

KAHIKATEA IN URBAN CHRISTCHURCH

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Introduction

Many Christchurch residents and visitors will be familiar with the kahikatea trees at Riccarton Bush, or seen on trips to the West Coast, but what about planted kahikatea in the urban area? *Dacrycarpus dacrydioides* (syn. *Podocarpus dacrydioides*) has been studied intensively since the 20th Century, but most of this work was conducted in primeval settings, such as South Westland or modified remnant stands in the Waikato as well as here in Christchurch's Riccarton Bush.

The coning/fruiting behaviour of wild trees is well understood, being typical of all conifers in being wind-pollinated. However, the species has fleshy, bird-dispersed pedunculate "fruit" (rather than woody cones), and exhibits dioecy, that is, separate male and female plants in the population, which is unusual in conifers but widespread among flowering plants, especially in New Zealand. In spring, male trees produce pollen-bearing cones called strobili that shed their pollen in large quantities on windy days to pollinate receptive ovules on neighbouring (female) trees. The ovules develop slowly through the growing season with the seeds swelling first, followed by the fleshy peduncle, which enlarges and turns a bright orange or red in April and May. In autumn, female trees can be a spectacular sight with flocks of birds gorging on the fruits, although some years are better than others.

With the growing interest in encouraging native birds back to the city, I am curious to see what the planted trees across the city are doing in terms of fruit set, factoring in that all planted kahikatea in the city are relatively young (probably all less than a hundred years). Many of the kahikatea are at the ricker stage – a long adolescence with juvenile lower branches and adult foliage above. Most trees covered in this article have only begun to commence coning in the last 25 to 30 years with some plants only beginning this year!

Another factor to bear in mind is that kahikatea has never been popular as a garden subject. It has a reputation as a large tree, not immediately attractive, and tricky to establish in public areas, so the total number of reproductive individuals is going to be small.

My questions are as follows: Where are the planted kahikatea located, and given the dioecious characteristic (male and female trees), which ones are

fruiting? What is the age and general condition of the planting, and the surrounding vegetation or environment? Lastly, are there any options for protection and expansion, i.e. enrichment planting?

Methods

The sudden appearance of waxy grey seeds on cultivated trees over the damp January of 2016, prompted me to map and assess locations of urban planted kahikatea, so in late February 2016 I set off with notepad and binoculars to establish a basic survey. The survey began in the north of Christchurch in the Belfast/Groynes area, and finished at Halswell Quarry in the south.

Reference was made to a number of sources, including Molloy (1995), the website of the VC Browne Aerial Photography collection for visual dating of post-WWII residential areas of Christchurch, and Dawson and Lucas (2011). Each location was numbered, with trees assessed for approximate age, sex, and condition, and a note made of the surrounding environment. As noted below, some trees could not be assessed as female (during the late summer period) nor as male (as young strobili develop over late September and October).

Trees were easy to find due to their distinctive upright appearance, and, having seen these trees in the 1990s, I went to those trees first and “filled in the gaps” afterwards. Nonetheless, many trees could have been missed, especially streamside trees in the Fendalton/Ilam area and hillside suburbs. Many trees are widely scattered and separated by many kilometres.

Tall trees emergent above a canopy were inspected for fallen fruit, or viewed for fruiting with a pair of binoculars. Condition assessment was subjective and based on apparent absence of damage, shape of crown, and foliage density. Recently planted, juvenile trees (usually under 20 years of age) with no reproductive structures were excluded. Because the focus of this article concerns planted trees, kahikatea in Riccarton Bush were also excluded.

Sizable trees lacking reproductive structures were seen at Millbrook Reserve (1950s), Somerfield Primary School (1960s), 388 Harewood Road (early 1960s), 10B Butler Street (1970s), 59 Brockworth Place (1970s), 60 Oxley Street (1980s), 471 Ferry Road (1970s) and 16 Dilworth Street (mid 1980s). Declining trees were seen at 474 Barrington Street (1960s) and Victoria Square (late 1980s or early 1990s). These are not dealt with further in this survey.

Results

After much driving through the detours and roadworks of post-quake Christchurch, it became clear to me that three broad categories of planted kahikatea can be seen (Table 1, p. 53).

Group 1: Early plantings of the affluent

These are the first plantings of kahikatea in Christchurch, established in the early part of the 20th Century from about 1900 to 1940. These are now large, bushy, often multi-leadered adult trees. Some were in prolific fruit in February 2016. They were also in relatively good condition except for one in a grove planting in Banks Avenue, Richmond that was affected by earthquake-induced subsidence. Most of these trees were in areas close to water either as lawn specimens or as part of an ornamental shrub planting (e.g. with gunneras, rhododendrons, etc.) demonstrating an early understanding of the environmental preferences of this species. The largest two trees were found in the New Zealand Section of the Christchurch Botanic Gardens, followed by four good trees at Ilam Homestead gardens, Banks Avenue, Glandovey Road, Ernle Clark Reserve and Ashgrove Terrace Reserve. All of these locations are, or were, large affluent garden developments (the Botanic Gardens being public), displaying ferneries, water gardens and “bush plantings” for beauty and scientific enquiry.

Group 2: Forest plantings in suburbia

This group consists of trees established through the long boom of suburban development from 1945 to 1985 in a variety settings. These trees have thin, slender upright crowns typical of the young adult stage of growth. Most are in private gardens of the 1960s – 1970s usually grouped with other indigenous species (especially tree ferns, beech, lancewoods or other podocarps), the property owners perhaps wanting to recreate a slice of “the bush” in suburbia when environmental awareness was a growing but peripheral interest. A stocky (recently decapitated) female tree from the 1970s covered in fruit can be glimpsed at a Greers Road property opposite the Papanui Substation, while a slender male tree on Main North Road opposite Saint Bedes College (1960s) is in slow decline after having two driveways widened around it. A male tree from the 1970s at Stanbury Avenue is dying rapidly from house and paving repairs. Numerous healthy (and prolifically fruiting) trees can be seen around the University of Canterbury campus, especially alongside the von Haast (Geology and Biology) building and also the Ngaio Marsh Theatre, which is currently being demolished. These trees were part of extensive native themed landscaping needed for softening the “brutalist” concrete, multi-storey buildings and open spaces of a new suburban campus. A male – female pair of kahikatea with good fruit, was an unexpected find by the wastewater pumping

station on Bridle Path Road next to the Ferrymead Reserve. The most beautiful of the plantings is a grove of five trees from the late 1960s on the riverbank in the New Zealand Section of the Christchurch Botanic Gardens, best seen from the Pinetum (Riccarton Avenue) side of the Avon River.

Group 3: Planting for the environment

Kahikatea in this group planted from about 1985 to the present make a significant departure in scale from previous plantings. Environmental awareness in the wider community was growing at this time and concerned residents are still planting kahikatea in private gardens, but in far fewer numbers than in the previous decade, e.g. at Dilworth Street, Ashgrove Terrace and Brookside Terrace. A much larger number of kahikatea have been planted on public lands, usually as part of a community led conservation project, stream bank restoration plantings, or other resource management obligations associated with subdivisions or retail development. Sourcing of seeds from Riccarton Bush became standard practice by the mid-1990s.

Despite the huge increase in numbers, the condition of plantings in this group is decidedly mixed. Excellent healthy stands at Ilam Homestead, Erica Street Reserve and the Botanic Gardens are fruiting well, compared to the scraggly wind-blasted or herbicide-distorted trees at Halswell Quarry, Roimata Reserve and Huntsbury Shops. In other cases, competition from surrounding grasses, flax bushes and even blackberry has retarded growth, e.g. Styx River Arbor Day Plantings (1990), Cashmere Stream at Westmorland (1994), Travis Wetland (2000) and Papanui Stream (2003). The most surprising plantings of kahikatea are a group along the multi-storey car park on Sissons Drive, behind Northlands Mall (from 2003).

The future

Not surprisingly, the earthquake sequence of 2010 – 2011 has put a halt on further significant riparian plantings in Christchurch as drainage infrastructure and city finances are reassessed. Massive changes to housing stock could put some trees at risk although most public trees should be safe. Dozens of juvenile and sapling trees planted around the University Campus, the Botanic Gardens, Travis Wetland, the Groynes and elsewhere, have not yet reached reproductive age, so we can expect noticeable increases in kahikatea fruit production over the next ten to fifteen years and beyond.

To conclude, Christchurch's planted kahikatea have started from experimental plantings in wealthy collectors gardens through to the ambitious modern wetland/conservation-led public plantings of today.

Large, long-lived native conifers such as kahikatea, totara and matai (referred to as the “Noble Natives” by Colin Meurk!), are considered desirable alternatives to the faster growing but often short-lived native shrubs and grasses commonly used across Christchurch.

The benefits of keystone species, with their bulk, longevity and massive fruit resources for sustaining wildlife are all appreciated in an increasingly built-up city. To achieve optimum results, protection of the current older planted kahikatea is vital and more attention must be paid to better siting and maintenance of younger plants, whether they be along riparian strips or as street plantings. Opportunities for planting kahikatea groves/mixed stands in the Residential Red Zone, Cranford Basin, Halswell Ponding Area and other projects around the city appear to be the next layer of the city’s planted heritage.

I hope readers may take the time to track down these precious slow-growing trees and view them as pockets of wilderness in the midst of the city.

Postscript

As this article went to press, hitherto unnoticed specimens of kahikatea have come to my notice, including a tall 1950s, prolifically fruiting, tree at 86 Fisher Avenue, while a dark, dense 1950s (?) tree was spotted on a rural property along Marshlands Road.

Two female trees at the University of Canterbury Student Union Building have been swept away by bulldozers, and two healthy trees at a vacant (1950s?) property in Hinau Street await their fate. Reassuringly, numerous young trees have been planted at a commercial property on Prestons Road and sizeable kahikatea grace the new Canterbury Earthquake Memorial.

Acknowledgements

I am appreciative, firstly, of the various residents who kindly allowed me to visit their properties (often at short notice on weekends!) to view their trees in a variety of garden settings. They include Chris and Geraldine Wilson, Adrienne and Cameron Moore, Dee McCrea, Mike, Olivia and John Nicolle, and Bob Crowder. Thanks also to my colleagues at the Christchurch Botanic Gardens for help in developing this article from a loose idea to reality, including John Clemens, Trevor Partridge, Sue Molloy, and Richard Poole, Dean Pendrigh with word processing and formatting assistance, and also the numerous trainees and volunteers who worked with me to “hear out” my initial ideas and drafts whilst at work.

References

Molloy BJP 1995. In: Molloy, B (Ed.) Riccarton Bush: Putaringamotu, natural history and management. Chapter 15, pp 216 – 224. Riccarton Bust Trust, Christchurch.

V.C. Browne Aerial Photography website:

<http://www.vcbrowne.com/VCBHome.aspx>

Dawson J, Lucas R 2011. New Zealand's native trees, pp 56-61. Craig Potton, Nelson.

Table 1 Kahikatea tree locations and information.

Tree #	Address	No. female	No. male	Planting period	Condition	Environment
Group 1: Early plantings of the affluent						
18	22(?) Banks Avenue	2	1	1930s	Excellent (generally)	Listed trees with stickers visible, on streamside with prolific weeds and grasses including bamboo
19	11 Glandovey Road	1		1900-1930s	Excellent (prolific fruit)	Listed tree, on streamside, diverse riparian/ornamental plantings under old cabbage trees, copper beech, rimu, and kawaka
20	15 Glandovey Road	1		1900-1930s	Good	Streamside tree with diverse herbaceous perennials, ferns, and shrub plantings
28	Ilam Homestead, University of Canterbury	1	3	1900-1930	Excellent (tall buttressed trees)	Among diverse ornamentals including rhododendrons, azaleas, southern rata, rimu, totara, and tree ferns
33	Christchurch Botanic Gardens		1	1930s-1940s	Excellent	Diverse native plantings of kauri, rimu, tree ferns, and kowhai
34	Christchurch Botanic Gardens	1		1900s-1930s?	Excellent (prolific fruit)	Pondside lawn specimen, mown grass with large kauri and lime (<i>Tilia</i>) trees
43	Ernle Clerk Reserve	1	2	1900s-1940	Fair to good	Riverbank footpath, three-cornered garlic, <i>Tradescantia</i> , ivy, sycamore
50	Ashgrove Reserve	1		1930s?		Former private native garden, among diverse tree plantings, <i>Knightia</i> , <i>Sophora</i> , <i>Olearia</i> , <i>Fuscospora</i> spp., totara

Tree #	Address	No. female	No. male	Planting period	Condition	Environment
Group 2: Forest plantings in suburbia						
1	845 Main North Road	1		late 1970s	Fair	Driveway shrubs and perennials
2	Groynes Reserve	7	3	late 1970s	Excellent	Grove planting beneath crack willow canopy with tree ferns, karamu, pittosporums and brambles
5	199 Main North Road		1	1970s	Fair to declining	Gravel driveways and remnant ornamental shrubs
6	Harewood Nursery, Gardiners Road	8	5	1980s	Excellent in an avenue planting (dense crown development)	Gravel driveway with mown grass
8	11 Leander Street	1	1	1970s	Good to fair	In native rock garden/shrubbery
10	365 Greers Road	1		1970s	Formerly excellent (heavily fruiting)	Next to driveway and drainage ditch among lancewood, and variegated pittosporums, now badly pruned
13	180 Wairakei Road	1		mid-1960s	Excellent	Next to patio fencing with diverse ornamental shrubs and palms
14	157 Brookside Terrace		1	1970s	Fair	With rimu, ferns and kowhai
15	Burnside High School	1	2	mid-1980s		In car parking and courtyard areas with bark chips

Tree #	Address	No. female	No. male	Planting period	Condition	Environment
16	Crown Land, New Brighton Road	1		early 1970s	Declining	Former residential planting now highly modified with mown grasses and disturbed soils
17	Crown Land, Kingsford Street		1	late 1970s/80s	Declining	Former residential planting now highly modified with mown grass and disturbed soils
21	77 Fendalton Road	2		1950s	Excellent	Diverse ornamentals, neighbouring property with lancewoods, kauri
22	University of Canterbury Halls, Maidstone Road		1	early 1970s	Good	Along driveway
24	University of Canterbury, Geology/Biology Block	5	2	late 1960s-early 1970s	Excellent to fair	Among diverse native tree and shrub planting
25	Okeover Stream (University of Canterbury School of Forestry)	3	3	early 1970s and late 1990s		Among diverse native bush/riparian landscaping
26	James Hight Library, University of Canterbury		1	mid-1970s	Good	Along foundation walls with nikau, tree ferns, rengarenga, and fierce lancewoods
29	University of Canterbury Students Union	2		early 1970s	Excellent	Among azaleas and groundcovers, now modified following demolition of former Union building
30	University of Canterbury childcare building		2	1970s	Excellent	Dry site with bark chip

Tree #	Address	No. female	No. male	Planting period	Condition	Environment
31	Mona Vale Gardens	1		1960s-70s	Good	Lawn specimen on very compacted, dry riverbank with mown grass, copper beech, and gunneras nearby
32	Mona Vale Gardens	1		1970s	Excellent	Diverse native plantings of kauri, rimu, tree ferns, and kowhai
35	Christchurch Botanic Gardens	3	2	early 1970s	Excellent (prolific seedlings in leaf litter)	Riverbank mown turf, diverse groundcovers/shrubs (only place where surviving seedlings seen)
37	Woolston Park	1	2	1960s	Fair to poor	In mown turf among coastal native plants, <i>Olearia</i>
38	Bridle Path Road	1	1	late 1960s	Fair	Among coastal native plants, ngaio, karo
40	112 Warren Crescent		1	early 1970s	Excellent	Kauri, golden totara, and ferns
41	39 Maryhill Avenue	1		1970s	Excellent (prolific fruiting)	Among North Island kowhai, red and silver beeches, lemonwood, cabbage trees, juvenile kauri, ivy
44	48 Stanbury Avenue		1	1980s	Fair/ declining	Flowering cherry, acanthus, paving
45	32 Thorrington Street	1		1970s		Mown turf beneath sycamore and elm
Group 3: Planting for the environment						
3	Styx Basin Reserve (west)	1		early 2000s	Fair	Among dense brambles and grey willow

Tree #	Address	No. female	No. male	Planting period	Condition	Environment
4	Styx Basin Reserve (east)	5	2	1990 for Sesquicentennial Project	Good to fair	Among dense brambles and grasses
7	Travis Wetland Reserve (southwest corner)	1	1	early 2000s	Fair	Among dense riparian/bush plantings and mown grass
9	Sissons Drive, Northlands Mall	2	1		Good	Among pittosporums, flaxes and rushes in artificial swale wetland alongside multi-level car park
11	Erica Stream Reserve	2		mid-1990s	Excellent (good fruit set)	Streamside with <i>Carex</i> , flax and bush plantings under light canopy of willows / eucalypts
12	Papanui Stream	1	1	early 2000s	Fair	Streamside with dense riparian sedges and flax
23	Okeover Stream (University of Canterbury, School of Engineering)	2		late 1990s	Fair to good	Among reeds, rushes and flax
27	Avon River University Drive	3	3	early 1990s	Excellent	Among riparian sedges / mown grass, responding well to the removal of overhanging willows and poplars
36	Christchurch Botanic Gardens	2	2	2004 (by author)	Excellent to fair	Riverbank mown turf, <i>Carex</i>
39	Upper Heathcote Reserve	1		mid-1990s	Fair	Riparian bush with crack willow and weeds

46	King Edward Reserve	3	2	1990s	Fair-poor	Rank grass, <i>Convolvulus</i> , pittosporums
47	Huntsbury Shops / Farnley Reserve	6	5	late 1990s	Excellent to fair	Riverbank footpath, mown grass/weeds
48	43 Cashmere Road		1	early 1990s	Excellent	Diverse ornamentals including rhododendrons, magnolias
49	73 Ashgrove Terrace	1		late 1980s	Excellent	Among ornamentals
51	Francis Reserve, Westmorland	1	1	mid-1990s	Fair/poor	In riparian plantings
52	Hendersons Road/Cashmere Road intersection	1	1	mid-1990s	Fair	In riparian plantings, hawthorn
53	Halswell Quarry car park	1		early 1990s	Poor	Mown turf, ribbonwoods
