

He Kōrero Kōrari

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Manaaki Whenua
Landcare Research

Tēnā koutou, tēnā koutou, tēnā koutou katoa.

Welcome to issue 11 of He Kōrero Kōrari. Isn't it great to be into warm, sunny days after such a cold winter!

Warwick and Deirdre Harris escaped the worst of it and travelled to the USA and Europe. On the way, Warwick talked to various groups about New Zealand plants, including harakeke and tī. On pages 10-13 he writes about some of the highlights—including the threat to harakeke from gophers!

Some readers may have seen reports in the media on the pohutukawa tree in Spain purported by some to be 400 years old. Read how the story came to be, on page 14.

There's an update on pandanus (page 8) and our usual tī time section (page 15). Warwick gives an interesting account of the effects of cold on cabbage trees from different regions of Aotearoa (page 15).

In June, Cath Brown and I attended the Building Bridges with Traditional Knowledge conference in tropical Honolulu, where we presented a paper on the harakeke evaluation trial. You can read about that on page 9.

And back in April – when it seemed the Indian summer would never

end – Kahu, Margaret and Edna spent another few days on Ngāti Moki marae, Taumutu, evaluating samples from the National New Zealand flax collection (page 4). Erenora Puketapu-Hetet and Tina Wirihana lent their expertise in an experiment to evaluate the colour variation in different cultivars (page 2).

Meanwhile, the harakeke at Lincoln have had their annual trim and are looking lush with new growth. It looks to be a bumper flowering year for both tī and harakeke.

Harakeke trial sites

Warwick Harris

The only plantings that I have visited and done maintenance work on since the last *Newsletter* are those at Lincoln and Taumutu. In the last *Newsletter* I moaned about the effects on my legs and body of squatting and kneeling to clean harakeke. Nevertheless, soon after having that moan I spent a solid week in early March 2001 grubbing the weeds from around the 48 Lincoln plants and trimming off the dead and dying leaves. During this time Angela Thornley arrived, watched what I was doing, and with further instruction from Sue Scheele, set about thoroughly trimming all the harakeke in both the National Collection and the trial planting.



Introducing Angela Thornley. This winter Angela expertly trimmed all the harakeke in the Lincoln Collection.

Right now the Lincoln plants, except for *Ate*, are in excellent condition, just waiting for a weaver to come and harvest leaves to make beautiful weavings! Just what is causing the damage to the *Ate* leaves and generally weakening the plants remains a mystery. It was thought to be cold damage, but Ross Beever has now undertaken to investigate if *Ate* is a variety with a particular susceptibility to yellow leaf disease.

I took the chance to record the size changes of the harakeke plants for another year at both the Lincoln and Taumutu plantings. This means that the growth of the plants at these sites has now been recorded for six years. At Lincoln from May 2000 to May 2001 mean leaf length increased from 198 to

223 cm and basal circumference from 150 to 170 cm.

On 10 April I went to Taumutu to see the weavers in action evaluating the properties of the harakeke varieties in the National Collection, and took the opportunity to measure the planting there. The plants had continued steady but slow growth with leaf length increasing from 126 to 137 cm and basal circumference from 79 to 92 cm, in the period May 2000 to April 2001. I spent a little time tidying up the planting, mainly pulling weeds off the matting to stop them from smothering

the smallest and weakest of the plants. There is a large size difference between the smallest and largest harakeke at Taumutu. The largest plant, a *Māeneene*, with leaf length of 225 cm and basal circumference of 187 cm is about the size of the average-

sized plant at Lincoln.

The colour of leaves

Sue Scheele

As part of the harakeke evaluation, we assessed leaves for suitability for raranga. We were aware that there was one very important characteristic that we were not taking into account – the colour of the prepared strips when dry.

We asked Erenora Puketapu-Hetet and Tina Wirihana to carry out a preliminary experiment for us. In early April, I cut leaves from the 12 trial cultivars at Lincoln, bundled them in plastic, and drove up to the North Island.

My first call was to Erenora at Waiwhetu, Lower Hutt. I was very glad of the chance to see the marvellous art studio complex set up by the Hetet whanau. As well as the beautiful fibre arts created by Erenora, there are artists working in wood, clay, greenstone, bone, stone, and painting. An art walk takes you around the studios to see



Part of the Art Walk at Maori Treasures Complex, Waiwhetu.



both traditional and contemporary examples of Maori crafts and art. Visitors can then enjoy excellent food and coffee in the Galleria café.

I thoroughly recommend a visit if you are in the Wellington region. They have a great website too, at www.maoritreasures.com Erenora and I spent some time discussing and refining the methods to use in making the test samples. Because this was an experiment, it was important for Erenora and Tina to follow the same procedures. We wanted to make sure that the colour comparisons we'd make later were based on the same criteria.

After a very yummy lunch at the Galleria café, I left for the long drive to Rotorua. I was looking forward to the spectacular scenery of the Desert Road, because I hadn't driven that way for many years. However, it started to drizzle as I left Lower Hutt and never let up for the whole trip. By the time I got to the Desert Road, the rain was so heavy that I could scarcely see tussocks on the side of the road, let alone the mountains!

Fortunately, the next morning was warm and sunny, and when I arrived at the Waiariki Institute of Technology, Tina Wirihana took me for a stroll to the pa harakeke she has established. The whole Orchiston collection is growing there, all beautifully mulched and showing vigorous growth. They look splendid curved in front of the campus Whareniui.

Other special harakeke of Rangimarie Hetet are planted near



Erenora Puketapu-Hetet in the outdoor preparation area.

the buildings. All these plantings are a credit to Tina and provide a wonderful resource for the students. It was great to see the special facilities they have for dyeing, and for paper making.

It must seem strange to have carted leaves for the experiment all that way when there were the same bushes already growing at Waiariki! However, it's possible that different growing environments might have different effects on colour. This time, we wanted to eliminate that as a

possible factor. Hence the importance of cutting all the experimental leaves from the same bushes.

Tina and I went over the methods to follow, with Tina adding that she would take some photos of the process to add to the report.

The process

Each weaver had 12 leaves from each of the 12 varieties. The leaves were identified by numbers rather than names, to ensure an unbiased assessment. Six leaves were used to make each kōnae — a two-cornered basket, with no plait at the bottom, and no handle. Four whenu (strips) of equal width were taken from each leaf (two from each side). Each kōnae was 12 x 12 whenu, using the maximum length of each strip. This meant that some kōnae were not in proportion. A weaver wouldn't be happy with that effect, but, for our purposes, it meant all samples had had the same treatment.

Unboiled leaves

Both Tina and Erenora plaited kōnae from unboiled leaves. The leaves were left out of their plastic



Tina Wirihana and the pā harakeke at Waiariki Institute of Technology.



bags for 3 days, sized, softened (hāpine), then plaited. The work was done outdoors and the daily temperature recorded.

Boiled leaves

The leaves were sized while green. They were boiled for 5 minutes and rinsed in cold water. The leaves were allowed to partially dry, until the leaves began to curl. Next the leaves were softened, soaked in water overnight, and hung to dry outside. The leaves were plaited after 7 days of sun bleaching.

Erenora boiled the leaves in a copper. Tina boiled the leaves in a hot pool at Whakarewarewa.

A month or so after my trip, the leaves turned up again at Lincoln,



Tina boiling the harakeke in the hot pool at Whakarewarewa. Photo: Tina Wirihana

all beautifully plaited into kōnae! Both Erenora and Tina produced excellent documentation

of the procedures they followed, and Tina sent great photos, some of which you can see in this newsletter.

We wanted to wait a good six months before assessing the colour, and I'll be doing that shortly.

Harakeke evaluation – The National New Zealand Flax Collection

Sue Scheele

After leaving Lincoln leaves at Waiwhetu and Rotorua, I drove to Hawke's Bay to harvest Havelock harakeke to take back to Lincoln. (Sorry,

couldn't resist that). This time I took four leaves from each plant in the Collection, to be evaluated alongside their counterparts at Lincoln. Again the leaves were identified by number only.

I spent a very intensive two days cutting, then measuring. I recorded the total length of each leaf, the length of the butt, the width and depth (using callipers) of both butt and leaf. On Saturday, I left Hawke's Bay with my precious cargo and drove back to Christchurch. The next morning I was out at Lincoln, cutting and labelling harakeke from the whole National New Zealand Flax Collection.

Ngāti Moki marae, Taumutu

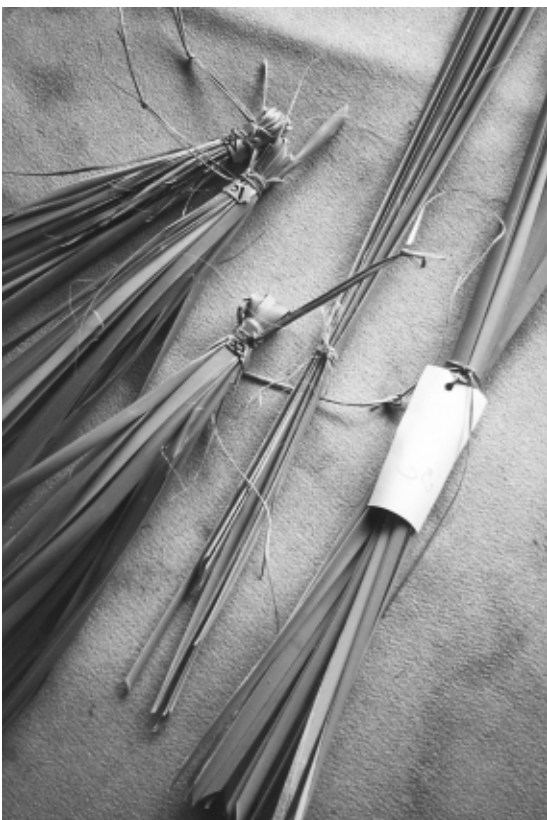
The evaluation team – Edna Pahewa, Margaret Murray and Kahu Te Kanawa – arrived at Ngāti Moki marae on Monday morning. After lunch, we settled down to what has become a familiar work routine.

This time, we wanted to assess the harakeke in the whole collection using the same criteria and methods as we had for the experimental trial varieties. This information will complement the records provided by Rene Orchiston. We also tested harakeke that is not part of the Orchiston Collection.

The results haven't been statistically analysed yet, but the team made some interesting observations.

Muka

Kahu did not find it easy to extract muka from most of the plants. On

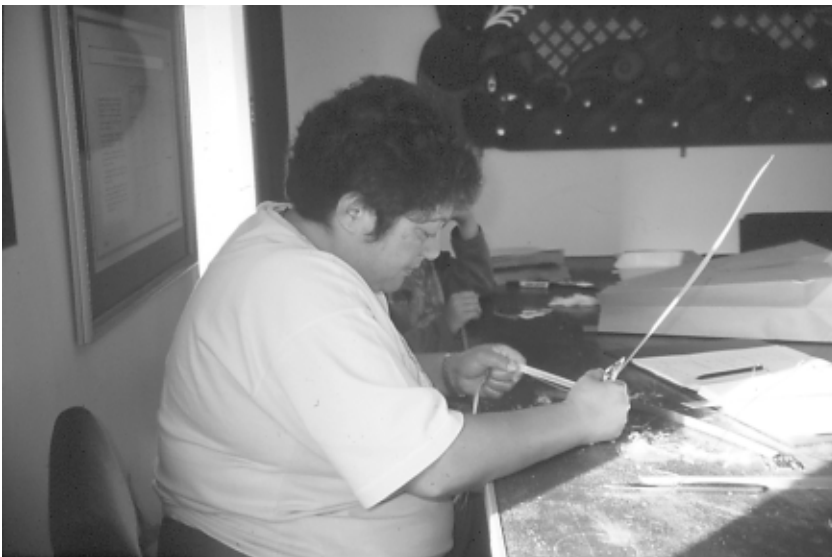


Harakeke bundled in appropriate groups in preparation for the boiling process. Photo: Tina Wirihana



the whole, the para would not separate easily. Canterbury had suffered a drought for the previous 4 months and this was evident in the lack of moisture when Kahu tried to extract the muka. The Lincoln bush of Diggeress's favourite, *Kōhunga*,

were all recorded as excellent. *Parekoretawa*, *Te Tatu* and *Whareongaonga* were also highly regarded, though their leaves are short, restricting their potential uses. *Ruapani*, *Ruahine*, *Taeore* and *Ngutunui* scored well too.



Kahu Te Kanawa stripping muka from a sample leaf.

did not even rate as a muka flax!

Some bushes, from both plantations, did stand out. *Makaweroa*, *Taumataua* and *Arawa*

Most of the harakeke tested that was not part of the Orchiston Collection did not rate highly for muka, apart from Buckley Fyers' *Te Hoe*, and *Puhina*, one of Whero

Bailey's harakeke. Edna brought down a fan of Emily's *Paretaniwha*, so we tried a leaf of that too. The muka extracted beautifully. The fine, silky fibres separated out well, making them very suitable for aho.

Raranga

Margaret scored most of the harakeke highly for raranga. The differences lie in what particular product each harakeke is best suited to. *Paoa*, *Turingawari*, *Mawaru* and *Ruhatairoa* were among those that rated highly for fine, plaited articles. *Paoa* is Margaret's favourite! A lot of the



Megan Fowler sorts the next leaves for Margaret Murray.

harakeke, such as *Tupurupuru* and *Takaiaapu* had long, strong leaves, making them suitable for backpacks. The all-rounder *Taeore* was regarded as excellent for making quality mats, as was the harakeke collected from Wairau Pa, near Blenheim. Margaret thought *Rangiwaho* and *Potaka* would be good to use in tukutuku panels, because their long fibres kept their form when scraped.





Margaret pulls the raranga strips.



Using a shearing comb to take raranga strips of the same width.

Tapamangu, Te Tatu and *Whareongaonga* – were rated as excellent, but the leaves were only long enough to be used for children’s garments. The *Kōhunga* from Havelock North rated well, though the para was a bit hard to get off from the butt end. The Lincoln *Kōhunga* did not rate so highly, because the para was hard to scrape. Similarly, *Tapamangu* from Havelock North was evaluated as an excellent flax for children’s piupiu. At Lincoln, the para was much harder to get off.

Because it was the school holidays, the weavers enjoyed some extra assistance. Kelly Smith and Megan Fowler came on the first day to watch the action, and were soon helping with handing out leaves, marking the sample bags and tying tags on the samples. To our surprise and delight, they turned up each day bright and early and keen to keep helping. Kia ora Megan and Kelly! Perhaps you’ll feel inspired to become expert weavers yourselves, or even

Again, one of the most important raranga features, the colour of the dried article, couldn’t be assessed at this stage.

Piupiu

The good muka harakeke were also highly regarded for piupiu. *Taeore, Ngaro, Makaweroa, Taumataua, Matawai Taniwha* and *Ngutunui* had the length for women’s piupiu, while *Tākirikau, Motuonui, Ruapani* and *Ruahine* were suitable for men’s piupiu. Other harakeke – such as



Edna Pahewa with prepared piupiu strands.





Kelly Smith putting tags on muka strands.

to take up science as a career!

As at the other evaluations, energy levels were maintained by the wonderful, healthy meals organised by Jill Marsh and Cath Brown. Warwick Harris was able to join us for lunch one day and took the opportunity to weed and measure the Taumutu trial planting.

When we had finished all the

testing on Wednesday afternoon, I took the weavers into Christchurch where they were staying the night. That evening, we enjoyed a meal together at a Thai restaurant, joined by Cath, Warwick and Deirdre, my partner Geoff, and Ranui Ngarimu.

The next morning, we visited Canterbury Museum to see the gallery on early Māori life. I was

pleased that Margaret, Kahu and Edna were as impressed as I am by the quality and interest of the exhibits. I thoroughly recommend it to anyone visiting Christchurch. The dioramas of the 'moahunter' period and the depiction of daily life in a village on Banks Peninsula are fantastic. In the display cases, material artefacts are arranged in such a way that it is easy to appreciate their beauty and function.

Before the weavers caught their plane home, we had lunch at the Gondola Restaurant, perched high in the Port Hills. It was a great opportunity for everyone to see the lie of the land, and how Christchurch and Banks Peninsula relate to each other. It can be hard to fathom from the landscape around Taumutu, with its "2000 acres of sky".

Back at Lincoln

The prepared leaves and the waste material were taken back to Lincoln, where Warwick oven-dried and weighed the samples. He also measured the dimensions of the raranga strips to record differences between the varieties in the length, thickness and tapering of the strips. Similarly, I measured the length of and weighed the piupiu samples, and counted the number of fibre sections in each strand.

The large amount of information gathered by the three series of quality evaluation now resides in files in Warwick's office, waiting for statistical analysis.



Jill Walsh provided marvellous meals to ensure the team had plenty of energy for their work!



Lydia weaves from pandanus grown at Ahipara

Warwick Harris

At the first National Hui of Māori and Pacific Islanders at Tokomaru Bay in 1983 two remits were passed. The first called for assistance in the conservation of the traditional Maori weaving plants of harakeke, kiekie and pingao, and that led on to the research on the harakeke weaving varieties.

The other remit came from the Pacific Islanders who asked if growing of pandanus in Aotearoa could be investigated. In 1991, led by the initiative of Emily Schuster, I was asked to do this with a grant from Te Waka Toi. As

a result, several *Pandanus* species were gathered together at Lincoln. They came from heated glasshouses of New Zealand botanic gardens, from Queensland and the Cook Islands. A report on this project was given in *He Kōrero Kōrari* 2, page 10.

Three species emerged from the investigation as having potential for growing in Aotearoa. *Pandanus baptisti* originates from New Britain Island, Papua New Guinea, and has small leaves without prickles. I do not know if it is useful for weaving. *Pandanus veitchii* has variegated leaves, is a horticultural selection, but Bill Sykes in his *Flora of Niue* says it is used there for weaving. The third species, *Pandanus utilis*, an important weaving plant from Madagascar, showed the most promise as a

pandanus that could be grown for weaving in Aotearoa.

Plants of these species were offered to Pacific Islanders for them to grow. One large plant of *P. utilis* was planted outside at Te Awataha Marae, Auckland. I wonder what has happened to that plant? Another plant was given to Lydia Smith at Ahipara and she grew it in her conservatory from where there is a

wonderful view of Ninety Mile Beach.

I came back from overseas to find presents of a kete and a framed weaving made from pandanus by Lydia. In the letter with the presents Lydia wrote, "As you can see, I have woven a couple of articles out of the pandanus plant you gave me. It is still flourishing beautifully in my conservatory. I'm still wary of planting it outdoors".

What Lydia has done is remarkable. She has shown that pandanus can be grown in Aotearoa with suitable leaves for raranga. She has fulfilled the request made by Pacific Islanders at Tokomaru Bay in 1983.

What's in a name?

Linguists, such as Bruce Biggs, who have studied the origin of Polynesian languages, can tell us about the derivation of the name harakeke. Throughout Polynesia the pandanus is known by some variation of the proto-Polynesian word "fara". Proto-Polynesian "f" is often reflected as "h" in Maori. Thus, "fara" becomes "hara". Biggs points out that there is a Polynesian base "keke" that means "hard, strong". So *harakeke* may have meant "the strong pandanus". Certainly, we know that although pandanus is a lovely plant to use for fine raranga, articles made from it wear much more quickly than those made from harakeke.

The flax species *Phormium cookianum* is called *wharariki*, "the small pandanus".



Lydia Smith's weavings from *Pandanus utilis*.



Building Bridges with Traditional Knowledge II

An international summit meeting on issues involving indigenous peoples, conservation, sustainable development and ethnoscience.

28 May – 2 June 2001

Hilton Hawaiian Village, Honolulu, Hawaii

Sue Scheele

Cath Brown and I attended this conference to present a paper and demonstration on the harakeke evaluation trial. We took harakeke with us from the plantation at Lincoln. At Honolulu airport, there were a tense few minutes as the Quarantine Officer separated the butt portions to search for any insects that might be hiding there. Fortunately, the thorough washing I had given the leaves before leaving home paid off.

The conference was truly global, with some 600 participants from Africa, Europe, Asia, North and South America and the Pacific Islands. There were about 20 people from New Zealand. Eight concurrent sessions of

contributed papers were held each morning. Each afternoon, a plenary session was devoted to a particular region (Africa, North and South America, Europe and Mediterranean, Asia, Pacific Islands), with papers from cultural representatives presenting their respective views on traditional knowledge.

Cath Brown and I presented our paper in a session entitled “Weaving, Plaiting and Felting”. It was very well received by the 20–30 people present. We had the compliment of several people coming up afterwards to say they had heard about it and wished they’d been there.

People particularly enjoyed Cath’s excellent demonstration of the techniques used to evaluate the harakeke. They were mightily



*Cath shows how to make a rourou. The beads around her neck are the seeds of the kukui, (candlenut tree), *Aleurites moluccana*. When burned, their soot provides the black colour used to dye tapa*

impressed with her ability to draw muka from the leaves using a mussel shell. The “products” – miro cords, a rourou, scraps of muka and leftover harakeke leaves – were eagerly snapped up.

We had good discussions too with the other speakers who shared our session: JD Baker (paper on pandanus use in Hawai’i), Elaine Joyal (“basketry ecology” – the relationship of baskets and weavers to the traditional management and conservation of wild-harvested plant resources), and Michelle Stevens (traditional resource management of wetland plants by California Indians).

Our presentation is available on video, so please get in touch with me if you’d like to see it.



The audience are hanging on to every word, as Cath Brown talks about harakeke. Building Bridges Summit, Honolulu, June 2001.



New Zealand plants abroad

Warwick Harris

As part of a visit to public gardens on the West Coast of the USA, I gave a series of talks about New Zealand plants and their uses. These talks related to the harakeke and tī research and I stressed the importance of these and other native plants in traditional and contemporary Māori life. Four of the gardens I visited had areas devoted to New Zealand plants. The distance between these gardens covers almost the same range of latitude as North Cape to the Bluff. They provide interesting information on the conditions under which our native plants grow,



Curator Kathy Musial in the New Zealand section of the Huntington Gardens, Los Angeles.

varying from the severe summer dryness of Los Angeles' Mediterranean climate to the winter cold of Seattle.

The Huntington Botanical Gardens

Located near Pasadena in Greater Los Angeles, Huntington is one of the greatest and most richly endowed gardens in the world. The curator Kathy Musial has a particular interest in New Zealand plants and endeavours to grow as many different species as possible. The summer heat of the southern Californian climate is too extreme for many of the species, even though the area of the Garden devoted to New Zealand plants is shaded and well watered.

However, harakeke, and especially tī kōuka, do well under the conditions provided.

In her trials of growing New Zealand plants Kathy has been disappointed to find that tent caterpillars eat kōwhai (*Sophora* species) out of existence. She related her continual battle with the gardener of the New Zealand area to prevent him from pulling out the juvenile mataī (*Prumnopitys taxifolia*)! The tangled stems and brown leaves of this plant give it the look

of being dead.

Arboretum, University of California Santa Cruz

Santa Cruz is located on the Californian coast in the region where two of New Zealand's most conspicuous introduced trees, the Monterey Pine (*Pinus radiata*) and the Monterey Cypress (*Cupressus macrocarpa*), have their native areas. Brett Hall, Director of Horticulture, Arboretum UCSC, guided my visit, showing me the Arboretum as well as local nurseries growing New Zealand native plants. The popularity of harakeke as a garden plant in the region was emphasised by the thousands of plants of *Phormium* ornamental varieties seen on a visit to Suncrest Nursery.

The speciality of the Arboretum is its large collection of Southern Hemisphere plants, probably the largest collection of this kind in North America. The Arboretum has gardens devoted specifically to South African, Australian and New Zealand species.

Tom Saucedo is responsible for the New Zealand garden. The garden has variation in aspect and soil moisture and I discussed with Brett and Tom how the species could be arranged better in relation to these conditions and their ecological preferences. Kauri, for example, have been planted on a flat area on the highest part of the garden. Brett expressed his dream of having a wharenuī and marae on this area as a place to present traditional Māori uses of plants. I advised him of the need to seek out Māori living





Harakeke and other native plants in the New Zealand garden, University of California, Santa Cruz.

in California to consult in order to realise this dream.

The biggest threats to harakeke and tī kouka in the Arboretum are gophers, which relish their rhizomes! Consequently it is necessary to protect the root area of these species with wire netting. Another example of native American animals including New Zealand plants in their diets are humming bird species which compete for the harakeke nectar. The New Zealand garden has to be protected by deer fencing as feral deer abound in the area, including in the suburbs of Santa Cruz. I saw a hind and her two fawns in the garden of Bob and Sim Gilbert who generously accommodated Deirdre and me during our visit to Santa

Cruz.

Strybing Arboretum and Botanic Gardens

At Strybing Arboretum, (Golden Gate Park, San Francisco), I gave a 4-hour seminar on New Zealand plants and their uses. There was no difficulty in presenting four hours of information to an enthusiastic audience. This included a walk out to the New Zealand collection at Strybing where I gave an interactive presentation with Scott Medbury, Director of Strybing.

Scott has a New Zealand connection as he worked at Pukekura Park, New Plymouth, in 1986 and has been enthusiastic about this country's plants ever

since.

In the garden I gave a demonstration of pruning and harvesting leaves from harakeke in the traditional way. The demonstration was watched with great interest and I took leaves back to the seminar room with the idea that I could show how to extract muka. However, time ran out and I did not do this, much to the disappointment of several women at the seminar. Actually, I was relieved as it probably was not a good muka harakeke and I am not very skilled at extracting muka! It is clear that there is an audience in San Francisco who would love to see Māori weavers demonstrate their skills.

In 1915 the International Panama-Pacific Exposition in San Francisco celebrated the recovery of the city from the disastrous earthquake and fire nine years earlier, and the opening of the Panama Canal. New Zealand had a significant pavilion at the Exposition, which included in its displays a diverse



Warwick and Deirdre Harris, with director Scott Medbury, by harakeke in the Strybing Arboretum.





Rimu gifted to Golden Gate Park following the San Francisco Exposition in 1915.

collection of native plants. Once the Exposition was over, these plants were gifted to Golden Gate Park and some probably remain in the New Zealand

collection at Strybing. These include rimu (*Dacrydium cupressinum*), pukatea (*Laurelia novae-zelandiae*), and tōtara (*Podocarpus totara*).

Collections of South American, Australian and South African plants adjoin the New Zealand area at Strybing and Scott Medbury has developed a plan to link these in a Gondwanaland garden. It is an

ambitious plan and its realisation is dependent on generous endowments. Scotts's enthusiasm for the plan leaves no doubt that he will work hard to implement it.



Old tī kōuka and pōhutukawa in the Presidio (ex-military area) of San Francisco.

San Francisco provides an ideal environment for many New Zealand plants and the notorious Bay fog is without doubt an important factor in this. Harakeke, pōhutukawa and tī kōuka, many of which are old stately trees, are abundant in the street plantings and gardens of the city.

Koromiko in Oregon

We continued our journey along the Pacific Coast on a day and a half trip on the Coast Starlight Express from San Francisco to Salem, the capital of Oregon. We were met there by Neil Bell. Neil's enthusiasm for New Zealand plants is shown both by the number of them in the large garden where we stayed and the fact that he has chosen *Hebe* as the subject for a cold-hardiness study in Oregon. There are about 100 *Hebe* species and in the order of 1000 varieties, many of which are hybrids. Rather loosely I will call all of these koromiko, although there are other Māori names applied to *Hebe* species.

On the way from Salem to Portland Neil included me in a field day demonstrating the koromiko evaluation at the North Willamette Research and Extension Centre in Aurora. Here he has gathered a considerable number of species and varieties and is evaluating their suitability as outdoor plants in the Pacific Northwest regions of USA. The principal areas of garden use of these plants are the populous cities of Portland and Seattle, where winter temperatures can fall to levels that can kill or damage many New Zealand plants.



The experimental layout of koromiko was impressive and colourful. However, I could immediately see that Neil had collected a beautiful richly-purple-flowered variety from three different sources and with three different names. This emphasised the problem there is in identifying and keeping track of the naming of different koromiko species and varieties.

In Portland the interest in New Zealand plants was again made clear in that my talk at the Hoyt Arboretum attracted twice as many people as could be accommodated. The Hoyt does not have a garden devoted to New Zealand plants but does have Sean Hogan, the Arboretum Curator, as their champion.

On our night in Portland, Deirdre and I slept in the library in Sean and his partner Parker's house amongst floor to ceiling shelves of botanical and gardening books. Their enthusiasm for plants has brought together neighbours to form a block-long interconnected garden. This garden is crammed with plants including many different New Zealand species. They grow harakeke as a patio tub plant to perfection. This could be a good way to grow weaving varieties in a small city section. It also has the usefulness of reducing the amount of back and knee bending involved in pruning and harvesting leaves from harakeke.

Seattle Sister City

Our host in Seattle was Randall Hitchin, Curator of the Washington Park Arboretum, who generously accommodated us in the "funky

attic" of the house he shares with partner Lynn Kanne. Seattle is one of six Christchurch Sister Cities and my presentation about New Zealand plants was linked in with a meeting of the Seattle Sister City Association. This was a two-hour session with a break half-way for refreshments that included typical Kiwi home cooking. The ex-patriate Kiwi women especially enjoyed chatting with Deirdre.

Dr John Bollard is a leading player in the Christchurch – Seattle Sister City Association and was the instigator of a New Zealand High Country Garden in the Arboretum. Hardy South Island plants do well in this Garden and the display board makes it clear where they come from.

For the new Millennium Christchurch has started six Sister City Gardens in Halswell Quarry. As part of my talk I showed what had been achieved so far in the formation of the Seattle Garden. There is a plan to erect a totem pole

in this garden. It is hoped that a carver from one of the First Nation Northwest Pacific Coast tribes will come and create the totem pole in Christchurch.

Several people have told me that there are remarkable similarities in the cultures of Maori and the Pacific Coast First Nation tribes. I feel there is great potential to strengthen the link between Christchurch and Seattle through exchanges between these cultures. Harakeke could play a pivotal role in such exchanges.

From Seattle Deirdre and I travelled on to the Eastern States of USA, and then on to Europe. Throughout we looked for harakeke, tī kōuka and other New Zealand plants. Perhaps the most isolated was a single large plant of harakeke in the garden of Victoria, the main town of Gozo, Malta. We count ourselves extraordinarily lucky that our travels ended before the Twin Tower and Pentagon Disasters of 11 September 2001.



Randall Hitchin and the New Zealand High Country garden, Washington Park Arboretum, Seattle.



The Spanish pōhutukawa

Warwick Harris

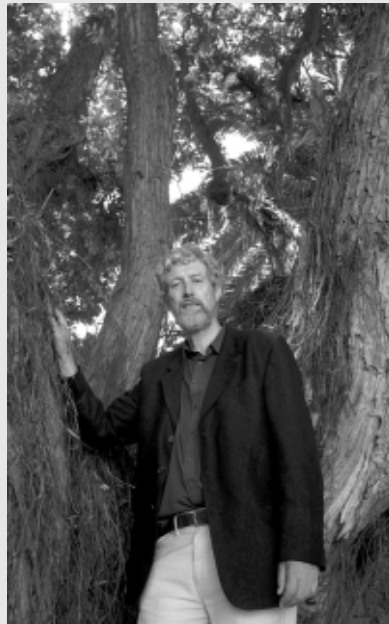
Early in August 2001, I travelled to La Coruna (the capital city of Galicia, in the northwest province of Spain), to visit old friends Juan and Tina Pineiro. Juan had worked with me on pasture research at Grassland Division DSIR, Palmerston North in 1974 and 1975. Juan arranged for me to talk on New Zealand native plants and landscapes, and the public response to it was so great that I had to repeat it to a second full house.

The reason for the interest in my talk was that the Mayor of La Coruna, a very forceful and progressive personality named Dr Francisco Vazquez, had declared that the pōhutukawa should become an emblem of La Coruna. The city already has as a great emblem the Roman lighthouse, the Tower of Hercules. The reason for the choice of pōhutukawa as another emblem was a very large tree of the species that stands in the grounds of La Coruna police station.

Juan took me to see the tree where I met Maria Cebreiro, City Councillor responsible for La Coruna's parks and gardens, and Jose Nunez, owner of the gardening company Viveros Orto that is responsible for most of the plantings in the city.

From this meeting I learned that there had been much debate about the age of the tree with some believing it could be 400 to 500 years old. Another idea in La Coruna is that it was planted in the garden of a soap factory in the late 1700s, having been brought there by a Dutch or British ship carrying vegetable oils for soap-making from the Southern Hemisphere.

Based on the first record of New



Warwick with the pōhutukawa in La Coruna.

Zealand plants taken to Europe being those collected during Captain Cook's voyage in 1769, I expressed the opinion that it was unlikely that the tree was more than 200 years old. I was photographed in front of the pōhutukawa by the local newspaper *La Voz de Galicia*, and the article that went with the photograph published the next day was headlined "New Zealand botanist says the pōhutukawa is 200 not 500 years old".

As we know the Dutchman Abel Tasman did not land in 1642, aging the tree more than 230 years would be substantial evidence in support of early visits to New Zealand by voyagers from either Spain or Portugal. Because of this a news release from Manaaki Whenua about the La Coruna pōhutukawa attracted wide media interest. I have had feedback from several people saying that they have seen old pōhutukawa in different parts of Portugal and responses from Australia and Japan. The debate about the tree's age has continued in La Coruna with further newspaper articles about it.

Because of this interest I have made a listing of information that relates to the possibility of undocumented voyages by Spanish or Portuguese to New Zealand. This includes the Spanish helmet dredged out of Wellington Harbour around 1880 and the Tamil Bell that the missionary-botanist William Colenso found with Māori inland from Whangarei about 1836.

There are historical figures who may have made voyages to New Zealand. The most likely is Juan Fernandez who is reputed to have encountered the east coast of New Zealand in a voyage from the west coast of South America in 1576. Apparently there is a chart of this voyage displayed in the naval museum in Madrid. Another candidate is the Portuguese mariner Mendonca who it is suggested encountered New Zealand in 1524.

I have been told that there are Māori who can whakapapa back to European ancestors before Cook's visits. This has been linked to the possibility of wrecks of Spanish or Portuguese ships, with the coasts near Raglan and Dargaville as two localities. I would certainly be interested in more information about this.

It is recorded in Captain Cook's journals that he was aware of the account of Juan Fernandez's voyage. Of considerable interest is the story told by Te Weherua recorded in Cook's journal of his third voyage in 1777. Te Weherua was a young man about 18 years old who, together with 10-year-old Koa, went to Tahiti with Omai when Cook sailed from the Marlborough Sounds. Omai, who acted as an interpreter between Cook and Māori, had spent two years in England after travelling from Tahiti on Cook's second voyage.

Te Weherua's story was that a ship



like Cook's had been at Terawhiti (in the region of Wellington) some years before Cook and that the Captain of this ship had a son with a Māori woman who was still living at the time. Te Weherua

also said that this ship had left an animal in the country.

Te Weherua and Koa both died in Tahiti in about 1780.



Ti Time

Warwick Harris

Right now the tī at Lincoln are in flower and it is going to be a bumper flowering year. On 22 October 2001, I recorded 194 trees with developing flowering shoots.



Previously the highest number of flowering trees in a year was 111 in 1999. Five of the trees already had open flowers on 8 October, three weeks earlier than last year when the first flower opened on 30 October. A good number of trees are flowering for the second time and for the first time several trees have more than one flowering shoot.

Ross Beever also reports that 168 trees are flowering in the Auckland planting, with 109 at Mt Albert Research Centre and 59 at UNITEC. They are keeping Ross and Stephanie Parkes busy as they work to gather information about the form of the inflorescences and flowers before these wither.

Keeping track of the progress of the flowering and fruiting of the trees at Lincoln will be part of my weekly routine for the next six months. The trees continue to grow taller and that means the flowers are becoming more and more difficult to reach for observation.

An important milestone in the tī

research programme was the publication of a paper on the damage caused to the trees in their first two winters at Invermay and Lincoln. Information from this paper is given in the item "Auckland tī chill out in the cold south".

Tī were very much before me during my travels in the USA and Europe. I find cabbage trees to be the most frequent reminder of home as they are widely used in garden, landscape and street plantings in temperate regions of the world. In cities like San Francisco and London they are everywhere. If all the people overseas who see cabbage trees knew where they came from, they would be the most widely encountered advertisement for Aotearoa.

I had the chance to elaborate on the use of tī kōuka as a garden and landscaping plant in a paper I presented at a symposium on the breeding and selection of ornamental plants at Melle, Ghent, Belgium, in July 2001. This paper, "Ornamental attributes of the natural variants of *Cordyline australis*" is published as part of the symposium proceedings in *Acta Horticulturae* 552. It makes considerable reference to information gained from the tī provenance experiment.

Auckland tī chill out in the cold south.

Warwick Harris, Ross Beever and Bruce Smallfield 2001: Variation in response to

cold damage by populations of *Cordyline australis* and of some other species of *Cordyline* (Lomandraceae). *New Zealand Journal of Botany* 39: 147–159.

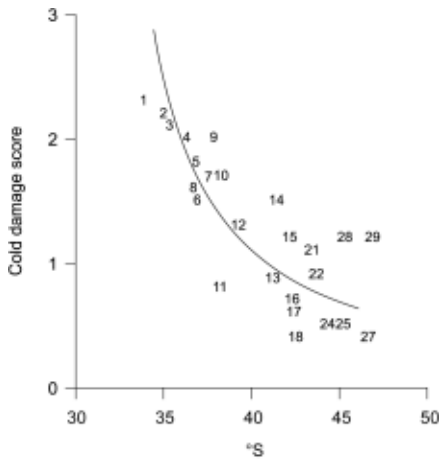
This paper reports on how the populations in the tī provenance experimental plantings at Invermay and Lincoln differed in the extent to which they were damaged by freezing temperatures in the winters of 1996 and 1997.

It was a fortunate coincidence that produced the results reported in the paper. The trees were young and still in the frost zone and encountered the most severe period of frosts at Invermay for many years. Frost temperatures dropped down to -9.7°C in July 1996 and -9.1°C in July 1997. At Lincoln the frosts were not as severe with freezing temperatures of -6.9°C in August 1996 and -6.3°C in July 1997.

These freezing temperatures caused marked cold damage to populations from northern New Zealand, especially those from Auckland province, whereas most trees of the southern South Island populations were not damaged. With the colder temperatures at Invermay, this separation of northern and southern populations was more marked than at Lincoln.

The graph that plots the cold damage score of the trees at Invermay after the 1996 winter, against the latitudes of the wild sites of the populations, clearly





Relationship between cold damage scores of tī kōuka populations at Invermay in winter 1996, and their latitude of origin. 0, no damage; 3, marked damage. The populations are numbered 1 to 29 from north to south.

shows this relationship. The cold damage score varied from 0 for no damage, to 3 where both old and young leaves on the trees showed signs of cold damage. The populations are numbered from 1 to 29 in order of their latitude from north to south. Population (27) from Dipton, inland Southland, the home locality of Bill English, had the plants that suffered least cold damage. They breed them tough down in Dipton!

An interesting effect of the cold damage at Invermay was that it was severe enough to kill the cells in the growing tip of the stems of frost-sensitive trees. This resulted in the breakdown of apical dominance (where the growing point inhibits the growth of lateral shoots or branches below it), so that these trees formed new shoots from their bases. Usually tī kōuka have a single trunk until they flower. Then the growing tip develops as an inflorescence or flowering shoot, and new vegetative shoots develop below this to start the branching from the top of the trunk.

The result of this is that at Invermay many of the trees from northern populations have several small trunks arising from ground level, while those

from the south have a single stout trunk. At Lincoln the cold damage was not severe enough to cause this effect. The only trees at Lincoln that have several trunks arising from ground level are those that had their growing points broken off by vandals soon after they were planted.

The tī ngahere (the forest cabbage tree, *Cordyline banksii*) was especially susceptible to cold damage to the extent that some plants of this species at Invermay were killed by the cold. At Lincoln the effect was to cause the tī ngahere plants to form many shoots, which make them look like harakeke plants! Still, each winter the young leaves of the tī ngahere are killed by frost even though they now receive some protection from the tall surrounding tī kōuka. In their natural habitat, tī ngahere receive protection from cold damage from the forest canopy and have fewer stems than the plants at Lincoln.

In 1883 the missionary-botanist William Colenso found a many-branched form of tī ngahere at an open site near Dannevirke and he named this as a new species, *Cordyline diffusa*. The response of the *C. banksii* plants at Lincoln confirms that what Colenso saw was an environmentally induced form of tī ngahere, not a new species.

Even though the leaves of tōī (the mountain cabbage tree, *Cordyline indivisa*) at Invermay showed signs of cold damage, they were not induced to form additional shoots. All the tōī plants soon died at Auckland and the last one at Lincoln died earlier this year. At Invermay several large tōī remain and it seems they like the cooler and moister climate there.

An important application of the tī cold damage study is that it supports the principle that plants used for restoration of native vegetation should be obtained from local sources. This maintains the local genetic integrity of widespread native plants and also increases the likelihood of success in establishing restoration plantings.

STOP PRESS

Ti hui

The hui on tī, where weavers will have the opportunity to work with the leaves of trees in the Lincoln collection, will take place at Ngāti Moki Marae, Taumutu, Canterbury, from 2 April – 5 April, 2002. Information will be circulated at a later date.

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