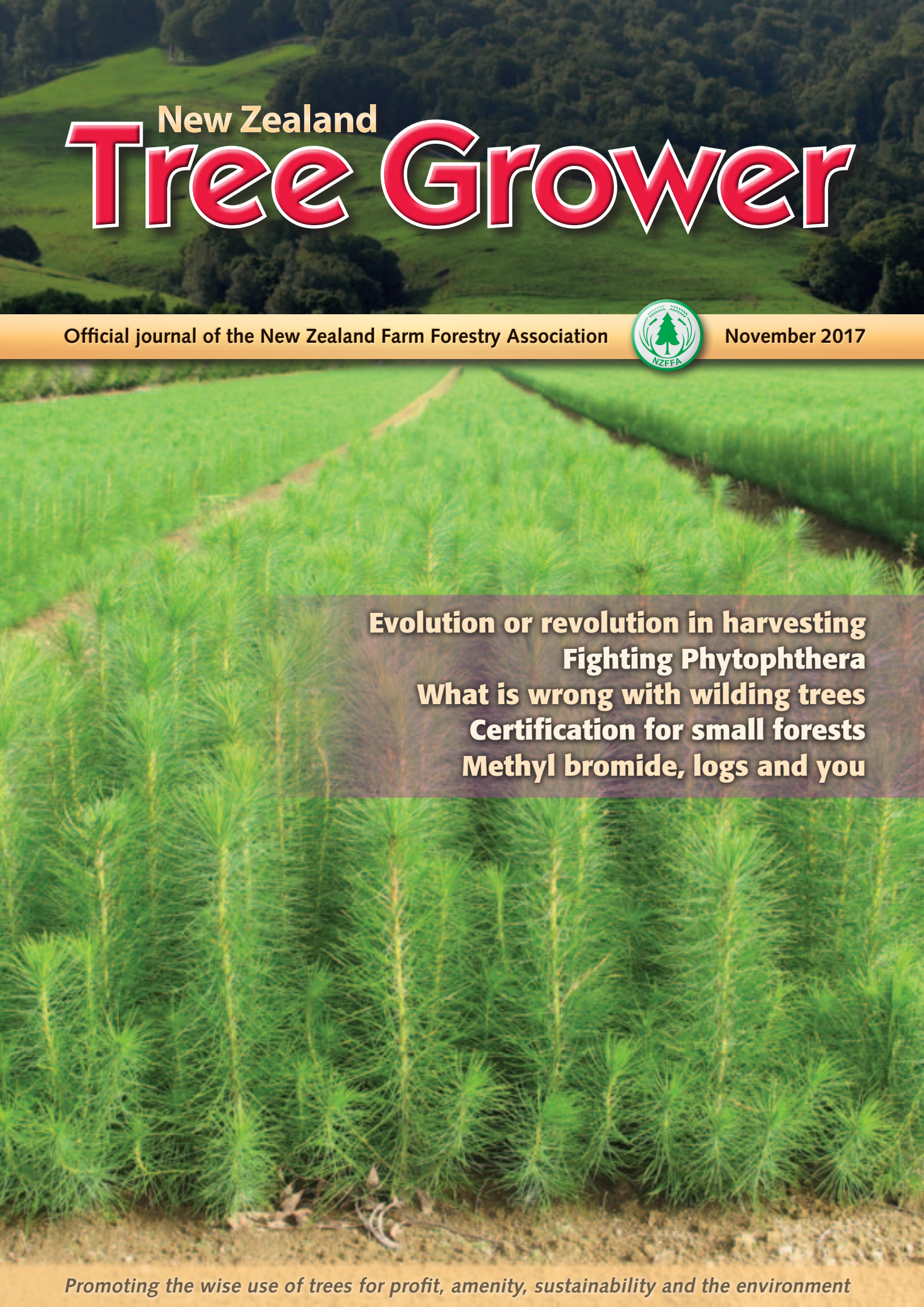

New Zealand Tree Grower

Official journal of the New Zealand Farm Forestry Association

November 2017

Evolution or revolution in harvesting
Fighting Phytophthera
What is wrong with wilding trees
Certification for small forests
Methyl bromide, logs and you

Promoting the wise use of trees for profit, amenity, sustainability and the environment

New Zealand Tree Grower
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From the President

Neil Cullen

The Editor assured me I would have the election result to ruminate on for this column and he is at least partially correct as NZ First announced last evening that they have decided to form a coalition government with Labour and by default the Greens. What that means in terms of agreed policy will be more evident by the time you read this but I think it is safe to assume that for better or worse there will be more government involvement in the forest industry.

This will probably be directed from a reborn NZ Forest Service and one of their briefs surely will be to follow up on the recommendations of Net Zero and the Parliamentary Commissioner for the Environment among others to ensure more of our pasture and marginal land is converted to forest.

The ETS perhaps under James Shaw is in for additional changes to those already proposed and climate change may come under the direction of an independent commission. As well as losing control of forestry, MPI will probably be divested of some biosecurity and regulatory functions and the NZFFA will be joining with other forestry organisations in consulting on all implications of these changes.

Included in with this copy of *Tree Grower* is the Annual Research Report of Forest Growers Research. Compiled by Harriet Palmer, this booklet gives a snapshot of where the $5 million of forest growers' levy money directed to research in 2017 is being spent. Manager Russell Dale outlines in his foreword the six different programmes where the funds are being used. All are of value to small-scale growers but of particular interest is the specialty species area where branches and individual members have contributed funds via the Specialty Wood Partnership. Participants at the Forest Growers Research conference in Christchurch in October were given detailed presentations on many of the programmes and there will be more reports on those in future issues of *Tree Grower*.

Natalie Smith has recently been appointed as our Office Manager and will be present in the office on Wednesday, Thursday and part of Friday to take your inquiries. She is keen to get to know members and contacts in the branches so those that who did not get to the Council meeting on the 3 November should make the effort to contact her.

In September, Hamish Levack and myself along with other New Zealand forest representatives attended a biennial gala dinner in Canberra attended by 500 people including 45 members of the Australian parliament. Organised by a cross party committee on forestry the dinner was addressed by the Prime Minister Malcolm Turnbull where he announced a National Forest Industries Plan. The lasting impression from the dinner and a prior meeting with their trans-industry body, AFPA was that forestry is given much more regard by the Australian government than is the case in New Zealand. With our new government and a new minister that situation looks like it is about to change.

The National Environmental Standards for Plantation Forestry have now been enacted and come into force on 1 May next year. They provide rules for eight core forestry activities and mean consistent regulations throughout the country. MPI and regional councils will be holding workshops to explain the implications and responsibilities for foresters under the National Environmental Standards for Plantation Forestry. With the dis-establishment of the Rural Fire Services, the NZFFA and NZ Forest owners Association have signed a charter with Fire and Emergency NZ that ensures continuing working together of the three organisations. The charter covers fire control, fire research and collaborating on national guidelines and fire management policies. Our representatives Geoff Cameron and Don Wallace helped develop the charter.

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Evolution or revolution in harvesting?

Keith Raymond

As many small-scale growers prepare to plan to harvest their forests and woodlots planted in the 1990s, there is a quiet revolution being planned in how harvesting these forests on steep slopes can be carried out. Changes to harvesting crews to make them smaller with less machinery, to shrink the size of yarder landings and move log sorting off the landing are some proposed innovations.

The current move into harvesting mechanisation may have put more people into the safety of cabs, but it has done little to improve the overall economics of bringing logs off the hills. If anything, it has become more costly, especially in smaller forests and woodlots, threatening their viability.

The other problem is that labour productivity has actually been falling and not increasing because hauler crews have more workers and lower production than ground-based crews. As we move forward and harvest the wood planted back in the 1990s, we need more hauler crews and know there is already a shortage of labour. The increased harvest will require around 100 extra contracting crews and 800 additional workers using current methods.

Research by Scion shows that the rising costs mean about 10 per cent of the small forest resource – up to 1.65 million cubic metres of wood a year – may be uneconomic to harvest. As harvesting increasingly moves into these forests on steeper land and in smaller, more isolated holdings, the challenges of maintaining international cost competitiveness and safe operations will increase. Added to that, pressure is coming on foresters in some areas to reduce the negative effect their operations are having on the environment.

These concerns have led to a re-think about how steep forests should be logged. Forest Growers Research – formerly known as Future Forests Research Ltd – has been leading the Steepland Harvesting programme.

Changing the process

Forest Growers Research believes the time has come to re-examine the way they operate and come up with a complete redesign of the harvesting and log manufacturing process. The problems facing forestry are not going away and will only become more acute as the wood available for harvesting over the next decade rises to an expected 35 million cubic metres a year from the current level of around 30 million cubic metres.

Most of this increased availability is in small forests in remote areas where harvesting, processing and logistics costs will be higher than current costs. These costs have been rising considerably over the last five years and will probably continue to rise without much ability of the industry to control them unless something really different is done. We also need our labour productivity

Forest Growers Research

Forest Growers Research co-ordinates industry input and funding of research programmes relevant to the forest growing sector in two main ways –

- Managing the research funded by the Forest Growers Levy Trust with money directly from forest growers in the form of a levy on harvested timber
- Managing research programmes which are funded by sources other than the levy and include the Steepland Harvesting PGP Research Partnership and the Specialty Wood Products Partnership.

rates to be going up, not down.

Over the past seven years, harvesting research carried out by Forest Growers Research has concentrated on supporting developments in tree felling and log extraction such as the ClimbMax steep slope harvester, the Alpine grapple carriage, the CutoverCam, HarvestNav machine navigation technology and tele-operated felling and tail-hold machines.

New research programme

A proposed a new research programme now takes innovation to a new level and covers the whole of the forestry value chain. This proposal is designed to cover everything from harvest planning through to log delivery to the local mill or port.

Some of the ideas contained in the plan could appear to be quite radical compared with current logging practices. The proposal is for a new, automated harvesting and logistics system that will eliminate manual hazardous tasks, such as log branding, log measurement, quality control, stocktaking and truck load securing. It will automate functions to make tasks such as log extraction, processing and sorting easier, safer, less repetitive and more efficient. It foresees greater use of tele-operation with other tasks beyond tree felling, such as log hauling, log sorting and truck loading.

The new research programme has identified four main requirements which will help to solve the problems identified –

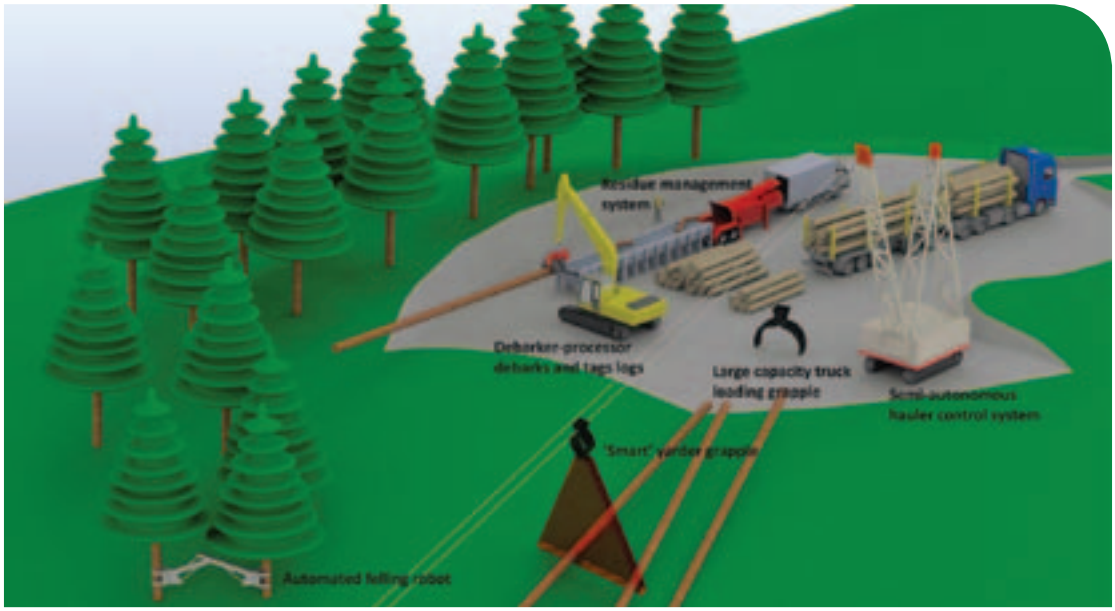
- Improve the economic harvesting of all forests by reducing costs and increasing labour productivity
- Design new jobs which draw from a wider pool of skilled employees who are attracted to the industry
- Further improve worker safety
- Reduce negative environmental effects and compliance costs.

The proposed multi-million dollar programme is planned to run over the next seven years and be jointly funded from the forest growers' levy on log production and from the government through the Ministry for Primary Industries' Primary Growth Partnership programme. An application for funding has already been approved to go to the next stage of the funding process. Work is focussed on completing a successful business plan to get the $5 million of government funding requested, in addition to $9 million in industry funding from the forest growers' levy.

Reducing log handling

It is a big programme, probably about twice the size of the Steepland Harvesting programme, which has now been completed. Without the 40 per cent of government funding which adds to the contribution from the Forest Growers Levy Trust and the in-kind contributions from manufacturing partners, it would obviously have a major effect on what can be achieved. If the business case is turned down it will not halt the programme, but it will compromise its size and effectiveness, and would mean that the research may have to be spread over a longer period of time and some activities would have to be dropped.

What are the changes that this redesign of the steep forest harvesting and log manufacturing process will bring about? Constructed landing areas will shrink dramatically, with fewer machines working on them and there will be minimal log storage on the landing. One of the main objectives is to cut the number of times a log is handled before it reaches the mill or port, which will help to reduce costs.



New harvest process

Export logs are currently handled anywhere between eight and 12 times before they go on the boat. The aim is to reduce this multiple handling, especially on the landing, and do it more productively somewhere else. Overall, we could cut the number of times a log is handled by 50 per cent.

More log grades

However, the plan does not involve reducing the number of log grades which have to be cut in the forest to meet customers' demands. If anything, the proposed new system will allow additional grades to be cut so that extra value can be extracted from each log.

Landing size is what limits the number of cuts. There has been a lot of research carried out over how many cuts a Waratah processor can handle. If you have to produce more log grades you have to build a bigger landing. This increases the cost because you often have to excavate into the hill and move more dirt to build a big landing in steep country.

Reducing log grades is not the answer to the landing space problem. The solution is to take the wood away from the landing to cut more grades, if that is what the market wants. Harvested logs will be transported away to separate automated log sorting and storage facilities.

Essentially, the proposal is for an advanced two-staging system. Under the plan, a landing would be reduced to a minimum size so there will be just enough room for the yarder and one processor-loader machine using a Quick Coupler to switch between log grapple and processor head. The processor would be positioned under the hauler boom to grab, process and stack to one side. Whole stem debarking would also be carried out before log making, to reduce the amount of chemical fumigation of export logs at the ports. The unsorted wood is loaded on to off-road trucks and taken to a separate sort yard, either along the roadside or any available space near the forest gate.

At the sort yard, a new robotic log sorting facility will scan and sort mixed grade logs as they arrive from the landing. A shape recognition scanner then calculates true volume eliminating manual log measurement and performs log quality control. Sorted logs will be put on to an automated loading gantry which will load the log trucks and secure the load using an automatic tensioning system with no chaining-up required by the truck driver.

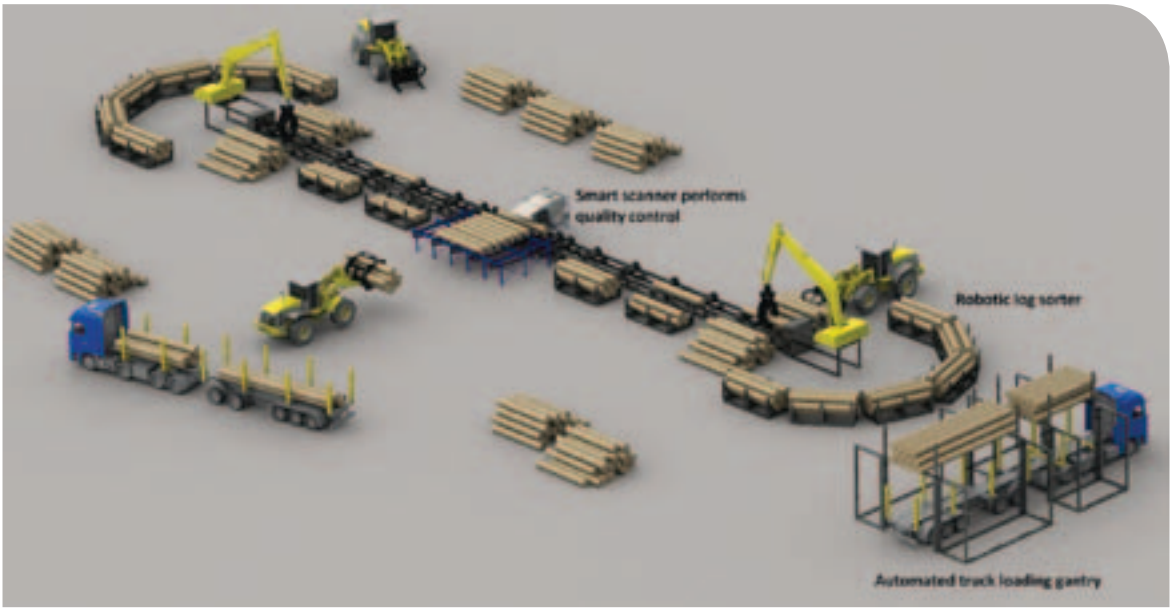
The sort yard opens up more opportunities for large volume high productivity motor vehicles which are often too big to get round tight forest roads. However, their ability to carry more logs than a traditional log truck on the highway improves productivity.

The potential is for each of these log sorting facilities to be able to service a number of harvesting crews or a number of small forests whose owners can get together and coordinate their harvest to maximise the opportunity. Up to 2,000 cubic metres of logs are envisaged being handled each day. Individual log identity ensures each owner's wood is identified and kept separate for invoicing and payments.

Significant benefits

If the programme is successful, as much as 95 per cent of all harvesting and logistics operations will be fully mechanised and at least 10 per cent of all harvesting operations will be automated. That would lead to significant benefits across the board, with targets being –

- A reduction across the forestry value chain of $10 a cubic metre of wood, making small forests more economic to harvest
- Improving the attractiveness of forestry as a career for



Robotic log sorting facility

skilled workers, along with improving safety.

- Alleviating the need for the estimated 800 additional workers in the industry with increased productivity and more automation
- Reducing log landing construction areas by up to 75 per cent
- Reducing the amount of chemical fumigant for export logs by 10 per cent with debarking in the forest
- Producing innovative new equipment and systems which could earn New Zealand manufacturers more than $50 million in sales by 2025 – Forest Growers Research estimates as many as eight or nine new types of equipment could be developed.

Working with forest owners

Forest Growers Research is looking to work with a number of forest owners, large and small, as well as their contractors, to set up five sort yards which could be serviced by up to eight crews per sort yard. That would be 40 hauler crews who would supply those five sort yards. In addition, 12 automated ground-based crews are planned. From that size of operation, profitability to the forest grower can be improved in a number of ways. First, labour productivity of hauler crews will be increased by making them a lot smaller. Potentially, a large crew of nine or ten workers could actually be split into two crews of four or five, each producing the same volume of wood as the larger single crew currently does. This reduces harvesting costs and improves profitability.

More efficiencies can be introduced including semi-automated log processing, automated sorting and tele-operated or automated log loading. By improving log measuring and individual log identification, logs can be sold by volume rather than weight, taking out costly operations such as weighbridges and manual log scaling at the port which cause a lot of truck delays.

It does not stop at the economic benefits. Sustainability benefits include improving or maintaining the social licence to operate, so that the community actually sees that harvesting and log transport is a good safe business, and one which is looking after its people. In terms of environmental sustainability, in addition to reduced soil disturbance with smaller log landings, another area which has major environmental potential is in reducing chemical fumigation of export logs. A lot of money is spent fumigating logs for export, and this cost is forecast to double after 2020, when complete recapture of methyl bromide becomes a requirement. If we can successfully debark logs on the landing to the standard required by Chinese log customers we may not need to fumigate as many logs.

Reducing environmental footprint

There is further potential in collectively managing log making residues which are currently unmerchantable, so they produce revenue instead of being a disposal cost. More use can be made of the high productivity motor vehicles which can carry more logs than standard logging trucks from the sort yards. If we can implement 58 or 60 tonne routes from the five in-forest log sort yards, this would result in over 9,000 fewer truck trips a year on the public highway by 2025.

The value to the forest industry of improved environmental results is estimated to be over $10 million a year by 2025. More importantly, we need to continue to reduce the environmental footprint of forestry operations. If you fast forward five or 10 years into the future we will not be able to cut large landings into hillsides, produce lots of tracking and leave piles of log residues around landings.

Concern regarding economic viability of small-scale steep country forests, and future environmental and social sustainability is driving these developments. Forest Growers Research is keen to see small-scale forest growers participate in the new programme.

If your forest is coming up for harvest we encourage you to ask your harvesting and marketing company, or your harvesting contractor, what innovations they are developing to reduce landing size and roading infrastructure, improve environmental results, and increase value recovery from your crop, to improve your forest's profitability. This will ensure that your future harvest is viable both economically and environmentally.

Keith Raymond is Harvesting and Logistics manager at Forest Growers Research.

NZFFA 2018 conference in Nelson

The 2018 annual conference, field days and AGM is being hosted by the Nelson branch from 6 to 9 May. You can find out more about the conference from the article on page 21. The registration form is in this issue of the *Tree Grower* or you can get a copy from the NZFFA website. The sooner you book, the happier the organisers will be.

Methyl bromide, logs and you

Julian Bateson

A long, long time ago in a place far removed from here, called Montreal, it was decided that the growing ozone hole over the Antarctic needed to be closed. If nothing was done very soon, this hole in the protective ozone would continue to get bigger. It would allow more of the harmful ultraviolet radiation to get through and damage the skin of those of us living in Australia and New Zealand.

In 1987 the Montreal Protocol was an agreement that all countries should restrict and ban the use of ozone depleting chemicals. One of these chemicals was methyl bromide which is used as a fumigant to kill problem insects. In New Zealand, the main use for methyl bromide is for fumigating logs before they are exported.

In August this year, a workshop was arranged by Stimbr, an acronym for stakeholders in methyl bromide reduction, to discuss the phasing out of methyl bromide. Stimbr is funded by a levy on the use of methyl bromide with some additional input from the government. Attendance at the workshop seemed to be a good time to find out about how stopping methyl bromide escaping into the atmosphere might, or might not, affect small-scale forest owners.

The problem defined

New Zealand is not required to stop using methyl bromide, but as part of a good faith promise, the government has agreed to stop any of it from being emitted to the atmosphere as a result of its use. In other words, it has to be all kept under control, which for a gas is quite tricky. The date set for the promise to take effect is in 2020.

In 1991 around 70 tonnes of methyl bromide were used in New Zealand. Now the figure is 300 tonnes – not exactly a reduction in its use. These 300 tonnes comprise over eight percent of the world consumption because many other countries have found alternatives and are using less or none at all. Our use is increasing quite rapidly as log exports to countries requiring methyl bromide to be used continue to rise.

It is important to point out that not all logs need to be fumigated to all export countries. For example, China, which is one country which requires fumigation of logs, needs just 17 per cent of them to be treated.

Disagreement about consequences

It was no surprise to find out that there was disagreement about the effect there would be from any restrictions in the use of methyl bromide. Peter Clark, on behalf of the Forest Owners Association, was adamant that if methyl bromide use as a log fumigant was stopped, all log exports would stop. Ken Glassey countered this with the fact that, in his opinion, only four million tonnes of logs a year, about a quarter of exports, would be affected. Each was adamant that they were right although it seems Ken was correct.

Following on from this was discussion about who requires logs to be fumigated and if the relevant countries, such as China and India, could be persuaded to go for a different option. One suggestion was for the logs to be fumigated when they arrived at their destination, but of course this does not reduce the use of methyl bromide, just moves the problem. There are regular meetings with Chinese officials to discuss what can be done and what alternatives may be offered to make logs safe to import without methyl bromide fumigation.

The research for a solution

When the 10-year deadline for methyl bromide use was set in 2010 by the Environmental Protection Agency, all those involved thought it seemed to be a long way away and they assumed that a solution could easily be found in the time available. However, it did not go quite as planned, and now with under three years to go, the possible alternatives are very limited.

One is for all logs to have their bark removed more thoroughly than at present. To do this effectively requires de-barking processors to move up and down the logs a number of times, using up time and costing money. In addition, this process cannot be used effectively on

smaller logs. Finally, de-barking only removes the insects we know about. Any new pest introductions may not be removed with de-barking, so it is quite limited in effectiveness.

Heating logs using electricity has proved to be quite effective in killing insect pests in the logs. But this process has only been tested on a small scale. The other potential solution is to use the chemical ethane di-nitrile known as EDN. This is very promising as it is not a greenhouse gas and is not ozone depleting – more about this later.

As mentioned earlier the EPA will not require a ban on the use of methyl bromide, it is a ban on letting any of it be emitted into the atmosphere. This means that if not all of it is used during fumigation then all the surplus gas, 100 per cent of it, must be contained and not allowed to just float away. If a sustainable solution could be found it would mean methyl bromide could be used after 2020.

Recovering the gas is not easy. One method is to use carbon to reabsorb the chemical, but you need five tonnes of carbon to collect one tonne of methyl bromide. Then you have to work out what to do with the carbon which is now contaminated. Landfill sites are not happy burying tonnes of carbon contaminated with a chemical, in fact they do not allow it.

The Genera method

We heard about research being carried out by Genera who fumigate millions of logs every year. They agree that currently no system in the world can economically recover all the surplus methyl bromide from fumigation. Just to clarify, for every tonne of methyl bromide used, about half a tonne is unused and available to be collected. The rest is absorbed into the logs, and from what I could understand, no one is entirely clear what happens to it in the log and if it is broken down or released slowly.

Genera have spent a lot of time and money looking for ways that can mean methyl bromide could be used after 2020. However, it seems that whatever they manage to do, it will be an interim solution until an alternative is found. This brings us back to ethane di-nitrile or EDN.

A probable solution

The only possible solution suggested at the workshop to treating logs in the foreseeable future without using methyl bromide seems to be to use EDN. It is effective against all wood boring insects, bark beetles, phytophthera and other fungi. It has a very low toxicity to mammals which makes it much better for health and safety than methyl bromide. In addition, it breaks down into ammonia and carbon dioxide which although not totally benign, are relatively harmless in the quantities which would be involved.

This seems to be the magic bullet, so you may ask why is it not being used. It is because EDN had to be properly tested and then approved by the EPA. Testing has been going on for some time, and is continuing. Meanwhile, the application to the EPA was submitted in July with the response expected sometime in early 2018. Russia and China are aware of this possible alternative to methyl bromide and discussions are already taking place to see how it may all work.

The right answer

This is where the workshop left us, with hope that the use of methyl bromide could be effectively phased out, possibly in time for the 2020 deadline, but unlikely. There is still a long way to go. Perhaps a successful method could be developed to recover all the unused methyl bromide after treatment, but this also seems to be unachievable. To reach the government target, recovery of the unused gas has to be 100 per cent and so far, the maximum recovery in tests has been 87 per cent.

It does not seem likely that the dire prediction made at the beginning of the workshop would eventuate, namely that all log exporting would be stopped if a solution to the methyl bromide problem cannot be found. But it is not all plain sailing and if an acceptable alternative is not found it would affect all log producers, including farm foresters.

Higher costs for an alternative to methyl bromide fumigation will reduce the income from log sales. If this means we are helping to mend the ozone hole, and reducing the amount of time people have to spend working with toxic methyl bromide, a small cost increase may be the right answer. And perhaps the only one.

NZFFA 2018 conference in Nelson

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Forestry acronyms and organisations

Howard Moore and Lynne Wallace

If you dislike the unnecessary use of acronyms, this article may be a hard one to read. The aim is to improve your understanding of some of the various organisations in the forestry sector and the associated acronyms you may come across. I hope it helps. Editor.

The main players

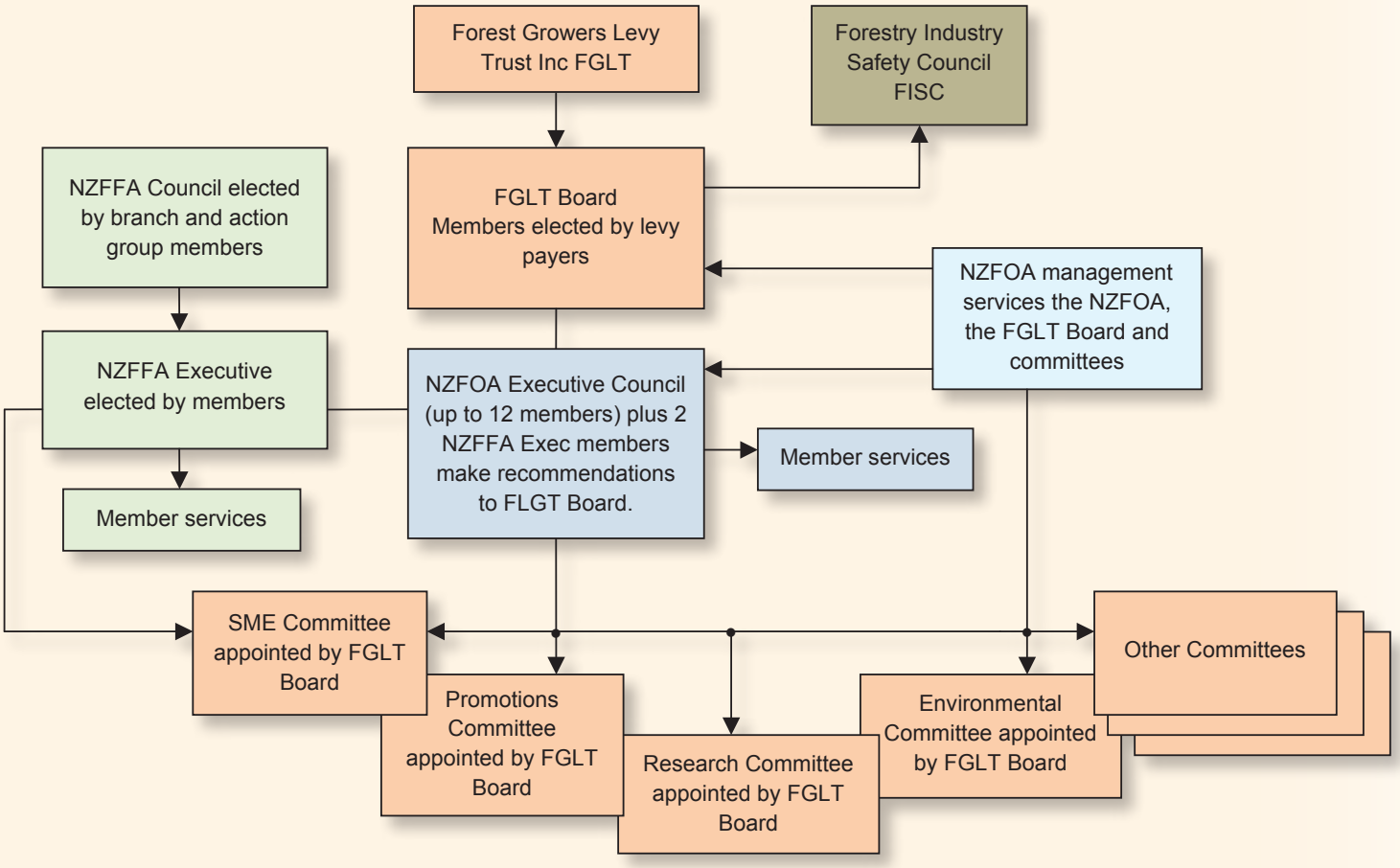
NZFFA is the New Zealand Farm Forestry Association. It is us, an organisation made up of small-scale foresters, originally comprising farmers with woodlots, but now with a much wider membership.

NZFOA is the New Zealand Forest Owners Association, and represents the owners of New Zealand's large commercial plantation forests.

These two organisations are linked in several ways. We share office space and both have input into the FGLT.

The FGLT is the Forest Growers Levy Trust which collects a levy on all logs sold at the mill or the wharf, for industry-good programmes and research. The FGLT is administered by a board of industry representatives, four elected by large-scale commercial growers and two by small scale-scale growers, with an independent chairman. Recommendations to the board pass through a committee made up of 11 members from the NZFOA and two from NZFFA. The NZFOA provides secretarial services to the FGLT.

Levy management structure and links with other organisations



Under the FGLT are several committees, one of which is SMEC, Small and Medium Enterprise Committee, set up to help ensure the interests of smaller forest growers are covered in the work funded by FGLT.

FISC is the Forest Industry Safety Council, established in response to the Independent Forestry Safety Review. FISC is the first true tri-partite industry-led body in New Zealand with the mandate to work across the full plantation forestry sector, representing one voice in health and safety. Ian Jackson is the NZFFA representative on the committee. Our esteemed editor, Julian Bateson, is on one of the working groups.

IRIS is the Incident Recording Information System for improved work-place safety. It is used to collect and analyse data to help identify causes of accidents and allow contributors to benchmark their health and safety performance against industry averages.

ACOP is the Approved Code of Practice for forestry. ACOP offers practical guidance to those engaged in forest operations including planning, establishment, silviculture, harvesting and transportation of log and log products, on how they can meet their obligations under health and safety regulations.

WPMA is the Wood Processors' and Manufacturers' Association which advocates on behalf of the wood processing sector. Its membership spans the whole wood supply chain, turning logs into high value end products including pulp, paper, sawn timber, panels, laminated products and mouldings.

FICA is the Forest Industry Contractors Association, formed to give a common voice on relevant issues and to aid development and improvement in forestry contracting. FICA has approximately 150 members made up of logging contractors, silviculture contractors and a range of associates.

Woodco is the Wood Council of New Zealand, a pan-industry body which represents the common interests of the forestry and wood processing sectors. Members include the NZFFA, NZFOA, WPMA and FICA. NZ Wood is a major promotional and development programme to promote New Zealand forests and wood resources to improve our economy, society and way of life.

Scion

Scion is the trading name for the New Zealand Forest Research Institute Limited, a Crown Research Institute which carries out scientific research for the benefit of New Zealand. There are several acronyms associated with this organisation.

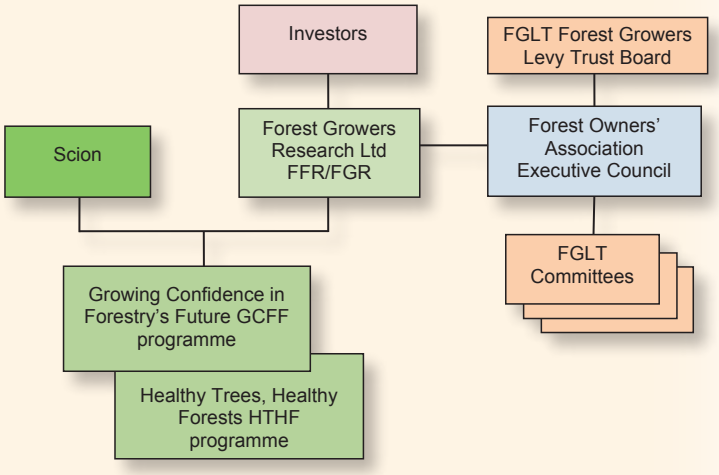
FIF is Forest Investment Finder, Scion's model of forest economics, which models the revenue for the forest grower given harvest intentions.

GCFF is Growing Confidence in Forestry's Future, a research programme run by Scion to make radiata pine forests more productive.

HTHF is Healthy Trees, Healthy Forests programme run by Scion aimed at phytophthora diseases responsible for red needle cast, kauri dieback and losses in horticultural crops.

NuBalM is Scion's Nutrient Balance Model, which enables forest growers to predict the supply of nutrients to their planted forest estate over multiple rotations.

Forest Growers' Research relationship with Scion



Ministry for Primary Industries

MPI is the Ministry for Primary Industries, which aims to maximise export opportunities, improve sector productivity, manage food safety, increase sustainable resource use, and protect New Zealand from biological risk. Some of the many acronyms associated with MPI are listed below.

SFF is the Sustainable Farming Fund, a grant scheme for farmers, growers or foresters to tackle a shared problem or develop a new opportunity.

NES is the National Environmental Standard for Plantation Forestry, drafted by MPI to improve the way we manage the environmental effects of commercial forestry.

SLMACC is the Sustainable Land Management and Climate Change Research Programme, a grant scheme to enhance and support adaptation to climate change

AGS is the Afforestation Grant Scheme, offering $1,300 a hectare for growers to plant new small to medium-sized forests

HEL is Highly Erodible Land, hill country with a potential for severe erosion, or with a potential for moderate erosion but where sediment will enter directly into waterways.

SLUI is the Sustainable Land Use Initiative, a programme run by Horizons Regional Council with

funding from MPI to reduce erosion through better land use.

ECFP is the Erosion Control Funding Programme, administered by MPI for Gisborne district landholders and community groups to help reduce wide-scale erosion.

NEFD is the National Exotic Forest Description, an annual survey of forest owners which provides a detailed description of production forests to help with policy planning and industry development.

Ministry of Business, Innovation and Employment

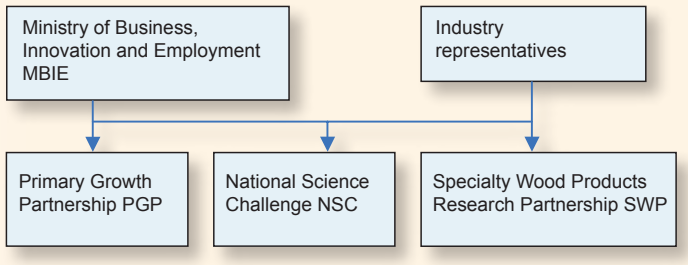
MBIE is the Ministry of Business, Innovation and Employment, formed in 2012 by bringing together the Ministry of Economic Development, Ministry of Science and Innovation, Department of Labour and Department of Building and Housing. Some of their many acronyms some are listed below.

NSC is the National Science Challenge, a funding programme for research to tackle some of the biggest science-based issues and opportunities facing New Zealand.

PGP is the Primary Growth Partnership, a joint venture between government and industry which invests in long-term innovation programmes to increase the market success of primary industries.

SWP is the Specialty Wood Products Research Partnership, an MBIE and industry funded research and development programme aimed at alternative timbers.

MfE is the Ministry for the Environment, the government's principal adviser on the New Zealand environment and on international environmental matters.



NOF is the National Objectives Framework, originating from the Land and Water Forum recommendations for a national framework for setting freshwater objectives, administered by MfE.

Fire

On the subject of fire things have become a little simpler since July when two separate organisations were merged into one.

NRFA was the National Rural Fire Authority, an organisation to reduce the number and consequence of wildfires in rural areas.

NZFS was the New Zealand Fire Service, responsible for fire safety, fire prevention and fire extinction.

These two became FENZ, Fire and Emergency New Zealand which has responsibility for rural and city fire fighting.

Some other organisations

FFR is Future Forests Research Ltd, formed in 2006 as a method for Scion to attract industry funding. It is now Forest Growers Research Ltd or FGR, trading as Future Forests Research. The diagram on the previous page shows how they all fit together.

NZDFI is the New Zealand Dryland Forests Initiative, a programme to develop genetically improved stock and management systems for ground-durable eucalypts.

FSC is the Forest Stewardship Council, an international not-for-profit organisation that sets standards for responsibly managed forest.

PEFC is the Programme for the Endorsement of Forest Certification, an international not-for-profit organisation promoting sustainable forest management similar to FSC.

NZIF is the New Zealand Institute of Forestry, representing New Zealand's forestry professionals, providing a forum to exchange ideas, opinions and information.

RPBC is the Radiata Pine Breeding Company, whose shareholders include major forest growing companies in New Zealand and Australia, and works to genetically improve radiata pine.

TTT is Tane's Tree Trust, encouraging the use of New Zealand indigenous tree species for biodiversity, landscape, cultural benefits, and the option for sustainable production of high-quality timber.

Internal NZFFA

The NZFFA itself has a number of special action groups frequently referred to by acronyms.

AMIGO is the Acacia Melanoxylon Interest Group, an action group of growers, researchers, nurserymen, and commercial users which is the main source of information for blackwood.

FIAG is the Forest Investors' Action Group for those primarily concerned with investment forestry.

IFS is the Indigenous Forest Section, a special interest group involved with growing and managing native trees

FFT is the Farm Forestry Timbers Society, a not-for-profit incorporated society for promoting and distributing locally grown specialty timbers in New Zealand.

EAG is the Eucalypt Action Group, which focuses on growing eucalypts for the timbers' decorative appearance, natural durability, strength and hardness.

CAG is the Cypress Action Group, which collates existing research and pools the experience and knowledge of farm foresters growing cypresses.

SAG is the Sequoia Action Group which focuses on the promising potential for sustainably plantation-grown redwood in New Zealand.

Wood councils

Regional wood councils provide a collective voice for the forestry sector in their areas. Each is made up of members across the supply chain, growers, consultants, loggers, processors and exporters.

SNIWC is the Southern North Island Wood Council, members of which own or manage about 164,000 hectares of forest and are involved with three regional councils and 17 district or city councils.

EWC is the Eastland Wood Council which provides a collective voice for the forestry industry in the Eastland region. It encompasses the Gisborne and Wairoa District Council areas and stretches from the Mohaka River in the south to East Cape in the north.

NWC is the Northland Wood Council which is a regional association representing the larger plantation forest owners and forest managers operating in Northland.

SWC is the Southern Wood Council set up in 2001 to promote, encourage and coordinate the sustainable economic development of the forest products industry in the Otago and Southland regions.

You will come across many more acronyms related to finance, climate change and scientific research. Next time someone talks weird collections of letters, ask them to explain. But be warned, asking such questions can make you very unpopular at meetings.

Lynne Wallace is relatively new to forestry, owns a small forest and is a member of the Forest Investors' Action Group.

Howard Moore is a Wellington branch member, a member of the Forest Investors' Action Group and business analyst with over 30 years of experience in forest finance.

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Fighting Phytophthora in forests

Nari Williams and Michelle Harnett

Scary-looking on paper and even scarier in forests, the word Phytophthora *does not seem to have enough vowels in it. And how do you get your mouth around it? It comes from the Greek for plant 'phyton' and destruction 'phthora' and pronounced figh-toff-thor-a.*

Hard to say or not, its plant-destroying nature means we have to talk about it. Pathogens from the *Phytophthora* genus are responsible for tree deaths around the world including in New Zealand where tree diseases have been in the news this past winter.

Outbreaks of red needle cast (RNC) have been reported around New Zealand. People watching the foliage of their pine trees turning reddish brown have asked if their trees were dying. Kauri dieback has also been reported to be spreading in the Waitakere Ranges. Wet conditions are causing tree decline and revealing a wider spread of the disease than previously recognised.

Both RNC and kauri dieback are caused by *Phytophthora* pathogens. *Phytophthora* are not quite fungi and not quite algae, but they have the characteristics of both. Technically they are oomycetes. They are spread by two types of spores – active spores or zoospores which 'swim' in water to find new hosts, and passive spores that survive harsh conditions. When the spores germinate they penetrate the foliage or roots of a host plant producing a network of fine threads or mycelia which produce spore-forming bodies called sporangia. Mature sporangia release new spores to start the cycle over again. Scarily, in wet and warm weather conditions, each cycle can be completed in a few days.

A new radiata pine disease

A mystery needle disease was found on the East Cape of the North Island during routine forest surveillance in 2008. Dark bands, or lesions, were noted on green needles, which turned red and were cast, giving rise to the local name of red needle cast. Successive waves of disease across winter left affected trees significantly defoliated through spring, the prime period of tree growth until the new flush established in summer.

Scion forest pathologists analysing affected needles found an unknown *Phytophthora*. In 2012, DNA sequencing identified it as *Phytophthora pluvialis*, a newly described species from Oregon. From Latin this time, pluvial means relating to rain.

The presence of a new pathogen affecting radiata pine, the backbone of the New Zealand forestry industry, caused great consternation. No one knew how far the disease would spread, how it would behave in following years and how it would affect forest productivity. With *Phytophthora's* reputation as plant killers the worst case scenario of tree death was considered a real possibility.

Another very real threat was the possibility that the presence of the pathogen on logs would affect log exports. Research was put in place to understand if there

Radiata pine with severe red needle cast

was a link between this new species and RNC and to study if the pathogen was likely to be transported and establish in new areas domestically and overseas. Scion pathologists quickly established that the pathogen was only found in needles and not branches or stems. There was also the concern that viable spores could piggyback on the outside of logs. However, the majority of log exports from New Zealand are essentially subjected to a 'temperature treatment' as they pass through the equator on their way to northern hemisphere destinations. Logs on ships are exposed to temperatures greater than 35°C and hitch-hiking spores were found to be deactivated at much lower temperatures, so the log export trade was able to continue.

Where do you start fighting an unknown enemy?

The Healthy Trees Healthy Future programme was set up in 2013 to fight RNC, kauri dieback caused by *P. agathadicida,* and *P. cactorum*, which is responsible for collar and crown rot in apples. Scion's Dr Nari Williams is leading the research. Scion is working with other Crown Research Institutes, universities and the forestry industry to investigate ways to control the diseases, breed resistant trees, and prepare future responses.

How infection occurs

The first part of the fight against *Phytophthora* began with identifying how the pathogen spreads and the infection process. It was discovered that RNC's zoospores were carried in water droplets with infection driven by misty and rainy conditions. The above average rainfall from winter 2016 and throughout 2017 has been perfect for the pathogen, explaining the widespread appearance of disease this year.

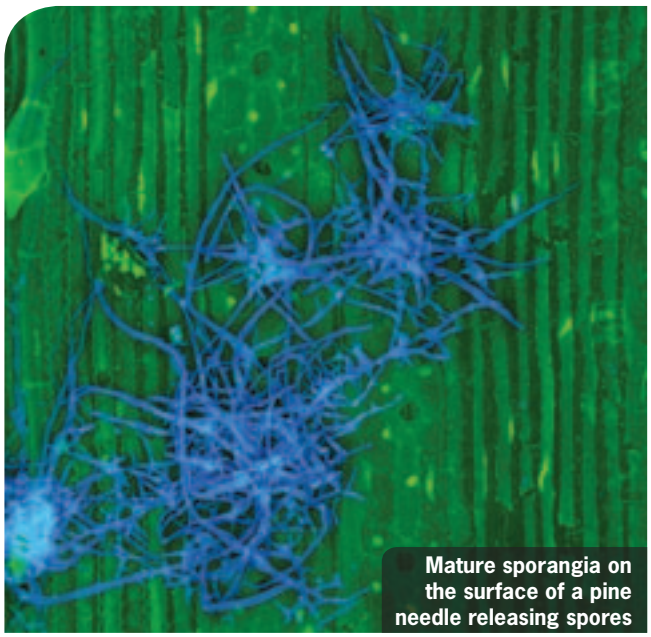
RNC spores landing on a pine needle germinate and their mycelia enter the needle via its pores. Inside the needle they occupy the spaces between cells, not the cells themselves. The infection remains isolated in the needles because a tough lignified layer of cells prevents its access to the rest of the tree. Sporangia later emerge from the stomata to release new zoospores to spread the infection.

Looking for natural resistance

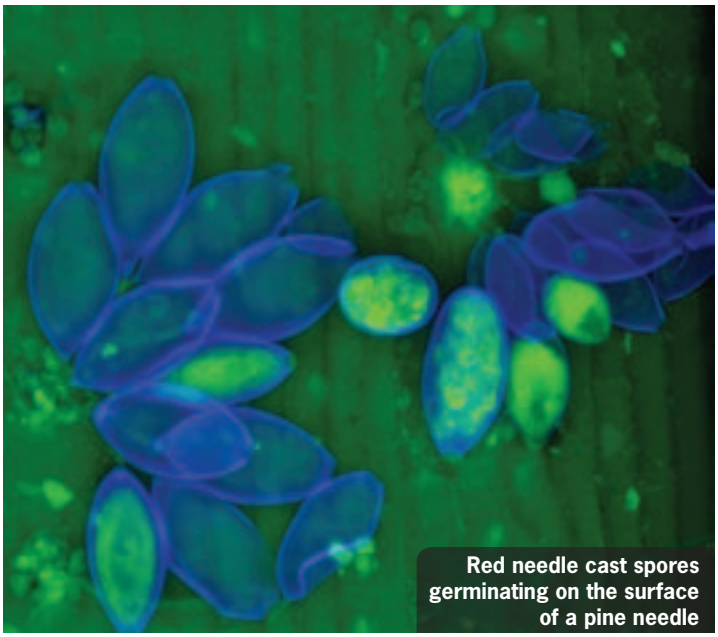
Finding or breeding RNC-resistant trees is a practical and environmentally acceptable long-term solution to the problem. Before the forest pathology team at Scion could start to look for trees with natural resistance they had to develop a reliable method to identify resistant trees.

Over the last couple of years, the team has worked out how to grow the pathogen in the lab and come up with ways to infect detached needles and trees in the laboratory and the field. In all, more than a quarter of a million pine needles have been picked, inoculated, incubated and assessed. To look at infection on a tree-scale, a fogging chamber which can expose whole trees to spore-containing mists was built on the Rotorua campus. Both laboratory methods have confirmed early observations that susceptibility to RNC can vary considerably between trees, which bodes well for the selection of more tolerant trees for planting in disease prone areas.

The most recent step has been to take selected trees into the field and leave them under heavily diseased trees to become infected in forest conditions. The researchers monitored the proportion of needles that remained disease-free over an eight-week exposure period. Where 95 per cent of the trees thought to be most susceptible were infected after two months, around



Mature sporangia on the surface of a pine needle releasing spores



Red needle cast spores germinating on the surface of a pine needle

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60 per cent of the foliage of the most resistant trees remained disease free. Needles from this trial have been collected for further analysis to help understand the mechanisms of plant resistance and behaviour of the pathogen.

Questions to be answered

A lot of questions around resistance remain to be answered. For example, do resistant trees produce something which inhibits the pathogen that confers resistance for life? Or is it just that the rate of pathogen growth is slowed and the disease will appear later?

Another alternative is that pathogen reproduction is interrupted, which could limit its establishment and prevent an infection turning into an epidemic. Working out which mechanisms are at play is central to identifying resistance which lasts and markers which enable broad resistance.

So far, comparing *P. pluvialis* on the surface of a disease-resistant and a susceptible radiata pines has shown that, while the pathogen may be present, it behaves quite differently. Spore-releasing sporangia are produced in abundance on the needles of susceptible genotypes, but not on resistant ones. This has considerable implications for disease suppression in the field.

The data on resistant trees is being used by the Radiata Pine Breeding Company who are looking at other traits, along with RNC resistance, before making any recommendations to the forest industry. Resistance to the pathogen in a particular genotype is all well and good, but if it is linked with an undesirable trait, that genotype may not be suitable for commercial development.

Nari Williams inspecting resistant and susceptible genotypes in the field

Spray to keep RNC away

Finding a cost-effective, Forest Stewardship Council-compliant, chemical control method to manage outbreaks is another important part of the overall programme. Phosphite, which is used for controlling *Phytophthora* diseases overseas and in New Zealand by the horticultural industry, was one potential candidate for control. Copper fungicides were another possibility. Copper-based sprays have the advantages of being cheaper than phosphite and are already used by the forestry industry to control dothistroma needle blight, meaning application methods and rates are already well established.

Phosphite was very effective against *P. pluvialis* in initial controlled trials. However, getting it into radiata pines via the foliage in consistent amounts in the field has proved difficult. A lot of work has been carried out trying to improve fungicide uptake using adjuvants – the chemicals often added to sprays to give even spray coverage, help the spray stick and to penetrate the foliage – but the problem remains.

Copper sprays have also been found to be effective. A major aerial spraying field trial took place in February 2017 comparing phosphite and copper as management methods. One month after application, needles treated with copper showed significantly less disease compared with the control and the phosphite treatment. The best time to apply the copper treatment for RNC seems to be during late summer. The next steps are determining the optimum dosage of copper and the best time to spray.

Gene genie

RNC was first reported in New Zealand about 10 years ago. Its relatively recent arrival was confirmed by taking a close look at its genome. A comparison of the genome of 'our' pathogen with that of *P. pluvialis* from different sources can tell a molecular biologist a lot about the origin of the pathogen found in New Zealand and how long it has been here.

The genomes of all organisms change as mutations take place. As populations drift apart they develop their own characteristics which distinguish them from other populations. Given enough time and separation, new species can evolve. With a good idea of the rate at which mutations occur, scientists can look at gene changes to establish how closely two populations are related and how long they might have been separated from their nearest cousins.

The family tree of New Zealand's *P. pluvialis*, as it stands at the moment, shows two different strains have arrived and are most closely related to strains from Oregon. Working backwards from reports of unusual needle disease outbreaks, and taking into account the introduction of stronger import regulations around

2000, Nari Williams has speculated that the pathogen arrived sometime before then, possibly on second-hand equipment or with live plant imports before the tightening of biosecurity regulations.

Douglas-fir is the primary host of *P. pluvialis* in Oregon. Douglas-fir in New Zealand is also susceptible to the pathogen. Infections tend to go unnoticed as needles are cast but do not change colour and would be more aptly called green needle cast in Douglas-fir. Work is currently underway looking at how widespread the infection is on Douglas- fir in New Zealand.

Chemical fingerprinting

Just as a doctor can diagnose what might be ailing us from the chemicals in our blood and urine, the same thing can be done for plants. As plants respond to stress and infection the chemicals they produce change. The changes start long before a tree starts to show obvious symptoms of disease. If we could monitor these changes we could use them as a diagnostic tool, especially in kauri, and get more insights into what is happening in susceptible and resistance trees and how to bolster resistance.

Work at Scion is being carried out on kauri using cells cultured from seeds. Starting with untouched material removes any other factors that could influence the responses of trees to their environments such as site, rainfall and other pests. The cultured cells are infected in petri dishes. The chemicals produced are then extracted and analysed. The individual components are separated in the results.

Different chemicals are produced by infected and healthy material but the tricky part is identifying them. A chemical reference library for radiata pine, kauri and apples infected with *Phytophthora* pathogens does not exist. There are many compounds and each unknown chemical needs to be isolated and identified using methods such as mass spectrometry. Stefan Hill, who is the research leader for advanced chemical characterisation, likens the whole process to first discovering the letters to form the words to write books in the library. Work continues in this area with the first samples taken from infected kauri plants in screening trials underway with collaborators at Landcare Research.

Kauri dieback

Kauri trees with odd symptoms were first reported on Great Barrier Island in the 1970s. The disease has now spread to Auckland, Northland and the Coromandel. In the Waitakere Ranges up to 16 per cent of the kauri are showing symptoms. The pathogen responsible, *P. agathadicida*, spreads in water within the soil to infect kauri roots. The infection grows rapidly through the root systems eventually starving the tree. To date, there are limited options for managing kauri dieback after it has become established. Given the slow regeneration time of kauri, the disease is a cause of major concern.


Kauri dieback lesions

The best chance for kauri long-term survival is finding trees with inherent resistance to the disease. Finding resistant strains of kauri is a major focus of the Healthy Trees, Healthy Future research programme. Scion is working with mana whenua groups from Northland, Auckland and the Waikato to screen kauri obtained from within their rohe. Seed was collected in 2016 and 2017 and germinated in the new *Phytophthora*-free growing facilities in the Scion nursery.

Many unknowns

Around 16,000 kauri seedlings have been successfully raised over the last two years. These will be used to test the susceptibility of kauri siblings from the same mother tree to the disease to identify families with potential dieback resistance. According to Nari Williams, seed collected from a mother tree has either been self-pollinated, or pollinated by a pollen donor somewhere upwind. If the seedlings collected from a single mother tree prove to be resistant, there is either a resistant pollen donor in the area, or the mother is resistant.

Early stages of screening have already shown different responses to infection across different kauri lines. However, there are many unknowns. The team is working to understand what the pathogen does when it infects a seedling. Is resistance due to one gene, a group of genes or something else? The aim is also to establish methods to assess disease susceptibility as trees age and across different environments.


Kauri seedlings growing in Scion's Phytophthora-free facilities

supported by forestgrowers commodity levy

Current efforts to slow the spread of kauri dieback are centred on preventing the spread of the pathogen. People who visit the bush in infected areas are urged to sanitise footwear, equipment, dogs' paws and anything else which may have come into contact with the soil. In places, boardwalks have been built to protect roots and people are asked to stay on designated paths.

Healthy trees and healthy future

The programme fighting New Zealand's *Phytophthora* problems has made significant progress over the last four years. The diverse strands of the work are coming together and we now have a good understanding of the pathogens, the infection processes and disease cycles of the main *Phytophthora* pathogens affecting New Zealand's tree species.

We now know the pathogen causing red needle cast in radiata pine is widely spread, is helped by persistent rainfall, and peaks in August and September. We know that spraying with copper in late summer provides around three months of protection from RNC which may be sufficient to break the annual epidemic of disease and prevent economic losses.

Pathogen resistant genotypes have been identified and are likely to be available to forest owners and managers in the coming years. We have insights into what causes susceptibility and resistance to *Phytophthora* pathogens and are in the process of developing higher throughput options for screening.

The collaboration has drawn in national and international expertise and has allowed us to follow many different lines of enquiry. The results so far, and those anticipated in the final two years of the programme, have led to the development of a suite of new methods to fight existing diseases and respond to new pathogens, keeping all our forests growing healthy and strong.

You can find more information on www.healthytrees.co.nz or contact Nari on Nari.williams@scionresearch.com

Funding

The work is funded by the Ministry of Business, Innovation and Employment, the Forest Growers Levy Trust and the Kauri Dieback Programme.

Nari Williams specialises in pathology, management and systems biology of* Phytophthora *diseases. Michelle Harnett is the senior communication adviser for Scion.

Carbon leaks from forest soils

From the Central Canterbury newsletter a research report which may be a bit disturbing.

After 26 years, the world's longest-running experiment to discover how warming temperatures affect forest soils has revealed a surprising, cyclical response. Soil warming stimulates periods of abundant carbon release from the soil to the atmosphere alternating with periods of no detectable loss in soil carbon stores. Overall, the results indicate that in a warming world, a self-reinforcing and perhaps uncontrollable carbon feedback will occur between forest soils and the climate system, adding to the build-up of atmospheric carbon dioxide caused by burning fossil fuels and accelerating global warming.

The study, led by Jerry Melillo, appears in the October issue of *Science*. Melillo and colleagues began this pioneering experiment in 1991 in a deciduous forest stand at the Harvard Forest in Massachusetts. They buried electrical cables in a set of plots and heated the soil 5°C above the ambient temperature of control plots. Over the course of the 26-year experiment the warmed plots lost 17 per cent of the carbon which had been stored in organic matter in the top 60 centimetres of soil.

'To put this in context, each year, mostly from fossil fuel burning, we are releasing about 10 billion metric tonnes of carbon into the atmosphere.'

That is what is causing the increase in atmospheric carbon dioxide concentration and global warming. The world's soils contain about 3,500 billion tonnes of carbon. If a significant amount of that soil carbon is added to the atmosphere, due to microbial activity in warmer soils, it will accelerate the global warming process. And once this self -reinforcing feedback begins, there is no easy way to turn it off. There is no switch to flip.

'The future is a warmer future. How much warmer is the issue,' Melillo says. In terms of carbon emissions from fossil fuels, we could control that. We could shut down coal-fired power plants, for example. But if the microbes in all landscapes respond to warming in the same way as observed in mid-latitude forest soils, this self-reinforcing feedback phenomenon will go on for a while and we are not going to be able to turn those microbes off.

Forest Stewardship Council certification for small forests

Rhys Millar

Certification for small-scale forests has been something which needs sorting out for a number of years. This article is a very useful summary of recent progress, with a little bit of optimism that one day soon it may be practical to have your forest FSC certified with the associated benefits.

Forest environmental certification is a market mechanism which allows customers and wood buyers to have sustainable forest management practices without using the bluntness of imposed boycotts. The most recognised forest environmental certification scheme in New Zealand and globally is the Forest Stewardship Council, usually referred to by its acronym FSC.

Other schemes, such as the Programme for Endorsement of Forest Certification or PEFC, are also important certification options but have not been so readily accepted by the large environmental non-governmental organisations such as Greenpeace and Friends of the Earth. As a result, they have not been so readily accepted by consumers. The industry and global consumer awareness of FSC, and the marketing power of the brand, will ensure that it stays as the primary forest certification scheme in New Zealand for at least the foreseeable future.

For the New Zealand forest sector, environmental certification has become important for market access. For owners of medium and large forests operating in this country, FSC certification has become part of daily business practice, providing security of access to export markets. This is demonstrated by the New Zealand Forest Owners Association assessment that currently the management of over one million of the 1.8 million hectares of plantation forest in New Zealand is FSC certified.

Where do small-scale owners fit in?

Due to the widespread and rapid uptake of the FSC certification scheme by the plantation forestry industry, growers of small forests in some regions have felt pressure to follow suit. In some places, the wood processing sector is experiencing high demand for FSC certified products and is requesting that all forest growers supply them with the FSC logs.

In 2009, the NZFFA commissioned a study to try and understand how the small-scale forest grower would be affected by certification and how growers could become certified. This study found that wood processors were increasing their demand for FSC certified logs. Handling non-certified logs was becoming problematic for some mills due to the significant cost attached to managing two lines of logs.

There are already cases of forest growers being unable to sell logs to local processing plants due to the lack of forest certification. Similarly, some processors are only buying non-FSC logs at a discounted price. There were examples cited in which forest owners in close proximity to sawmills, closer than 20 kilometres, being forced to transport logs to alternative mills over 100 kilometres away due to their lack of certification.

There are also many situations where the regional demand for FSC is minimal and of little importance to small-scale forest growers. It is a situation of each grower needing to evaluate their own marketplace to determine the relevance of certification.

More relevance for certification

Certification is likely to increase in relevance in the future as log buyers have a greater selection of forests to choose from. With most of the future expansion in log supply coming from small-scale forest growers, there is potential for a buyers' market to develop. Log-buyer preference will be given to volume, quality of logs and records of quality control.

Forest accessibility, efficiency of harvest, and ability to supply the market specifications will be the main requirements for market access. FSC certification of logs and their products is one of the main specifications that, in some markets, will need to be met by the forest grower. In a marketplace flush with logs, small-scale forest growers will benefit if they can provide the wood-processing sector with what they demand.

Such forest growers will retain market access and will

not suffer from the potential discounting of non-FSC certified logs. Just as important, these small-scale growers will not suffer from being excluded from the processing plants which are close to their forest.

Gaining certification

Owners of medium and large forests have the resources and in-house expertise to manage the requirements of FSC certification and have built this into their daily management systems.

Historically, small-scale forest growers have not had sufficient market incentive to obtain certification. For the small-scale grower with a limited harvestable forest resource, the premiums or additional access to the markets which could have resulted from having certification have traditionally been insufficient to justify the cost and time attached to the certification procedure.

There are a number of barriers for small-scale forest owners that contribute to the lack of uptake of FSC certification. For example, there is not enough available information about what is required by forest owners. The jargon-filled legalistic speak of the FSC principles and criteria, and of the interim New Zealand standard, have also been a barrier. However, for small-scale forest owners the main barrier to obtaining FSC certification is cost. This includes the direct cost of certification and the indirect costs attached to achieving compliance to the certification standards.

The only option currently available for small-scale forest owners is by a group certification scheme. This is an adaptation of the same scheme used by large forest growers, but has not considered many of the concerns relevant to the small-scale grower. Its significant cost forms another barrier.

Possible trade barrier

The NZFFA is aware that members are increasingly likely to be disadvantaged in the future without access to an effective certification procedure. Without a suitable method for small-scale forest growers to gain FSC certification, there is a threat that certification could amount to a trade barrier.

FSC International has also recognised this threat and in recent years has developed the Small and Low Intensity Managed Forests initiative. This allows for the development of streamlined FSC certification procedures that will reduce the cost of obtaining certification for small-scale forest owners. Forest management standards can be developed which are simple and easy to interpret. Auditing requirements are also significantly reduced. The initiative aims to provide more cost-effective methods for small scale forest owners to complete the requirements of FSC certification.

The NZFFA have determined that gaining FSC certification by way of a Small and Low Intensity Managed Forests group scheme will be achievable for small-scale forest growers. The growers would need to manage their plantations and farms in an integrated manner which enforces the principles of sustainable land management.

In some cases, significant changes to forest management will be required as a part of being FSC certified. These are most notably, but not limited to, the active management of indigenous biodiversity and the need to undertake rigorous social and environmental impact assessments, as well as consulting with local stakeholders. The NZFFA is currently developing system that will allow members to gain FSC certification in a cost-effective manner.

National standard for certification

The FSC Principles and Criteria for Forest Stewardship provide an internationally recognised standard for responsible forest management. However, any international standard for forest management needs to be adapted at the regional or national level to reflect the diverse legal, social and geographical conditions of forests in different parts of the world.

The FSC principles and criteria therefore require indicators that are adapted to regional or national conditions so that they can be implemented at the forest management unit level. The principles and criteria, together with a set of indicators accredited by FSC, constitute an FSC Standard. The national standard establishes the required elements against which FSC accredited certification organisations will evaluate forest management practices within the context of New Zealand plantations.

In November 2009, a group representing most plantation forest owners, major environmental organisations along with social and Maori interests decided to form a Standard Development Group and re-commence standard development in accordance with FSC procedures. This had previously been abandoned in 2003 because there was too much disagreement on a number of points.

It was agreed by the Standard Development Group that small-scale forest growers would be represented by the Economic Chamber of the group, and that a set of indicators would be developed which are specific to small and low intensity managed forests. This has resulted in requirements for managers of these forests which are less onerous and more applicable to the scale of forest management in place. It was also agreed that Small and Low Intensity Managed Forests would be defined by forest area up to 1000 hectares in size.

Current status

In 2012, the FSC Board of Directors decided that a set of international generic indicators was needed so as to ensure the consistent application of the FSC principles and criteria across the globe. This process was necessary to improve and strengthen the credibility of the FSC system.

With a collective sigh, the New Zealand Standards Development Group has accepted this directive and is steadfastly working through the development of the new standard. For the NZFFA it has provided an opportunity to push for further changes in the way that small forest owners are managed within FSC. The NZFFA and the Economic Chamber have been supported by the Environmental and Social Chambers to develop a third tier of forest size. Subject to public consultation, the third tier will focus on small forests of less than 100 hectares. This forest size is often the domain of farm foresters. The small forests' will be able to meet the requirements of FSC using more abbreviated and streamlined procedures, reflecting their limited capacity.

Ecological integrity

One previous area of contention which was of particular relevance to small-scale forest growers is that of reserves or set-asides. It has been agreed that small-scale forest owners and farm foresters often lead the implementation of sustainable land management initiatives. For example, planting erosion prone slopes and protecting waterways are two commonly used activities that deserve support from the certification system process itself.

During the development of the national standard, the NZFFA therefore negotiated for greater flexibility in the reserve contributions. Being able to include land use activities such as shelterbelts, planted riparian forest areas and continuous cover forest management as reserves reflects the Standard Development Group's recognition of the role that small forests have to play in sustainable land management. They also ensure that the ecological integrity of the standard is retained.

It has also been recognised that it is appropriate for farm foresters, a subset of small-scale forest growers, to use their whole properties to meet the reserve requirements of the standard. That is, rather than simply assessing a farm's woodlots in isolation from the remainder of the farm, a whole-of-property method is suitable when considering reserves management.

The current National Standard was ready for public consultation in September, with the main change from the previous standard being the inclusion of this third tier of small forest class.

This is significant progress for small-scale forest owners, and I encourage you to support these changes when consultation is required. Forest certification is not going away, and in reality, will begin to increasingly effect small-scale forest owners, particularly as downstream processors increase their demands for more of their log supply to be FSC certified. Given that all major New Zealand forest owners are FSC certified, only the owners of smaller forests will be affected by this increasing demand.

The future

It is considered that a Small and Low Intensity Managed Forests group certification scheme will be the most cost-effective and helpful method for small-scale forest growers wanting to become FSC certified. Group certificates will be held by an individual entity such as the NZFFA, which as the group certificate holder is accountable for the group's compliance against the New Zealand standard.

There is a need for direct accountability from the individual group members to the group certificate holder. This holder must monitor the forest management of every landowner for compliance with the group's systems, policies and ultimately the FSC principles and criteria.

Given the position of the NZFFA as not-for-profit operating for the benefit of its members, it is in an excellent position to develop a Small and Low Intensity Managed Forests group certification scheme. Certification could provide increased benefits to at least some of its members.

The group's certificate would be managed by the NZFFA's appointed group manager whose responsibility would be to manage the consistency and integrity of the scheme and to ensure that individual forest managers are managing their forests to a high standard. The web-based system will underpin this scheme, allowing group members and the group manager to be able to complete the requirements of FSC, and also to easily demonstrate the correct management.

Rhys Millar is Director of Ahika Consulting Ltd in Dunedin.

The NZFFA 2018 annual conference in Nelson

Sunday 6 May to Wednesday 9 May 2018

We invite you to Nelson next May to enjoy the autumn splendour in an historic and modern centre of forestry activity. There is not much flat land in the top of the South Island and little of that to be wasted on trees. The rural land holdings here are traditionally small, but adequate for intensive farming of all sorts of berries, fruit trees and hops. The result is a never-ending pleasure of foothill garden valleys, borders of native remnant giving way to plantation hills, beech ranges and the tops.

The 2018 NZFFA conference will be based at the Tahuna Function Centre in Nelson, from Sunday 6 May to Wednesday 9 May. Registration will open on Sunday at 1.00 pm at the Function Centre. In fact, all the conference activities, meetings, dinners and the start point for all field days will be at this one location. Accommodation is available at the associated campground and numerous nearby motels. Restaurants are within easy walking distance.

A leisurely Saturday or early Sunday arrival will ensure time to attend any of the pre-conference Action Group meetings. Scheduling has not been completed but there should be no time constraint as all afternoon will be available. The Sequoia Action Group will kick off with their meeting at 9.00 am. The Executive meeting will follow at 10.00 am and will last until 1.00 pm. The other Action Group meetings will continue from 1.00 pm to 6.00 pm.

Late on Sunday afternoon we will have a social time preceding our welcome dinner. Our own world explorer Bevan Walker, will treat us after with a show and tell of his latest kayak adventure in the Antarctic.

Monday meetings and field trip

Monday morning will start with the Branch Management and Council meetings. For those not involved with the meetings we have arranged two alternative tours.

The morning visit will be to the World of Wearable Arts & Classic Car Museum. The afternoon trip will take in the seaside Mapua Village on Tasman Bay, a popular spot for many sports activities, craft and antique shops and eateries.

After the Council meeting the main body of tree fanciers travel south to Bevan Walker and Nora Flight's Tunnel Creek Evergreens. Bevan has been developing his forest since 1971. The initial rotation was planted over the first three years and harvested in yearly dollops for 15 years starting when the trees reached 25 years of age. The yearly replanting of commercial species was accompanied with the introduction of 40 species of exotics.

Bevan was the Husqvarna South Island Farm Forester of the Year for 2016. He featured in a May 2016 *Tree Grower* article and a Trees on Farms film segment. Bevan's tour will be in two parts divided by lunch. At the tour end we travel back to Tahuna beach for drinks and the awards dinner.

Autumn colours on Bevan Walker's planting

Tuesday meetings and field trip

All Tuesday morning will be allocated to the AGM and conference business meetings. After this we travel south as far as Wakefield then east into the Richmond Range foothills to Robert and Linda Appleton's Pig Valley Farm. Robert has been methodical in his trees of the world farm arboretum, identifying micro climates to maximise success and combine a myriad of species.

The property has been organised in terms of world geographical zones. Appropriate tree species from all over the world are grouped in their respective temperate climates. We will have lunch first and Robert will explain his plan before travelling the world in trees with a walk around this working farm. Following this is a free evening and a chance to explore Nelson's eateries.

Wednesday no meetings, only fun

Again we go south, but today it is a bit further. First there is a brief stop to visit the second oldest trial in the Scion permanent sample plot measurement database. It was set up by Forest Research Institute in 1949 when the stand was already 18 years old. The purpose was to study the growth and yield of Douglas-fir under different thinning regimes. Although the Forest Research Institute finished the study in 1982 the various forest owners of Golden Downs State Forest have continued to maintain and measure the trees. If practical, a hard hat is advisable for visiting these sky-high giants.

We continue south from here through state forest and the roadside autumn splendour established years ago by the NZ Forest Service. At Top House we join the

Dawn redwood at Robert Appleton's

Douglas-fir planted in 1931 for growth and yield studies

Farm forestry and exploring the area

Logging the hills of native timber began early. At Wakefield the Pigeon Valley Steam Museum has working steam engines which 'donkeyed' the monster logs on skylines to the valley floor. This engineering expertise carried on to see steep country logging equipment and techniques pioneered by local companies supplying machinery world wide. Not to be outdone, the engineering of value added production and development of new wood products continues.

Farm forestry in Nelson must compete with many other weekend activities, most of which are considered more fun by the other and younger family members. Like most NZFFA branches we struggle for membership and attendance. We have had over 50 years of farm forestry in the Nelson province, so many of our active members are second or third generation tree growers.

The same diversions that tempt us to bugger off for the weekend in place of scratching around our trees should tempt any conference goer to have a few days exploring our bountiful area. A day boat trip from Kaiteriteri along the Abel Tasman coastline could be relaxing after all that walking and talking.

If you are still packed with energy, the bike trails in the area display a wealth of history, the gardening of all these small holdings and the natural beauty of coast and foothills previously obscured. A favourite drive to impress visitors is a circuit along the coast or Moutere valley to Motueka and Kaiterteri then back along either the east or west bank of the Motueka river to Kohatu and over Spooners range to Nelson. All the northern hemisphere trees planted by homesick pioneers around their homesteads give an uncharacteristic splash of colour framed by sombre native highlands. Take an extra day or two and enjoy our autumnal splendour.

trail from Marlborough to the west coast and continue to St Arnaud on Lake Rotoiti, for morning tea. This is the tranquil upper source of the Buller River which we will follow as it collects the Hope and Gowan rivers and is transformed to a white water rafting gorge.

The Gavin's project extends three kilometres along the Buller's north bank providing glorious views of Mt Owen, Mt Murchison, and the Buller river valley. The Gavin's stretch of the Buller is flanked by easy walking river terraces. We are in good cypress country, mostly free of canker, and as we envy the silviculture treatment Patrick Milne will give us the latest news and theories.

There is also an interesting variety of other useful alternative timber species in a lower area which occasionally floods, an attractive area that could have been very ugly. We will tour the Gavin's efforts before and after our farewell picnic lunch at the bach and garden area. This will end the conference and field days.

Selective harvesting our indigenous forests

Wink Sutton

Indigenous forests are living ecosystems. In untended indigenous forests the total standing volume usually only varies by a small amount. Although old trees die, fall over and rot on the forest floor, any volume loss is soon made up by the growth of the remaining trees. If trees did not decay an indigenous forest which survived a thousand years would have a thousand year's of wood accumulated on the forest floor. The gap in the canopy allows more sunlight to reach the forest floor. This sunlight facilitates natural regeneration.

For several centuries foresters in the European indigenous forests have successfully practised selective harvesting. Trees are harvested before they die naturally. As well as providing more crown space for trees that remain, the wood harvested is sold to provide income and to ensure that indigenous wood is available to local wood users. Similar management systems are now practised in indigenous forests around the world. Such a forest management system for our indigenous forest was proposed by the first professional forester to comment on our forests – Captain Innes Campbell Walker in his report of 1877.

Are New Zealand's indigenous forests so unique and so fragile that they cannot be selectively harvested? If our indigenous forests are unable to be selectively harvested our forests must be the exception, as most of the world's forests can be. Because almost all indigenous forests have been transferred to the Department of Conservation and as such ownership generally prohibits any harvesting, the only selective harvesting possible is in the small area of privately owned indigenous forests. Selective forest management in podocarp forests was trialled in the 1960s and 1970s by the former Forest Service but, because selective harvesting was portrayed as being destructive, such trials were stopped with the transfer of most of our indigenous forests to the Department of Conservation. Although the general public is largely unaware, there are at least two examples of such systems being successfully applied in New Zealand's beech forest.

Pressure from politicians and environmentalists stopped further selective harvesting trials in our indigenous forests. The trials that were established were successful. Now it is difficult to distinguish those areas that were selectively harvested from those areas that were left untouched.

Foresters, politicians and environmentalists want the same objective – healthy indigenous forests. Foresters want to responsibly manage some of our indigenous forests to provide a return as well as access to the indigenous timber. Foresters have been wrongly portrayed by publicity seeking environmentalists, politicians and much of the media as forest destroyers, which clearly they are not.

The Department of Conservation controls about a third of New Zealand's land area but is prohibited from harvesting indigenous trees. This deprives itself of any financial return as well as depriving the public access to indigenous timber – fallen trees are just left to rot on the forest floor. As the Department of Conservation is grossly under-funded, responsible selective harvesting of some of our indigenous forests could go some way to providing income as well as providing New Zealanders with access to indigenous timber. Responsible harvesting could be done, as it is in France, Germany and Switzerland for example, without any loss of the recreational, scenic, biodiversity or other forest values.

When it rains, it pours

Jo McIntosh

This article looks at how local and global events can affect your insurance coverage and specifically the effect on standing timber insurance. We then discuss what steps you can take to optimise your insurance arrangements and costs.

They say when it rains, it pours, and that certainly has been the case recently in the New Zealand insurance market. The Insurance Council recently advised that there have been $2.5 billion of insured losses in New Zealand over the last 12 months, saying '2017 has been a huge year for New Zealand with earthquakes, floods and fires hitting us hard.'

The Kaikoura earthquake accounted for around $2 billion, with other claims such as the Port Hills fire and weather-related damage from cyclones Debbie and Cook also having significant effects. We have had our fair share of natural catastrophes, exacerbated by other recent events, including the devastating Christchurch earthquake, which the Insurance Council have estimated the costs so far as $19 billion.

An interesting insurance market

New Zealand is an interesting insurance market. We are fortunate to have one of the highest uptakes of property insurance in the world and traditionally, insurance is more affordable here than in other parts of the world. For example, it appears that up to 85 per cent of Houston home owners did not have flood insurance. The effect on New Zealand's insurance rates and capacity as a result of these local events is developing, as well as the increased frequency and cost of global ones such as hurricanes Harvey and Irma.

Tim Grafton from the New Zealand Insurance Council recently commented that we are currently in renewal and reinsurance season. However, the past 12 months of experience in New Zealand will have more of an effect on reinsurance costs than what is happening around the world. He continued to add that the jury is out on the effect the four hurricanes and earthquakes in Mexico will have on global reinsurance costs.

> 'I do not think it will be enough to affect the global market, which is awash with capital. The earthquakes in Mexico would bring total insured losses of around US$2 to $3 billion and most of that would come from commercial losses as Mexico is under-insured in personal residential property.
>
> Insured losses from the recent hurricanes are still unclear but early indications are within $30 to $40 billion. Reinsurers indicated they estimated there would need to be over $100 billion in insured losses suffered for there to be a significant market shake that would affect New Zealand. Reinsurers and insurers would predominantly base their risk assessment on local historical events such as the Canterbury and Kaikoura earthquakes.'

Reinsurance

Most New Zealand retail insurers have significant reinsurance arrangements to protect their financial position and ensure they can pay claims. While these reinsurance structures differ between insurance companies, most have a loss limit on the amount they pay for a natural catastrophe such as an earthquake. Once a claim goes over the nominated loss limit, the reinsurance is activated and the reinsurer pays above this limit. A significant portion of the money which has been flowing into New Zealand over the last few years to pay for rebuilding and claims is from these reinsurance recoveries.

Like most of us, the retail insurers have an annual insurance renewal. They need go to the global insurance markets to arrange their reinsurance programmes for the following year. Generally this has proved to be progressively more expensive for New Zealand retail insurers, particularly in the property market. While there is still insurance capital available, the costs are generally increasing as reinsurers harden their position on New Zealand and price the risks to reflect their exposures and loss experience as well as to generate a return.

This increased reinsurance cost ultimately flows through to the price you and I pay for our insurance.

Market effects

In terms of standing timber insurance, fortunately this policy line mainly sits outside the property insurance

pool as far as insurers are concerned. However, there have been losses and there is some pressure on reinsurance costs. As a result, many of you will have seen a modest rise in rates over the last two years. This upward pressure on standing timber rates has been offset by increased insurer competition and generally the premiums we are paying today remain below that paid in 2011.

The liability insurance market is also being kept in check by very good local competition, unless you have had claims or are in a particular sector not favoured by liability insurers. Pricing is currently relatively stable. Most of the pricing movement is tending to be in the property insurance market. Property pricing is generally increasing for the reasons discussed above.

Certain regions, such as Wellington particularly, are facing large premium increases and pressure on terms due largely to earthquake risk. There are some property risks which are perceived as so unattractive that they may struggle to find an insurer. Insurers are underwriting risks with much more care and paying great attention to the construction, age and location of property. For some property owners the terms of cover may also, for example increased natural disaster excess conditions.

Timing is everything

Because we are in a hardening market cycle for property insurance at the moment, the insurance industry was particularly disappointed with the government's introduction of two new tax increases and the cumulative effect this will have on insurance costs. From July this year, there was a 40 per cent increase in the Fire Service Levy used to fund the fire service. The fire service benefits all New Zealanders and it is unfair to have only those who insure pay for these costs.

On top of this, from 1 November there was a 33 per cent increase in the Earthquake Commission levy applied to house and contents insurance. Both of these levies also have GST applied to them. This affects commercial premiums but also means people with house and contents insurance will be levied and taxed over $450 without even counting the 15 per cent GST applied to the premium that the insurer charges.

The worry is that people will start cutting back on insurance and deliberately under-insuring by reducing values or limits or, at worst, not purchasing any insurance at all. New Zealand is very prone to natural disasters. We certainly do not want an increased number of New Zealanders exposed to great hardship if they are under insured or not insured in a natural disaster.

The Insurance Council has said 'Does New Zealand continue to go down the path of making it increasingly difficult for low income people to protect themselves, or should we really be addressing our vulnerability? General taxation should fund the Fire Service which benefits everyone, insured and uninsured alike. The Crown balance sheet is now strong and can bear the $1.75 billion exposure that the EQC levy seeks to fund.'

What you can do to minimise these effects

It is very important for you to consider your risk exposure and manage this exposure with astute insurance placement. Talk to your adviser in advance of your insurance renewal and get an indication on pricing so that you can budget and plan. Make sure you have read and understood the policy and coverage offered.

For those with commercial property insurance, it will be vital to talk to your adviser well in advance of your renewal. You will want them to work with you to prepare a quality submission to insurers. This may mean you will need to provide extra information such as detail on construction, earthquake strengthening and details about how a building compares to the New Building Standard which is usually expressed as a percentage. If purchasing new property check in advance with your adviser that it is insurable, get an indication on premiums and understand what information will be required.

Finally, please do not cut corners and or take the risk of not insuring or under-insuring. Having worked with clients following losses, it is stressful enough and tough enough without the very real benefit of insurance assistance. I am proud of the work Aon have done with our clients, the planning and conversations over the years has resulted in them having good cover in place, at a time when they really needed it. As a specialist forestry broker, Aon keeps abreast of developments and works with you to optimise your risk and insurance.

You need a good umbrella.

Jo McIntosh is an Executive Director of Aon and specialises in insurance for forestry and horticulture.

supported by forestgrowers commodity levy

The levy-funded Forest Resources and Environment Committee

Don Wallace

The Forest Resources and Environment Committee, commonly known as the Environment Committee, is one of several joint NZFFA/NZFOA committees funded by the Forest Growers Levy. It is chaired by Peter Weir of Earnslaw One.

This committee began as part of NZ Forest Owners Association committee structure and, as with many other such committees, from the beginning of 2015 when the levy was introduced, became fully funded by contributions to the levy of logs harvested. The committee meets quarterly and members include representatives from the major corporate foresters. Don Wallace, and more recently Michael Orchard represent small-scale forest growers.

Like all the levy-funded committees, the Environment Committee has to compete for funds against the other committees such those involving research, fire, biosecurity and promotions. In 2017, the total budget allocated to the Environment Committee was just over $300,000.

The Committee's role is to develop policies on a wide range of issues relating to forest growing and the environment, including forest certification, climate change, water and the Resource Management Act. Current concerns include interpretation and implementation of the Resource Management Act, forest certification, the forest sink, compliance costs and power line corridor maintenance.

How it deals with these issues, and their effect on small-scale forest growers is best illustrated by looking at some of the initiatives which it has been involved in.

The National Environmental Standard for Plantation Forestry

The National Environmental Standard for Plantation Forestry, the NES-PF, was initiated by corporate forest owners wanting to have a standard set of rules throughout New Zealand. Until now there have been no standard rules under the Resource Management Act for plantation forestry with each of the Territorial Local Authorities being free to set their own rules under the RMA for forestry and the severity of the rules varied markedly.

In August 2017, the NES-PF was gazetted and from May 2018 it will set nationally consistent technical standards, methods or requirements relating to matters under the RMA and provide consistent rules across the country by setting planning requirements for certain specified activities. It prevails over district or regional plan rules except where it specifically allows more stringent plan rules.

This has significant benefits for corporate foresters as they no longer have to negotiate and take court cases against multiple local authorities over the rules that they wish to impose on foresters. The result is not so clear for small-scale foresters. It will result in new rules regarding, for example, planting setbacks from boundaries and streams or construction of access tracks. These may cause problems and increase costs for those in areas that currently have more liberal rules.

Certification of plantations

As members will be aware, some consumers of wood and paper and related materials are interested in where the product comes from and, in particular, that the trees which have been used in the manufacturing process have not been illegally logged. There are currently two certification systems used – the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC). There are differences between the two systems, but both are used to certify wood grown in New Zealand.

Most of the corporate foresters have integrated FSC into their business, but the costs associated with certification are too high for small foresters and few are certified. There is, however, a mechanism called 'controlled wood' whereby a certain percentage of wood from forests which have not been certified is allowed to be included with the wood from certified forests. It is through this mechanism that wood from small-scale forest growers can be included in the system.

The three-yearly FSC General Assembly was in Canada in October this year. The NZFFA is a member of FSC but we could not justify the cost attending the meeting. We therefore relied on others members of the committee attending who had our proxy vote to represent our views on matters such as controlled wood and making FSC certification more cost-effective for small-scale foresters. This meeting was in progress as the *Tree Grower* went to press.

Power lines

Both the national (Transpower) and local (Lines Companies) power distribution companies are concerned about the problems caused when power lines are too close to trees. They have been asking for increases in clearance distances, usually without offering any compensation to land owners. It is only due to a united stand that foresters will be able to ensure that any solutions are fair to both sides.

The Environment Committee has been working with Transpower and the Electricity Supply Association, which represents the local electricity lines companies, to try to get an equitable solution. There is no clear result yet but some work being done by Transpower, to replace rigid separation rules with a more flexible risk-based approach, has some promise.

Fumigation of export logs

Many of the countries which accept our log exports insist that the logs are treated to kill pests before they arrive. To date, the usual way to do this is to treat the logs on the wharf by covering them with a tent-like structure and pumping in methyl bromide to kill the bugs. The tent is then opened and the remaining gas vented to the air.

There are at least two drawbacks to this method. Methyl bromide is a known ozone-depleting gas and there are concerns regarding the effect it has on the people carrying out the treatment. For these reasons, methyl bromide is due to be phased out in 2020 and there is a need to identify an alternative treatment that satisfies our export markets. (For more details about this, see the article on page 7.)

The committee has been working with Stimbr, the acronym for stakeholders in methyl bromide reduction, to identify a replacement treatment method. There are potential long-term alternatives to chemical treatment such as using electricity to heat logs, but none is likely to be commercially viable in the 2020 timeframe.

The only effective and safe alternative to methyl bromide appears to be ethylene dinitrile or EDN. EDN is, apparently, almost completely absorbed by the logs and any remaining gas is less toxic that methyl bromide. Work is therefore proceeding with Stimbr to get EDN approved for use in New Zealand and to persuade the countries which receive our wood that EDN is as effective as methyl bromide as a phytosanitary measure.

Social licence to operate

While we can come up with all kinds of measures to improve our environmental position, there is little point if the population at large is hostile to our efforts. This has led to significant efforts by Scion in an area called social licence to operate.

'Social licence' generally refers to a local community's acceptance or approval of a company's project or presence in an area. Fundamentally, it involves persuading ordinary people that forestry is good for them.

The different levels of social licence are illustrated in the diagram below.

Level of social licence	Symptoms and indicators
Withheld/ withdrawn	Shutdowns, blockades, boycotts, violence, sabotage and legal challenges,
Acceptance/ tolerance	Lingering or recurring issues and threats, presence of outside NGOs and watchful monitoring
Approval/ support	Company seen as a good neighbour, pride in collaborative achievements
Psychological identification	Political support, co management of projects and a united front against critics

Initiatives undertaken recently in this area include –

- Publishing environmental fact sheets on topics such as debris flows, water quality, forest soils, pollen and ecosystem services
- Hosting a website that gives guidance on managing rare species in plantation forests
- Working with our partners in environmental associations such as ECO, World Wildlife Fund, Federated Mountain Clubs, Friends of the Earth and Forest & Bird, to update the NZ Forest Accord
- Sponsoring an NZIER report on the contribution of forestry to New Zealand
- Agreeing conditions for access to forests with the Walking Access Commission.

Forest engineering practice

As happens in any industry, the quality of forest engineering practice varies between companies carrying out harvesting and related work. Recently, the Environment Committee has been alerted to some examples of sub-standard practices which threaten the licence to operate work we are doing and are looking at ways to ensure that these are not repeated.

Don Wallace is a member of the NZFFA Executive.

What is wrong with wilding trees?

Nick Ledgard

Two years ago, the New Zealand wilding control management strategy was written. Its conclusion of 'a stitch in time saves nine' was sufficiently convincing that a business case for control was made to Treasury. This was eventually approved, with $16 million being allocated over a period of four years. The Ministry for Primary Industries is responsible for overseeing the expenditure of this sum.

It is estimated that during the first year of operation, wildings have been removed from over a million hectares, mostly in the eastern South Island hill and high country. A major follow-up control effort is planned for the 2018/19 season.

What is wrong with wilding trees?

Wildings are the natural regeneration, or seedling spread, of introduced trees. The term is usually applied to members of the family *Coniferae* – pines, firs and larches – the group in which most of the major spreading forestry species of concern occur. The majority of wildings grow close to the parent seed source and are termed fringe spread. Wildings further afield are termed distant spread and usually occur as scattered outlier trees. Often these have grown from seed originating from hilltops and exposed ridges and slopes, which are known as take-off sites.

The most frequent forestry-related question I am asked is – what is wrong with wilding pines? The people wanting an answer are aware that many forests either planted or wildings have been registered with the Emissions Trading Scheme, with carbon credits sold for handsome sums. They may have seen, and been attracted by, the Douglas-fir wildings back-dropping Queenstown, the larch framing superb views of Mt Cook on the road to the Hermitage, and those surrounding Castle Hill village and Naseby township – lodgepole pine, larch, Corsican pine and Douglas-fir.

They have also seen tourists buying place-mats and calendars of high country scenes which often feature wilding trees. Some may even be aware of the background to Glentanner's tourist accommodation success, where timber used from wilding larch grown on the station allowed building construction to be significantly cheaper than normally possible. These people conclude that if wildings can be worth money and look good, then why are we trying to remove them and prevent their spread?

The simple answer to this is that wilding control is needed due to their ability to spread vigorously into areas where they are not wanted. More about that later.

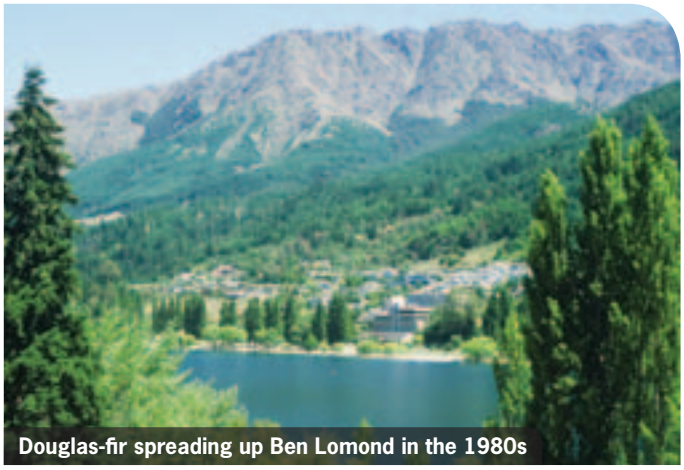
Acceptable spread-prone trees

Before we proceed further, it must be pointed that some spread-prone trees and forests are not acting as a seed source to invade significant new areas due to their location and the surrounding land-use – usually

The author's credentials

Nick Ledgard has worked with trees in New Zealand's hill and high country for almost 50 years, most of that time with Scion, the trading name for the Forest Research Institute. In 2006 he set up the NZ Wilding Conifer Management Group, and managed that until retirement in 2011. One result was a national Wilding Conifer Status Report, which in 2014 was developed into the NZ Wilding Conifer Management Strategy 2015-2030, which has resulted in major government-funded removal operations over the last year. Away from work, and together with a colleague, he manages 380 hectares of wilding forest for production and protection.


Douglas-fir spreading behind Queenstown in the 1980s


Douglas-fir spreading up Ben Lomond in the 1980s


The same place as above in 2011


After aerial spray to the natural tree line in 2012


Wilding removal on Ben Lomond


Aerial spot spraying contorta pine


Larch and Corsican pine by Lake Pukaki

improved pasture or closed canopy forest. As long as this is the case, and they are not negatively affecting important existing values such as visual landscape, existing land-use and conservation, then there is indeed no need to remove them. They can be managed for normal commercial and amenity purposes. They also have environmental benefits such as shelter, soil stablisation and wildlife habitat.

However, unfortunately, for every wilding tree or forest that can regarded positively, I believe that there are many where the positive aspects are outweighed by the negative. As with the use of trees anywhere, it is all about the wise or informed use of the right species in the right site. Only too often, wildings are the wrong species in the wrong site.

Landscape values

From a landscape point of view, my concern is probably less than that of some others as wildings can look more attractive than planted blocks of trees. They tend to grow best in certain sites and not in others and this, combined with feathered edges of often uneven-sized trees, allows them to blend better into the natural topography. However, even in these situations, the dark green, conical shape of conifers can be very obvious in landscapes dominated by pastel-coloured, low stature shrublands and tussock grasslands.

In addition, they grow faster and taller than most of our native vegetation and can very effectively block off views and create icy road conditions. Those familiar with the wilding trees alongside the Mt Cook highway in the Mackenzie Basin would be well aware of this. However, the visual landscape will always be a matter of value judgement, with beauty being in the eye of the beholder, and much variation in beholder viewpoint. Fortunately, our hill and high country is a large area, and as long as we do not let wildings get out of hand, there will always be enough variety and space to satisfy the tastes of most observers, whether they be introduced tree advocates or opponents.

Water yield

It is well accepted that forests can significantly reduce water yield or quantity although water quality is often improved. Research has shown that major reductions in water yield can only be detected when the tree cover exceeds 20 per cent of a catchment's area. Current high awareness of wilding spread is unlikely to see such cover levels reached in the future. In addition, new aerial boom-spray techniques allow ready control of closed canopy conifers.

So it is not with the visual or water yield aspects of wildings that I take issue. It is with their influence on conservation, future land use options and their perceived commercial value – along with the resources required to retain control, in the face of their ability to spread insidiously until they reach a stage where control is not possible.

Reduced conservation value

Once wildings invade an area their relatively fast growth can soon dominate the site. Most rare or threatened native plants and animals find it difficult to compete and must try to survive in a very modified habitat. Even where conservation is not threatened, future land use options are reduced, as the sheer bulk of wilding trees means considerable extra cost if they have to be removed for pasture development or plantation forestry. I have experienced the frustration and time delays involved in having to remove rogue outlier wildings to establish a more useful crop.

Commercial value – timber and fibre

As the manager of a large wilding forest, I can safely say that it is mainly a myth that most wildings can fetch good money in timber or fibre sales. Profitable sales have been made from some wilding stands, but such stands are nearly always fringe spread within a hundred metres or less of the parent trees. Within this distance seedlings establish densely and therefore grow up straight, with small branches and little taper.

Some species can be harvested at a relatively young age, around 20 to 30 years old, for posts and poles, or left for some decades longer until natural suppression favours the better trees which can yield good sawlogs. However, of the estimated 1.8 million hectares of land affected by wilding spread in New Zealand, only a small fraction contains fringe spread. Most is distant spread growing well away from the parent trees. These outlier wildings are often malformed, have large branches and pronounced taper. At best they will fetch firewood prices – to quote one commentator 'the equivalent of growing sheep for dags'.

In addition, approximately two thirds of the area affected by spread involves contorta or Lodgepole pine *Pinus contorta*. This species may be valuable in its native North American home range, but it has yet to attract a ready market in New Zealand. Therefore, when you are considering the commercial worth of wildings for timber and fibre, please be aware that in most cases they are the wrong species, on the wrong site, widely scattered, of poor form and often far from markets.

Commercial value – sale of carbon credits

This is the relatively new boy on the block, and has significantly altered the traditional view of a forest's worth and the time-frame associated with the income. Forests established after 1989 can be registered with the Emissions Trading Scheme, after which there is an allocation of carbon credits, acknowledging the


Mt Barker wilding forest


Harvesting Mt Barker wildings, earning around $2000 a hectare

amount of carbon dioxide taken out of the atmosphere and stored in the trees. Credits can then be sold on an increasingly viable national and international market.

The ETS is not quite as simple as that, but the point at issue here is that some wilding forests have qualified for ETS registration. Such registration will be much harder in the future, and it will only be granted for forests on the right site with little risk of significant further spread. Any owners of ETS wilding forests must accept liability for the further unwanted spread from those trees.

When considering the case of those advocating that wildings are the answer to meeting our carbon storage targets, a colleague commented 'That is a bit like saying that farming rabbits or possums is a solution to improving our export earnings'. Such opinions push the positives, but ignore the negatives, the most worrying of which is our ability to retain control over the long term.

Retaining control

This is my answer to the question – What is wrong with wilding trees? There is nothing wrong with wildings in situations where they can be easily contained, but we must always be in a position to retain control at an acceptable cost. Supporters of wilding spread must address the core question of 'how far?' Where do you draw the line, how will you do that, and what will be the cost?

Wildings are very capable of invading unimproved grassland areas, but do supporters want to see all areas other than improved pastures, swamps and intact native forest and shrublands, taken over by wildings right up to road margins? If you ask most will say 'No, not everywhere', but they fail to address the significant effort and cost required in keeping those no-go areas clear. In addition, they are often quite happy to accept contorta as the spreading species, when if carbon storage or commercial return is the aim, there are much better species available. Intentional forests will always have better volume growth and form. Therefore, if an area is considered best in trees, surely it is logical to establish the best species for the job, rather than to accept forests by default.

Forestry prospects

Finally, I would not want the above writings to make any reader think that I am against all use of introduced trees in our hill and high country. Far from it. Many shelter and soil stabilisation roles can only be practically filled by introduced trees. Hill and high-country farmers must diversify to remain viable custodians of their land, as it is very difficult to be green if you are in the red.

Forestry is one of the few long-term sustainable diversification options available to them, especially now that they have the carbon storage option which can bring about a commercial return over a relatively short time-frame. In addition, from an ecosystem point of view there is ample proof that trees can play an important role relative to healthy and stable soils and diverse fauna and flora populations. I fully support the wise informed use of trees in the appropriate places.

Why not rabbit farming?

Howard Moore

In his useful article Nick Ledgard thoughtfully defines wilding conifers and gives a wide-ranging review of the arguments for and against. He writes with authority, and manages a forest of these species with first-hand experience of their performance and control. Sitting in Wellington and without that background, I have a different perspective. Call me naïve, but I think rabbit farming is not all that stupid.

A year ago, I became involved in spin-off work from the review of the Emissions Trading Scheme. At that time, the Paris Agreement on climate change was only a year old. Under the Paris Agreement the New Zealand carbon budget for 2021 to 2030 is around 610 million tonnes, but we are on track to emit 840 million tonnes. The government plans to meet its obligations by buying around 230 million carbon credits. MFAT officials have been looking for countries who might sell them to us and while this is allowed under the Paris Agreement no-one has worked out the rules, and there is no talk yet about prices.

Happily, officials seem relaxed that international carbon prices will remain low until 2030, making the cost to New Zealand acceptable. *Carbon News* of 10 February this year said –

> New Zealand cannot rely on international carbon credits to meet its emissions reductions targets after 2030, officials have told the Government, warning that credits could be expensive and in short supply...

I also note that despite several independent reports arguing for another million hectares of forests to sequester carbon, the government has no plan for planting trees, nor is it asking the industry to do so. The conclusion is that it believes buying offshore credits will be more cost effective than afforestation. Consistent with this, in the ETS review it is suggesting auctioning credits to manage supply and demand and therefore control the carbon price.

Given that, the decision on whether or not to plant more trees rests solely with individuals and the industry officials hope to make the market more efficient. For example, this can be by reducing ETS compliance costs and harvest liabilities in the expectation that this will encourage more forests where they are appropriate. But it will be over to land owners to decide whether they plant, or sell their land for planting.

The market is not encouraging commercial foresters. Land suitable for production forestry is expensive. It is hard to get approvals for overseas investment, and at $18 for a New Zealand Unit, carbon prices are not sufficiently high to overcome these hurdles. In a forward scenario of managed carbon prices farmers have incentive to plant a million hectares of new forests. What has this to do with wilding conifers?

- A deficit of 230 million tonnes of carbon dioxide is huge – apart from agriculture our 100 biggest emitters produce about 14 million tonnes a year.
- If the government is right and carbon prices stay flat, the likely cost of making up the deficit will be around $4 billion, spent offshore with no local benefits, and may be higher.
- Officials believe that that money could not be better spent here.
- Right or wrong, as a taxpayer I am concerned at the risk of buying these offshore credits. I would rather we did all we could to get our emissions under control now, even at a perceived higher cost.
- Wilding conifers offer a risk management strategy. For them, we do not need foreign investment as we already own the land, do not need nurseries and do not have to plant and tend the trees.

This would mean the loss of grassland to forests, with all of the environmental implications of species displacement and water yield. However, climate change is already nasty and becoming worse. We can expect more severe floods, droughts, pests and diseases, wildfires, landslides, coastal erosion, species loss, refugees and immigration. Our landscapes, lifestyles and wellbeing are heading downhill. In that perspective, the managed loss of grassland to forests looks pretty benign.

Nick's colleague suggested that the idea of growing wildings for carbon storage was 'a bit like saying that farming rabbits is a solution to improving our export earnings.' If rabbit farming is better than your existing land use, why not? Rather than looking at wilding conifers as a problem perhaps we should be looking at them as part of the solution. Some of that $4 billion might be better spent on developing a really strong 'rabbit-proof fence' to contain them – not killing them as pests.

Howard Moore is a Wellington business analyst. He closely follows climate change in relation to forestry and is a member of the Forest Investment Action Group of the NZFFA.

Forestry and the use of firearms

Hamish Levack

Many NZFFA members own guns, some of which may have been inherited from a relative or donated by a friend who probably used them to control animal pests, to hunt game, or on occasion, to put stock out of their misery. It is possible that some of you have let your children hunt rabbits or goats on their own, sometimes take a pot shot at a flying duck without checking where the bullet would land if the bird was missed, and that you are not always careful about storing your weapons safely.

All the above, along with several other activities involving firearms that you may well be unaware of, are criminal offences. Prosecution can result in large fines or up to four months in prison. This article covers the importance of being licensed if you have a gun.

Early gun control

I bought my first rifle in 1963 as a young man residing and working in Kaingaroa Forest. All you were obliged to do in those days was to tell the local policeman that you had made the purchase. The next shopping Friday, on my way to Taupo in a bus filled with my fellow employees from the single men's camp, I asked where the police station was. 'We'll show you', was the answer, 'We have to go there as well to get our probation papers signed'. Incidentally, even though some of these men had already been convicted for violent crimes, they too had rifles and went hunting.

It was a different era. Most young fellows my age had not only been taught about rifles at school but had also learned how to strip down and reassemble guns blindfolded. Most older ones had seen active service in the forces, so I suppose it was taken for granted that we all knew how to handle firearms safely. However, I had not had anything to do with a rifle for quite a while, and the local policeman did not bother to check whether I had remembered to –

- Treat every firearm as loaded
- Always point firearms in a safe direction
- Load only when ready to fire
- Identify my target beyond all doubt
- Check my firing zone
- Store my firearms and ammunition safely
- Avoid alcohol and drugs when handling firearms.

Today, if you want to be licensed you are tested for the above as well as relevant ancillary knowledge, and if you wish to remain licensed you need to be tested again every 10 years. Because they are about 60 firearm fatalities a year in New Zealand, probably most readers will have known people who have been killed by guns.

In my case I recall one particularly upsetting suicide when a promising graduate forester killed himself at Rotoehu Forest village in 1970. About 10 years later another friend of mine was mistaken for a deer and killed by a hunter. I also had a relative who lost an eye while cleaning a handgun which happened to be loaded.

Toughening up on gun controls

In the mid-1960s the police attempted to set up a complete register of firearms but lacked the resources to complete it. In 1983 the Arms Act came into force. It resulted in a change from a system that tried to control firearms to one that tried to control users. After 1983, police had to conduct background checks before issuing a new licence. However, at that stage existing owners were automatically issued with a licence, and there was no control on buying or selling firearms.

The Act was amended in 1992 to rectify this. It also restricted ammunition sales to licensed holders of firearms, to add photographs to firearms licences, to require licence holders to store their firearms securely, and to require all licence holders to be re-vetted for new licences every 10 years. Today if you are a member a gang, have a reputation for violence, a history of depression, been irresponsible with alcohol or drugs, or even if you have mixed with people deemed to be unsuitable, you will not be given a firearms licence.

In January this year Police Commissioner Mike Bush announced his concern about the high number of illegally-held firearms in the country and in June a select committee inquiry into the use of firearms made a number of recommendations. Some were accepted but government once again rejected the proposal that serial numbers of guns should be recorded in a police register.

The appropriateness of this decision keeps on being queried, the latest doubts being expressed last July after Quinn Patterson shot two people dead, and nearly killed another. He had applied for a firearms licence but had been rejected, yet he had managed to amass a number of firearms.

Make sure you have an appropriate licence for your gun. You can obtain a copy of the Arms Code from a police station or download it online at www.police.govt.nz

Harvesting rules in the National Environmental Standards for Plantation Forestry

Elizabeth Heeg

This article provides an overview of harvesting activities in the National Environmental Standards for Plantation Forestry. It is not intended to be used as guidance or as a replacement for the regulations. A full review of the standards is required for each forestry project's compliance requirements as these will differ depending on the nature of the harvesting and location.

The National Environmental Standards for Plantation Forestry, the NES-PF, will come into effect on 1 May 2018. It provides one consistent set of regulations for plantation forestry which will apply nationally, in place of most of the existing regional and district council rules for plantation forestry activities. The regulations cover the eight main plantation forestry activities – afforestation, pruning and thinning to waste, earthworks, river crossings, forestry quarrying, harvesting, mechanical land preparation and replanting.

A main feature of the NES-PF is that it is risk-based. The higher the risk of significant adverse effects on the environment from a particular forestry activity, the more likely it is that the activity will need a resource consent, and the stricter the controls on that consent will be. The NES-PF specifies the type of consent that is needed and the controls councils can put on the consent.

Three assessment methods

Three environmental risk assessment methods are used to determine the level of risk, including the Erosion Susceptibility Calculator, the Wilding Tree Risk Calculator, and the Fish Spawning Indicator. Most plantation forestry activities in the NES-PF are permitted, providing that foresters meet the specified permitted activity conditions to prevent significant adverse effects on the environment.

If you are intending to harvest, you need to be aware of your responsibilities before conducting any harvesting operations. Harvesting is a permitted activity in a territorial authority jurisdiction if notification conditions are met. Harvesting is a permitted activity in a regional council jurisdiction in any Erosion Susceptibility Calculator green, yellow, or orange zone land but not on land classified in the red zone, where a resource consent will be required, providing that a number of permitted activity conditions are met.

For example, you must comply with what is listed in the bullet points below.

- Complete a harvest plan which identifies the environmental risks that harvesting activities could have on your particular site. You should then describe how you will carry out operations to comply with the conditions and avoid, remedy or mitigate those environmental effects. Any harvesting activities must be in accordance with that plan.
- Notify your regional council and territorial authority at least 20 working days, and no more than 60 working days, before beginning harvesting and give details of where you will be harvesting, and the date you plan to start and end the operation. You must provide them with a copy of your harvest plan if they request it. If harvesting is continuing, notice must be given annually. There are also specific notification conditions for salvage operations.
- Manage sediment from harvesting to ensure that after reasonable mixing it does not result in effects in receiving waters. Examples of these effects are a conspicuous change in colour or clarity, making it unsuitable for consumption by farm animals, or having a significant adverse effect on aquatic life.
- Minimise ground disturbance by using butt suspension where practicable and stabilising or containing disturbed soil to reduce sediment entering water bodies. Butt suspension is suspending the sawn base of the tree being harvested above the ground or surface of the waterbody while pulling it to a landing.
- Minimise disturbance of water bodies and the coastal marine area by felling away from these areas where it is safe to do so, fully suspending trees above

rivers three or more metres wide, and not operating harvesting machinery within specified setbacks except in certain circumstances.
- Manage slash and debris by placing slash on stable ground, ensuring slash piles will not collapse and that slash is not deposited into or near a waterbody and removing it if it is.

Other regulated activities

A harvesting operation may involve other plantation forestry activities regulated under the NES-PF. For example, you may need to assess whether your harvesting operation also involves earthworks and river crossings and meets the permitted activity conditions for those activities. If you are carrying out earthworks you will need your harvest plan to be a combined earthworks management and harvest plan. You will also need to assess if your harvesting operation involves ancillary activities and general provisions covered and whether you meet the conditions for being permitted. These include –

- Construction, installation, use, maintenance and removal of slash traps
- Indigenous and non-indigenous vegetation clearance
- Discharge of sediment and disturbances to wetlands and beds of water bodies
- Noise and vibration
- Dust
- Indigenous bird nesting
- Fuel storage and refuelling.

If any of the permitted activity conditions related to harvesting operations cannot be met it is likely you will need to obtain a resource consent. The NES-PF specifies the type of consent you will need and also the controls councils can put on the consent.

Guidance material

The Ministry for Primary Industries is developing a suite of guidance material for foresters which will be available before 1 May 2018 to help you understand your responsibilities. This material will include examples of good practice and harvest plan templates. You can look at our NES-PF web page at www.mpi.govt.nz for more information and for a copy of the regulations. You can also get in touch with us on 0800 88 83 33 or info@mpi.govt.nz – put NES-PF in the subject line.

Elizabeth Heeg is the manager at the Ministry for Primary Industries with responsibility for forestry regulatory policy and implementation.

Letters to the Editor

To the Editor
It was with disappointment that the article I wrote 'Towards commercialising cypress' was published in the May *Tree Grower* with three photos showing cypress canker and none showing healthy trees. The intention of this article was to be balanced and not to portray only the negative. A photo and caption was also submitted of a healthy tree. Please publish this photo with the caption provided.

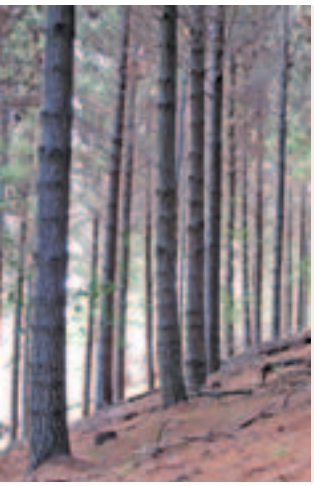
Dean Satchell

Well-formed Barr hybrid tree

To the Editor
If you need to see pictures of well-formed trees then look at my species – Lawson's cypress. This is truly the future of cypress development.

Vaughan Lawson

(Unfortunately, the photographs supplied were not of sufficient quality to print from. However another photograph of good-looking cypress was sent in and is printed below – Editor.)



Log prices – wow

Allan Laurie

It seems almost amazing that politicians should climb on a 'let's add value' band wagon when forest owners are enjoying the most sustained, stable and highest prices for logs ever recorded. Even more amazingly we have heard misinformed rhetoric about introducing guaranteed supplies to local mills and export log tariffs as well as limitations around overseas ownership of forests.

My suggestion is for some of the noisier ones to band together, buy the forest at the current premium, impose their rules and then sell their forest log by log at a discount to meet the market. What a wonderful investment that would be.

Meanwhile at the forest floor, contrary to the above, common sense is prevailing. Both export and domestic log segments are booming, and it appears the current stability and strength is destined to continue. This month we record virtually no change to export prices comparing with the start and end of the mid-July to mid-October period, perhaps a dollar or two a cubic metre at the wharf gate. During the three months prices moved within a four-dollar band affected by shipping rates and foreign exchange.

The factors affecting the market

The domestic scene has been going from strength to strength with prices improving steadily by two to four dollars across the regions over the three-month period. A summary of the factors which have affected the market over the last three months is as follows –

- Domestic consumption is strong, prices continue an upward trend and some mills are struggling for supply
- While the main centres of Auckland and Christchurch are off an apparent boil in terms of new house starts, other second tier cities are experiencing significant increases
- China softwood log consumption has exceeded expectation at close to 70,000 cubic metres a day across the eastern seaboard
- Log supplies to China from New Zealand, Australia, Pacific north west and Russia have been pretty much in step with consumption resulting in a stable inventory
- Shipping costs have been a source of wailing and gnashing of teeth for exporters with costs increasing toward the high US$20s a cubic metre
- The India log trade is still struggling with the imposition of GST and log tariffs which means log buyers have to now fund up to 23 per cent of the value of their cargo before discharge.

Domestic sales strong

As in my last report, S grade logs destined for structural end use have continued to be the strongest in terms of price trend and demand. Over the last three months, the overall upward rise in S30 grade logs, with a minimum small end diameter of 30 cm, is two to four dollars a tonne across the regions. As always, there are spot opportunities with one respondent this month quoting sales in the central North Island for S35 logs at over $150 a tonne.

Stories around log supply to domestic mills have hit the headlines with some fiery debate over log supply versus adding value versus sawmill survivability, all playing out in a misreported melee of bad information. Log supply is short for the grade of logs some mills prefer, probably as a result of a mix of lack of suitable log quality availability, or a failure to meet the market price, or perhaps even a temporary loss of the cheque book. When you hear up to 70 loads a week of S grade logs being trucked from the central North Island to Northland, it is probable that the price is not the only interplay.

Pruned logs have remained stable with the average across New Zealand being about $170 a tonne for P1 logs with a minimum small end diameter of 40 cm, mainly unchanged in six months. Again, sales at significantly above and below the $170 mark have been recorded where log quality and pruning timeliness have played a key role in clearwood recovery. This segment can certainly pay dividends for those forest owners getting it right.

Whatever the regional push and pull, there are many sawmills doing a fantastic job of sales, prices and profit

Radiata pine log sales						
Dollars per tonne	Northern North Island	Central North Island	Southern North Island	Northern South Island	Central South Island	Southern South Island
P1 (P36-P38)	172 - 192	175 - 190	170 - 180	172 - 180	167 - 175	168 - 180
S30	127 - 146	127 - 133	116 - 124	119 - 125	115 - 120	120 - 125
S20	116 - 121	111 - 116	101 - 106	109 - 113	96 - 101	-
L30/A30	101 - 110	-	-	-	95 - 105	80 - 90
Postwood	82 - 95	90 - 100	84 - 94	72 - 90	90 - 100	82 - 93
Chip	54 - 59	48 - 52	46 - 51	45 - 50	48 - 52	44 - 48
Dollars per JAS						
Pruned (P40)	166 - 171	171 - 176	160 - 165	162 - 167	156 - 161	160 - 165
Pruned (P32)	129 - 134	133 - 138	126 - 131	127 - 133	123 - 128	139 - 144
A grade	131 - 136	134 - 139	121 - 126	124 - 129	118 - 123	123 - 128
CS/KS	124 - 129	128 - 133	116 - 121	118 - 123	111 - 116	117 - 122
CI/KI	113 - 118	116 - 121	109 - 114	110 - 115	105 - 110	112 - 117
Pulp (CIS/KIS)	107 - 111	112 - 116	102 - 106	101 - 105	96 - 100	102 - 106

while continuing to provide the main components for turning a commercial plantation forest in to a new house. News of large sawmill expansions, new engineered wood manufacturing start-ups and new technology options being explored to timber treatments are all signs of an industry on a roll where higher log prices are clearly not a deterrent, rather a catalyst for sweeping change, technology advancement and new building concepts. There is nothing but good news here.

China continues to dominate the export segment

China gross domestic product grew by 6.9 per cent for the second quarter, exceeding earlier forecasts, adding some confidence to the market. After a period of gloomier outlook, the financial sector is much more positive with activity expanding on the back of the central government's spend on infrastructure.

In terms of the wood fibre sector, domestic prices for timber have made a turn-round in those regions previously showing weakening. With softwood consumption snapping along at close to 70,000 cubic metres a day, most commentary has turned towards the positive.

In terms of softwood log supply, New Zealand continues to be dominant. Of the two million cubic metres or more delivered monthly to the eastern seaboard, New Zealand and Australia supply about 1.4 million cubic metres, Pacific north west about 550,000 and Russia the balance.

October settlements for radiata pine logs landed in China have been in the order of US$137 to $139 a cubic metre. This is back up to where they were in 2014

Macrocarpa log sales	
Macrocarpa logs	South Island
Pruned minimum SED 40 cm	350 - 375
Pruned minimum SED 30 cm	170 - 190
Small branch minimum SED 30 cm	145 - 150
Small branch minimum SED 20 cm	115 - 125
Large branch/boxing/sleeper	100 - 110
Firewood logs	65 - 75

Prices are unchanged since the August report

which at that time was a market peak. Ordinarily we would be starting to look back down the tunnel about this time to see if the calamity train was coming but this time all eyes and movements are forward.

The strengthening RMB against the dollar has helped importers absorb the log price increases, also increasing margins and restoring come profitability to traders. Most commentators are suggesting there is another one or two US dollar increase in our midst for November settlements.

Even at the current elevated levels, the market appears to be comfortable. However as always, the levels of consumption are the ultimate determinant, it will not take much to tip the supply demand scales at the current levels.

India market very quiet

The effective 23 per cent increase in log prices as a result of GST and tariffs is keeping this market significantly

subdued. Buyers are struggling to get sufficient funding in place to supply the 18 per cent GST portion in particular, and orders have slowed considerably.

As the market overcomes this and the GST starts to flow back into bank balances, most commentators are suggesting a market revival of some proportion. Indeed, despite the last two months, the overall growth in volume is expected to be 20 to 30 per cent year on year.

Interestingly, I gave an address to a conference in New Delhi in mid-September to an audience made up mainly of hardwood traders. The feedback regarding New Zealand was very positive with a very clear indication that most see New Zealand as a very important supplier to India in the future.

They also recited significant concerns regarding supply of hardwood logs from traditional markets of Malaysia and Indonesia. Comments were centred on the increasingly smaller, lower quality and harder to source logs. Most agreed they did not see supplies of hardwood logs increasing in the future.

The Indian economy is displaying some weakening generally with gross domestic product starting to fall below forecasts. Most commentators are citing the monetisation policies on the back of GST being to blame and Prime Minister Modi is coming in for a bit of criticism. However, those with a longer term view appear to agree the compass pointing in the right direction and the destination will have been worth the trip. Judging by levels of enquiry that come in to my office, now almost daily from India, there is certainly no shortage of log supply wannabe's out there.

Enjoying the returns

The continuing buoyancy and apparent robustness of markets is making for some wonderful returns for forest owners and long may it continue. With labour shortages, port congestion and persistent rain, it certainly does not look like production is going to ramp up any time soon. That is exactly what we need to ensure we continue to enjoy the current returns with plenty out there to potentially tip the supply demand scales the wrong way.

It has never been more important the only way forward for climate, country and the planet is to get out there and plant more trees.

Allan Laurie is the managing director of Laurie Forestry Ltd with over 28 years of experience in marketing logs for small to medium growers.

Tree Grower 25 years ago

How often have the NZFFA complained recently about the ageing membership. In the November 1992 *Tree Grower* were a number of photographs of attendees at field days. There was definitely no majority of young members. In fact, the age range looked very similar to photographs taken at recent field days.

What topics were in the articles in November 1992? Wink Sutton was concerned, as he still is, about the world's need for wood. He explained that plantations were only a partial solution and large-scale substitution of wood not a likely option – 'The plantation solution will require and urgent and massive investment on a global scale.'

Another article asked the question – is pruning justified? This is a question we have heard many times over the years. To be honest the article was quite difficult to follow but one conclusion was that if the project does not get $111 a cubic metre for its pruned P1 logs then the pruning investment will not pay. In other words, pruning was a bit of a gamble.

Eucalypts and encouraging their use was the basis of another article by Peter Davies-Colley. He noted that the demand for '…quality eucalypt logs will be much greater than supply for the next 25 years. Processing eucalypt logs is not a difficult process, it is just a different process from radiata pine.' Peter also added that growing them is not more difficult than radiata pine, just different. The conclusion was we need more trials and more trees in the ground. This could be an article for the current *Tree Grower.*

An interesting article by Eion Garden looked at the future for forestry on farmland. He used examples of his property in the South Island and the trees he had been growing. He estimated that conservatively he could get $55,000 a hectare.

He then calculated what would be the case for trees planted in 1992 and harvested 30 years later in 2022, just five years from now, but including discounted rates and loss of opportunity costs of the money over the 30 years. He came up with costs of $22,000 a hectare. He then looked forward with a two per cent a year projected increase in timber value and a one percent inflation rate. He calculated it would mean a revenue of $137,000 a hectare which would be profit of $115,000 a hectare.

We can see why a lot of trees were planted in the early 1990s when 10 hectares could be projected to produce over $1 million nett at harvest. I doubt anyone is projecting similar figures for the next 30 years.

Where we must get to with quad bikes

Julian Bateson

In the past I have often commented on the risks associated with quad bikes although for a while I have left the subject alone. This is partly because multi-purpose utility vehicles or side-by-sides are beginning to replace them and proving to be safer. However, there are still many quad bikes in use in New Zealand, a lot still on farms and in small forests. Sadly, just in the past weeks, two more quad bike riders on farms are reported to have been killed in accidents to add to the annual toll.

I am not sure exactly how many quad bikes are being used for work and recreation because the figures supplied vary from 80,000 to 100,000. These quoted numbers seem to have been about the same for the past 10 years or more, so they are unlikely to be accurate. However, in the absence of any other figures, I will stick with these estimates.

What I do know is that a few weeks ago a coroner was quoted about being significantly concerned with the increase in deaths from quad bike accidents in 2016. At the time, no number was mentioned and my initial enquiries got me nowhere. Even Worksafe said they had no idea what the figure was, so I thought I should delve a little deeper. This was not due to my macabre personality. It was because if there was an increasing problem in spite of all the health and safety changes, we should all know what was happening and how it may be remedied.

Coroners' reports

I contacted the coroner's office at the Ministry of Justice and after a bit of email conversation discovered that in 2016 the total number of deaths attributed to quad bikes was 15. This is more than twice the annual average for the preceding 10 years. These deaths are not all from work related accidents but a mixture of work and recreational activities. Because coronial inquiries usually do not take place for many months or years, only four of the 2016 accidents have had inquiries. In one of these reports the coroner noted that 'the number of deaths due to quad bike crashes is horrendous'.

Just to confuse the issue it was reported a few weeks ago that there have been fewer deaths from quad bikes on farms so far this year. However, I have not seen any figures to corroborate this and as noted at the beginning of the article, two more recently reported deaths. Any death is one too many.

I thought it would be helpful to find out what really happens when a quad bike kills someone. All we usually tend to hear, unless we are closely associated with the accident, is that someone died and it was due to a quad bike accident. More people are wearing helmets as a requirement of the new health and safety laws, but they are obviously not preventing many of the deaths.

The very helpful Ministry of Justice agreed to an official information request and after the requisite waiting period sent me the results of all quad bike coroners' inquiries concerning fatal accidents from late 2007 to early 2016. The total number was 61. In addition were two inquires involving deaths from accidents involving multi-purpose utility vehicles.

Roll-over protection

Reading through the reports is very sobering and not something I would recommend. Each report is a life lost. However, there is a lot to learn with information about the accidents which I have not seen elsewhere, although it may exist in another form.

One of the most regular comments made by the many different coroners was about the lack of roll-over protection. This roll-over protection involves a bar or bars which prevent the upturned bike from crushing the driver after an accident. The coroners became more concerned as the years went by that nothing seemed to be being done about roll-over protection by the Ministry of Labour as it used to be, and then the Ministry for Business, Innovation and Employment. These ministries said it was not up to them to set standards. Meanwhile the quad bike manufacturers refused to help and in fact have consistently refused to

endorse or encourage any use of roll-over protection.

As I worked my way through the sad litany of death, a pattern became clear. Most of the deaths from quad bike accidents were due to the driver being crushed or asphyxiated by the overturned vehicle. Wearing a helmet will save some lives and in two of the reports the coroner noted that had a helmet been worn it was likely the injuries would not have been fatal. However, these were accidents where there were no crush injuries. Sometimes a helmet was found beside the body. This may have been due to it being not fastened correctly, not fastened at all or not even being worn.

Reason for accidents and what are the main risks

Quad bikes are 'error intolerant' which was the phrase used many times in the reports. The bike needs the full attention of the driver all the time when being driven and even then, a slight error can be fatal.

A quad bike working on a steep slope, with a tank of spray or towing a trailer are all significant risks. When you do all three, as often seems to happen, the combination is extremely dangerous and frequently lethal. Quite often the trailer is empty when the quad bike rolls and crushes the driver. Age and experience of the driver may help but quite a number of those killed were in their 60s and 70s and had been riding quad bikes for years or decades.

Not everyone who rides a quad bike will be injured or killed, we know that. However, in addition to the deaths mentioned above, ACC says that around 850 people a year are injured significantly by quad bike accidents. That means 17 serious injuries a week, every week. These are injuries which need medical treatment and are then processed in some way by ACC. Minor injuries are not included.

ACC also estimate that every day of the year, 35 workers come off a quad bike in some form of mishap but without serious injury. Note the use of the term 'workers' as they exclude recreational use in this case. This is well over 10,000 every year coming off a quad bike with minor or no injuries. These are close calls, near misses or incidents and indicates how many 'errors' with consequences are being made on quad bikes. A further study of 386 non-fatal quad bike accidents by ACC confirms they mainly involved people who were –

- Middle aged
- Owners or managers
- Experienced riders
- Often towing a trailer usually not loaded

I would imagine that most of you who read this and ride a quad bike could tick three of the above bullet points.

Research seems conclusive

This brings us to what is an obvious solution to reduce injury and death from quad bike accidents other than not using the quad bike at all. Roll-over protection has been widely researched in Australia, hardly at all in New Zealand.

A recent Australian report, published in 2016, from all the survey results in 'the largest survey carried out to date' about where roll-over protection was effective in reducing serious injuries stated 'There were no cases of serious head or chest injuries involving …operative protector devices and these operator protective devices appear to not cause serious chest and head injuries'. The term 'operator protective devices' was used to describe a number of different a roll-over protection devices on a quad bike.

The research explained in more detail what is written above. It is that, from all the survey data, there were no serious head or chest injuries in roll-over crashes if roll-over protection was used. There was only one instance of an accident caused by a roll-over bar catching in a tree branch but no serious injury resulted.

It seems quite clear to me from the research that if a roll-over device is used on a quad bike it will save the driver from serious injury or death. Unfortunately, even with the Australian research showing that a roll-over protection is a 'no brainer', no authority in New Zealand is recommending their use.

Sadly, there seems to be no pressure or discussion about this. I can only assume the quad bike manufacturers are still managing to keep a lid on the discussion. I may be wrong on this, but it has been their plan of action in the past and I have no reason to assume it has changed.

Other alternatives

There is a way to avoid quad bike accidents and that is not to ride them. For quite a while now the multi-purpose utility vehicle has been an alternative and I have mentioned them before in *Tree Grower* safety articles. One of my neighbours bought one a few years ago to use on his 1,000-hectare hill country farm to replace his quad bike. He reckons that not only are they much safer, they will do a lot more than a quad bike and go places a quad bike could not manage.

There have been reports that these multi-purpose utility vehicles have had accidents and that people driving them have been killed. This is true. I have seen two coroners' reports involving deaths in these vehicles. On both occasions the drivers were not wearing the seat belts, were not wearing helmets and had removed the side netting which replaces the doors and when in place prevents the driver or passenger falling out in the event of an accident.

Both the deaths were caused after the drivers were thrown out as the vehicles rolled, and then crushed by the overturned vehicle. The vehicles remained in one piece and if the drivers had remained belted inside they would almost certainly have survived, although they may have been injured. My recollection is that one of the drivers was returning home in the dark drunk and the other was a young recreational driver going too fast.

Now what?

Perhaps you have read this far and asked what my point is. Partly it is to let you know more about risks with quad bikes. Partly it is to let you know how you can avoid these risks. Partly it is to put out a message that something must be done now. The world is not a perfectly safe place and forestry work is inherently dangerous as is farming. Serious injuries in both professions are rising, not falling. Anything which can reduce one injury or fatality is worth knowing.

One set of risks which in my opinion is completely unnecessary is to ride a quad bike without roll-over protection. As the coroners say, quad bikes are error intolerant and whatever your age or experience, a brief lapse of concentration can be fatal. You may have been riding them for a month or 20 years but if the bike rolls, you are in trouble. This is not the case with many other vehicles where a minor lapse is less likely to have major consequences.

Especially high risks which have caused fatal accidents on quad bikes and should be strictly avoided –

- Tyres pumped above recommended pressures
- Having unequal tyre pressures
- Spray tanks with no internal baffles only partially full
- Towing a trailer empty or full
- Driving across a slope especially with a trailer or spray tanks containing spray
- Driving in the dark on unfamiliar ground
- Driving after drinking alcohol.

The rules are that you must wear a helmet when riding a quad bike. This is to be recommended as a very good idea and will save you from serious head injury, but it will not save you from being crushed. There are no rules about roll-over protection because the manufacturers of the quad bikes oppose it. Worksafe seem unable to get round this problem.

The independent Australian research clearly indicates that roll-over protection will save you from being crushed by an overturned quad bike on virtually every occasion it happens. It is important to remember that not all those crushed by a quad bike will die. The fortunate ones survive, but may be left with health problems. When I discussed this article with a work colleague he mentioned a young friend of his who had survived being trapped under a quad bike for five hours. The friend survived, but has lifelong serious injuries to live with.

Roll-over protection is vital

The quad bike manufacturers need to accept the research and the fact that roll-over protection on quad bikes is vital. For anyone involved in selling or promoting the use of quad bikes I would recommend that in future you only promote or sell a quad bike with roll-over protection.

If you own a quad bike or are buying a new one, insist on roll-over protection now. It will, according to the research, save lives and serious injuries. We must act now or the process will just continue with more deaths. More farmers and owners of small forests will be crushed by overturned vehicles and killed or seriously injured.

I leave it to you to make the decisions. But I know what I would do.

Julian Bateson is the NZFFA health and safety representative. The views expressed in this article are his and do not represent the policy of any group or organisation.

NZFFA 2018 conference in Nelson

The 2018 annual conference, field days and AGM is being hosted by the Nelson branch from 6 to 9 May. You can find out more about the conference from the article on page 21. The registration form is in this issue of the *Tree Grower* or you can get a copy from the NZFFA website. The sooner you book, the happier the organisers will be.

Keeping New Zealand Green Our forests – and their future By Elizabeth Orr

A review by Wink Sutton

In my opinion Alexander (Pat) Entrican, Director General of the NZ Forest Service from 1939 to 1961, was one of the several visionaries who have contributed to the success of the New Zealand forestry sector. Entrican's daughter, Mrs Elizabeth Orr, has just published a balanced assessment of Entrican's contribution, *Keeping New Zealand Green. Our forests – and their future*. Her assessment is based on published material as well as her access to the A R Entrican papers in the Alexander Turnbull Library, a collection which has only recently become available to the general public. Mrs Orr complimented her intensive research with interviews with former NZ Forest Service employees, most of whom were involved with Entrican.

Mrs. Orr's assessment concentrated on two aspects of Entrican's major contributions – the Tasman newsprint sawmill at Kawerau and indigenous forest management – which she suggests are the hitherto largely untold stories of the Forest Service. I would have liked to have seen greater coverage of Entrican's other major contributions, especially staff training of which I and many others were beneficiaries, and wood use – eventually achieving the acceptance of knotty pine when wood users were used to clear or near clear indigenous timber.

Farm foresters might have preferred a longer section on their contribution to forestry, but Mrs Orr has included an account of the support given to this group by both her father and his successor as Director-General, Lindsay Poole. The valuable co-operation between farm foresters and the Forest Research Institute over trials of non-radiata species such as *Acacia melanoxylon* is also described. Interesting too is Canadian Leon McIntosh Ellis's understanding in the early 1920s of the possibilities of farm forestry

On the development of the newsprint mill at the Tasman Pulp and Paper at Kawerau there are full details in the book of this long saga. What I never understand was why there were so many problems at Kawerau but there appeared to be few problems with the NZ Forest Products pulp mill at Kinleith. The reason is almost certainly explained by the decision of the 1943 Labour Government to grant exclusive rights to NZ Forest Products for the manufacture of wrapping and writing paper as well as corrugating and liner board paper.

All these paper products are manufactured from chemical pulp. The major paper product left was newsprint but this required groundwood pulp. Newsprint traditionally was made from mechanical pulp that came from spruce, a non-resinous wood. Pines had not been used for mechanical pulp as pines contain resin and the resin clogs up paper making machines.

With chemical pulping, resin does not cause such problems. The newsprint mill of the Southland Paper Mill in Lufkin, Texas had developed a process for dealing with resin from southern pines in the manufacture of newsprint. It was particularly fortunate for the Kawerau pulp and paper mill that Entrican had developed a close working relationship with the president and management staff of the Southland Pulp Mill. Without help from the North American company it is very doubtful that newsprint could have been successfully made from radiata pine at that time. Entrican deserves much credit for establishing the relationship with the Southland Paper Mill.

The stumpage issue – 3d per cubic foot or the equivalent of 88 cents a cubic metre – is addressed by Mrs Orr. Although setting the stumpage was a political decision and not one of the Forest Service, Entrican seems to have accepted overall responsibility. Using historical costs the rate was calculated by a senior Forest Service officer, A P Thomson.

However, Entrican should not shoulder all the blame for what was a political decision. Although the flat stumpage ignored tree size and tree quality the stumpage was not a total disaster. Bob Fenton in a paper to 1963 FRI Symposium showed that if a flat stumpage of 3d a cubic foot was applied in 1963 to a radiata regime that simply maximised volume production and minimised costs, including maintenance costs but excluding most other overheads, the investment earned positive LEVs of five to six per cent. As well as the absence of price premiums for log size and quality the uniform stumpage

can be also criticised because there was no adjustment for future inflation.

Entrican probably accepted the low stumpage rate because he believed the newsprint mill would be very profitable. Because the State had made a large investment in the plant the State would enjoy a high return. Because of capital overruns and poor management the mill was barely profitable. Possibly because of these low returns the government eventually sold its shareholding.

The other major theme addressed in Mrs Orr's book is the management of indigenous forest. The greatest achievement of Entrican's directorship was the comprehensive 10-year Forest Survey. Until this survey had been completed and analysed the Forest Service was unable to confidently state what area was covered by indigenous forest and the volume, by species, it contained.

Mrs Orr shows that from the beginning, the Forest Service's policy for the State's indigenous forests was their long-term perpetuation as a healthy sustainable multi-purpose forests. There was some selective logging at Whirinaki in the 1930s – before Entrican's directorship. Mrs Orr presents a history of events during Entrican's era and especially those following his retirement. The ill-fated beech scheme is also discussed. It is very doubtful that beech utilisation as proposed was ever a viable economic option but it heightened public awareness of indigenous forest management.

In the 1960s further selective harvesting trials were established in the Whirinaki forest. The objective of these trials has been grossly misrepresented. The trials and the practice of selective harvesting were portrayed as forest destruction and foresters were portrayed as forest destroyers. Such thinking was created by publicity seeking environmentalists, and spread by some politicians and by most of the media – television, as well as some newspapers, especially the weekly publication, *Truth*.

Environmentalists claim that the Whirinaki forest was 'unique' and should not be selectively harvested. Yet, after several years, they could rarely distinguish between those forest areas which had been selectively harvested and those which had not been harvested. Also, they could not distinguish between regeneration that had been planted and that which had occurred naturally. Locals took interested parties – including opponents, usually greenies – on a tour of operations. In 1979 alone there were 86 tours, many of them at weekends.

Both environmentalists and foresters want the same objective – a healthy sustainable forest. Events at Whirinaki clearly show that the opposition to selective harvesting appears to have little factual basis. It certainly was not as destructive as was claimed by opponents.

Mrs Orr presents a refreshingly new assessment of the contributions of the Forest Service, concentrating on the contributions of Alexander Entrican. Mrs Orr concludes with a plea for action now to preserve our fauna and their habitats.

The book is generally easy to read but I am sure someone who is not familiar with many of the names in the book may have problems following what actually happened. However, a list of key players in the pulp and paper story are given on page 73. The publication is a most valuable contribution to our forest history.

NZFFA caps, badges and gate signs

Promoting the NZFFA is always a good idea and many of you may have forgotten about the caps, badges and gate signs which can be purchased from the national office. As you will see the prices are very reasonable. I can confirm that the cap is good quality. If does not get blown off into a nearby deep gully it should last many years.

Individual prices are given below along with special deals if you buy more than one item at a time. These prices include all the extras such as postage, packing and GST. If you want any of these badges or a cap just give the national office a call on 04 472 0432 or try any of the other methods such as post or email.

- Cap $25
- Gate sign $7.50
- Jersey badge $7.50
- Lapel pin $7.50
- Gate sign, jersey badge, lapel pin all for $15
- Gate sign, jersey badge, lapel pin and cap, all for $35

Branch and special interest group contacts

All the branches and special interest groups now fall into the same category in the NZFFA rules. This should not make a lot of difference but it does make it easier to set up new special interest groups. All the contact names listed below for branches and groups are the relevant secretaries.

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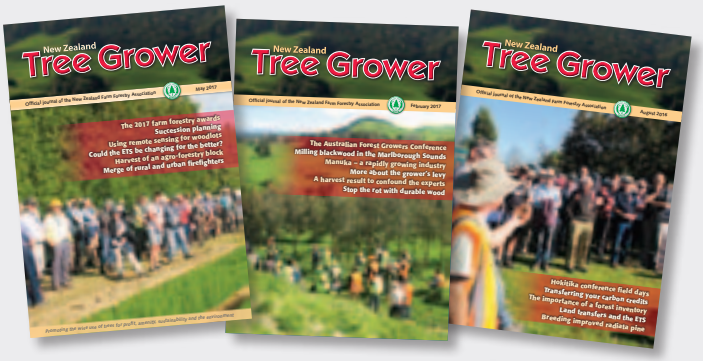
Are you a member of the NZFFA?

The New Zealand Farm Forestry Association has been around for over 50 years and has around 2000 members. There are 32 active branches and special interest groups.
If you are reading this issue of the *Tree Grower* you are probably already a member, but could well just be a casual reader or subscriber. If you are a member of the NZFAA, you could make a gift membership to a friend or relative.
The cost of joining if you have less than 10 hectares of trees is only $85 a year.

Why join the NZFFA?

Tree Grower



You will get four copies a year of the *Tree Grower* – the best source of information about growing trees in New Zealand.

Field days

Your branch will hold regular field days where you can see what other farm foresters have grown, where they may have made mistakes, and what trees grow well. This is an opportunity to mix with other like-minded tree growers.

Special interest groups

If you want to know more about cypress, eucalypts, redwood, blackwood or indigenous trees, then you can have the opportunity to join one or more of these groups. Some have their own magazines, such as *Indigena* for the indigenous group. Many are involved in field trials that you can join and help with.

Annual conference

This is held in a different region every year. The conference is mainly field days and gives attendees the chance to visit farm forestry properties, QEII Trust covenanted areas, logging sites or other places of interest. It is also an opportunity to attend the AGM, meet up with over 200 other members of the NZFFA and have a good time.

How to join

Joining is very simple. Copy the form below, complete the details and send it to NZFFA, PO Box 10 349, The Terrace, Wellington.
You will get some free back issues of *Tree Grower* and all your membership privileges.
If you have less than 10 hectares of trees the membership cost is only $85.
For 10 to 40 hectares the cost is $135 a year.
For over 40 hectares of trees the cost is $205 a year.

I would like to join the NZFFA ❑ $85 a year ❑ $135 a year ❑ $205 a year

I enclose a cheque payable to NZFFA ❑

Please debit my credit card: ❑ Visa ❑ Mastercard

Number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Expiry date: ☐☐☐☐

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