

# Horticulture

in New Zealand

Bulletin of the Royal New Zealand Institute of Horticulture (Inc.)



**41**

**Spring**

**1986**



# HORTICULTURE

## IN NEW ZEALAND

ISSN 0110 - 1153

BULLETIN OF THE ROYAL N.Z. INSTITUTE OF HORTICULTURE  
NUMBER 41, SPRING 1986

Editorial .....	1
Notable and Historic Trees .....	2
Cape Tulip .....	3
The English Pleasure Grounds .....	5
1987 A.G.M. and Conference .....	9
Awards and Honours .....	10
From the Executive Officer .....	11
Garden History Section .....	13
Two New Hebes .....	16
N.Z. Trees and Shrubs in Britain (Part Two) .....	19

### STUDENT SECTION

Editorial .....	27
The Story of Bees .....	28
Guidelines for N.C.H. Subject No. 9 .....	32
Welcome to New Members .....	33
Planting Kauri .....	34
Dancing Daffodils .....	39
Chelated Trace Elements .....	41

Cover Photo: Cape Tulip, *Hormeria collina*.

---

### ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC)

<i>Patron</i>	His Excellency the Governor-General
<i>Vice-Patron</i>	THE HONOURABLE MINISTER OF AGRICULTURE AND FISHERIES
<i>President</i>	Mr R.J. Ballinger, OBE, JP, B.Ag. Sc.
<i>Chairman of Executive</i>	Mr A.G. Jolliffe, NDH, Dip PRA, MSc. (Indiana), FIPRA, ANZIM
<i>Chairman of Examining Board</i>	Dr R.C. Close, M.Sc., Ph.D.
<i>National Secretary</i>	MR D.B. CAMERON, B.Sc., Dip. Tert. Ed. P.O. Box 12, Lincoln College
<i>Annual Journal Editor</i>	MR M. OATES, B. Hort. Sc. (Hons) (Reading)
<i>Bulletin Editor</i>	MR D.L. SHILLITO, Dip Hort., Dip Hort Mgt.
<i>Student's Editor</i>	MR N.W. OWERS, N.C.H.

The Editor welcomes articles, letters and news items for consideration of publication. Contributions should be addressed to the Bulletin Editor, P.O. Box 12, Lincoln College.

Views expressed are not necessarily those of RNZIH.

Registered at Post Office Headquarters, Wellington as a magazine.

# EDITORIAL

With this being my last editorial for the Bulletin, I thought I would have no shortage of things to say. However, when it comes the time to put pen on paper it is not quite that simple.

I feel sure there are better ways that this could be put, but, I would like to thank all those people over the last four years who have helped with the production of the Bulletin. Contributors, artists, the Institute team and Caxton Press for putting out what I consider to be a high quality product.

The best of luck to all those students who will be sitting exams in a few weeks time. I hope you do well in them and you receive your qualification in the not too distant future.

One last word to drum up support for your District Council. Why not get some value out of the Institute and go along to District Council activities. Only if it is to explain that they never do anything you think they should do. I'm sure they could change. If they never see or hear from you how are they to know what you want!!!

One thing I did decide before I started writing this was that it had to be short.

Happy reading

David Shillito  
EDITOR.

# NOTABLE AND HISTORIC TREES

One of our recent and interesting registrations was that of an *Erythrina sykesii* in Auckland. This historic tree stands on the corner of Normanby and Boston Roads, Mt. Eden.

The history of the tree is interesting in that it was planted by Mr Whitney, son of the founder of the Colonial Ammunition Company. The date of the planting is uncertain. Mr Whitney Jnr. was born in 1885 and became the managing director of the company. The C.A.C. was closed down in 1982. The factory supplied ammunition for the New Zealand and Australian armed forces during the Second World War.

This *Erythrina* is a survivor of the many plantings done by the Whitney family. Although this tree is not the most imposing of its kind it is a landmark in Mt. Eden and represents a period in our history by its links with C.A.C. and the Whitney family.

The registration was accomplished by Mrs Winsome Shepherd and the measurements done by Mr J. Adam. In spite of protracted negotiations with Mt. Eden Borough Council, all have agreed to the national significance of the tree.

The registration of trees does require persistence, energy and tact. Our tree registration officers have been having great success lately especially in New Plymouth and Hastings. These will be described in the next issue of the Bulletin.

Please be vigilant and support us by sending information you may have or a source you know of. Legislation must come and only through our registered trees will we prove our case.

Ron Flook  
Convenor

4.9.86

# CAPE TULIP

by W.R. Sykes  
Botany Division  
D.S.I.R.  
Christchurch

*Homeria* belongs to the Iridaceae and is one of the many genera in the iris family whose species mainly or solely originate in South Africa. There are 31 species according to a recent authority, but only one is likely to be found wild in New Zealand. This is *Homeria collina*, Cape tulip from the S.W. Cape Province from where many of the South African plants which are adventive in this country originate.

Cape tulip is also widely cultivated in New Zealand and the wild populations are presumably cultivation escapes. They generally occur on hill country pastures in North Auckland, near the Mahia Peninsula on Portland Island and in the Marlborough Sounds. Undoubtedly the species would be much commoner if strenuous attempts had not been made to eradicate it because it is one of the most serious poisonous plants to occur in pastures. More recently there has been a campaign to alert people to the dangers of growing Cape tulip in the garden. There have been a number of stock losses here and also in temperate Australia where it is sometimes even more serious a problem than in New Zealand. Also, Cape tulip is believed to have caused the death of a man in New Zealand.

Cape tulip has a globose corm about 1 cm diameter and this produces offsets prolifically which may remain dormant for a considerable time (several years) until conditions are suitable for germination. From the corm arises the single, long and straplike leaf which grows to 60 cm, occasionally to 90 cm long, and lies almost flat on the ground. It is also characterised by the shining green surface of the convex upper side and the blue-green concave lower-side. The flowers are erect and borne in clusters of 2 to 4 on a leafless stalk up to c.70 cm tall, but usually much shorter than this, and are initially enclosed in a membranous sheath. The perianth segments (sepals and petals) are all about 4 cm long and are usually salmon-pink with a band of deeper colour near the base, but are occasionally yellow or a deeper red. The flowers are followed by narrow cylindrical capsules 4 to 5 cm long, each containing many triangular seeds.

The aerial parts die down in summer and the corm becomes dormant until the autumn rains. The leaf emerges and is present during the winter and spring, whilst the flowers appear from September to December. Reproduction is from seed or corms.

Although *H. collina* is easily recognisable by the above description, it is sometimes confused with *Sparaxis tricolor*, another iridaceous plant from South Africa. However, the latter has a number of flat semi erect leaves arranged in a fan and there is only one flower within each membranous sheath. Also the individual flowers last for a number of days and the

perianth is some shade of red with a basal dark brown blotch above the bright yellow tube.

Various herbicides have been tried on Cape tulip where the populations are too large to remove manually, although they are generally not very efficient because the corm is very difficult to poison, and the seeds can lie dormant in the soil for a time and are thus very difficult to destroy. In the garden these herbicides are not selective enough to use with safety. Soil sterilisation is a possibility because this could destroy a heavy infestation of Cape tulip, although it would result in everything in the area treated killed and the ground locked up for a month or two. Such a treatment would be unacceptable to many gardeners. A small number of plants is best taken out by hand digging, taking care to remove every small cormlet as is done for *Oxalis latifolia* and *O. pescaprae*. I am indebted to Dr Graham Bourdot of M.A.F., Lincoln, for his thoughts on the control of Cape tulip.



Cape Tulip, *Homeria collina*

# THE ENGLISH PLEASURE GROUNDS

by Harold Hall

The stately homes of England, their gardens and their pleasure grounds, were conjointly all part of the upper class image. Usually they consisted of wooded walks which were circumjacent or adjacent to the house. They were supposedly created by the owners to provide paths through tranquil woods and natural, as well as man-made features. However, one suspects, like the magnificent and lavish homes built by these early aristocratic gentlemen, these large and expansive grounds were all part of the owner's plan to not only out-do his neighbour, but to significantly raise his station and title in life.

From a botanical and a horticultural aspect, these grounds, fortunately, became the habitat for countless indigenous and exotic type fauna and flora, providing the perfect blend and the creation of a gardening environment still unsurpassed - perhaps anywhere in the world - even today.

There was however, after travelling around and seeing the various stately homes, a distinct pattern which distinguished these estates and their gardens and pleasure grounds with one another. For example, similar species of trees were planted. *Cedrus libani* and its kin *Cedrus atlantica* 'Glauca' could be seen enhancing the building and stone-work of numerous stately homes. No pleasure ground would be without its *Sequoia* or tall beech hedge and protective Yews. Buildings within the landscapes which were erected in similar periods of history can be identified by like features and designs - many, I suspect, were built by the same architect.

The early Head Gardeners had certainly planted for the future generations. Large trees which have now reached maturity have notched up a few centuries of growth and beneath their canopy of branches, have seen many changes.

Capability Brown must have had tremendous insight and vision to create the landscapes so much enjoyed by our present generation. One sees so often stately homes and their parks and pleasure grounds impressed by his romantic landscapes.

At Harewood, the many paths laced the pleasure grounds. Some led for miles up to the village, whilst others quietly meandered by the side of the lake and the numerous different features. Mainly because of the Princess Royal's personal interest in rhododendrons and primulas, Harewood Gardens became a centre of gardening interest and was visited by a large number of enthusiasts.

Between the wars rhododendron species and extra-European primulas were regarded as somewhat of a novelty by the Head Gardeners and owners alike. It was only when seed began to be allocated from the many expeditions abroad from Yunnan and Tibet that a real intense interest was taken in the many beautiful species. In 1928, a very useful handbook on "primulas" assisted Head Gardeners with information and cultivation problems, for these plants were new to the European gardening scene

and no one was able to determine their real usefulness in these northern gardens. Later, editions of the *Rhododendron Year book* became a great asset in the identification of species. Many were now finding their way into the gardens of England's stately homes, the owners of which were now reaping the benefits from the financing of the overseas expeditions to the far eastern countries some years previously.

Luckily for myself, a great influx of seed began to arrive in the gardens at Harewood during the time I was an apprentice. Collectors' names, such as Kingdom Ward, Forrest, Rock, Farrer, Wilson and others, became familiar to me when engaged in trying to identify the habits etc. of the individual species. The only kinds of rhododendrons seen at Harewood before the thirties was *R. ponticum*, *R. 'Doncaster'*, *R. 'Cynthia'* and *R. 'Anthony Waterer'* which, except for *ponticum*, were all hybrids. Most of these varieties did some travelling, for most of the above kinds can be seen now as very large trees or bushes here in New Zealand.

The Royal Botanic Gardens in Edinburgh gave invaluable assistance, and I remember on a number of occasions the visits to Harewood by Sir William Wright Smith, a professor from the Royal Botanic Garden, who for many years previously had been experimenting with this new and exciting range of exotic plants.

Propagation of the rhododendrons was carried out at Harewood with great care. Housed in a specially allocated greenhouse, the seed was sown in 6 inch and 8 inch clay pans. *Rhododendron* seed is very fine and often germinates very slowly. I have seen seedlings appear through the surface moss months after sowing. It was essential, therefore, to have a suitable compost containing charcoal and sharp silver sand to ensure good drainage to prevent souring. Watering was a long process, for each pan was partly submerged in special tanks, allowing the water to percolate up through the drainage holes, and by capillary action, gradually soak the compost. The seedlings were potted and later planted out in specially prepared flats in the kitchen garden. Train waggon loads of peat and sand were incorporated into the soil, ensuring that the Ph was adequate; also wattle fences were erected to reduce excessive winds and as the plants became stronger, heavy mulches of leaf-mould assisted in cutting down moisture loss during the Summer months. After twelve months or more growing in the nursery, each species was found a suitable home in the pleasure grounds and were still given attention until they had become well established.

Rockery, rock garden, alpine garden - all are terms used to describe a home for the growing of high altitude plants, and students of these mountainous specimens will know that the main aim of such a garden is to, as far as possible, try and imitate nature by providing, if not the altitude, at least the right kind of ground environment. Usually this can be reproduced by creating moraines, rock crevices and large cool rock surfaces, etc.

The gardener became more aware of the popularity of the alpine garden, possibly after the turn of this century, for with the many species then flooding England from the various collectors, it was becoming evident that here was a race of plants worthy of a place in any garden. Such was the case at Harewood, for



in the thirties, the late Princess Royal and the Sixth Earl of Harewood commissioned "Conways Ltd of Halifax" to build a rock and water garden in the pleasure grounds. Later, the same firm received an order to build a large rock garden at Fort Belvedere for his Majesty King Edward VIII, this indicating the popularity of these features at the time. The site which was chosen at Harewood was ideal, although one or two large trees had first to be removed to allow the necessary light to filter through. The site was on the slope of the earth dam which held back the water of the 60 acre lake, with a cascade waterfall some five metres high spilling water into a beck, which eventually found its way some five miles downstream into the Rivers Wharfe and Ouse and ultimately, the North Sea. As an apprentice I was assigned for some six months on the workforce employed under the contractors.

The stone to be used in the construction of the garden was to come from the estate quarry approximately two miles away, and was the same stone which was used to build Harewood House in the seventeenth century. Some of the rocks weighed up to five tons and was to me, an education and an eye-opener to see how these rock builders could, by the simple means of block and tackle, lift these huge weights on and off a specially designed and strengthened horse drawn waggon. Three large poles, secured at the apex of the triangle from which dangled the block and tackle, actually performed the lifting, and soon had the monster rocks raised to a height sufficient to allow the waggon to be backed underneath and the rock then lowered. The reverse was carried out when unloading. It was to me, even more fascinating to watch the rocks being manoeuvred along planks and metal rollers onto the site and placed exactly into the right position. Each stone or rock had to face the correct way - strata-wise - giving the effect that the outcrop had been there since the world began.

The "Home Farm" abattoir supplied buckets of fresh animal blood, which was liberally splashed over the rocks; this soon turned green and encouraged "Lichen" to grow which gave the rocks an aged look and natural appearance.

Who could forget the rhododendrons - *R. repens*, *R. williamsonianum* and *R. ferrugineum*, and the much talked about at the time *Gentiana*, *G. sino-ornata*, *G. acaulis* and *G. farreri*.

Regretfully, this is another feature at Harewood, which has been taken over by indigenous flora, and like many other rock gardens, because of them being so labour-intensive, they are falling out of use in the gardens and pleasure grounds of the stately homes.

Polyanthus and primroses and the European kinds had been grown in England for a very long time. It was, however, only about the beginning of this century and the opening up of the virgin fields of botanical exploration in China on its borders, did England see the inflow of the new primulas, and as they were arriving at the same time as the rhododendrons, it became an exciting, but bewildering time, for the private service gardeners, for many of the species had not been fully tested or tried out in the commercial nurseries.

These plants from the wilds, however, did have their own idiosyncrasies, and it was unfair to expect them to accept locations and growing conditions far removed from their own particular native habitat. I am sure on today's count of these Asiatic primula sections, many species must now have faltered and may only be found in the botanic gardens. Thumbing through a New Zealand catalogue, I see there are a few "oldies" still flourishing, but knowing the "candelabras" for cross-pollinating I wonder how far removed the colours have become from their originals. It was the candelabras which provided the blase of colour at Harewood. In the "Dell" as it was known, these handsome plants had found the ideal site to prosper - moist underfoot and dappled sunshine provided the right environment. Enthusiasts will remember the popular Extra European kinds:

*P. japonica*, *P. beesiana*, *P. bulleyana*, *P. anisodora*, *P. cockburniana*, *P. helodoxa*, *P. poissonii*, *P. pulverulenta*, *P. Burmanica*, *P. capitata*, *P. farinosa*, *P. mooreana*, *P. littoniana*, *P. florindae*.

When I was at Harewood, I often became confused with the species in the Capitata Section and how to distinguish them from the Denticulata Section. However, once the easy mark of distinction had been explained, I did not make the mistake again. The flowers in the heads of the Capitata Section all point downwards, whereas those of the Denticulata Section all point upwards.

In a book published about Primulas in 1928, the authors E.M. Cox and G.C. Taylor pointed out that this genus must be treated as individual plants and that gardeners tended to tar all the Primula family with the same brush. Constantly they reiterated the words 'drainage, sunshine, moisture and shade' as ensuring success in the cultivation of that genus.

In the thirties, when growing was perhaps at its height, propagation was mostly from seed - although the large clumps were split to be replanted. Plants taken by the latter method tended to be uneven. Most of the Extra European kinds were sown direct into seed pans, or direct into cold frames, soon after the seed had been taken in the Autumn. Here in New Zealand, Autumn sowing would be more suitable in the North Island and in the Spring in the lower South Island, or as soon as the frosts have passed. Those people with bush areas attached to their property would discover the perfect foil for the Primulas, especially if fortunate in having a small stream to provide added moisture.

The pleasure ground amenity was, at one time, only available to the favoured few, but thankfully it has now become part of England's national heritage. Identifying with the New Zealand bush, and though different in fauna and flora, also in views and extent, there is, however, distinct similarities in these two pleasant surroundings, for both promote a sense of freedom and tranquility and above all, an environment where people can find peace and be as one with mother nature, which is so important in this troubled world of today.

**PRELIMINARY NOTICE**

**1987 CONFERENCE AND ANNUAL  
GENERAL MEETING**

15 - 18 MAY 1987

THEME: Tentative HORTICULTURE - THE MERGING OF TOWN AND  
COUNTRY

ACCOMMODATION: HALLS OF RESIDENCE, WAIKATO UNIVERSITY

CONFERENCE SECRETARY: P.O. BOX 4185, HAMILTON.

The organising committee has met and planning is underway for what promises to be a bumper conference.

Topics under consideration for workshops are as follows:

Garden History  
Cut Flower Production  
Amenity Horticulture  
Alpines  
Therapeutic Horticulture  
Nursery Horticulture  
Fruit and Vegetable Production  
and others.

Garden visits will be planned around these workshops.

The conference will have a definite Waikato flavour, not Auckland or Wellington, but Waikato. It will, however, need that essential ingredient - people, so plan your attendance now!

# AWARDS AND HONOURS

At the Annual General Meeting in Dunedin on 17 May 1986, the following remit was adopted:

"That the criteria for and timetable of all R.N.Z.I.H. awards be documented and circulated in the Bulletin."

Set out below are the criteria for the Institute's awards. All awards are made at the Annual General Meeting in May of each year and to allow time for the Awards and Honours Subcommittee to consider all nominations and make its recommendations to the National Executive, nominations must be in the hands of the Executive Officer by 30 November in the previous year.

D.B. Cameron  
EXECUTIVE OFFICER.

## ASSOCIATES OF HONOUR — FELLOWSHIP

Nominations are called for the awards of Associate of Honour and Fellowship of the Royal New Zealand Institute of Horticulture.

### ASSOCIATE OF HONOUR

- i. This title may be conferred only on persons who have rendered distinguished service to horticulture. (The person does not need to be a member of the Institute.)
- ii. Nominations can only be made by the National Executive, District Councils or elected Associates of Honour.
- iii. Only three can be elected in any one year.
- iv. Nominations are active and considered for three years.

### FELLOWSHIPS

- i. This title shall be conferred on those members who have made a significant contribution to horticulture by their activities or interest in, or service to horticulture.
- ii. Nominations can only be made by the National Executive or District Council.
- iii. Where there is no District Council the National Executive may nominate someone on the recommendation of a member.

DATE: All nominations are to be in the hands of the Executive Officer by 30 November each year.

FORMS: Forms and other information are available from the Executive Officer.

# FROM THE EXECUTIVE OFFICER

They say that spring will arrive in Christchurch. The lambs have arrived but the weather has not; early veges and flowers are nowhere to be seen.

Again my staff and I have moved - this time to "Annex A" Farm Road, Lincoln College. We are told that this move will be permanent. Time will tell.

## CONSTITUTION REVIEW

A special general meeting was held in Wellington on 20 August and a number of proposed changes to the Constitution approved. The major change was to establish a category of membership entitled "Associate Members", whereby existing members who are over the age of 65 years and have been full members for 10 years or more may apply to become "Associate Members". Associate Members will have all the rights and privileges of ordinary members, but will pay a subscription of approximately 65% of the fee set for individual members.

## FINANCES

The bad news is that the Institute is to have its annual grant from the Ministry of Agriculture & Fisheries reduced by 10% per year for the next five years in line with the government's policy to move more towards a "user pays" situation for operations such as ours. However, the good news is that our student examination entries are well up on last year and hence additional income has been generated in this direction. This year we will be examining over 800 students which is an increase of nearly 100% over a three year period.

The other good news financially is that we are at present in the process of negotiating a substantial sponsorship and advertising contract with General Finance Ltd. who are providing the financial backing for this year's National Garden Fair to be held in Wellington. The R.N.Z.I.H. name will be associated with the publicity for the Fair and the outcome is expected to be financially quite rewarding for the Institute.

## COMING EVENTS AND DATES TO REMEMBER

1986

- Sept. 30 : Subscription notices for 1987 mailed out to all members; please note that 10% G.S.T. must be paid on all subscriptions from now on.
- Oct. 1 : G.S.T. Day : The day you start loving or hating the Governments most radical tax change ever!
- Oct. 7 : C.H.P. Examination in Te Puke
- Oct. 8 : " " " Katikati
- Oct. 9 : " " " Auckland
- Oct. 13 : " " " Kerikeri

Oct. 17 : C.H.P. Examination in Hastings.  
Oct. 21 : " " " Gisborne.  
Oct. 29 : " " " Nelson.  
N.D.H. O & P examinations in Christchurch (Subject  
No. 14).  
Inaugural Certificate in Parks Practice examination  
in Wellington.  
Oct. 30 : N.D.H. O & P examination in Christchurch (Subject  
No. 20).  
Oct. 31 : Final date for submission of Work Record Reports  
(Subject No. 9) and Projects (Subject No. 19).  
Nov. 3 : C.H.P. Examination in Alexandra.  
Nov. 4 : N.D.H. O & P Examinations in Lower Hutt (Subject  
No. 14).  
Nov. 5 : Meeting of Examining Board Subcommittee in  
Christchurch to finalise C.H.P. results.  
Nov. 6 : N.D.H. Schedule II O & P examinations in Auckland  
Nov. 11 : N.D.H. O & P Examinations in Auckland (Subject  
No. 14)  
Nov. 12 : " " " " " (Subject  
No. 20).  
Nov. 17 to  
Nov. 24 Written examinations for all R.N.Z.I.H. qualifi-  
cations at various locations throughout the  
country.  
Nov. 30 : Closing date for nominations for Associates of  
Honour or Fellowships of the R.N.Z.I.H.  
Dec. 4 : National Executive meeting in Wellington.  
Dec. 15 : National Office closes for Christmas.

## 1987

Jan. 19 : Examining Board subcommittee meeting to consider  
examination results.  
Jan. 20 : Examining Board meeting in Wellington.  
Jan. 23 : All results posted to students by this date.  
Feb. 15 : Closing date for submission of remits or items of  
General Business for 64th Annual General  
Meeting.  
May 15-18: 1987 Annual General Meeting, 64th Annual Conference  
and meeting of National Executive in Hamilton.

So, as you can see, there is plenty of action over the next  
six or eight months.

### NEW DEVELOPMENTS

1. The prescriptions for the National Diploma in Apiculture  
and the Horticultural Sales Certificate are in the process  
of being reviewed.
2. Ian Gear in Hamilton is spearheading the development of  
a new qualification probably to be called a "Certificate  
in Amateur Gardening".
3. John Taylor has almost completed a complete revision of  
the R.N.Z.I.H. "Student Guide". This should prove to be  
an invaluable document.

Dave Cameron  
EXECUTIVE OFFICER.

# GARDEN HISTORY SECTION

At least forty members and friends attended the first Garden History Seminar held by the R.N.Z.I.H. The content of this Seminar was of a very high order indeed and Otago District Council are to be congratulated on presenting those attending with such a wealth of interesting talks and visits. In spite of the weather we will remember our visits to the Dunedin Botanic Garden, Glenfalloch and Larnach Castle. Increasingly we are becoming aware of the special attributes, exhibited by each Botanic Garden in New Zealand and the history behind the mature plants growing in these gardens. It is now being shown that there is a common linkage between many of these plants throughout the country.

In Glenfalloch we saw an outstanding garden, yet one which those presently managing it for its preservation are feeling growing pressures from rising costs and increasing urbanisation. Methods to preserve such superb gardens as exemplified by Glenfalloch must continue to be successful and New Zealanders as a whole should come to regard such creations as part of our national heritage. Too many such gardens have been lost to the nation in the short span of our one hundred and fifty years of colonization.

The grounds of Larnach Castle were an eye opener to many of us since we did not know New Zealand had such an example. The layout with its perimeter nineteenth century planted conifers, statues, ornaments, cupola and conservatory are equal to the best known to the Australian Garden History Society. In Australia many such gardens receive state help for their maintenance or reconstruction.

## PLEASURE GARDENS IN NEW ZEALAND IN THE NINETEENTH AND EARLY TWENTIETH CENTURY

### VAUXHALL GARDENS - A HISTORIC DUNEDIN GARDEN

*by Dugald McKechnic*

Sixteen year old Dugald McKechnic presented an outstanding piece of research on the early Dunedin Vauxhall Pleasure Gardens. Dugald's presentation of his subject and thoroughness of research was an inspiration to all who were present at the Garden History Seminar. Sadly today, little evidence of this garden remains and we are reminded how easy it is to lose an important garden. For those who missed the seminar, Dugald's article is published in the Historic Places Trust Journal No. 13 June 1986.

Pleasure Gardens in nineteenth and twentieth century New Zealand have not yet received the publicity they deserve. Thelma Strongman in her book "The Gardens of Canterbury" covers Professor Bicherton's Wainoni Garden in Christchurch. Preliminary work on Auckland's and Wellington's 'Pleasure' gardens

has only just started. These places of entertainment have been overlooked when examining the past social history of this country and it is highly desirable that all newspaper articles, photographs, postcards and other information be preserved and collated.

Dugald McKechnic certainly showed us how it could be done.

#### COTTAGE GARDENS

Although there was not general agreement with all the views expressed by Anthony Wyber in his talk on Cottage Gardens and endangered Cottage garden plants, he showed those present at the seminar that he was an enthusiast. His subject was thought provoking. What plants should we look for in recreating a nineteenth century cottage or villa garden in New Zealand? If you wish to further your interest in this subject an Australian book "The Cottage Garden Revived" by Trevor Noble, Kangaroo Press Ltd, 1985, may be useful. It is available from some of our libraries in New Zealand.

#### AIMS AND OBJECTIVES OF THE GROUP

The initial objects of the Garden History Group shall be:

1. To promote the study of the History of Gardening and Horticulture in New Zealand in all its aspects.
2. To encourage the recognition, appreciation, protection and restoration of Historic Gardens, Landscapes, and important horticultural material by working in conjunction with concerned organisations and persons e.g. The New Zealand Historic Places Trust, the Institute of Landscape Architects, Horticultural Societies and others.
3. To publish a Garden History section in the Journal of the R.N.Z.I.H.: to encourage publication of Garden History Research, both there and elsewhere, to produce a quarterly newsletter in the Bulletin for members of the group.
4. To hold an annual seminar in conjunction with the R.N.Z.I.H. Annual General Meeting.
5. To index New Zealand Garden History researchers and their area of research.
6. To establish depositories in specific libraries for the preservation of documents relevant to New Zealand Garden History e.g. plants, designs, drawings, catalogues, letters, papers and unpublished research papers.
7. To encourage the establishment, maintenance and cataloguing of national collections of plants.

The Garden History Committee would like to hear your suggestions for future seminars. Did you feel that the programme was too long?



One suggestion received is that the Seminar could start on the Friday morning at the same time as the National Executive meets. In this way the Conference could end on the Sunday afternoon. Please let us hear from you.

Don't forget that the Garden History Committee welcomes items of interest and comment but please do not send us historic material for filing. We will advertise that you hold it but we are not a depository for such material.

Co-ordinators for Garden History were named for Otago - Cliff Donaldson; Canterbury - Thelma Strongman; Wellington - The Garden History Committee. We would like to have co-ordinators names for other areas please.

All correspondence should be directed to:-

R.N.Z.I.H. Garden History  
P.O. Box 11-379  
WELLINGTON.

---

## N.Z. SEED REQUIRED

I have had a request from a Mr Dumoulin of France for some seeds of New Zealand plants.

He specifically asks whether anyone could supply seed of:

*Parsonsia capsularis*

*Parsonsia heterophylla*

*Carpodætus serratus*

If anyone can help with these, could they write to Mr Dumoulin at:

Mr DUMOULIN Serge  
a "la levade" par  
12270 Najac  
FRANCE.

Editor.

# TWO NEW HEBES

by Derrick Rooney

In May 1981, during a field trip in North Canterbury with Dr Brian Molloy, of the Botany Division, D.S.I.R., I collected cuttings from a plant of *Hebe traversii* growing on a bank near the Mason River. The bush had a "different" look, and I thought it might have horticultural potential.

Subsequently, I distributed rooted cutting to various sources in New Zealand (including the Christchurch Botanic Gardens and the University of Canterbury) and kept one to grow on in my own garden at Hororata, in inland Canterbury, where it is now a dome-shaped shrub about 90cm tall.

The leaves are longer and broader than those of the forms of the species from further south in Canterbury and the white flowers are in dense, erect spikes carried clear of the foliage at the ends of the branches. Although a characteristic of many forms of this species is lax, open branching the Mason River plant is close branched and has a dense, compact habit. Its flowering period in late midsummer lasts only about two weeks but during this period it is one of the most attractive flowering shrubs. The specimen in my garden has shown itself well able to tolerate dry conditions in summer, and has also survived unharmed, immersion for several days in floodwater up to 50cm deep; it has grown equally well, and is if anything even more floriferous, in the garden of Mr F.D. Richards, at Windwhistle, where the altitude is 1,200 ft and the annual rainfall much higher than at Hororata.

Its hardiness is not in doubt; in my garden, which is in a frost hollow, it has shown no sign of injury in screen temperatures as low as -11.5 deg C.

While the possibility that this plant is a natural hybrid with one of the other species which grow in the Mason River area cannot be completely discounted, it does not have any characters inconsistent with *H. traversii* so I propose the name *Hebe traversii* 'Mason River' to differentiate it from the fine-leaved, lax-branched forms of the species.

Cuttings of this plant were supplied to an English nurseryman who visited my garden, and to representatives of the Sydney Botanic Gardens, but I have not heard of their fate. Certainly its performance so far in the two gardens where I have been able to monitor its growth suggest that 'Mason River' may be a worthwhile addition to the range of hardy garden hebes.

*Hebe* 'Jasper' which has been on sale in some New Zealand garden centres in the last year, originated in a batch of seedlings at the Forest Research Institute nursery at Rangiora, near Christchurch, when plant stocks were being raised for revegetation experiments in the Craigieburn Forest Park, central Canterbury.

One bed of seedlings was labelled *Hebe adora* and according to

a scientist on the institute's staff the records showed that the plants had been raised from seed collected at Craigieburn. It was not recorded whether the seed came from wild plants or from nursery-raised specimens planted in previous revegetation studies; if it were the former the parent was most likely the unnamed species, closely related to *H. odora* which grows in the central and southern Canterbury ranges, where "true" *H. odora* is unknown.

As the remaining seedlings in the bed were surplus to F.R.I. requirements, I was offered a chance to select a plant for my own use, and I chose one which had smaller leaves than the others, and a low, almost cushion-like growth habit. It has retained this cushion habit in my garden, and after six years is no more than 30cm high and 40cm across. The branching is very dense and the new stems produced in clusters each year are usually only a few centimetres long.

The striking features of this hebe are its cushion form and its winter colouring; in late autumn the light purplish-red flush on the young stems deepens, and a yellowish-cream band develops around the leaf margins. I called it 'Jasper' because these colours, red and cream, are found in the fragments of 'Jasper' rock in the Hororata riverbed.

Whether *Hebe* 'Jasper' will reproduce these winter colours in warmer gardens remains to be seen; it has already done so in one Southland garden. Even without its winter colour it is a very pleasant little evergreen. The original plant has not flowered.

A cool aspect, in strong light but sheltered from the most intense sunlight, suits this shrub, which is not too big to be grown in a medium-sized rock garden. Good drainage is essential. As is the case with many hebes, it likes a dry atmosphere and an abundance of moisture at the roots, and is subject to die-back in warm, humid conditions or when temperatures are high and the soil is very dry.

I have found it difficult to propagate, because cuttings taken in the normal way usually damp off, but a Southland nursery to which I supplied propagation material has not trouble with it. I believe that at least one English nurseryman is now propagating this clone, I hope under the name I have given it.

# FROM THE AUCKLAND DISTRICT COUNCIL

The late Mr J.W. Kealy was a stipendary magistrate in Auckland. Apart from being a very active member of the Auckland Branch of the Institute, he was a founding member of the Auckland Horticultural Council and a proponent of the Botanical Gardens. When Mrs Kealy was tidying out some boxes, she came across the following written in those dark days when the New Zealand troops were forced to shift from their foothold in Greece to Crete and thence Egypt.

## "FLOWERS - AND WAR"

'To the lover of his garden, no less than to others, war is a sad affair. To leave to someone who does not care so much the pruning of treasured fruit trees, of well loved roses; to miss the early daffodil and the longed for first flowering of the last-planted rhododendron - awaited six long years - these are real trials.

A trial too, to be stationed among the dust and cinders of a desert camp in Egypt, where even a fleshy-leaved herb two inches high is such a rarity as to call forth real affection. These things are trials.

Still, there are compensations. But for Adolph Hitler I should probably have never seen yellow alyssum filling the crannies of the marble of the Acropolis, the grape hyacinths and blue anemones of every field of Greece, or the little violets that hide themselves among the oak-scrub of Olympus. Greece is a kindly flower-spangled land. A few hours stolen from among those spent in setting up a defensive position near Olympus yielded not only violets, but primroses, cowslips, scented thyme of several species as well as other unfamiliar aromatic herbs, tiny forgetmenots and violas, and field and wood anemones.

Further south, hillsides were made a glory by masses of Jerusalem sage and cistus. Here were fiery red anemones, there blue - blue of the faint shades of dawn to that of the sky at noon. Old stone bridges held their quota of sweetsmelling golden drop.

At Thermopylae I saw German tanks for the first time but what impressed me more were the ordered groves of olives running to the very edge of the blue sea, the old Oriental planes growing not as street trees but in their natural setting; vivid fields of young grain and oaks and hollies of the rolling hills.

These are the things that have endured, that will endure. Even the tanks cannot destroy the pink convolvulus, the wild roses and the countless other flowers that lift their heads along the roads that leads one through that famous pass. When Hitler and his gang are but a corrupting memory the kindly Greek peasant will still follow his ox-drawn plough and tend his vines.

There are those who see in war only a negation of their faith. Certainly at times the path of faith is hard. But war is of the works of man. Somehow the problem does not seem so hard to

face when one looks at these fields and hills - the works of God. One day a raiding dive-bomber made me seek a rock to cover me. I found the rock, and as I sheltered beside its overhanging face, there within a few inches of my head I found a single, starfish-like, flat tuft of light sky-blue campanula, its greyish leaves completely hidden by the glory of its flowers. Another day I sheltered among clumps of wild lavender beneath olive trees; olives even older and more gnarled than those other olives at Gethsemane - perhaps the only things now living on this earth which looked on Christ two thousand years ago.

Planes may bring death during their little day. The flowers and the trees speak beauty and God's love and peace and immortality.'

---

## HOW WELL NEW ZEALAND FLOWERS, SHRUBS AND TREES THRIVE IN GREAT BRITAIN

by Daniel Bruhin

(Switzerland)

This is the second part of an article by Daniel Bruhin on New Zealand plants growing in Great Britain.

The Nikau Palms from New Zealand (*Rhopalostylis sapida*), the most southerly palm in the world, have been present at Tresco since 1863, and they love the place too much to leave it. They even seed themselves freely and grow in many places in the Gardens. The largest specimen is 13.5 M. high and has a girth of 92 cm. Seeds form well and they are ripe in June. What a tropical appearance in the gardens with the presence of this beautiful palm.

Companions to the New Zealand palms are the following which must be mentioned to give an idea for the future visitor how exotic the Gardens are.

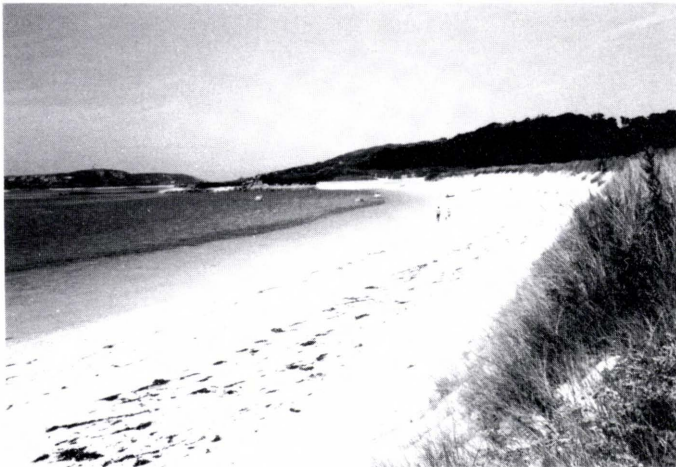
The Canary-Island Palm (*Phoenix canariensis*) is also very common. Over 15 specimen of a large size are in the gardens. The height of most of them is around 14.5 M and girths are up to 239 and 443 cm. Other *Phoenix* species include *Phoenix reclinata* (South Africa), with 12 forks (!), *Phoenix theophrastii* from Crete (Europe), *Phoenix dactylifera*. By the way, a *Metrosideros*, probably *M. robusta*, grows in a *Phoenix reclinata* and is now much larger than its "host" palm (6-7 m. high), quite a strange sight, above all when the rata is in flower. To finish with the palms, there were also *Archontophoenix cunninghamiana* (Australia), (but it is still young), *Ptychosperma elegans* (Australia), *Livistona australis* (7.50 M. high girth 107 cm), present at Tresco since 1860, *Syagrus campestris* from Brazil, planted in 1914 (750 cm high, 257 cm girth), *A Washingtonia filifera* Robusta (California) now already 10.50 M

high and with a girth of 139 cm, *Jubaea chilensis* from Chile (10.50 M high and girth 236 cm); Surprisingly only one of this hardy palm was present and the climate at Tresco is near the climate of the original habitat in Chile. And others such as *Chamaerops humilis* (South Europe) multi-forked, *Trachycarpus* sp. (China/Japan) which is probably the worlds hardest palm.

Cabbage Trees are well represented too with most species on "show" and of remarkable beauty and big sizes. There were *Cordyline australis*, *C. australis* var. *Atropurpurea*, *C. Australis* var. *Aureo-Striata* (a very nice specimen and I have heard it is very rare), *C. banksii*, *C. baueri*, *C. indivisa* (also present in North Scotland), *C. kaspar*, and even one species which was made at Tresco: *C. x Scilloniensis* (*C. australis* X *C. banksii* in 1882). The Tresco species feature *C. banksii* flower spikes but much broader leaves and is more tree like such as *C. australis*. The oldest Cabbage Trees were planted in 1856 and some have girths up to 212 and 345 cm. *C. x Scilloniensis* is a natural hybrid and some gardeners say it was not present before 1920.

Five species of *Phormium* are present and 21 cultivars are on show. The oldest introduction being from 1890 and the latest from 1981. I was particularly impressed by *Phormium veitchii* which looked like a mini umbrella tree from Madagascar (*Musanga cecropioides*).

As New Zealand is host to many Norfolk Island Pines (*Araucaria excelsa*), I must mention that these are present at Tresco (more than three species). The largest is 22.5 M and has a girth of 222 cm at 130 cm or 343 cm at soil level. It was planted in 1851. These are the only specimen outdoors in Britain, as are most of the other plants at Tresco.



Coast of Tresco Island

A still rare New Zealand shrub which grows only on West Island in the Three King Island group, off the northern tip of New Zealand, is *Elinghamita johnsonii*. Two plants were given in 1872 by a brother of Duncan & Davies of New Plymouth. For your information, I saw both plants and one of them had (certainly for the first time) a fruit setting, though still green. I have asked the gardeners to protect this unique fruit from birds and hopefully there might be seeds when it will be ripe and red. (If fertilisation was sufficient.)

Next to the *Elinghamita johnsonii*, under the massive Pohutukawa, was the rare Chilean Palm *Juania australis* or Chonta which grows only in the Juan Fernandez Islands, off the coast of Chile. The palm was planted in 1970 and for the moment, only 5-6 leaves are emerging from the soil, about 150 cm long each.

Tree Ferns are not forgotten and some 4-5 metres high *Dicksonia squarrosa* (Whcki) thrive on the shade within the garden and outside in the little wood (since 1863). Most other Tree-Ferns are present too, such as the Ponga (*Cyathea dealbata*) introduced in 1865, the Mamaku (*Cyathea medularis*) though not as high as the giants in New Zealand, introduced in 1891, *Cyathea robusta* introduced in 1959 (unknown to me), *C. smithii* (1894), *Dicksonia fibrosa*, (the Whcki Ponga) introduced in 1914 and of course the very hardy Australian *Dicksonia antarctica*, also seen in West Scotland!

The beautiful Lobster Claw or Kaka Beak (*Clianthus puniceus*) makes a wonderful flower show in early June against a wall and I had the pleasure to see it on my 1984 trip. This was the original species with red flowers. I have heard this plant is now very rare in New Zealand in the wild. I also saw it in West Scotland.

I saw a few specimen of the Puka (*Meryta sinclairii*) from Three Kings Island and Hen and Chicken Islands. These have a very tropical appearance with their big leaves. They were about 3-4 m. high. They were introduced to Tresco for the first time in 1914.

There is also the rare *Chordospartium stevensonii* (Tree Broom) introduced in 1922. It is very locally endemic in the Kaikoura range in the South Island of New Zealand. I have not seen it myself at Tresco but the former head gardener told me it is not a good specimen. Poor flowering maybe because it has too much shade.

In 1983, I forgot about it and in 1984, nobody could find it for me as it was outside in the little wood. I found the Rewa-Rewa or *Knightsia excelsa*, one tree species of the Protea family confined to New Zealand. It was planted in 1914. Although I remember quite well from New Zealand what the tree looks like where I saw plenty of it, and the flower's perfume is not one of the best available, I did not find it. This is an extremely rare plant in Europe and few gardeners would know that New Zealand has two species of trees in the Protea Family.

Chatham Island Forget-Me-Not (*Muosotidium hortensia*) are present too and make a good display in early Spring with their large green leaves and splendid big blue flowers. Personally, I have not seen them at Tresco but I saw them in flower in abundance in the North-west of Scotland, near the sea in several botanic gardens in May, the most northerly being at Inverewe (57°N. Lat.). The lowest temperature recorded at Inverewe was -8.6°C (1985) and other New Zealand flowers thrive here, *Nothofagus* trees, *Cordyline* sp. etc.

Back to Tresco, an evergreen oak (*Quercus ilex*) is completely draped with a New Zealand liana called *Maehlenbeckia complexa*, introduced in 1890. The wiry stems of this plant are a constant temptation for Tarzan-like activities and have proved the demise of many a chainsaw.

A very rare and showy New Zealand species which has not yet been introduced to Tresco Abbey Gardens is the Poor Knight's Lily, *Xeronema callistemon* from Poor Knight Island and Taranga (Hen) Island. It is in cultivation at Kew Gardens, London (in the Alpine House and Temperate House) as well as in some private gardens. The plants at Kew are said to have flowered in 1983 or 84. There were also various plants of *Xeronema* at Logan Botanic Garden (West Scotland) outdoors all year round. However, they were all killed by a severe winter a few years ago. But one plant was saved as it was wintered in a glasshouse. It was planted from seeds in 1969 and flowered



*Ranunculus lualaba*



for the first time in 1981 with just a few spikes. In 1983, it produced nine flower spikes. Hopefully, it will be divided and sent to Tresco soon as there it will survive outdoors easily, all year round.

There are many more New Zealand plants at Tresco but there is not room to talk about all of them. So here is the list of some others, they include *Griselinia littoralis* and *lucida*, *Hebes* (over 20 species and cultivars), *Hoherias*, *Leptospermum* sp. (19 species and cultivars), *Microsorium*, *Myoporum laetum*, *Neopanax* sp. *Pseudopanax* (5 species), *Olearias* (over 30 species including a superb *Olearia augustifolia* and *O. x Scillonensis* (*O. phlogopappa* x *O. lirata*), *Nothofagus solandri* and *N. menziesii* (18.75 m high and a girth of 119 cm), *Pittosporum* (over nine species and cultivars), *Pseudowintera*, *Schefflera*, *Senecios*, *Sophora* sp., *Suttonias*, *Fuchsia excorticata*, *Notospartium glabrescens* (in 1949, not available now), and many others. Most were planted a long time ago and have a good size.

On top of all that, even New Zealand native insects are present in the gardens such as stick insects (*Clitarcus nookeri*) or Sand Hopper (*Talitrus sylvaticus*) which probably came through a nursery on the British mainland where these insects were only eggs mostly from ferns from New Zealand.

Of course, New Zealand plants are not the only "sub-tropical" inhabitants at Tresco and plants from other famous places such as South Africa, Chile, Mexico, Australia, South and Central America, Himalaya region, Tropical high mountains and from Islands such as Japan, Canary Islands, Acores, etc. thrive there. So I would like to mention the most important plants from these countries in this New Zealand plant report.

To mention just the most important plants at Tresco from Australia, we have 20 species of *Eucalyptus* such as the beautiful pinkish/red flowering *E. ficifolia* or the giant *E. globulus* introduced in 1848 and identified correctly by Josef Hooker himself. This tree is 28 M. high and used to be higher until some surgery had to be done to protect a nearby Norfolk Island Pine. Not to be forgotten, the beautiful *Hymenosporum flavum*, a Pittosporaceae from Australia introduced in 1904, now very big and in flower from April to August. The flowers are yellow and this tree is one of the favourites for some gardeners at Tresco. Also present are the Hoop Pine (*Araucaria bidwillii*). The Australian Kauri (*Agathis robusta*) is 7 M. high. Several Bottle Brushes are displayed (*Callistemon* sp.) and also a beautiful *Kunzea baxteri* which both belong to Myrtaceae family. All were in flower in June. Banksias were well represented too such as the giant *Banksia intergrifolia* (1890) which is said to be the largest in the world (18 m. high, 213 cm. girth at 130 cm. or 317 cm. at soil level). *Banksia grandis* had its beautiful flower spike (25/30 cm. high) on show in June as well as *Banksia caleyi* (1965), I was one of the few people to see this last *Banksia* as it was almost inaccessible. Thanks to a gardener, I could spot it. A sight never to be forgotten were the various *Banksia coccinea* in flower (June), colour scarlet with intricate rows of white stamens. There were quite a few of these beautiful flowers. Thirteen different species of *Banksia* are represented at Tresco. The Queensland Lily (*Doryanthes paimeri*) displayed for me in the Summer 1983 an enormous spike

of deep red flowers. Over 20 species of *Acacias* can be seen. For *Banksia* fans, *Banksia coccinea* flowered for the first time at Tresco in 1962.

From South Africa, there is the largest collection of *Protea* flowers under such a northerly latitude with over 12 species. Most of them are large shrubs with many flowers such as *P. grandiceps* or King Protea, (*P. cynaroides*). Large clumps of *Lampranthus* are spread on the ground. *Lampranthus littlewoodii* makes a nice display if grown over a stone border where it falls down in a cascade of flowers. Also from South Africa is the very nice red flowering *Greyia sutherlandii* from Natal. It belongs to the Sapindaceae family and displays *Metrosideros* like flowers, although there are only a few flowers on this shrub (flowered in June 1984). *Leucadendrons* are not forgotten either with 13 species. A *Calodendrum capense* from South Africa, the Cape (1907), was measured as 14 m. high and 306 cm. girth. The South African Bird of Paradise (*Strelitzia reginae*) also flowered profusely in August 1983. Not to be forgotten are the Hottentot Figs (*Carpobrotus edulis*) which grow wild on many islands on Scilly on the coasts (Yellows, pinks etc.). Five species of *Leucospermum* (Proteaceae) are magnificent too.

Chile displays seven *Puya* species, some being new cultivars raised at Tresco. *Araucaria araucana* is present too but I think the climate is a bit too dry for it as the specimen present are not the nicest. *Lapageria rosea*, Chile's national flower is present too but it was not in flower in the period I was there. *Myrtus* species are abundant and as already mentioned, the Palms *Jubaea chilensis* and *Juania australis* are around with one example of each.

Madeira is represented too with a giant *Clethra arborea* and with *Euphorbia mellifera* (also Canary Islands introduced in 1934). Sixteen species of *Euphorbia* are present, from different countries from Africa. The Azores display the rare *Camp-anula vidalii*, with fleshy pink hanging bells in Summer (introduced in 1854). I unfortunately missed it. (One of the few to be in the glasshouse collection).

The Canary Islands are represented by the beautiful *Echiums* and Tree-Echiums such as the *Echium pininana* (introduced in 1913), now rare in the wild at Palma Island where only two populations of less than 50 plants each survive. Others include the beautiful *Echium wildpretii* (red coloured), *E. webbii* Tresco Blue *E. callithyrsum* and Tresco's own hybrid: *E. Scilloniensis* (*E. webbii* x *E. pininana*), 1948 (Blue coloured). Some blue flower spikes of *E. pininana* were up to 5-6 m. high. There is also a large collection of over 40 species of *Aeoniums* in all shapes and colours, mostly from the Canary Islands and a few from Madeira and Crete. The extremely rare *Lotus berthelotii* of which only one or two plants survive in the wild, is present at Tresco too, but as it is so rare, it is conserved in the glasshouse collections. Introduced for the first time in 1914.

And last, but not least, the plants from Mexico and neighbouring countries, 22 species of *Agaves* are on display. One or two *Agave ferox* made beautiful flower spikes in the Summer 1983 and I now have a few seedlings growing well from these plants.



*Lampranthus littlewoodii*  
from South Africa

I was also lucky enough to see the general flowering of the beautiful *Fulcraea longaeva* (Agavaceae) (introduced 1894), which grow in the desert in Mexico. There were around 30-40 plants in Tresco Gardens and as well a few growing wild along the coast of the same Island. Adult plants of *Fulcraea* flower very rarely, say every 10-20 years and when they do, they tend to flower all at the same time. Well this happened fortunately in the summer of 1983 as this year was a *Fulcraea* year (in July). Flower spikes were between 4-6 m. high and after flowering they die and produce large numbers of offsets (bulbs).

Also from Mexico was a giant *Dasyliirion acrotrichum* (1890) so heavy that the main stem had toppled under its own weight and has had to be supported on granite pillars. It was several metres long. Younger specimens were around in the gardens.

A few species of *Beschorneria*, also a Mexican succulent were around and flowered in June.

There are many more plants to be described from many countries but this is impossible. Over 600 Genuses with above 3,000 species are represented at Tresco Abbey Gardens.

As the Scilly Islands have such a good climate, no wonder they are the first to provide the mainland with flowers such as daffodils. The flower industry started in 1868 and now gives a living to many people in the winter time. The mild winters of Scilly enable the flowers to be grown in the open and picking begins in November and ends in April. During an average season, up to 800 tons of flowers may be exported which amounts to about 50 million blooms. For all these flowers, shelter is needed, and for that purpose, New Zealand species mainly are the best. Among them are:

*Pittosporum crassifolium*, *Habea lewisii* and to a lesser extent *Coprosma repens*, *Olearia traversii*, *Brachyglottis repanda* and *Senecio aureii*. It is great to hear some New Zealand plants are so useful overseas. Other shelter trees used on the Scilly Islands include the Chilean *Escallonia macrantha* and the Japanese *Eucunpus japonicus* (by the way, the foliage of this shrub is highly nutritive and often fed to cattle).

I can now only suggest to any New Zealander who visits Great Britain to visit these Scilly Islands and the Tresco Abbey Gardens, and especially if he or she is home-sick!

To come back to the severe Winter experienced in January 1985, I received a report from the Isle of Wight (South of England) with the following:

Lowest temperature registered was  $-5^{\circ}\text{C}$  (on one night only). Plants which survived from New Zealand were:

*Agathis australis* (Kauri) planted in 1973 and now 5 M. high. Another one nearby in a private garden and which cones each year survived very well too. *Metrosideros carminea* (Climbing Rata) has been only slightly harmed. Species which appear dead above the ground are: *Metrosideros excelsa*, *M. robusta* and *M. kermadecensis*. Snow fall was above average and reached a depth of 8-9 cm. and lasted about three days before disappearing under the daily sunshine. Most of the damage to the plants was done by a continuous icy salt laden East Wind which lasted for days. The plants on the Isle of Wight grow in the Ventnor Botanic Garden.

Ventnor Botanic Gardens got an award of Merit from the Royal Horticultural Society for the following New Zealand plants:

*Pittosporum crassifolium* Variegatum, *Coprosma repens* Silver Queen, *Hoheria populnea* Foliis Purpureis and Alba Variegata, *Sophora tetraptera* Grandiflora, *Brachyglottis repanda* Purpurea.

Photos and Measurements all by D. Bruhin (1983/1984)

Girths always measured at 130 cm from soil level unless otherwise stated.

I thank the following people for having provided help re. information at Tresco:

Peter Clough, former Head Gardener

Mike Nelhams, Head Gardener

Jane Bird, Gardener

Frank Naylor, Gardener.

At Inverewe:

Peter Clough, Head Gardener

At Ventnor Botanic Garden

R.J. Dore, Curator.

# STUDENT SECTION

## EDITORIAL

A late spring indeed this year! Although September is classified as 'Spring' the winter weather has certainly carried on this year. What a real 'old fashioned' winter compared to the last two years. Although the harsh frosts in this part of the country has badly affected and indeed killed some of the more tender plants this year e.g. silvery cassia, *Cassia artemisioides* (Leguminosae - sub family Caesalpiniodeae), the colder temperatures have brought about better displays of some ornamental winter display plants, for example, winter rose, *Helleborus niger* hybrids, (Ranunculaceae) and ornamental kale, *Brassica oleracea* var. *acephala* hybrids, (Cruciferae).

Any plants requiring vernalisation (low temperature promotion of flowering) will certainly have received enough chilling this past winter and should be well ready to burst into bloom when the warmer weather comes. The amount of moisture in the ground will ensure an adequate water supply for plant growth. The distinct, pleasant smell of freshly cut grass and the evening 'drone' of lawn mowers are a sure sign of warmer weather and longer days ahead.

Honey bees, *Apis mellifera*, become busy at this time of year, pollinating the many plant blossoms ensuring in most cases their continued reproduction, and as well providing man with a valuable commodity - honey. In this bulletin an interesting article on these amazing creatures produces some revealing facts and incredible statistics.

The other evening whilst pottering around the garden I looked up and saw a field mouse, *Mus musculus*, scampering across the ground. When one thinks of these, one gets the impression of a 'pest' devouring quantities of seeds. However, I was intrigued to read in a book on Proteaceae the useful role that rodents play as pollinators in the fynbos of South Africa. Nocturnal rodents are pollinators for as many as 35 *Protea* spp. in their natural habitat, whose flowers are produced at ground level. Examples of these are *Protea amplexicaulis*, *P. cordata*, *P. humiflora* and *P. subulifolia*. Hence a 'foe' in one habitat can indeed be a 'friend' in another.

Examination time is approaching again. No doubt you will have your head into the assignments and studying hard. All the best for examinations. As a way of relaxing afterwards - why not sit down and write a brief article on your favourite horticultural subject? Your comments would make interesting reading for others.

Kind regards

Nick Owers.

# THE STORY OF BEES *APIS MELLIFERA* AND HONEY

---

(Taken from a New Zealand Honey Marketing Authority pamphlet)

PART ONE OF A TWO PART ARTICLE.

Recently on a television programme regarding the pollination of kiwifruit, *Actinidia deliciosa* var. *deliciosa*, alternative methods to natural pollination of flowers in orchards were investigated, namely the mechanical spraying of previously crushed pollen onto female flowers. This method, along with hand pollination, it was suggested could ensure better, more uniform fruit set of kiwifruit with resulting consistent supply of higher grade fruit available for the much valued export markets. If these methods proved successful, bees, *Apis mellifera*, could well be rendered 'jobless' in the kiwifruit orchard.

However, the bee will always remain 'supreme pollinator' of nature at large and these fascinating creatures, who are a legion to themselves, will forever be a priceless link in the cycle of nature.

To tell the whole story of bees (even if it could be told as there is a great deal still to be learnt about bees) would fill a volume, so the article below merely points out a few facts about them.

## THIS IS THE STORY OF BEES AND HONEY

The bee family is comprised of a ruling queen, thousands of worker bees and some drones. The make-up of the family is complex, and to understand their relationship to each other, we must study their respective responsibilities.

### THE QUEEN

She is the most important member. She is the mother of workers and drones and if she dies and is not replaced, the whole hive will perish.

### WORKERS

These gather nectar from the flowers to make honey, nurse the baby bees, keep the temperature of the hive at a constant 34 degrees celsius and have many other duties. They are females but cannot lay fertile eggs.

### DRONES

These bees are males and their only useful purpose in life is to perpetuate the race by impregnating a virgin queen. The drone develops from an infertile egg laid by the queen.

There is a "master mind" in every hive which directs the work to be undertaken under circumstances which have never arisen before, but the bees know the correct procedure to benefit the whole hive and not individuals. 50,000 to 60,000 citizens inhabit the hive. Bees can communicate to each other the exact location of abundant food supplies several miles away from their hive, and on the return of a forager, precise directions are communicated to other bees how to find their way by taking a bearing on the sun.

In flight, a bee beats its wings 12,000 times a minute and can fly at 32 kilometres an hour for a distance of 3 to 5 kilometres away from its home hive. In the season of the nectar flow from the flowers its active life is only three weeks for it works itself to death. A modern aircraft can carry a quarter of its own weight in passengers or freight, whereas a bee can carry practically its own total weight in pollen and nectar. Aeronautical engineers maintain that it is "impossible" for a bee to fly with such a load; - but it does do so, and to make a single pound of honey, a bee would have to bring home 30,000 loads of nectar. Of course, no one bee makes so much honey, and the jar on your breakfast table is the combined result of the labours of many bees.

LET US IMAGINE that an accident has befallen the queen of the hive and that she has been crushed by the bee-keeper in moving the honey combs in the hive.

The whole colony immediately knows that a tragedy has befallen them and the "master mind" decides that action must be taken at once to ensure that the life of the hive can continue. Without a laying queen - and a healthy queen lays between 1,500 - 2,000 eggs each day - the whole colony will perish.

On realising the tragedy, some worker or nurse bees select some day old eggs laid by their queen and begin to feed the tiny eggs with a special substance called Royal Jelly secreted from the glands in the heads of the workers when a new queen is needed. Other workers set about enlarging the size of the wax cell containing the egg, for a queen is larger than a normal worker bee and must have more space for growth. A mixture of honey and pollen in the form of bee bread is also fed to the egg, and the end of the wax cell sealed over.

It is miraculous that a tiny egg so small that it can be hardly be seen when first laid and which was destined to be a worker bee is transformed into a beautiful elongated queen simply because it is fed in its formative stages on Royal Jelly. Incidentally, the bees always select eggs which are less than three days old for development into their new queen.

#### QUEEN CELLS

When built under such emergency conditions queen cells are bulbous, and after 11 or 12 days the young virgin queen is ready to emerge into the hive. If you stand close to the hive at this stage, you may hear her high pitched piping as she bites her way through the wax capping of her cell, Her first object in life is to ensure that she is the only queen present, and as soon as she is sufficiently strong enough to walk round the frames,

she hurries to see if there are any rivals. If another queen cell is found the sides are torn down and the embryo queen destroyed; if she should meet another queen hatched at the same time as herself, there is a fight to the death, for only one queen remains as ruler. The queen has a sting which she normally reserves solely for the purpose of stinging and destroying another queen.

#### FIRST FLIGHT

Within a few days, the queen will make one or more orientation flights which enable her to fix in her multi lens eye objects close to her hive and enable her to find her way back home after her mating flight.

#### MATING FLIGHT

When the virgin queen is ready for mating, there is great excitement amongst the drones of the hive and others which happen to be in the vicinity. The queen leaves the hive and flies in spiral motions high into the air pursued by drones trying to catch her to implant their seeds into a special sac within her body called the spermatheca. Only the fastest and strongest drones succeed in mating with the queen in flight, and sufficient seeds or spermatozoa are implanted by the drones to last the queen for the whole of her egg laying life, enabling her to produce fertile eggs. Sometimes, a queen will make several mating flights to ensure that she is adequately impregnated with drone seeds.

Before we leave the subject of impregnation of the queen by drones or males, mention must be made of the extra-ordinary fact that the queen can deposit a fertile egg into a cell whenever she wishes which will grow and develop into a worker bee, and she can also deposit an egg which is not fertile and will become a male bee or drone. Thus, there is the phenomena that a worker bee has a father (the drone that impregnated the queen on her mating flight) but the drone has no father because the egg from which it develops is not fertile.

THE QUEEN OF THE HIVE is not always reared under 'panic' conditions, as described when the ruler is accidentally killed. Under normal conditions, when a queen is two or three years old and begins to fail in her ability to lay her quota of eggs, the "master mind" of the hive decides that a new and more vigorous queen must rule to keep the hive at full strength.

Worker bees having taken the decision; start to build acorn shaped cells, usually at the lower end of a brood frame and the old queen will deposit one of her eggs into the base of the cell when it is first started. If she is contrary, and keeps to normal brood cells, the worker bees will remove a day old egg from a cell and deposit it into the specially prepared queen cell, and begin to feed the larvae or egg on "royal jelly" as previously described. Before the young virgin emerges, however, the old queen realises that she is no longer wanted and on a sunny day before the expected emergence of her daughter leaves her hive with worker bees and drones in



attendance.

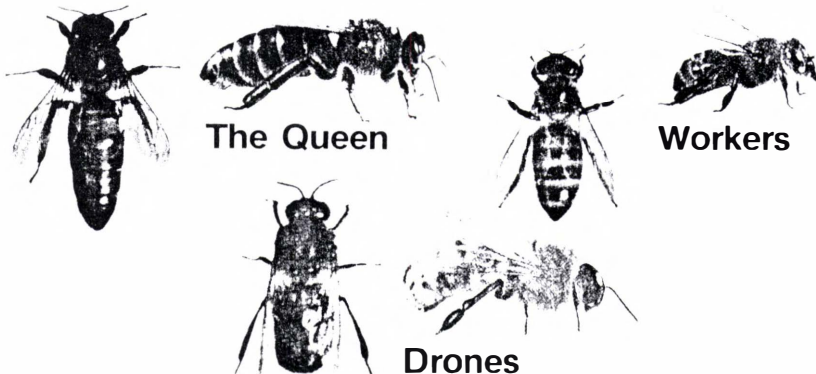
### THE SWARM

This departure of the old queen is called a "swarm", and the departing bees usually settle on a bush or a fence post within seven metres of their old home.

The beekeeper, not wishing to lose his valuable bees will collect them and place them in an empty hive, often destroying the old queen since she is failing, and giving the colony a young queen to continue their activities. If left to their own devices, however, the swarm sends out 'scouts' for several miles distance searching for a suitable home which may be an entrance to the roof of a house, a cavity in a tree, or a dry hole in the ground under a large rock. On return of the scouts with reports of their findings, the "master mind" decides which site will provide the best shelter, and the whole swarm flies off to the new home.

If the queen is still found to be lacking in her capacity to lay sufficient eggs, the "master mind" may decide to raise a new virgin queen and the old queen is destroyed and bundled out of her home to die. This seems very callous and barbaric by human standards, but in the bee's view, it is the health and strength of the colony which counts, and their ability to survive as a unit is all important.

Having studied the family pattern of the bee colony you now know that there is a fertile, egg laying queen as the head and most important member, with workers and drones. Before leaving the structure of the family it must be mentioned that the worker bee is an incomplete female. That is to say, whilst the worker bee is capable of laying eggs, those eggs will always be drones because they cannot be fertile. The worker bee's body is incapable of fertilisation. In fact, worker bees only lay eggs under such dire circumstances as the death of the queen and where no newly laid eggs can be reared into queens by being fed with Royal jelly. The workers are so worried and upset, that they lay their infertile eggs in imitation of their queen, but the result can only be the formation of drones and the whole colony of bees will perish.



# GUIDELINES FOR N.C.H. SUBJECT No. 9 “WORK RECORD REPORT”

The Work Record Report is to be divided into two sections, namely:

1. A Property Report and
2. A Work Record in the form of a diary.

## OBJECTIVES

PROPERTY REPORT - To enable students to develop an analytical approach to the function and objectives of the property on which they are working, or have worked.

WORK RECORD - To enable students to learn by recording in diary form a systematic method of record keeping in which observations and job activities are written up.

## THE PROPERTY REPORT

This is to be a written assignment consisting of no more than 1,200 words excluding diagrams, maps, photographs or other resource material. It is to be a review of the place of work and its principal activities. Included are to be: The geographic location, size, topography, building, facilities, shelter, soil type, drainage, plants/crops grown, machinery and irrigation methods used or any special features of the property. Also to be included are facts about the organisation structure, staff numbers and lines of communication and authority.

Grading to represent 40%.

## THE WORK RECORD

The Work Record will be in the form of a diary.

Page size - A4.

The student is to keep a record of his/her work activity for a 12 months period.

Particular importance is to be placed, where appropriate, on a description of the work method or techniques used, with comments on effectiveness and values, the word content may vary but handwritten notes representing approximately half a page per day is a guide.

The notes should preferably be written daily but weekly description of the student's work activity will be acceptable.

Where work activity is repetitive, students may supplement their diary with observations and information outside the scope of their work, provided it is of a nature which will add to their horticultural knowledge.

In addition to the recorded notes, supplementary information including cultural or technical information or photographs must be included to add to the value of the diary as a reference record. Personal comments should be appended where appropriate.

For ready reference a simple alphabetical index of significant items of work or horticultural interest may be included.

Grading to represent 60%.

NOTE: Both the Property Report and Work Record are to be submitted to the Executive Officer, R.N.Z.I.H., P.O. Box 12, Lincoln College, by 31 October in the year in which the candidate has submitted an examination entry for this subject.

All documents submitted will be returned to candidates after marks have been ratified by the Examining Board in January of the following year.

## **WELCOME: to the following new members**

Berridge A.C., Kaiapoi  
Christchurch Polytechnic  
Dodds L.J., Hamilton  
Evans K.W., North Canterbury  
Foster B.J., Matata  
Hilliham D.W., Auckland  
Hogan M.D., Porirua  
Irwin S.L., Dunedin  
Jannissen N.C., Tauranga  
Longhurst B.G., Greytown  
MacKay M.A., Wellington  
Murray J., Tauranga  
Olafsson T., Gisborne  
Orsman M., Wellington  
Penny J.A., Christchurch  
Polstra J.T., Otorhanga  
Rasmussen R.B., Waihi  
Raukawa A.M.N., Southland  
Seymour K.P., Gisborne  
Stedman A.R., Hamilton  
Thompson B.K., Ashburton  
Trubshaw A.J., Tauranga  
Vause S.M., Auckland  
Walker D.J., Orewa  
West D.N., Te Awamutu  
Wilson S.P., Hamilton

Booth B.R., Palmerston North  
Coombes A.N., Hamilton  
Ellis S., Waihi  
Fletcher P.J., New Plymouth  
Franks G.E., Te Awamutu  
Hitchins A.L., Hamilton  
Hornby C.A., Hawera  
Jacobson G.A., Wellington  
Kommeren G.A., Hastings  
McCormick R.P., Hamilton  
MacNicholl W.J., Masterton  
Newman S.P.R., Gisborne  
Olsen M.J., Auckland  
Penfold G.R., New Plymouth  
Pilkington C.J., Auckland  
Rapley S.V., Katikati  
Raudnic R.D.G., Wellington  
Seeman B., Hamilton East  
Stedman V.M., Hamilton  
Thomas L.J., Hamilton  
Tombs A.G., Dunedin  
Tucker A., Waihi Beach  
Von Pein J.S., Gisborne  
Watty P.M., Taranaki  
Wilkie F.J., Auckland

# PLANTING KAURI *AGATHIS AUSTRALIS*

## INSTRUCTIONS AND CARE

Taken from a booklet published by the New Zealand Forest Service

by R.C. Lloyd

### INTRODUCTION

#### You Want to Grow Kauri?

There are various situations in which people may find themselves wanting to grow kauri *Agathis australis*. It may be to incorporate them as ornamentals or interesting specimen trees in a large private garden or a botanic garden; or to add to or enrich the variety of native forest trees regenerating amid scrub cover on land that is set aside for a park, recreation area, or scenic reserve; or to create a kauri plantation on grassed land or cleared scrub land. Whatever the purpose, the notes here will provide guidelines for the planting out and subsequent care of kauri seedlings.

#### Where They Will Grow

Without doubt, kauri thrive best in the region where they occur naturally - Northland, Auckland and Coromandel. Nonetheless, they can be successfully grown throughout the country, although the further south of their present natural range they are planted, the more care and attention they will need.

#### Tree Stocks Available

Kauri trees for planting in State forests are raised in a Forest Service tree nursery at Sweetwater near Kaitaia. They are grown from seed and are ready for transfer to planting sites when they are 3 years old (known as 3/0 stock) and their average height is around 28cm. In certain instances 2-year-old (2/0) stock, averaging 20cm in height, can be used - such as planting amid manuka scrub or in a sheltered garden position.

### POINTS TO REMEMBER

Thorough preparation and good care will pay dividends, so it will be to your advantage to note the important points below.

#### 1. Time of Planting

Seedlings planted in autumn survive and grow better than those planted in winter or early spring. They should therefore be in the ground at least 1 month before the onset of wintery conditions.

## 2. Soil Nutrients and Soil Acidity

Kauri will tolerate low levels of soil nutrients. Since both vigorous and unthrifty trees contain the same proportions of these essential elements, some other factor or factors are responsible for good healthy growth. Soil condition is believed to be one possible explanation. Kauri can, however, make use of soil nutrients if available, and much more vigorous growth can be expected if adequate supplies of fertiliser are present.

(See under *Fertilisers*)

Lime is not required unless soil acidity is below about pH 4.5. So far, best growth of kauri has been obtained with pH between 4.8 and 5.5.

## 3. Soil Condition and Pre-pitting

A cultivated soil is much more conducive to good establishment and growth than an uncultivated soil. This particularly applies to heavy clay soils.

It is common practice to carry out "pre-pitting" where kauri seedlings are to be planted in uncultivated ground or heavy soils. At least 1 month before planting, though preferably 3 months before, the soil is dug to make a hole 30cm in diameter and 30cm deep.

The soil from the hole is left alongside to "weather" until planting time. When it is replaced around the seedling after this period of exposure, the soil should be quite friable, or loose, and will provide the seedling with a rooting medium that is, initially at least, free of other competing roots and from which the available nutrient could be more readily taken up.

Where practicable, there can be some benefit in mixing well-rotted compost with the soil at the time of planting or, alternatively, in placing well-rotted compost beneath the roots at the time of planting. (If compost is not well rotted, it could "burn" the roots.)

The better the soil, the better the growth, but response on poor soils can be improved by applying fertiliser in the spring following planting.

(See under *Fertilisers*.)

## 4. Placing Seedling in Planting Hole

Take care when planting out that you do not disturb the seedling's roots when removing it from its container.

Tamp the replaced soil firmly and note that it is best to have the soil level around the tree slightly higher than the root collar, as the soil will tend to sink. This is a particularly advisable precaution when planting on a large-scale on an open site that has been worked over with discs or harrows. Sinking here could cause pooling of water around the trees, which is highly undesirable as kauri don't like wet soils or wet sites.

## 5. Aspect and Shelter

Kauri tend to do best on a northerly aspect, and likewise to survive and grow better in sheltered places rather than those exposed to strong winds.

## 6. Light

The greater the amount of *overhead* light a seedling receives, the better its rate of growth.

## 7. Frost

Small newly planted kauri seedlings are sensitive to frost. Once they are established and growing well they have been known to withstand up to 17° of frost.

When planting the seedlings outside their natural range, take care to protect them from frost damage by selecting situations that offer adequate side and overhead cover, such as a surround of manuka scrub. Where there is no protection from such a "nurse crop" you will need to provide an artificial cover in the form of scrim or a manuka brush shelter.

Because of the tendency of frost to hit in valley bottoms, seedlings in such situations are more at risk than those on elevated ground.

## 8. Wet Sites or Soils

Sites or soils that are likely to become waterlogged are not suitable for kauri seedlings as the development of root-rotting fungi is common under these conditions. The seedlings can be killed off as a result, or if they survive they grow extremely slowly.

## 9. Fertilisers

A slow-release nitrogen-phosphorus-potassium (NPK) fertiliser such as diammonium phosphate is beneficial in the early stages of establishment as it induces a sturdier healthier-looking plant, although it does not necessarily improve growth to any significant degree.

The application of a small handful (110-140 grams) of this type of fertiliser, if desired, can be made early in the spring following planting. Place it in a small hole in the soil, about 15cm deep, and about 15cm from the tree. Locate the hole on the uphill side if the tree is on a slope.

*On no account* mix any artificial fertilisers with the soil at the time of planting a seedling as the roots are liable to get "burnt".

## 10. Spacing and Branch Formation

Under natural forest conditions kauri shed their lower branches as they grow. When they are "open grown", that is planted and grown without a surround of competing plant life, the trees retain their lower branches. This retention has two possible

drawbacks. It may detract from the otherwise attractive form of the young tree, and it may lead to knot formations in the timber. This latter aspect could be of concern to those growing plantation kauri.

You can eliminate the problems resulting from branch retention by removing lower branches from time to time as the tree grows, and before the branches become too thick. To remove a branch, jerk it downwards, and it will come away easily. There will be a white wound that bleeds lightly, but it will heal quickly.

#### 11. Damage from Surrounding Vegetation

Kauri are very susceptible to being misshapen through being bent away from their vertical position by such things as heavy shed branches from surrounding vegetation. Also, if the tip is wind-shipped against nearby sturdier and unyielding plants it will be damaged beyond recovery. Where the tip is badly damaged in this way, it is not unusual for a branch to take over as main stem but, because of the branch's initial position, this results in a tree with a kinked or bent trunk.

### PLANTING KAURI IN GARDENS

Kauri when young are extremely attractive trees, their erect cylindrical boles, with a pattern of alternate bands of grey and silver bark, carrying an almost symmetrical conical crown. When older, the bulk of the trunk becomes massive, the bark takes on a rougher more mottled appearance, and the crown is more spread and heavily branched.

For garden planting they have a high interest as feature trees. In such situations they can also grow much better than their counterparts planted in scrub or plantation. The reason is they do not have to compete for water and nutrients to the same degree, and also they do not suffer from root competition in a garden.

For your planting, select first of all a position sheltered from strong prevailing winds.

Where the garden soil has been cultivated recently, there will be no need for preconditioning of the soil before planting your kauri seedling. If there is a lawn which has been down for several years, however, it will probably be advisable to pre-pit, particularly if the soil is poor. You could also replace poor soil with good soil. In either case an incorporation of well rotted compost will be an advantage.

In areas where heavy frosts are likely you will need to surround the planted seedling with scrim, on top and on all sides, during its early establishment and development.

#### Follow-up Care

Very little follow-up treatment will be required once the seedling is established in a garden, although an application of fertiliser the following spring could be beneficial. (See

item 9 under points to note.)

As the tree grows taller it may be necessary to stake it. If so, use cloth or cloth-like material to tie the tree to the stake. Wire or rope will rub or bite into the stem, causing it to bleed gum, and you could end up with a malformed or badly damaged tree.

One other follow-up to bear in mind in a garden planting of kauri is that of branch retention. (See item 10 under points to note.)

#### KAURI *Agathis australis* STATISTICS

Kauri trees reach maturity at around 300-400 years, when they stand about 30m high. Some notable trees have been recorded as being over 1,000 years old. Several old giants on record have reached over 50m in height and attained girths of over 16m.

\*\*\*\*\*

## **BROWNROT**

*(Sclerotinia fructicola)*

Until 1950, brownrot was generally regarded as the most serious disease of stonefruit in New Zealand. There was no effective control and the disease caused heavy losses whenever the conditions favoured the fungus.

If left on the tree or ground from the previous season, brownrot-infected fruit become heavily encrusted with fungal tissue to form 'mummies' which are very resistant to breakdown by other organisms.

### **FLOWERING**

As blossoming approaches, a fruiting body containing spores is produced from 'mummies' on the ground. These spores are forcibly ejected into the air to land on flowers and cause infection. At the same time, spores from the mummified fruit on the trees and from twig cankers are spread by wind and rain, also causing blossom infection.

Primary blossom infection gives rise to further blossom infection and new twig cankers. Showery weather during blossoming provides favourable conditions for infection and many flowers are likely to be attacked. After petal fall however, it is unusual to find many new lesions until the fruit is approaching maturity.

### **PRE HARVEST**

When wet weather coincides with harvesting, spores are produced abundantly on twig cankers and infect ripening fruit. Infection may also occur during dry conditions, possibly from latent infection within the fruit or from the high quantity of spores which have accumulated on the hairs of developing fruit during the growth period. As the fruit ripens, infection then occurs with many new lesions developing over a short time.



# DANCING DAFFODILS

by

Hugh Redgrove on  
behalf of the N.Z.N.A.

When Wordsworth wrote of daffodils dancing in the breeze, he was probably referring to the Tenby Daffodil *Narcissus obvallaris* now a rare native of the West of England. It has a golden perianth and flared trumpet.

But there are many other species of narcissus in various forms mainly natives from Spain and Portugal, Southern France, the Alps and the Atlas Mountains of N.W. Africa. It is from these wild daffodils that all our lovely and spectacular daffodils and narcissi have been bred during the past 300 years.

There is a strange fascination about these small species and generally speaking they grow well in all parts of New Zealand. They are not grown nowadays for cut flowers, nor do many make any great garden display so that often some are hard to find, but they are so delightful in association with other small plants that every keen gardener will want to possess some.

The Hoop Petticoat daffodil is to be found in most garden centres under the name *N. bulbocodium*. This has very small perianth petals and a wide open gold trumpet. It increases well and may be naturalised in short grass or other low ground cover, usually 20-25cm high, flowering August-September. There is also an autumn flowering one with cream coloured flowers from North African species and this makes a cheerful display in May. It is called "Nylon".

There are two small trumpet daffodils which flower in winter. One is "Bambi" the other "Androcles" and they should be available from most bulb specialists. Quite early in July they will open their flowers, true heralds of spring. They are probably hybrids.

"Angels Tears" is a delightful name for a lovely little species with several pendant bells on a stem which grows 15 to 30cm and has the name *N. triandrus*.

The flowers may be pure white, creamy-white or golden yellow and these have various botanical names. "Thalia" is a hybrid, pure white and closely resembling the species except that it is twice the size. "Silver Chimes" is glistening white and shows the tazetta blood bred into it.

*Narcissus cyclamineus* is unique; It has a long tubular trumpet with the perianth turned up like the "ears of a kicking horse" to quote E.A. Bowles. Unfortunately, it is very slow to propagate and is best grown from seed. But this species has given rise to numerous hybrids most of which are considerably taller but have all some feature that reminds one of its parentage. There's "Peeping Tom", a golden daffodil with telescopic trumpet, "February Gold", very early flowering with perianth

reflexed, "Charity May" "Jenny" and "Dove Wings".

There are many other small hybrids but the ones mentioned should all be obtainable from the larger bulb merchants or from specialists, but I must mention one New Zealand raised hybrid. It is named "Hawera" and resembles "April Tears" with 2-4 lime coloured flowers on each 25cm stem and flowering early.

All the daffodil species will come true from seed and if sown in late summer in pots they may be expected to flower in three years time. Sow the seed thinly and then there is no need to transplant. Feed occasionally then after two seasons in the pot, plant out each potful complete in association with other small plants and you will have a great thrill when they first flower. The hybrids may be grown in the same way but they will vary in form to some extent.

---

---

---

---

## A STUDENT'S VIEW

by Neill Leitch

At this year's R.N.Z.I.H. Annual General Meeting and Conference there was great enthusiasm for New Zealand to become a 'botanical museum' for the world.

We should consider a few things first before rushing into this, the first being - do we set up a live collection or seed bank?

I take it for granted that everyone concerned with this idea were sincere and wanted to conserve endangered plant species and maintain genetic diversity, and were not simply interested in doing it for the sake of recognition. I agree with these reasons but believe that in the first instance we should be selfish and conserve our own native plants first. If we don't we may forsake them in our enthusiasm to save the 'exotics'. We must move ahead, but always putting our plants first. After all it wouldn't look good for the record - "Preserved world's but lost own in process".

I don't want to dampen everyone's enthusiasm, but we must move cautiously to avoid putting natives at risk by the exotic takeovers. We already have enough of these which we all recognise such as gorse and broom, but the worst are the ones we don't recognise until it is too late. For instance our botanic gardens operate a seed exchange with others throughout the world. We imported seed of *Nemesia strumosa* the description of the plant indicated it may have potential in this climate. Its potential was that of a weed, and it established rapidly in parts of the garden and has taken over. Fortunately it is also contained there, but will we always be so fortunate?

# CHELATED TRACE ELEMENTS

## THEIR SIGNIFICANCE, CHARACTERISTICS, EFFICACY

*Dr. Ernst U. Belger, agronomist  
BASF Agricultural Research Station  
Limburgerhof  
Federal Republic of Germany*

*Taken from BASF Agricultural News 4/81*

In its study "Agriculture towards 2000", the F.A.O. warningly pointed out that enlarging the amount of land for agricultural use will face growing limitations in the future. For this reason, during the 20 years ahead of us, nearly three-quarters of the rise in food production in the developing countries will have to come from larger harvests and intensification of management practices on land already devoted to agriculture.

### THE PROBLEM: THE TRACE ELEMENT GAP

More intense land use and the subsequently larger harvests also mean more nutrients are removed from the soil. These nutrients must be replaced by fertilizer applications, or the top soil in the root zone will gradually be exhausted. In the case of the primary nutrients and some secondary nutrients, current fertilization practices already take this into account. All too often, however, even modern cultural systems still forget about the trace elements. There is no doubt about the importance of their role in the smooth functioning of the plants' metabolism. This justifies their denotation as "essential" nutrients, and a sufficient supply of these micronutrients to the crop must be viewed as a basic prerequisite for the plants to exploit their genetic potential.

Advanced agricultural practice is characterized by the use of modern crop management methods and highly developed inputs. The latter include high yielding varieties with their high nutrient demand, also for trace elements. This need is met by increasing use of highly concentrated mineral fertilizers, but only certain special fertilizer brands also include the accompanying trace elements. The higher requirement for micronutrients therefore increasingly faces inadequate supply or none at all. This situation must be given proper attention if the agricultural yields are not only to be maintained at a constant level, but also pushed to higher levels.

### THE SOLUTION

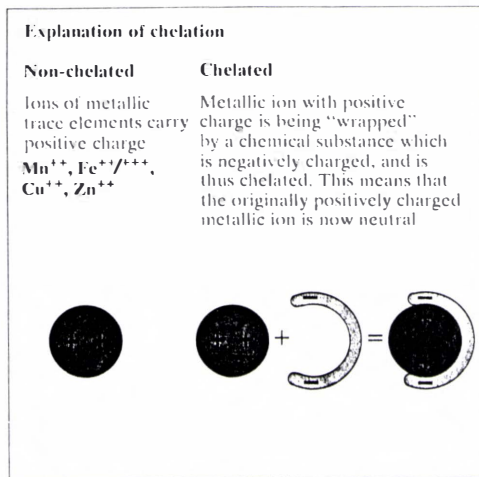
Supplying trace elements along with the standard fertilizer applications is nothing really new. Awareness of the need, however, has grown over recent years. One conventional method of supplying them is to apply inorganic salts of these elements as a soil application or to the foliage (in dissolved form as a spray). The effectiveness of this method remains a matter of debate in the case of several elements. Application of inexpensive iron, zinc and other sulphates, oxides, etc. is simple and cheap, but frequently does not have the hoped-for result. It still is not fully clear just how effective such compounds

are. It has not been conclusively proven, to what extent iron oxides are utilizable by the plant, because of the complicated absorption mechanism for this element. There likewise are no certain figures on how much of the zinc sulphate applied to the foliage is actually taken up by the leaf tissue.

### CHELATION

BASF realized very early that it would have to find more effective products for the farmer to use for this purpose. One way to improve the effectiveness of the trace elements was found to be the chelation of these nutrients. In this process the positively charged ions of metallic trace elements are treated by a chemical coating; they are, so to speak, neutralized, so that their tendency to be bound to negatively charged poles (e.g. the leaf surface) is greatly reduced. Chelated trace element ions, as organic complexes, are less susceptible to undesired fixation in the soil. The plant can take up metallic chelates as molecules, which means they are more easily or rapidly assimilated via the surface of green plant parts, and they are more mobile within the plant tissue and more utilizable in the plant's metabolism than metallic ions.

Table 1:



BASF has played a decisive role in the development of chelated trace elements from the very start. It combined metallic iron with EDTA (ethylenediaminetetra-acetic acid), which has been found particularly effective and economical, and since 1963 it has offered the farmer the iron fertilizer Fetrilon, currently with 13% Fe as an organic compound. For preventive and curative treatment of chlorosis due to iron deficiency, Fetrilon has become a standard product for fruit, grapes, vegetables and ornamental plants. In a similar manner BASF worked out a chelated copper fertilizer, in which copper is likewise bound organically. Cutrilon, with ca. 14% copper, is recommended for preventive and curative treatment of copper deficiency and for enriching soil substrates with this element.

## FETRILON-COMBI

The intensive work with trace elements quickly led to the realization that under practical conditions it often is not possible to diagnose the trace element deficiencies exactly. The visual symptoms frequently are difficult to interpret. This can also be made even more difficult by the fact that an especially pronounced deficiency may optically mask a more mild deficiency of another nutrient. A latent deficiency also may occur, with visual symptoms that are not yet severe enough to permit easy identification, however, already adversely influence the size and quality of the harvest. Particularly the crops in the tropics and subtropics are widely plagued by latent trace element deficiencies. Moreover, in overseas countries opportunities to obtain soil and leaf analyses are frequently inadequate. A specific fertilizer recommendation based on these analyses is possible only in rare cases.

## EFFECT

To provide a solution for these numerous instances in agricultural practice of trace element requirements, BASF developed a trace element concentrate. It has been in use in all parts of the world for a number of years now, under the brand name Fetrilon-Combi. Fetrilon-Combi contains all the trace elements essential for optimal growth in a balanced ratio. The metals are bound organically. Since magnesium, an important component of the chlorophyll molecule, also is one of the nutrients frequently neglected in modern fertilization, and since many crops (such as legumes) have a high sulphur requirement and many tropical soils have a sulphur deficiency, these two secondary elements were integrated in this trace element mixture.

Fetrilon-Combi is available in two formulations as green and red which are both readily soluble, wetttable powders. They are most easily and economically applied in combined sprayings with the standard crop protection products. Repeated sprayings of low application rates (1-2 kg/ha) over the course of the growing period and during the phases of fruit production/grain-filling have been found most effective. The nutrient compositions are listed in Table 2.

The choice between the two forms is determined by the soil reserves of micronutrients on the respective crop site and by the particular requirement of the crop for trace elements.

Replicated trials and practical experience over recent years have provided the evidence, that Fetrilon-Combi not only measurably raises the yield of intensive crops, but also substantially improves the composition, and hence the quality, of harvested produce.

Table 2

FETRILON-COMBI		Nutrient content (%)	
Element	Fetrilon-Combi green	Fetrilon-Combi red	
MgO	4.0	2.0	
Fe*	1.5	2.0	
Zn*	0.5	2.0	
Mn*	1.5	1.5	
B	0.3	0.5	
Cu*	0.5	0.5	
Mo + Co*			
S	approx. 8.0	approx. 8.0	

\* Chelated

SUMMARY

To handle obvious monodeficiencies of iron or copper, BASF offers agriculture and horticulture the iron chelate Fetrilon and the copper chelate Cutrilon as monochelates.

The objective of the proven trace element concentrate Fetrilon-Combi is to prevent or cure latent or mixed trace element deficiencies. We still see large, and growing, gaps in meeting the crops' demands in this respect. Further improvements and supplements to Fetrilon-Combi therefore are planned in the near future. The improvements are for one of a chemical nature such as a further increase in the micronutrient content. For another, however, they also involve the physical properties of this product. We expect from these improvements, products with still better storage stability and markedly improved effect.

# DISTRICT COUNCIL SECRETARIES

## AUCKLAND

Mr B Keene,  
48 Pokapu Street,  
Tititangi, AUCKLAND

## BAY OF PLENTY

Mrs. J.A. Swinbourn,  
12 Tilby Drive,  
Matua,  
TAURANGA

## CANTERBURY

Mr. E.D. Moyle,  
6 Winslow Street,  
CHRISTCHURCH 5

## NORTH TARANAKI

Mrs L. Skipper,  
50 Omata Road,  
NEW PLYMOUTH.

## OTAGO

Mr R.M. Scott  
83 Hawthorne Ave.  
DUNEDIN

## POVERTY BAY

Poverty Bay Hort. Society,  
P.O. Box 1275,  
GISBORNE (Liaison Only)

## SOUTHLAND

Mr. G.A.R. Petrie, AHRIH,  
64B Clifton Street,  
INVERCARGILL

## SOUTH TARANAKI

Miss E.A. Free,  
23 Egmont Street,  
HAWERA

## WAIKATO

Ms T. Thompson  
56 Banbury Cres.  
HAMILTON

HAMILTON EAST

## WELLINGTON

Mr M. Oates  
P.O. Box 11-379,  
Manners St. WELLINGTON

## WHANGAREI

Mr. K. Young, FRIH  
P.O. Box 1530  
WHANGAREI

RNZIH Notable & Historic Trees Committee — P.O. Box 11-379, WELLINGTON

RNZIH Regional Horticulture Sub-Committee — P.O. Box 11-379, WELLINGTON

## ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC.)

Annual Subscription rates: (Subscription year ends 31 Dec.)

Individual Members	\$28.00
(less \$7.50 without Journal)	
Small Non Commercial Societies	\$28.00
Sustaining Members	
i) Corporate Bodies	\$65.00
ii) National Commercial Organisations	\$110.00
Associate Member (on application)	Approx 65% of Individual Sub.
(over 65 years and being full member for 10 years)	

G.S.T. is not included in these figures

Subscriptions should be sent to: the Secretary, RNZIH, P.O. Box 12, Lincoln College, Canterbury.

Get in touch with your District Secretary and become involved with local RNZIH affairs.

