



Steering Group Update – February 2022

Chairman's Introduction

Planting trees for a multitude of reasons including the absorption of carbon dioxide and mitigation against flooding, remains firmly on the UK Government's agenda as part of the battle to help combat climate change. The Government's aim is to be planting 30,000 new hectares of trees per year by 2025. That's a requirement for around 70 million extra trees per year. England, Scotland and Wales are each in forestry-expansive mode. Nurseries are the first to expand. They require seed to grow the new trees. The job of NTIS is to make sure the seed and so the trees planted are well adapted for the climate both now and in the future. The type of new woodlands established will vary from native (mainly in England) to exotic (mainly in Scotland). The partners of NTIS promote the planting of the appropriate seed source. New seed stands and seed orchards are required to supply the in-demand seed. How much better to be planting healthy, improved seed sources that absorb 20-25% more carbon following a tree breeding programme, than unimproved material. This is where NTIS comes in. NTIS encourages its members to provide the seed to industry, promotes the use of improved stock to industry and government departments, and ensures there is no loss of genetic diversity in native woodlands for the benefit of indigenous ecosystems but also as a future breeding resource.

There were two further 'virtual' meeting this year; such meetings work well with no effective 'travel' time. The Steering Group retains its cross-section of membership from DEFRA and State forestry and research representatives, to nursery people, those responsible for genetic conservation and deployment of native trees, and those responsible for planting and managing large up-land exotic plantation and those responsible for milling the final product. It is this variation of sectors' interested in different aspects of genetics and tree breeding that remains the strength of NTIS. High-lights of the last year follow.

The England Tree Action Plan (ETAP)

This was launched in May 2021

<https://www.gov.uk/government/publications/ealert-18-may-2021-england-trees-action-plan-launches/ealert-18-may-2021-england-trees-action-plan-launches>

NTIS is working with Steering Group members to ensure appropriate material is planted. Improved Sitka spruce from the Conifer Breeding Co-operative (CBC) absorbs 25% more carbon and selected broadleaves from Future Trees Trust (FTT) absorb 20% more carbon than unimproved stock. New oak seed orchards are being established by FTT, whilst new Douglas Fir seed orchards are planned by CBC.

The Science & Innovation Strategy (SIS)

This was launched in Oct 2020 by the Welsh Government. In spring 2021, Forest Research (FR) responded in terms of the Main Areas of tree breeding Research it intends to carry out over the next 5-years namely (i) Improve the stiffness of Sitka spruce (ii) rescue and breed larch tolerant to *Phytophthora ramorum* (iii) improve *Eucalyptus glaucescens* for biomass and (iv) investigate the genetic diversity of emerging species. In addition it will continue to maintain legacy breeding (databases etc), be part of the CBC Norway spruce breeding programme and the FTT DEFRA-funded Living Ash Project II, genetic evaluation of sycamore, genetic diversity of Sitka spruce PhD with CBC and Edinburgh University, and the BBSRC-funded 'Sitka spruced' genomic selection project with Oxford University

This will be the first biomass orientated breeding programme in Britain. It is also good to see breeding for *P.ramorum* tolerant larch in the SIS as this is something NTIS has particularly lobbied for.

Genomic Breeding and Selection

Understanding the role of specific genes or groups of genes, within a genome and then selecting for individuals that display those genes or groups is an exciting new area in tree breeding. Currently there are two important contracts attempting to learn more in this area – the BBSRC-funded ‘Sitka spruced’ led by Oxford University and the EU-contract ‘B4EST’ led by the Centre for Ecology & Hydrology (CEH). As the name suggests, the former is investigating Sitka spruce (SS) while the latter investigates Scots pine (SP), Norway spruce (NS) ash and eucalyptus.

A genetic linkage map for SS which includes 20 thousand DNA markers is currently under development, with a publication in preparation. This contract finishes soon.

B4EST runs until spring 2022. It is developing genetic markers and a number of thermal genotyping arrays for SP, NS, ash and eucalyptus which will be commercially available to all tree breeders. Sadly this will be the last EU-sponsored tree breeding contract. Partners of the B4EST contract in UK are also keen to re-invigorate the SP breeding programme. This needs to be in collaboration with FR (who hold the IP) and CBC.

UK Treescapes Programme

Under this new DEFRA initiative, ‘newLEAF’ received funding in Aug 2021. Headed-up by CEH, it has the sub-title ‘*Learning to adapt to an uncertain future: linking genes, trees, people and processes for more resilient treescapes*’. <https://www.ceh.ac.uk/news-and-media/news/scientists-aim-maximise-benefits-trees-people-and-planet>

The new project will work with many partners to establish if tree populations will actually be resilient to climate change issues and, if not, what human intervention is needed. It will also investigate how people make decisions in uncertain times, and how best new scientific knowledge can be used to inform policymaking and land management practices

Tree Production Innovation Fund (TPIF) <https://www.gov.uk/guidance/tree-production-innovation-fund>

A number of partners benefitted from this new DEFRA initiative as part of the Nature for Climate Fund, <https://www.gov.uk/government/publications/ealart-23-march-2021-more-on-nature-for-climate-fund> including FTT to support tree climbing, scion collection and grafting of clonal oak seed orchard, and CBC to develop plus-tree population in NS and DF and the creation of clonal archives and seed orchards, and DF progeny trials. The funding was short-lived (6-months) but allowed some good work to be done with long-term future benefit.

Forest Genetic Resources (FGR)

The UK FGR website is now up and running and is a fantastic new resource. In map form it shows where all the conservation areas are located for broadleaf species and Scots pine, as well as where all the various broadleaf research trials, seed orchards and plus trees are. This is a marvellous resource for students of tree breeding and anybody wanting to know more about the guts of tree breeding. <https://ukfgr.org>

The metadata forming the site is mainly sourced from FTT although a few FR trials are present. It is intended that other broadleaf progeny trials operated by FR will gradually be added to make the website more complete.

Social Media

The NTIS website does not seem to be that well visited. This could be because the news on the site is ‘stale’ and it’s slow to up-date in terms somebody having an idea of news to be posted and then having to contact the website manager to action that proposal. The modern way to get a message across quickly is social media and so NTIS now has a ‘Twitter’ account. This is managed on a daily basis by an enthusiastic manager. It is intended that the role and purpose of NTIS will gradually extend beyond just those organisations that make up the Steering Group. The Twitter account has been operational for around 4-months now and it’s time for an analysis of the data to investigate the ‘reach’ of our new initiative.

Availability of Improved Planting Stock

NTIS is not convinced that those who ought to know about the benefits and availability of improved planting stock – namely nursery managers – are indeed fully aware. Recent feedback from the CONFOR Nursery Producers Group (NPG) is worrying in that it suggests managers do not always know what improved stock is available and how to source it. This is fundamental work. Such users need to be aware of the off the benefits of improved stock; this is one of the primary objectives of the NTIS. To that end, NTIS intends to work with CBC and FTT to investigate the problem, hopefully by invitation to a NPG meeting. FTT have already started to address this issue: <https://www.futuretrees.org/our-impact/>

The NTIS Action Plan

It is over 4-years since the NTIS was launched and the 'Action Plan' was written. During that time it has become apparent that NTIS does not directly fund research; it is a facilitator helping to bring other organisations together to meet mutual goals. The current Action Plan is very prescriptive and was drawn up before the first NTIS meeting took place. Work has started to review and rewrite the Action Plan to better reflect the objectives for the next 5-years. A sub-group has already met to discuss the way forward and a new draft Action Plan will be circulated soon.

Chair of the Research sub-group

Professor John MacKay of Oxford University has stood down from this role having held the position for the last 4-years. Dr Stephen Cavers has agreed to take over as Chair with Dr Jo Clark acting as Secretary. Many thanks to John for his earlier work and we look forward to Stephen and Jo taking this area forward and keeping the Steering Group up to date with what's happening, and keeping an eye open for new opportunities.

Secretary of NTIS

Tim Rowland, has moved on as CEO of FTT and so is no longer Secretary of NTIS. At time of writing, a new Secretary has yet to be appointed.

Woodland Carbon Code (WCC)

The WCC incentivises the planting of trees on marginal land that would not otherwise be planted for purely commercial reasons. It would not therefore tend to suggest that improved stock should be planted BUT unless the environment is deemed to be totally dominating a site and so suppressing any genetic benefits from selection and breeding, improved stock could absorb and retain more carbon, and increase financial returns. This is an area which CBC and FTT need to retain a watching brief and NTIS is ready to help if a case can be made to use improved stock and gain more WCC credits. That said, if there is a shortage of improved stock, better quality land should always be favoured as giving a better return. In addition, WCC sites may be more geared to creation of native woodlands which suggests appropriately sourced stock in terms of adaptability (Native Seed Zone). <https://www.confor.org.uk/news/carbon/>

Improvement of species

CBC has established new NS provenance trials to compare seed orchard stock from around Europe with seed stand stock available within UK. They have also started a programme of NS plus-tree selection. A 'Strategic Development Plan' is in preparation and was the subject of an Annual Members' Day in November. They have also created a new class of membership 'Supporter'. <https://www.coniferbreedingcoop.co.uk/>

FTT is progressing with new trials for birch and sycamore. 100 candidate trees have been selected and seed is currently being stratified. <https://www.futuretrees.org/>. FTT held their annual supporters' day which can be accessed here: <https://www.futuretrees.org/events/>

Final comment from the Chair.

There has been good progress in tree breeding this year. CBC and FTT are pressing on with plus tree selection and seed orchard establishment, and FR now have a plan to select for resistant larch. The database of FGR is increasing and knowledge of genomic selection is increasing. Added to this, NTIS now has a Twitter account. The apparent lack of awareness of improved material by some nursery managers is worrying and needs to be addressed. The next year also needs to see the production of a new Action Plan.

Many thanks to all Steering Group members for participating in the work of NTIS.

Dr Steve Lee, Chair NTIS

www.ntis.org.uk

1st February 2022