New Zealand Tree Grower

Official journal of the New Zealand Farm Forestry Association

August 2017

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Farm forest owners who recently harvested

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New Zealand
Tree Grower

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President
Neil Cullen
Phone: 03 415 8470
Email: cullen@farmside.co.nz

National Head Office
Level 9
The ForestWood Centre
93 The Terrace
Wellington 6011
Phone: 04 472 0432

PO Box 10 349
The Terrace
Wellington 6143
Email: admin@nzffa.org.nz
Website: www.nzffa.org.nz

Editor
Julian Bateson
Bateson Publishing Limited
PO Box 2002
Wellington
Phone: 04 385 9705
Mobile: 021 670 672
Email: bateson.publish@xtra.co.nz

Advertising Management
Bateson Publishing Limited
Phone: 04 385 9705

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From the President

Neil Cullen

It was a rewarding experience in June to visit the Mystery Creek Fieldays and see the work done there by Murray Downs and his team from the Waikato Branch in promoting tree planting on farms to the thousands of visitors. This was the second year that Don Carson, Communications Manager with NZ Forest Owners Association, had added his skills to the efforts to promote forestry. Don had organised a generous prize from Arbogen and PF Olsen for a competition for those who participated in an exercise in looking at the economic returns from planting a tree block. The lasting impression I got from speaking to site visitors was that there are a lot of land owners out there keen to plant trees but with little knowledge of what is involved or matters such as the ETS.

One of the great parts of the position of President is reading in the branch newsletters of all the different activities that are being organised around the country. Middle Districts Branch recently ran a Back to Basics day where those wishing to learn the basics of planting, pruning, thinning, safety, chainsaws and species selection could all have a go. This sort of activity is something other branches could consider running as we all need reminders and updates of these skills and it may attract new members who are looking for this sort of experience.

Branches are the bedrock of our organisation so it is vital that they are maintained and rejuvenated with younger members. It is apparent to all that our membership overall is aging and branches are struggling to attract new people to replace those who pass on. If this is not addressed many branches will have no one to run them and may fold.

One potential source of new recruits is the Young Farmers organisation. They have 70 clubs spread around the country and branches could look on their web site www.youngfarmers.co.nz, contact the clubs in their region and either invite their members to a field day or offer to speak to their club on all the reasons why trees should play a part in their future careers.

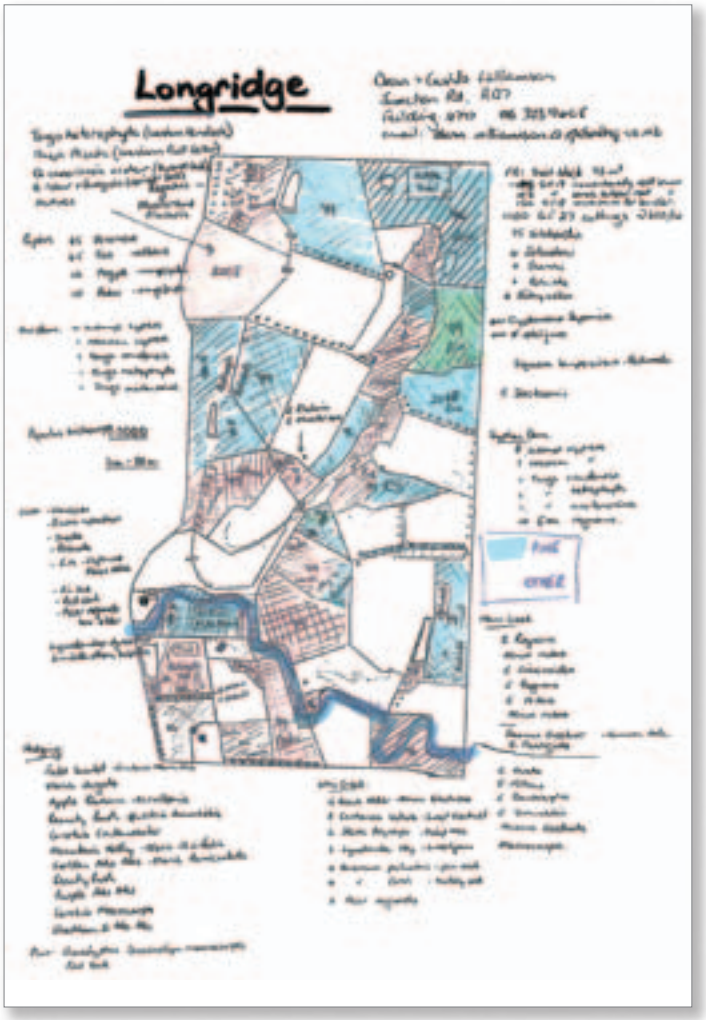
At our recent Executive meeting we were briefed by Fiona Ewing, CEO of the Forest Industry Safety Council, about the different activities that they are focusing on. Their tagline is 'Together towards zero' and that is zero fatalities and zero serious harm. An ambitious target but delivering on this or making substantial progress towards it will improve the public image of forestry and raise the profile of the industry as a career of choice. To achieve this vision FISC is concentrating on growing a safety culture, learning from incident reviews, and organising certification for both contractors and individuals. Members should use www.safetree.nz as a one-stop-shop for providing health and safety information. Among the resources available on this website are animated replays which demonstrate all the factors that lead to a serious harm incident.

With the election only weeks away it is important to consider the policies of the various parties in regard to forestry and land use. Questions that could be asked of candidates are how their party intends to meet the Paris Accord commitments, and if increasing new forest planting is one of the answers, how this is to be achieved. Also worthy of support is the Woodco proposal that the government has a wood first policy in regard to new buildings. An article in this issue by Hamish Levack has collated the different political party's responses to forestry questions to make comparisons easier.

Longridge – half in forestry

Julian Bateson

The first stop of the Feilding conference field days was Longridge, farmed by Dean and Cushla Williamson. Dean admitted that in general, the land looked after itself, probably because over half of it is in forestry. The planting started when fencing the odd corner or steep slopes planted to make farming easier. However, it has gradually increased and we could see how much – from the annotated map showing where trees have been planted on the 45 hectares since 1994. He admitted that some of the trees were planted in the right place and quite a few in the wrong place.



Tree planting at Longridge

The first stop was to look at the coastal redwood planted in 2002 as a trial block, one of the 50 or so similar trial blocks around New Zealand. Dean saw that it seemed to be a very good site for redwood so he decided to plant the whole paddock in redwoods, although some had died and had to be replaced. He likes the redwood so much he does not want them to be cut down and harvested.

There were quite a few questions, one being a bit cheeky about why we do not see much on forestry featured in the rural publications he is involved with. He said there was not enough time to give a good answer.

There was the usual discussion about the value and use of redwood timber. Gabrielle Walton explained that she was using 70-year-old redwood for joinery in a new house and that was an excellent timber. Her main problem was finding someone to do the work because joiners are not used to it. In addition, in the Bay of Plenty, a lot of redwood has been cut down for export to the United States for use in children's playgrounds. Even the very small trees are being used leaving a lot less to grow a bit bigger for future timber use.

The blackwoods

We moved on to the blackwoods where Dean admitted he have removed all the ugly ones recently so we would not see them. These trees had been planted in 2004 and the consensus was he should expect some reasonable logs. They make a good decorative timber and are more valuable than cypress.

Paul Millen has said the market for blackwood is undeveloped and as a result many growers are offered prices as low as $200 a cubic metre. Paul said he asks for at least $3,000 a cubic metre for dried and sawn timber, which is a lot better than $200, but he added that you need to work for it.

Malcolm McKenzie said he had been milling a few blackwood each year and selling rough sawn and dried timber for $3,000 to $4,000 a cubic metre. For the trees we were

looking at, he suggested thinning to final spacing within the next year as they need more room to grow.

A variety

We moved on past a small plantation of oaks, some of which had been milled at only 15 years but apparently providing quite stable timber. The growth rate was quite good, as much as 15 millimetres a year in diameter.

The next stop was to see some cypress, in the form of lusitanica. They were planted at about 1,000 a hectare in 1999 on a south facing slope and have done very well. There seemed to be no signs of canker.

We passed by some radiata pine of varying ages as well as some Corsican pine, the latter being planned for use as poles and posts. The eucalypts we came to had been planted on north facing slopes and were three different species – *E. pilularus, E. muelleriana* and *E. obliqua*. Some had avoided damage from the frosts and John Millet said that in his experience, *E. pilularus* is very fussy about the site but *E. muelleriana* is more site tolerant.

Finally, we were shown some Japanese cedar. Dean admitted they probably should have been be thinned but said they are difficult to thin as most of them are so good. A comment from the audience was that you should always get someone else to thin your trees as they will not be swayed by how good they look.

Redwoods, cypress, eucalypts and blackwoods at Longridge

Waipiko – A winning property

The second visit of the day was to Waipiko Farm, a property on which John and Diny Dermer were awarded the Husqvarna North Island Farm Forester of the Year in 2014. The property covers 186 hectares and is situated between the Oroua and Kiwitea rivers. John's grandfather bought the farm in 1909 and John has been managing the farm since 1974.

Generally, John says it is a great spot to live. There was a severe flood in 2004 which covered a lot of the farmland but with the house being on a hill, it did not get damaged. Most of his ewes had to survive for some time in the water but he did not lose any. Now there are no signs of the damage although the area of the rifle range has around 75 centimetres more soil washed down from upstream farms. The rifle range has been there for over a hundred years and the Cheltenham Rifle Club uses it regularly.

Sheep and bulls

John decided to change from running about 2,000 sheep in 1986 to mainly rearing bulls, although now has only around 75 of these as he concentrates on lamb trading which is less work, and causes less pugging of the soil. His lamb marketing organisation is moving to use the Global Animal Protection programme to satisfy Whole Foods supermarket in the US. Accreditation is tricky as they are in semi-wholefoods and buying lambs from sale yards is prohibited due to the stress they suffer. Sales have to be farm to farm.

John has been keen on his wetlands for many years and has put in a number of dams with pipes near the top so that the wetlands can remain wet. Unfortunately, the wetlands were too far to visit due to the limited time available.

First stop

The first stop was by a sheltered block, although with rivers running north south and a lot of planted shelter along these corridors, John said there is plenty of shelter on the farm. We had stopped by some eucalypts which were mainly *E. Nitens* and *E. mulleriana* although a few of these were supplied as *E. jacksonii*. However, a visitor questioned this and when samples were taken from the trees in question, they were declared to be *E. mulleriana*.

One of the questions was to ask what timber will John take out and what will be replanted. The recommendation was to take the *E. nitens* and let *E. mulleriana* grow. John said that the natives will recover well, and has no plans to replant, just let the natives grow. He would not use plantation trees again along the water margins as thinnings fall across the creeks and cause problems.

There was a question about markets for eucalypts, the usual perennial problem. Dudley Franklin said that you sell radiata when you need the money but you have to use money to prepare eucalypts for the market. Eucalypts are hard to sell when wet, but will sell when dried He said he had used *E. nitens* as untreated timber outside for 20 to 30 years and it was still in good condition. So he has recommended that people who have a reasonable quantity of *E.nitens* to use it to make decking.

In other discussions, it was noted that the redwoods we could see had not been pruned much. John said some had been pruned but regrowth from epicormics was quite significant. The comment was made that to prune redwoods it should be little and often, about a metre at a time.

John concluded by saying the farm would not stay in the Dermer family as neither of his two daughters wanted to be farmers. He had developed the farm from something that was a bit rundown, to a productive one which also had a lot of tree shelter and many wetlands. He said he was known as the farmer who liked trees – not a bad epitaph for a devoted farm forester.

Some of the shelter and woodlots around the farm

A survey of New Zealand farm forest owners who recently harvested

Kristopher Brown and Rien Visser

The majority of New Zealand's timber harvesting contractors have developed into large-scale commercial entities that meet the requirements for larger industrial forest owners. These requirements are usually based around high and continuous wood flow to minimise the number of contracts to manage and meet their existing market sales contracts. Such harvesting systems are very cost effective on larger commercial estates, but they are often problematic to manage for farm forests.

Access, the cost of moving a number of large machines and a high capital cost create production demands that may be contrary to farm forest objectives. Previous studies have shown that a percentage of smaller woodlots will be uneconomic to harvest under current market conditions and cost structures which means a negative financial return to the land owner.

The increasing number of harvesting-related articles in *Tree Grower* over the past several years indicates that it is a timely issue and a top concern among farm foresters. Many farm foresters have shared their experiences with regard to financial results, the effects of logging activities on farming operations, the post-harvest condition of the harvest area, infrastructure, paddocks and fences, and environmentally sensitive areas such as streams and native vegetation. In addition, these articles provide invaluable advice for fellow farm foresters who are preparing to harvest.

This article summarises the findings from a survey of 17 farm forest owners with recent harvesting activity. The aim was to obtain an insight into the values and objectives that such land owners have placed on their woodlots and to establish good and poor harvesting practices from the perspective of the farm forester. This should help farm foresters who are planning to harvest their woodlots. A follow-up study will focus on the requirements for successful harvesting systems for farm forestry – woodlots through to small commercial forests.

Location, scale and harvest systems used

We surveyed 17 farm forest owners from Northland down to Otago who recently harvested their woodlots. Three older harvests, one occurring in 2011 and two in 2014, were included in the study, but most of the harvests were in 2015 and 2016. Land owners had woodlots ranging in size from 2.5 to 265 hectares, with a median of 30 hectares. Six of the landowners had woodlots ranging from 100 to 265 hectares. The woodlots were predominantly radiata pine.

The actual harvested areas ranged from one to 100 hectares. On average, a 10-hectare harvest took 10.5 weeks to complete, with wet-weather harvesting taking slightly longer than dry-weather harvesting. Overall, wood harvest duration was variable depending on the efficiency of the operation, ranging from 0.12 to 2.5 hectares a week. In comparison, contractors working in larger commercial plantations will harvest an average of 2.5 hectares a week.

In the survey, 14 harvests were completed with ground-based machines, two by cable yarding, and one harvest used a combination of both. On average, logging crews were relatively small, consisting of four machines and four to five crew members. This compared with larger crews working on the company forest lands with an average of 5.6 machines and 6.7 workers.

Swing yarder being used to extract harvested trees to the landing for processing

Characteristics of the woodlot harvests

Region	Woodlot area in hectares	Harvest area in hectares	Harvest duration in weeks	Wet weather	Harvest system	Machine and crew numbers	Woodlot replanted
Canterbury	40	12.5	12	No	G	3 and 3	Yes
Gisborne	140	7.5	3	No	G	6 and 5	Yes
Otago	10	10	16	Yes	G	4 and 5	Yes
Canterbury	150	15	8	Yes	G	6 and 4	Yes
Canterbury	265	2.2	3	No	G	4 and 3	Yes
Northland	13	13	18	No	G	4 and 3	Yes
Waikato	14	7	3	Yes	G	3 and 6	No
Canterbury	8	8	12	No	G	3 and 5	Yes
Otago	16	11	6	No	G	4 and 4	Yes
Wairarapa	100	11	20	Yes	C	8 and 6	Yes
Waikato	230	1	5	No	G	4 and 4	No
Waikato	230	1	1	No	G	2 and 2	No
Bay of Plenty	250	100	50	Yes	GC	5 and 6	Yes
Bay of Plenty	5.5	2.25	-	No	G	2 and 4	Yes
Wellington	2.5	2.5	20	Yes	G	2 and 3	No
Northland	30	3	3	No	G	4 and 4	Yes
Northland	30	30	20	No	C	5 and 8	No

G = ground-based C = cable-yarded

Values and objectives for woodlots

Participants were asked to describe the degree to which certain values or objectives were relevant for their woodlots. All agreed that commercial value was important and most agreed that their woodlots provided important aesthetic values, water quality protection, shelter for livestock and erosion control. Less often, participants indicated that their woodlots provided important values related to invasive weed management, wildlife habitat, and recreation.

A few years ago, Rodenberg and Manley surveyed 728 owners of small forests throughout New Zealand who had between 20 and 200 hectares of forest. They also found that income from timber and environmental reasons were among the top ownership objectives, while recreation was least important. Overall, these findings indicate that while all woodlots have economic value to their owners, most will have two or three additional values of equal importance.

Landowner perspectives on harvesting practices

We asked participants about their harvest experience with regard to financial, safety, environmental, and cultural results, as well as how logging activity affected normal farming operations. For poor practices, participants were asked to explain what went wrong.

Financial

While most agreed that they received sound financial advice before harvesting, just 59 per cent were satisfied with value recovery from their woodlots and 64 per

Values and objectives that landowners have for their woodlots

Importance ranking	Your woodlot provides important	Strongly agree	Agree	Not applicable	Disagree	Strongly disagree
1	Commercial value	75%	25%	0%	0%	0%
2	Aesthetic values	44%	44%	12%	0%	0%
3	Water quality protection	44%	37%	19%	0%	0%
4	Shelter for livestock	25%	56%	13%	6%	0%
5	Erosion control functions	50%	25%	19%	6%	0%
6	Wildlife habitat	13%	56%	25%	6%	0%
7	Invasive weed management	37%	25%	25%	13%	0%
8	Recreational opportunities	13%	44%	31%	12%	0%

cent were satisfied with the overall financial result from harvesting. Factors which led to dissatisfaction with value recovery included confusion about the tonnage delivered to the buyer, merchantable logs left on the hill, stem breakage during harvesting and the amount of logging residues left behind. One land owner noted that logs that could have gone to export were sent to chip at a much lower value.

In one case, poor harvest planning meant that the yarder struggled to bring large trees to the landing. As a result, stems had to be cut on the hill to help extraction and the land owner believed that this reduced value recovery. In another case, at least a quarter of the value due under contract to the forest owner was not accounted for, or paid for. In addition, wet and wintry logging conditions meant merchantable logs being left on the hill for two harvest sites.

Participants who were not satisfied with the overall financial results gave reasons including –

- Unforeseen deductions such as port scaling fees
- Lack of transparency regarding harvest recovery, costs and returns
- Perceived low nett returns
- Long transport distance to the market
- High costs associated with harvesting, log transport, and logging equipment transport.

One land owner felt that his overall financial return was compromised partly because the harvest manager seemed to be looking after the logging contractor's interests.

Safety

A total of 64 per cent of participants agreed that they received sound safety advice before harvesting. Forest owners harvesting in 2011 and 2014 suggested that if they were harvesting today, safety would have featured more heavily in pre-harvest discussions.

Overall, 70 per cent of land owners felt that the logging crew worked safely. Two participants felt they were not in a position to assess the operation's safety as they were not usually on site. For the three who disagreed, safety concerns included the harvesting crew's long working hours while under duress from the crew foreman, and motor-manual processing too close to heavy machinery on the skid site. Another forest owner was concerned about a forestry worker who was standing on a stack of logs while using a chainsaw to process them.

Disruption of farming operations

A total of 65 per cent of participants agreed that normal farming operations were not disrupted as a result of harvesting, although one stated that this was due to planning and proactive management. Examples of farming disruption included sharing access roads and tracks with logging trucks and machinery, taking down fences and adjusting grazing schedules to reduce harvesting effects on livestock.

In one case, harvesting was noisy enough to disrupt cows and their regular milking schedule, so stock had to be moved away from the harvest area. One owner

Landowner perspectives related to financial, safety and environmental results	Strongly agree	Agree	Not applicable	Disagree	Strongly disagree
Financial					
I received sound financial advice before harvesting	41%	41%	12%	6%	0%
I am satisfied with the way the value was recovered from my woodlot	53%	6%	0%	41%	0%
Overall, I am satisfied with the financial result	35%	29%	0%	35%	0%
Safety					
I received sound safety advice before harvesting	29%	35%	12%	18%	6%
Overall, the logging crew worked safely	23%	47%	12%	12%	6%
Interaction with farming					
The harvest operation did not disturb normal farming operations	6%	59%	18%	18%	0%
Harvest operations did not damage fences or other farm property	6%	35%	12%	47%	0%
Environmental					
I received sound environmental advice before harvesting	12%	41%	29%	18%	0%
Overall, environmental values were protected during harvesting	6%	70%	12%	12%	0%
Specifically, the level of soil disturbance was acceptable	12%	70%	0%	18%	0%
I am satisfied with the distribution of logging residue	12%	59%	0%	18%	12%
I am satisfied with the post-harvest condition of access roads and associated stream crossings	12%	59%	12%	12%	6%
Fuel, oil, trash and slash were cleaned up	12%	70%	0%	18%	0%

indicated that the destruction of fences and delays in harvest completion disrupted grazing and delayed restoration of fencing and pasture. Survey results indicated that, in most cases, any fences left in the way of forest harvesting would be damaged.

Environmental

Just over half, 53 per cent, of participants agreed that they received sound environmental advice before harvesting. Five landowners answered that this was not applicable because of a perceived low risk to water quality – low rainfall, rocky soils or a harvest area well-removed from water.

However, 76 per cent of participants felt that environmental values were protected during the harvest. Two of these participants expressed concern about the potential water quality effects of temporary log crossings in wet gullies and bladed skid trails on hillslopes. Two were not satisfied, with one concerned about damage to native forests.

For soil disturbance from harvesting operations, 82 per cent found the level of disturbance was acceptable. However, one of these participants expressed some concern about ruts. Three found that the level of soil disturbance during harvesting was unacceptable, noting severe rutting of log truck roads and skid trails. Another noted that the use of an excavator's dozer blade as an anchor on steep banks resulted in excessive soil disturbance. In all three cases of dissatisfaction, the harvests were conducted during the winter months under wet conditions.

While 70 per cent of participants were satisfied with the post-harvest condition of roads and associated stream crossings, 18 per cent were not. Problems included a washed-out access track due to a culvert being blocked with woody debris, and rutting of logging roads due to wet weather logging. Where problems occurred, they were associated with harvesting during the autumn and winter months. Two harvests were stopped prematurely, with wintry conditions a contributing factor.

Logging residue and site clean-up

While 11 participants were satisfied with the post-harvest distribution of logging residue, six were not. One wanted harvesting residues to be distributed across the cutover for nutrient retention. Others lamented about the volume of off-cuts on the skids that would go to waste. Another was frustrated with the number of unprocessed logs and overall quantity of waste from 'lazy log making'.

A total of 82 per cent of participants were satisfied with the clean-up of fuel, oil, rubbish, and slash while 18 per cent of participants were not happy about cans, wire rope and other rubbish left behind after the harvest.

Logging residue, mainly slash and offcuts, left over at the landing

None of the participants surveyed indicated that they had any sites of cultural or historical significance in their harvest areas. All answered 'Not applicable' to this question.

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Open discussion with farm forest owners

Participants were asked, 'If you could change anything related to the harvest operation, what would it be?' The top response was that they would not change anything, indicating that about a third of those surveyed were very satisfied with their harvest experience.

Four participants indicated that they would shop around more thoroughly for logging contractors or timber marketing professionals the next time. Six indicated that they would improve their pre-harvest planning with regard to log price quotes, harvest feasibility, planning for directional felling and interruptions to farming activities. One said, 'Make sure you have a contract which is relevant to the arrangements with your contractors and use the process of negotiating the contract to clarify expectations and obligations of all parties'.

One participant wanted to be involved more directly during the harvest to solve major problems as they arose. Another indicated that they would monitor the performance of the harvest manager and logging crew more closely next time. In terms of post-harvest lessons learned, responses included insisting on good site clean-up, maintaining access for site management and weed control, and using waste wood and slash.

Advice to those planning harvesting

We also asked participants, 'What main piece of advice would you give to a fellow farm forest owner preparing to harvest?' Top responses were to choose your logging contractor carefully, plan ahead five participants, and understand all of the costs involved with harvesting your woodlot.

Others provided the following advice –

- Use the NZFFA network for advice about harvesting
- Talk to an integrated forest management company
- Get a log price quote
- Outline harvesting requirements in a contract
- Consolidate your harvest with a neighbour when possible
- Be prepared for increased traffic on the farm
- Get roads and skid sites in well before the harvest
- Make loggers care about protecting the farm during harvesting
- Be more involved with the logging operation
- Monitor the performance of the harvest manager and logging crew'
- Have some way of tracking payments owed to you as logging moves forward.

Planting again

Finally, we asked participants, 'Based on your experience to date, would you encourage other farmers to plant woodlots?' A total of 80 per cent of the landowners surveyed indicated that they would encourage farmers to plant woodlots. In fact, 12 of the 17 harvest areas from this survey were replanted in forestry. In addition, several participants cited the benefits of woodlots for livestock shelter, erosion control, improved grass growth, offsetting livestock greenhouse gas emissions, aesthetic values, wildlife habitat and land use diversification.

Again, this demonstrates that many farm forest owners expect their woodlots to provide other functions in addition to commercial value. For example, while one said that he simply likes trees and building with wood, another emphasised the importance of planting trees only in locations suitable for harvest operations.

Conversely, 20 per cent of the land owners surveyed said they would not encourage farmers to plant woodlots. Participants justified their responses with the following reasons –

- Low economic return
- A perceived devaluing of farmland by planting trees
- A poor experience with the logging contractor
- Long cartage distance and therefore transport cost
- Carbon credit bureaucracy
- An undue regional council or district council influence on land use decisions and forest harvesting on the farm.

Conclusions

Commercial value was the most highly ranked woodlot objective. However, values associated with aesthetics, water quality protection, erosion control and livestock shelter were recognised by 75 per cent or more participants. There were many factors involved with whether or not a land owner had a positive harvesting experience financially, and about two-thirds were satisfied.

A good understanding about the economic feasibility of harvesting – all costs associated with harvesting, infrastructure and log transport – and the likelihood that a positive result can be achieved is necessary during the planning stage. Many participants emphasised the importance of pre-harvest planning, with some advocating for a harvesting feasibility assessment at the time of tree planting.

Dissatisfaction with the overall financial result was mostly linked with perceived poor wood value recovery. In addition, operating in wet weather was a factor behind a number of complaints, so it appears prudent to avoid harvesting in such conditions when possible.

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Kristopher Brown is a Post-doctoral Fellow at the School of Forestry, University of Canterbury (kristopher.brown@canterbury.ac.nz). Rien Visser is Associate Professor and Director of Studies (Forest Engineering).

Questions for politicians during the lead up to the 2017 General Election

Hamish Levack

The aim of this article is not to recommend which party to vote for, but to arm readers with ideas to underpin questions relating to forestry that they may like to ask politicians during the campaign leading up to the General Election. To help with this, the National, Labour, Green, NZ First, Maori, Opportunity and ACT political parties were asked if they had any relevant policies which they had developed that might result in government changes to forestry-related legislation.

Cross-party forest policy

For some time, the New Zealand Institute of Forestry has been struggling to lead the development of a national forest policy, but further work is required before it will be publicly available in its final form. At the time writing the Institute of Forestry was asking the NZFFA and other forestry sector agencies for comment.

Sector-wide acceptance is required. If achieved, the policy would be useful in helping to influence district and regional planning. Current government endorsement of the policy, much less cross political party endorsement, is less likely because at least nine past attempts have all failed, mainly because governments like to maintain expenditure flexibility

Woodco's Strategic Sector Action Plan 2013 is perhaps better at summarising many of the immediate or short-term government actions that are needed. Some political parties say they would commit to some of these.

The sector's wish list

As an indication of what the forestry sector would like from the government, political party forest representatives were sent a copy of Woodco's Sector Strategic Action Plan 2013, *Prosperity from Forestry and Wood Products,* which said that in order to implement the strategy, the sector would need the government to act in the following policy areas.

Economic

- Develop a clear, coherent policy framework for sustainable long term economic growth, and therefore investment in forestry and wood processing
- Set up a government ministry or department responsible for forestry and independent of other primary industries
- Introduce more flexible arrangements to allow local authorities to fund rural roads over a longer period of time
- Review and rationalise the building codes and standards and implement a system that ensures they remain current and easy to use
- Redirect the building levy towards updating and simplifying building standards as part of a partnership approach with industry, and implement processes for regular updates
- Promote awareness of engineered timber products and increase the supply of skills in timber design in line with NZ Wood
- Introduce a green procurement policy requiring that wood is considered as an option for new government buildings
- Support forest training and education providers including partial qualification training.

Income tax

- Enable woodlot owners to aggregate their woodlots without penalty, for economies of scale in harvesting and wood supply
- Introduce accelerated capital depreciation rates and encourage re-capitalisation of processing plant and adoption of automation and precision technologies.

Climate change

- Recognise the carbon credit value of wood and

paper products in line with UNFCCC carbon storage agreements
- Improve public procurement policies for sustainably sourced and recycled domestic wood and paper products, to recognise those whole of life environmental benefits.

Research and development

- Align government's research and development policy for wood processing with Callaghan Innovation's focus on increasing high-value manufacturing productivity
- Provide high funding ratios in forest and wood processing sector research and development in expectation of expanding the public good benefits provided by the sector
- Support research and development assessment of renewable biomaterials and bio-energy to improve New Zealand's export earnings, economic resilience, energy security and environmental credentials
- Provide entry financial assistance for the design phase of building high value timber commercial buildings.

Environmental

- Build on the broad support already achieved to implement a National Environmental Standard for plantation forestry for those issues that are not addressed by current RMA reforms.

Updating Woodco's strategy

Woodco is reviewing its strategy but this is unlikely to be completed before 2018.

However, when the NZFFA and the Forest Owners Association met Louise Upston, the Associate Minister for Primary Industries, in June this year she was told that current priorities for the assistance wanted from government were –

- Help in extending the deadline to have the wood export fumigant methyl bromide replaced with alternatives
- Help with general publicity about the net benefits of plantation forestry by maintaining and enhancing the licence to operate
- Recognition of the above by getting the Statistics Department to set up satellite account of national forest assets including those that provide ecosystem services
- Help with forest-related trades training.

Political party responses

Representatives from The Opportunities Party, the Green Party and the Maori Party provided their policies. The Labour Party and NZ First also responded by the deadline with probable policies which were those that were yet to be authorised by their respective caucuses. The National Party chose not to provide any information.

A partial response, or lack of a response, is understandable because they may not wish to reveal their hands prematurely for fear of their competitors stealing new ideas. However, it is reasonable to assume that forest policy positions announced before the 2014 elections have not changed, and that party caucuses would subsequently agree to the views, provided indicatively by their current party representatives. Bouquets go to Geoff Simmons of the The Opportunities Party, and Stuart Nash of the Labour Party, who sought the views of the NZFFA on their draft forestry related policies.

The ACT Party

The ACT Party has no intention of giving forestry any special encouragement. It wants to scrap the Emissions Trading Scheme.

The Opportunities Party

The Opportunities Party, known as TOP, advocates radical tax reform that would have a major effect on forestry. Currently farming takes place in the pursuit of untaxed capital gain which pushes up land prices and depresses the return on investment on land – for sheep and beef it is around two per cent. This makes large tracts of New Zealand's land too expensive for forestry which requires more realistic land prices to get a commercial return on investment from growing trees.

This pursuit of capital gain has been a major contributor to the nett loss of stocked forest area in recent years. TOP aims to put all investments on a level playing field from a tax perspective. The equity in land and buildings, but not trees, would be taxed at a minimum rate of return. This would be introduced slowly to hold land prices stable while incomes grow, eventually restoring the affordability and from a forestry perspective, economic viability, of land prices.

The intention is to put forestry on a level with other farm types. In addition, by removing housing as the primary investment for New Zealanders, people would have to find other ways to make money, which would mean more capital for investing in businesses, including wood processing.

TOP is opposed to the grand-parenting of nitrogen leaching rights which has already been adopted in many parts of the country because this hands the rights to pollute to the largest existing polluters. It rewards them and penalises forest owners for having invested in a relatively environmentally benign activity. The intention is to incentivise forestry by charging land owners

leaching over a certain level, and give that revenue to land owners in the catchment that are leaching below that level.

TOP also wants to see the 1.1 million hectares of erosion-prone marginal farm land afforested, and would fund this by placing a charge on commercial users of fresh water and an appropriate increase in the carbon price. Biodiversity offsets would be used to allow developers to invest in environmental improvements elsewhere, which would provide a source of revenue for habitat restoration and protection. TOP would close our carbon market to foreign credits, cap the issuing of new credits at our 2030 target, allowing the carbon price to rise, incentivising more afforestation.

The Maori Party

The Maori Party, in general, supports Woodco's strategic plan and in particular backed –

- The Vivid Economics report, commissioned by GLOBE-NZ to develop scenarios to help illuminate long-term low-emission pathways which recommends the encouragement of large-scale afforestation
- Tax reform to allow owners to aggregate their woodlots without penalty for scale economies
- Accelerated capital depreciation rates
- The recapitalisation of processing plant and the adoption of automation and precision technologies
- More investment in forestry research and development.

The Maori Party emphasised that it did not support the use of genetically modified root-stock.

The Green Party

The Green Party says that its aim is to promote a viable, stable and sustainable commercial forest industry of both native and exotic timber species. It recognises the high value of the eco-services provided by forestry and therefore aims to protect and expand the national forest estate. It also has an international perspective, and says that it wants to contribute to the sustainable management of the world's forests by ensuring that all wood products used or sold in New Zealand are sourced from legal, sustainably-certified, forests. It is unclear how the Green Party would get round the high cost per hectare problem that small-scale forest owners will have to face if they had to be certified as sustainable.

While not directly advocating for a stand-alone government forestry agency, the party wants to retain and expand government ownership of state forests, even to the extent of buying back some forests that were previously owned by the government. It wants more government funding to be allocated to the QE II Trust and Nga Whenua Rahui, and to help private owners and relevant government agencies control pests better.

Forestry research and development is supported, particularly for bioenergy projects, the use of more wood in buildings, and increasing genetic improvement and diversity. The Green Party is opposed to any genetic engineering. It says it wants to promote farm forestry, particularly on erosion-prone land, and wants to encourage collaborative marketing. It supports new investment in large-scale manufacturing and a reduction of log exports.

NZ First

NZ First in general supports Woodco's Sector Strategic Action Plan and in particular 'advocates the restoration of the New Zealand Forest Service, in order to administer all native and exotic forests on Crown lands, including those within the present Conservation Estate currently administered by the Department of Conservation, and re-establish the Crown's ability to create state forests on Crown land and on private land with the co-operation of landowners'. NZ First also supports an initiative which provides for the preferential use of wood in structures and would favour it being applied to all aspects of government procurement.

The Labour party

Stuart Nash, the Labour party forestry spokesman, provided a discussion paper for feedback. In this he says '…governments should only intervene through the imposition of legislation and or regulation when there is clear market failure, …. which is the case in the forest sector … and intervention is needed to change the dynamics of the industry to benefit the economy, the environment and our future.' He also says 'a forest department should be separated out from MPI, and among other things be responsible for the development and implementation of a national i.e. conservation as well as commercial Forest Strategy'.

Most NZFFA members would agree with these sentiments. However, there is likely to be mixed support for his three other key proposals which are –

- Include forestry cutting rights for stands of forest over 500 hectares in the Overseas Investment Act
- Implement an export levy of between one and five dollars a cubic metre on all wood exported without value added – in other words on logs
- Require all log exporters and traders to be licensed to export.

In this regard, Stuart aligns himself with the NZ First forest policy, because in 2016 Winston Peters also said he advocates greatly reducing log exports by 'adopting a quota, licensing etc' to 'stop the exploitation of our forestry resource' and 'ensure the vast majority of our raw forest products are processed here in New Zealand'.

This sort of intervention could well backfire. Private owners may be disinclined to replant, and invest in

afforestation, if they were suddenly constrained by government from not getting as much of a return on investment as they would under the current free market for export logs.

It may also be counter-productive to make it difficult to attract foreign investment in forestry. Among other things this would discourage forest aggregation and scale economies. Most of New Zealand forest assets are already foreign-owned because, in general, there was and still is, insufficient capital in New Zealand to buy them. Some profit may go overseas eventually, but usually more than 100 per cent of the investment expenditure in these forests ends up in New Zealand pockets, via wages, land purchases and taxes. Liquidity is needed if we want more investment in forestry and afforestation, and obstructing overseas buyers would not help.

Stuart Nash says that his proposed export levy on all logs would be channelled into forest research and presumably other 'forestry good' projects. This concept is already in place via the Forest Growers Levy Trust, but only at 27 cents a cubic metre.

The National Party

It was disappointing that the National Party did not respond. From Minister Upston's recent publicity releases, all that appears to be on offer is a continuation of government contributions to contestable forest research via the Sustainable Farming Fund and the Primary Growth Partnership funds, and very modestly encouraged afforestation using other contestable funds such as the Afforestation Grant Scheme.

Although the National Party has indicated that it supports the recommendations of the Vivid Economics Report mentioned above that a million or so more hectares of hill country should be planted in trees, it is not treating the matter with any urgency. Even if a National-led government is re-elected in September, no decisions to encourage more afforestation can be expected until after June 2018. This is when the Productivity Commission has to report into 'the opportunities and challenges of a transition to a lower net emissions economy for New Zealand'.

Conclusion

Forestry-related promises by the political parties are still being revealed, and will be available on respective party web-sites. Nevertheless, this article indicates probable party support for issues that concern forest owners. Keep in mind of course that, under MMP, no party will 'die in the ditch' to keep a pre-election forest policy promise.

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The levy funded Fire Committee

Geoff Cameron

The NZFFA has been represented on this committee for a number of years, giving small growers a say on a small but important component of forest and land management at the national level. Since the forest grower's levy was introduced, this committee is one of the many now funded by the levy.

It is chaired by a member of the Forest Owners Association Executive, currently Grant Dodson. The members are all practising fire managers, either as Principal Rural Fire Officers or senior forest managers with responsibility for rural fire management. I have represented the NZFFA on the committee since 2012 and Don Wallace is the NZFFA Executive representative. The committee meets four times a year.

The Fire Committee's purpose is to advise the NZ Forest Owners Association and the NZFFA executive on rural fire issues which affect forest owners. The chair is a member of the Rural Fire Committee of the Commission. The main tasks are –

- Advocacy
- Consultation to reach a common position where required
- Setting strategic direction and priorities for fire research
- Advice on training
- Providing regional representation on fire matters
- Providing leadership on rural fire management issues where appropriate.

Activities over the past four years

Contribution to the Fire Service Review

The Fire Committee saw the review of the current legislation as a once in 40-year opportunity to get modern legislation that would meet the needs and activities of all fire fighters and managers. Although the implementation of the Enlarged Rural Fire District strategy had streamlined the governance and increased professionalism in the management of rural fire in New Zealand, there were still improvements to be made. Forestry interests were represented on all 12 boards that had been formed.

The Fire Committee met the review team and made representations on funding and governance, as well as reinforcing the point that rural fire management is really part of land management and the same as any other forest protection process. It is not just a response activity. Funding was always seen to be tricky, as was our requirement to strengthen stakeholder effectiveness. We looked for equity of treatment for rural volunteers.

The Fire Emergency New Zealand (FENZ) Act was given the Royal Assent on 11 May, and was implemented on 1 July this year. Significant features as they affect our sector –

- Included is the statement that FENZ must promote the use of fire as a land management tool, and provide fire prevention, response and suppression services
- The detail of the fire prevention services that must be provided have not been discussed with the sector
- The rural division of FENZ will have a National Rural Fire Manager with five regional managers
- About 120 people currently working in rural fire management changed to FENZ on 1 July
- The funding for this will come from an increase in insurance levies.
- FENZ will pay for fire suppression work and for agreed training.

FENZ and the Fire Committee are working on a high-level charter and statement of intent, as well as regional and local agreements to ensure the current levels of cooperation are not lost. There has been no word on the nature and size of the advisory committees, meaning that our sector has lost important governance roles in this sector.

A benefit to members of the NZFFA is that you will no longer have to insure for fire suppression costs. However, you will continue to bear the commercial risk associated with the tree crop itself and insure as outlined in the article on page 24 of the May *Tree Grower*.

Rural fire research.

Fire research is now partly funded from the forest growers' levy. The Fire Committee has helped the fire research team at Scion by discussing research priorities as we see them, so that the research team can report good interaction. This is crucial in their bids for other government funding. The Fire Committee also receives

and discusses fire research reports from the research team at each meeting.

The main areas of research which may be of interest to NZFFA members –

- Scion researchers have given considerable input into the fire weather system, and made this a world-leading system. It has enabled many of the research advances listed below.
- In particular, a major recent contribution of research transfer has been to better define activity restriction trigger points – weather conditions at which forest operations are limited, stopped or mitigated. This work contributed to trigger points for the Marlborough and Kaikoura area, and is now being extended to give national coverage from selected weather stations.
- Using fire modelling techniques to predict the likely path of wildfires for current fire management purposes, and to show what has been saved by fire suppression actions. This fits with research into fire behaviour in New Zealand conditions and especially research into the fire conditions likely to be experienced in wilding fires.
- A project to review the use of fire as a land management tool.
- Research into the social dimension of wild fires, particularly on the resilience of rural communities which are affected.
- Fire fighter fitness and training is an important area of research, given the emphasis on health and safety in rural areas in general and forestry in particular.
- Work on defining wildfire-prone areas so that greater reduction and readiness programmes can be established.
- The safety and fire management benefits of using unmanned aerial vehicles or drones.

National fire prevention campaign

Some members will know the character Bernie who is central to this campaign. The campaign has been jointly funded between the National Rural Fire Authority, the department of Conservation and the New Zealand Forest Owners Association, with the latter acting as banker for the group.

The campaign has been reviewed, along with the messages from the fire danger signs. The campaign now uses people from the commercial and the farm forestry sector to talk about how rural fires have affected them, their business and their lives – in other words, making fire prevention a personalised issue and relevant to our sector. Over past year we saw the use of Ket Bradshaw who suffered significant losses during the first Marlborough fire. You may see her story, and those of others, in Air NZ's *Kia Ora* magazine as well as on truck backs and side curtains.

Health and safety

Like most sectors, the rural fire sector is very interested in the new health and safety legislation. Most wildfire incidents have a mix of paid, contractor and volunteer fire fighters, and so the implications of such a mix for forest owners, particularly if a fire crosses into a neighbouring forest, are being carefully worked through. The Person Conducting a Business or Undertaking, known as a PCBU, should be identified as part of any new operation starting.

New and refined policies have been implemented by Rural Fire Officers and will continue under FENZ. Hazards will be identified, near misses reported and cowboy activities will be stopped. Firefighters will not be put into dangerous or unknown situations. For example, the use of quad bikes and chainsaws by untrained firefighters will no longer be allowed. Members may have noted that the courts have recently been severe on a farmer whose farm worker lost his life in a controlled burn.

Review of operational guidelines

Forest owners have been abiding by a 2001 publication called *Operational Guidelines for Fire Management*. This was not widely known or used and had become out of date. After the Marlborough fires a couple of years ago, the insurance industry reviewers noted the wide discrepancy of standards and suggested that either the forest sector get its standards sorted or they would impose their own.

The Fire Committee chose the former and those documents are currently being reviewed. The NZFFA has a voice on the management committee for this contract to ensure the resulting reviewed standards, in the form of best practice guidelines, are suitable for a range of forest owners. The new document is waiting for the research results on trigger points before final publication.

NZFFA conference and AGM 6 to 9 May 2018

The 2018 NZFFA conference is being held from 6 to 9 May in Nelson.
The November issue of *Tree Grower* will have the registration form and more details about this event.
Now is the time to pencil the dates in your diary and be ready to book your space.

The new organisation Fire and Emergency New Zealand

Kevin O'Connor

On 1 July 2017, all urban and rural fire services were amalgamated into one new organisation, Fire and Emergency New Zealand. While this is a significant change for the fire sector, there will not be much change for small-scale forest owners and growers. You can expect Fire and Emergency New Zealand to be there when you need them, just as the Rural Fire Authority and New Zealand Fire Service were previously. The creation of a single fire and emergency service should mean better coordination between rural and urban services, improved support of the thousands of volunteer firefighters our fire services rely on, and increased money for equipment and training in rural fire services.

New Zealand previously had many separate rural fire authorities, run independently of the urban-focused New Zealand Fire Service. In short, for many years, fire services have been provided by 40 organisations with different structures, ways of working and means of funding. The Fire and Emergency Act was passed by Parliament in early May. It replaced the legislation governing fire services – the Fire Service Act 1975 and the Forest and Rural Fires Act 1977. The new legislation recognises significant changes in New Zealand's demographics and the role of firefighters over the past 40 years.

Volunteers still needed

Volunteers make up around 85 per cent of fire services personnel, relying on them particularly in rural communities. With greater numbers of New Zealanders living in towns and cities, volunteers for rural firefighting are becoming harder to attract and keep. The same applies on the outskirts of cities as people travel into the centre of the cities to work. Volunteer brigades and voluntary rural fire forces have previously run independently, but now all volunteers will become Fire and Emergency New Zealand personnel.

This does not mean volunteers become employees, but it will make it easier to support volunteers, hear their feedback and act on their suggestions and concerns. We have brought together a wide range of volunteer and career personnel from urban and rural sectors to help make things and different in the future. These

working groups will continue to contribute to the new organisation's approach to supporting and strengthening the volunteer workforce. Funding has been set aside for the next three years for this work.

Fire and other emergencies

As we know from recent floods, we are seeing more emergencies caused by extreme weather. Firefighters used to just focus on fire but in recent years they have done a lot more, including responses to motor vehicle crashes, medical emergencies, hazardous materials spills, storms, floods, earthquakes and a wide range of other rescues.

In some locations, half of the work is fire response and the other half emergency response. While many rural firefighters are already responding to this range of incidents, they did not have the legal mandate for this work. They were given that mandate under the new Act.

The government has approved extra funding of $303 million over four years for Fire and Emergency New Zealand, including a large component to cover under-investment in rural fire services. Funding for rural fire services has previously been variable across the country and often from local council rates. This has now changed, with the fire levy the principal source of funding. It will have a noticeable benefit for rural communities as equipment, gear and training are reviewed and upgraded, particularly in areas at higher risk of fires.

Minimal change

The principle behind the transition to Fire and Emergency New Zealand is for minimal change from day one. We already have fire services which are successful, respected and in many communities, well-loved. We have taken the best of rural and urban, and focused on what will make them even better.

These are the biggest changes in a generation and we are taking the time to get this right. Three years have been allowed for the integration of urban and rural systems with complete unification over the following years.

It did not make a lot of sense to have 40 separate organisations providing fire services in a country with a population the size of a small city in other parts of the world. But not everything can be run from Wellington. Fire services are part of the community and every community has different conditions and circumstances which need to be taken into account. Feedback has been consistently clear – rural communities do not want to be dictated to by a head office in Wellington.

The creation of one fire service means Rural Fire Authorities and Enlarged Rural Fire Districts no longer exist. A new type of committee will be introduced to ensure the voice of the community and stakeholders, such as forestry, are heard and understood. These Local Advisory Committees will be advisory rather than having a managerial or governance role, and will ensure Wellington headquarters hears and understands the fire and emergency risks and needs of the regions. Local Advisory Committees will be made up of people from the local community and will be established from mid-2018 following public consultation on their boundaries.

Changes to funding

Councils are no longer funding rural fire services. This means property owners no longer have to pay for the council's firefighting capability from their rates. Instead, funding for all fire services is from the fire levy paid in fire insurance. The 2017/18 fire levy rate was increased for the first time in eight years to cover the extra costs of the wider scope of work. Public consultation on the levy for future years is expected to take place in 2018.

A modern penalties and offences scheme will be introduced, replacing the use of cost recovery for rural fires. Fire and Emergency NZ has an important role in education about compliance under the new legislation. Under the new Act, serious offences may be prosecuted through the courts which will be able to impose higher penalties, but the emphasis will be on educating and encouraging communities to be responsible.
Even with a national fire service in place, insurance still has a part to play. Fire suppression insurance is still a good idea for protecting your crops, or for third party liability if a fire starts on your property and spreads to other properties.

Commercial forestry companies

Forest companies have been involved in designing a new agreement with the New Zealand Forest Owners' Association. The agreement sets out the fire management responsibilities, who will pay for what, and how things will operate in an emergency.

Fire and Emergency NZ will carry out fire control much as Rural Fire Authorities did, including fire control measures, developing fire plans, setting restricted and prohibited fire seasons, and fire permitting. Using fire as a land management tool also continues. To keep day-to-day operations running smoothly, many of the current rural leadership roles have been retained, and there will not be any significant changes at a firefighter level. You can find out more on the website: www.fireandemergency.nz

Kevin O'Connor is the National Manager Rural, Fire and Emergency New Zealand.

Selling standing trees and forest land

Kim von Lanthen

If we think of a woodlot as an asset, then it has a market value. For woodlot owners wanting to cash out before harvest, there are two important questions. Can I sell a woodlot as a standing crop? and will I get a fair price? The answers are, yes and maybe. It depends on how well you prepare for the sale. People love certainty, and will pay more if they know what they are getting.

Most sales of woodlots involve both land and trees. Over the last year, the Real Estate Institute recorded sales of 9,010 hectares of woodlots for a total of $49 million. Most transactions were at the bottom of the North Island and top of the South Island. The size of the blocks varied from four to 1,121 hectares, with an average of 120 hectares. The predominant method of sale was private negotiated treaty, with a few blocks sold by tender.

Unfortunately, the Real Estate Institute does not provide detail beyond the number of hectares sold, the method of sale and the total sale price. You cannot draw many conclusions from this.

The specialty forest exchange ForestX which has been trading since August last year, has completed 24 sales in its first few months. As a platform for buying and selling forests, it tracks all forms of sales from start to finish. The emerging picture from the exchange suggests that quite a detailed analysis will be possible in the future as it builds its transaction base.

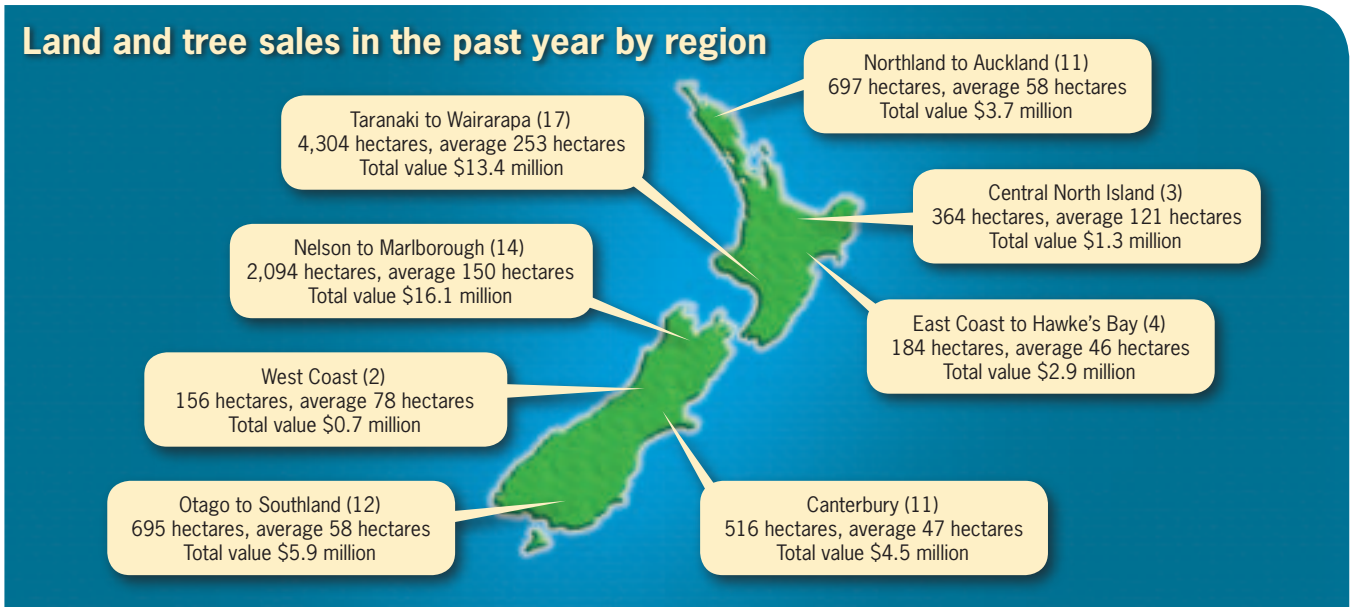
Paired samples

The 24 transactions to June include sales across all age classes of trees, and of several plantation species. There have been two sets of sales in close proximity to one another that allow close examination of paired samples to show what has been happening in the market.

The first pair was sold in Canterbury. Both forests were established in the early 1990s with similar access to processing and ports. One forest sold for more than the capital value of the land, the other sold for less. That is, in one sale the buyer wanted the trees and paid for them, and in the other the buyer saw them as a problem. The first vendor carefully described the trees being sold and their silvicultural history. The second vendor was less specific in describing them.

The second paired sample was in Otago. Both blocks were planted in the same year, with similar access to processing and ports. The blocks were of different sizes but the owner of the smaller block received 13 times more for his trees in dollars per hectare than the owner of the larger block. Again, the block with better information on the trees produced the better value.

You could argue that these price differences might be due to differences in the quality of trees or harvesting



access, but the extent of the differences cannot be explained by these characteristics alone. The quality of the information presented by the vendors appears to have had a bearing.

Preparing for sale

This conclusion might be premature and will be tested as we build transaction history. It is logical to suggest that any vendor should carefully prepare for a sale and offer a comprehensive description of the asset in advertising.

What should this comprehensive description contain? Effective advertising should cover the main reasons for the value. These include the physical characteristics of the forest with a full and honest description of what is being sold, and what it might earn using a frank assessment of costs and revenues into the future. Other value includes the likely risks the buyer will consider over matters such as resource consents and log prices.

Some information is common across all forests and need to be collated right at the outset.

- Location including road name and number with a map of the forest boundaries
- Resource including stocked area, species with genetic improvement if possible, the year planted, stocking, slope and any current roading
- Management regime – pruning, thinning, for carbon
- General health and vigour
- Site including distance from public road, access points and vehicle access
- Wood volume with total standing volume estimates.

Buyers will try to assess the net cash flow the forest will generate and sellers need to be ready to substantiate any figures they offer. Main questions relate to –

- Cash in the log markets, carbon and ancillary crop income
- Cash out including maintenance and other outgoings such as ground rent, rates and insurance, roading and harvesting options

Taxation

Income tax is also important. A vendor must pay tax on income from the sale of standing trees, but a buyer cannot deduct the expense until such time as the trees are harvested or sold again. This mismatch in the timing of the tax liability and the tax credit can mean that the buyer will offer less for the trees than the vendor expects. The effect is greatest with young trees and least with mature ones because it relates to the time the buyer must wait to claim his tax credit.

When preparing for a sale it is important you understand these concepts, and the risks that the buyer will consider. These are likely to include –

- Market risks outlining local market demand, distance to market, presence of alternative land uses along with availability and terms of finance
- Regulatory risks showing the availability and terms of resource consents, changes to carbon regulations and tax changes.

If the vendor is selling only the standing crop, he may offer the buyer a forestry right. Included in the agreement often as a joint venture are the terms of access, harvest, roading improvements and any clean up.

Take courage, woodlots are selling. But there are indications that the price you receive will be influenced by the efforts you make in drawing together accurate and comprehensive information on what is being sold. It could also be enhanced by the sales strategy you deploy, if you can add competitive tension by interesting several parties in bidding for the block.

Kim von Lanthen runs Commodity Markets (NZ) Ltd, www.forestx.co.nz

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Soils underpin the future of our forests

Simeon Smaill and Michelle Harnett

Soil forms the foundation which supports the forestry industry. Managing the mix of minerals, microbes, moisture and organic matter which make up soil to get the greatest tree growth while maintaining soil health is critical for sustainable long-term forestry in New Zealand. Work being carried out at Scion under the Growing Confidence in Forestry's Future programme aims to equip all forest owners and managers with the knowledge and methods to meet this challenge.

Tree health starts in the nursery with vigorous seedlings that grow into robust trees. The microbial make-up of nursery soil plays an important part in this process. Some soil fungi form symbiotic relationships with plants. These mycorrhizae – literally root fungus – colonise a host plant's roots. The fungal mycelia act as a very fine and long extension of the plant's roots, absorbing water and minerals which are shared with the plant. In return, carbohydrates made by the plant are transported to its roots where they can be used by the fungus. The more the mycorrhiza helps the plant, the more carbohydrate the plant can provide to the fungus – it is a mutually beneficial relationship.

Radiata has a lot of fungal friends

At least 28 different mycorrhiza species are known to be associated with radiata pine. Some species form better partnerships with radiata pine than others, providing greater benefits to the plant. Seedlings colonised with more of these better species of mycorrhizae thrive and grow more quickly for several years after planting when compared to seedlings colonised by other mycorrhizae.

Promoting and encouraging healthy populations of mycorrhizae in nursery soils has the potential to further improve the performance of seedlings. Soil and plant ecologist Simeon Smaill, and other Scion researchers, have been looking at the effects of routine fungicide spraying and fertiliser application. They have found that seedlings which are given lower levels of fungicide had greater survival rates and grew faster than seedlings which received a standard dose.

The work on reducing the use of fungicides has moved from small scale trials at Te Ngae Nursery and Scion's research nursery, to operational scale trials at the ArborGen nursery in Tokoroa. A 50 per cent reduction in fungicide has helped rather than harm the seedlings. Reducing the amount of nitrogenous fertiliser has also led to growth gains. Seedlings from this study have been planted out at sites around New Zealand with forest growth results expected between 2018 and 2020.

The work to date has shown that it is possible to make savings with reduced chemical costs without compromising seedling growth and survival. As the results from the field trials become available, and with further research focussing on getting even greater benefits from the tree and mycorrhiza relationship expanding to a greater number of nurseries around New Zealand, forest owners can be confident they are planting healthy seedlings with strong mycorrhizal partners.

Nutrients by the numbers

Forests tend to be on less productive soils with lower nutrient levels. Some soils around the country are known to be deficient in nitrogen, phosphorus, magnesium and boron. The flow and availability of nutrients within pine forests has been widely studied over the last 40 years. While applying fertilisers can improve tree growth and productivity, concerns and questions about the use and cost-effectiveness of fertilisers still remain.

In the case of nitrogen, a faster growth rate could

affect wood quality, especially wood density. It can also be difficult to predict the effects of applying fertiliser. Forests are complex systems and factors such as forest age, availability of other nutrients and water, and the presence of pests and weeds all complicate and obscure the effects of fertilising the land. These, and rising costs, have contributed to a decline in the use of nitrogenous fertiliser over the last two decades.

Phosphorus is another nutrient that, if applied more widely and not just where it is known to be deficient, should increase tree productivity. However, as with nitrogen, the unpredictability of the growth response is resulting in a decline in use.

Precision management

Precision nutrition management which removes this uncertainty – knowing what, where, how much, and the best time to apply fertilisers for the greatest productivity gains – has been identified as the best way forward for fertiliser use. A main sticking point to developing this method is the lack of nutrient availability data at specific sites. To remedy this, forest soils around the country need to be sampled and analysed. Encouraging individual owners and managers to do their own sampling is a practical and cost-effective way to collect soil samples, and numerous forest owners are now carrying out this work.

A survey of farm foresters, small-block owners, corporate foresters, and other industry stakeholders in 2015 found that the role of soils in productivity was well recognised. Owners and managers were interested in using soil data, but were unsure how to take soil samples, or how to translate soil data into forest management.

The issue of the nitty gritty of soil sampling was addressed by a series of 'how to' workshops and videos supported with written instructions. Small to medium forest owner who are interested in getting their own soils tested can check out the instructions and get the analyses done at a commercial laboratory such as Veritec or Hill Laboratories then discuss how to use the results to increase productivity with Scion staff or forest management consultants.

From information to action

To be useful, data from the soil samples needs to be translated into practical forest management recommendations. For the last 25 years, scientists at Scion have been developing and improving a nutrient balance model with the odd acronym NuBalM. This model predicts how nutrients affect growth at stand level, the effect that management decisions could have and how to ensure soil quality is maintained to support future rotations.

NuBalM considers how nutrients are cycled during a stand's lifetime. The model uses indices of site productivity to make initial growth predictions under different silviculture regimes. Then the nutrient demand needed to support the predicted growth in a given year is calculated and the nutrient supply available is estimated. Comparing demand versus supply, NuBalM then revises the productivity predictions. Nitrogen is the main nutrient considered currently, but the model also tracks phosphorus, calcium, potassium and magnesium flows.

Soil sampling with a Hoffer tool

Measuring productivity – diameter at breast height

supported by forestgrowers commodity levy

Soil testing is easy

I have owned my forestry block and adjoining land for a number of years and this year decided I should test the soil. My fruit trees, other tree crops and vegetables have always performed poorly and I had initially put the blame on the altitude and severe winds which we get in the spring and autumn. However, the continuing poor results suggested that I needed something else to blame other than my poor management, and I took the plunge.

I was very surprised at how low the price of the soil test was at just over $100. This even included an extra charge for trace elements. Collecting the soil samples, mixing them all to make sure the final sample was representative, then packing and despatching them in the bag provided was a fairly simple task. Within a week I had the results.

I will not go into all the details here, but the results showed expected low nutrient levels, although I was surprised to see how low some were. The only item which was not in the low column was copper. Virtually all the others were less than half what they should be in a balanced soil, with phosphorus at about a five per cent of what it should be.

These results can explain partly why the cypress are very prone to canker and why the pines are growing steadily, but very slowly. It is interesting to note that the native trees seem to have no obvious problems, but they have had a few million years to adapt. The eucalypts also seem unconcerned with the low nutrients and are growing much faster than the pines.

I have already, on the advice of a well-known cypress expert, been adding some fertiliser to selected cypress to see if the canker on these trees is reduced with the addition of extra nutrients. The pine trees will have to take their chances with their slow and steady growth as they seem healthy enough. However, I will be putting a lot more fertiliser and trace elements around my fruit and nut trees to redress the imbalance and see if they increase their performance.

Julian Bateson

A lot of variables

The minimum number of site parameters needed to run the model is six – 300 Index and Site Index, stocking rate, rainfall, organic matter in the soil, and an estimate of soil fertility. Up to 200 more variables can be used if they are known.

NuBalM's accuracy has been checked by comparing its predictions with actual observations taken in 32 locations across the country. Simulations were run using the minimum six inputs. It was found that there was close agreement between predicted and observed values for stem wood mass across a range of stocking and thinning regimes, and low to medium fertiliser regimes.

More data was available for two long term productivity sites in Tarawera and Kinleith, especially about the amount of organic matter in the forest soils, and the effect of fertiliser on available nitrogen. This extra data was used to check how accurately NuBalM could predict above ground biomass and the distribution of nitrogen in the soil.

A more detailed simulation with 18 variables accurately predicted biomass except where extremely high levels of nitrogen had been applied. In that case the model under-estimated the amount of stem wood mass. The model also accurately predicted total nitrogen levels, but not its distribution in different soil layers.

Work is continuing to refine the model and increase its accuracy and ease of use. For example, the model considers the effects of nutrients on weed growth but only allocates nutrients to weeds after the needs of the pines have been met. This is too simplistic as weeds and trees will be competing for the same nutrients. Nutrient leaching and the effects of other minerals are also focus areas. Leaching information will be particularly useful in the development of catchment level nutrient management plans, which are becoming an important consideration for land managers and regional councils.

Sustaining successive rotations

The short forestry rotations in New Zealand of 25 to 30 years result in frequent and significant forest soil disturbance. More than 50 per cent of the country's planted forests will soon be in their third or fourth rotations. The pressures of short and successive rotations can lead to soil degradation and a drop in its ability to support the subsequent rotations. Loretta Garret and other Scion researchers are evaluating the effects of successive rotations and how they affect site productivity.

Organic matter in particular is critical to nutrient supply in forests. The amount removed at harvesting

supported by forestgrowers commodity levy

influences the nutrients available for the next rotation. Scion has used observation and theoretical methods to investigate the effects of removing organic matter. The first method used the Woodhill Long-term Site Productivity Trial to assess soil changes over two rotations. The second used NuBalM to simulate the response of nitrogen and radiata pine productivity to the removal of different amounts of organic matter at harvest.

Removing parts or all of the trees

The sandy soil of the Woodhill site is low in carbon and nitrogen. At the end of the first rotation in 1985, parts of the site were prepared for replanting by removing either just the stem, the whole tree or the whole tree plus the forest floor. Half the site also received large doses of fertiliser, with the aim of removing all possible nutrient limitations the trees might face. As a result, the amount of fertiliser used was much greater than would ever be conventionally applied. The second rotation at Woodhill was harvested in 2014.

Leaving harvest residues in place benefitted soil carbon and nitrogen levels, whereas removing most of the organic matter in the form of the whole tree and forest floor decreased the carbon and nitrogen levels in the top 10 cm of soil. Adding fertiliser to the scraped ground did increase overall carbon and nitrogen levels but did not restore the values of those nutrients to the initial value. Fertiliser application also reduced the amount of phosphorus available.

The theoretical effects of the different site preparation regimes used in the Woodhill trial were also simulated with NuBalM over four rotations, using data combining current growth trajectories from six New Zealand regions. The predicted changes in nitrogen levels and how they could affect stem wood biomass or productivity were calculated. A factor to account for genetic gains with time was included in the modelling.

Decreasing nitrogen

The model results showed the amount of nitrogen in the soil decreased with successive rotations, and that the decrease was larger and faster as increasing amounts of organic matter were removed. The effects on simulated productivity were minimal for the first two rotations. Beyond that, the effect was substantial. By the fourth rotation, a 75 per cent loss in productivity was calculated for the whole tree and forest floor regime and a 25 per cent loss calculated for the whole tree treatment. No loss of productivity was predicted within the four-rotation simulation for the stem only removal.

The results from the Woodhill trial and NuBalM modelling show that management decisions around organic matter removal affect nutrient levels and therefore productivity. The simulation suggested there is a threshold where productivity will be markedly affected. With more site-specific nutrient data and information on the factors that affect this, avoiding soil degradation and maintaining productivity, especially on low nutrient sites, will be easier.

Closing the productivity gap

The site productivity of nitrogen deficient Woodhill is much lower than the most productive sites in New Zealand. Understanding and correcting site nutrition to close the productivity gap is one of the aims of Growing Confidence in Forestry's Future. The productivity gap defines the difference between the biological maximum productivity for the site and the current productivity achieved from that site – basically, the gain in productivity that can be produced by the land owner from research which improves management. Given the large number of factors that could be restricting productivity, solutions are likely to be complex and involve multiple treatments. Using Woodhill again as an example, adding nitrogen fertiliser would increase productivity, but not to a theoretical maximum as the availability of phosphorus or another nutrient will eventually limit growth.

However, the task is not impossible. Understanding the factors that influence nutrient use, availability and growth, along with their interactions, is increasing all the time. Data from fertiliser trials is showing that the response to fertiliser takes time, and that three to five years after application, soil phosphorus content and moisture availability accounted for around 80 per cent of the differences in fertiliser growth response. These and similar results will allow forest owners and managers to predict the returns on nitrogen fertiliser more accurately. There will be opportunities to increase growth responses further by improving the phosphorus content of a site's soil, for example, and supplementing other growth limiting nutrients.

Combining our knowledge of where site productivity is below its biological potential, increased soil sampling and analysis, methods such as NuBalM will enable precision nutrient management to become a routine part of forest management. Healthy, productive and sustainable future forests will give the best return to owners and growers with the added benefits of protecting our soil capital, improving our environment with better ecosystem services and providing renewable raw materials for new bio-based industries.

For more information on soil research at Scion email simeon.small@scionresearch.com

When to harvest
The challenge of decision making

Allan Laurie

At this year's Fielding conference I was approached by a number of people all who had similar questions to ask. These revolved around pressure being applied by forestry companies to get them to harvest early. Their questions all related to a similar scenario – should I accept a proposal to harvest my trees when they are only 22 or 23 years old?

This scenario and range of questions are similar to ones I now field almost every week. I can state from the outset I am almost appalled that some seemingly reputable New Zealand based companies are pressurising owners to harvest early, with a range of inaccurate information presented to justify the argument. In my view this pressure is entirely due to companies aiming for volume and client growth along with a procurement strategy, rather than doing what is right for the forest owner.

In this first article of my time on the soap box, I will endeavour to respond to the misleading facts being fed to some forest owners. In a future edition of *Tree Grower,* I will respond to any critics and I will also give some information on financial and crop growth analysis.

I acknowledge there will be exceptions to a harvest early rule. We all face a life of uncertainty, sometimes with personal circumstance that dictates the need to realise an asset earlier than maturity and sometimes those decisions have to ignore what is best for the forestry crop. However, I would also say that over 90 per cent of the people who approach me with the questions about harvesting early never include a need to harvest as part of their thinking. Some even say 'I don't actually need the money right now but…'

What then is an ideal harvest age?

I will cover this in more detail in a subsequent article but in summary, the ideal harvest age for radiata pine in New Zealand is 27 to 30 years. As always, there may be exceptions to the rule with tree ages a bit younger and older applying in some circumstances.

The key here is that information is everything and it can only be gained from a good analysis of your trees. Once the current status is known in terms of stocking, likely log grade mix, volume per hectare and expected productivity, then an informed decision can be made.

Some of the pressures which are applied

Let us look at some examples of the sort of pressure I get to hear about

We have a logging crew in your area

The only way to make an informed decision about harvest timing is to have undertaken a detailed assessment. If the logging crew is just around the corner you will not have time to investigate the status of your crop and whether in fact it is a good time to harvest.

Suggesting there will be cost savings because the crew are right there is only correct at the small scale. Equipment position costs at a tonne rate are insignificant compared to the downside of harvesting early.

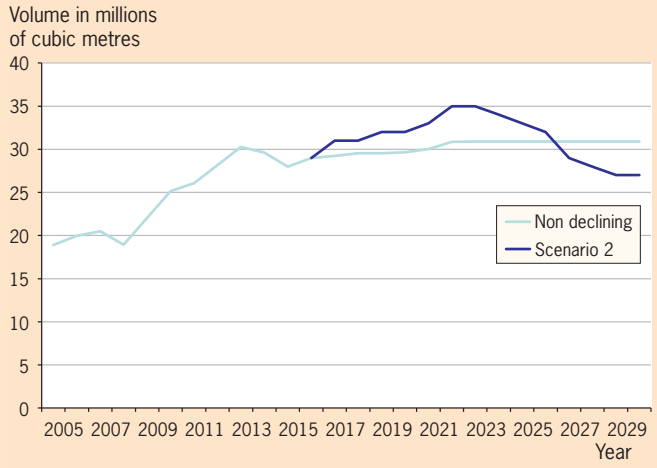
There is a wall of wood looming

You may be told that you will struggle to sell your block with the looming wall of wood. I have seen no concrete evidence of a wall of wood coming, going or otherwise. To add to this, I have seen graphs presented to owners which clearly show an increase in harvest volumes in the region. The big lie here is the graphs reflect private harvest volumes only, rather the combined corporate harvest volumes in the same region which will probably show a decline.

I can accept there will be some regions where volumes are destined to increase in the next few years. However, at a national level, the total supply graph shows little growth. David Evison from the School of Forestry recently gave a paper on harvest projections and I am grateful to him for allowing me to use this in a presentation I made in China last year.

The light blue line in this graph at the top of the next page, is the forecast cut until 2030. It is called the non-declining yield prediction because it assumes rational behaviour in terms of cut strategy. It also reflects how the market has behaved up until now.

New Zealand plantation forest industry harvest volumes 2005-2030



This tells us the expected New Zealand annual cut will hover around 30 million cubic metres a year for the next 20 to 30 years.

The dark blue line reflects irrational behaviour. This assumes the tree crop being harvested at the same rate it was planted which most commentators suggest reflects irrational behaviour. If it did happen it would be followed by a massive decline in annual harvest, which would not benefit anyone.

The only irrational behaviour which intercedes with this graph is the rate at which forest owners are currently harvesting early. It is therefore likely that the non-declining yield projection is already affected by this. Taking this into account, together with large volumes lost from wind and fire damage along with the clearance of mid rotation stands for dairying, the harvest of 30 million cubic metres annually and sustainably is already under threat.

In 10 years prices will fall

The full statement often made is that there will be a wall of wood in 10 years time and log prices will probably fall. The wall of wood lie is already refuted. The ability to sell volume and achieve price is only affected by potential markets and wood availability internationally.

Here is a quick look at some reasons why wood fibre values are unlikely to fall in the foreseeable future.

- China has recently halted all domestic harvest removing over 15 million cubic metres annually
- Indian consumption of softwood fibre is expected to more than double to three million cubic metres by 2020
- Indian GDP growth and population numbers match China with massive economic reforms in place and as the need and demand for housing increases, softwood consumption must increase to similar levels currently in China
- The planet is still losing over a million hectares annually to deforestation and with the emphasis now on climate change, with Trump the exception, most world leaders are refocussing priorities and deforestation is in the spotlight
- There are vast tracks of arboreal forests is Russia that could be harvested but Mr Putin is unlikely to flood the markets and drive his own price down
- Russia has massive infrastructure and accessibility problems which will continue to ensure New Zealand can be very competitive even at the current excellent price levels
- The effect of a cessation in bark beetle harvest in Canada is significant and annual harvest is declining. I have seen a big mix of reports which provide conflicting data. Those forecasts have included an annual decline of five million to 20 million cubic metres from now. Either way those volumes have been competitors for New Zealand radiata pine at some level internationally and are therefore significant in the future supply context. The fact that several large sawmills in Canada have closed recently or about too close confirms volume shrinkage.

You will struggle to get a logger

This time the comment often made is that the demand for logging crews will increase to the extent that you will struggle to get a logger to cut your trees in the future. There is no foundation to this argument. Yes, we are struggling to get enough people on the ground at present, but so are most New Zealand industries, and we are still cutting 30 million cubic metres annually.

Mechanisation is playing a major role in harvest. We now have fewer people producing a lot more. Logging crews of five or six people can now harvest 400 to 600 tonnes a day, figures which 10 years ago were rare or unheard of.

We would also expect to see mechanisation keep a lid on costs. Improved productivity as a result of improved harvest systems and technology suggest competition in scale will increase. I can see no justification for an argument which suggests harvest costs will increase significantly outside normal inflationary factors.

Next time in *Tree Grower*

I have suggested there is no justification for harvesting early based on the range of misleading information which some forest owners are being exposed to. In the next article we will look at forest productivity and value, some of the main reasons which will affect the decision to harvest. Whatever you do, please do not forget it has never been more important to get out there and plant more trees.

Allan Laurie is the managing director of Laurie Forestry Ltd.

Succession planning for forestry owners

Jo McIntosh and Nigel Webb

Generally speaking, those involved in forestry tend to be patient, long-term planners. Planting young trees is not a quick return, but you do it because in the long-term you know it will pay off. It is vision for a better future – for yourselves, your family and maybe because you want to leave a legacy.

Like many of us, you spend your time working towards a goal. You make frequent decisions that will ensure your business continues to grow and mature, and of course, appreciate in value. However, often overlooked or ignored are the business risks related to health and life. If neglected, an unforeseen event could have the potential to incapacitate your business in an instant.

Consider this. You have an investment in forestry with a business partner. One day, out of the blue, you get a call to tell you your business partner has unexpectedly died. Apart from the personal loss and shock, the effect on the business might be that the deceased partner's estate is now your new business partner. How will that work? Will it work at all?

Alternatively, you are keen to leave your farm and forest to your children, but only one child has expressed an interest in the farm. How do you structure your estate so that it is fair to your other children? You certainly do not want your remaining family unhappy over the result. Too many families and businesses fall apart bickering over estates. Regardless of the way your forestry business is organised, be it sole trader, partnership, corporate or family owned, you need to plan for the continuation or at minimum, the transition of your business in case you or your business partners face certain, unforeseen circumstances.

Succession planning can be approached in several different ways and may not be as complex as you think. However, sadly and often, well-structured succession plans are often considered unimportant at the time, or one of those things we do not get around to, until it is too late. None of us know what is around the corner, and the reality is that sometimes people do die early, or they do become incapacitated and unable to work in the business ever again.

A buy-sell agreement

A buy-sell agreement is commonly used for succession planning. It allows owners of businesses to pre-determine what may happen when certain unforeseen eventualities occur. With a buy-sell agreement in place, the owners can agree on a buy-out formula before conflict arises and avoid deadlock among those involved if it does. A buy-sell agreement sets out certain parameters to ensure the correct formal process to handle the death or disablement of a business owner. Here are some examples.

- It can provide protection for multiple owners when one of the owner's interests may not align with the interests of the other
- It can protect the rights of the surviving business owners when the recently deceased owner's shares pass through to their spouse
- It can protect the rights of the surviving business owners when the recently deceased owner's shares pass through to their children
- It can protect the rights of the surviving business owners when the recently deceased owner's shares are subject to probate because no will or appropriate trustee paperwork is in place
- It provides protection if one of your children is involved in the business as this can create disparity for other siblings in the event of a business owner's death.

These are just a few examples of the challenges which business owners may face if the appropriate framework is not in place. Clearly, a buy-sell agreement can provide a framework around future intentions. However, that still leaves the problem of funding the shares of the recently deceased or disabled business partner.

Funding the shares

There can be a number of potential consequences if the surviving business owners find themselves needing to fund the shares of the recently deceased owner –

- Buy the interests of the deceased or disabled owners business partners
- Liquidate the business or sell to a third party
- Borrow money to buy the shares
- Sell assets to create funds to buy the shares.

If the remaining business owners are forced to borrow money to buy the shares, then consider the following consequences.

- In a business crisis such as this, lenders may not extend credit
- The nett result of further borrowing is that additional debt still exists after interest payments have been made
- These added costs may be felt after the business crisis during difficult trading periods.

If forestry assets are required to be sold, this can also have severe consequences for the surviving business owners.

- Forests may be sold in a fire sale at a reduced price
- Once the assets have been sold, the business may not be able to continue to trade
- Without assets, securing further borrowing will be difficult
- This process may even extend to borrowing from personal means or families.

Funding with life insurance

When using life insurance with a buy-sell agreement, either the company or the individual co-owners buy life insurance policies on the lives of each co-owner, but not on themselves. If you were to die, the policy owners receive the death benefits from the policies on your life. That money is paid to your surviving family members as payment for your interest in the business. If all goes well, your family gets a lump sum of cash they can use to help sustain them after your death, and the company has ensured its continuity.

The advantages of using life insurance are –

- It creates a lump sum of cash to fund the buy-sell agreements on the death of one of the business owners
- The proceeds are usually paid quickly after your death, ensuring that the buy-sell transaction can be settled quickly
- Life insurance premiums can be funded by the business
- Life insurance premiums are often a modest cost compared to the potential benefits
- Life insurance sums insured can be adjusted from time to time if required as the value of the business grows over time
- Multiple lives can be added to the same policy and different ownerships can be applied when entering into a cross purchase agreement.

However, death is not the only type of event that could trigger a buy-sell agreement. With the advances in medical technology, people are staying alive for longer and it may be necessary for business owners to cash up their shares as a result of a disability. Therefore, funding may be required if this were to eventuate.

It is also prudent for business owners to complement life insurance on the business owners with total and permanent disability insurance. This is important if one of the business owners were to be totally and permanently disabled and a buyout provision had been clearly stipulated in the buy-sell agreement.

Take some time to plan

Buy-sell agreements, when written and structured correctly, are very important when considering all levels of succession planning, whether private, family or business owned.

Life insurance as well as total and permanent disability insurance are simple options when businesses and business owners are looking at ways of making provisions for shares if one of the business owners should die or become totally disabled.

It is vital that annual reviews are undertaken, both with the buy-sell agreement and the insurance cover provided. Circumstance almost always change as the value of the forest changes. The business owners and the structure of the business itself can also change. Aon can help NZFFA members with their succession planning to ensure the best results are achieved.

Jo McIntosh is an Executive Director for Aon and specialises in insurance for forestry and horticulture. Nigel Webb is the Aon Regional Sales and Development Manager.

Disclaimer: This article is class advice and is not to be construed as being personal financial advice. It is recommended that anyone acting upon this information seek professional financial advice before proceeding.

Redwood stability across the environment

Paul Silcock and Simon Rapley

An emerging opportunity

The Sequoia Action Group successfully applied to the Sustainable Farming Fund in July 2015 looking to build on redwood genotype x environment research undertaken by Future Forests Research in 2013. The previous project was limited in scope to analysing data only from two high productivity sites of the 11 Kuser trials in New Zealand. The 2016 work included three additional sites and the results indicated that –

- The best clones at one site would probably remain the best clones at another
- There was medium-to-high genetic control for all growth and wood property traits measured, while epicormic shoots were under low genetic control
- On average, rapid redwood growth will probably result in lower wood density.

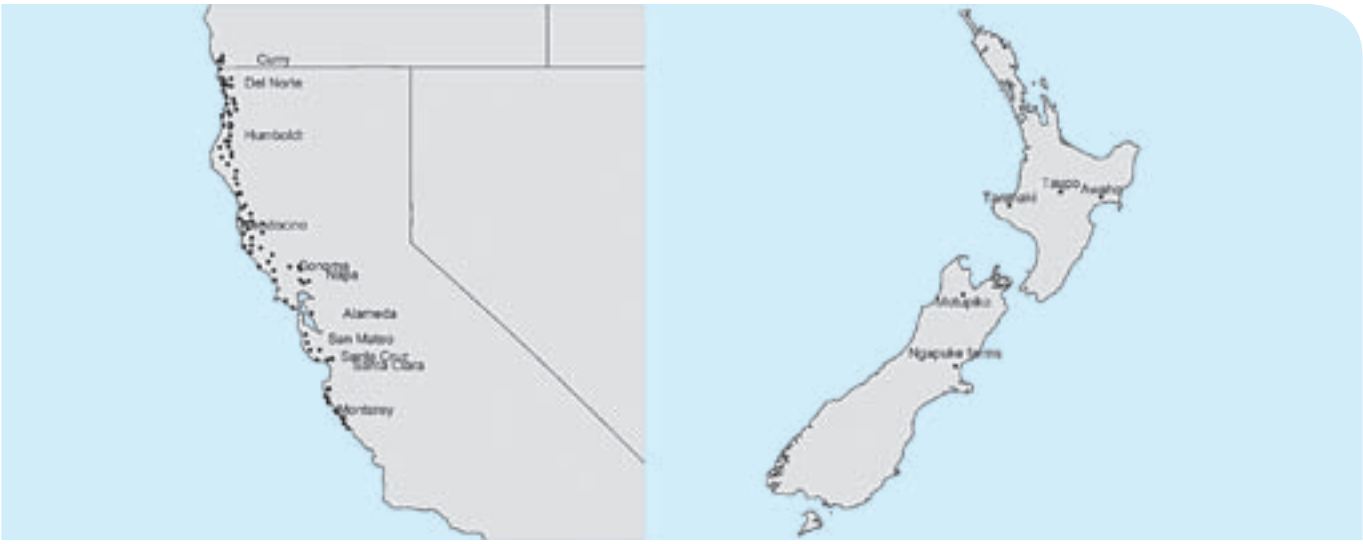
With co-funding from The New Zealand Redwood Company, SAG and NZ Forestry Ltd, Scion were contracted to carry out an extension of the analysis, looking at the growth performance and wood quality traits of the 198 Kuser clones from 90 locations at five New Zealand trial sites. The project began in June 2016.

Representatives from the funding organisations considered that one of the most important issues for people wanting to grow redwood in New Zealand is genetics and quality of planting stock. Understanding how site influences redwood productivity is important as redwood is sensitive to temperature, wind, soil moisture, soil fertility and mycorrhizal associations.

It is well established that we can grow and manage redwood stands successfully. However, there is no formal breeding programme. Instead, independent programmes by growers who are making selections among clones from various importations and from domestic material. The objective of this study is to provide information to growers on how the performance of clones changes across sites and where, from the natural range of redwoods, do the best trees for New Zealand come from?

What we found out

The sites at Awaho, south of Wairoa, and Taranaki represent higher quality forestry sites, ideal for growing redwood with high annual rainfall spread evenly across the year and with deep fertile soils. The two sites in the South Island at Motupiko and Ngapuke represent lower quality sites with limited rainfall, higher mean wind speed and a shallow soil profile. The Lake Taupo site with free draining ash soils and high altitude was so unsuitable for redwood that it was removed from the analysis.



Geographical distribution of collected sample of coastal redwood and distribution of experimental sites across New Zealand

Diameter at breast height, the presence of epicormic shoots, wood density and stem acceptance were measured. These traits were investigated for presence of genotype x environment interaction by using mixed statistical models.

Clonal rankings were consistent across high quality sites. Where site quality was poorer, these rankings were not consistent, meaning some clones were more sensitive to changes in site conditions than others. This is helpful to growers as it gives confidence that a clone selected for superior growth and wood properties from a good site will perform in a similar manner on another good quality site somewhere else in New Zealand.

If there is one or more provenance of coast redwood which is better suited to New Zealand conditions, it did not become obvious during this study. In addition, there was no relationship between the genotype's performance in New Zealand and the climate or geographic location of the its origin.

Implications for redwood growers

We can assume that genotypes from any part of redwood's natural range may do well in New Zealand, so seed collected from any part of the natural range will include some genotypes well suited to New Zealand. There is already evidence of this here. We do not have any reason to favour any part of the natural range over others. If a genotype has proved to be a good tree on a good site then we can also assume that it will be a good tree on another good site.

The best evidence of good performance of redwood here is from field trials in New Zealand. The climate of California is very harsh. Most growing seasons are dry without any rain for five or six months from mid-spring to mid-autumn. It would therefore be speculative to assume a genotype which performs well in California will also do well in New Zealand.

In the short term, redwood growers should ask for evidence of the performance of clonal stock on good sites in this country. Wood properties, stem form and tendency to grow epicormic shoots following pruning are important traits along with growth rate.

Redwood growers will get the best results by planting redwood on the best sites. There are tree crops that will do well on tough sites but coast redwood is not one of them. Consideration should be given, when establishing redwood on low quality sites, whether the investment into high quality genetic material is worth pursuing, or whether using lower cost seedling material is a more suitable strategy.

Wood properties

The study showed a clear negative relationship between diameter at breast height and wood density. What does this mean and should we be worried? Redwood is a low-density wood with a range of basic densities. These were identified in the Mangatu Sawing Study of 13 sample trees 38 years old sample trees, with a range from 274 kilograms a cubic metre to 420 kilograms a cubic metre.

Arguably the most important feature of redwood is its dimensional stability although durability is also very important. One of the reasons redwood is a very dimensionally stable wood is because of its low basic density. Walker, in 2006, explains that high density woods have proportionally more cell wall and less lumen – the space inside the cell – and so shrink and swell more.

We do not want to produce dense redwood as we

Kuser trial site at Jeremy Thompson's Taranaki site

do not want to use it as structural wood where strength is important or for paper production where high density equates to high yield. Redwood breeders and growers should be trying to produce wood of consistent properties, including density. Wood of either very low density or very high density is undesirable but there is a range of densities perfectly acceptable for the intended end use of New Zealand grown redwood.

The future

Redwood growers need to develop a breeding strategy to ensure the best genetic gains are available for the industry in the long term. While we did not identify a provenance effect, we know there are limitations in the sample size of the Kuser collection. It may therefore be possible to identify a group of provenances which are best suited to New Zealand from the natural range of redwood as the next best option. Selection of a range of provenances is actually quite normal in tree breeding programmes.

The Rotoehu provenance trial may also yield further information or selections which could improve our understanding of the redwood population. If we can identify better provenances then seed collections from superior trees within those provenances should be made for breeding in New Zealand.

A second alternative is to identify the best redwoods from across New Zealand that already appear to have good local adaptation and performance, and combine these with unrelated genotypes with known traits from cultivars already identified and field tested here. A third option is to run both options together, to take advantage of the widest and best genetic material that can be accessed, no matter what the source. What is clear is that we, the redwood growers of New Zealand, who now represent over 7,000 hectares of young forest, need a breeding strategy. We did not get all the answers we were hoping for from this study but we are fortunate to have access to some of the best minds in the business to help set a course for the future.

The Kuser study

The Kuser study is an abbreviation of International Range Wide Provenance Test of *Sequoia sempervirens*. Professor John Kuser from the Department of Horticulture and Forestry, Cook College, Rutgers University, New Brunswick, with assistance from Professor Bill Libby from the Department of Forestry, University of California and Jim Rydelius of Simpson Timber Company undertook a range wide study of coast redwood.

The purpose of the study was to study genotype by environment interaction of the species by sampling genotypes from throughout the natural range of redwood and establishing clonal replicate tests within the natural range and at overseas sites.

The method

Two randomly selected genotypes from 90 different locations throughout the natural range of redwood were sampled for the purpose of reproducing copies for use at trial sites. Trial plots were established in California, Oregon, Hawaii, Spain, France, New Zealand, Thailand, India, Chile, Britain, Ireland and south-eastern United States. The intention was to monitor differences in date of seasonal onset of growth, height growth, diameter growth, branch and crown measurements, wood density, age at first cone production, cone abundance, heartwood to sapwood ratio and stem taper.

The writers do not know how far this objective has been accomplished. It would appear that with the passing of Professor Kuser and changing trial site ownership, continuing measurement of trials has not been conducted or collated for analysis. Trial sites are known to exist in California and France but attempts to access data from these sites last year was not successful. The California site has suffered from bear damage and the French site has changed ownership and the new owners are not sure what to do with the trial.

Of course, most of our interest in New Zealand is how the various genotypes have performed in trials. Jim Rydelius, former General Manager of The New Zealand Redwood Company, imported almost a full set of Kuser clones to New Zealand. These clones were multiplied at nurseries and distributed to the Kuser trial sites.

The Sequoia Action Group consists of redwood growers and enthusiasts from New Zealand and the US. There has been a modest but focussed programme of innovative work on clonal breeding, silvicultural management and wood properties undertaken since the sequoia renaissance of early 2000. This group, with industry and research support, steers the existing research programme while pooling and disseminating the experience and knowledge of farm foresters growing sequoia. The committee consists of Paul Silcock, Russell Coker, Graham Milligan, Jeremy Thomson, Ian Brown, Robert Appleton and Dougal McIntosh.

Towards commercialising cypress as a high value plantation forest species

Dean Satchell

Cypress species are well known in New Zealand for their timber, usually called macrocarpa, this being a namesake for the species *Cupressus macrocarpa*. Macrocarpa and hybrids have been planted for shelter, shade and aesthetic values for well over 100 years, primarily because of easy establishment and good growth throughout New Zealand. Older plantation and shelterbelt trees have often proved to be very robust, growing into large trees free from disease, standing the test of time to eventually be the target of loggers and sawmills satisfying demand for the timber. The species achieved recognition in New Zealand because of the quality of the timber, which has a rich colour and lustre similar to kauri, a traditional native appearance timber now in short supply.

Price and demand for quality cypress timber remains high, but problems with form, slow growth and disease levels that have resulted from growing unselected seedlots has progressively diminished grower confidence and interest in the species. Poor volumes of poor quality logs mean little value to the grower. Overcoming these problems by making high quality clones available to growers could transform the economics of cypress forestry.

Commercial proposition

For cypress to be a viable commercial forestry crop, trees need to be available which grow fast, grow straight, produce a high proportion of heartwood and be resistant to disease. All of these need to be rolled into one tree, but also consistent between trees in the stand. Clonal forestry potentially offers all of the above via a single selection process.

One advantage with cypress over other commercial plantation conifers grown in New Zealand is that clones can be selected which apparently do not suffer from physiological ageing. This means that continued propagation does not result in slower growth of propagules. The opportunity is for one-off selection of superior clones which can continually be reproduced as cuttings. Clonal selection also offers the ability to test and select for desirable wood properties such as colour, heartwood content, durability level, density and strength.

Macrocarpa with poor form and heavy canker load

Stem canker affecting form of this clone

However, the length of time a clone should be tested in field trials before it can be recommended for use is not well understood and is open for question. Early selection comes at a lower cost but entails greater risks once planted. This is because some poor traits may not be expressed in immature trees. How long does it take for cypress to express undesirable traits?

The research

This research evaluated during late 2016 involved over 2,500 trees from 11 clonal trials planted between 1994 and 1998. The primary purpose of the research was not to evaluate performance with the aim of making selections for deployment, but rather to evaluate relative performance and health for clones between different sites and geographical regions. Also of interest was identifying issues relevant to selection of clonal cypress tree stock.

Performance of the clones was assessed using a rating method and four performance criteria – tree size, tree form, stem health and foliar health. Of interest to growers are three key performance and siting parameters relevant to clonal selections –

- Overall performance of each clone
- Each clone's relative adaptability to different sites
- How each site performed in general.

By evaluating each clone over a range of sites, its adaptability to different sites can be assessed as relative performance between sites. The relative performance of all clones between sites can also be assessed. Furthermore, by evaluating each clone against the other clones across all sites, differences between clones and differences between sites are revealed.

Of particular interest was within-clone variability, across sites and within site. A good clone is consistently good. A clone that performs well in one site but not another should not be a candidate and would not be selected if properly tested across a range of sites.

Each site has different problems such as level of wind, soil nutrition, soil drainage, soil moisture, rainfall, humidity and temperature, along with seasonal variations. Each of these different variables might affect all clones or individual clones in different ways. Climatic explanatory variables used in this research were seasonal rainfall and seasonal temperature.

Results

Although most of the clones in these trials performed very poorly, this result supported the reasoning that comparing relative performance between clones and sites was the intent for this research. Mediocre clones offer insight – hostile sites prove more challenging for mediocre clones than good clones and so the data reveals the challenging variables.

Both growth and form as well as stem and foliar disease were found to be strongly influenced by site. That is, relative performance of different clones differs significantly by site. Some clones proved to be more resilient than others to site or climatic factors. For example *Ovensii* proved to be healthy at all sites but growth and form was variable, especially in exposed South Island sites. Ferndown, on the other hand, had variable health on all sites and on average was healthy in cooler Bay of Plenty sites but not Northland, while growth and form scores were more variable than for *Ovensii*.

Ferndown Leyland, generally a well-formed tree, but here the form has been seriously affected by canker disease

Dry or cool conditions alone were insufficient to significantly reduce disease levels, but cool dry conditions consistently produced low disease levels. The old adage that you can avoid canker by growing cypress in the South Island can be dismissed. Canker was rife in some South Island locations but virtually absent in the central high country.

Some clones did perform well throughout all locations they were present. This illustrates the commercial potential for the species if high quality resilient clones were used in production forestry.

Conclusions

Very few if any of the clones evaluated from these historical trials are suitable as the one silver bullet for growers. The clones were mostly selected on early

growth and form and some were selected from single trees based on their performance in one site. We now have insight and can conclude that early selection must be avoided.

We can also conclude that selections could still be made from single trees, provided the propagules were thoroughly tested before considering for deployment. The two BHYB (Barr Hybrid) clones showed promise by growing into very good trees across a range of sites showing resilience, whereas other clones such as PS did sometimes perform well, but in few sites, so were not resilient. Clonal trials over a wide range of sites reveal the very best, most resilient clones. Identifying such adaptability must precede use. The most promising clones in these trials are the two Neil Barr hybrids BHYB1 and BHYB2, but unfortunately these were not planted across the full range of sites.

A key result of this research is that evaluating performance of clones for selection requires sufficient tree maturity for adequate expression of traits, both good and bad. A good-looking lightly branched young tree may become heavily branched and fluted on maturity, such as the NZR clone. In addition to growth, form and disease resistance, selection criteria recommended for clonal selection programmes includes light branch structure at maturity, low levels of fluting, a low incidence of stem breakages, resistance to toppling and possibly even resilience to low nutrient status in soil. Based on observations undertaken in the course of this research, in the author's opinion, the length of time required for trialing clones across a wide range of sites before claiming resilience should be no less than a decade and ideally would be 15 years.

Most importantly, what these historical trials do are to offer lessons for applying to future selection and trial work and research questions which could form the direction for future work. All too often, we look forward without looking back, but with the time frames involved in growing trees, any insight from what was done some time ago has got to be a good thing.

Forestry and a capital gains tax

Wink Sutton

Both the Labour and the Green political parties are considering a capital gains tax. Calculating the capital gains on property, shares or other products may appear to be relatively simple. However, calculating the capital gains on a forestry investment is virtually impossible.

Over a 25 to 30-year rotation the inflation adjusted price per cubic metre may fall, but because of forest growth, the return will actually increase. It is very difficult – almost impossible – to determine what proportion of the increase in value can be attributed to forest growth and which should be attributed to a change in the price per cubic metre.

How are any capital gains to be assessed? Not all plantations have similar costs. A farmer may plant and tend a plantation on their farm, but keep no record of when or how much was actually spent. On the other hand, a forestry company may have maintained good records of actual costs but have no record of overhead costs. Will the basis of any calculations be the same? If it is not, then any calculation must be inequitable. In addition, over what period is the capital gain to be assessed?

In 1964 I was a forestry university student in England. My degree included an extra course in forest taxation. The then UK Labour Government was proposing to introduce a capital gains tax. Before details of the tax were announced we had a discussion in our class on how a capital gains tax might be applied to forestry. We conclude there was no way the tax could be applied fairly. When details of the capital gains tax were finally announced, forestry was excluded.

In the late 1980s our finance minister, Roger Douglas, seemed convinced that forestry investments were being inadequately taxed. As I understood his intentions, he was proposing to tax forest owners yearly on how much their forest had increased in value over the last year. This ignored the fact that forest owners may have no plantation income until eventual harvest.

In discussion with him I pointed that under such a tax scheme no one would invest in New Zealand plantations. Investors would move to countries such as in South America. His response, as I recall, was that his proposal was logical and let investors go to South America. Fortunately, Douglas's forest tax scheme was never implemented.

Injuries and fatalities in the forestry sector

Julian Bateson

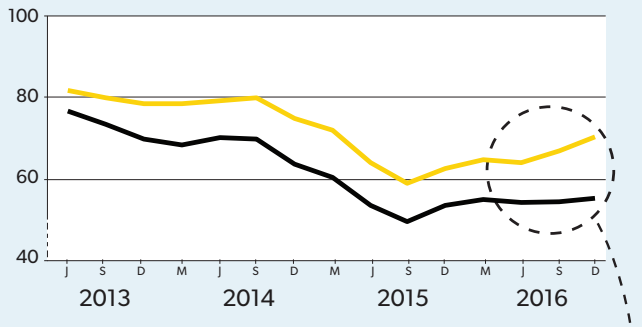
Some of you may have been wondering about how health and safety is going in forestry. A few years ago in 2013, there was a significant rise in fatalities for those working in forestry and the serious injury rate was also very high. The Forest Industry Safety Council was created a couple of years later with the aim of reducing fatalities and injuries in forestry, hopefully to zero. So, how does it all look now?

HOW ARE WE TRACKING?

HEALTH AND SAFETY PERFORMANCE OF THE NZ PLANTATION FORESTRY INDUSTRY **DECEMBER 2016**

SEVERE INJURIES

RATES OF SEVERE INJURIES TO WORKERS



Rolling average last four quarters

53 SEVERELY INJURED IN LAST QUARTER

+2.4%
rise in severe injuries per 10,000 workers

+0.6%
rise in severe injuries per 10,000m³ roundwood produced

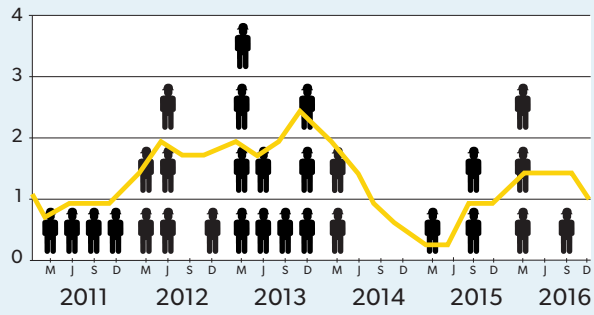
173 SEVERELY INJURED IN LAST 4 QUARTERS

+10.9%
rise in severe injuries per 10,000 workers

+4.0%
rise in severe injuries per 10,000m³ roundwood produced

FATALITIES

WORKERS KILLED ON THE JOB

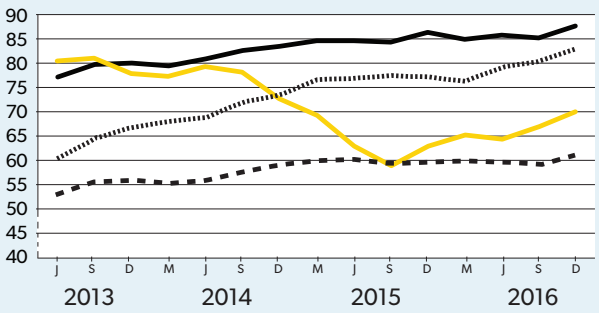


Rolling average last four quarters

4 Forestry workers died in the last four quarters

HOW WE COMPARE

RATES OF SEVERE INJURIES



Rolling average last four quarters per 10,000 workers

The website Safetree has all sorts of information available on it, and if you register you can also be sent regular information. One of the updates is a chart, part of which you can see printed on the opposite page. It tracks how things are going.

It is slightly historical because the figures for serious injuries are now obtained via ACC claims. This is much more accurate than it used to be when figures were obtained from other sources, but it means that the data can take six months or more to get released. The chart therefore has figures supplied up to the end of 2016 but still gives us a trend of how the past few years have been progressing.

Analysing the graphs

On the top left of the chart is the graph of severe injuries in forestry over the past four years. The yellow line shows injuries per 10,000 workers, the black line is very similar but is based on the amount of timber harvested. As you will see, the injury rate per 10,000 workers, a standard measure, started to fall quite significantly from 2013 until late in 2015, but then has begun a slow but significant rise. As the figures below this graph show, there was a 10.9 per cent rise in serious injuries over the whole of 2016. This is a worrying trend and I have not seen any significant reasons given for this.

The graph at the bottom right is an interesting comparison. Yes, there are far too many injuries in forestry and in 2013 the rate was very similar to that in agriculture, although it is now significantly lower. You will note that the injury rate in agriculture has not decreased at all. In fact, it has gradually risen by about 15 per cent.

Around two or three years ago I remember being at a government launch of a safety campaign for agriculture in which the target was for a reduction in injuries of five per cent a year over the following five years. This, in my opinion, was a pathetic target, a point which a Federated Farmers council member agreed with on the day of the launch, so I was not alone in my assessment. The target should have been to aim for zero injuries – it seems so obvious. Now it seems that not even the 'pathetic' target has been achieved.

As many of the NZFFA members are farmers, we need to be aware of this rising trend and do what we can to reduce it. This is not going to be easy and if you examine the graph more closely you will note that all the industries with high risk injuries have a worryingly upward trend. I am sure researchers are looking into this, but it seems that there may be some fundamental problem with workplace injuries and a solution is probably well above my pay grade.

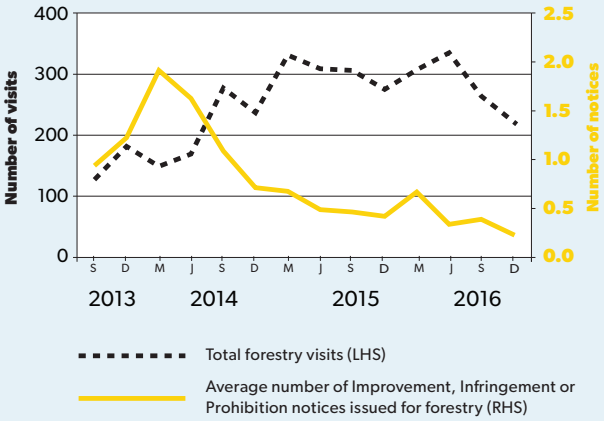
Some optimism

The final graph I will point out to you is has a more optimistic note. This graph, on the right at the top, shows the number of Worksafe visits by inspectors to forestry worksites and how many infringement notices were issued.

In late 2013 and early 2014, up to three infringement notices per visit were issued, implying that every inspector's visit found a number of serious safety problems. Over the following two years this has fallen to about one notice for every five visits. We can deduce that now, most of the harvesting sites are following the safety rules, which can only be a good trend. It does make you wonder, if there are apparently better safety practices, why the injury rate is rising.

OUTCOME OF WORKSAFE ACTIVITIES

FORESTRY VISITS AND NOTICES



A different kettle of fish

The paragraph heading is in fact the title of a report produced by Worksafe about safety in small and medium scale forests. It was produced in late 2016 but I did not find out about it and see a copy until May this year. No information about the report was supplied directly to the NZFFA.

You can probably find *A different kettle of fish* on the Worskafe website under 2016 research reports. The web link is, as usual, impossibly long for a printed magazine to use, but I can send it to anyone who asks.

Worksafe had realised that, as they say in their introduction 'small-scale forestry differs from industrial forestry in a number of ways' and so they decided to look more closely at small-scale forestry to see if they could improve matters with regard to health and safety. It has not escaped my notice that six years earlier in 2010, ACC came to the NZFFA with almost exactly the same message and a desire to improve matters before the peak harvesting of small forests began due to the 1990s increase in planting.

For the Worksafe research, I am unaware of them contacting any part of the NZFFA to help supply useful information. If this is the case, seems a bit remiss of them and probably would have saved them some government money if they had done so.

Health and safety concerns

The research for the report employed a variety of methods and the areas included Northland, Gisborne, the central North Island, Hawkes Bay, Wanganui and Otago. They looked at published local and international research, literature from other state sector bodies, consultants and forestry related associations. They interviewed, among others –

- Managers of corporate forests
- Contractors working in corporate forests
- Contractors working on small scale lots.
- Farmers who had woodlots on their farms.

Worksafe identified some main health and safety concerns –

- Verbal contracts increase the likelihood of misunderstandings, or are used to avoid health and safety responsibilities where these are seen as costs
- Harvesting small areas and steep land
- Favourable market conditions increase production pressure
- Small lot owners are a diverse group who tend to engage harvesting contractors with small crews of between one and three workers
- Most contractors are engaged to harvest a particular block and a price per tonne is agreed
- Work availability is subject to international prices of wood and fluctuates accordingly
- Achieving mechanisation for a contractor involves a significant capital investment
- The supply chain tends to be fragmented where most of the risk is borne by the smaller harvest contractors who are less likely to have health and safety systems and often work in isolated and challenging physical environments
- Wood buyers who purchase logs on truck or at the wharf gate are unlikely to have Health and Safety at Work Act 2016 Act duties.

The conclusions of the report

A number of conclusions were made as a result of the research. They are summarised below and confirm what many of us would have expected.

Participants were aware that unsafe harvesting led to injury and fatalities and thought their knowledge about safe practice was sound. Crews and contractors were, however, less likely to have any awareness of occupational health related risks. Harvesting woodlots and small-scale forestry would increasingly involve working on smaller areas and steep land.

Contractors, crews and farmers with woodlots and owners of private small-scale forests confirmed that favourable market prices led to an increase in harvesting mature stands. This increased production pressure on contractors and crews to get the logs to market as quickly as possible.

The projected increase in harvesting woodlots for the next 10 to 15 years will lead to an increase in the number of inexperienced contractors entering the harvesting market. These contractors stressed that WorkSafe would need to focus on this to ensure that cowboys were monitored and if necessary, squeezed out of the sector. All anticipated an increase in injury and fatalities

Harvesting woodlots would involve working on steep slopes and this presents greater risk for contractors and crews in terms of injury and fatality. Those working on small woodlots will most probably be ground based crews not heavily mechanised. As a result, the risks associated with breaking out, felling manually, and having crew on the ground would continue to result in injury and fatalities. However, contractors and crews thought that mechanised crews would increasingly enter the small lot harvesting sector. They faced being squeezed out by these contractors and crews who would be able to harvest more quickly and who would also be less likely to have high injuries or fatalities.

What next?

What are they going to do next based on this research? That is a good question to which I found few answers in the report. However, the following two useful sentences were in the executive summary. 'Greater guidance was needed for farmers with forests on their properties in terms of what they needed to ensure was in place before contractors came on to their property. All stressed that a template would be very helpful.' This is good and something which has already been mentioned to me a number of times. However, production of such a template is not easy. Has anyone out there some helpful suggestions?

Recent fatalities in forestry

As I have mentioned above, the data in the graphs takes us up to the end of 2016. Since then, sadly, there have been three fatalities in forestry workers this year in March, April and May. As I interpret the information, all involved men working with chainsaws on the hill. Two were working for corporate forest owners and one for the owner of a small forest.

No deaths in forest work are acceptable and we all have to continue to make sure the aim is for no deaths, and no injuries. The target is zero and nothing else is acceptable.

Julian Bateson is the NZFFA health and safety representative.

Log prices remain high and set to continue

Allan Laurie

As in my last report, the markets are being boringly repetitive and this is fantastic. For log exports, once again prices have remained mainly unchanged. During the last three months there have been price movements up and down a few dollars, but by mid-July, they were basically the same on a wharf gate basis as they were in April.

However, it is pleasing to see a good range of increases in the domestic segment. This appears to be driven by a combination of competitor export prices and local demand which has hovered between rampant and exciting. For S grade logs, sometimes called framing grade, good increases have been reported and spot prices can be found outside those in the table if the local mill is expecting to run out of logs.

Here is a summary of the factors which have affected the market over the last three months –

- Domestic consumption has continued nationally with some mills reporting unprecedented sales and many struggling for supply
- Domestic log prices have increased significantly breaking all previous records
- Canterbury demand has softened slightly signalling a saturated supply chain for housing and a swing to retail and industrial construction
- China consumption has exceeded all expectations sending a wave of positivity through this important market
- There is a very clear slowdown in logs heading to China as Canada and US sawmills target the US housing market
- Shipping costs have hit a low and rebounded two to three dollars a cubic metre now hovering in the mid to high twenties
- The India economy has gone through demonetisation, tariff imposition and now GST imposition. Following the considerable wailing and gnashing of teeth most commentators are suggesting the Prime Minister of India is on track for sustainable economic growth goals with wood fibre potentially benefitting significantly.

Woodlot harvest results

In the last market report I wrote that I would respond to requests I had from the annual conference suggesting if growers gave the Editor or myself the results of their recent harvest, we would print them. This month, for the first time, are two forest harvest results in the table below. If you really do want this information in

Approximate location or region	North King Country	North Canterbury
Distance to export port	145 km	128 km
Distance to domestic markets	Not available	115km
Distance from public road to processing areas	500 metres	1 km
Logging difficulty	Moderate, ground based	Moderate, ground based
Age of trees at time of harvest	23 years	31 years
Net stocked area harvested	5.2 hectares	26 hectares
Approximate stems per hectare	400	224
Approximate volume recovered per hectare	665 tonnes	582 tonnes
Silviculture undertaken	Pruned to 6.5 metres and thinned	Pruned to 6 metres and thinned
Nett return per hectare after all costs,	$54,868	$29,472
General overview of quality	Mostly timber belts	Wide spaced good pruned butts mostly lower quality second logs

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	125 - 145	120 - 132	114 - 122	118 - 124	112 - 118	118 - 124
S20	111 - 115	109 - 115	-	107 - 112	94 - 98	-
L30/A30	101 - 110	-	-	-	95 - 105	80 - 90
Postwood	82 - 95	90 - 100	82 - 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 (P30)	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

the *Tree Grower,* we are going to need more than two respondents in three months. Please send them in.

Just a reminder. Those sending in harvesting information will remain anonymous and areas ranging from one hectare and greater can be included. Results can be sent to the Editor or to me via the Laurie Forestry Ltd contacts page.

China market remains stable

As China runs into the hottest months of the summer, consumption has continued to exceed forecasts and is still reaching up to 70,000 cubic metres a day. Recent news out of China is very encouraging with GDP growth hitting numbers well above forecasts. Revisions by those possessed of an intelligent crystal ball are suggesting the end of year growth reaching back up to 6.6 per cent, above early predictions. This is adding to a mix of confidence and should continue to see softwood consumption rates break previous records for this time of year.

Total log arrivals in China are running at close to two million cubic metres a month after a big slowdown from New Zealand in April and May. As a result, total eastern seaboard inventory has fallen by 1.1 million cubic metres since April currently hovering around 3.5 million cubic metres and falling.

Use of radiata in China

Just in case there are any new readers out there who are wondering what happens to our logs in China and how our wonderful radiata pine logs are used. The staggering fact is that over 70 per cent of the consumption, which means over 50,000 cubic metres a day, are logs being milled into plywood and timber to hold up concrete

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

until it dries in high rise apartment construction. I have seen it first hand and it is inspiring to say the least.

In high rise apartment construction, a new story is added every four to seven days depending on the area involved. Remember also it is a round-the-clock operation, seven days a week. Five day working weeks are rare for China workers.

The first stage is to erect steel work which is not unlike scaffolding but covering the entire floor section. The second stage includes plywood being held in place against the steel work by timber. The final stage is a concrete pour. From what I have seen not a lot of nails are used nor are there large quantities of reinforcing steel.

Regardless of our western prejudices, the construction systems are cheap, very efficient and capable of using lots of our radiata pine. It strikes me that the so-called Auckland housing crisis has a potential solution if developers were able to follow the China model, perhaps with a little more steel reinforcing in the mix.

Better prices for pruned logs

As a matter of record, China A grade prices were reported at US$131 to $133 a cubic metre in the May *Tree Grower*. Current settlements are in the US$133 to $135 band with the movement in the dollar exchange rate effectively taking away any gains at the wharf gate.

Pruned log prices have firmed ahead of unpruned grades with three to four dollar a cubic metre increases across the market. Again, recovery in this segment looks sustainable with the demand strong. Shipping rates have firmed slightly but continuing to hover in the range US$25 to $27 a cubic metre. The recent plethora of vessels in New Zealand ports after dropping off irrigation pipes and palm kernel has ensured a lid on pricing.

India market continues to be interesting

After demonetisation, which is a fancy word for the removal of the 500 and 1000 Rupee notes from the currency, the revised tariff on logs has settled at 1.4 per cent of CNF value – CNF refers to the landed price in India in US dollar terms. Now Prime Minister Modi has introduced GST and has amazingly survived the experience with veiled unrest not gaining any traction, at least nothing we have heard about.

At a predicted growth in GDP of over six per cent for the next quarter, a stable currency and reforms which are widely tipped to bring India in to a very big economically exciting space it is not all bad news.

India has usually been a 1.1 to 1.2 million cubic metre a year market for New Zealand logs and some commentators are suggesting growth to three million cubic metres by 2020. This market continues to be very much 'watch this space' with several ports in the process of being opened up for the log trade. In the meantime, prices are stable to firm with recent corrections bringing India comparative cargos back in to a similar price space to China.

Domestic market hitting some high notes

The log price tables in this report reflect some of the biggest log price increases seen in the domestic market for many years, probably a record. As at mid-July –

- S grade logs up $4 to $25 a tonne
- Chip and pulp logs up $2 to $6 a tonne
- Postwood logs up $8 to $12 a tonne

There are some big variations and rapidly changing prices at present with some out-of-this-world spot opportunities around the country. It is likely the log price tables will be out of date by the time *Tree Grower* reaches you in a couple of weeks' time.

One example is a spot price quoted by one of my spies at $150 a tonne for S grade logs landed at the mill. There are stories also emerging out of the North Island of logs being shipped from one port to another to keep sawmills in logs. Another example included multiple loads a day being transported in excess of 300 km to keep sawmills supplied. Watch this space people. It is starting to get really interesting.

Christchurch demand has come off the boil due to a mix of factors. Some are saying housing has reached saturation point for the moment with developers complaining that new house buyers have suddenly disappeared. Some are saying it is winter, do not panic. There is also an apparent swing from domestic to industrial and retail consumption.

However, the love affair with steel and concrete in this segment continues. It is indeed a pity to see these steel, concrete and glass monstrosities rise out of the rubble of the earthquake in the central business district. To a forester they are something like an unsightly behemoth lacking any vestige of wood other than a token here and there – an opportunity lost.

Prices are good, stability in export sales continues and most spoken to are at peace with the world. On the assumption that a couple of world leaders do not come along and muck it up completely, it looks like we can all settle in to the easy chairs in the medium term. Therefore, it has never been more important that 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. Visit their website at www.Laurieforestry.co.nz

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Update on recent biosecurity problems

Eucalyptus variegated beetle and myrtle rust

Peter Berg

On 8 March 2016 a eucalyptus foraging beetle new to New Zealand was collected by SPS Biosecurity as part of the forest owner's levy funded surveillance programme. The insect, Paropsisterna variicollis, *or eucalyptus variegated beetle (EVB) was found in a forest near Te Pohue, inland from Napier. Subsequently a number of other sites where EVB was present were detected and it soon became evident that it was already quite widespread.*

Based upon experience in parts of Australia where the insect is native and the experience with other related species already in New Zealand, it was thought likely it would hibernate over winter – for example, in ground leaf litter or bark fissures. Preparations were made to spray around the trees, stems and foliage in infested areas with a view to attempting eradication as the insects emerged in the spring. However, new identifications in other locations continued to be made and it became apparent that the insect was not completely inactive over the Hawke's Bay winter. By early summer further surveys confirmed the insect was quite widespread.

Not a major pest in Australia

This became the first incursion to be managed under the Government Industry Agreement which the forest growing community had signed up to only a short time earlier. While initial demarcation surveys, monitoring and eradication attempts were directed by the Ministry for Primary Industries, incident governance and technical advisory committees were set up. The Technical Advisory Committee included experts located both within and outside New Zealand.

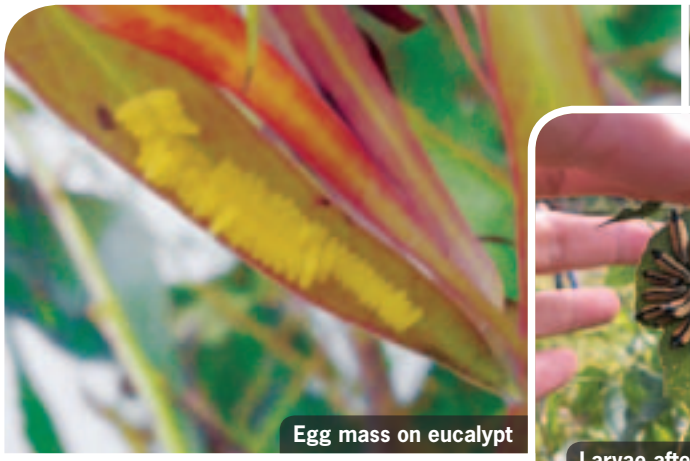
It was noted that EVB was not generally a major pest in commercial eucalypt plantations in Australia. However, related beetles do cause significant damage to eucalypt species in Australia, and other paropsine beetles such as *Paropsis charybdis* Eucalyptus tortoise beetle which are minor pests in Australia have become serious pests in New Zealand, at least partly a result of having no natural predators.

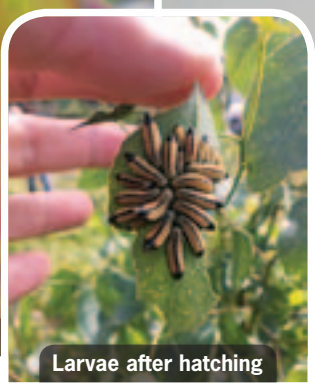
Initially found on *Eucalyptus globulus* the insect was subsequently found on a number of species such as *E. bosistoana, E. nitens* and *E. quadrangulata* which have some commercial interest – particularly the more durable species. While the extent of the damage is not consistent, in a number of cases trees are quite severely defoliated and it appears that repeated attacks could prevent trees developing as well as would otherwise be the case.

Control not eradication

By early 2017 it was evident that EVB was relatively widespread in the Hawke's Bay region and that eradication was no longer an option. Attention switched to the best forms of control and management for this pest. Among a number of proposals being considered are –

- Looking at other vectors already introduced to control paropsines such as *P. charybdis* and determining if they might also be effective with EVB. For example, a parasitic wasp *Ennogera nassaui* gave good biological control of *P. charybdis* after it was released in the 1980s, although *Ennogera* has itself become the victim of another parasitic wasp.
- Looking at other bio-control options specific to EVB
- Considering spraying in accessible situations or for larger plantations
- Improving information about preferred host species and the biology of the insect to try and find better site and species mixes to minimise the likelihood of attack by EVB. However, EVB is found in Tasmania


Egg mass on eucalypt


Larvae after hatching


Adult beetles on severely browsed eucalypt leaves

so it is not likely we will find many situations where EVB will not survive in New Zealand.

Not detected early

The entry pathway for the insect is unknown but it seems it was a hitch-hiker from Australia because other parts of New Zealand remain free of the insect. It also appears that it was in New Zealand for some time before being identified because early detection included eggs, larvae and adult insects – a breeding population. MPI have also developed an app for mobile phones which enables rapid reporting and identification of any insects found on eucalypt species. The app encourages anyone spotting insects feeding on eucalypt leaves to record them, even if they do not appear to be one of the three species profiled. The app connects to insect experts on NatureWatch NZ to make identification. NatureWatch is an online community for nature watchers, naturalists and biodiversity experts.

The full significance of this new pest to our eucalypt plantations remains unclear, and it is also uncertain what control options might be applied. However, targeted work is now being undertaken and should provide valuable assistance in the long term.

Myrtle rust

Myrtle rust was first identified in New Zealand on 3 May this year in a Kerikeri plant nursery. The rust is a fungus *Puccinia psidii*, native to tropical South America but now widely spread. As its common name implies it is a pest on many species of the *Myrtaceae* or myrtle plant family.

Airborne urediniospores released by the fungus permit rapid, long-distance spread and once established in Australia – first identified there in about 2010 – it was expected that its arrival in New Zealand was simply a matter of time. In the early 1970s poplar rust arrived in very much the same way after a period of prolonged westerly weather, being located over a period of only a few days at several locations along the west coast of the North Island.

Myrtaceae species in New Zealand include native species such as manuka and kanuka, pohutukawa, rata and ramarama. Exotic species of significance here are the eucalypts, feijoa and a range of other ornamentals.

Probably blown to New Zealand

After being first identified at Kerikeri other identification has been made in rapid succession in Taranaki, King Country and Te Puke in the Bay of Plenty. Not surprisingly the greatest incidence is in the west-facing Taranaki region. Investigation has not found obvious links between several of the introductions and this lends weight to the possibility that most and possibly all are the result of a wind-borne infection.

The plant species that myrtle rust has been detected on include *Lophomyrtus, Metrosideros, Syzygium, Leptospermum* and *Eucalyptus,* but mainly the first two. Myrtle rust has not been confirmed on feijoa. Symptoms to look out for on infected plants are –

- Bright yellow powdery eruptions appearing on the underside of the leaf in a young infection
- Bright yellow powdery eruptions on both sides of the leaf in a mature infection
- Brown or grey rust pustules – older spores – on older lesions.

In addition, some leaves may become buckled or

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twisted and die off. It is interesting that mostly younger plants are being infected. In Australia, eucalypts are affected mostly at the juvenile stage and with modest malformation resulting. However, in Brazil, larger plants and some clonal material is now being damaged.

MPI ask that if you have seen the symptoms of myrtle rust, do not touch it –

- Call the MPI Exotic Pest and Disease Hotline immediately on 0800 80 99 66
- If you have a camera, take clear photographs, including the whole plant, the whole affected leaf and a close-up of the spores and affected area of the plant
- Do not touch it or try to collect samples as this may increase the spread of the disease.

Incident control is based in Wellington. MPI is acting as the lead agency for the response with support from other central and local government agencies, industry and tangata whenua. Local coordination is based at the DOC Bay of Islands office in Kerikeri.

In New Plymouth, local coordination has been set up at the Taranaki Emergency Management Centre. Generally, destruction and removal of infected plants and their neighbours has been undertaken and surrounding the plants heavily treated with a fungicide and all areas closed off and monitored for further outbreaks.

When this article was written in late June, the most recent identification at Te Puke was the first for a couple of weeks and while in the areas so this is unlikely to mean that the outbreak has been contained. It does indicate that with with good practice the consequences of this new pest may be able to be lessened.

Peter Berg is the NZFFA representative on the levy funded Biosecurity Committee.

Emissions Trading Scheme
Register or miss out on five more years

Stuart Orme

In another six months' time, the Emissions Trading Scheme will be 10 years old and the opportunity to collect the second five years' worth of carbon will slip by if you do nothing. If you have land not in the ETS but which could be eligible, then we cannot recommend strongly enough that you make an application to the Ministry for Primary Industries as soon as possible.

The reason for the urgency is that we have some reasonably clean applications that have been with MPI for several months and yet still not processed. MPI have advised us that, unless they receive applications promptly, they may not have the time and resources to process them, let alone get them back in time for participants to answer the evidence requests that quite often arise.

In previous articles we have covered the potential benefits of the ETS. Here are a couple more points worth mentioning.

Additional carbon available through Field Measurement Approach is only available if you have more than 100 hectares registered in the ETS. Your trees may be putting on more carbon than the standard tables suggest. Therefore, if you can, it may be worth adding more land to reach this 100-hectare threshold which allows you to measure the amount of carbon actually being added by your trees.

A review of the ETS is in progress at the moment. The results will hopefully be known soon. One of the recommendations may mean, if it is accepted, that an owner will be able to get more of the 'enduring' carbon and therefore have more units available. If you have the credits you have the options.

The big opportunities that we see if you miss out on the ETS are predominantly –

- Reverting indigenous vegetation which is worth anywhere between $50 and $350 a hectare each year, depending on the value of the carbon units
- Plantings of poplar and willow which are greater than 30 metres wide on average and unlikely to be felled due to the protection purposes they were planted for
- Any plantings where land owners have previously not been prepared to engage with the ETS due to political uncertainty but now might wish to reconsider.

Stuart Orme is a Registered Forestry Consultant based in Masterton.

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.

Far North
Dean Satchell
33B Skudders Beach Rd, RD1, Kerikeri
Phone: 09 407 5525
Email: dsatch@xtra.co.nz

Mid Northland
Peter Coates
242 Nook Rd, RD 4, Whangarei
Phone: 09 436 5774
Email: pcoates@xnet.co.nz

Lower North
Nigel Price
10 Amante Crescent, Mairangi Bay
Phone: 09 478 5676
Email: nigelprice@clear.net.nz

Waikato
John Simmons
PO Box 4221, Hamilton East
Phone: 07 856 5710
Email: j.ksimmons@paradise.net.nz

Waitomo
Marion Loveridge
853 Puketarata Road, RD 4, Otorohanga
Phone: 07 873 1722
Email: jmloveridge@xtra.co.nz

Bay Of Plenty
Tony van Veen
9 Taupo Avenue, Mount Maunganui
Phone: 07 575 8235
Email: aval.vanveen@xtra.co.nz

Taupo & Districts
Kyle Brennan
238 Jay Rd, RD 2, Reporoa
Phone: 07 333 8664
Email: kyleandmadelein@xtra.co.nz

Gisborne E Coast
Randolph Hambling
PO Box 888, Gisborne
Phone 06 868 6497
Email: randham@xtra.co.nz

Hawkes Bay
Heather Holdsworth
35 Pirau Rd, RD 3, Napier
Phone: 06 879 7962
Email: tetokatrust@ruralkiwi.com

Taranaki
Bill Davies
52C Flint Road, Stratford
Phone: 06 765 8121
Email: ahouroa@farmside.co.nz

Middle Districts
Rick McAslan
27 La Lena Grove, Fitzherbert, Palmerston North
Phone: 06 357 2356
Email: r.lmcaslan@inspire.net.nz

Wairarapa
Harriet Palmer
49B Totara Rd, Miramar, Wellington
Phone: 04 973 3077
Email: harriet.e.palmer@gmail.com

Wellington
Eric Cairns
178 Mangaroa Valley Rd, RD1, Upper Hutt
Phone: 04 526 7929
Email: cairnse@paradise.net.nz

Nelson
Nancy Cowan
25 Browning Crescent, Stoke, Nelson
Phone: 03 547 5515
Email: nancyc@snap.net.nz

Marlborough
Graham Cooper
Homebrook, Maxwell Pass Road, RD4, Blenheim
Phone: 03 578 2261
Email: cooper.robinson@kinect.co.nz

West Coast
Michael Orchard
The Tree Centre, Box 80, Hokitika
Phone: 03 755 7310
Email: orchards@xtra.co.nz

North Canterbury
Gary Fleming
173 Flemings Road, RD 7, Rangiora
Phone: 03 312 9274
Email: garyfleming@xtra.co.nz

Central Canterbury
Derrick Rooney
Hororata Road, Hororata
Phone: 03 318 0763
Email: woodlot@clear.net.nz

Ashburton
Bernard Egan
47A Walnut Ave, Ashburton
Phone: 03 308 3999
Email: geegeeber@gmail.com

South Canterbury
Allan Laurie
Laurie Forestry Ltd, 22 Shearman Street, Waimate
Phone: 03 689 8333,
Email: allanl@laurieforestry.co.nz

North Otago
Scott Johnston
109 Tokarahi-Tapui Rd, 13 CRD, Oamaru
Phone: 03 432 4255
Email: sjohnston@netspeed.net.nz

Mid Otago
Chaz Forsyth
70 Evans St, Opoho, Dunedin
Phone: 03 473 8317
Email: cihforsyth@gmail.com

South Otago
Scott McKenzie
376 Hillfoot Rd, RD2, Clinton
Phone: 03 415 7193
Email: scott.mckenzie@xtra.co.nz

Southland
Roger Washbourn
130 Grant Road, RD9, Invercargill
Phone: 03 213 0968
Email: rogerw@southnet.co.nz

Southern High Country
Clif Tapper
16 Pioneer Court, Cromwell, Central Otago
Phone: 03 445 1044
Email: jill.clif@xtra.co.nz

Special interest groups

AMIGO
Kees Weytmans
114 Snowsill Road, Ormond, Gisborne
Phone: 06 862 5444
Email: kees@forestmeasurement.co.nz

Cypress Action Group
Graham Milligan
4 Level St, Dipton
Phone: 03 248 5147
Email: milliganseeds@xtra.co.nz

Eucalypt Action Group
Gary Fleming
173 Flemings Rd, Mt Grey, Rangiora
Phone: 03 312 9274
Email: garyfleming@xtra.co.nz

Farm Forestry Timber
Li Legler
93 Onekura Rd, RD2, Kerikeri
Phone: 09 407 4991
Email: lilegler@slingshot.co.nz

Forest Investors Action Group
Howard Moore
76 Spencer St, Crofton Downs, Wellington
Phone: 04 938 8060
Email: howard.moore@paradise.net.nz

Indigenous Forest Section
Julian Bateson
PO Box 2002, Wellington
Phone:04 385 9705
Email: bateson.publish@xtra.co.nz

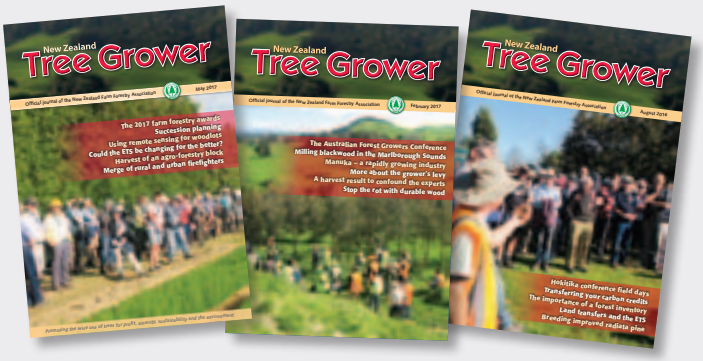
Sequoia Action Group
Russell Coker. 28 Westmont St, Ilam, Christchurch
Phone: 03 358 7211
Email: russell.coker@xtra.co.nz

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: | | | |

Name on card: _____ Signature: _____

Address: _____

Email: _____ Phone: _____ Postcode_____