

Organisational details for an international conference on:

Achieving forest establishment success at scale to address climate, environmental, social and economic challenges around the world

17–21 March 2025

**Rotorua,
New Zealand**

Organised by: **IUFRO 1.01.04-Forest Establishment and Early Growth Dynamics**

Unit Lead: **Carol Rolando**

Deputy Lead: **Charles Nock**

Hosted by: **Scion,
New Zealand Forest Research Ltd,
Rotorua, New Zealand**

Venue: **Novotel, Rotorua, New Zealand**

Background:

The last international conference for IUFRO 1.01.04 unit - Forest Establishment and Early growth Dynamics, held in Corvallis, Oregon in 2017 focused on “Forest regeneration in a changing environment”. This IUFRO unit has been meeting regularly since 1992 to address the latest science and technology related to regenerating and managing young forests [see Wagner et al. (2018), *New Forests* 49:699-703; <https://doi.org/10.1007/s11056-018-9687-8>].

Conference Goal:

Since 2017 there has been a rapid rise in global efforts to plant billions of trees at scale to mitigate climate change, address environmental degradation, reforest large areas devastated by natural disturbances (e.g. wildfires), and to accelerate development of the bioeconomy. In parallel, emerging technologies offer new opportunities to increase productivity, overcome labour constraints and to minimise environmental impacts of tree planting operations. The application of Indigenous Knowledge in forest establishment practices has also been gaining importance globally. As a result of all these factors, planted forest establishment is again a highly topical area of forest science and it is vital that forest regeneration and afforestation efforts are accelerated by adopting the latest advances in forest science and technology.

The goal of this next conference in New Zealand is to bring together forest leaders, researchers, practitioners, and technologists to present the state-of-the-art science and technology being developed and implemented to address the opportunities and challenges associated with actively establishing and regenerating forest ecosystems in an increasingly complex, extreme, and rapidly changing environment.



Proposed themes (*in-scope*)

Forest establishment covers the period from tree planting to canopy closure and typically encompasses operations and considerations such as:

- Matching species, stock types and provenances to site factors and current and future ecosystem services (purpose of tree planting) e.g. timber and/or accelerating carbon sequestration and storage.
- Afforestation following natural disturbance events (e.g. wildfire) or large-scale environmental degradation.
- Innovative harvesting methods and site preparation (e.g. cultivation, vegetation management and nutrition) strategies for regeneration.
- Planting stock quality and assessment.
- Incorporating Indigenous Knowledge into forest establishment science and practise.
- Planting methods (e.g. timing, density, tools and mechanisation).
- Survival assessment and identification of the causes of mortality.
- Understanding and managing early growth and vegetation dynamics.
- Increasing productivity in young stands.
- Forest health and risk management in young forests.

The conference scope includes advances in forest science, technology, policy, practice and Indigenous Knowledge that support forest managers, scientists, policy makers and regulators working on sustainable practices for forest establishment and early stand management. The underpinning science disciplines are wide ranging and include plant ecophysiology, micro-meteorology, soil science, resource competition, nutrition, inter- and intra-specific competition dynamics, forest ecology, quantitative silviculture, young tree growth/process-based modelling, plant protection, data science, mechanisation and automation.

Accordingly, we seek conference presentations on the following topics that connect science with practices (management, policy, regulation) in the following general areas:

1. Forest establishment (under climate change, following natural disturbances and for recovering degraded environments)

This theme encompasses science related to the concept of “right tree, right place, right purpose” and includes:

- Performance (survival and early growth) of local and non-local provenances.
- Seedling physiological responses to abiotic stress during forest establishment.
- Quantifying how genotype x environment x silviculture interactions influence survival, uniformity and early growth dynamics.
- Matching species and stock type to site.
- Plantation design (density/stocking) to meet intended purpose.
- Management interventions to improve establishment success.

2. Precision silviculture for newly planted forests

Application of new technologies to modernise and optimise forest establishment practices and overcome labour constraints e.g.:

- New approaches to tree planting, workflow planning and measuring establishment success
- Remote sensing for plantation planning and monitoring e.g. identifying planting micro-sites, tree locations, and seedling stress.
- Monitoring environmental conditions and evaluating establishment success (survival, uniformity, growth).
- Mechanisation and automation of site preparation and/or establishment (planting/weeding/nutrition) operations.
- Impacts of mechanisation on communities, labour shortages and social licence.





Image: Nelson Thiffault, Canadian Forest Service

3. Defining quality stock for forest establishment

Linking seedling quality and nursery treatments to forest establishment success and vice versa:

- What are the physiological mechanisms and attributes leading to successful forest establishment?
- Have the stock specifications for optimum establishment changed?
- What are the gaps in our knowledge?
- Does mechanisation shift the goal posts on quality stock?

4. Forest establishment using Indigenous Knowledge

Approaches to forest establishment using Indigenous knowledge to revitalise the indigenous cultural values of native forest landscapes and establish new forests for a range of ecosystem services.

- Indigenous approaches and solutions to establishing forests under climate-induced stress.
- Indigenous Knowledge and sustainable forest design/ establishment
- Provenance and seed selection from Indigenous perspectives
- Blending traditional knowledge and science for forest establishment

5. Optimising vegetation management to meet social, environmental and economic pressures

Combining knowledge of mechanisms of inter-specific competition/facilitation and weed control techniques to support cost-effective tree establishment. Includes:

- Optimising/reducing/changing herbicide use to meet environmental, cultural or regulatory requirements, and maintain social license to operate

- New technologies for precision herbicide application.
- Cost-effective alternatives to herbicides to managing competition/facilitation
- Herbicide application methods to reduce unwanted environmental impacts.

6. Adapting forest ecosystems to climate change by favouring their resistance, resilience or transitioning to new systems

A shift from 'business-as-usual' forest management is currently taking place in both industrial plantation forests and native forests to establishing a continuum of new forest types optimised for a range of multiple-purpose outcomes.

This shift includes discussions on the pros and cons of establishing single species vs mixed species forest systems, transitioning from exotic plantations to native forests and valuing ecosystem services that support such changes financially. Transitioning from one forest system to another will require novel management techniques. We invite papers that address the role of establishment in enabling forest system change.

- The ecology and interactions between tree species and the impact on establishment success.
- Establishing ecologically novel forest systems.
- Establishment practices and technologies under forest canopies.

7. Forest protection at establishment

Managing impacts of pests and diseases during planting including biosecurity in nurseries and the implications for establishment.

Possible invited speaker topics

- Global perspectives on how to design and establish forests, including Indigenous perspectives.
 - ◊ How **Europe** is addressing forest establishment challenges
 - ◊ How **N. America** is addressing forest establishment challenges
 - ◊ How **S. America** is addressing forest establishment challenges
 - ◊ How **Africa** is addressing forest establishment challenges
 - ◊ How **Asia** is addressing forest establishment challenges
 - ◊ How **NZ** and **Australia** are addressing forest establishment challenges
- Are the logistics (tree nursery capacity, labour, know-how, etc.) available for large-scale tree planting programs?
- Designing forests for the future forest-which forest where?
- What does world class forest establishment look like? An industry perspective
- Transitional forestry in New Zealand: re-evaluating the design and management of forest systems through the lens of forest purpose
- How can trees be planted to aid recovery of native forests and achieve multiple objectives?
- Forest establishment and policy
- Establishing short rotation tree crops for bio-energy
- Forest establishment and its purpose – the risk of getting it wrong?
- Tree planting as a solution to climate change and environmental degradation: Facts and Fiction

Conference publication

- Booklet of speaker abstracts
- Possible Special Issue Journal

Proposed conference format

- 3-5-4 days (1 day OECD workshop, 2 days presentations and 1 day field tour)
- Conference
 - ◊ Register Sunday evening (16 March)/Monday morning (17 March)
 - ◊ Ice breaker session on Sunday or Monday evening
 - ◊ Start Monday with plenary session or OECD Workshop
 - ◊ Tuesday/Thursday presentations with submitted papers
 - ◊ Aim for 20 min presentations (15 min with 5 min Q&A), adjustable on numbers received
 - ◊ At least two invited speakers for plenary session/s
 - ◊ Social events:
 - * 1 x Conference dinner
 - ◊ Local field day on Wednesday
- Possible optional post-conference field tour of 3-4 days.

Registration of interest

To register your interest in this event please contact:

Carol Rolando (Unit Lead):
Carol.Rolando@scionresearch.com

Kylie Gunn (Event Co-ordinator):
Kylie.Gunn@scionresearch.com

CONFERENCE LEADS		
Carol Rolando	Scion, New Zealand Forest Research	IUFRO 1.01.04 Unit Co-ordinator Conference leadership and Coordination Carol.Rolando@scionresearch.com
Charles Nock	University of Alberta	Deputy Co-ordinator and Lead nock@ualberta.ca
ORGANISING SUPPORT		
Kylie Gunn	Scion, New Zealand Forest Research	Events Manager Kylie.Gunn@scionresearch.com
Mary Anne Gloyne	Scion, New Zealand Forest Research	Planning Support
Pam Taylor		
NZ SCIENCE PROGRAMME COMMITTEE		
Responsibility: Key-note speakers, theme development, paper acceptance, hosting, chairing and field programme		
Paul Adams		Forest Growers Research, New Zealand
Brian Richardson, Thomas Paul, Dejan Firm, Don White, Ki-Taurangi Bradford, Peter Clinton, Heidi Dungey		Scion, New Zealand Forest Research
INTERNATIONAL SCIENCE PROGRAMME SUPPORT		
Responsibility: Key-note speakers, endorsing themes, paper acceptance, potentially chairing		
Nelson Thiffault	Canadian Forest Service	Canada
Andrew Nelson	University of Idaho	USA
Bob Wagner	Purdue University	
Keith Little	Nelson Mandela University	South Africa
Ian Willoughby	UK Forest Research	United Kingdom
Nick McCarthy	South East Technological University, Waterford	Ireland
TBD		Europe
TBD		Australia
Roger Arnold	Forest Scientist	China/Asia
Karin Hjelm	Swedish University of Agricultural Sciences	Scandinavia
Horacio Bown	University of Chile	Chile

