Tāne's Tree Trust
Native Trees for the Future

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EDITORIAL

DOES NEW ZEALAND REALLY APPRECIATE THE HUGE DIVERSITY OF VALUES PROVIDED BY NATIVE TREES?

Mike Dodd is a scientist employed by AgResearch and based at Ruakura in Hamilton. He obtained a B. Agr. Sci. (Hons) from Massey University in 1989 and a PhD in grassland ecology from Colorado State University in 1997. Neither of these efforts have any real bearing on NZ native trees, but in recent years his research interests have focussed on the role and management of indigenous plants in pastoral farm systems. As a member of the Trust he manages the website and leads the Trust's second Sustainable Farming Fund project "Opportunities for native trees on farms".

I suppose that my first introduction to the value of native trees was as a young boy exploring the bush below my grandmother's house at Piha, west of Auckland. About half way up the hill in the Glen Esk valley was a mighty kauri with a girth of about 7-8 metres, known locally as Te Toa ("The Warrior"). The background was that during the kauri logging years it was used as a kind of pulley for hauling the huge tree trunks to the railway line, and thus escaped being felled itself. My reflections on those days were a mixture of awe at the engineering feats and efforts of the foresters and disappointment at the loss of so many forest giants.

There is no doubt that as a nation we have been very short-sighted in the management of our native forests over the last 2 centuries. So now we find ourselves in a fix – desperate to retain and protect our unique biodiversity, but conscious of the enormous potential of that biological resource. The debate over whether we can 'have our cake and eat it too' is rightfully vigorous, and the reason I am a member of the Trust is that it is one of the few organisations trying to take the positive position on this simple but age old question.

I feel compelled to take this opportunity to comment on the troubled state of our research capacity into the management of native trees for multiple outcomes. It seems to me that this type of work should be one of the highest priorities for government-funded research, for two reasons – that it involves our national natural heritage and that it is necessarily of a long-term nature, features which make it a poor candidate for industry-based funding support. But central government funders have shown little interest – what little money was available in the last two FRST rounds was dominantly directed to issues around water quality and conservation. Perhaps what is even more disturbing is that it seems to me that it is only we scientists that are squealing about the lack of funding support, and that few other sectors are voicing great concern – is this a reflection that we are no longer considered important?

Setting aside these matters, I really wanted to talk about the exciting things happening out there. The "Opportunities for Native Trees on Farms" project is one attempt to address the idea that it is possible to manage native plants for sustainable use. Our idea for this project was to tap into farmers' (the real experts!) experience and really focus on the useful functions of native trees in the context of farm systems. We wanted to know whether there really was a significant role for native plants in working landscapes, as Morgan Williams has suggested. I have been really impressed by the experiences of the farmers we have talked to in the context of the project workshops. Reflecting on what we've heard, one gets a strong impression that for most farmers, their initial motivations were largely 'conservationist', in that they sought to manage their native vegetation primarily for its own protection, and somewhat for their own enjoyment thereof.

However in the course of their learning how to do this, a whole range of secondary benefits have emerged, which in many

cases have provided the impetus to greatly increase the extent of their efforts – more fencing, more pest control, more planting. The stories from 'left field', while not necessarily widely applicable, make for good reading, and so I will note a couple. Like the farmer in Northland with a small herd of goats who decided to fence her kahikatea fragments and discovered that the value of the fleeces (now free of prickly foliage) had gone from 50c/kg to $30/kg; or the sheep farmer in Te Kuiti who has improved his lambing rate by 20% through subdividing the forest fragments to provide strategic shelter and minimise losses. I have also recently met a bull farmer in the Waikato who has quite large areas in native forest, and is convinced that he now get another 40kg LW per head on the bulls since he joined a possum control scheme to improve the condition of the forest. It is well documented that possums consume quality pasture as well as native tree foliage, but his is the first instance I've come across where that loss has made a demonstrable difference to the livestock enterprise.

These sorts of experiences emerging from the SFF project have also provided grist for the research mill, and in the last year I have been able to initiate a couple of small projects looking at the benefits of good management of native trees for farm systems. As well as trying to measure the pasture consumption of possums on a paddock basis, we have some entomologists looking at the role of native vegetation as habitat for the predators of pasture pests such as porina and grass grub, and a Waikato university student is exploring the relationship between the presence of native vegetation on farms and their capital value and marketability. Hopefully we will be able to report some useful results in the near future, through the Trust's various workshops and publications. Keep an eye on that website!!! (OK, but it's my job).

Mike Dodd

TRUST ACTIVITIES (November 2004 to May 2005)

Website:

Don't forget to check the website regularly. The discussion group facility is not being used and it would be good to get people making more use of this. Perhaps someone would like to start a controversial discussion? **www.tanestrees.org.nz**

Donations:

During the 2004/5 year donations were received from the following network members: -

S Anderson	C Barnard	N & B J A Bryant	L Burdett
P Carr	T Cumberland & C Pountney	M Doole	H Gordon
D Hammond	C Hinton	A Leadley	E Macky
A McPherson	C Paton	H Phibbs	J Spiers
J Purey-Cust	A S Steward	D White	Y Whiteley
P Whitmore	T & S Wilding	J Black	P Beaumont
R & M Haliburton	D McDonald	A Williams	

Renewal of Subscriptions:

Subscription notices for the 2005/06 year are attached to this newsletter. The Trust would be grateful if you could renew your subscription as soon as possible.

Funding:

Sustainable Farming Fund:

Our earlier project *"Opportunities for Native Trees on Farms"* is almost complete. As I write Mike Dodd is running the last of the workshops, two in the Waikato and two in Northland. The final stage will be the production of a handbook, which it is hoped will be included in the series commenced by Forest Research (and continued under its new name, Ensis) which has already brought out the totara and kauri books.

The Workshop programme has begun with the first workshops held in at Kaukapakapa and Napier last year. In May we made our first official visit to the South Island holding workshops at Gore, Rangiora and Geraldine. To date all workshops have been very successful with attendances between 50 and over 100. Feedback from all has been positive and many new members have joined from the workshops. Preliminary arrangements are underway for workshops in the lower North Island and Nelson. If you are interested in having a workshop in your area between February next year and July 2007, please get in touch with Ian Barton.

The production of a handbook about Continuous Cover Forestry for New Zealand is underway. The first draft has been gone through by three very competent editors and the second draft is being rewritten.

The "Archives" project, which is to produce a database of information on all research relating to the planting of native trees, has also begun. The database itself is now complete and has been tested while Tony Beveridge, Andrew & Mary McEwan and Peter Allan are beginning to search Ensis records and those held by Archives New Zealand at Auckland, Wellington and Christchurch. A notice about this project can be found elsewhere in this newsletter.

The project, which we are most anxious to get off the ground, is "*Interactive information database system for establishment and management of native timber plantations* "This is a system to record all native tree plantings on the database system run by Ensis. Unfortunately our February 2005 application to fund this has been turned down by the Sustainable Farming Fund. The Trust will now begin seeking funding elsewhere. Despite this setback we are still asking those who are involved with planting natives to make contact with the Trust. David Bergin (Ensis), who will run this project, is keen to build up a preliminary list of what is available around the country.

Membership:

Membership has now reached 220, of which 24 are corporate members. Membership has been boosted by people who have attended workshops deciding to join. Existing members are urged to tell others, who may be interested, about Tane's Tree Trust. The Trust brochure, which will be updated and reprinted later this year, is available to anyone who would like copies to distribute.

Trustees:

Three Trustees will stand down next November. They are Warwick Silvester, Mark Dean and Peter Berg. However they are eligible for reappointment. This process will begin at the 2005 AGM. (See AGM notice enclosed with this newsletter)

Strategic Plan:

The current Strategic Plan covers the period April 2004 to March 2007. Of the 19 key performance targets to achieve; 21% have been achieved, 47% are underway and 32% have not yet begun.

KYOTO AND THE FUTURE FORESTS PROGRAMME

This project, announced by Climate Change Minister, Pete Hodgson, a year ago, provides the opportunity for landowners to gain financially from internationally tradeable carbon credits by re-establishing permanent forests.

Ian Barton and Peter Berg attended a meeting in Christchurch in April where the staff of MAF's Indigenous Forestry Unit outlined the work done to date. While there are still a lot of issues to be resolved it is currently proposed that landowners will be able to register from late 2006. There is still a great deal of work to be done with the details of this project. The first step will be making submissions to the "Climate Change Response Amendment Bill 2005". Submissions to the Commerce Select Committee close on 13 June and the Trust will be involved in these. At this stage it is anticipated that landowners will be able to harvest timber from their forests on a continuous cover basis.

More information will be made available as it comes to hand.

A.G.M JULY 30 2005

This year's A.G.M. will be held at Waiau Pa in Franklin District. An agenda is included with this newsletter. On the back of the agenda is a map showing routes from the Motorway to Waiau Pa. In the afternoon we will be visiting Whitecliffs Reserve, about 4 km away, where Greg Steward has trial plantings of puriri and several other native species, all established using nurse plants. This is an excellent trial and not to be missed

TIMBER TREES OF THE FUTURE

MANOAO -Silver pine- (Manoao colensoi) -by Ian Barton

HISTORY

Manoao has had a varied history as far as its name is concerned. Originally called *Dacrydium westlandicum* its name later became *Dacrydium colensoi*, then *Lagarostrobus colensoi*. A taxonomy revision in 1995 resulted in its present name.

As far as can be ascertained it was little used by the Maori; despite the high durability of its heartwood. This attribute was highly prized by Europeans who used the timber for posts, poles and sleepers during the early days. Latter-day uses are also in this area although it is now being appreciated as a high quality furniture timber.

DISTRIBUTION

The species ranges over most of the country from just south of Kaitaia to as far south as the Arawhata River in south Westland. But it is only common in Westland between latitudes 41^{o} 50' and 44 ^{o} South, up to an altitude of 500 metres. It is normally found in areas of high rainfall and on poor, poorly drained, soils where it has little competition from other species. However it grows best on deep, fertile, well-drained soils. It is one of the few native timber species able to propagate itself by root suckers.

TREE SIZE and GROWTH

It grows up to 15 metres tall and one metre diameter but is usually somewhat smaller. Growth rate is normally very slow –in the region of 0.6 to 1.7 mm of diameter annually. However, although no trial data is available, there are indications that it will grow much faster on sites that are drier than the boggy areas where it is normally found.

TIMBER

Manoao timber is classed as very durable. It is yellowish / white in colour and sometimes mottled. It is straight and even in the grain, dense, firm and compact. Abundant white crystals on the surface of the seasoned wood are the origin of the name "silver pine". However this makes the wood difficult to paint and varnish. Timber characteristics, with *P. radiata* figures shown in brackets for comparison, are as follows: -

Density @ 12% m.c	610 kg/ m^3	(500 kg/m$^{3)}$
Moisture content: green	65%	(130%)
Tangential shrinkage -green to 12% m.c	3.3%	(4.7%)
Radial shrinkage	2.0%	(2.2%)
Modulus of rupture	61 Mpa	(90 Mpa)
Modulus of elasticity	6.4 Gpa	(9 Gpa)

DAMAGING AGENCIES

Manoao is a hardy species with no known fungal or insect diseases. It is very prone to fire damage

POTENTIAL

The species is worthy of study because of its durable attributes. It is also, along with pink pine (*Halocarpus biformis*), the main source of the chemicals manool and manoyl oxide, which are used as substitutes for ambergris in the perfume industry. As far as is known there have been no attempts to grow manoao commercially for this purpose.

RESEARCH REQUIREMENTS

Trials with manoao are urgently needed to determine whether it can be grown at rates which are faster than it attains in its natural habitat. Its potential as a producer of valuable chemicals and a very durable timber makes it an ideal candidate for consideration by those interested in growing native species commercially.

REFERENCES

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Clifton N C	1990.	*New Zealand timbers*
Farjon A	2001	*World Checklist and bibliography of Conifers* (2nd ed) Royal Botanical Gardens, Kew
Hinds H V & Reid J S	1957	*Forest Trees and Timbers of New Zealand*. Govt Printer Wellington
Howard A L	1948	*A manual of the timbers of the world.* MacMillan & Co, London

CONTRIBUTIONS FROM MEMBERS

It is always good to be able to publish details of the results of members work and anyone who has experiences to share is encourage to write them down and send them to Ian Barton. The following article is the second we have published.

Natives Trees for Timber and other Uses at Tinui in the Wairarapa

Allan Levett

The objective at Tinui Forest Park is to create a sustainable forest of diverse species that could provide a full income in perpetuity once harvesting of the first crop begins in a few years. Natives are playing four different roles within that vision:

- Medium-sized trees such as Pittosporums are used as nurse plants within stands of oaks and *Acacia melanoxylon*. These were suggested by Eric Appleton as they complement the shape of the oaks and reduce epicormic growth;
- Low-growing Hebes, Coprosmas, flaxes and toe toe are being planted as a firescreen along a busy road fence-line to protect main crop cypresses, redwoods and pines;
- Totara, kahikatea and Pittosporums are planted along stream beds that dry out in the summer, to add diversity to existing manuka/kanuka, Coprosmas, Pseudopanax and mahoe; and
- Totara and *Nothofagus solandri* are being planted in two 1-2 hectare blocks for eventual timber. Around the edges and here and there within the main crop trees, mixtures of other timber trees are also inserted, including: black maire, rimu, kahikatea, rewarewa, tawa, titoki, kohekohe, and red and silver beech. Others such as miro, matai and hinau will be added. (Not too far away a small stand of 35 kauri has been planted on a sunny ridge on the edge of a steep valley containing 7 hectares of regenerating bush.)

In general, there have been few problems establishing the natives of the first three categories on what was relatively open, exposed farmland. Spots are sprayed before planting and the plants are release-sprayed for two more years. But establishing the main crop trees has proved more difficult.

Tinui is about 25 kilometers from the coast at Castlepoint and 45 kilometers northeast of Masterton. The soil is mainly crushed argillite and mudstone, and the yearly rainfall is usually about 850mm – though averaging over 1200mm in each of the past two years. It is generally wet in winter and dry in summer, except recently when it seemed to have been wet most of the time! The prevailing wind is from the northwest but cold south easterlies are prevalent during winter months.

The land is steep in places and on the exposed rolling country, is marked by the ancient pits and mounds widely seen on the North Island's east coast. Patrick Grant in Hawke's Bay Forests of Yesterday, says they were created by excessive gales in earlier centuries, the most recent 350-450 years ago, which destroyed much forest. Grant describes mixed podocarps, and less frequent beech forests that grew in northern Wairarapa until milling began late in the nineteenth century. While rimu, kahikatea, totara and matai dominated, there was a greater diversity including tawa, rewarewa, black beech, miro, hinau, titoki, maire, rata, nikau, kowhai and many smaller species.

These are the likely forests that existed further south and were milled in the Wairarapa with many ups and downs from the 1860s until the 1920s. Totara, rimu and matai are the only timbers specifically mentioned in Bagnall's brief section on saw milling in his more general history of the Wairarapa. However there were no mills in the Tinui area nor toward Castlepoint and the local contractor says that there are no stumps on what is now farmland or radiata pine forest. He says that in the nineteenth century the land was covered in manuka, kowhai and other low-growing species. Perhaps on this exposed hill country the larger trees reported elsewhere were wiped out by devastating gales and fires, which Patrick Grant says occurred in Hawke's Bay in the seventeenth century, and there was no re-growth. The exception is totara, the evidence for which is still to be seen in old fence posts and battens.

The Tinui Forest Park property consists of 306 hectares on a north-south strip of land about four kilometers long, of varying width around one kilometer, running parallel to and up to the top of the Tinui Taipo range on the western side. This distinctive landmark is of upstanding sandstone blocks. On the steep eastern side, in our property, are about 36 hectares of regenerating bush. In 2001, Pat Enright of the Wellington Botanical Society identified plants in this bush and elsewhere in the Taipos. Pat found four main trees, rimu, totara, matai and kahikatea, three kinds of cabbage tree, 51 other species of trees and shrubs, 10 lianes, 60 different ferns, 24 orchids, 12 grasses 20 sedges, 8 rushes and 74 various flowers and other composites – an amazing variety. As well, Pat identified 61 exotics in the above categories, among them too many radiata pine wildings, and 22 different birds including tui, bellbird, kereru, kotare, pukeko and a host of introduced species.

It was easy to decide on totara as a main timber crop. Totara trees, none seemingly older than about 80 years, are scattered throughout the property. Seedlings continue to appear near clumps of manuka/kanuka, within the 36 hectares mentioned above and in two 7 hectare steep blocks of regenerating bush elsewhere, that are being left. As well there are still totara posts and stakes in the older fences. By way of experiment we planted two small copses of bare-rooted totara stock near some of the older individual trees at the back of the property, four and six years ago. This was before David Bergin's excellent bulletin, Totara Establishment, Growth and Management, became available. Our spacing was too wide. Where sheltered, the young trees have put on height and girth but have produced branches and prolific multiple leaders and will have to be pruned.

As the main site for our native timber trees we decided on a 4-hectare paddock at the road entrance to the property. This is a south-eastern slope from a south-north ridge. The upper half had to be cleared of a few big eucalypts and many wattle trees, of two kinds, and their many brittle branches which had broken off and were lying on the ground. The rest contains strong-growing grasses as well as tussocks in the damp patches.

On the upper slopes there is one main clump of 32 totara and a few individual trees scattered further away. They range in height from 6 to 12 meters and in diameter at breast height from 12cm to over 50cm. Two years ago the trees were pruned to 3-4 metres, at which point many of them fork into double and triple leaders. We have cut a track along the middle of the slope thereby creating two areas, the upper half for totara and other podocarps, the lower half of open pasture mainly for beech, which does not mix so readily. Part of the lower area has been fenced, and we began planting there in 2001. The rest of the paddock continued to be grazed until this year.

During these years extensive main planting of exotic species was carried out elsewhere in the property and energy was spent in developing the native's area to get it ready, mainly clearing and track work. Planting has been limited to about 120 plants per year until this year when more extensive planting will be undertaken.

In the autumn of Year 1 we spot-sprayed just below the new track, that is along the upper part of the lower area, and planted in July. It was open ground. The plants consisted of 60

black beech, over a metre high, in PB5 planter bags and a dozen black maire, both from a native plant nursery near Masterton. Each was planted next a nurse plant, including ribbonwood, Pittosporums, Olearias and Coprosmas. The spacing was about 2 metres. Surprisingly, while there was over 90% survival of the beech and maire, there was much lower survival rate among the so-called nurse plants.

In Year 2 we planted beech and nurse trees further down the slope where the ground remains wet and frost-prone most of the winter and growth of the grasses and tussocks is more vigorous. When purchased, the beech were just as tall as those of Year 1 but had less developed root systems in PB4 bags and were quite spindly. Unfortunately they experienced a wet winter, a lot of wind and late frosts. We staked and tied many but even so most of them, and virtually all of the nurse plants, succumbed.

In Year 3 we began some autumn planting of black, silver and red beech in root trainers, plus nurse natives and black alder, and experimented with 600mm high, 150mm square, plastic tree protectors and bark mulch. The total cost was about the same as before. Of course the beech were smaller than earlier plantings, but (of those in the protectors) a high proportion survived. Silver beech had the highest rate of survival. As well they were easier to spot spray in their second year and fewer nurse trees are required. On advice from John Wardle, who grows black beech in mid-Canterbury, and whom I met briefly at the Wellington NZFFA conference in 2003, the nurse trees are now planted as a kind of hedge to protect against wind.

In Year 4 tree protectors were used with all beeches, black and silver, which came in PB3 bags, so the cost was high. Plants from root trainers inside the protectors are more subject to weeds and branch sprouting without a clear leader. Few other plants were used. The spacing has been extended to 2-3 metres. Autumn planting, when the ground is still warm enough for root growth, is thought to give the plants a chance to get established before winter, and also to be well-established in the event of a subsequent drought. There were still about 15% losses in Year 4, more where no protector was used. The soil is very cloggy and seems to hold a lot of water. It appears that most trees died where they were planted in the wettest sites and after frosts, which lingered in the coldest parts of the winter.

This year so far we planted about 100 black beech in the autumn, from PB3 bags and each with a protector. At a cost of $7 per plant, this is the most expensive planting rate to date. In addition we have form pruned some of the earlier plantings, especially the maire, where double leaders had developed. In the winter we will plant 250 bare-rooted totara in a relatively sheltered site without tree protectors, at $1.90 each, and about the same number of nurse Pittosporum, which we have grown ourselves from seeds. These will be planted in alternative rows, at 2m spacing. There is also a small gully in this area in which we will plant about a dozen each of rimu, matai and kahikatea.

In future, where necessary, we should be able to start re-using the tree protectors first purchased in Year 3. While the protectors make it easier to spray, as noted above, weeding is still required inside the protectors for at least one year, and if the plants are small to start with, form pruning until a main leader appears above the top. At the same time we will avoid all wet areas and increasingly, because the sites will be more sheltered, try to plant without protectors.

We have used tree protectors with tawa, rimu, karaka and kahikatea but not with rewarewa and kauri, all planted in the lower area somewhat apart from the beech. Kahikatea and kauri have proved to be the best survivors. The main task to date has been releasing each year, and sometimes twice yearly. In addition we have had to form prune the kauri, some of the small beech from root trainers, the maire and the larger beech planted in Year 1 and now 3 metres tall, to encourage a single leader.

The main crop planting of exotics at Tinui Forest Park will have been completed for the time being this year. From now on more time, a little more money, and some useful experience will be available to tackle more extensively the expensive business of planting natives for timber on the open pasture land.

NOTICES

FUTURE WORKSHOPS

Our funding from the Sustainable Farming Fund will allow us to run about 18 workshops around New Zealand over the next three years. Five have already been held and planning has begun for others in the Lower North Island and Nelson. If you are interested in having a workshop in your area please contact the Chairman.

Ian Barton 09 239 2049 or e.mail ibtrees@ihug.co.nz

INDIGENOUS FORESTRY ARCHIVES

Tane's Tree Trust has been granted funding from the Sustainable Farming Fund to create a database which will hold references to all research involving the growing of indigenous species. The Trust will be searching archival records held by Archives New Zealand, Ensis, the Macmillan Brown Library and other institutions which may hold data.

We have anecdotal evidence which suggests that, at the dissolution of the Forest Service, many staff saved material which would otherwise have been lost and may still hold this. Alternatively, retiring officers may still hold material that they were working on.

The Trust would like to hear from any person who holds indigenous research data, or knows of others who do. We are interested in recording this information and discussing its future care and storage.

Please contact Ian Barton at <ibtrees@ihug.co.nz>; telephone 09 239 2049 or write to 40 Isabella Drive, PUKEKOHE 1800

PUBLICATIONS AVAILABLE

The following are available from Ian Barton

Back numbers of Newsletters 1, 2, 3, 4, 5 & 6.	$1.00 ea
Proceedings of the launch of Tane's Tree Trust (first copy free)	$6.00
Trees, Timber and Tranquillity Lindsay Poole's autobiographical book	$20.00
Tane's Tree Trust brochures (free copies to pass to others)	No charge
Totara: Establishment, growth and Management by David Bergin (first copy free to members)	$15.00
Kauri: Ecology, establishment, growth and management by David Bergin and Greg Steward (first copy free to members)	$15.00
Native Trees: Planting and early management for wood production by David Bergin and Luis Gea. (first copy free to members)	$15.00
Indigenous Forestry: Sustainable Management. MoF & NZFFA (212p)	$25.00
Performance and tree health of a six year old planted kauri stand in the Bay of Plenty by Greg Steward & Ian Barton (first copy free to members) Tane Tree Trust Bulletin No. 1	$3.00

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Tane's Tree Trust is indebted to Ensis for assistance with the printing and mail out of this newsletter.