversity...), disservices (allergies, risk of injury, damage to roadways, etc.), tolerance to abiotic stresses (e.g., drought, soil compaction) and biotic stresses (native and non-native pests and pathogens), and management constraints (e.g. tree growth, pruning, etc.). We then used the Promethee algorithm to aggregate all these criteria and provide a comprehensive ranking of the tree species tested, from most to least preferred.

Results: We were able to quantitatively or semi-quantitatively estimate 28 criteria from among the 38 preselected for the 40 tree species. Preference functions were used to normalise these criteria to enable their aggregation. Tree species were successfully ranked from best to worst based on maximising service provision and tolerance to multiple stresses, as well as minimising disadvantages and management constraints. The ranking of tree species differed depending on the weighting assigned to the different criteria.

Conclusions: This study demonstrates that it is possible to design a multi-criteria decision-making tool to compare the suitability of tree species for planting in urban areas. It shows that criteria with different quantitative or qualitative measures, which must be either maximised or minimised, can be aggregated in the search for a compromise. The method also allows criteria to be weighted individually, giving users the possibility to assign different weights to different criteria, depending on their specific objectives. However, challenges remain, such as documenting a larger number of criteria for more tree species in order to transfer the tool to the European level. The data and knowledge gathered collectively as part of the Urban Tree Guard project should provide a solid basis for this development.

New challenges in monitoring tree health and invasive pathogens in urban environments and support decision

Latini, M.¹, Riggi, S.¹, Morales-Rodriguez, C.¹, di Pietro, M.², Paganini, R.², Vannini, A.¹

¹ DIBAF – University of Tuscia, Viterbo, Italy

² SmarTrees srl, Viterbo, Italy

Abstract

Tree health and biosecurity are paramount for ensuring the performance of urban green spaces and their provision of ecosystem services. Innovative general and specific approaches can support this mission by offering valuable tools and metadata to inform decision-making. One such tool is the Decision Support System (DSS), increasingly adopted by major cities to guide urban planning and management.

Integrating informative layers into DSSs—such as data on urban tree composition, history, and health status—can significantly enhance their capacity for monitoring tree health and assessing risk.

Multisensor devices, strategically installed across different urban green space typologies, can collect extensive temporal datasets. These data are crucial for evaluating the impact of various environmental factors, including biotic stressors. For instance, sap flow curves from chestnut trees affected and unaffected by *Phytophthora* root rot offer valuable insights into disease impact.

This information can be further enriched by metabarcoding, which explores microbial biodiversity associated with trees, as demonstrated in several recent pioneering studies.

Another emerging opportunity lies in laser scanning technologies, employed through both proximal and remote sensing methods. Alternatively, simpler panchromatic image scanning using a ‘street view’ approach can yield detailed, individual-level data on urban trees.

The major advantage of these novel approaches is their ability to create temporal data layers, which can be integrated into DSSs. These layers enable differential visualization of tree conditions and performance over time, enhancing urban forestry management.

These innovations represent a fundamental step toward more sustainable and resilient urban management, where tree health becomes a key indicator of environmental quality and urban well-being.

Know them to stop them: The first world database on bio-ecology and distribution of Scolytinae

Marchioro, M.¹, Kertesz, V.², Czwieniczek, E.², Stancanelli, G.², Faccoli, M.¹

¹ University of Padua, Department of Agronomy, Food, Natural resources, Animals and Environment (DAFNAE), Padua, Italy

² European Food Safety Authority (EFSA), Parma, Italy

Abstract

Scolytinae (Coleoptera: Curculionidae) are one of the most successful groups of invasive forest species. They generally move among continents transported within live plants, timber and wood-packaging materials. This grants them protection from adverse travel conditions and allows them to often go unnoticed by phytosanitary inspections. The economic and ecological damage caused by these insects are caused both by the direct action of burrowing within host plant tissues and by the plant pathogens vectored by some species. Typically, monitoring protocols consist of ethanol-baited traps or pheromones-baited traps for specific surveys at points-of-entry and surrounding forests, in order to detect new introductions at an early stage. However, knowledge of their bio-ecological traits, as well as their origin, is essential to contrast the introduction of new and potentially harmful species. This kind of information is scattered through a large amount of papers, catalogs and books, not always easily available. For this reason, an online open access database collecting information for all the 6,501 Scolytinae species currently known was created: "Scolytinae hosts and distribution database" (<https://www.scolytinaehostsdatabase.eu/site/it/home/>).

The database contains information on their reproduction, feeding habits, host plants and distribution. The database is kept updated yearly with information from new publications. Moreover, a new project aims to expand the database adding pictures and information about diagnostic methods for identification of the species, both morphological and genetic; and giving information on the impact of the species, particularly on the transmission of pathogenic fungi. With this database, it will be possible to quickly retrieve a wealth of information on Scolytinae, that will be useful in planning effective monitoring methods and thus preventing new introductions. By knowing the host plants and the origin of the species it will be possible to plan more targeted phytosanitary policies and protocols.

Improving pinewood nematode monitoring in France based on risk analysis

Grosdidier, M.¹, Kersaudy, E.², Tassus, X.³

¹ Plateforme ESV, INRAE, Avignon, France

² Pôle Santé des Forêts, Direction régionale de l'alimentation, de l'agriculture et de la forêt de Nouvelle-Aquitaine, Bordeaux Cedex, France.

³ ANSES, Angers Cedex, France

Abstract

The Plant Epidemiological Surveillance Platform (ESV Platform) is in charge of improving plant health surveillance in France. The platform is made up of experts from 7 partners (INRAE, Anses, DGAI (Ministry of agriculture), Chamber of Agriculture, FREDON, Agricultural technical institute, Cirad). Surveillance, analysis, and advice are the main areas of action for public policy and plant health professionals. The ESV Platform includes many working groups dedicated to a specific topic (*Xylella fastidiosa*, Huanglongbing, pinewood nematode (PWN), vine dieback, ...). PWN, *Bursaphelenchus xylophilus*, is a UE priority quarantine pest, obliging each state member to monitor and to manage this pathogen on its territory. The PWN monitoring working group brings together experts and professionals to work on improving surveillance of this pest.

As part of this effort, a relative risk analysis was conducted. After identifying the risk criteria, a multi-criteria analysis was carried out with the experts of the working group, resulting in maps that can be used by risk managers. Thus, areas at risk of PWN entry and establishment have been identified, as well as areas at risk of disease expression in France. Based on these results, surveillance conducted in recent years was evaluated, and a sampling plan is proposed.

Moreover, the insect vector population was estimated according to two models to better target the risk of establishment and improve insect monitoring through trapping.

The invasion framework helps the management of the spread of canker stain disease of plane trees.

Santini, A., Pepori, A.L., Pecori, F., Luchi, N.

National Research Council, Institute for Sustainable Plant Protection, Sesto Fiorentino, Florence, Italy

Abstract

Ceratocystis platani, the causal agent of canker stain disease (CSD), is an invasive forest pathogen (IFP), native to North America and introduced to Europe during World War II. The outcome of the disease is almost always fatal, and it can completely alter natural, planted and urban forests and woody landscapes. Oriental and London plane trees in some parts of Europe are currently at risk of extinction in both urban and natural areas, as there are no limiting factors to the spread of this pathogen wherever plane trees grow. This results in direct and indirect impacts on natural and human communities, including significant alterations in species richness and abundance, as well as the loss of various ecosystem services.

The invasion process of IFPs consists of four main stages: the arrival of individuals (propagules) in a new territory, sometimes followed by a phase of population establishment, then its development into an epidemic phase, and finally its geographical expansion. The principle of preventing the risks associated with these invasive species is to hinder the transition from one phase to the next as quickly and effectively as possible.

Here we highlight how the development and validation of various early and highly sensitive detection methods, both biochemical and molecular, can prevent the further spread of the CSD to the east and north Europe, as well as to better understand the biology of the pathogen.

Two targets at one shot – entomopathogens against insect pests and plant pathogens

Čepukoit, D., Jaseliūnaitė, S., **Burokienė, D.**

State Scientific Research Institute Nature Research Centre, Vilnius, Lithuania

Abstract

The bark beetle *Ips typographus* has recently become one of the most destructive biotic agents in mature spruce forests in Europe. This beetle is widespread in the distribution area of its main host, *Picea abies*. Ecologically, this pest is an integral part of the spruce ecosystem. It colonises fallen, stressed, or dying trees until its population exceeds a critical level. However, the rapid intensification of climate change is altering forest ecosystems. Aggressive beetles are now killing healthy trees in large numbers. Once they exceed a critical threshold, they cause considerable economic damage to European forests. Despite the presence of aggressive insect pests in European forests, phytopathogenic fungi such as *Alternaria*, *Diaporthe*, *Fusarium*, and *Phytophthora* are important for both forests and nurseries. These pathogens cause significant losses every year, so effective methods of biocontrol must be found. Chemical pesticides are widely used to control plant diseases. However, they have a negative impact on the environment and disrupt the balance of the ecosystem. For this reason, attention is increasing focussing on natural alternatives, especially on the biocontrol potential of microorganisms. Entomopathogenic fungi (EPF) are widespread in nature and have been shown to have considerable biocontrol potential against insect pests and plant pathogenic fungi. In this study the antagonistic effect of EPF's on phytopathogens was analysed. The results showed that certain isolates of the microorganisms exhibited high antagonism against the most important plant pathogens (*D. eres*, *F. culmorum*, *F. oxysporum*, *Ch. thielavioides*, *B. cinerea*, *P. cactorum*). Further studies will investigate the pathogenicity of EPF in *Galleria mellonella* (model organism) beetles. This work will help to provide information on the use of entomopathogens in biocontrol against insect pests and potential plant pathogens. The results of this study will contribute to the development of biocontrol measures for the protection of forests, seedlings and nurseries.

One-Stop Shop for Resilient, Future-proofed Urban Treescapes (FREE3)

Östberg, J.

Nature Based Solutions Institute, Malmö, Sweden

Abstract

A steadily increasing proportion of Europeans lives in urban settings, where green infrastructure is vital for quality of life. Urban trees are a central element, improving air quality, mitigating urban heat, supporting biodiversity, and offering social, psychological, and economic benefits. However, urban environments challenge tree health due to pollution, heat, and limited soil. Urban trees risk premature decline from inadequate management, especially in small and medium cities lacking access to updated, future-proof information.

FREE3 builds on the COST Action CA20132 (UrbanTreeGuard) and develops a free, open-source “one-stop shop” platform to support urban tree management. The project will offer a tree inventory tool, risk assessment resources, and decision-support systems for best practices in urban forestry. It includes training, webinars, and stakeholder engagement to support implementation and long-term sustainability. The aim is to enhance resilience, ecosystem services, and livability of European cities.

Session IV

Pests and pathogens in urban settings

The status of *Ceratocystis platani* in Türkiye: Spread beyond Istanbul

Doğmuş-Lehtijärvi, H.T.¹, Beram, C.R.², Aday Kaya, A.G.³, Ozdemir, S.⁴, Woodward, S.¹

¹ Isparta University of Applied Sciences, Faculty of Forestry, Cünür, 32260 Isparta, Türkiye

² Faculty of Science, Pamukkale University, Denizli, Türkiye

³ Isparta University of Applied Sciences, Yenişarbademi Vocational School, Isparta, Türkiye

⁴ Isparta University of Applied Sciences, Sütçüler Prof. Dr. Hasan Gürbüz Vocational School, Isparta, Türkiye

Abstract

The presence of *Ceratocystis platani* causing serious dieback and mortality of *Platanus x acerifolia* and *P. orientalis* was confirmed in European districts of Istanbul in 2018 (Lehtijärvi et al. 2018). At that time, a survey along roads and in parks indicated that the disease was more marked following management interventions, including pruning and felling.

In late 2023, dying *Platanus* were observed in towns, cities and the wider environment in locations in Anatolia (Asia) to the south and west of Istanbul, including the Marmara region and as far south as Denizli. A project began in 2025, therefore, to determine the spread of *C. platani* in Türkiye and to provide training to local tree managers in the recognition of the problem.

Loop-mediated isothermal amplification (LAMP) technology was used for the first time in Türkiye to identify the pathogen in infected tissues in the field. The pathogen was found in trees of both *P. orientalis* and *P. x hispanica* and data on occurrence analysed using the Kriging approach to visualize spatial distribution patterns, hotspots and risk areas, enabling accurate predictions in areas with low sampling density.

Information on recognition of diseased trees and infection biology of *C. platani* is being provided in training courses and workshops for municipal employees, quarantine officers and personnel from the General Directorate of Forestry, emphasizing the threat of plane stain canker and detailing the importance, use and application of the LAMP device. Practical training will be included to ensure that participants can use this technology effectively. In these courses, field personnel become more proficient in pathogen detection, enabling a more proactive role in combating serious quarantine diseases like plane tree canker.

Management of *Ips typographus* in the UK

Sumner-Kalkun, J.¹, Cavadino-Phillips, I.¹, Deol, A.², Toft, F.², McGovern, P.², Bridges, M.¹, Carter, R.¹, Manea, A.¹, Theissen, A.¹, Vaughan, O.¹, Facey, S.¹, Blake, M.¹

¹ Forest Research, Wrecclesham, Surrey, UK

² Forestry Commission, Bristol, UK

Abstract

The larger eight-toothed spruce bark beetle (*Ips typographus*) is one of the most damaging pests of spruce (*Picea* spp.) across Europe. Spruce makes up more than 50% of commercial planting in the UK, so it is vital this beetle species is prevented from establishing. Breeding populations of *Ips typographus* were not found in England until 2018, when they were discovered and eradicated from Kent, England. Since 2021, subsequent incursions in Kent, Sussex, Norfolk and Suffolk have been detected. Extensive work has shown that these are the result of long-distance dispersal from the continent. Methods of surveillance and management of *I. typographus* in the UK have developed since 2018, leading to more efficient monitoring and detection. Evidence shows that current eradication campaigns have been successful in significantly lowering *I. typographus* activity by removing spruce and preventing onward spread to surrounding sites, compounded however, by regular dispersal events from continental Europe. This talk will explore the current surveillance and eradication methods in place to prevent this species from establishing and causing significant economic and environmental damage to our forestry and timber industries. We will also examine how our strategies have changed throughout the years and how they will develop in the future.



Fig. 1. Pheromone trap baited with *Ips typographus* lure used as part of the surveillance strategy to monitor and eradicate *Ips typographus* in the UK.

Acknowledgement: This work was supported by the UK Government Department for Food, Environment and Rural Affairs; Forestry Commission England and Forest Research.

Safeguarding against Pine Wilt Disease: Monitoring pine-associated nematodes and their beetle vectors in Great Britain

Whitham, T.^{1, 2}, Correia, M.³, Ryalls, J.², Bell, L.², Inácio, M. L.^{4, 5}, Girling, R.², Platoni, A.¹, Blake, M.¹, Bonifácio, L.^{4, 5}, Prior, T.³, Facey, S.¹

¹ Forest Research, Farnham, Surrey, UK

² School of Agriculture, Policy and Development, University of Reading, Reading, UK

³ Fera Science Ltd., York, United Kingdom

⁴ INIAV, Oeiras, Portugal

⁵ GREEN-IT Bioresources for Sustainability, Oeiras, Portugal

Abstract

Pine wilt disease (PWD), caused by the pinewood nematode, *Bursaphelenchus xylophilus* (PWN) and transmitted by *Monochamus* beetles, poses a serious global threat to coniferous forestry. Despite rigorous border surveillance and containment measures, the spread of PWN persists. In the UK, PWN and other *Bursaphelenchus* species have been detected in infested wood materials arriving at ports and processing facilities, with such interceptions projected to increase.

To safeguard the UK's PWN-free status, annual nationwide (GB) surveys of coniferous forests are conducted to identify potential infections. Additionally, a targeted local survey at Alice Holt Forest in Surrey, examined nematodes carried by beetles. Together, these comprehensive efforts assessed the nematode communities associated with declining pine trees and their insect vectors.

Preliminary results indicate that while PWN has not been detected, other plant-parasitic nematodes are present within GB conifer stands. Beyond its role in preventing the introduction of *B. xylophilus*, this research contributes valuable insights into the diversity of native nematode species.

Impact of leaf miner moth infestation on fungal community composition in Horse Chestnut Leaves

Korkmaz, Y., Diener, S., Dörfler, J., Varney, J., Blumenstein, K.

University of Freiburg, Faculty of Environment and Natural Resources, Chair of Pathology of Trees, Freiburg, Germany

Abstract

The horse chestnut leaf miner (*Cameraria ohridella*) is a moth that creates larval galleries in the leaves of *Aesculus hippocastanum*. With multiple generations per year, the feeding larvae severely damage the horse chestnut's phyllosphere. In addition, fungal leaf pathogens contribute to necrosis, increasing leaf die-off and weakening these widely distributed urban trees. In recent years, drought stress has further intensified these symptoms, especially in urban environments. Despite the overlap of moth herbivory and fungal infection, the relationship between *C. ohridella* and leaf-associated fungi on otherwise symptomless leaves has not been investigated. This study tested whether leaf mining facilitates fungal colonisation or disrupts persistence through tissue modifications. We conducted a two-year, semi-controlled experiment on saplings using insect-proof enclosures with overwintered, infested leaf litter and separate controls. Foliar fungal communities were analysed with three complementary approaches: high-throughput DNA metabarcoding, traditional culturing, and airborne spore trapping. Fungal diversity remained stable, but community composition shifted between treatments. Opportunistic fungi colonised damaged tissues, while other taxa were excluded due to microhabitat disruption. Metabarcoding identified the broadest taxonomic range, culturing identified actively growing fungi, and spore trapping revealed airborne colonisers. Our findings show that herbivory-driven restructuring alters fungal communities in horse chestnut leaves. The loss of beneficial endophytes and the increase of opportunistic fungi may reduce host resilience and negatively impact tree health.

Foliar fungal endophytes of trees on a rural-urban gradient: a continental-scale study

Lanzavecchia, G.¹, **Franić, I.**¹, Augustinus, B.¹, Eschen, R.², Orbach, J.¹, Witzell, J.³, Prospero, S.¹

¹ Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Birmensdorf, Switzerland

² CABI, Delémont, Switzerland

³ Linnaeus University, Växjö, Sweden

Abstract

Urban areas are characterized by habitat fragmentation, altered climate (e.g., extreme heat and drought), high pollution, and a large proportion of non-native species. These challenging conditions impact urban trees and organisms associated with them, including foliar fungal endophytes. This is important because some fungal endophytes are known to help their hosts resist biotic and abiotic stresses, while others can become pathogens in weakened hosts. Urbanisation may alter endophyte communities directly, or indirectly via stress-induced changes in their hosts, potentially reducing their diversity and favouring generalists over specialists and pathogens over mutualists, with consequences for tree health. Despite their ecological importance, endophyte diversity in urban trees remains poorly understood, with most studies focusing on culturable taxa and on a limited number of tree species within small geographical areas.

This study aims to investigate foliar fungal endophytes along urbanisation gradients across European cities using high-throughput sequencing. We focus on three widespread broadleaf tree genera—*Quercus*, *Acer*, and *Fraxinus*—including native and non-native species at each location. In collaboration with participants of the COST Action CA20132 “Urban Tree Guard,” sampling was carried out in about 40 European cities in the summer of 2025. Within each city, trees were sampled at sites along a rural-urban gradient. Data on tree morphology, health status, and local tree diversity were collected and will be supplemented with open-access data on climate and land cover to analyse the relative importance of these factors in driving the differences in endophyte diversity. Additional sampling and exploratory data collection will be carried out in autumn 2025.

This study will enhance our understanding of how anthropogenic activities affect diversity patterns of tree endophytes on a continental scale and the potential consequences on tree-associated biodiversity. Ultimately, these findings represent groundwork for mitigating the effects of urbanisation and preserving the ecological functions of urban forests.

Birch pollen virome: fungal and plant viruses co-infecting urban trees in Berlin

Nouri, S.¹, Colino, H. F.¹, Kutnjak, D.², Pecman, A.², von Barga, S.¹, **Rumbou, A.**¹

¹Humboldt-Universität zu Berlin, Albrecht Daniel Thaer-Institute, Division Phytomedicine, Berlin, Germany

² National Institute of Biology, Ljubljana, Slovenia

Abstract

Viral epidemics in European birch have been spreading throughout Europe over the last two decades (1). The disease is called birch leaf-roll disease (BLRD) and is primarily attributed to a DNA badnavirus, birch leaf-roll-associated virus (BLRaV), although it usually involves a complex of co-infecting viruses (2). Consequently, a wide range of foliar symptoms may be exhibited, including interveinal chlorosis and necrosis, leaf rolling, reduced leaf size and mottling.

To investigate the virome of pollen samples from urban birches in Berlin, we applied RNA-Seq on two samples. Bioinformatic analyses revealed the presence of the known plant viruses BLRaV, cherry leaf roll virus and birch idaeovirus. Additionally, three mycoviruses were identified in those samples; the recently reported 'birch toti-like virus' (BTLV); a second totivirus not reported before; and a novel putative mitovirus. To validate the results, primers specific to BTLV were designed and pollen samples collected in spring 2025 were tested for the presence of the virus, which was confirmed.

To our knowledge, this is the first report of putative fungal viruses in tree pollen. The discovery of virus families, typically associated with fungal hosts, in birch pollen raises compelling questions about cross-kingdom viral transfer (3). However, we cannot exclude the possibility that these viruses are harboured by the pollen microbiome (4). As birches and other urban tree species propagated via tissue culture or in nurseries are not subject to virus regulatory controls, these pathogens continue to spread. Our aim is to raise awareness of the limited knowledge surrounding the biological relevance and broader ecological impact of the virome in urban tree populations, which are already under stress due to various factors.

Artificial inoculations of *Dothistroma septosporum* and *D. pini* on urban pines: A comparative study of disease progression and physiological changes

Corcobado, T.¹, Monteiro, P.², Neidel, V.¹, Schwanda, K.¹, Pinto, G.²

¹Austrian Research Centre for Forests, Department of Forest Protection, Unit of Phytopathology, Vienna, Austria

²Centre for Environmental and Marine Studies (CESAM), Department of Biology, University of Aveiro, Portugal

Abstract

This Short-Term Scientific Mission, funded by the COST Action "Urban Tree Guard (CA20132)," was carried out at the University of Aveiro aiming to perform artificial inoculations of *Dothistroma septosporum* and *D. pini* on two pine species (*Pinus sylvestris* and *P. pinea*). The main objective was to compare disease impacts on both hosts by evaluating infection rates (visual symptomatology), morphological traits (growth), eco-physiological parameters (leaf-gas exchanges and spectral reflectance indexes), and biochemical profiles. From 23 fungal isolates, one per species was selected based on highest sporulation and germination rates. Six-month-old seedlings were placed in a climate chamber under controlled conditions (16/8 h photoperiod, 18/15 °C day/night, 95% RH, PPFD 150 $\mu\text{mol m}^{-2} \text{s}^{-1}$). Moisture was maintained by manual watering to promote infection. Inoculations were done by spraying seedlings with a 480,000 spores/ml suspension; control plants were mock-inoculated with water. Leaf-gas exchange and spectral reflectance were measured at two, three, and four to five weeks post-inoculation. At the end, symptoms were assessed, and healthy-looking needles from symptomatic seedlings were collected for biochemical analyses of primary and secondary metabolism. Symptomatic needles were also tested using molecular methods to confirm both *Dothistroma* species presence.

Results showed that *D. pini* caused stronger effects on *P. sylvestris*, reducing growth and photosynthetic parameters, though without mortality. In *P. pinea*, both pathogens reduced growth and photosynthetic activity, with *D. septosporum* causing significant mortality. Biochemically, *P. sylvestris* had higher photosynthetic pigments, sugars, and flavonoids contents, while *P. pinea* showed higher lipid peroxidation (MDA), phenolics, and amino acids contents.

These findings underscore the differing susceptibility between pine species to *Dothistroma* species and contribute to understanding host-pathogen interactions in forest ecosystems.

Dothistroma needle blight on non-native pines in Central Europe: Emerging pathogen risks for urban and native forests

Blumenstein, K., Deutsch, L., Diener, S., Rana, A., Korkmaz, Y.

University of Freiburg, Faculty of Environment and Natural Resources, Chair of Pathology of Trees, Freiburg, Germany

Abstract

Non-native pine species are rarely present in German forests but are commonly planted in arboreta, botanical gardens, parks, and cemeteries. Many of these pines are showing needle blight symptoms indicative of *Dothistroma* spp., however there are hardly systematic studies of their fungal pathogens and limited to southern Bavaria. In our ongoing study, we surveyed 33 non-native *Pinus* species across multiple arboreta and botanical gardens from south to north: Freiburg, Tübingen, Hohenheim near Stuttgart, Frankfurt, Göttingen, and additionally Zurich, Switzerland. Symptomatic needles were sampled and analyzed using microscopy, fungal isolation, and DNA-based species-specific markers to detect *Lecanosticta acicola*, *Dothistroma septosporum*, and *D. pini*.

Our results reveal the distribution of needle blight pathogens across sites: both *Dothistroma* species co-occurred in Hohenheim, *D. pini* occurred only in Tübingen, *D. septosporum* was detected in Göttingen, and no *Dothistroma* infections were found in Frankfurt. In Freiburg and Zurich, both *Dothistroma* species were present, and *Lecanosticta acicola* was additionally detected. Infections were generally limited to a single pathogen per tree, with occasional co-infections.

These findings indicate that non-native pines, even less common species, may act as reservoirs of fungal pathogens in urban and peri-urban landscapes. Arboreta and botanical gardens—often located near natural forests—could facilitate pathogen spread to native pine populations and may create an ecological risk. Importantly, we confirmed pathogens at sites where they had not been previously recorded, highlighting their ongoing expansion and the need for more monitoring. Future work will extend to additional pathogens on the same trees, testing potential co-infections, including *Diplodia sapinea*, *Sydowia polyspora*, and *Lophodermium* spp., and surveys will expand to northern Germany, France, and Switzerland to provide a comprehensive assessment of pathogen pressures on native and non-native pines in European urban environments.

Biotic and abiotic damage to oaks in forest and urban habitats: A comparative study

Sikora, K.¹, Dziuk, A.¹, Sobolewski, R.K.², Tkaczyk, M.¹

¹Department of Forest Protection, Forest Research Institute, Sękocin Stary, Poland

²Department of Landscape Architecture, University of Environmental and Life Sciences, Wrocław, Poland

Abstract

Background: Oaks (*Quercus robur*, *Q. rubra*) play key ecological roles in both forest and urban ecosystems, yet they are increasingly threatened by decline caused by complex biotic and abiotic stressors. While Acute Oak Decline (AOD) has been extensively documented in natural forests, limited data are available on its occurrence in urban environments.

Objectives: This study aimed to compare the extent of biotic (mainly bacterial) and abiotic damage in oaks growing in forest and urban habitats, with a particular focus on the presence of AOD-associated bacterial pathogens.

Methods: Field surveys and microbiological sampling were conducted in 2023/2024 in two contrasting environments: urban areas of Wrocław and forest plots across western Poland. Symptomatic oaks were sampled, and DNA extracts were tested using multiplex real-time PCR targeting *Brenneria goodwinii*, *Gibbsiella quercinecans*, *Rahnella victoriana*, and *Lonsdalea quercina*. Forest trees were additionally assessed for abiotic injuries and signs of insect activity.

Results: In urban areas, 11 out of 56 oak trees tested positive for AOD-related bacteria, with *B. goodwinii* most frequently detected. Its presence in *Q. rubra* was confirmed for the first time in Poland. In forest habitats, biotic damage was less frequently linked to AOD bacteria but more often to bark injuries and secondary insect colonization, especially in sites with high drought stress. The overlap of multiple pathogens was more common in urban trees than in forest stands.

Conclusions: Urban trees, though exposed to severe abiotic stress, can serve as reservoirs for bacterial pathogens traditionally associated with forest decline. These findings underscore the need for integrated urban–forest health monitoring and highlight the role of environmental context in modulating oak vulnerability.

Possible causes of shoot dieback of *Juniperus excelsa* in Western Türkiye

Aday Kaya, G.¹, **Doğmuş-Lehtijärvi, H.T.**², Çiçek, N.², Cançelik, A.², Drenkhan, R.³, Woodward, S.²

¹ Isparta University of Applied Sciences, Yenişarbademi Vocational School, Isparta, Türkiye

² Isparta University of Applied Sciences, Faculty of Forestry, Isparta, Türkiye

³ Estonian University of Life Sciences, Tartu, Estonia

Abstract

A serious dieback problem on *Juniperus excelsa* was reported by the Turkish Forestry Directorate in the Lake District of Western Türkiye (Burdur, Bucak and Sütçüler provinces); these juniper trees are of great economic and ecological significance in Turkish forests and urban/ornamental plantings. This work, including an STSM, focused on possible fungal pathogens causing the dieback; the potential role of insects was ruled out by previous investigations.

The fungal community present in 900 shoots of 180 *J. excelsa* trees was sampled. Isolates (108) from affected *J. excelsa* trees were divided into 47 groups based on morphology. One or more isolates from each morphological group were selected and DNA extracted. PCR was used to amplify the ITS region using ITS1F and ITS4, and the amplicons sequenced at the Estonian Bioscience Centre, Tartu. BLAST analyses identified 21 species within the 47 groups, including several species previously associated with blights and cankers on junipers and several wide host-range pathogens. Potential pathogens of *Juniperus* identified included *Cytospora cedri*, *Kabatina juniperi*, *Dothiorella iberica* and *Phaeobotryon* sp., along with wide host-range pathogens, such as *Alternaria* spp., *Botrytis cinerea* and *Epicoccum nigrum*, and known decay-causing fungi.

In May 2025, pathogenicity tests were established in a growth room at IUAS, by inoculating stems of two-year old *J. excelsa* plants with mycelium from fresh cultures. Three months after inoculation, plants were destructively harvested and lesion lengths measured, to determine the most virulent of the species within the pathogen isolates.

Mapping of urban forest managers in protected areas in Serbia

Đorđević, I.¹, Češljarić, G.¹.

1. Department of spatial planning, GIS and forest policy, Institute of forestry, Belgrade, Serbia.

Abstract

Urban forests and protected areas are interconnected components of the broader ecological landscape, working together to provide essential ecosystem services, to support sustainable land use, particularly where protected natural spaces extend into or border urban environments, and to protect biodiversity. Their connection is particularly evident within the frameworks of green infrastructure and landscape planning. Urban forest includes all trees, forests and green spaces within and around urban areas. These spaces are managed to enhance citizens well-being and to support various recreational, aesthetic and ecological functions. From the other side, protected areas are legally and formally designed spaces aimed at long term protection of nature, biodiversity and ecosystem services. The effectiveness of both systems in delivering their intended functions is strongly dependent on the quality of urban forest management and urban forest managers play a critical role in this interface. To gain insight into who manages urban forests in Serbia, specifically within the context of protected areas, official database of the Agency of Nature Conservation was used. From this dataset, all protected areas located outside urban environments were excluded, allowing for the identification and mapping of urban forest managers operating within cities. To examine differences in the size of urban forests under various management types, non-parametric statistical tests, the Mann-Whitney U test (two groups) and the Kruskal-Wallis test (three and more groups), were applied. The analysis identified two main types and four categories of urban forest managers, which were subsequently mapped and spatially visualized (Figure 1 and Figure 2).

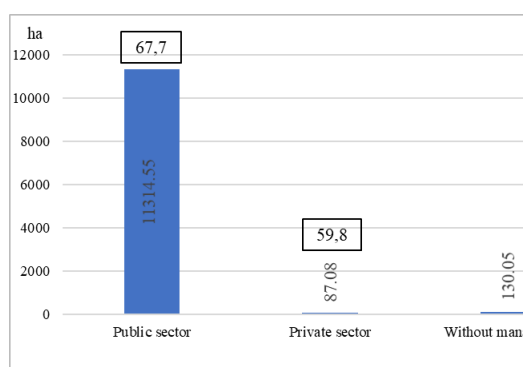


Figure 1. Type of urban forest managers (area, rank)

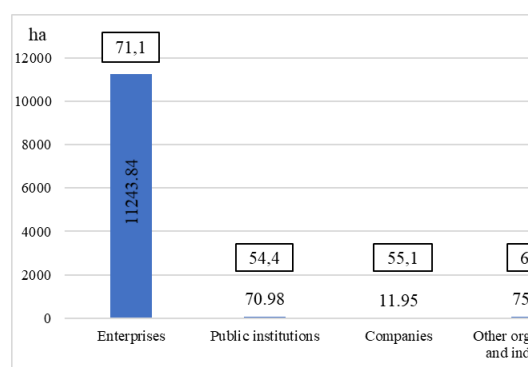


Figure 2. Category of urban forest managers (area, rank)

The results of the Mann-Whitney U test showed that there is no statistically significant difference in the size of urban forests between public and private sector managers ($U = 1269.000$, $Z = -0.974$, $p = 0.330$). Although the public sector had a slightly higher average rank (67,7) compared to the private sector (59,8), the difference was not statistically significant. This suggests that, on average, urban forest areas managed by the public sector are larger than those managed by the private sector. Additionally, the number of urban forests is higher in the public sector (103) compared to the private sector (28).

The Kruskal-Wallis test did not show a statistically significant difference in the size of urban forests among different categories of managers ($\chi^2 = 4.313$; $df = 3$; $p = 0.230$). Although enterprises had the highest average rank (71,1), the differences between the groups were not statistically significant. The high average rank for enterprises suggests that they generally manage larger areas of urban forests. In contrast, institutions, companies, and other organizations had lower average ranks (54.4 - 60.9), indicating that they manage smaller areas on average. Looking at the number of urban forest, enterprises (82) have the highest urban forest, compared to other organizations and institutions (23), public institutions (21) and companies (5).

Although the results showed no statistically significant differences in the size of urban forests managed by public versus private sector managers, or among the four manager categories, certain trends were observed. Public sector managers and enterprises, on average, manage larger urban forest areas, suggesting a concentration of management responsibility and possibly greater institutional/organizational capacity within public sector. These findings suggest that while surface area alone does not significantly differ across management types/categories, there is a need for further investigation into the quality of management, stakeholder engagement, and biosecurity outcomes across these types/categories. Future strategies should aim to strengthen the coordination between public and private managers and to ensure that all managers, regardless of size, are equipped to effectively support urban sustainability and conservation goals.

***Diplodia seriata* is a “silent killer” of *Quercus robur* trees after replanting in Novi Sad, Serbia**

Zlatković, M.¹, Marković, M.¹, Pap, P.¹, Djilas, M.¹, Kesić, L.¹, Pavlović, L.², Orlović, S.^{1,2}

¹ University of Novi Sad, Institute of Lowland Forestry and Environment (ILFE), Novi Sad, Serbia

² University of Novi Sad, Faculty of Agriculture, Novi Sad, Serbia

Abstract

Species of the Botryosphaeriaceae are well-known endophytes, latent pathogens, and opportunists of various forest and ornamental trees, including pedunculate oak (*Quercus robur*). In Serbia, *Q. robur* is a keystone species of riparian forests in the lowlands. It is also a valued ornamental tree, frequently produced in both forest and ornamental nurseries. *Q. robur* forests are suffering from acute oak decline, caused by various abiotic and biotic factors, including the pathogenic fungus *Diplodia seriata*. In Serbia, the fungus has been isolated from necrotic lesions on the stems of mature trees in a riparian forest; however, Koch's postulates were fulfilled on 3-year-old seedlings, and the fungus has never been isolated from a dying tree.

In May 2025, during a monthly inspection of urban greenery, several dead and dying *Q. robur* trees were observed in Zeleznicki Park, Novi Sad. These trees exhibited symptoms typical of Botryosphaeriaceae infections, such as girdled stems with sunken bark, internal necrotic lesions, and pycnidia containing spores that morphologically resembled those of *D. seriata*. Fungal isolations were performed; DNA was extracted from the cultures, amplified, and sequenced using ITS rDNA. Phylogenetic analysis confirmed that the pathogen responsible for the dieback was *D. seriata*.

Q. robur is a demanding species when cultivated for ornamental purposes, as it requires regular pruning of its deep roots to promote the development of a wide network of shallow, fine roots essential for successful replanting. However, if this is not done, as in the present case, and if mature trees, rather than young seedlings, are planted in spring instead of autumn, in sandy soil (despite the species preference for gley soils) and are not watered regularly, latent fungal infections such as those caused by *D. seriata* can become devastating. This is the first record of *D. seriata* killing *Q. robur* in urban areas in Serbia.

Presence of *Rhynchophorus ferrugineus* in the city of Porto Santo island: phytosanitary assessment and georeferencing of *Phoenix canariensis*

Nunes, N.¹, Nunes, L.², Castro Rego, F.², Martins, L.M.³

1 Institute of Forests and Nature Conservation, Funchal - Madeira, Portugal

2 Centre for Applied Ecology "Professor Baeta Neves" (CEABN), InBIO, School of Agriculture, University of Lisbon, Lisbon, Portugal

3 University of Trás-os-Montes Alto Douro (UTAD), Vila Real, Portugal

Abstract

Background: Canary Island date palms (*Phoenix canariensis* Chabaud) play a central role in the public areas of the island of Porto Santo. Above all they represent an emotional value associated with the historical image that the community has built on its spaces. In 1827, in Reverend James Bulwer's work, 'Views in the Madeiras', the image of a tall palm tree marked the landscape. In late 2023, however, where vegetation is already scarce due to environmental conditions, the presence of a beetle that poses a serious threat to the island botanical heritage was detected.

Objectives: This study focuses on the phytosanitary assessment and georeferencing of Canary Island date palms on Porto Santo Island, following the detection of the red palm weevil (*Rhynchophorus ferrugineus* Olivier).

Methods: A total of 1164 palms across 22 treatment zones were inventoried and evaluated in terms of health status, geographic position, dendrometric parameters and were subjected to various mitigation strategies. Interventions included endotherapy with acetamiprid, the use of pheromone traps and, in irreversible cases, the felling and incineration of the infested trees.

Results: Sixteen palms were removed, mainly due to their height or advanced deterioration. The study also presents an economic and cultural valuation of the palms, using historical and tourism-related factors and applying the Granada Standard, which estimates their total value at approximately €2.7 million.

Conclusions: The findings support the need for an ongoing integrated control program with preventive measures such as banning the pruning of green fronds and well-monitored corrective actions. Given the potential impact of palm loss on tourism and in the iconic landscape of Porto Santo, preserving this emblematic species requires sustained, evidence-based interventions.

Isolation and Pathogenicity of Oomycetes from Recreational and Control Sites in Spanish National Parks

Romeralo, C.¹, Aldea, J.¹, Hernández-Escribano, L.¹, García, M.¹, Pardos, M.¹, Gómez-Aparicio, L.², Solera-Álvarez, P.J.², Caballol, M.^{3,4}, Oliva, J.^{4,5}

¹ Department of Forest Dynamics and Management, Institute of Forest Sciences, INIA-CSIC, Madrid,

² Institute of Natural Resources and Agrobiology of Seville (IRNAS), CSIC, Seville

³ Joint Research Unit CTFC-AGROTECNIO-CERCA, Lleida, Spain

⁴ Forest Science and Technology Centre of Catalonia (CTFC), Solsona, Spain

⁵ Department of Agricultural and Forest Sciences and Engineering, University of Lleida, Lleida

Abstract

Forest diseases, particularly those caused by invasive exotic pathogens, pose an increasing threat to ecosystem stability, with significant economic and environmental impacts worldwide. Among the most concerning pathogens in forests and nurseries are species of the genus *Phytophthora* and other oomycetes, which attack tree root systems, leading to mortality and threatening forest biodiversity. Conservation areas are experiencing a growing influx of visitors, increasing the biosecurity risks associated with human-mediated pathogen dispersal, particularly through vectors such as hikers and mountain bikers. Soils in these areas are especially vulnerable, as they play a crucial role in seedling regeneration and ecosystem resilience. This study aimed to advance our understanding of visitor activity as a pathway for pathogen introduction and to assess the potential pathogenicity of these organisms in forest species. To achieve this, we collected soil samples from both recreational and control areas in six National Parks across Spain, obtaining 144 soil samples from trees of eleven forest species. To determine whether visitor presence increased the risk of soil-borne pathogen introduction, we applied the baiting method to isolate *Phytophthora* spp. from the samples. We then conducted pathogenicity tests to evaluate whether the isolated species posed a threat to the forest species present in the National Parks. From the 144 soil samples, we obtained 102 isolates belonging to *Phytophthora*, *Pythium*, and *Phytopythium* species. We observed a significant effect on the plant species, with *Fraxinus excelsior*, *Quercus robur* and *Betula pendula* yielding the highest number of isolates. Sampling location also had a strong effect, with certain National Parks, such as Picos de Europa, showing higher frequencies of pathogen presence. Soils from recreational areas had a higher isolation frequency, although the difference was not statistically significant. From the pathogenicity trials, we found that all isolates of *Phytophthora* (regardless the isolate) produced more necrosis than the controls, although the result depended on the plant species. Our findings suggest that visitor presence may elevate the risk of introducing certain forest pathogens, although their establishment may be influenced by other environmental and biotic factors. These results highlight the need for biosecurity measures to mitigate pathogen spread in forest national parks.

The evolution and impact of invasive insects and phytopathogens in urban ecosystems of the Republic of Moldova

Mocreac, N.^{1*}, Bulgaru, V.², Iordospol, V.¹, Novac, T.¹, Vaseliciuc, S.²

¹ Technical University of Moldova, Chisinau, Moldova

² Research and Management Institute (ICAS Chisinau), Moldova

Abstract

Currently, the total area of green spaces in urban localities of the Republic of Moldova amounts to 6.6 thousand hectares. The largest share is found in the municipality of Chişinău, which accounts for 66.1% of this total, or approximately 4.4 thousand hectares. The municipality of Bălţi has 0.3 thousand hectares, while the city of Călăraşi reports 0.2 thousand hectares. Of the total 6.6 thousand hectares, 69.0% consist of squares, gardens, and parks. Green spaces with restricted access—such as sports parks, areas adjacent to educational institutions and residential buildings, as well as recreational areas for children and youth—represent 18.6%. Green spaces in tourist and leisure areas account for 7.8%, while those with a specialized function—such as botanical, zoological, and dendrological gardens—make up 2.7%. Additionally, some green spaces serve utilitarian purposes, including land stabilization and the protection of water sources. In these areas, the dominant tree species primarily belong to the families Pinaceae and Cupressaceae, as well as Fabaceae (*Acacia* spp., *Gleditsia* spp.), Sapindaceae (*Aesculus hippocastanum*, *Acer* spp.), Platanaceae (*Platanus occidentalis*), Malvaceae (*Tilia* spp.), Oleaceae (*Fraxinus* spp.), Ulmaceae (*Ulmus* spp.), Fagaceae (*Quercus* spp.), Juglandaceae (*Juglans* spp.), among others. Among invasive plant pathogens of trees in urban areas of the Republic of Moldova, Dutch elm disease caused by *Ophiostoma ulmi* is of particular concern. Some of the earliest invasive insect species recorded on tree species in urban and rural areas of the Republic of Moldova include *Hyphantria cunea* (Drury, 1773), first reported in 1966; *Cameraria ohridella* Deschka & Dimić, 1986, reported in 2004; and more recently, *Corythucha arcuata* (Say, 1832) in 2019, *Metcalfa pruinosa* (Say, 1830), and *Tomostethus nigrinus* (Fabricius, 1804), both reported in 2020.

Invasive pests and pathogens threatening green urban areas in 'St. George' city park in Dobrich, northeastern Bulgaria

Georgieva, M.¹, Ivanov, V.¹, Georgiev, G.¹, Hristova, M.¹, Georgieva, L.²

¹ Forest Research Institute – Bulgarian Academy of Sciences

² Sofia University St. Kliment Ohridski, Faculty of Geology and Geography

Abstract

Background: Urban environments harbor invasive species that pose a significant threat to established tree and shrub vegetation. Newly introduced non-native pests and pathogens in northeastern Bulgaria have been identified, causing severe damage to host plants and altering the species composition in urban green areas.

Objectives: The current study aimed to identify the threat of penetration and spread of aggressive insect pests and fungal pathogens, leading to the degradation of tree and shrub vegetation in urban green areas of a pilot site – the largest city park 'St. George' in Dobrich (northeastern Bulgaria).

Methods: Between 2023 and 2025, the health status of tree and shrub vegetation was evaluated by specific indicators, including assessment of crown condition, the presence of dried or rotted trees that pose a threat to human health, and the presence of pests and pathogens that cause allergic reactions in people. In this study, we developed a mobile-based system based on ArcGIS Field Maps from ESRI, suitable for both Android and iOS. It includes 20 specific fields for assessing the health status of trees in urban areas, collecting data from field studies, and transferring them to electronic records.

Results: Severe infestation of oak (*Corythucha arcuata*) and sycamore (*Corythucha ciliata*) lace bugs was established. The newly introduced aphid *Cinara cedri cedri* was identified on *Cedrus atlantica* trees. Both the horse chestnut leaf miner (*Cameraria ohridella*) and the fungus *Guignardia aesculi* caused foliar damage and premature defoliation of *Aesculus hippocastanum* leaves. Pine species were infected by the pathogens *Dothistroma septosporum* and *Diplodia sapinea*. The fungal pathogen *Botryosphaeria dothidea* caused blight disease on *Sequoiadendron giganteum* and *Juniperus* spp. A xylariaceous ascomycete *Biscogniauxia mediterranea* – a causal agent of charcoal canker disease was established on red oak (*Quercus rubra*) trees.

Conclusions: The adverse effects of the invasion of non-native pests and pathogens have deteriorated the health status of the tree species and reduced the ecosystem services delivered by the largest city park in Dobrich. Water stress during the last growing seasons appeared to reduce the resistance of trees and predispose them to infection by invasive pests and pathogens.

Acknowledgments This work was carried out in the framework of the project 'Threats from aggressive insect pests and fungal pathogens in green urban ecosystems in Bulgaria', Contract No. KP-06-COST/18 dated 14.12.2023, financed by the Bulgarian National Science Fund.

Remote sensing in invasive pest monitoring in urban forests in Croatia

Zorić, N., Balenović, I., **Matošević, D.**

Croatian Forest Research Institute, Jastrebarsko, Croatia

Abstract

Monitoring of pests, native or alien invasive, is a one of key activities in prevention of damages in urban forests. Conventional monitoring methods (pheromone traps, visual transects, glue rings etc) are time consuming and require significant financial inputs. Development of remote sensing sensors, GPS technology and geographic information systems (GIS) support novel approach towards detecting pests which has the potential of accurately measuring pest damage and populations on a whole area basis. Accurate and efficient monitoring of insect populations is a key point to improve pest control and mitigate damages. Technical limitations of remote scouting, especially resolution of satellite and aerial images, have until recently precluded wide scale adoption. Recent technological advancements have increased resolution of visible and NIR sensors while also decreasing size and cost providing more affordable ways to assess forest health. Therefore, usage of small aerial vehicles or drones equipped with multispectral sensors could provide a better insight into urban forests health and damages caused by pests. With relatively low-cost platform we have insight on the area with better resolution than with those from satellite. Surveys of invasive alien and quarantine pests in urban forests are being conducted in Croatia. European food safety authority (EFSA) is recommending usage of unmanned aerial vehicles (UAVs) as a versatile remote sensing-based toolkit for monitoring forest health and occurrence of forest pests.

The European urban tree inventory (EUTI)

Augustinus, B.A.¹, Kičić, M.², Avdagić, A.³, Battisti, A.⁴, Beřka, M.⁵, Branco, M.⁶, Brundu, G.⁷, van den Dool, R.T.⁸, Eriksson, A.⁹, Gomez-Gallego, M.¹⁰, Gounaris, N.¹¹, Hysa, A.¹², Igondová, E.¹³, Jactel, H.¹⁰, Jürisoo, L.^{9,33}, Kesic, L.¹⁴, Kopeć, D.¹⁵, Köpke, K.¹⁶, Lloyd, G.¹⁷, Marzano, M.¹⁸, Matošević, D.², Matsiakh, I.¹⁹, Morales Rodriguez, C.²⁰, Ogris, N.²¹, Ossola, A.²², Papazova-Anakieva, I.²³, Paraschiv, M.²⁴, Petridis, Z.²⁵, Ramos, A.P.⁶, Romeralo, C.²⁶, Samson, R.²⁷, Teqja, Z.²⁸, Topalidou, E.²⁹, Vettraino, A.M.²⁰, Wheeler, P.³⁰, Witzell, J.⁹, Zlatković, M.¹⁴, Anisimova, S.³¹, Marčiulyrienė, D.³², Bhatti, A.³², Queloz, V.¹, Brockerhoff, E.G.¹

¹ Swiss Federal Research Institute WSL, ²Croatian Forest Research Institute, ³University of Sarajevo, ⁴University of Padova, ⁵Poznań University of Life Sciences, ⁶University of Lisbon, ⁷University of Sassari, ⁸Wageningen University, ⁹Linnaeus University, ¹⁰INRAE, ¹¹Homeotech, Thessaloniki-Greece, ¹²Technical University of Munich, ¹³Slovak Environment Agency, ¹⁴University of Novi Sad, ILFE ¹⁵University of Lodz, ¹⁶Humboldt University of Berlin, ¹⁷University of Sheffield, ¹⁸Forest Research – UK, ¹⁹Swedish University of Agricultural Sciences, ²⁰Tuscia University, ²¹Slovenian Forestry Institute, ²²UC Davis, ²³Ss. Cyril and Methodius University in Skopje, HEF, ²⁴Romanian National Institute for Research and Development in Forestry, ²⁵Karlsruhe Institute of Technology, ²⁶Institute of Forest Sciences (ICIFOR-INIA-CSIC), ²⁷University of Antwerp, ²⁸Agricultural University of Tirana, ²⁹Hellenic Agricultural Organisation DIMITRA (ELGO-DIMITRA), ³⁰Open University, ³¹University of Forestry, Sofia, ³²Lithuanian Research Centre for Agriculture and Forestry, ³³Estonian University of Life Sciences

Abstract

To protect and prepare urban trees from future threats, we first need to know which trees are planted in urban environments – which is a clear knowledge gap. Many European cities are establishing and maintaining urban tree inventories. These inventories are primarily used for local tree management. While these datasets hold great potential as a foundation for research on urban biodiversity and biosecurity, their fragmented formats and limited public accessibility hinder broader scientific use. We set out to collate a comprehensive collection of European urban tree inventories ('EUTI') as part of the COST-action UB3Guard. The taxonomically and formally harmonized collection contains 183 inventories from 31 countries with data on approximately 9.5 million individual trees belonging to more than 2,400 species. We analysed how both climatic and cultural factors shape urban tree composition across Europe, revealing strong regional differences in species selection. These patterns carry important implications for urban tree biosecurity, since different tree species may host different pests. This affects the resilience of various urban ecosystems, especially in response to climate change and the spread of invasive pests and pathogens. EUTI provides an unprecedented resource for exploring the ecological, social, and economic dimensions of urban forestry at a European scale, underscoring the value of standardizing and sharing urban tree data for both scientific and policy purposes.

'Biosecurity and Surveillance for Quarantine Pests of Trees in Forests and Cities', Carcavelos, Portugal, September 8-10, 2025

List of Participants

Alain Roques, INRA (Zoologie Forestière), Centre de Recherches d'Orléans, Orléans, France
Alberto Santini, Consiglio Nazionale delle Ricerche, Sesto Fiorentino, Italy
Alessandro Paletto, Council for Agricultural Research and Economics – CREA, Trento, Italy
Ana Paula Ramos, Instituto Superior de Agronomia, Lisbon, Portugal
Ana Silva, Instituto Nacional de Investigação Agrária e Veterinária, I.P., Oeiras, Portugal
Andrea Vannini, University of Tuscia, DIBAF, Viterbo, Italy
Benno Augustinus, Eidgenössische Forschungsanstalt WSL, Birmensdorf, Switzerland
Birger Ilau, Estonian Agriculture and Food Board, Tallinn, Estonia
Carmen Morales-Rodriguez, University of Tuscia, DIBAF, Viterbo, Italy
Carmen Romeralo, Agencia Estatal Consejo Superior de Investigaciones Científicas, Madrid, Spain
Christine Gundelach Rannes, Ministry of Food, Agriculture and Fisheries of Denmark, Copenhagen, Denmark
Clarinda Burrell, Scottish Forestry, Edinburgh, United Kingdom
Daiva Burokiene, Nature Research Centre, Vilnius, Lithuania
Diana Marčiulynienė, Lithuanian Research Centre for Agriculture and Forestry, Kaunas, Lithuania
Dinka Matosevic, Hrvatski Sumarski Institut, Jastrebarsko, Croatia
Dmitrii Musolin, European and Mediterranean Plant Protection Organization (EPPO), Paris, France
Driss Dahhane, Office National de Sécurité Sanitaire des Produits Alimentaires, Rabat, Morocco
Eckehard Brockerhoff, Eidgenössische Forschungsanstalt WSL, Birmensdorf, Switzerland
Eeva Terhonen, Natural Resources Institute Finland, Helsinki, Finland
Elodie Pagot, Telespazio, France
Erik Jönsson, Stångby plantskola AB, Lund, Sweden
Ferenc Lakatos, University of Sopron, REUFIS, Hungary
Ferenc Lakatos, University of Sopron, Sopron, Hungary
Fernando Alves, Camara Municipal de Lisboa, Lisboa, Portugal
Francis Maire, Groupe des Experts Conseils en Arboriculture Ornementale, Gargas, France
Funda Oskay, Çankırı Karatekin University, Cankiri, Türkiye
Helena Bragança, Instituto Nacional De Investigação Agraria E Veterinaria, Oeiras, Portugal
Hervé Jactel, INRAE UMR BIOGECO, Cestas, France
Ilija Đorđević, Institute of forestry, Belgrade, Serbia
Irena Papazova-Anakieva, Ss.Cyril and Methodius University in Skopje, "Hans Em" Faculty of Forest Sciences, Skopje, North Macedonia
Iva Franic, Eidgenössische Forschungsanstalt WSL, Birmensdorf, Switzerland
Jason Sumner-Kalkun, Forest Research, Wrecclesham, Surrey, UK
Joan Webber, Forest Research, Farnham, Surrey, UK

Joana Henriquez, Instituto Nacional de Investigação Agrária e Veterinária, Oeiras, Portugal
Johan Östberg, Nature Based Solutions Institute, Malmö, Sweden
Johanna Witzell, Linneuniversitetet, Växjö, Sweden
Jovana Blagojevic, Institute for Plant Protection and Environment, Beograd, Serbia
Julio Javier Diez Casero, University of Valladolid, Palencia, Spain
Kahraman İpekdağ, Hacettepe Üniversitesi, Cankaya Ankara, Türkiye
Katarzyna Sikora, Department of Forest Protection, Forest Research Institute, Sękocin Stary, Poland
Kathrin Blumenstein, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany
Katie Parker, Forestry Commission, UK
Kiril Sotirovski, Ss.Cyril and Methodius University in Skopje, "Hans Em" Faculty of Forest Sciences, Skopje, North Macedonia
Lazar Kesic, Institute of Lowland Forestry and Environment, Novi Sad, Serbia
Lazar Pavlovic, University of Novi Sad, Faculty of Agriculture, Novi Sad, Serbia
Léonia Nunes, Centre for Applied Ecology "Prof. Baeta Neves" (CEABN-InBIO), School of Agriculture, University of Lisbon, Portugal
Luis Bonifácio, INIAV - National Institute for Agrarian and Veterinary Research, Quinta do Marquês, Oeiras, Portugal
Manuela Branco, University of Lisbon - Instituto Superior de Agronomia – ISA Lisboa, Portugal
Maria Mirazchiyska, European Commission, Health and Food Safety Directorate-General, Crisis Management in Food, Animals and Plants, Plant health, Brussels, Belgium
Marie Grosdidier, Plateforme ESV, INRAE, Avignon, France
Mariella Marzano, Forestry Commission Forest Research Agency, Roslin, United Kingdom
Marta Belka, Poznań University of Life Sciences, Poznań, Poland
Matteo Latini, University of Tuscia, DIBAF, Viterbo, Italy
Matteo Marchioro, University of Padua, Department of Agronomy, Food, Natural resources, Animals and Environment (DAFNAE), Padua, Italy
Milena Lakicevic, University of Novi Sad, Novi Sad, Serbia
Milica Zlatkovic, Institute of Lowland Forestry and Environment, Novi Sad, Serbia
Miloš Trifković, Mendel University in Brno, Brno, Czechia
Nadejda Mocreac, Technical University of Moldova, Chisinau, Moldova
Natália Nunes, Institute of Forests and Nature Conservation, Funchal - Madeira, Portugal
Nick McCarthy, South East Technological University, Waterford, Ireland
Nicolas Meurisse, Bioeconomy Science Institute (previously Scion, the New Zealand Forest Research Institute), Rotorua, New Zealand
Noah Guitton, Telespazio, France
Paula Całusińska, State Plant Health and Seed Inspection Service (SPHSIS), Warszawa, Poland
Refika Ceyda Beram, Pamukkale Üniversitesi, Denizli, Türkiye
Rein Drenkhan, Estonian University of Life Sciences, Tartu, Estonia
Roeland Samson, Universiteit Antwerpen, Antwerpen, Belgium

Salah Salmati, Office National de Sécurité Sanitaire des Produits Alimentaires, Rabat, Morocco

Simone Prospero, Eidgenössische Forschungsanstalt WSL, Birmensdorf, Switzerland

Stephen Woodward, Isparta University of Applied Sciences Faculty of Forestry, Isparta, Türkiye

Susanne Raum, Technical University of Munich, Freising, Germany

Talor Whitham, Forest Research, Farnham, Surrey, UK

Tamara Corcobado Sanchez, Austrian Research Centre for Forests, Vienna, Austria

Tea Tasa, Estonian Agriculture and Food Board, Tallinn, Estonia

Tom McDonald, Department of Agriculture, Food and the Marine, Ireland.

Tomasz Kaluski, European Food Safety Authority, Parma, Italy

Tuğba Doğmuş Lehtijärvi, Isparta University of Applied Sciences Faculty of Forestry, Isparta, Türkiye

Yasin Korkmaz, Albert-Ludwigs-Universität Freiburg, Freiburg, Germany

'Biosecurity and Surveillance for Quarantine Pests of Trees in Forests and Cities', Carcavelos, Portugal, September 8-10, 2025



Photo credit: Nick McCarthy

