

Awards

The 2017 awards season has been busy for the HTHF team. Industry, peers and colleagues have been recognising Scion's high achieving scientists including our own programme Leader Dr Nari Williams, and others from the Forest Protection team.

Nari took home an early career researcher award for her work in forest disease at the inaugural Science New Zealand (SNZ) awards acknowledging her work with *Phytophthora* and her leadership of the Healthy Trees, Healthy Future programme to defend our forests and horticultural crops from present and future *Phytophthora* diseases. This included her efforts in stakeholder engagement, particularly with tangata whenua on kauri dieback.

We're very proud of Nari receiving this award and feel it is very well deserved.

Scion's world-class Biosecurity Team received the SNZ team award acknowledging their successful management of several new-to-science diseases and development of a forestry biosecurity surveillance system considered by overseas experts to be the best in the world. Also recognised were their science impacts over the last 25 years, including pest eradications, exclusion of pitch canker, and successful pest management of nectria flute canker and market access assurance.

Ian Hood was confirmed as a fellow of the Australasian Plant Pathology Society in September 2017, joining other notable New Zealand members, such as Alison Stewart and Ross Beever. Ian's long career working on decay fungi, Armillaria and Swiss needle cast was fittingly recognised by this award.

Nari says "It was a real thrill to receive this award and to be recognised for doing science that I am passionate about".



Our Science NZ award winner Nari Williams with Dr Richard Gordon (Chair, Science New Zealand) & Hon Dr Megan Woods (Minister of Science, Research & Innovation).

Mana whenua kauri cone collections 2018

With the kauri seedlings from the 2017 mana whenua cone collection growing strong, and the 2016 seedlings being tested, planning is well underway for the 2018 collection. The science review in April 2017 recommended that the next step of our mana whenua kauri lines should be to collect seed from healthy-looking trees in areas that have a longer history of infection. We agree with this as it will be targeting collections from trees which have already been exposed to the pathogen in the field and may be showing signs of resistance to infection. Discussions are underway with two mana whenua with well-established kauri dieback infestations that fit the criteria for these collections. This means we won't be putting out a general request for collection sites but, as our work with the 2016 and 2017 collections isn't complete, we will be staying in touch with our mana whenua partners keeping them informed of the outcomes of this work.



Pinus radiata genome assembly

In a world first, the Scion Forest Genetics Team in collaboration with Massey University, has completed a draft assembly of the radiata pine genome. At 25 billion base pairs, the radiata pine genome is eight times the size of the human genome, and its sheer size was a substantial challenge to researchers.

"A complete genome assembly means that we now have the instruction book for how radiata trees grow," says Dr Emily Telfer who leads the project. This milestone marks the beginning of a post-genomics era and opens the door to a new era of precision forestry.

The next steps

Following assembly, the next steps will involve understanding the role each piece of the genome plays and eventually, how those pieces can be manipulated faster and more precisely to produce future generations of forest stock.

Armed with this knowledge, the forestry industry could more easily breed trees with highly desirable characteristics. Emily explains, "Currently it takes decades for us to breed new characteristics into trees. Once we better understand the genome puzzle we will be able to produce superior trees much more quickly."

She says that in time this will revolutionise modern forestry. "We could breed trees suited to different markets - from

construction timber to biofuels."

Another major advantage will be in mitigating the effects of climate change and disease. As environments alter with climate, diseases not previously found in New Zealand may establish and threaten our forests.

The genome assembly will also benefit the international scientific and forestry communities. Radiata is the backbone of New Zealand's forestry industry, but it is also the most domesticated pine in the world and is grown commercially in Australia, Chile, Spain and South Africa.

Just the beginning

"Now the real work begins," says Emily. "We've already begun our second draft assembly and the next step will be to begin the task of deciphering what each of the DNA segments relates to in physical terms".

The genome assembly began in 2013 and, with assistance from the international conifer genomics community, was completed in September 2017 using Scion's newly acquired high-capacity computer server – the largest of its kind being used for genomics in New Zealand.

The official announcement of the first draft genome assembly was made at the Forest Growers Research Conference in Christchurch in October 2017.

HTHF Programme Overview Committee chair is moving on

Prof. Alison Stewart – Scion's Forest Science GM – is taking up a new position of Chief Executive of the Foundation for Arable Research in March, and resigning from her position as the HTHF Programme Overview Committee chairperson. We have appreciated Alison's contribution to the HTHF programme and wish her well in her new role.

Forest Protection Science Leader Lindsay Bulman will step in to Chair the Programme Overview Committee for the remainder of the programme.



HTHF Poster series

Nari and the team have started putting together an HTHF programme poster series focusing on the “Enabling Technologies” outcomes of the programme. To date they are:

1. Modelling the dynamics of red needle cast
2. Know thy enemy: plant pathogen genomics advancing disease management
3. Quantifying the physiological impacts of *Phytophthora* infection on trees

There are more to come and you are likely to see these rolled out at various public presentations this year.

To learn more about this programme

Contact Dr Nari Williams at nari.williams@scionresearch.com
Visit our website www.healthytrees.co.nz

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