Autumn 2025
Newsletter

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CONIFER BREEDING
CO-OPERATIVE

Twelve months on from our last edition, we are excited to provide our friends and supporters with a 2025 update. We make no apologies for the length of this Newsletter…there is much to tell!

As regular readers will know, the Conifer Breeding Co-op exists to take forward the improvement of key commercial conifer species. Our breeding goals are both conventional (improving performance traits for growth & quality) and also aim address more recent concerns around pest and disease resistance and future proofing against climate change. The need to provide viable alternatives to Sitka spruce to allow diversification of commercial forests in particular has added renewed impetus to our work.

At the time of our last bulletin, we were sprinting towards the finishing line with three major projects funded by the FC's Tree Production Innovation Fund: **"Alternative Conifers", "Scots pine for England"** and the **"Resilience in SS"** field trial. We are proud to report that these projects were all successfully completed in March 2025 moving our breeding agenda forward by several years, in one "giant leap" as the man said. We provide below a more detailed account of what has been achieved in each project.

Alternative Conifers Project

Plus Tree Programme

Over the 3 ½ year funding period we have succeeded in assembling full breeding populations of Douglas fir and Norway spruce Plus Trees from superior stands across all regions of the UK.

This has been an epic task and would normally require a much longer time scale, but with TPIF funding available, we seized the day! Thanks must go to the many landowners and managers who have assisted us along the way.

Grafts made from these Plus Trees are currently being grown on (see pictures below) to ensure they are robust before being planted out into new Seed Orchards hosted by our members. Four new Douglas fir and three new Norway spruce orchards are planned which will be dual purpose, acting both as a breeding resource and commercial seed production orchards.

As many will know, grafts retain the biological age of the donor tree, meaning that orchard trees should move into their reproductive phase within the next 6-7 years. Commercial quantities of quality ("Qualified") seed should start to enter the nursery supply chain from around 2032. For Douglas fir this will be the first time material specifically derived from UK sources has been available.

While we now have the required numbers of Plus Trees to form our base breeding population, our search for quality DF & NS trees is not over. The breeding population can still benefit from further additions, and replacements will be required for any individuals removed from the programme after testing.

18 month old Norway spruce Plus Tree grafts.
(courtesy of Forestart).

3 year old Douglas fir Plus Tree grafts.
(Courtesy of Maelor nurseries).

We would be very pleased to hear from landowners and managers who have high quality Norway spruce or Douglas fir stands they think may be suitable for inclusion in the programme.

Please contact Tanya, our Programme Administrator, on 07717 863136 for a chat

Data collection from Douglas fir field trials.

To increase the knowledge base around Douglas fir performance in the UK, Forest Research have collected and analysed data from two types of DF experiments set up in the 1990's.

The first were progeny trials set up to evaluate the performance of DF families from Washington and Oregon under UK conditions. Comprehensive information has been collected on growth rate, form, wood stiffness and wood density. The best performing trees in these trials have been grafted and incorporated into our breeding/seed orchard stock.

The second type of trial was set up to compare the performance of Douglas fir seed from several commercially-available European sources. Data collected will allow FR to publish updated recommendations to the industry on the choice of most suitable seed and planting stock to use until such time as our own new seed orchards become productive. Keep an eye out for new guidance to be issued in 2026...

Scots pine for England

Alongside the major push to develop DF and NS breeding resources, we have been looking to build resilience into the Scots pine seed orchards currently supplying the market.

Improved SP is generally performing well around the country, but the Plus Tree population used as the foundation of these orchards was heavily skewed to northerly sources. There was some concern that these orchards might not continue to perform under warmer drier climate change scenarios in the east and south of the country.

We have gone some way to mitigating these risks by creating a sub-population of 80 SP Plus Trees collected from southern UK sites which have proven ability to perform well in hot, dry environments.

Neil Bebbington senior grafting technician, Forestart, with a strong Jan 2024 Scots pine Plus Tree graft.

2024 Resilience Trial in Sitka spruce.

After a frustrating delay due to lack of funding, the long-planned multi-site trial of full-sibling Sitka spruce families was finally planted last winter. We are testing 100 full-sibling families (plants are the product of controlled crosses between two tested, superior parents) on 5 sites across the UK.

The trial has been extremely complex to set up due to the design: Each family representative is clonally replicated across all sites. Information will be collected on conventional commercial traits but also resilience to drought and pests and diseases. The powerful clonal design will minimise background "noise" in the data providing more definitive indicators of performance.

Sadly our "marginal" site in the East Midlands, has been "tested to destruction" by this spring's acute drought. We are currently considering whether to replant or to deploy the reserved stock on a different site. Elsewhere, the unusually dry conditions may help to identify families with drought-tolerant genetics.

In the fullness of time, the trials may enable CBC to develop separate breeding groups matched to particular growing conditions and UK regions if the industry demand exists.

18-month-old full sibling SS rooted cuttings, batched by family, labelled by sibling number. (Courtesy of Maelor Forest Nurseries).

What Next?

Plus Tree genetic testing

The Co-op will move into the first phase of true breeding once our orchards start to flower and produce seed (5-7 years depending upon species).

From 2030 onwards orchard seed will be tested to evaluate the genetics of our Plus Trees across a range of sites. Field trials will serve two purposes:

- Identify the best parents for targeted breeding efforts
- Quantify the growth and form gains, moving the orchards from "Qualified" to "Tested" status.

Rolling Front Breeding

In the next 5 years, the CBC will be moving into a data-heavy field-testing phase and needs to prepare well for it.

Since the last time any serious tree breeding was undertaken in the UK (over 35 years ago), thinking in the tree breeding field has moved away from Discrete Generation Breeding to Rolling Front breeding where data are continuously collected and incremental genetic gains are continuously captured.

RFB requires advanced data management and analysis tools.

STOP PRESS.

We are thrilled to announce that, thanks to a new TPF grant along with industry match funding, the CBC will shortly be purchasing a data management system used by leading tree breeding programmes around the world. The future looks bright...