



CONIFER BREEDING COOPERATIVE CHAIR'S REPORT

Open Day

Professor John MacKay

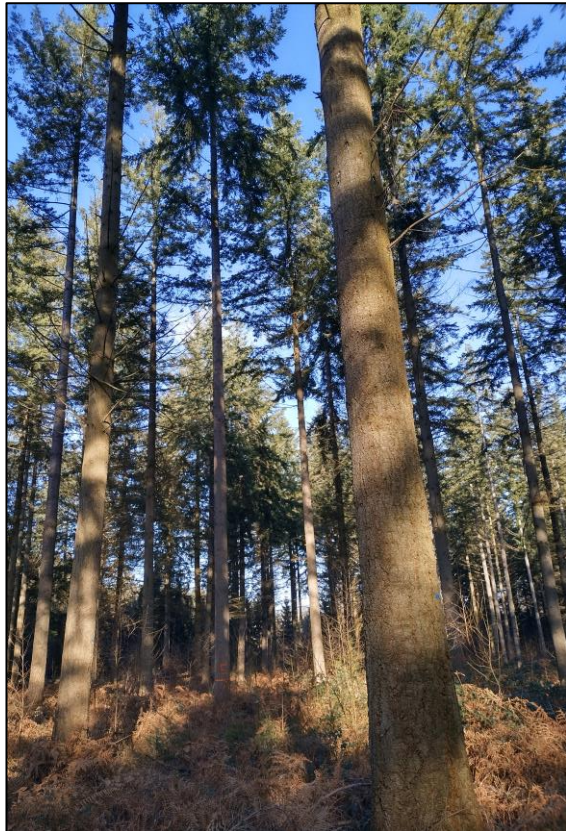
29 September 2022



CONIFER BREEDING
CO-OPERATIVE

<https://www.coniferbreedingcoop.co.uk/>

See updated website



What's New



New Chair, Membership



Programme Administrator



Strategic objectives



Scaling up in alternative conifers



External funding

SITKA SPRUCE BREEDING - 1960S TO NOW

- Breeding population of 360 individuals
- Seed-Orchards: gains ~ 25% for volume
- Extra gain from VP in single families for quality traits (20%+) and uniformity
- 95% of the Sitka spruce planted in UK consists of improved planting stock
- Development of genomic selection (DNA markers)

CONIFER BREEDING CO-OP

2014	Sitka Spruce Breeding Co-operative formed. Four members (FR, FC, Tilhill, Maelor)
2016	IP Agreement Signed w/ FR. Five members (+Forestart)
2017	Renamed: Conifer Breeding Co-operative Eight members (+Elite Trees, Scottish Woodlands, Alba Trees)
2022	Members: Forest Research, Forestart, Forest and Land Scotland, Forestry England, Gresham House, Maelor, Scottish Woodlands, Tilhill

CONIFER BREEDING CO-OP: **UPDATED** OBJECTIVES

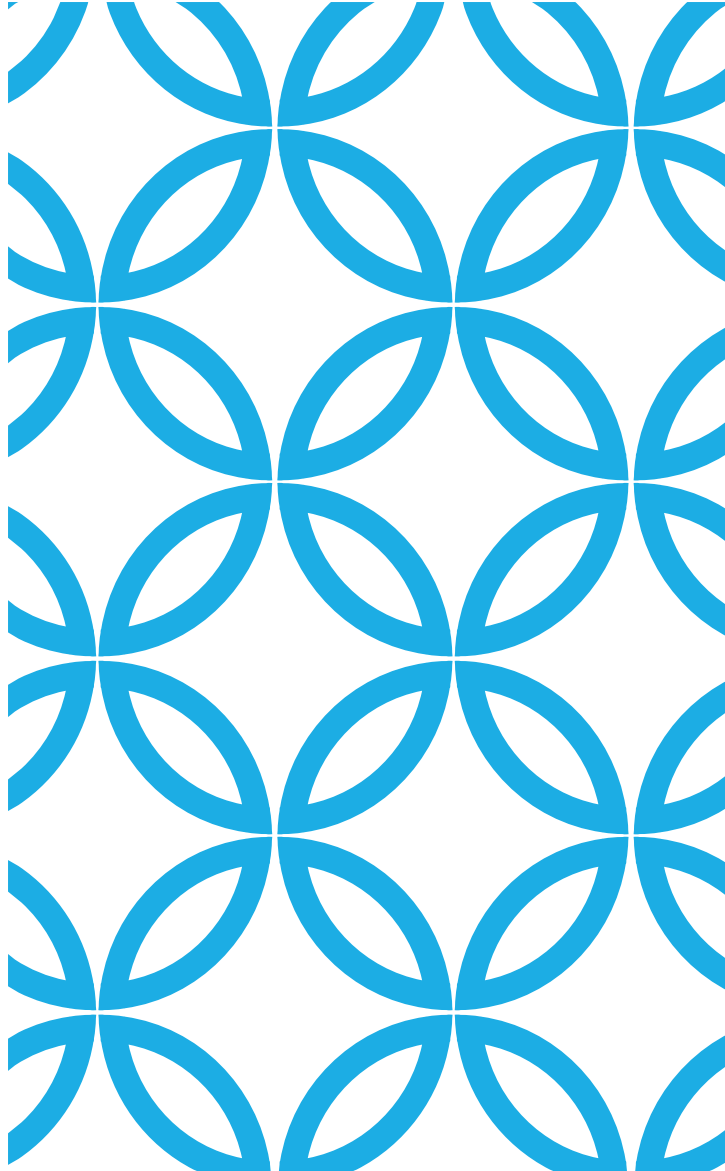
1. Develop **adapted breeding objectives** for priority species and regularly update them
2. Incorporate **more genetic diversity** into our base populations to ensure long-term adaptability
3. Develop a **resilience platform** of field trials across GB for continuous long-term evaluation of climate and pest resilience (provenance trials, progeny trials)
4. Actively **integrate new technologies including** DNA analyses, rapid determinations of wood properties and methods for evaluating resilience to climate change and pests
5. Support the **production of improved FRM** primarily through recommendations for seed orchard development and full crosses for vegetative propagation

MEMBERS CATEGORIES

Membership Types	Open to	Annual fees; contributions	Access to IP
Full Membership	Corporate bodies	£5,000; WIK*	Full IP**; discounted access to genetic material***
Associate Supporter NEW	Corporate bodies	£2,500; no WIK	Documentary IP on demand; no discounted access to genetic material
Associate Corporate	Corporate	£250	Newsletters, restricted access to IP
Associate Individual	Individuals	£25	
Honorary Associate	Individuals	Free	

WIK:** Work in kind carried out by member; *Full IP:** germplasm (+Trees), documentary evidence (breeding value)

*****Genetic material:** seeds from controlled pollinations



FUNDED PROJECTS FROM THE TREE PRODUCTION INNOVATION FUND

Partners: Co-op, Forest research, UK Centre for
Ecology Hydrology, University of Oxford

SUPPORT FROM THE TREE PRODUCTION INNOVATION FUND

PHASE 1 – Short, proof-of-concept projects (6 Months)

Project 1 - Development of +Trees populations and climate resilience in alternative commercial conifers

Project 2 - DNA finger-printing and traceability in commercial conifers

PHASE 2 – Development project (36 months)

Project 3 - Injecting diversity and quality assurance into alternative conifers

Total funding of £850,000 across partner organisations



PROGRESS ON MAIN SPECIES

Sitka spruce

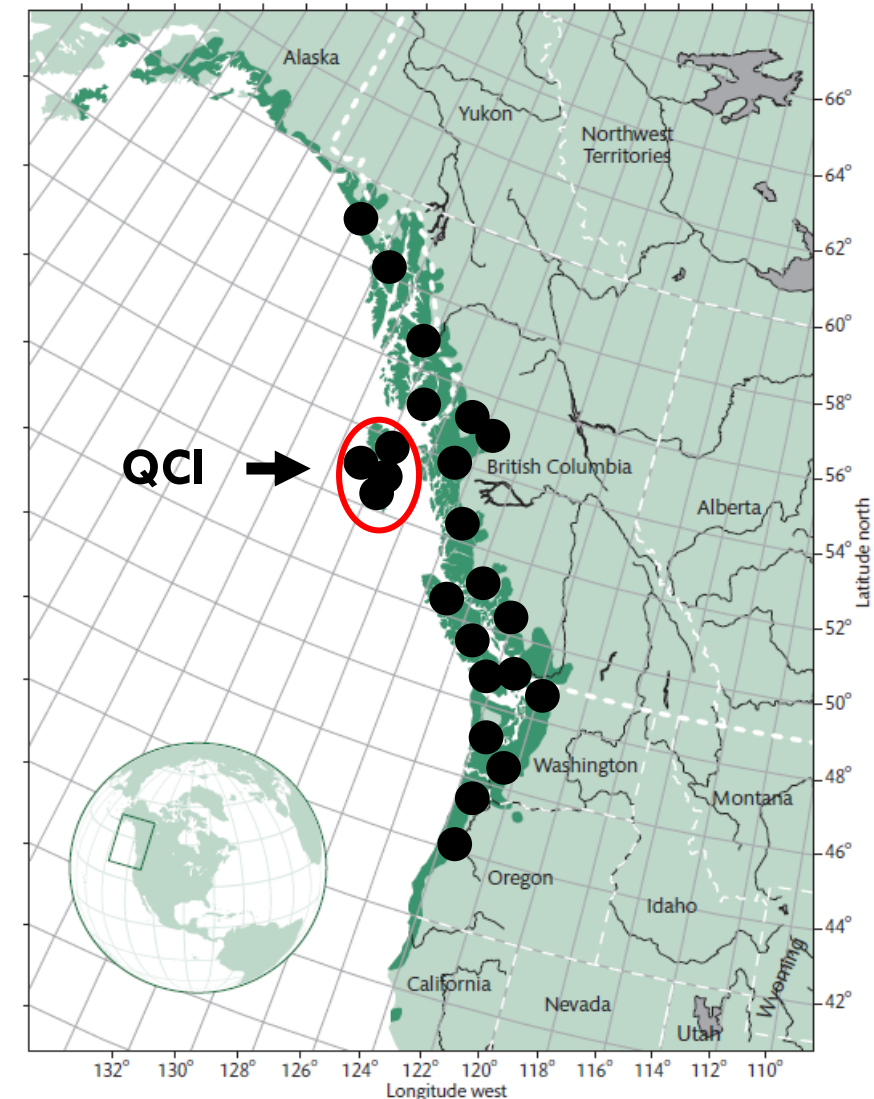
Alternative commercial conifers

SITKA SPRUCE: OBJECTIVES

- Broaden the breeding population: progeny trials planned
- Prioritize productivity for **optimal wood yield in timber production** for the UK
- Select and integrate **high stiffness + Trees** from provenance trial – captures more genetic diversity

Wood property		Characteristic value					
Sitka spruce		C14	C16	C18	C20	C22	C24
Stiffness	8.2	7	8	9	9.5	10	11
Strength	20.9	14	16	18	20	22	24
Density	338	290	310	320	330	340	350

Origin of trees in provenance trial





NORWAY SPRUCE PROVENANCE TRIALS

- Compares performance of 16 commercial sources of Norway spruce
- 4 trial sites planted across Scotland and Wales (winter 2020/21)



Norway
spruce



Douglas-
fir



Scion
Collecti
on

PLUS-TREES SELECTION AND SAMPLING SCIONS
FOR GRAFTING — IN PRIVATE AND PUBLIC
ESTATES (TREE PRODUCTION INNOVATION FUND)

**Alternative
Conifers**

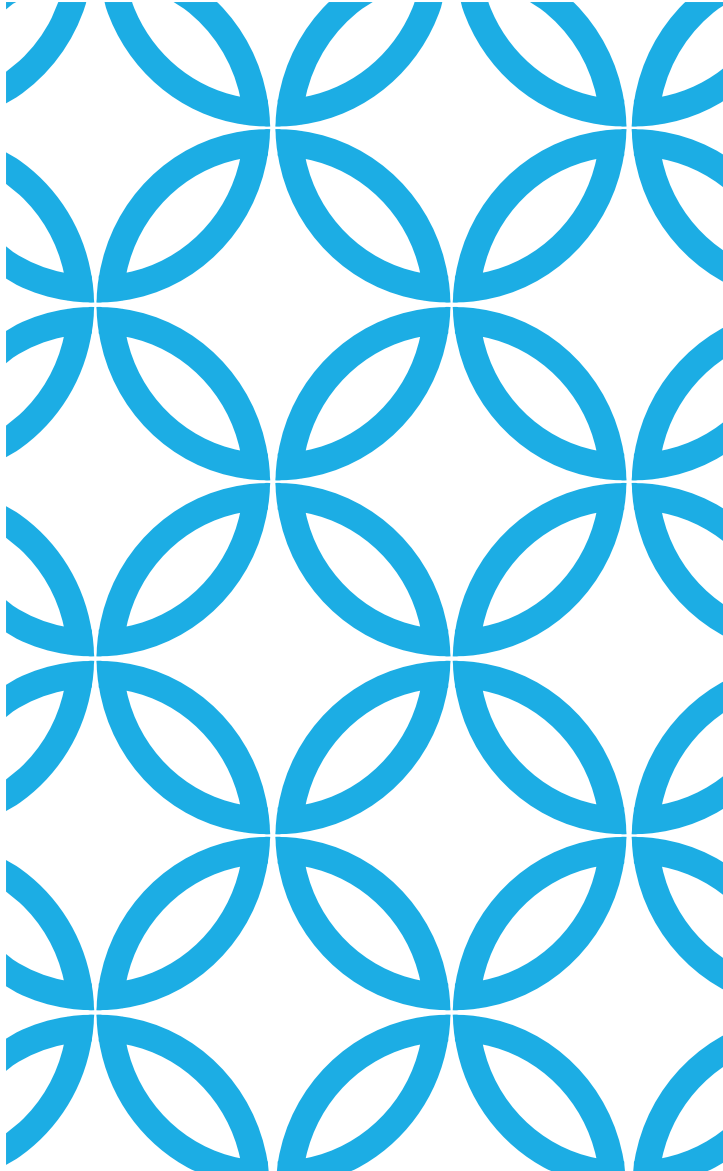
GRAFTING (FUNDING FROM TPIF)

Norway Spruce



SAMPLING FOR DNA ANALYSIS





TAKE HOME MESSAGE

Consolidation

Expansion

Partnership