Growing confidence in forestry's future
Research Programme 2013-2019

Newsletter

SCION
forests · products · innovation

This is the first of our 6-monthly newsletters for the 'Growing Confidence in Forestry's Future' (GCFF) research programme.

The six-year programme (Oct 2013 - Sep 2019) will be undertaken by a multi-disciplinary team of scientists at Scion, along with collaborators from other Crown Research Institutes and universities. The research aims to raise the profitability of current and future commercial forests. The programme is a joint initiative between Scion, the Forest Growers Levy Trust and the Ministry of Business, Innovation and Employment (MBIE). It has been allocated $3.375 million per annum funding from MBIE with further contributions from the Forest Growers Levy Trust.

In these newsletters, we will introduce the programme, provide updates on research activities and technical developments, announce upcoming events (e.g., workshops, annual conference), and provide links to key outcomes. These newsletters are intended to provide an insight into the key research activities and findings of the GCFF research programme for a wide audience from research, industry, iwi to policy makers.

More detailed information on specific outcomes will be delivered through regular events and available in peer-reviewed science publications and technical reports on key studies as the programme develops.

We look forward to meeting and working with you to make a positive difference for the forestry sector in New Zealand.

Peter Clinton
(Programme Leader)
and the research team

About the programme

Raising the profitability of commercial forestry investments is an imperative for the entire New Zealand forestry sector and also vital to increasing economic wealth for our country as signalled in the Government's Business Growth Agenda. The value derived from each hectare of forestry land must remain competitive with other rural land uses. Research and innovation is critical to improving the value of forestry through sustainable intensification otherwise land use change will continue and forestry's contribution to New Zealand's economy will decline.

The programme is one of the most significant initiatives being taken by the sector and focuses on improving the value realised from existing forests and doubling the productivity of future forests. Together, this will create a stable future wood supply that will, in turn, encourage the investment needed to enable the sector to achieve the Woodco vision of increasing the value of forestry exports to more than $12 billion by 2022.

Achieving this goal will require a shift from current low input forestry management practices to precision forestry, integrating the latest advances in sensor technology, tree physiology, genetics and forest ecology. The programme targets points where improvements can be made in the forest growing cycle, for both current and future forests, that will boost productivity under intensified management regimes while maintaining wood quality and the quality of the environment. The overall programme aligns well with the "Our Land and Water" National Science Challenge, which is focused on enhancing primary sector production and productivity while maintaining and improving land and water quality.
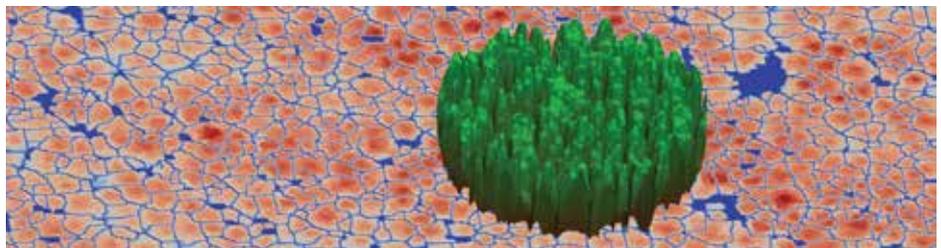
Remote sensing technologies will make it possible to manage forests from afar.

Programme structure

One of the core elements of the programme is the development of a forest 'phenotyping platform' capable of providing information on performance of different genetic material under a wide a range of environmental conditions.

Advances in remote sensing technologies, such as LiDAR, coupled with increased computing power have made it possible to assess multiple traits on large numbers

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of trees. This platform will integrate remote sensing, wood properties, environmental physiology and genetics to identify what drives growth and wood quality. Using this, trees of interest (particularly those with improved disease resistance) can be identified for breeding programmes.

Understanding the full productivity potential of radiata pine is another key challenge. Process-based growth models will be used to predict potential productivity across New Zealand under current and future climatic conditions and compare it to actual productivity data. Interventions to close the productivity gap will then be determined and tested in a series of forest accelerator trials. These trials will enable site modifications aimed at increasing productivity to be assessed for effects on growth, plant health, wood quality and soil microbial communities.

The research targets different intervention points in the forest growing cycle, for both current and future forests. The goal is to increase the returns from existing forests through mid-rotation interventions aimed at increasing productivity and end-of-rotation segregation, while also focussing on how to increase the productivity and consistency of future forests. More detailed information about the research programme is contained in the research summary document, which is available from the programme website *www.scionresearch.com/gcff*

studying the cumulative effectives of multiple aerial applications of herbicides, chemicals and fertilisers, which will be increasingly likely as a result of intensification of forest management.

The programme will host several leading scientists in the coming months who will collaborate on areas of interest in growth modelling and wood quality. Dr Michael Battaglia from CSIRO is an authority in tree physiology, process-based modelling, and climate change. Along with Dr Jody Bruce, they have used process-based modelling to develop forest management strategies in Australia that best utilise site conditions and mitigate water loss from watersheds.

Professor Laurence Schimleck, head of the Wood Science and Engineering department at Oregon State University, is a world leader in wood science research. He has extensive experience in the influence of forest management on wood quality in Australia, South-Eastern and North-Western United States and has particular expertise in the use of near-infrared spectroscopy to assess wood properties.

Latest news

Getting started

A major focus for the first three months was contracting the programme with MBIE, sub-contracting and working through the structure of the research activities with industry representatives. With the advent of the forest growers' levy, new industry structures have been evolving to replace Future Forests Research Ltd (FFR), and with the appointment of Russell Dale as the FOA Research and Development Manager good continuity with FFR is assured.

e-Cambium workshop

The programme kicked off its tech transfer programme with a workshop on the e-cambium model, led by its developer Dr Dave Drew from CSIRO. Through this collaboration there is now a good link into CSIRO, which led to the inclusion of Scion in a successful CSIRO-led research proposal to Forest and Wood Products Australia. This project will see Scion working with CSIRO to better understand what future increases in productivity will mean for wood properties and end-product quality.

Research progress

A major review of mid rotation interventions to increase the productivity of existing stands is underway, and key highlights from that review will be reported in upcoming newsletters.

Development of research plans for several new areas is well underway, with field work initiated to support the development of the phenotyping platform, as well as a new PhD programme initiated in the area of remote sensing and a post-doc at the University of Auckland to investigate the potential of an acoustic camera for assessing log properties. We are working closely with industry on a number of these projects, for example, Timberlands Ltd is providing substantial in-kind support to the LiDAR research within the programme by providing of access to data from their extensive estate.

Soon we will be looking for sites for new field trials, both short term and long term and these will provide the opportunity for first-hand involvement in an active research programme.

International linkages

Later in the year Scion will be hosting Dr Dan Neary from the USDA Forest Service. Dan recently received an OECD fellowship to work with Dr Brenda Baillie

Wood Quality Workshop

Engagement

Scion researchers have been involved with a number of industry conferences and workshops in the last two months. The first was the Farm Forestry Association's Annual Conference in Blenheim. Presentations were given on a number of topics including alternative species (redwood, cypresses, eucalypts and indigenous species), riparian buffers and radiata pine productivity.

Next was a series of two Wood Quality Workshops which asked the question - Is wood quality still relevant? The short answer was "yes it most certainly is", but there was some good discussion

around the challenges of assigning a dollar value to improvements of wood quality, whereas it is relatively easy to do so for growth traits.

The final event was the Forest Ecosystem Services (FES) Forum, which was held in Wellington. Speakers from regional councils and government agencies from around New Zealand, the United States Forest Service, Australia's CSIRO and Scion's own researchers shared their research and perspectives on the future for ecosystem services. The forum also discussed how New Zealand might address the opportunities, risks and challenges associated with realising the values of FES and incorporating them in future policy decisions.

Presentations from the wood quality workshops are available on the programme website and the FES forum presentation on the Scion website.

Looking ahead

Kick-off conference

This is scheduled for 10-12 June in Rotorua. We have a number of world leading scientists presenting at this conference as well as programme contributors and industry representatives. The final day of the conference will be a field trip to Scion to see the laboratory facilities and the wood quality research, followed by a visit to Tarawera Forest to discuss issues around productivity and sustainability in more detail. Please see the conference website for the conference agenda and registration instructions: *(http://www.scionresearch.com/general/news-and-events/events/calendar-events/fs/pathways-to-doubling-productivity)*

Innovation clusters

To foster active engagement of interested parties/stakeholders and effective technology transfer a number of innovation clusters are planned. Key areas of engagement will be around the phenotyping platform, product quality improvement, productivity enhancement, and sustainability. The format/set up of these clusters is in development, and more information will be available on the website along with a calendar of planned events.

Field days and Canterbury A&P show

Scion will have a presence at the Mystery Creek Field Days in conjunction with the Farm Forestry Association and Woodmetrics, where the focus will be on decision support tools for small-scale forest owners. Planning is underway for a stand at the Canterbury A&P show in November.

To learn more about the research projects in the programme:

Contact
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Visit
the programme website
www.scionresearch.com/gcff

Register
for the programme conference
on 10-12 June Rotorua
(http://www.scionresearch.com/general/news-and-events/events/calendar-events/fs/pathways-to-doubling-productivity)