

TreeMatters

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EDITOR'S LEAF

Erika Commers

Hi all, I am happy to be at the tail-end of the winter issue of Tree Matters, and at the tail-end of winter no less. We have some great articles in store about New Zealand arborists and unique New Zealand trees.

Recently I have become attuned to the encouraging increase in dialogue being shared about the values that trees provide, especially within the urban developed environments. It seems that this understanding is finally starting to gain some ground, perhaps even more so beyond our arb community. However, with this awareness increasing, it certainly doesn't give us room to become complacent, as there is always an ongoing need to remind people of the benefits of trees.

If environment and sustainability specialists, planners, and even engineers understand and promote the importance of retaining and planting trees, we need to be as ready as ever to rise to the occasion to meet these needs. This may mean leading with pruning options when conflicts are perceived or diagnosing plant health issues and offering remediation. Also, a clear understanding of what ecosystem service benefits are, and how to go about measuring them is essential. Engaging with this conversation will demonstrate professionalism and currency in your practice as an arborist, whatever role you fill.

In this issue we have an article about i-Tree that is not to be missed. The i-Tree tools and the concept of measuring ecosystem service benefits is already widely in use in Canada, the UK, and Australia. This open-source software suite is free for everyone to access, thanks to a partnership of public funding and development with the US Forest Service and Davey.

If you would like to see a clever application of the information i-Tree can provide, check out my favourite tree map created by New York City at tree-map.nycgovparks.org. While we aren't able to make any in-person visits abroad just now, zoom in and take yourself on a desktop tree discovery tour of New York City, you never know what you may encounter. And if technology or the pursuit of new information excites you, get into the i-Tree software tools and give it a go.

On another note, it appears that Arbor Day may have fallen a bit flat this year with the disruption that COVID-19 played in our normal spring planning and activities. If you weren't able to plant a tree, or if you've fallen behind like I have, give yourself permission to take a 'rain check' and commit to planting something soon, or any time if you know you can provide enough recycled water during the summer heat. It's also a good time to begin planning for a double effort during the next planting season, especially if this year has fallen short.

Enjoy the already longer days and stronger sun. It seems the weather has some trees confused into early bud break again, so I've been appreciating some early cherry blossoms and magnolia blooms in my area. Stay well and be kind.

HENRY'S ANSWER TO A COMPLEX PROBLEM

Mark Roberts

Henry Louis Mencken is famous for many things including saying; "for every complex problem there is an answer that is clear, simple, and wrong." Mencken was an American satirist and cultural critic who died in the 1950s – by all accounts, he was free with his opinion and took no prisoners. I suspect he'd be finding easy pickings in today's political environment. I came across Mencken's quote when listening to an oncologist talk about the complex responses the human body has to various cancer treatments; 'the human body is a vastly complex biochemical organism,' she said.

Trees don't have quite so many moving parts as the human body, but I think it's fair to say trees are also complex biochemical organisms. Of course, trees do not exist in isolation. There is a multitude of separate biochemical organisms living on, in and next to our trees. Those organisms exist in different amounts, in different conditions and at different times, subtly and/or collectively changing what happens on, in and around our trees. There are also abiotic factors and mechanical forces to consider. It all becomes very complex very quickly and one would be forgiven for getting confused when considering the complexity of it all. Luckily the oncologist had an answer to that as well – although not specifically referring to trees, she pointed out that, 'those that were not confused, were not paying attention'. At this stage, I became confused and stopped listening to her.

Tree risk assessment can also be a complex problem. Not only do you have to consider the tree with its multitude of organisms living on, in and around it, abiotic factors and mechanical forces, you also have to consider the target; where it is, what it is, what it's worth and what could happen to it in the event of a tree or tree part impacting it. And then, there is the event: could the event actually happen and if so, when? Yep, assessing tree risk can be vastly complex, but luckily there are tree risk methodologies to help us. But which methodology is the right methodology to use – yet another complex question?

A risk assessment is simply the collection and modelling of data to make a prediction, and almost every industry and/or activity has at least one method. Jerome Tixier(1) and others reviewed 62 commonly used risk methods applied for industrial safety and determined that; "there is no one general method to deal with [all of] the problems of industrial risk". Jeff et al(2)

reviewed 12 commonly used risk methods used in the pharmaceutical industry and determined that; "each assessment method requires different data and has its unique characteristics and features, as well as strengths and weaknesses."

It would seem that there are good points and bad points to them all. So, maybe there is a type of method that is better; quantitative or qualitative – which one of those should we use?

Quantitative data is information about quantities, information that can be measured. Quantitative data is usually expressed in numbers. Qualitative data, on the other hand, is information about qualities, information that can't be precisely measured. Qualitative models are usually expressed in words. As far as common tree risk methodologies go there are both types available. So, which is best?

When it comes to a preferred type of method you're talking about personal preference. A debate about which method is more correct based on how the data is collected and presented is more about human nature than is about the method used. Some people like numbers, some people don't, some people like cats... Personally, I use quantitative and qualitative methods depending on the wants and needs of the client or situation – sometimes I even use both for the same tree.

So, if no single-risk methodology deals with all of the problems and each has strengths and weaknesses and the type of method is down to personal preference, what's the point of using a risk methodology at all? Our next complex question.

As a risk assessor, you need to manage your own risk. By using a recognised peer-reviewed risk methodology you are addressing this. You are managing your own risk by apportioning some of the decision [the risk rating generated] onto the methodology; you add the data, follow the process and the resulting outcome is generated by the methodology, not yourself. Of course, the outcome generated is only as good as the data entered, hence the methodology (and the owner/creator of it) is not actually responsible for your outcome.

But what if you put good data in, follow the steps correctly, and it still goes horribly wrong? What if you correctly undertake a risk assessment and failure and impact still occurs? The next complex question.

Exceptional unforeseen freak occurrences can and do happen, and when they happen, if they are actually outside of anyone's control, blaming someone is probably pointless, but people love to blame – and

blame they will do. By using a risk assessment methodology, the methodology generates the rating – so if you find yourself in the blame game, you could try removing yourself from the equation, and blame the methodology.

With that in mind, the developer and/or owner of the risk methodology needs to manage their risk. Yet more complexity. To manage their risk the developer and/or owner of a risk methodology needs to control the use of their method. To do this the developer and/or owner of the method may choose to train and test, train and not test or not train and not test.

By requiring users to undertake training and pass a test the developer and/or owner can document that users have demonstrated their ability to use the methodology correctly. This is a very tidy way of managing users, but it is not as simple as it sounds. If you are using a test to confirm competency, the testing regime needs to be robust and defensible; i.e. what was tested, how were the questions worded, how was the pass mark generated, how is it marked, what are the conditions of assessed? etc. There is a lot of credibility in testing, but there is also a lot of complexity hidden behind it.

A developer and/or owner of a risk methodology could choose the options of training and not testing, or even not training and not testing. Training and not testing or not training and not testing is also a very

tidy way of managing your users. By not testing there is no evidence to confirm the users were competent to use the methodology in the first place. There is less credibility in not testing, but there is also less complexity.

Trees and tree risk assessment can be complicated. Choosing the best tree risk methodology can be complex, but remember, for every complex problem there is an answer that is clear, simple, and wrong. It is OK to be a little bit confused because that probably means you are paying attention and when the time comes to choosing a tree risk methodology, it is unlikely that one single method will do everything, so why be limited to one?

1. Review of 62 risk analysis methodologies of industrial plants. (2002) Tixier T, et al. Journal of Loss Prevention in the Process Industries, Elsevier, 15(4), pp.291-303.

2. A Review of Quantitative Risk-Benefit Methodologies for Assessing Drug Safety and Efficacy (2010) Jeff J, et al [Report: ISPOR Risk-Benefit Management Working Group] – Value in Health 13(5) pp. 657-666



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5 MINUTES WITH DALE THOMAS

What inspired you to pursue a career in arboriculture?

At the start it was just a job that kept me out of trouble. I started looking up to the lead climbers in the yard (Treescape 2001). I wanted to be like them, better than them if I could. I'd hustle all day on the ground to get us ahead in hope that they would put me up a tree at the end of the day.

What is the best part of your current job?

The people I work with. Having a laugh with my colleagues or seeing the concern in a young climber's eyes when he puts his life in my hands, then the elation afterwards when things work out as planned.

What is the best job you have had in Arboriculture?

Hard to pick one.

Rocking around London in a unimog with a hiab on the back and a 12" chipper on the front, rigging out all the removals for royal parks and council boroughs.

Seed collection; traversing through huge mountain ash in Victoria for Vic Forests.

My current Job at Treesafe has awesome variety. I manage contracts & projects, train, operate excavators, climb, run the social media and help develop operating procedures.

What motivated you to volunteer for NZ Arb?

I've been out of the climbing comp scene since Texas 2016. It was time to re-connect with the greater arb community and see if I can instigate some positive change.

What do you think one of the biggest challenges facing Arboriculture in New Zealand is?

Re-professionalising the industry. We have been going backwards for the latter half of my career. The 'mushroom movement' in Auckland started with the end of blanket tree protection. I'd love to see the return of greater protection, but until then we also need more NZ Arb Approved Contractors. We also need clients (from Councils to domestic) to recognise and demand that badge.

If you were a tree what tree would you be and why?

I'd be a gnarly old pōhutukawa on the west side of the Āwhitu peninsula. While travelling in my 20s I'd almost always make it home for Christmas. Seeing the old pōhuts on the drive out 'the heads' in full flower feels like home.



Christchurch Botanic Gardens in Autumn, CC 1.0 Universal

NEW ZEALAND'S URBAN FORESTS – MONITORING & MANAGING FOR IMPROVED ECOSYSTEM SERVICES

Justin Morgenroth^{ab}, Toby Chapman^{ac}, Howell Davies^{ad}, & William Melville^{ae}

a. New Zealand Urban Forest Initiative

b. University of Canterbury

c. Christchurch City Council

d. Auckland Council

e. Wellington City Council

What Is an Urban Forest and Why Does It Matter?

The urban forest is comprised of the trees located within an urban environment. It includes street trees, park trees, riparian plantings, rooftop gardens, and importantly the trees located on private property. Apart from aesthetic value, the urban trees that surround our homes, workplaces, and recreation areas provide New Zealand's largely urban population with numerous other benefits. Urban forests provide nature-based solutions to climate change by sequestering greenhouse gases from the atmosphere, they mitigate flooding risks and surface runoff by intercepting and absorbing precipitation, and they reduce energy consumption through shading. They provide habitat and biodiversity. Moreover, they sustain human wellbeing by contributing to positive mental and physical health outcomes for NZ's citizens. Together, these benefits are known as ecosystem services. Trees clearly play a critical role in creating healthy, liveable and sustainable cities.

Managing Urban Forests

Generally speaking, the street and park trees in our communities are managed by our local government. This includes trees in cemeteries, reserves, and botanic gardens. Local governments manage our urban forests by designing our landscapes, planting trees, maintaining them for decades (or even centuries), and eventually removing them when they die or when their associated risk outweighs their reward. But what about all the trees on private property? Well, their management falls to us, the citizens. We manage the trees in our private gardens or the trees at our workplaces. So we're all urban forest managers, to a certain extent. To effectively manage NZ's urban forests, we need to develop our knowledge about the trees in our cities, and the benefits they provide. In many countries overseas, this task has been undertaken with the use of novel software suite called i-Tree.



What Is i-Tree?

i-Tree is a software suite that allows users to assess and analyse urban forest structure, diversity, and benefits. The software was developed in 2006 by the United States Department of Agriculture (USDA) Forest Service and has since been peer-reviewed by scientists around the globe. While it was initially developed for American cities, it has expanded its scope and is now used by more than 300,000 users in thousands of communities, villages, towns, cities, and regions around the world.

What Does i-Tree Do?

The i-Tree software suite has numerous tools with various uses. The tool with the greatest potential to help New Zealand cities better understand their urban forest structure and the benefits provided is called i-Tree Eco. Eco guides users through the process of establishing tree inventory plots, then collecting data from trees in those plots in order to establish a city's urban forest structure. Once this is understood, those data are combined with local hourly air pollution and meteorological data to quantify the ecosystem services and disservices provided by trees, along with the associated economic value of those services. Simply put, i-Tree Eco measures urban forest structure, then estimates its function and value to the community. The costs associated with trees have long been known and are now better supported by science. It's easy to quantify design, engineering, planting, and maintenance costs. But i-Tree Eco finally provides the framework to quantify the benefits and value of trees. For example, overseas communities that have used i-Tree Eco have found that for every dollar spent, urban forests provide \$3 - \$5 in benefits; that's a considerable return on investment. With this critical information, i-Tree Eco results can be used by city arborists, policymakers, government, community groups, advocacy groups, educators, and researchers to make better management decisions about New Zealand's urban forests.

Will i-Tree Work in New Zealand?

i-Tree Eco was originally developed by the USDA Forest Service for use in the United States of America. However, since then it has been used in many cities around the world. The cities that have gained the most accurate and valuable information from i-Tree

Eco are those that have adapted i-Tree Eco for local conditions; that is to say, inclusion of all local tree species and local pollution and meteorological data. To date, the USDA Forest Service has developed a number of versions of i-Tree Eco for use in Australia, Canada, Colombia, Europe, Mexico, South Korea, and the United Kingdom. For i-Tree Eco to provide accurate benefit values to New Zealand communities, it needs to be adapted for local use. This is because our flora, pollution, meteorological conditions, power generation costs, geography, and population density differ too greatly from the base version of i-Tree Eco developed for America. It should be noted that the American version of i-Tree Eco has been used by some groups in New Zealand without adapting it for local conditions. This approach is pragmatic, but fraught with inaccuracy. A more accurate (but also complex and costly) approach is to adapt i-Tree Eco for use in New Zealand.

Adapting i-Tree for New Zealand's Urban Forests

The New Zealand Urban Forest Initiative (NZUFI) is already in discussion with stakeholders at the USDA Forest Service to adapt i-Tree Eco for use in New Zealand. The NZUFI is based at the University of Canterbury and comprises researchers, as well as, city foresters and arborists from councils around New Zealand, including the Christchurch City Council, Wellington City Council, and Auckland Council. The NZUFI is working hard to collect accurate information about NZ's unique tree species and is collaborating with relevant organisations to get access to population densities and geographic details on our towns and cities, along with air pollution and meteorological data from these areas. Ultimately, our aim is to adapt i-Tree Eco for use in New Zealand such that we can better describe our urban forest resource and understand the benefits our urban trees provide us with. By using local data, i-Tree Eco NZ will have greater accuracy, meaning the results produced can be used with a greater degree of certainty. Once the adaptation process is complete, i-Tree Eco NZ will be freely available to anyone wanting to use it. If you're interested in learning more about i-Tree Eco NZ or want to help with adapting i-Tree Eco to New Zealand's conditions, feel free to get in touch with the authors.

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FUNGI PROFILE: CYCLOCYBE PARASITICA FORMERLY AGROCYBE PARASITICA

Rimu Tane

Tawaka

Poplar mushroom

Cyclocybe parasitica is a New Zealand native fungus that affects both native and introduced hardwood trees.

Though generally regarded as a heart rot fungus it can invade sapwood as well. Common throughout New Zealand. Fruits during summer and autumn, with fruiting bodies up to 300mm in diameter. See attached photos.

Once the fruiting body is mature it is easily identifiable because the membrane that covers the gills falls and forms a skirt on the stalk.

Cyclocybe parasitica has been observed in trees suffering crown dieback. The fruiting bodies often occur

high in the canopy. The spread of *Cyclocybe parasitica* is increasing in New Zealand because it is regarded as a high-quality edible mushroom, with grow kits available for purchase and people trading spores and inoculated wood around the country.

Cyclocybe parasitica can have variable effects on individual trees. Some trees last upwards of 30 years after infection with only minor effects. Other trees reportedly suffer major dieback within 2-3 years of the fungi first fruiting.

For more information see inaturalist.nz/taxa/815897-Cyclocybe-parasitica





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BRACING & PRUNING OF A NOTABLE NORFOLK ISLAND HIBISCUS IN AUCKLAND

Andreas Ross (Rossy)

*Earlier in the year Pro Climb was asked by Auckland Council to provide a tree management solution for a notable Norfolk Island hibiscus (*Lagunaria patersonii*) (register: notabletrees.org.nz/tree/view/994) in Monte Cecilia Park, Auckland.*

Most likely, the tree was planted around 1850 by William Hart who purchased the surrounding property in 1844. If you would like to read more about the history of Monte Cecilia Park and the Pah Homestead, please follow this link to the Wikipedia article: en.wikipedia.org/wiki/Pah_Homestead

Fourteen years ago, it was noticed that the tree was splitting from the stem crown (main union) to the base. This split has slowly increased to over 30cm at the stem crown. There was no documented information available that would allow us to know if the split in the trunk was accelerating or gradually increasing. We only knew that it started narrow and is now larger. From our experience with other tree species, we assumed that the splitting would be accelerating due to the increased weight (additional growth) and the changed leverage forces due to the displacement of the crown.

Unfortunately, previous attempts to stabilise the split by installing dynamic bracing and conducting crown-reduction pruning did not bring the hoped-for results.

Due to the heritage value and the focal point that the tree provides within the park, the clients wished to retain the tree. But of course, not at all cost, so it was our job to understand what needed to be done to retain the tree as a safe asset. This also required estimating the cost of the initial work and of the ongoing maintenance. The client then set this information against the total cost of losing the asset by removing it. Fortunately, our suggested tree management solution was accepted and that allowed us to do this work and share it with you.



Split in notable Norfolk Island hibiscus tree in Monte Cecilia Park



Photo showing previous bracing

Creating Our Tree Management Solution

It was our task to create a tree management solution that was cost-effective, that stabilised the trunk, retained the tree's aesthetics, and conserved the tree for future generations. We were honoured to have the opportunity to provide the tree management solution, to work with this notable asset, and to be trusted with the task of sustaining this amazing tree.

The current tree dimensions are:

- DBH: 204.5cm (measured at 1.4m)
- Crown spread: 20.5m (measured N-S and E-W)
- Height: 22m (measured with the app Arboreal from W and SE)
- Specific wood weight: 0.8722 (measured from samples)

While inspecting the tree we found that, although the split in the trunk increased to 30cm over the past years, the tree still showed a closed canopy. This was one of the indicators demonstrating that the tree has great vitality and would be able to deal with weight reduction pruning, and invasive bracing if necessary. On a tree with less vitality, we would have expected to see a gap in the canopy mirroring what was happening with the trunk.

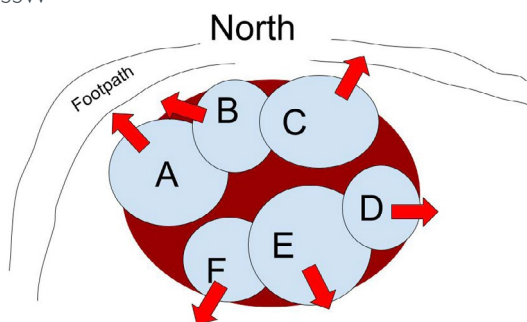
The tree has no known history of significant limb failure, and calculations showed that it is very unlikely for the tree to uproot as a whole. However, there was a risk of the tree splitting apart due to the defect in the trunk. To prevent this from happening, the split in the trunk needed to be stabilised.

My personal favoured approach to managing this tree would have been to fence the tree off from the public, conduct regular weight reductions to slow the splitting of the trunk and encourage lower limb growth. Allowing the tree to split apart over the next 30-40 years until it would rest on the ground. This would turn the tree into the most amazing feature within the next 50 years, if the asset was not lost in the process, a risk I would be willing to take to create a natural asset of unique character.

But this was not an option due to the location of the tree near the footpath and heritage gardens below. So, we needed to find a different solution.

Our climbing inspection and visual observations showed us that the tree has two large limbs and four leaders that are weighted as follows:

- Leader A – Upright leader weighted towards NNW
- Leader B – Horizontal large limb weighted towards NW
- Leader C – Upright leader weighted towards NNE
- Leader D – Horizontal large limb weighted towards E
- Leader E – Upright leader weighted towards SSE
- Leader F – Heavy leaning upright leader weighted towards SSW



The arrows show the direction of the lean of the stems

By understanding the lean of each leader and its estimated weight we could design a system that uses not only material strength to hold the leaders in place but also uses the counterweight principle to stabilise the tree.

After calculating the total above-ground tree weight, we designed a static bracing system that would be able to carry the weight of the tree and prevent any further opening of the split.

We were initially hoping to bolt the tree using threaded rods, but the size of the trunk and the cost of the equipment to drill through the tree made this option unviable.

Our next approach included installing bolts above the split and connecting them with steel cables. As the bracing system would be under constant tension, we would have preferred an invasive system leaving most of the xylem and phloem unrestricted to move the necessary nutrients through the tree.

We needed to drop the idea of using wire rope as the distance between the leaders was too short for wire rope to be used effectively and we could not achieve the minimum distance required to meet compliance.

We also needed the distance of the diameter of the leader between each rod installation to meet industry standard requirements. Each leader was over 800mm in diameter meaning that our bracing system would have been spread over a horizontal distance of 1.6 metres. We were not comfortable with that distance between the bracings as we could not predict if this could create negative torsional tension within the tree.

So, for now, we have used a non-invasive static bracing system consisting of heavy lifting chains, shackles, hammerlocks, turnbuckles and webbing slings. It is designed to last a minimum of five years and will be inspected every 12 months.

We chose the triangle configuration for the bracing so that each leader will be supported by two bracings with a total load capacity of 34 metric tonnes.

We also conducted a 15% crown reduction on the tree's canopy and removed all of the earlier dynamic bracing.

Ongoing Tree Management

The notable hibiscus tree will be pruned every 3-5 years. Through this repeated pruning, the canopy will be reduced from its current size to a size of 17m height and 15m crown spread over the next ten years. Once these dimensions are achieved, the tree will be retained at that size.

By staging the pruning over a longer time period, the tree can adjust to the foliage loss and any negative effects of the pruning are mitigated.

We look forward to monitoring the development of the tree over the next years and decades to come. It will be interesting to continue to evaluate the tree management approach and to see how the tree develops.

This project has been a steep learning curve for our whole team. We will be investing more resources into developing our understanding of the management of large mature trees, to be able to find solutions to tree problems that can't be solved by applying the industry standards that do work so well for 99% of our trees.

And we look forward to the next challenge.





INTERVIEW WITH ANDREW BENSON

Ian Lawson Interview with our New NZ Arb Executive Committee member Andrew Benson

Prior to discovering arboriculture, you had done some previous studies, tell us a bit about this and what took you from that to arboriculture?

I was originally educated as a biochemist with an undergrad degree in the UK. It very was interesting, but by the time I graduated in 2002, I wasn't feeling terribly inspired to work indoors in a sterile laboratory all day. It was the end of that summer when I walked past a tree crew and thought to myself as I looked at the man climbing around a large sycamore, "that looks like fun. I'd like to do that". I've been in the arb industry for nearly 18 years now, in the UK and New Zealand.

Did you come to Aotearoa/New Zealand to work as an arborist? And then what made you stay?

Yes. I had been working as a climber in Wales (UK) for almost four years. I lined up a job as a climber with Treescape before I came out here. The plan was just to stay for a year and then go back to the UK to be a grown-up. I fell in love with New Zealand very quickly and here I am, 14 years on with a black passport and I still haven't grown up.

You're based in Auckland now, but you've been in and around the NZ arb industry for 14 years. Where have you worked in Aotearoa and how did you end up in the City of Sails?

Auckland just happened. It seemed like the default position when I showed up here in 2006. To be honest, I didn't know much about New Zealand 14 years ago. I worked in Wellington for about 18 months around 2010/2011 as a project manager for Treescape while I was finishing off my arboriculture degree through Myerscough in the UK.

How do you describe yourself now?

The job title I have at the moment is 'urban tree ecophysiolgist'

That's a bit different, what does it mean and why not just Consultant Arborist?

Ecophysiology is the study of how the environment affects biological processes of different organisms, which is largely what my Ph.D. involved. I find the term 'arborist' seems to encompass a wide range of jobs, but largely the perception of the public, and even other professionals, is that all arborists are tree cutters, which as we all know is not the case. So, the job title is a point of difference to a certain degree, but also nicely describes my area of expertise in a concise 'one-liner'.

When you presented the SMART session at last year's conference you were in the final stages of your Ph.D. After so long what made you go back to study at such a high level?

The Ph.D. was a by-product of getting to the bottom of some unanswered questions. Very little is known about the underground parts of trees, and despite it not being formally taught in the curriculum, everyone seems to have an opinion on what we should or should not do when it comes to roots and tree preservation, but very few people have actually studied it in detail and we (as an industry) know very little about it. I had some questions about how we (as an industry worldwide) were tackling this, which is increasingly important as urbanisation is on the rise. The only way I could answer my questions was to do some research, and since I didn't have the academic bona fides to pull it off on my own, I signed up to do a Ph.D.

The SMART session was a new addition to the conference programme in 2019, and was well received by many. What inspired you to bring that to us?

I took part in the AREA session at the ISA conference in Ohio in 2018. It's five post-grad students giving a ten-minute talk during the science and research day at the conference. The whole thing was very supportive of students who are new to public speaking, which can be nerve-racking the first few times you do it. It's also very useful to help young researchers to get industry exposure and promote their career. I had such a good time taking part, and I could see that the other students did too, I wanted to share that with New Zealand's post-grads and our delegates at the conference.

Who inspires you in the world of arboriculture and trees, what do you want to bring to the table that is uniquely Dr Benson?

The people that inspire me the most are the younger generation that ask questions and want to do more than just the 'off the shelf' 9-5 career path. People who stand up and say, 'we can do this a better way'. People who break from the norm and try to do things differently for the betterment of our trees and ourselves. The arb industry can be a little 'stagnant' in places, but every now and then someone comes along and makes ripples and things change for the better. Be it with new information, new standards, new ideas or just someone who has the right attitude and gets up and gets on with doing a bloody good job. These people should inspire us all. I hope I've been able to make a few ripples recently with the research I've done and will continue to do.

Most arborists in New Zealand stop studying at level 4. I personally have been inspired by you to now go back and start my diploma. Where do you see the gaps in arboriculture education in Aotearoa, and what do you think sets apart those who go on to do more?

The biggest gap I see in New Zealand's education system is that there are currently no options to get a qualification in arb which is higher than a diploma (level 6). I think we desperately need to change that and provide education at an undergrad level to offer people opportunities to be able to learn more, give them access to new information and lift the standard of our industry. That's not to say we're doing a bad job, far from it, but there is plenty of scope to do better and we should always be learning. The government has recently made many vocational qualifications free, including arboriculture, and it's now possible to get a diploma in arb for free. There is no reason at all that anyone in our industry shouldn't be seizing this opportunity while it is available. I have personally enjoyed every moment of my academic journey and it has opened doors for me that I never thought possible. It is of course incumbent on me, and anyone else who chooses to do more, to help others to achieve the same goals with further education, formal or otherwise.

What advice would you give our young arborists around the country knowing what you do now?

We all have a responsibility to care for our environment and you have been charged with caring for a very important part of that environment. Enjoy what you do but be humble and be respectful of every tree that you work with. Time is running out for our generation to make impactful changes on our climate crisis and you, as an arborist, are in a position of influence. Plant trees when and where you can and encourage the people for whom you work to consider alternatives to removal.

What would you go back and tell yourself when you first started out in trees?

Nothing. I'm very happy with the way things have panned out for me and I wouldn't want to jeopardise that with a time machine and some potentially bad advice.

Why now? Why have you recently made the decision to join the Executive Committee of NZ Arb, and what do you think the association brings to the industry and its members?

I figured it was about time I stepped up and made my contribution. NZ Arb is a great association and it keeps us all together. There are some great things happening in the background and some very good people at the helm. I hope I can use my recent background to the advantage of our industry.

What are the challenges for New Zealand and our urban trees given the huge pressures from human development and climate change?

We're running out of space to plant trees. Climate change is brought about by greenhouse gas emissions which go hand in hand with human development. We're exterminating the very thing that will save us from this catastrophe so we can make it worse. It really is no wonder we haven't been visited by intelligent life from other planets, because what we're doing to our own planet doesn't seem particularly intelligent. One of the biggest problems is that our environmental impacts are taking place on a temporal scale we cannot comprehend. 'Oh, it's just one tree' is all too common to hear, but when a population of people say that, it becomes a lot and the environmental impacts mount up and we're handing that off to future generations. Education and awareness are the biggest challenges, both within and outside of our industry.

What's the single most important thing we can do to enact changes to improve those outcomes??

Don't be afraid to say 'No' when something isn't right. Stand up for what you believe in. Educate people about the benefits of trees at every opportunity. What Zane Wedding has done recently is an excellent example of reaching a wide audience with a well-delivered and important message and we should all be applauding him for that. This is what we should all be doing, whether it's to a private client who wants a tree removed, or a property developer who wants to clear a swathe of trees for new development.

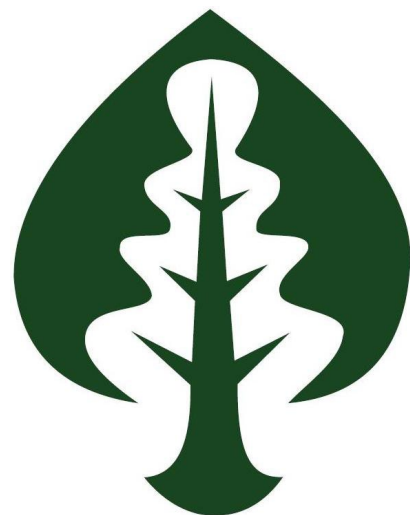
You organised a tree biomechanics workshop earlier in the year with international presenters. Given that we won't be able to tap into that pool for the foreseeable future, what are the ways that we can stay up to date with the latest research and new information from around the world?

The TREE Fund are running regular webinars which are a great free resource. You'll find academics and practitioners alike on those 60-minute talks giving all sorts of new information. Arboriculture and Urban Forestry is a journal published by the ISA and the archives can be accessed for free. I still have access to many scientific publications so contact me if there something specific you need, and I'll do my best to dig it out.

They say that if you don't share what you know, it isn't knowledge. Do you have any aspirations to teach in the future?

Not in a formal context, but I'm always happy to impart the few bits of knowledge I've picked up over the years to anyone who wants to learn. Mind you, I had no aspirations to move to New Zealand 15 years ago, or to do a Ph.D., so who knows what will happen in the future?

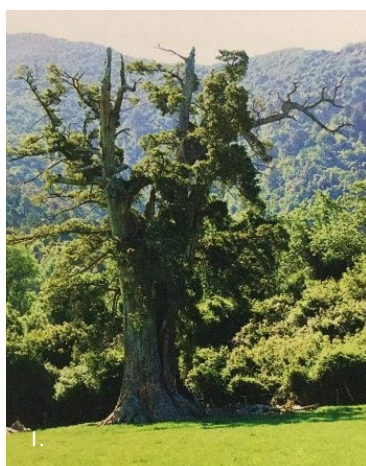
NOTABLE TREE STORIES IN SEARCH OF BIG SOUTH CANTERBURY TŌTARA



In each edition of tree matters we will endeavour to feature trees from the New Zealand Tree Register. The idea is to highlight a specimen or group with outstanding attributes and/or a tree with an especially interesting history.

For us Mt Peel has always been a favourite spot for viewing big tōtara. A number of huge tōtara short in stature but stout in girth can be found on the flat land and flanks of Mt Peel. These mighty trees are a remnant of a forest that once extended throughout South Canterbury. This article is about some of the remaining bigger trees hiding in remnant bush reserves or standing as solitary sentinels in paddocks now grazed around Mt Peel.

On a trip early this year to South Canterbury, we measured a number of large tōtara and added them to the NZ Tree Register (NZTR). This was in part to solve a mystery found in the book *Tōtara: A Natural and Cultural History* written by botanist Philip Simpson. Two photographs in Simpson's book, which are shown below, seemed to show two enormous trees (see image 1 and 2) and so began our quest to find them.



While it was not clear in Simpson's book, we later discovered that these two images are actually the same giant tōtara subsequently measured and entered in the NZTR as CR/1617. The second large tree referred to in Simpson's notes seems to be CR/1618, which can be seen to the right background in image 2.

We were able to locate these trees on farmland on Tōtara Estate farm off Blandswood Road, Mt Peel during an initial binocular survey. Permission was subsequently sought from and granted by landowner Mr Graham Carr to measure the pair. Tree CR/1617 was found to be a fusion of two stems and has a combined girth of 981 cm and a diameter at breast height (DBH) of 312 cm. The smaller tree CR/1618 is located around 100 metres from CR/1617 and has a girth of 816 cm which corresponds to a DBH of 260 cm. Both trees are now thankfully fenced off from livestock (see image 3 & 4).

Pleased to be off to a good start and following a tip from the Mt Peel store owner we next set off to find another tree. This trail led us to another huge tōtara situated on the Bradley family farm nearby. Entered as CR/1619 in the NZTR this tōtara has a 908 cm girth and sits in a beef cattle paddock on Mr and Mrs R and S Bradley's farm (image 5).

While in the area, we were granted permission by Peel Forest Estate to visit and measure several other large tōtara in a paddock full of invasive European sycamore trees. Two trees, a 34.6 m tall tree entered as CR/1623 and 803 cm girthed tree entered as CR/1622 (image 6) were subsequently measured. Other paddocks with large tōtara were closed due to farming activities. They await another trip and we are certain that several huge tōtara with girths in excess of 8.0 metres await discovery.

In our time in South Canterbury we were able to visit, measure and locate 10 impressive tōtara. Eight are found near Mt Peel (image 7 & 8), one was at Raincliff (image 9) and further one at Talbot Forest in Geraldine. They are listed in order of girth/diameter in the table below. Further images can be viewed by using the NZTR number to search the online register.

NZTR Ref #	Girth/DBH (cm)	Height (m)	Image	Champion Tree Points
CR/1010	1070/341	21.3	See image 7	505
CR/1616	981/312	20.8	See image 8	Fusion of two stems
CR/1617	930/296	22.6	See image 3	Fusion of two stems
CR/1619	908/289	22.4	See image 5	445
CR/1009	865/275	26.0		440
CR/1618	816/260	21.8	See image 4	405
CR/1622	803/256	23.4	See image 6	405
CR/1592	696/222	22.8		362
CR/1608	644/205	31.0	See image 9	368
CR/1623	635/202	34.6		375

This list is however not exhaustive as a number of significant tōtara trees still lurk in Mt Peel forest, Blandwood's Dennistoun Bush and on farmland and bush near Peel Forest Estate and Peel Forest Lodge. There are certainly enough to further pique our interest for future visits and exploration.

By Kevin Barker & Olga Brochner



Image Captions

Image 1: Mystery tree #1; from the book TŌTARA by Philip Simpson, Auckland University Press ISBN: 9781869408190

Image 2: Mystery tree #2; from the book TŌTARA by Philip Simpson, Auckland University Press ISBN: 9781869408190

Image 3: Olga Brochner beside CR/1617 taken by Kevin Barker

Image 4: Kevin Barker beside CR/1618 taken by Olga Brochner

Image 5: Kevin Barker beside CR/1619 taken by Olga Brochner

Image 6: Olga Brochner & Tristan Boot beside CR/1622 taken by Kevin Barker

Image 7: Olga Brochner beside CR/1010 taken by Kevin Barker

Image 8: Kevin Barker beside CR/1616 taken by Olga Brochner

Image 9: Olga Brochner beside CR/1608 taken by Kevin Barker

The New Zealand Notable Trees Trust manages a free public database containing historical records and verified details of the most notable and significant trees in this country.

The database is constantly being updated.

New trees may be registered at any time – together with any contributions of information or support.

View online at www.notabletrees.org.nz





5. (a)



5. (b)



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TREE RISK MANAGEMENT IN CONTEXT

Nick Arnold

The positive contribution of trees to urban communities has been well documented (ISA 2011). A healthy and sustainable urban forest can impart many benefits from social, communal, environmental and economic. In contrast to many infrastructure assets, trees can appreciate over time.

Where there is a tree/occupancy interface, i.e. where urban trees are planted or situated in occupied urban environments, there is often a cost associated with their maintenance. As we learn more about trees and how they interact and respond to their setting, it is becoming increasingly clear that a tree's situation and management regime may impart varying degrees of risk.

While the number of significant tree failure incidents can be considered comparatively low in relation to other activities (NTSG UK 2011), this may not always match public perception, particularly where a previous incident has occurred. To give some context, it has been estimated that there is about a 1 in 10 million chance of an individual being killed by a falling tree (or part of a tree) in any given year, based on research from the Centre for Decision Analysis and Risk Management (DARM) on behalf of the NTSG. Compare this to data supplied by the Royal Society for the Prevention of Accidents (RoSPA 2020) which estimates that in the UK, between 30-60 people are struck by lightning each year, equating to odds of approximately 1 in 1-2 million.

The determination of levels of 'acceptable' risk must be considered in the context of the benefits or values afforded by a particular asset or activity, or in this case tree. The condition and management of trees within and immediately surrounding managed landscapes should consider the safety of all site users and infrastructure in this context.

As with other assets, it is recommended that a proactive, as opposed to reactive, and proportionate approach be undertaken to the planning, assessment and maintenance of trees. The occurrence of a significant failure event, in the absence of a suitable (documented) tree management strategy, could potentially result in some degree of liability post-incident (either for an individual, institution or asset owner).

As with the inspection of other assets and infrastructure, it is important to understand the limitations of self or unqualified assessment. Where formal tree inspections are undertaken it is recommended that a suitably qualified and insured practitioner be engaged, preferably holding a minimum, recognised level of arboriculture qualification (as determined by national governing bodies and industry stakeholders), combined with a documented level of experience in the fields of tree assessment and asset management.

In addition, the methodology selected as part of a site risk assessment should align with both occupational health and safety, and arboricultural standards of best practice. Repeat measures are a fundamental component of any monitoring program, and as such, it is typically recommended that documented tree assessment(s) in areas of higher relative occupancy be undertaken annually (unless otherwise specified).

In order to receive the full benefit of an independent report, it is important to fully understand what is and what is not included as part of any service agreement. Indicative data on the species, age and physical attributes of a site's tree population can help provide context to present and future management. In addition, accurate mapping should be a core component of any report, particularly where the client may have little or no species knowledge.

Recommendations for individual tree management, no matter how detailed, are of little use if the tree in question cannot be physically located.

Comprehensive tree reporting should also provide information on required remedial maintenance and risk mitigation options, if any. The user of the report should be able to clearly understand what, if anything, is needed to reduce the risk posed by an individual tree. It is important to remember that pruning or removal may only be one way to mitigate or eliminate risk – residual habitat creation and/or target exclusion through physical delineation (e.g. underplanting or fencing), particularly in the case of established, historic or otherwise venerable specimens, is often a more desirable alternative to full tree removal.

When commissioning an assessment, it is important to distinguish between 'hazard' and 'risk' in a tree management context. The two terms are not synonymous and can often be misapplied. While a hazard is something that has the potential to cause harm (i.e. whole or part of a tree), risk indicates the possibility or likelihood of harm occurring and the severity of the associated consequences.

While the accepted arboricultural methods of best practice typically incorporate elements of the Visual Tree Assessment Method (VTA – as developed by C. Mattheck and H. Breloer) to identify hazards, risk can be determined through one of several recognised industry methodologies. The method of risk assessment employed must satisfy the applicable occupational health and safety/legislative requirements.



As such, the analysis of risk should incorporate information on both the probability and consequence of failure. In turn, the perceived consequence of failure may consider the part of a tree most likely to fail, its location within the tree, the nature and value of potential targets and the occupancy rates of those targets. As an example, occupancy rates could be considered fixed as in the case of buildings, high or frequent (e.g. busy thoroughfares or urban centres), moderate to occasional (e.g. playing fields) through to lower or rarely used (e.g. 'out of bounds' or fringe boundary) areas.



Figure 1 (previous): Evidence of a significant limb failure. Source Author 2018.

Figure 2: A rapidly declining tree in a busy car parking area. Source Author 2020.

While it should be acknowledged that every tree as a living organism, has the potential to fail (and that this potential may be exacerbated by severe weather), there are a number of documented defects, typically related to tree health, structure and/or previous management practices, which can increase the potential for failure to occur. It is the proactive and timely management of these 'foreseeable' risks that need to be balanced with the financial limitations of site risk assessment, asset maintenance and the numerous benefits provided by trees. It is important that tree owners and managers take a balanced and proportionate approach to tree management.

It should be further acknowledged that trees naturally senesce and undergo structural and physical changes over time; this can affect their respective viability in a given setting. Sustainable urban forest management provides for the useful life of trees in their current growing environment with appropriate plans for renewal once the end of this useful life is reached. In an urban environment this may be when the risk posed to site users and/or assets outweighs a tree's imparted benefits and target exclusion is not considered a viable management option.

While whole of site assessment is considered preferable from a tree inventory perspective (i.e. knowing what a site has in terms of total tree asset); reporting that is focused on documented higher occupancy zones can represent a sound and legally robust investment where budgets are limited.

It is through the adoption of proactive and sustainable management practices that an organisation may identify, and where possible; reduce levels of risk and associated costs, ensure compliance with relevant legal and regulatory requirements, increase stakeholder confidence, and ultimately maximise the benefits of a site's collective tree asset.

An additional consideration is the lack of geographic continuity in the adoption and enforcement of tree planning provisions (including tree protection) which are typically implemented by Local Government Authorities (LGA's). Each may maintain and develop significant or heritage tree registers, urban tree management policies, guidelines and associated information relating to the protection and management of both public and private trees. As such, it is recommended that clarification about local trees of

significance and permitted activities be sought from the respective LGA prior to any significant tree works or removals.

In summary, a successful tree risk management strategy should include or consider:

- accurate mapping and asset identification
- an appreciation of site usage (or zoning) which can provide context to the potential consequences of tree failure – should one occur;
- a monitoring/assessment cycle (to include the level of assessment required);
- documented evidence of risk management (e.g. target exclusion, pruning and or tree replacement), preferably undertaken on a risk priority basis; combined with
- adequate record-keeping on all of the above.

It is an understanding of these elements combined with the sourcing of suitably qualified, experienced and insured contractors that will not only provide a proactive strategic plan and site continuity but also a balanced and proportionate response to tree management which ultimately aims to reduce both risk (and its associated costs) while nurturing the intrinsic values that trees have to offer.

References:

Mattheck C., Bethge K., Weber K. (2015). *The Body Language of Trees*. KS Druck GmbH, Kronau.

National Tree Safety Group - NTSG (2011). *Common Sense Risk Management of Trees*. Forestry Commission UK.

Royal Society for the Prevention of Accidents - RoSPA (2020). *Lightning at Leisure – The Risk*.

Trees Are Good (2011). *Benefits of Trees*. International Society of Arboriculture – ISA.

About the author:

Nick Arnold is a former member of the NZ Arboriculture Association Executive Committee, and is now residing in Perth, Australia where he is an arboricultural consultant throughout Australia, undertaking medium to large scale site inventories and tree risk assessments.

IDENTIFICATION CHALLENGE

WHAT AM I?

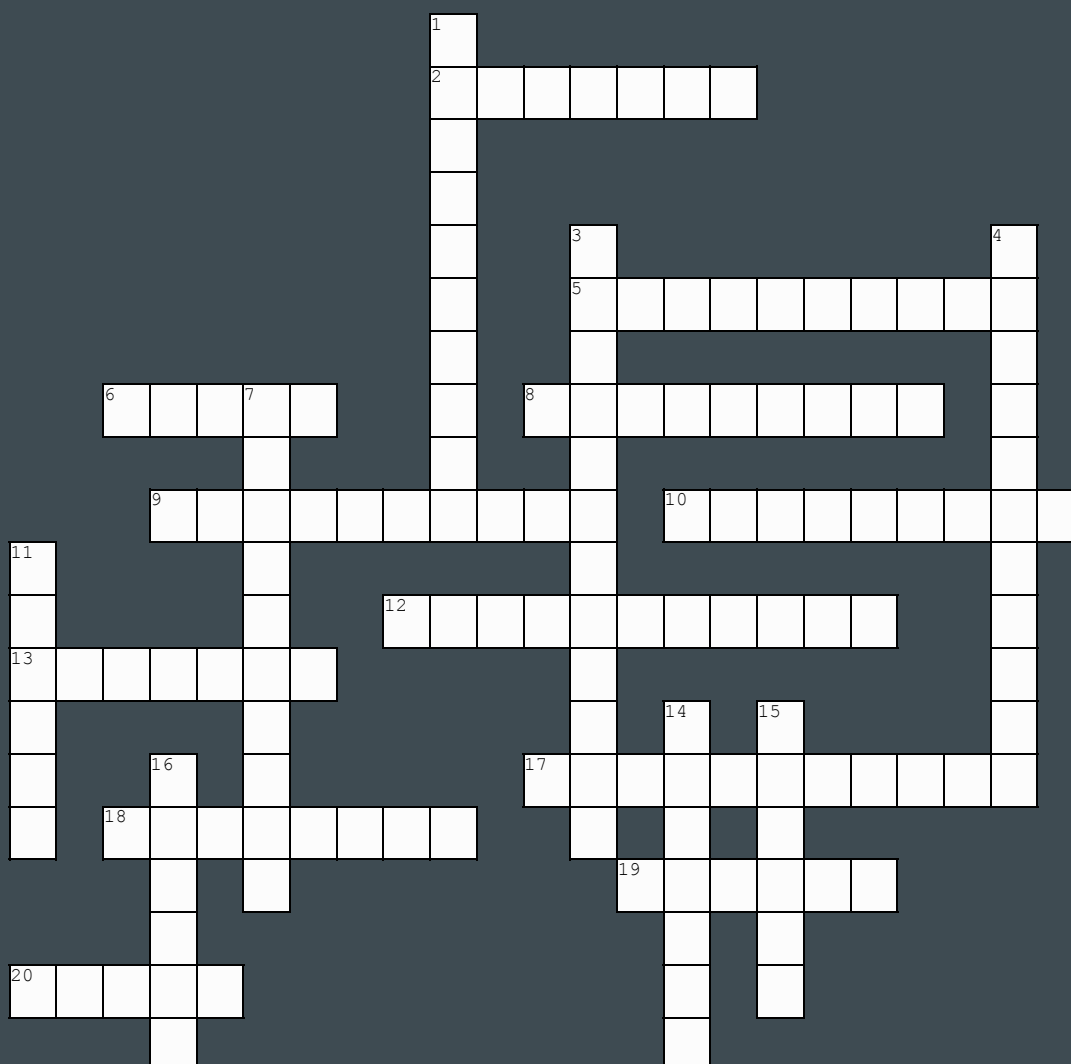
Based upon the plant part pictures, can you identify this tree?

Answer can be found on page 41



WINTER ARB CROSSWORD

Click anywhere on this page to download a printable A4 version of the winter crossword



ACROSS

2. A modified subterranean plant stem that sends out roots and shoots from its nodes.
5. Radial cambial division
6. *Prumnopitys ferruginea*
8. *Gordonia axillaris* is better known as what, that you might have with bacon?
9. Which genus was recently reclassified placing the two New Zealand species within *Lophozonia* and *Fuscospora*?
10. A tree which has male and female reproductive organs on separate plants is said to be what?
12. Red / far-red light receptive pigment responsible for growth regulation and photoperiodic flowering
13. Large plant cell organelle responsible for storage
17. *Cunonia capensis* is better known as what item of cutlery?
18. Oak, beech and *Lithocarpus* belong to which family?
19. Whipping is traditionally used at the neck of a what?
20. Arbor day is traditionally observed in which month

DOWN

1. Scopolamine is a secondary compound commonly found in which genus of plants common on the North Island?
3. A flattened hyphal 'pressing' allowing fungal organisms to enter host cells
4. The 2020 ISA conference is currently scheduled to be held in which city?
7. Tangential cambial division
11. Which genus of tree may be useful if you need to blow your nose?
14. A small leaf-like appendage to a leaf, typically borne in pairs at the base of the leaf stalk.
15. *Neolentinus lepideus* is better known to wreck what?
16. The main stalk of compound pinnate leaves on which the leaflets are borne

Answers can be found on page 41

SPECIES PROFILE: **REWAREWA**

Knightia excelsa – rewarewa; New Zealand honeysuckle, New Zealand bottlebrush

Protea family: Proteaceae; flowers without petals



INFLORESCENCE BUDS



JUVENILE GROWTH



REWAREWA FLOWER



MATURE FOLIAGE

Etymology

Proteaceae – from Proteus, the sea-god, who changed shape
Knightia – from the name Knight, the English plant physiologist.
Excelsa – latin for tall, lofty, high.

Distribution

Rewarewa is an endemic species found growing throughout the North Island of New Zealand from North Cape to Marlborough Sounds. It predominantly occurs in the northern half of the North Island in lowland to montane forests from sea level to 900 metres in elevation. The rewarewa and the toru, (*Toronia toru*) are the sole representatives of the Protea family in New Zealand. There are two closely related species in New Caledonia.

Habitat

Rewarewa often grows near hīnau (*Elaeocarpus dentatus*) in lowland forest and is associated with kāmahi (*Weinmannia racemosa*) in the central North Island where it is regarded as a pioneer species often associated with regenerating forest. Therefore, it is also tolerant of relatively poor soils.

Descriptive Features

Rewarewa has a juvenile and a mature form. It begins as a spindly straight-stemmed seedling with long leaves and continues to appear dishevelled as a juvenile as it grows taller with whorls of long toothed leaves. As rewarewa matures it becomes a dense upright columnar canopy supported by a solid central trunk, the lower-half may be bare of branches.

Rewarewa is distinctive and easily recognised as a juvenile because there is little that resembles it. The young leaves are stiff and the marginal teeth are larger than those of hīnau. As an adult it can be easily distinguished by its tall narrow (fastigate) and dense appearance. It may reach a height of 30 metres, with a trunk up to one metre in diameter. The bark is dark brown to nearly black with a smooth appearance.

Vegetative Characteristics

The leaf form is a linear-oblong (long, narrow) coarsely toothed entire broadleaf that is 10-15cm in length (25 cm on juvenile plants). Leaves are 2-4 cm wide with prominent veins. They are thick and firm and feel rather dry. Leaves can be lime-green when young to dull green when older, and are arranged alternately along the stem. The young branchlets and leaves are densely covered with red-brown hairs, appearing like velvety tomentum.

Rewarewa produces sexually perfect flowers (bisexual). They occur in dense racemes arising laterally from woody branches. The inflorescences are 5- 10cm long, the flower buds are densely furry with dark red-brown velvety tomentum. When open the flowers are pink-red in colour with lime-green anthers. Pollination occurs by birds and bees.

Flowering occurs from mid spring to early summer. Seed is produced every year. The buds begin to form during winter. Fruits take a year or so to mature and may remain on the tree during the following season flowering. The fruits appear as dry woody follicles 3-4cm long which split to release 2cm long, thin, winged seeds.

Cultivation

The winged seed is wind-disbursed. Rewarewa grows easy from fresh seed. However, cuttings are very difficult to strike. Young plants are very quick growing but cold-sensitive. Rewarewa will handle dry and moderately windy conditions.

Pests & Problems

Young plants can be badly damaged by thrips in warmer parts of the country. The sapwood is prone to attack by the common borer insects Anobium and Lyctus.

Wood Properties

Rewarewa wood is very attractive and recognisable wood, and is similar to honeysuckle, hence the European common name. The wood is easily identified by its speckled appearance, caused by darker red to purplish medullary rays through silvery pinkish sapwood. The heartwood is darker purplish-brown. Rewarewa's colouring makes it an attractive finishing timber when used in small proportions to contrast with other timbers. It is used primarily for decorative purposes.

Rewarewa has excellent machining properties, and is a useful for turning timber; as well as for marquetry and inlays. It is notorious for tangential shrinkage and is difficult to kiln- or air-dry. However, it is very strong.

The timber has historically been used for tramways, brake blocks, and fence battens, although it is not durable in exposed situations. It is useless for firewood because it is too wet.

Other Uses

In spring, rewarewa flowers produce abundant nectar that is favoured by native birds. It also produces an excellent honey.

Maori use the inner bark as a traditional medicine to heal wounds and check bleeding. Māori suggest that the rewarewa seedpod is the model for Māori canoes, right down to the figurehead.

Outstanding Examples

There is no record of a largest known living rewarewa, or of any notable specimen. If you know of a spectacular individual, submit a record of it to the New Zealand Notable Trees Trust. And if you're in Auckland, it's worth a visit to the Chelsea Heritage Estate to view a spectacular specimen growing to the east as you drive down lower Colonial Road.

References:

icm.landcareresearch.co.nz/research/freshwater/documents/Rewarewa.pdf

Tane's Tree Trust; tanestrees.org.nz/species-profiles/rewarewa/

Salmon, J.T. 1980: *The Native Trees of New Zealand*. Reed

Eagle, Audrey. *Eagle's Complete Trees and Shrubs of New Zealand*. Wellington: Te Papa Press

New Zealand Plant Conservation Network: nzpcn.org.nz/flora/species/knightia-excelsa/ (08/2020)

The University of Auckland: nzplants.auckland.ac.nz/en/about/seed-plants-flowering/proteaceae/knightia-excelsa.html

Wikipedia: en.wikipedia.org/wiki/Knightia_excelsa

NZ wood: nzwood.co.nz/forestry-2/rewarewa/



KNIGHTIA SEED



JUVENILE LEAF



ADULT LEAF

NZ ARB CONFERENCE QUEENSTOWN 2020



NZARB
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SIR GORDON TIETJENS TO OPEN THE 2020 NZ ARB CONFERENCE

NZ Arb is thrilled to have secured Sir Gordon Tietjens 2020 NZ Arb Conference keynote speaker.

Gordon Tietjens is considered to be one of the finest coaches of any sport in the world.

Rugby achievements

He led New Zealand's dominating run in the world of rugby sevens throughout the 1990s and 2000s. In the fourteen years since the IRB Rugby World Series has been run, he has won twelve World Titles and four Commonwealth Games Gold Medals. He was named the New Zealand Rugby Union Coach of the year in 2010, recognised for guiding his team to a fourth consecutive Commonwealth Games gold medal.

Awards

In 1999 he was awarded the NZ Order of Merit in the New Zealand's Honours List and in 2007 the Insignia of a Companion of the New Zealand Order of Merit. In 2012 Gordon became the 49th inductee into the International Rugby Board's Hall of Fame. The commemorative cap and gold pin were presented at an awards ceremony at Twickenham, shortly after New Zealand clinched their 11th World Series title from 14 attempts. Gordon was further promoted in 2013 to a Knight Companion of The New Zealand Order of Merit for his services to rugby. In 2016 Gordon took up a new position as Coach of the Samoan national sevens team.

Current Work

Gordon is known for his no-nonsense leadership style and uncanny ability to spot raw new talent. Whether it's the motivation he injects into his teams, his refusal to accept anything but the best from his players, or his absolute belief in his ability to pick and coach people to be the best they can be, Gordon is a remarkable man with a remarkable track record in sport and working with winning teams.

Many of these principles have been mirrored throughout his 30 year career with Bay Engineers Supplies where he is currently the Strategic Sales Director.

Author

Gordon has written two bestsellers 'Titch, Sevens is My Game' and 'Legacy: Sir Gordon Tietjens'.

Keynote Speaker

Gordon is a compelling and fascinating conference speaker and will motivate and inspire your team to achieve the most that they can.

Tietjens will open the Conference on Monday 9 November at the Queenstown Memorial Hall.

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7–10 November, Queenstown Memorial Centre



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CONFERENCE PROGRAMME

Programme subject to change. Visit nzarbconference.co.nz/programme for the latest information

Friday 6 November

12:00 – 17:00	NZ Arb Husqvarna NTCC set-up – Queenstown Gardens
17:30 – 19:30	NZ Arb Husqvarna NTCC Gear Check – Venue TBC

Saturday 7 November

08:00 – 17:00	NZ Arb Husqvarna NTCC Preliminary Events – Queenstown Gardens <ul style="list-style-type: none">• Silky Saws Aerial Rescue• Kask Work Climb• Metrogreen Throwline• AB Equipment Belayed Speed Climb• Donaghy Ascent Event
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Sunday 8 November

08:00 – 13:00	NZ Arb Husqvarna NTCC Masters Championship – Queenstown Gardens
12:00 – 16:00	Registration Desk Open
FROM 12:00	The Queenstown Life or Death Experience – more information on activity options available soon (not included in registration fee)
13:00 – 14:00	NZ Arb Husqvarna NTCC Preliminary Event Awards – Queenstown Gardens
15:00 – 17:00	Tree Tour – Local case studies in Queenstown – Limited spaces available
14:00 – 17:00	Climbers Rigging Workshop – Andreas Ross, Pro Climb Ltd
18:30 – 21:00	Conference Opening & Industry Awards Celebration Award Presentations: NZ Arb Husqvarna NTCC Masters, NAOTY, Volunteer of the Year, President's Award

CONFERENCE PROGRAMME

Programme subject to change. Visit nzarbconference.co.nz/programme for the latest information

Monday 9 November

07:30 – 17:00	Registration Desk Open		
08:45 – 09:00	Mihi – Welcome & Housekeeping		
09:00 – 09:45	Keynote Speaker – Sir Gordon Tietjens <i>The Leadership Game</i>		
09:45 – 10:15	Award Presentations – Ron Flook		
10:15 – 10:45	Morning Tea – Trade Zone		
10:45 – 11:30	Keynote Speaker – Paul Seagar, 5th Green <i>Growing Your Business & Measuring its Success: A Holistic Approach</i>		
GENERAL ARB STREAM		PRACTITIONERS STREAM	
11:30 – 12:15	Stuart Barton <i>The Do's & Don'ts When Establishing Planted Trees</i>	11:30 – 12:15	Menno Kluiters <i>Mature Trees: Understanding the Relationship Between Pruning & Body Language</i>
12:15 – 13:00	Martin Weaver <i>The National Arboretum of New Zealand – A Foreboding Past, the Stable Base & an Amplified Future</i>	12:15 – 13:00	Andreas Ross <i>Estimating & Calculating Forces in the Rigging System</i>
13:00 – 14:00 Lunch – Trade Zone			
14:00 – 14:30	Joe Newdick <i>Bringing out Your Inner Lorax</i>	14:00 – 14:30	Chelsea Robertson <i>Disability & Accessibility in New Zealand Arboriculture</i>
14:30 – 15:00	Lisa Ellis <i>Why Environmental Policy-making is so Hard</i>	14:30 – 15:00	"Pursuit of Excellence" Brought you by Husqvarna
15:00 – 15:30	Peter Senior <i>How to Take Over the World, the Right Way – The Story of Clogger, the Little Kiwi Company that Could</i>	15:00 – 15:30	Kiwi Climbers <i>Thinking outside the box</i>
15:30 – 16:00 Afternoon Tea – Trade Zone			
16:00 – 16:30	Janet Cubey, Royal Horticultural Society <i>What's in a Name – Botanical Rules can be Broken</i>	16:00 – 17:00	Wiremu Edmund <i>Stand in the gap, brought to you by STIHL Ltd.</i>
16:30 – 17:00	Zane Wedding <i>Te Ao rakau I te ao Maori (The World of Trees in the World of Maori)</i>		
17:00 – 18:00	NZ Arb AGM		
18:00 – 19:00	Exhibitor Networking Function – Trade Zone		

CONFERENCE PROGRAMME

Programme subject to change. Visit nzarbconference.co.nz/programme for the latest information

Tuesday 10 November

08:30 – 15:30	Registration Desk Open		
09:00 – 09:45	Dave Hockly, DataStory 3 Ways to Take Your Arb Marketing to the Next Level		
09:45 – 10:30	Sam Judd, Young New Zealander of the Year The Environment & Global Financial Crisis		
10:30 – 11:00	Morning Tea – Trade Zone		
GENERAL ARB STREAM			
11:00 – 11:45	James Fletcher, Worksafe WorkSafe’s Approach to Safety & Wellbeing – Opportunities for the Arboriculture Industry		
11:45 – 12:30	Ian Barber, University of Otago Dendroglyphs on the Chathams – Tree Carvings that have Stood the Test of Time		
12:30 – 13:15	Lunch – Trade Zone		
13:00 – 16:00	ISA Certification Exam		
STUDENT MENTOR & ACADEMIC RESEARCH TALKS (SMART)		UTILITY ARB STREAM	
13:15 – 13:25	Speaker Co-ordinator	13:15 – 13:45	Asplundh Learnings from an International Perspective
13:25 – 13:45	Speaker 1		
13:45 – 14:05	Speaker 2	13:45 – 14:25	Sam Glenn, Delta Meaningful Measurement Matrixes – Good Data, Better Reporting
14:05 – 14:25	Speaker 3		
14:25 – 14:45	Speaker 4	14:25 – 15:05	Kelvin Barnsdale, University of Canterbury Precision Pruning with Drones
14:45 – 15:05	Speaker 5		
15:05 – 15:30	SMART Stream Presentation	15:05 – 15:30	Panel Discussion Chaired by Mark Way
15:30 – 16:00	Conference Close – Jaiden Palmer, NZ Arb President		
16:00 – 18:30	Workshop: Working ‘On’ Your Business ... not ‘In’ Your Business – Paul Seagar, 5th Green (not included in registration fee)		

Tuesday 10 November

08:30 – 17:00	TRAQ Renewal Course
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Arbor Care Ltd	Tauranga	info@arborcare.co.nz	(07) 543 1775

Manawatu

Vertical Arborists	Palmerston North	hello@verticalarborists.co.nz	0800 967 528
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Canterbury

Treetech Ltd	Christchurch	office@treetech.co.nz	0800 873 378
The Tree People	Christchurch	info@fourseasonstreecare.co.nz	0800 4 SEASONS

UPCOMING EVENTS

VIRTUAL VOUS: CLOUD-BASED RENDEZVOUS FOR TREE CLIMBERS	5-8 SEP / ONLINE – TREEXP.COM/VOUS
NZ ARB HUSQVARNA SOUTH ISLAND REGIONAL TREE CLIMBING COMP	12-13 SEP / ASHBURTON DOMAIN
ISA TRAQ COURSE	17 SEP / OTAGO MUSEUM, DUNEDIN
NZ ARB HUSQVARNA WAIKATOP / BOP REGIONAL TREE CLIMBING COMP	19 SEP / HAMILTON GARDENS
KAWERAU WOODFEST	25-28 SEP / PRIDEAUX PARK, KAWERAU
WEBINAR: SOIL ASSESSMENT FOR URBAN TREES – PART 2 ACTIONS	29 SEP / ONLINE – TREEFUND.ORG/WEBINARS
NZ ARB HUSQVARNA AUCKLAND REGIONAL TREE CLIMBING COMP	10-11 OCT / JELLCOE PARK, ONEHUNGA
WEBINAR: MEASURING MULTI-STEMMED TREES	13 OCT / ONLINE – TREEFUND.ORG/WEBINARS
NZ ARB HUSQVARNA NATIONAL TREE CLIMBING CHAMPIONSHIP 2020	7-8 NOV / QUEENSTOWN GARDENS
2020 NZ ARB ANNUAL INDUSTRY AWARDS CELEBRATION	8 NOV / QUEENSTOWN
2020 NZ ARB ANNUAL CONFERENCE	8-10 NOV / QUEENSTOWN MEMORIAL CENTRE
ISA CERTIFIED ARBORIST EXAM	10 NOV / QUEENSTOWN MEMORIAL CENTRE
ISA TRAQ RENEWAL COURSE	11 NOV / QUEENSTOWN
ISA ANNUAL INTERNATIONAL CONFERENCE (USA)	15-17 DEC / ALBUQUERQUE, NEW MEXICO

For more information please visit nzarb.org.nz

"WHAT AM I" ANSWER & CROSSWORD SOLUTION



WHAT AM I:

ILEOSTYLUS MICRANTHUS
(GREEN MISTLETOE)

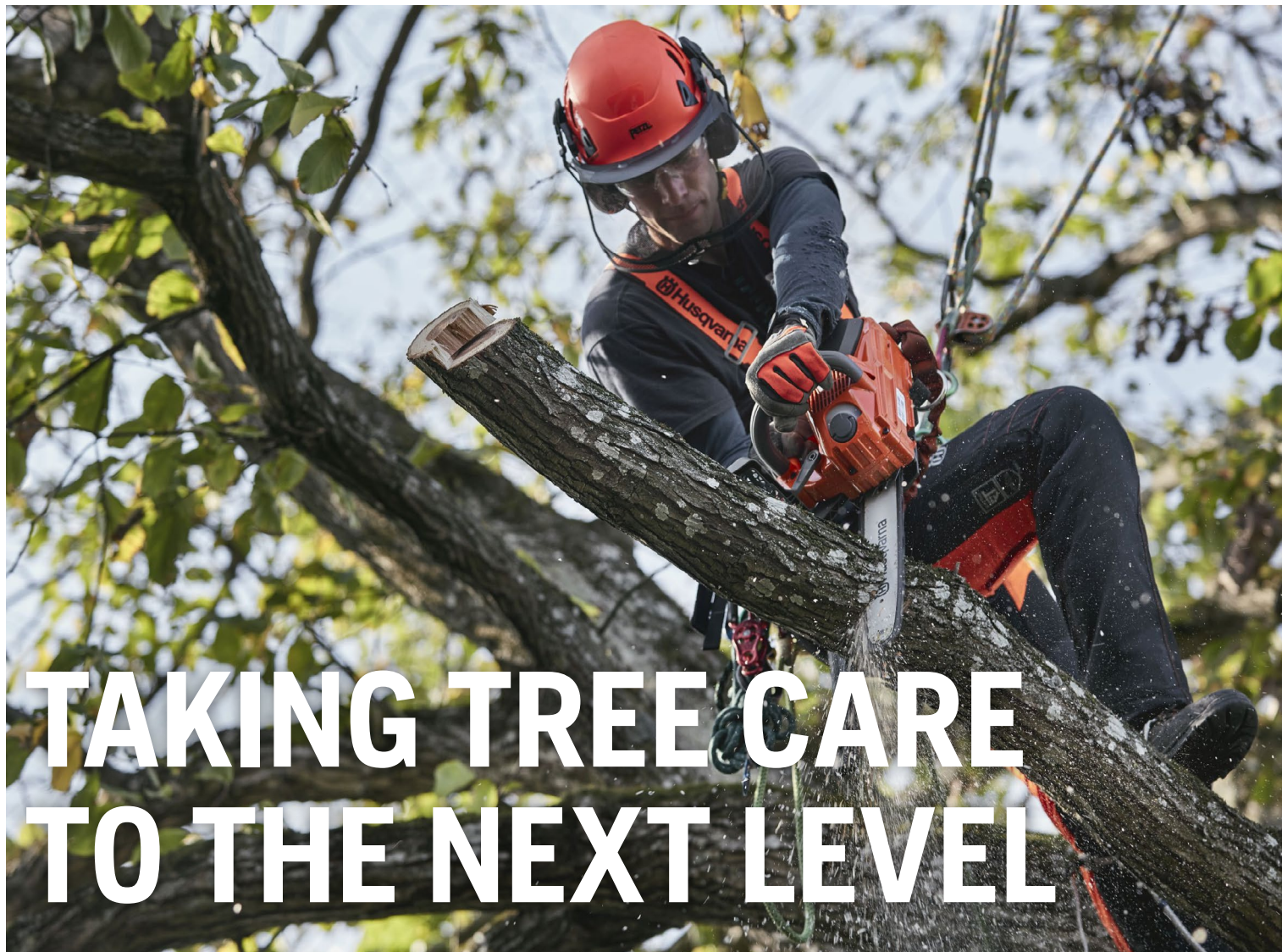
CROSSWORD:

Across

2. Rhizome
5. Periclinal
6. Matai
8. Fried egg
9. Nothofagus
10. Dioecious
12. Phytochrome
13. Vacuole
17. Butterknife
18. Fagaceae
19. Splice
20. April

Down

1. Brugmansia
3. Appressorium
4. Albuquerque
7. Anticlinal
11. Davida
14. Stipule
15. Trains
16. Rachis



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