

Horticulture

in New Zealand

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



40
Winter

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HORTICULTURE

IN NEW ZEALAND

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BULLETIN OF THE ROYAL N.Z. INSTITUTE OF HORTICULTURE

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ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC)

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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.

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EDITORIAL

With this being my second to last bulletin, it gives me great pleasure to announce that a new editor has been appointed. Pamela Gibbons, a tutor in Amenity Horticulture at Lincoln College, will I'm sure, add new and diverse interest to the bulletin. Pamela has a very wide experience in horticulture from nursery work to working in botanic gardens to teaching horticulture. Pamela gained a Diploma in Horticulture from Lincoln College and then travelled to England to study the Kew Certificate. I hope you will all send in plenty of articles as it makes the editor's job much easier.

This issue has a number of important notices which members are asked to read carefully. Please note the amendments to the constitution on page four.

My congratulations to those people who received their National Certificate in Horticulture or National Diploma in Horticulture. Also congratulations to those who received prizes for their performances.

A special welcome to all the new members. I hope you can in some way contribute something to the Institute either through the bulletin or through your District Council.

The Annual General Meeting and Annual Conference. I guess you read the information about these every year, look at the programme and think there are some quite interesting speakers. And then you think NO, the Annual General Meeting is only for the people who.....(add your own words). Well you are wrong. Having attended the Conference in Dunedin this year, yes my first, but not my last, I would strongly suggest that members attend these. They are really great value and you meet so many interesting people who are just like yourself and believe it or not have the same views on some things!! some times!!

So when next year's Conference is advertised in the bulletin you should have already made up your mind to go.

Regards,

David Shillito
EDITOR.

THE ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE GARDEN HISTORY GROUP FOUNDED 1985

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.

ADMINISTRATION

The needs of the Garden History Group shall be administered by a small working committee with at least one National Executive Representative. The Committee members will be confirmed at each annual seminar and regional groups, Local Co-ordinators being appointed where possible.

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

NOTICE OF SPECIAL GENERAL MEETING

A Special General Meeting of the R.N.Z.I.H. will be held in the No. 1 Committee Room, City Council Chambers, Mercer St, Wellington commencing at 9.30 a.m. on 20 August 1986.

The purpose of the meeting is to consider the adoption of a number of amendments to the Constitution of the Institute, as discussed at the Annual General Meeting in Dunedin on 17 May 1986.

The proposed changes are set out overleaf and members' attention is drawn in particular to Clause 3 (f) which provides for long-standing members over the age of 65 years to apply to become "associate members" and hence pay a reduced membership subscription.

A quorum of 14 members is required for the Meeting to be able to act on behalf of the entire membership.

Any members unable to attend the meeting but wishing to record their vote on the proposed changes may ask another member attending the meeting to act as their proxies, provided they advise me in writing before the meeting of the name of their proxies. Members in this position may care to ask a member of the National Executive to act as proxy as the Executive will be meeting immediately following the Special General Meeting and hence their attendance at the meeting can be anticipated.

D.B. Cameron
EXECUTIVE OFFICER.

NEWS FROM TIMARU

Arbour Day 5 June 1986, was commemorated in Timaru by the Parks and Recreation Department apprentices planting a grove of one of the world's most endangered trees.

The planting took place in Centennial Park and the Easter Island Kowhai, *Sophora toromiro*, was chosen. The tree is extinct on Easter Island but two specimens are in cultivation in Christchurch and Sweden. Only the Christchurch tree produces viable seed and it is heartening that the resulting trees produce a straight and dominant leader.

The plants use as a street tree is a definite probability and in the long term the tree should once again appear on Easter Island.

SPECIAL GENERAL MEETING - 20 AUGUST 1986

AMENDMENTS TO CONSTITUTION

As you will recall at the Annual General Meeting (in May), it was agreed that a Special General Meeting would be called to consider the proposed changes set out below.

CLAUSE 3 (b) v) Amend "AHRIH" to read "AHRNZIH".

3 (c) Honorary Members

This category has not been used for some time and probably will not be used. Most people are elected Associates of Honour.

First paragraph line 5: delete "8 (e)" replace with "8 (d)" and delete rest of sentence. (i.e. members cannot become Honorary Members.)

3 (d) Fellows

Delete paragraph 3 (d) (i) and replace with:

"Fellowships shall be conferred upon those members who have made a significant contribution to horticulture by their activities or interest in or service to horticulture, and who in the opinion of the National Executive are worthy of election to the status of a Fellow."

3 (d) iv) Amend "FRIH" to read "FRNZIH".

3 (e) Delete and replace with:

"Sustaining Member

Sustaining Members shall be any companies, societies, associations, firms or bodies which pay annual subscriptions subject to rule 8 (b)."

Sustaining members shall each be entitled to nominate one member of the organisation to attend meetings and speak on behalf of the organisation.

Additional Clause:

Add "3 (f) Associate Members

Members who have paid not less than 10 annual subscriptions and have reached the age of 65 years, may apply to become Associate Members, subject to rule 8 (k)."

Additional Clause:

Add: "3 (g) i) Members

All members of the Institute not otherwise specifically designated shall have rights and

privileges subject to rule 8 (a) herein.

- ii) All students registered for the examinations of the Institute shall be required to become members of the Institute upon registration, and to remain members until graduation. They shall have the rights and privileges of members subject to rule 8 (a) herein.
 - iii) All members whose annual subscription, as specified in rule 8 (a) herein, has lapsed, may be liable for a rejoining fee on renewal of their membership."
- 5 (a) iii) Add: "and who shall be an ex-officio member of the Executive".
- iv) Add: "and who shall be an ex-officio member of the Executive".
- v) Delete "his", replace with "his or her"
line 3: Delete "he" replace with "he or she"
line 11: Delete "he" replace with "he or she"
- 5 (b) ii) Delete word "Secretary" and replace here and throughout Rules with "Executive Officer".
- 8 (a) Delete "General" (line 1).
- 8 (b) Line 2: delete "an", (twice), "subscription" becomes "subscriptions".
Line 3: "amount" becomes "amounts".
Note: A range of subscriptions can be set for different bodies.

Insert new Clause:

- 8 (k) "Associate Members shall pay an annual subscription of approximately 65% of the amount which shall be fixed as the subscription for members at a General Meeting of Members and except for the official Journal, shall receive the periodic publications of the Institute.

RECOMMENDATION

THAT the changes as outlined above be approved and included in the Constitution, subject to approval under the "Incorporated Societies Act 1908".

ENDANGERED PLANTS TAKE ON A NEW MEANING IN TIMARU

Five years of drought with evaporation rates greater than rainfall was brought to an abrupt end on 13 March 1986 in Timaru.

Approximately 25% of the annual rainfall fell in twelve hours and history records the floods of South Canterbury on that day and records of the aftermath are still being assessed.

The 60,000 trees and shrubs planted in Timaru's open spaces over the five year period got their feet wet for the first time. Parts of Caroline Bay were covered with 900mm of water and waterfalls appeared in the Botanical Garden for the first time.

The greatest damage occurred when a three metre high concrete retaining wall collapsed onto the main propagating house and hundreds of bagged plants beside it.

This was the bad news. The good news was the adjoining frame containing hundreds of New Zealand endangered plants remained untouched with that portion of the retaining wall still standing.

Round one to the endangered plants.

The endangered plants at the Timaru Botanical Garden are grown for public education and display and for sale or gift to interested persons or organisations.

The plants are offered at \$3.00 each or a donation towards costs involved in the acquiring of further endangered plants and postage costs.

The following plants can be obtained by contacting the Director, Parks and Recreation Department, P.O. Box 522, Timaru:

<i>Aciphylla traversii</i>	<i>Carex elingamita</i>
<i>Carmichaelia appressa</i>	<i>Carmichaelia kirkii</i>
<i>Cassinia amoena</i>	<i>Chordospartium stevensonii</i>
<i>Cotula calcarea</i>	<i>Cotula dioica</i> Subsp <i>monoica</i>
<i>Cotula rotundata</i>	<i>Cyathodes parviflora</i>
<i>Fuchsia procumbens</i>	<i>Gunnera hamiltonii</i>
<i>Hebe acutiflora</i>	<i>Hebe cupressoides</i>
<i>Hebe gibbsii</i>	<i>Hebe insularis</i>
<i>Hebe speciosa</i>	<i>Helichrysum dimorphum</i>
<i>Hibiscus diversifolius</i>	<i>Lepidium oleraceum</i>
<i>Metrosideros carminea</i>	<i>Myoporum debile</i>
<i>Myosotis colensoi</i>	<i>Pittosporum michei</i>
<i>Pseudopanax ferox</i>	<i>Teucrium parvifolium</i>

"HORTICULTURE — OUR HERITAGE AND FUTURE"

Ralph Ballinger, President R.N.Z.I.H.

Ladies and Gentlemen,

I would like to congratulate the Otago District Council on the new, and I believe, improved format of the Conference meetings. Also the challenging theme of the Conference - "Horticulture, our Heritage and Future" could not be better, and I thank them for the opportunity in this opening presidential address to present this theme.

I am also very heartened by the thought that there are three follow up speakers, who are specialists in their subject who are going to develop further the points raised in my paper. I believe it is the first time that I will have the luxury of being able to sit back after a speech, and be told what I am talking about or maybe being corrected on some particular point.

I think too that it is advisable for a president to be given a set subject; and to be kept within certain bounds. It is very timely that we should give attention to this subject "Horticulture - our Heritage and the Future" and the three sections that we are covering will certainly be playing an important role in the future. These are Amenity Horticulture, Production and Research.

It is very appropriate that we as an Institute are studying this theme chosen for the Conference. In the history of New Zealand, probably no industry has had to adjust so quickly as horticulture to meet the dramatic explosion in development that has taken place over the last ten years. Because these changes have taken place so rapidly it is all the more important that we should take stock of our present position, assess our heritage, and then set our course for the future.

Twenty years ago horticulture was virtually a Cinderella industry, and like Cinderella no-one wished to know us. From a peasant industry, with very little capital, suddenly over night, with the coming of the kiwifruit boom the whole scene changed. For the first time people from the towns and cities were vying with each other to put as much money as possible into horticulture. People wanted to learn more about the industry and also become involved at some level.

Fifteen or twenty years ago very few were engaged in horticulture and most people could not see how it would ever affect them. I believe that in the future horticulture in it's broad coverage of home gardening, parks and reserves, national parks, recreation, commercial horticulture, research, education, literature and the many horticultural societies, will affect in some way practically every person in the Community.

OUR HERITAGE

Let us look at what we have inherited in the three sections of horticulture that we are studying.

FIRST AMENITY HORTICULTURE

Amenity is described as those things which bring pleasantness, and with horticulture this is our gardens, our landscape, our parks and reserves, our national parks and in fact our whole environment.

From the people who have been involved in this area I believe we have received a great heritage. In many ways this was horticulture as we knew it. In the Royal New Zealand Institute of Horticulture's examinations the very large majority of students taking the national diploma or certificate in horticulture had a parks and reserves training or they came from plant nurseries. And fortunately their training was sound.

Many of the men and women in charge of our parks and reserves or who were instructing in training centres had come from Britain and received their horticultural education at some of the well known training centres of that country. This knowledge and their skills they passed on to their trainees and so filled an important role until our own educational institutions turned out trained students.

We are fortunate too that many of our pioneers were closely associated with the land and had an appreciation of the environment, so that they had the foresight to set aside blocks of land for parks and reserves, so that today these are surely a part of a very fine heritage.

We are fortunate too that our educational institutions saw the need to bring in courses in landscape architecture and as a result the talents of these trained students is contributing in no small way to improving the environment in our towns, cities, villages and highways to help make this country a more pleasant place to live in.

PRODUCTION

In the second section - production, in which we will concentrate mainly on horticultural crops, we have seen the incredible boom in kiwifruit which has contributed more than any other single factor to the explosion in the horticultural industry.

Before this development we had a modest production in vegetables for the home market with some processing for export. In fruit we had a sound production and export of apples and some stone fruit for home consumption. There was a very small flower industry and a competent nursery section which catered mainly for the home market.

With the boom in kiwifruit came several dramatic changes. First came a great rush of finance and people into the industry and along with these a host of trading companies servicing the establishment, production and marketing of the new crops. The price of land doubled and trebled and trade magazines now found

it economic to put out glossy journals to spread the new gospel and to advertise all the new machinery and technology.

This was all very well. Money can buy new equipment but the main essential in growing crops is to have the knowledge as how to do it. There was a great thirst for knowledge and the Technical Correspondence Institute, the community colleges, technical institutes and universities were inundated with students wanting to know more about the growing of plants. It didn't stop there, but spilled over into the secondary schools and horticulture is now an accepted subject. All of this has also been fostered by a greater awareness in the community of our environment and a search for knowledge by students of the world about us.

However, in the process horticulture has moved in the production area from almost a peasant industry to one that is accepted at every level of society. Twenty years ago a producers meeting in Blenheim might attract eight or nine people. Today a meeting on practically any horticultural crop could have an attendance of one hundred with the attendance sheet reading like the Who's Who of Marlborough.

The other follow on from the kiwi fruit boom came the search for similar pots of gold and the trial cropping of avocados, persimmons, Asian pears, blueberries and babacos. There also came an increased interest and an expansion of other crops such as cherries, peaches, nectarines, apricots, apples, grapes, boysenberries, black currants and asparagus.

The third section of horticulture that we are looking at is in a completely different situation from the other two areas. In research two factors always stand out. The first is that most research is long term and secondly, research workers, because of their training always like to be one hundred per cent sure of their findings before it is released to the industry. Because the expansion of horticulture in the last ten to fifteen years has been so sudden, and cropping and technology changing so rapidly it has been impossible for research to keep ahead of what has been happening in the field. This is not the fault of research workers, but rather that the whole industry was unprepared for such dramatic changes.

As recently as 1970, those engaged in the horticultural industry and could see the great changes ahead tried to persuade our educational and research institutions that more money should be put into horticultural research. Unfortunately at that time horticulture still had such a low rating in the minds of those in authority, that little was done. If only a modest sum had been invested in research at that time I am sure that millions of dollars would have been saved for this country in the mistakes made in recent years in the planting of the wrong crops, planting inferior cultivars, using seedling material instead of grafted stock, and also poor marketing of the final products.

When the full impact of the size of the horticultural boom was at last realised and thoughts turned to research this was handicapped in that most of the heads of organisations still thought in the terms of agriculture. In agriculture production

is mainly thought of in the terms of the whole crop, whereas horticulture is more intensive and the production unit is more the individual plant. In irrigation we set out in this country with flood irrigation and the idea that there would be an endless supply of water. In horticulture where we look at the maximum production in meeting the highest possible yield from a limited area the approach must be different.

In the recent book 'Plant Breeding in New Zealand' the number of pages allocated to horticulture would indicate massive plant breeding programmes, but in most of the new crops this is mainly a sorting over of the overseas material available for trial. This was a logical and practical step but it also indicates the pressure imposed on plant breeders by the rapid expansion of these crops. If time had been available new cultivars could have been raised, the best areas assessed as to where they might be grown, the best methods of production ascertained and the right lines established for particular markets. Instead for many crops it was a matter of trial and error in the field as to which crops might be grown.

This is what we have inherited in the three aspects of horticulture - amenity, commercial and research. This is our heritage from the past; for the present day. We now look at the possibilities as to where we may go in the future.

FIRST BACK TO AMENITY HORTICULTURE

This section as I have stated in the first part of the paper has a great heritage. I believe it has an even greater future. Society is at present poised on the brink of terrific changes in our way of life. With the new technology demanding less manual work, the need for a shorter working week, glide time at the office and earlier retirement, nearly every person in the community is going to have more leisure time - and horticulture is in a position to meet this great need.

In particular amenity horticulture with which I link recreation and sports; with our parks and sports fields, golf courses, national parks and walkways - all opening up terrific opportunities for people of all ages. With this I also place home gardening as being of particular importance.

I think that it is a wonderful thing that our local bodies and the government already accept the need for a considerable percentage of the budget to be spent on amenity horticulture. Also the rate payer and the tax payer accepts this priority in the way that money is spent.

It is very pleasing to see that there are four or five articles in the recent journal of our Institute covering various aspects of amenity horticulture and this reflects the deep interest of the Institute and its members in this sector of horticulture.

In passing I would add that I believe our future would be brighter with the re-introduction of the Beautiful New Zealand Scheme. This is one project that benefitted all New Zealanders and also overseas visitors every day of the year. I know that there are some difficulties in operating the scheme, but these could be overcome and the benefits obtained far outweigh any

cost involved.

PRODUCTION

The future of this sector lies in a greater discipline and a more professional approach in all areas of production. This discipline is essential in two main areas. Firstly in the actual production of all crops, whether it is in the field, glasshouses or in the nurseries. And secondly a discipline among the organisations of the growers who are involved in this production.

DISCIPLINE IN THE AREA OF CROP PRODUCTION.

An importer of cut flowers into Hong Kong put his finger on it recently when he said that growers must have a commitment to the job that they are doing, and by this meeting market requirements. This he said required a consistency in the quality of the product being marketed and a reliability in the delivery of the articles to the market at a time when it was required.

This I believe is true of any production whether it is meeting a demand for a home market or for one overseas. Every market can have a different requirement. To meet this consistency and reliability any production unit must be completely geared to meet the needs of a particular market and not expect to be able to switch from one market to another as the price dictates or the spirit moves. With many export markets the product is often sold before it arrives, so failure to deliver the quantity and the quality of product as agreed to spells failure for every one concerned and certainly kills any future sales. There is a great future in the production area but for this to succeed there must be a complete commitment to the job in hand.

The other area in production where discipline is required for a sound future is among the producers themselves. The typical "do it yourself" or "go it alone" attitude of New Zealanders can be a considerable handicap in both production and exporting when a united programme is required. Overseas buyers usually do not care if it is Joe Bloggs or Jack Smith that has grown the flowers or fruit that he buys, but he is very much aware that it is a New Zealand product. Consequently if there is any lack of quality control by just one exporter is sufficient to down grade every other line from this country.

Not only individual growers, but also growers organisations and indeed all exporters must cooperate to establish a standard of excellence for all New Zealand products on all markets.

RESEARCH

The third area we look at for the future is research. For a sound future in horticulture it is essential that there is planned research with dedicated research workers. Without this there will continue to be a waste of money in the haphazard search for new crops and the most efficient way to grow them.

I believe that three of the basic points which have to be sorted out are; what research is to be carried out; who is to do this

work; and most important who is going to pay for it?

In the past everyone has turned to the government to meet all our needs; another New Zealand failing. However this is changing and with the passing of the Plant Varieties Act we saw the commercial seed firms setting up their own plant breeding programmes and producing their own cultivars. In the nursery trade we have seen the setting up of their own research centre at Massey University. Each day the government is making it clear that they wish to consolidate their "user pays" programme. So the question as to who pays for research is important and each section of the industry will have to answer this.

With the horticultural industry expanding so rapidly there are so many unanswered questions. Which crops can be grown? Which areas are the best? How to get optimum growing conditions? Which markets are going to be serviced?

I am quite sure the world wide trend for more crops to be grown under glass or some form of controlled growth will continue as quality of product and time of marketing become more demanding. This controlled growth trend will also extend into the field as we have seen this last season with windbreaks and overhead protection for cherries to prevent excess rain at the time of harvest.

Computerisation and new technology is coming forward rapidly to help in crop production but for these to be successful there will be the need for the control of the individual growth factors. Research will be needed to know what is going to be the result of changing these different controls. Also where does pure research fit in with this new technology? Is it going to direct new developments or is it moving so quickly that it can only check results?

There is a challenging future in research and there is a great deal to be accomplished.

These then are the heritage and the future of horticulture as I see it. I will now leave it to our three speakers to develop these themes or challenge the concepts that have been presented.

FROM THE EXECUTIVE OFFICER

Well, I guess that's the first obvious thing to emerge from the National Executive/Annual General Meeting/Conference weekend in Dunedin on 17 - 19 May. I'm now officially designated Executive Officer rather than National Secretary, but it's really only a matter of semantics for nothing in my job has changed (although there is more of it).

The Dunedin weekend was a great success except that Robin Bagley and Robert Scott didn't organise the weather very well - the only blot on their most excellent copy book!

Copies of the Minutes of the National Executive and Annual General Meeting have been forwarded to all District Council secretaries, but the following points may be of particular interest to members:

Membership of the National Executive

Mr Phil Jew and Mr Alan Mason leave the Executive, and will be replaced by Mr Brian Buchanan of Auckland, and Mr John Williams of Motueka. A big "thank you" to Phil and Alan for services rendered and a warm "welcome" to Brian and John.

Subscriptions for 1987

These were set as follows: (please note that 10% G.S.T. must be paid in addition to these figures).

Individual Members	\$28.00	(Reducible to \$20.50 for those <u>not</u> wishing to receive the Annual Journal)
Small non commercial Societies	\$28.00	
Sustaining members:		
a) Corporate Bodies	\$65.00	
b) National Commercial Organisations	\$110.00	

Annual Journal

This year's Journal will be designated 1986/87 and should be distributed in February 1987. In the following year the Journal will be "1988" and distributed in February 1988 and so on. By the way, we do apologise to any members who found that the binding of their 1985 Journal fell apart. The printer has apologised for the faulty glue and has refunded us \$500 on the printing costs. I have a limited number of spare copies with good bindings, so I will be happy to exchange these for faulty ones on request.

Notable and Historic Trees

The Committee's report to the Government, written in conjunction with the Commission for the Environment has received favourable comment from many quarters. Copies of the booklet are available from the National Office at a cost of \$3.00 each.

Constitution Review

A number of proposed changes to the Constitution are set out elsewhere in this issue of the Bulletin and this matter will be voted on at a Special General Meeting to be held in Wellington on Wednesday 20 August 1986.

Awards and Honours

The following Awards were presented at the Annual General Meeting in Dunedin:

Associates of Honour:

Dr E. Chamberlain of Auckland
Mr I. Bonisch of Ashburton
Miss M. Watling of Christchurch (posthumously)
Mrs B. Cave of Dunedin

Fellowships:

Dr K.R.W. Hammett of Auckland
Mrs B.A. Nicholas of Hawera

The citations for the Associates of Honour will be published in full in the 1986/87 Annual Journal.

Members should note that following the adoption of a remit at the Annual General Meeting, the criteria for, and timetable of, all the R.N.Z.I.H. awards will be documented and circulated in the Bulletin. This will appear in either the Spring 1986 or Summer 1986/87 issue of the Bulletin.

1987 Annual General Meeting and Conference:

Advance notice for members' diaries. The 1987 Annual General Meeting and Conference will be hosted by the Waikato District Council and the venue will be the Conference Centre, University of Waikato in Hamilton, from 16 to 19 May 1987.

Final Thought

A number of District Councils have expressed the desire for District Council activities to encourage the participation of more of our student members. The National Executive and the Examining Board endorse this initiative and would encourage all District Councils to promote activities that will interest as wide a range of our membership as possible.

Dave Cameron
EXECUTIVE OFFICER.

RNZIH DIRECTIONS FOR THE FUTURE

by Mike Oates

The 63rd Annual Conference in Dunedin had as its theme 'Horticulture - Our Heritage and Future'. I believe that in future years, this conference, and the issues it addressed, will be looked upon as a turning point in the Institute's history.

The establishment of the R.N.Z.I.H. Garden History Group was I feel, the most significant step taken by the Institute since the establishment of the Notable and Historic Trees Scheme in 1977. It is fitting that the Institute should take a leading role in this area as it has shown an interest in garden history for many years through articles in the quarterly bulletin and Annual Journal, as well as the Banks Memorial Lecture. A very real effort is needed to preserve and record these important aspects of our heritage for future generations, before they are lost forever. The task is enormous yet a start has been made with the establishment of this group. The support of all members is needed to ensure its success.

Conference was also a milestone in the life of the Notable and Historic Trees Scheme. Could this be the last conference before the establishment of a government funded New Zealand Notable Trees Scheme? Let us hope so. The Notable and Historic Trees Committee has done an incredible amount of work during the past eight years. This work must not be wasted. Obtain a copy of the working party report that was submitted to the Minister for the Environment. Read it, and tell others about it. Notable and Historic trees are part of our heritage, they must be protected.

Rare plant conservation is the final subject I wish to discuss, as it was touched on many times at conference. In the Banks Lecture, Dr David Given talked about the role of botanic gardens in rare plant conservation. Tony Wyber, at the seminar on garden history, talked about the many species and cultivars of garden plants of merit that have disappeared over the years, many of which we have never seen in N.Z. Graham Patterson asked some timely questions about the Institute's role in rare plant conservation. Should we be doing something? Can the Institute and its District Councils encourage and promote rare plant conservation in New Zealand?

I believe we must investigate ways in which the Institute can become involved in rare plant conservation, especially with regard to our native species. If a species is rare or endangered in the wild, its future may depend on continued cultivation in private or public gardens, with possible planting back into the wild at some future date. The Institute could play a role in encouraging cultivation of rare native species both by individuals and by public gardens. Rare plant conservation in New Zealand botanic gardens is often given a low priority because of funding constraints. This is because our main botanic gardens are run by local authorities and funded from rates. Unlike other countries, we have no National Botanic Garden

funded by government, Our internationally recognised collection should be funded and maintained by government. The Institute could have a role to play here.

Finally, I would like to quote from the objects of the R.N.Z.I.H.

"To provide and encourage the protection and preservation of the flora indigenous to New Zealand and notable exotic trees."

I believe the Institute has admirably fulfilled half of this objective. Perhaps it is now time to make a start on the other half.

EMPLOYMENT IN NEW ZEALAND REQUIRED

I have received a letter from a Mr Evan Edwards in Edinburgh who is interested in coming to New Zealand and working in a Botanic Gardens as a horticultural training officer/supervisor.

He is 26 and single. He has worked in a number of horticultural properties and is at present Training Officer for the National Trust of Scotland. His role is to develop, organise and run one year training programmes for school leavers.

If anyone can help Mr Edwards in a position or know of a suitable position could they please contact him at:

Mr E.T. Edwards
14 Mearenside
East Craigs
Edinburgh EH12 8UQ
Scotland
GREAT BRITAIN.

I have a copy of his curriculum vitae if this is required.

Editor.

OBITUARY

IAN DOUGLAS GALLOWAY M.B.E.

Wellington City's dynamic Director of Parks and Recreation died on 6 May. Ian Galloway had spent most of his working life with Wellington City, commencing as the City's first horticultural apprentice and serving as Director of Parks and Recreation for 20 years.

Upon completion of his apprenticeship he travelled to England and spent the first year working for the Bournemouth Parks Department, and then the next two as a student studying and working at the Royal Botanic Gardens, Kew, London. Upon his return to New Zealand he was appointed Maintenance Officer of the W.C.C. Parks Department and then Deputy Director of Parks (Administration), before being appointed Director of Parks in August 1965.

During his term as Parks Director, the Department was forged into a close knit team with a strong and decisive leader.

He was a member of the Royal N.Z. Institute of Horticulture throughout his career and a long serving Dominion Councillor and National Executive member. As a member of the Examining Board he was for some time Acting Chairman. In 1972 he was awarded an Associate of Honour of the R.N.Z.I.H. In 1974 he was awarded an M.B.E. for services to horticulture, and in 1975 he was made a Fellow of the Institute of Parks.

Ian was a horticulturalist at heart, and I know many of us had developed a close friendship and understanding with him. He leaves a legacy that will long be remembered and appreciated by all of us who knew him. He is survived by his wife, Alison.

THE HEBE SOCIETY

From L.J. Mercaif

The genus *Hebe* has been widely used in horticulture for many years. The diversity of flower, foliage and form ensures that it provides the gardener with some most interesting plants, although it must be admitted that, at times, it has been used *ad nauseum* and that less discriminating growers have propagated and used species and cultivars which do not always give the genus a good image.

The first *Hebe* cultivars were produced in the United Kingdom and over recent years the genus has experienced a tremendous resurgence of popularity in that country. Gardeners are discovering the usefulness of the genus, numerous new cultivars are appearing and at least two specialist nurseries are devoting much of their production to *Hebe*. So popular has the genus become, that early last year a Hebe Society was formed. The aims and objects of this newly-formed society is to encourage the growing of *Hebe* and allied New Zealand plants, to assist in the conservation, improvement and research into the growing of *Hebe*, *Parahebe* and other allied plants, and to assist with research into the nomenclature of cultivars. The society publishes regular newsletters and it also intends to publish an annual bulletin.

Anybody who is interested in joining this newly-formed society should write to:

Mr V. Haywood
Hon. Treasurer,
The Hebe Society
1 Woodpecker Drive
Hailsham
E. Sussex BN27 3E7
UNITED KINGDOM.

CORRECTION

PIRTANDA GARDENS MELBOURNE

The correct name for these gardens is 'Pirianda' and not 'Pirandia' as appeared in the article printed in the Autumn Bulletin No. 39, Page 10.

The other error which appears in this article is the area of the gardens. It should read 11 hectares (27 acres) and not 0.8 hectares (2 acres) which appeared.

GRADUATES 1985 EXAMINATIONS

NATIONAL CERTIFICATE IN HORTICULTURE

SCHEDULE I

AITKEN D.J.	DUNEDIN	ALLOWAY P.J.	CHRISTCHURCH
BAILEY G.F.	TIMARU	BAKER T.J.	ALEXANDRA
BARNETT G.C.	CHRISTCHURCH	BERRY P.G.	DUNEDIN
BODELL A.	PALM. NORTH	BOWKETT MS C.M.	WAIKATO
BOWMAN G.E.	WELLINGTON	CLAYTON-GREENE D.E.	WELLINGTON
COLEMAN G.J.	WELLINGTON	CONNOLLY C.J.	INVERCARGILL
COOPER MS A.J.	INVERCARGILL	DOIDGE J.P.C.	AUCKLAND
DOWNES MS S.A.	HASTINGS	EVANS C.P.	AUCKLAND
FLOYD A.R.	WELLINGTON	GOSDEN MS M.L.	DUNEDIN
HILL-MALE H.D.	AUCKLAND	HOARE MS D.	WELLINGTON
MacCARTHY B.T.	ASHBURTON	McCULLOUGH J.D.	NEW PLYMOUTH
McROBIE K.S.	DUNEDIN	MALEY Ms K.I.	NEW PLYMOUTH
MATCHETT A.J.	DUNEDIN	NICELY I.K.	LEVIN
ORCHARD M.J.	WELLINGTON	PATTERSON MS A.M.	NELSON
QUAIFE MS C.A.	HAMILTON	REES A.J.	WELLINGTON
SCOTT P.D.	CHRISTCHURCH	SULLIVAN S.J.	CHRISTCHURCH
WATSON P.C.	HAMILTON	WHITLOCK MS G.	PALM. NORTH

SCHEDULE II

BRIDGMAN P.C.	TAURANGA	CHAPMAN J.W.	AUCKLAND
FALLS J.E.A.	HASTINGS	HALL K.J.	TAURANGA
HURST E.J.	HASTINGS	RUSSELL G.W.	AUCKLAND
WARD P.J.	ASHBURTON		

SCHEDULE III

RAINS MS G.B.	LEVIN	SHARE S.J.	CHRISTCHURCH
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SCHEDULE IV

COULTER M.H.	ASHBURTON	FOLLETT J.M.	HAMILTON
KERR V.C.	KAIKOHE	KNIGHT H.B.L.	AUCKLAND
OLSEN C.P.	PALM. NORTH	SEWELL N.R.	PALM. NORTH
SMITH B.R.	TWIZEL		

NATIONAL DIPLOMA IN HORTICULTURE

SCHEDULE I

JACKSON I.M.	CHRISTCHURCH	SMITH K.P.	HAMILTON
SOLE D.T.	WELLINGTON	WRIGHT A.W.	AUCKLAND
WOOLLEY P.R.	AUCKLAND		

SCHEDULE II

KEAN B.R.	HAVELOCK NORTH	PULFORD W.M.	NELSON
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SCHEDULE IV

WRIGHT W.T.

INVERCARGILL

CONGRATULATIONS

Congratulations to the following winners of prizes for meritorious performance in the 1985 examinations:

J.A. CAMPBELL PRIZE - for candidate completing the National Certificate in Schedules I or IV with best average marks in Subjects Nos. 10-14.

MS M.L. GOSDEN - MT. COOK

DAVID TANNOCK PRIZE - For highest marks in Oral and Practical (No. 21) Schedule I

MR B. MCKENZIE - DUNEDIN.

JUNIOR MEMORIAL PRIZE - for highest marks in Oral and Practical I (No. 9), all Schedules

MRS P.A. GODWIN - GISBORNE.

P.J. SKELLERUP PRIZE - for candidate completing Nos. 1 - 9 all schedules, with best average marks

MR W.R. HEWLETT - HAMILTON.

RITA M. SKELLERUP PRIZE - for candidate completing National Certificate in Schedules II or III, with the best average marks in Subjects Nos. 10 - 14.

MR J.E.A. FALLS - HASTINGS.

N.Z. VEGETABLE & PRODUCE GROWERS NO. 1 PRIZE - for the best overall record for the year in Schedule III by a first year student

MRS L.J. WIEDERKEHR - TAURANGA.

N.Z. VEGETABLE & PRODUCE GROWERS NO. 2 PRIZE - for the best overall record in Schedule III (other than a first year student)

MR S.J. SHARE - CHRISTCHURCH.

N.Z. NURSERYMEN'S ASSOCIATION PRIZE - for the best record for the year in Schedule IV.

MS L.A. MOUNTIER - AUCKLAND.

WHANGAREI DISTRICT COUNCIL PRIZE - for the best thesis submitted for N.D.H. Schedule IV.

MR W.T. WRIGHT - INVERCARGILL.

DUGALD MCKENZIE PRIZE - for the best thesis presented in N.D.H. Schedule I.

MR K.P. SMITH - HAMILTON.

NOTABLE AND HISTORIC TREES COMMITTEE

ANNUAL REPORT 1985-86

1985 was an eventful year. On 20 March 1985 a seminar was held which was formally opened by the Minister for the Environment, Mr Marshall. It was resolved at this seminar to establish a working party of invited specialists from organisations with an interest in trees. This working party was to make recommendations for legislation to protect notable trees by December 1985. The working party was set up and met on three occasions for a one day session through the year. Submissions were invited and committee members researched the specific problems assigned to them.

The 'Recommendations' were published in December 1985 by the Commission for the Environment. The number published was sufficient only to distribute to key members of the most important organisations. The report has been highly commended and encouraging comments have been 'overheard'. The board of the Historic Places Trust has given full support to the scheme. Each member of the R.N.Z.I.H. Executive should have received a copy of the report.

However, to circulate to a wider public will incur costs amounting to, say, 100 copies for \$1,000 - these are commercial rates. The Notable and Historic Trees Committee is anxious that the impetus in the drive for legislation is maintained. The question to the R.N.Z.I.H. Executive is - can some way be found to achieve cheaper printing other than commercial rates?

This important piece of work has much to give R.N.Z.I.H. publicity as a national educational organisation and concludes the editorial foresight shown in the R.N.Z.I.H. Annual Journal 1940 in publishing H.H. Allan's 100 important trees in New Zealand. For these reasons, it is imperative that pressure on government for legislation for New Zealand Notable Trees is maintained by further lobbying from the R.N.Z.I.H. National Executive and that further copies of the 'Recommendations' are printed.

The committee continues to labour, in spite of losing yet another, voluntary secretary. Their great efforts are continuing to register as many Notable Trees as possible. We have also produced a new set of display cards, conveniently packed suitable for a travelling display. Please don't hesitate to request the use of this set.

The 1985 annual accounts have been lodged with Mr D. Cameron, Executive Officer.

Ron Flook
Convenor.

EXAMINING BOARD ANNUAL REPORT TO 1986 ANNUAL GENERAL MEETING

The Examining Board continues to be an important part of the activities of this Institute. Since the last report the Board has met on four occasions, while its Executive Committee has met three times chiefly to consider Oral and Practical examinations. The contribution of Board members is much appreciated.

Throughout 1985 and 1986 the Board co-operated with the Recreation Committee of the Local Government Training Board, and with the Horticultural Training Committee of the Agricultural Training Council.

1985 proved to be a busy year with examinations to conduct, existing prescriptions to be reviewed and finalised, and new prescriptions to be prepared. The Secretary, Mr Dave Cameron, and his staff, Mrs Enid Reeves - Examinations Officer, and Mrs Vicki Black, have managed very well. All examinations were conducted efficiently and the Board records its appreciation to examiners for setting and marking of scripts. The results were collated and tabled at the Board meeting of 21 January, confirmed and then forwarded to students by 24 January.

During 1985 the Board has been involved with a number of projects. The following aspects are reported:

1. Horticultural Trade Fair, Auckland, July 1985

A special feature of this was an area devoted to horticultural education and training. The Board considered it essential for the Institute to be represented and information provided about R.N.Z.I.H. qualifications. The Secretary prepared material for a display, and then was assisted by the Auckland District Council to set up the exhibit and to man the display. This effort generated considerable interest and has been regarded as a worthwhile venture.

2. Outlook Conference on Training and Education for the Horticultural Industry

This conference was held on 29-30 August 1985, and was attended by Dr Close, Mr Taylor, and Mr Cameron. Information was provided on the qualifications of the Institute and contributions made to the discussions being held.

3. Review of Existing Qualifications

- a. National Certificate in Horticulture (N.C.H.)
- National Diploma in Horticultural (N.D.H.)
- National Diploma in Horticulture with Honours

The detailed review of these was completed and the new prescription introduced in 1986. There are now five schedules, namely: Amenity Horticulture, Fruit Production, Vegetable Production, Nursery Production and Floriculture.

Each schedule is now of the same size. The N.C.H. is completed after passing Subjects 1 to 14, and the N.D.H. after Subjects 15 to 20 are completed. The N.D.H. (Honours) requires, in addition, the completion of a thesis on an approved topic.

It is true to say that there have been some problems with the transition of existing students from the old to the new prescription. While the Board has endeavoured to inform all students of the new prescription and the transition arrangements, there have been some misunderstandings. The Secretary and his staff have made an extra effort to keep students informed, and to clarify specific issues. The Board introduced the new prescription after taking into account comments received by many interested persons and organisations.

b. Certificate in Horticultural Practice

The final review of this qualification was completed in 1985. The new procedures have been adopted from 1986. The main changes have been to make provision for the completion of certificates in kiwifruit production and in floriculture, and to clarify some aspects of the examination procedures.

4. New Qualifications

a. Certificate in Horticultural Management (C.H.M.)

During 1985 a prescription committee was established and met three times. The committee consisted of three growers, five providers of tuition, one from the Agricultural Training Council, and was chaired by Mr R. Ballinger.

A final draft of the prescription was adopted by the Board.

Students now are registering for this certificate and the first examinations will be held at the end of 1986.

The prescription provides for 50% of the course to be internally assessed, and the Board is appraising the assessment procedures to be used by each teaching organisation.

b. Certificate in Parks Practice (C.P.P.)

This was considered in its final form by the Recreation Committee of the Local Government Training Board, and by the Examining Board.

The procedure in the new prescription have now been adopted. The first C.P.P. to be issued will be that in Groundsmanship. A few candidates will be examined in Wellington at the end of 1986. Further candidates will be examined late in 1987, at the end of the two year training programme.

5. Beekeeping Qualifications

A meeting of interested organisations was held in May 1985, and discussed training and education and the necessity to establish training pathways. There was agreement that there would be a certificate in beekeeping issued by the National Beekeepers Association and a National Certificate and National Diploma in Apiculture by this Institute.

The 1961 Approvals Notice, with respect to apiculture, is in need of revision. In December 1985, the approvals notice was discussed with the Beekeepers Association. A list of potential members of a prescription committee has been established and a first meeting of the committee is planned for late May 1986. The aim is to complete the revision by the end of 1986.

6. 1985 Examinations

A total of 633 students were examined for the Institute's various qualifications in 1985. This included 490 candidates for written examinations for N.C.H./N.D.H., H.S.C., N.D. Apic. and C.H.T., plus 143 candidates for the Oral and Practical examinations for the Certificate in Horticultural Practice.

The Institute conducted written examinations in 27 centres (including 6 overseas) and Oral and Practical examinations at 18 separate venues. This involved the appointment of over 70 examiners.

The increase in written examinations has been handled by the secretariat without great difficulty but as numbers continue to increase, the move to computerised records is a must in the near future. A carefully designed computer based record system will allow for the administration of examinations of the new qualifications at present being introduced to be undertaken with only minimal increases in staffing levels. The National Executive has approved of the purchase of computer facilities.

The Oral and Practical Examinations are an expensive exercise and the Board gratefully acknowledges the large input of time and facilities that are provided by growers and various other industry organisations to enable these examinations to continue. The Institute is slowly moving to a position where enough income is being generated by examination entries to enable examiners to be reimbursed for their considerable out of pocket expenses associated with the Oral and Practical exams.

7. Financial Budget for Board Activities

A copy of the draft budget for 1986 for the Examinations account is attached. It appears that the examinations operation of the Institute will be selfsupporting in 1986. In 1985 a small surplus (\$1,115) was achieved even though a large number of extra meetings were held throughout the year to finalise a number of new developments. It is

essential that the Board continues to budget for an annual surplus to allow for continued development work in future.

8. Acknowledgements

The Board appreciates the voluntary assistance and support received from many organisations and persons. This "input-in-kind" has been a feature of the Board's activities for many years.

Ronald C. Close
CHAIRMAN.

May 1986.

APPENDIX TO EXAMINING BOARD REPORT

AT 16 MARCH 1986

Examinations 1985

Written Examinations:

Number of candidates examined 490

National Diploma in Horticulture

Schedule I	220	
Schedule II	71	
Schedule III	18	
Schedule IV	109	

Horticultural Sales Certificate 27

National Diploma in Apiculture 1

Certificate in Horticultural Theory 44 490

Number of Examination Centres 27*

* Kaikohe to Invercargill plus Perth, Sydney, Melbourne, Wyong, Rarotonga, and London

Number of examiners appointed 75

Oral and Practical : National Diploma in Horticulture

Number of students examined: (Those are included in the 490 listed above)

Auckland	-	Schedules	I and IV	46	
Lower Hutt		"	I and IV	32	
Christchurch		"	I and IV	45	
Havelock North		"	II	7	
Auckland			II	8	
Levin			III	2	140

Oral and Practical : Horticultural Sales Certificate

H.S.C. 8

Oral and Practical : Certificate in Horticultural Practice

Auckland	24	
Kerikeri	20	
Nelson	10	
Hastings	16	
Gisborne	15	
Te Puke	21	
Kati Kati	37	143

Oral and Practical : National Diploma in Apiculture

N.D. Api. 1

General

1. Six candidates have completed the requirements for the award of the National Diploma in Horticulture
2. Fifty one students have qualified by examinations for the award of the National Certificate in Horticulture:

Schedule I	34
Schedule II	8
Schedule III	2
Schedule IV	7

EXAMINATIONS ACCOUNT

1985	<u>INCOME</u>	Proposed 1986 Budget
7,635	CHP Enrolments/Registration 175 @ \$60	10,500
4,085	Student Registrations 400 @ \$20	8,000
40,948	Examination Entries	48,000
47	Sundry Income	1,000
39,145	Government Grant	43,500
1,500	Loder Cup Committee	1,500
<hr/>		<hr/>
93,360		\$112,500
	<u>EXPENDITURE</u>	
1,120	Audit and Accountancy Fees	1,500
12,320	Exam Board Expenses	16,000
11,981	Examiners Fees and Expenses	14,000
7,337	CHP Expenses	9,000
574	General Expenses	3,000
1,500	Loder Cup Committee	1,500
3,710	Postage and Telephone	4,000
4,279	Printing and Stationery	8,000
49,289	Salaries and Wages (1985 + 15%)	57,500
<hr/>		<hr/>
92,245		\$114,500

LAPOINYA RHODODENDRON GARDEN

by Robert Scott

The tourist brochures in New Zealand advertise a "Surprisingly different" Australia while the mainlanders tend to regard it with a certain amused detachment. It was omitted from a stylised map to promote Australia's bicentenary in 1988, which caused considerable embarrassment in high places. I refer of course to Tasmania. During a recent visit I encountered many historic, scenic and botanical surprises. Although I did not come across a Tasmanian Tiger, I did see a special rhododendron garden at Lapoinya, some 20 kilometers from Wynyard on the North-West Coast.

Purchased in 1974 as an 8.5 hectare block and developed by the owners as a retirement project, the garden now contains a rich and colourful assortment of native and introduced plants. Among the first plantings were seedling raised rhododendron species, *diaprepes*, *basilicum*, *grande*, *falconeri*, and many unnamed hybrids. Later many rare species and scarce, named hybrids were received from Victoria as well as imported from England and America. An indication of the wide range of rhododendrons grown can be gauged from the information booklet which lists some 210 species from *aberconwayi* to *zeylanicum* located at Lapoinya. Two individual species of note were *R. nuttallii* with clusters of large, trumpet-shaped, fragrant blooms and *R. xanthostephanum*, a medium-sized shrub with a profusion of delicate soft-lemon flowers.

Other trees and shrubs of interest included the celery-topped pine, *Phyllocladus aspleniifolius*, King Billy pine, *Athrotaxis selaginoides*, *Azara dentata* and both Victorian and Tasmanian waratahs, *Telopea oreades* and *T. truncata*, plus a range of maples, flowering cherries, cammellias, fuchsias and lilliums. Moisture loving primulas, hostas and giant rhubarb, *Gunnera manicata* grew in profusion along the edges of a stream running through the property. Although a garden noted for year round interest, the massed plantings of rhododendrons and deciduous azaleas in flower during an October visit provided a memorable show of colour and scent.

Tasmanian rain forest trees surrounding this interesting and attractive garden provided a magnificent backdrop to the mainly introduced exotics. Predominant forest species were blackwood, *Acacia mexlanoxylon*, sassafras, *Atherosperma mochatum*, myrtle or evergreen beech, *Nothofagus cunninghamii* and man ferns *Dicksonia antarctica*.

The brochures were right, Tasmania is a surprisingly different Australia with horticultural delights to reward those prepared to venture beyond the casinos.

WELCOMETO THE FOLLOWING NEW MEMBERS:

Abashi E., Japan
Adams L., New Plymouth
Aebig F.R., New Plymouth
Anderton D.F., Tauranga
Atherfold B.H., Te Awamutu
Barker M.G., Waiuku
Barrett D.M., Tauranga
Belich A., Auckland
Bigge P.H., Hamilton
Birch L.J., Hastings
Boniface M.A., Invercargill
Bouwhuis G., New Plymouth
Bowen P.R., Hastings
Boylan B.C., Maniaia
Bridger I.E., Wanganui
Brooker K.G., Tauranga
Brown A.F., Waikanae
Burt N.A., South Canterbury
Calder W.P., Christchurch
Cameron C., Gisborne
Carson O.J., Christchurch
Chambers R.B., Manawatu
Christiansen D.M., New Plymouth
Clark D.L., Tauranga
Clyma S.A., New Plymouth
Coleman K.M., Palmerston North
Collins T.L., Wanganui
Cooper A.F., Papatoetoe
Cox N.J., Hamilton
Craig K.R., Mt Maunganui
Crawford M.L., Hastings
Cruickshank E.J., Ngaruwahia
Davers J.M., Timaru
Davis J.N., New Plymouth
Dekker A.J.M., Christchurch
De Wenzly S., Wellington
Dingle T.G., Napier
Dominic H.P., Te Awamutu
Donnison D.K.T., Hamilton
Down R., Hamilton
Duthie S.M., Auckland
Dyer J.S., Wanganui
Eichler D., Tauranga
Endt C.A., Auckland
Ewer S., Wairoa
Farquhar D., Te Puke
Finlin D.J., Dunedin
Fullerton R.L., Henderson
Galbraith R.N., Gisborne
Gardiner J.W., Wanganui
Garrud J.G., Wanganui
Gleeson J.A., New Plymouth
Goodall R.B., Auckland
Gordon L., Taupo
Gravatt S., Te Awamutu
Gray T.R., Ashburton
Guthrie J.M., Timaru
Abbott D.R., Te Puke
Adnitt C.N., Tauranga
Alexander J.S., Gisborne
Ashworth R.B., Nelson
Ballinger H.M., Hamilton
Barraclough M.G., Wanganui
Barton K., Dunedin
Bierings E.J., Christchurch
Biggs M.O., Auckland
Birchler J.D., Eltham
Bonny M.S., Auckland
Bowen A.M., Tauranga
Boyes A.M., Hastings
Bradbury K., Auckland
Brill S.J., Rarotonga
Brooks W.R., Wellington
Bryant D.J., Auckland
Cadwallader D., Auckland
Calkin M.C., Wanganui
Cameron J.A., Wanganui
Chamberlain A.M., Canterbury
Chignell M.G., Nelson
Christie B.D., Nelson
Cleverly M.O., Dunedin
Coburn T.M., Palmerston North
Collingwood A.L., Geraldine
Cookson D.W., Gisborne
Corston A.A.C., Gisborne
Crafer M.H. Hawera
Crapp P.B., Te Puke
Crawley R.D., Wanganui
Cutler S.T., Christchurch
Davies J., Putaruru
Davy D.J., Maniaia
Denholm J.L., New Plymouth
Dewes W.T., Gisborne
Dockery H.B., Auckland
Donaldson R.F., Tuakau
Dowling K.A., Plimmerton
Durham P.E., Waipawa
Dwan J.S., Christchurch
East T.N., Te Puke
Elwood G.P., Christchurch
Ensor R.J.M., Rangiora
Falvey E.T., Timaru
Fielding K., Raumati South
Fraser T.M., Hastings
Galbraith A.N., Gisborne
Gallagher N.S., Balclutha
Garea B.J., Auckland
Gibbons T.S., Auckland
Goldsmith I.C., Tauranga
Gordon J.A., Hamilton
Gourlay C.L., Hamilton
Gray A.D., Dunedin
Gregory B.J., Tauranga
Hahn M.M., Westland

Hall M.M., Wellington
Hampton D.C., Auckland
Harries A., Wellington
Harris K.D., Auckland
Harris, R.K., Whangamata
Havill L.C., Te Puke
Hayes I.L.A., Auckland
Hayman D.M., New Plymouth
Hill S.D., Tauranga
Holder S.C., Cambridge
Holmes L.N., Wanganui
Holwill K.M., Gisborne
Houia T.M., Auckland
Harris K.H., Wanganui
Jacobs C.P., Hawkes Bay
Jefferson P.J., Tauranga
Johnstone A.N., Cambridge
Jones J.J.K., Petone
Keech P.W., Rotorua
Keith B.G., Porirua East
Kennedy M.J., Wanganui
Kent J.E., Te Puke
Kingsbury N.D., Ashburton
Knowles D.J., Hastings
Law C.M., Kaponga
Leahy A.G., Hamilton
Lees N., Whangarei
Lewis H.B., Hamilton
Lockhart W.E., Taupiri
Loughrey G.I., Dunedin
Lowe D.A., Te Puke
Luckman A.J., Paeangaroa
Ledingham J.A., Wellington
McCann K., Auckland
McEnnis M.M.M., Lower Hutt
McGhie R.A., Hamilton
MacKenzie M.F., Canterbury
McNaughton P.E., Hamilton
McWilliams B.A., Masterton
Main S.M., Auckland
Manley R., Wanganui
Markham J.G., Mosgiel
Marshall P.W., Taupo
Maxwell J.N., Bulls
Miller T.A., Te Puke
Mirams W.S., Auckland
Mole P.R., Wellington
Moore B.W., Otago
Morgan C.A., Auckland
Morrow P.J., Tauranga
Murray J.S., Tauranga
Neal R.E., New Plymouth
Nicholson K.B., Hamilton
Nicol K.J., Wellington
Nixon G.W., Plimmerton
Nugleren L.A., Hamilton
Orr R.S., Waikato
Paris J.M., Wellington
Parry J.W., Christchurch
Paterson A.B., Gore

Hall S.A., New Plymouth
Harding J., Christchurch
Harris G.M., Upper Hutt
Harris R.G., Dunedin
Hart C., Tauranga
Hawken L.J., Auckland
Hayes M.E., Hamilton
Henry R.A., Frankton
Hinds M.J., Fielding
Holdsworth J.A., Hamilton
Holroyd K.R., Te Awamutu
Hoogenraad R., Hanmer
Hutchinson M.E., Auckland
Irwin S.L., Dunedin
Jamieson P.J., New Plymouth
Johnson R.G., Kaikohe
Jones A.M., Tauranga
Judd E.K., Hastings
Keen S.J., Timaru
Kelly R.M., Hamilton
Kenny B.C., Ashburton
Killen B.P., Hamilton
Knapp M.W., Tauranga
Kuypers B.M., Wanganui
Law R.J., Levin
Lean P.A., South Canterbury
Lewis D.J., Gisborne
Lewis V.M., New Plymouth
Longworth B.A., Masterton
Lovell T.A., Nelson
Lucas J.W., Tauranga
Lederman M.J., Wellington
McCaffrey L.D., Wanganui
MacDiarmid G.M., Tauranga
McFarlane S.A., Blenheim
McGreevy J.R., Hastings
McKinstry P.J., Auckland
McNeilage B.M., Tauranga
Maera S., Auckland
Major-Johnston N.J., ChCh
Mann K.P., Auckland
Marsden K.N., Hastings
Maxwell C.B.R., Te Puke
Melling A.B., Auckland
Mills P.J., Wanganui
Mitchell K.J., Wanganui
Monroe J.E., Wellington
Moore B.W., Waitati
Morris M.S., Tauranga
Morton R.H., Otago
Nash T.M., Christchurch
Newman D.T.W., Auckland
Nicholson W.K., Hamilton
Nicol R.W., Tauranga
Nolan B.E., Paremata
Ogle D.J., Keri Keri
Paltridge C.R., Auckland
Parratt S.E., Hamilton
Parry M.I., Thames
Paterson D.C., Auckland

Paul S.D., Christchurch
 Pene R.E., Hawkes Bay
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 Reynolds J.A., Waiuku
 Richards M.R., Wanganui
 Robb N.A., Christchurch
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 Verplanke-De Meyer C.H.J. Napier
 Wada A., Christchurch
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 Webb L.H.J., Wellington
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 White M.A., Te Puke
 Whiterod J.R., Wanganui
 Williams P.A., Auckland
 Wilson J.E.I., Waitara
 Winter S.R., Blenheim
 Woodcock K.L., Tauranga
 Wooton S.A., Christchurch
 Young C.C., Christchurch
 Young R.H.E., Christchurch.
 Pellow C.D., Auckland
 Penfold G.R., New Plymouth
 Perano H.E.I., Napier
 Percival T.E., Napier
 Petley C.J., Hamilton
 Pocock B.M., Christchurch
 Polglase A.R., Hamilton
 Preston G.K., Foxton
 Pullan B.L., Buller
 Redwood A.E., Gr. Barrier Is.
 Reid I.C., Christchurch
 Richards B.A.J., Christchurch
 Rickard A.P.R., Gisborne
 Robb W.D., Hamilton
 Robinson B.D., Upper Hutt
 Ross M.E., Hamilton
 Roycroft G.L., Kati Kati
 Rudland S.B., Te Araroa
 Safe K.O., Tokoroa
 Salmon D.R., Napier
 Scally L., Christchurch
 Scott C.J.F., Wellington
 Sheed B.J., Christchurch
 Sims R.T., Oxford
 Smallman T.R., Tauranga
 Smith J.C., Napier
 Smith L., Tauranga
 Smith N.C., Dannevirke
 Sperring J.E., Napier
 Standing J.S., Tauranga
 Stewart F.J., Feilding
 Stovold P.B., Te Puke
 Stringer D.M., Blenheim
 Sullivan L.A., Wanganui
 Taylor J.M., Taranaki
 Thessman M.D., Hamilton
 Thornton P.L., Christchurch
 Tilly N., Wellington
 Underhill D.C., Napier
 Van Rossen M.G.C., Tokoroa
 Vermeren J.S., Hamilton
 Volman E.J., Hastings
 Walker C., Wanganui
 Walsby J.C., Leigh
 Warrington B.A., Gisborne
 Watts P.J., Palmerston North
 Weber J.C., Lower Hutt
 Whelan A.M., Invercargill
 Whitton S.R., Wellington
 Wild A.R., Auckland
 Wilson D.J., Hamilton
 Wilson L.F., Otorohanga
 Wood A.M., Tauranga
 Woolrich K.N., Auckland
 Wreford W.D., Timaru
 Young L.J., Wellington

HOSTA SPECIES AND CULTIVARS IN NEW ZEALAND

This is the second part of an article on Hostas by Jim Rumbal, Duncan & Davies. The first part outlines propagation methods and was printed in the 1986 Autumn issue.

HOSTA SPECIES AND CULTIVARS IN NEW ZEALAND

Many hundreds of forms are listed by some American specialist garden nurseries but all are not available here. The list below is not exhaustive but contains many of the forms that are grown in New Zealand and can be obtained if one is prepared to search.

NAME	SYNONYM	DESCRIPTION
<i>Hosta albomarginata</i>	<i>H. minor</i>	Dwarf, elliptical leaves to 90cm long, glossy beneath, creeping rootstock flower rich violet delicately marked inside.
<i>H. albomarginata</i> var <i>albomarginata</i>	<i>H. minor variegata</i> <i>H. sieboldii</i>	the white margined form as above
<i>H. albomarginata</i> <i>alba</i>	<i>H. minor alba</i>	the white flowered form
<i>H. albomarginata</i> 'Louisa'		the white flowered and white margined form
<i>H. crispula</i>		Blade of leaves green up to 21cm long - pointed with broad white margin wavy. Flowers pale lilac 0.6 - 0.75m

NAME	SYNONYM	DESCRIPTION
<i>H. decorata</i>	<i>H. decorata normalis</i>	Rounded blunt leaves of dark green, matt surface. Dwarf to 20cm, flowers rich deep lilac delicately marked within 0.6m, loose clump.
<i>H. decorata marginata</i>	<i>H. decorata var decorata</i>	As above with attractive white margined leaves. Loose clump.
<i>H. elata</i>		Large broad - long pointed wavy - slightly glaucous - pale green - flowers 0.7m lilac - recurved bracts - early flowering.
<i>H. fortunei</i>		Large broad - light green slightly glaucous wavy flowers, lilac 0.7m
<i>H. fortunei</i> 'Albo picta'		Butter yellow blades edged with pale green deepening to two tones of green by mid summer. Lilac flowers.
<i>H. fortunei</i> 'Albopicta Viridis'		Green bud sport of 'Albopicta'
<i>H. fortunei</i> 'Aurea'		Soft yellow leaves becoming pale green in summer. Less vigorous, lilac flowers.
<i>H. fortunei</i> <i>hyacinthina</i>		Greyish green edged with line of glaucous grey. Good flowers 0.7m lilac.
<i>H. fortunei</i> 'Obscura'		Broad green rounded leaves, lilac flowers 0.7m
<i>H. fortunei</i> 'Obscura Marginata'	Yellow edge - <i>Aurea marginata</i>	Dark green broad rounded with yellow margin - 0.7m lilac flowers

NAME	SYNONYM	DESCRIPTION
<i>H.</i> 'Honeybells'		Blunt pointed light green leaves. Palest lilac/white fragrant blooms, 0.9m tall.
<i>H. hypoleuca</i>		Large leaves, glaucous, whitish beneath, large head, horizontal flowers 0.7 m, white.
<i>H. kikutii</i>		Lance shaped fresh green leaves. Prominent bracts - white flowers 0.45m.
<i>H. lancifolia</i>		Shining dark green leaves - small and long pointed - compact clump 0.6m - late, flowers for long period - lilac.
<i>H. lancifolia</i> 'Kabitan'		Yellow leaves edged with green - smaller than above.
<i>H. longipes</i>		Leaves matt green heart shaped - abrupt point - distinct brown spotting on stalks and central veins. Dwarf 0.45m, profuse blooms pale lilac.
<i>H. montana</i>		Rich green narrow heart shaped - large clump spode blue flowers on brownish stems over long period 0.9m.
<i>H. montana</i> 'Aureo marginata'		As above with broad yellow margin to leaves.
<i>H. plantaginea</i>	<i>Funkia subcordata</i>	Clear bright green, glossy, heart shaped, flowers white late, scented 0.9m.

NAME	SYNONYM	DESCRIPTION
<i>H.</i> 'Royal Standard'		Broad, heart shaped, rich green leaves, tall flower stems almost white, fragrant.
<i>H. sieboldiana</i>	<i>H. glauca</i>	The largest of hostas, leaves up to 77cm wide and longer, greyish glaucous green, - distinctly pointed - short flower spikes, palest lilac white, early.
<i>H. sieboldiana elegans</i>		Large rounded cuped glaucous blue crinkled and deeply veined - flowers as above.
<i>H. sieboldiana</i> 'Frances Williams'	Gold Edge	As for <i>H. sieboldiana elegans</i> but with a broad yellow margin.
<i>H.</i> 'Thomas Hogg'		Frequently confused with <i>H. crispula</i> , can be identified by smooth dark green pointed leaves with broad creamy margins - glossy beneath. One of the earliest to flower - light lilac 0.6m.
<i>H.</i> 'Slim Poly'		Of lancifolia origin with shorter more rounded blades - otherwise similar - neat.
<i>H. tokudama</i>		Closely allied to <i>H. sieboldiana</i> - best described as a miniature <i>H. sieboldiana elegans</i> - blue cup shaped small - 116cm.
<i>H. tokudama variegata</i>		As above with the glaucous blue leaf variegated with yellowish green.

NAME	SYNONYM	DESCRIPTION
<i>H. undulata</i>	<i>H. undulata</i> <i>medio picta</i>	Undulate leaves or sometimes even twisted - pointed leaves of green with broad white central variegation, dwarf - 96cm, flower rich lilac, late summer.
<i>H. undulata</i> <i>erromena</i>	<i>H. lancifolia</i> <i>fortis</i>	Rich green broad leaves Tall flower spikes 1m rich lilac.
<i>H. undulata</i> <i>univittata</i>		Similar to <i>H. undulata</i> but more vigorous and taller - the cream variegations on larger leaves are more of a central irregular stripe 0.6m, rich lilac
<i>H. ventricosa</i>		Broad heart shaped, rich dark green glossy beneath. Flower rich violet - attractively veined - bell shaped 1m.
<i>H. ventricosa</i> 'Aureo maculata'		As above with leaves striped and variegated with creamy yellow which fades as summer advances 1m.
<i>H. ventricosa</i> 'Variegata'		Broad dark green with border of soft creamy yellow. The deep violet blooms contrasting beautifully with the creamy margined leaves 1m.
<i>H. venusta</i>		A miniature - 25cm or less - blade narrowly ovate, 12cm long. Flower pale lilac on 38 to 51cm scape. Creeping rootstock.

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STUDENT SECTION

EDITORIAL

The extended mild weather certainly came to an abrupt halt in mid-June and we are now experiencing real winter chills - an ideal time to heat up the study and work through those assignments. Remember also to make the effort to attend field trips organised in your area - you'll find them most worthwhile.

Although deciduous trees are devoid of leaves at this time of year they provide a different form of interest with their bark and branch formation. It is interesting to note as well, just how many plants flower through the colder months of the year. These provide an array of colour needed to brighten up the grey days. For example, the *Camellia sasanqua* cultivars - their glossy green foliage making an ideal background for many variations in flower colours from whites through pinks to reds. Many Australian plants flower at this time of year including the snowy mint bush *Prostanthera nivea* (white flowers reminiscent of snow drops!) and the buttercup tree *Cassia australis* which produces a mass of yellow flowers. Blue colour is provided by flowers of *Iris unguicularis* and *Gentiana acaulis*.

Earlier this year we travelled up to the north of the North Island and were captivated by the many plant species growing up there. Among many highlights, it was most interesting to visit the Otamatea Kauri and Pioneer museum at Matakoho which contained an amazing display of native timbers and kauri gum along with many other exhibits. This proved to be an ideal 'appetiser' for the visit to Waipoura State Forest where we were able to view the giant kauri *Agathis australis* trees 'in the flesh'. 'Tane Mahuta' or 'Lord of the Forest', the oldest living kauri, produces some staggering statistics including a total height of 51.51 metres, girth of 13.77 metres and an estimated age of 1,200 years!! It is interesting to compare this specimen to one in the Christchurch Botanic Gardens which is approximately 70 years old, 15 metres high and 4 metres wide - a comparative baby. I suppose in another 1,000 years or so it may reach similar dimensions...only time will tell! When one stops to think about such a time span it puts a completely different perspective on a human's lifespan doesn't it?

The Annual Conference of the R.N.Z.I.H. at Dunedin was most enjoyable. The many talks, field trips and discussions provided a lot of information. The student workshop Session was very successful and demonstrated just how much is to be gained by pooling ideas on a particular horticultural matter, and discussing solutions to problems. All students, as well as others, can gain immensely from such discussions - Why not get one going in your area? - if you already have you will appreciate the benefits.

With material covering the Annual General Meeting and Conference comprising the entire Autumn bulletin and 75% of this one, it means the Student Section has been much reduced in volume. However, in the next issue it will be back to its 'full quota', so any material submitted by you would be much appreciated.

Kind regards, Nick Owers.

LITTLE BARRIER ISLAND

"HAUTURU"

by Brent Torrens

In October last year I was lucky enough to be part of a group of 12 horticulturists who spent three days on Little Barrier Island. The prime objective was to observe the natural flora of the island.

Haturu, a fauna and flora reserve, is situated 80km from Auckland in the Hauraki Gulf between Cape Rodney and Great Barrier Island. It is made up of 2,817 hectares of largely mountainous terrain which is forested. The highest peak rises to 722 metres above sea level. Transport to the island is by boat, and as there is no wharf, visitors are taken ashore by dinghy by the ranger, Alec Dobbins. (The reason there is no wharf is to prevent the accidental introduction of harmful pests to the island).

"Dobby" as he is commonly known, and his wife are the only permanent residents of the island, and he is responsible for deciding the best time and place to make a landing. Landings are made at the only flat area of the island, Ti Titoki Point, or on either side of the same. Ti Titoki Point is on the south western side of the island and the prevailing wind is south westerly, so landings are not always possible, but are often made through surf onto the boulder beach. Fortunately for us, the day we had chosen was perfectly fine and calm. An earlier date was planned for us but the weather conditions were most unsuitable and we never left home.

The first and biggest impression we got of the flora, was the lushness of most plants, with many having much larger leaves and flowers than their counterparts on the mainland. The coastal vegetation is made up largely of dense pohutukawa, *Metrosideros excelsa* forest. As we climbed past the coastal forest we saw large mapou, *Myrsine australis* specimens dominant. The mapou had leaves approximately twice the size of any I had seen before. In one valley we saw some very large rata, *Metrosideros* spp which were flowering profusely. Here there were also some very fine specimens of tawa, *Beilschmiedia tawa*. As we climbed higher on the ridge the smaller shrubs such as korokio, *Corokia buddleoides* and mairehau, *Phebalium nudum* were abundant and in flower. Again the size of the leaves impressed us, especially korokio, which had beautiful dark green leaves up to 12 cm long. There were numerous turututu, *Dianella nigra* the leaves of which being as large as a young flax. *Dianella nigra* prefers dry hillsides amongst scrub and undershrubs, which is exactly the conditions on the ridges of Hauturu. The dominant species on the ridgetops were kauri, *Araucaria australis* and beech, *Nothofagus* spp. association and in some places dense tawhero, *Weinmannia silvicola* forest.

Descending down another ridge and into the valley floor below

we saw taraire, *Beilschmiedia taraire*, kohekohe, *Dysoxylum spectabile* forest which is relatively open compared with other forest associations higher up on the ridges and valleys. This association gave way to puriri, *Vitex lucens* and pohutukawa, *Metrosideros excelsa* on the coast.

On the valley floor itself, on the banks of the stream, there were the best nikau, *Rhopalostylis sapida* any of us had ever seen. The base of each leaf on some specimens was at least 10 cm wide. The trunks were up to 30 cm through, with the outside of them being beautiful, shiny dark green in parts. The banks of this stream were a highlight for me as one of my favourite natives, taurepo, N.Z. *Gloxinia*, *Rhabdothamnus solandri*, was in abundance. There were bushes up to 2 metres in height, with leaves 5 cm across. Unfortunately only one or two bushes were in flower at that time. What a magnificent spectacle it would have been to see the whole valley floor 'alight' with the small orange/yellow flowers. Taurepo, which is restricted to the Northern parts of New Zealand on dry banks must have suited this site particularly well. The valleys on the island are very steep and free draining, creating ideal conditions for taurepo.

Underneath the lush coastal pohutukawa forest there were many broadleaved shrubs such as whau, *Entelea arborescens*, kawakawa, *Macropiper excelsum* and rangiora, *Brachyglottis repanda*, all of which were relatively free of pests.

As we ventured up a small ravine we found it impossible to continue without damaging the vegetation. The whole of the ground was lush green with dozens of different species of ferns, lichens, mosses and small shrubs. Even on nearly vertical rock faces there was green.

Native orchids also occur on the island in numbers. Although there are reported to be thirteen species we only saw *Thelymitra longifolia*, growing beside the track, *Earina autumnalis* and *Dendrobium cunninghamii* as epiphytes.

Hauturu is also a native bird sanctuary and has many species that are not found in many places on the mainland, as well as the common bush birds of New Zealand in abundance. Also the island supports the world population of stitchbirds, *Notionis-
tis cincta*, which became extinct on the mainland in the 1880's. Wood pigeons, *Hemiphysa novaeseelandiae* are common and it is interesting to note that they are often seen feeding on clover growing in the rangers farmlet.

Hautu is also the home for the giant weta, *Deinacrida heteracantha* which is a fearsome looking insect growing up to 20 cm in length. Although we did not come across any live ones, we were shown some preserved specimens by the ranger.

From a botanical point of view, Hauturu is well worth a visit as it has such a wide range of species and habitats, in such a small area. The area that was possible to cover in such a short time was only small, although I feel I have covered a fairly wide range of the more common plant associations on the island. Because of the health and vigour of most plants, and

because there are so many species I believe it is a unique and valuable area of New Zealand native flora.

Any groups wishing to visit Little Barrier Island should contact:

HAURAKI GULF MARITIME PARK BOARD
P.O. BOX 5249
AUCKLAND.

Ph. 771-889

N.B. A permit from the H.G.M.P.B. is required to land on the island.

THE ELUSIVE BLACK TULIP AT LAST?

A Dutch group claims it has produced a black tulip, a bloom that has long eluded horticulturists.

The West Friesland Floral Institute said that after 25 years of intensive work with dark tulips it had eliminated the last intrusive strain of purple.

"We now have a perfect black flower with good strong leaves," said the institute's chief, Henk van Dam. The blend was achieved by crossing and recrossing two dark varieties, Queen of Night and Vienerwald.

Attempts to produce a black tulip in the Netherlands date from the sixteenth century and the subject has been featured in more than one cloak-and-dagger novel.

Mr Van Dam said it took the combined resources of six horticultural concerns to bring the project to fruition and the result could be a major boost to a Dutch flower industry already earning almost \$US2 billion (\$NZ3.72 billion) a year in exports.

RAISING KAURI *AGATHIS AUSTRALIS* FROM SEED

(Taken from New Zealand Forest Service Information Series No. 77 "Raising Kauri From Seed" by R.C. Lloyd)

Raising kauri *Agathis australis* from seed is not difficult, and it can be interesting and worth while to have a go yourself rather than buy seedling trees.

CONES

Kauri is a conifer, bearing male and female cones and producing seed annually, though with variation in quality and quantity.

Male or pollen cones, known as catkins, form as buds in February-March and grow to a cylindrical shape 2½-4 centimetres long by the following September, when their colour changes from dark green to light brown and the scales open to shed their pollen, fertilising the female cones. Some two weeks later the male cones drop to the ground.

The female or seed cones form at branch ends near the treetops and mature over a period of two years, ripening between late summer and early autumn of their second year. The various stages of their development are:

- * small buds, with no resemblance to a cone, that form in February-March and remain closed until the following spring.
- * young pale-green oval cones about 2½ centimetres in diameter.
- * mature dark-green round cones with flattened tops, ranging from 5 to 7½ centimetres in diameter.

While still on the tree the fully ripened female cones break up with the scales dropping to the ground, shedding their winged seeds as they fall.

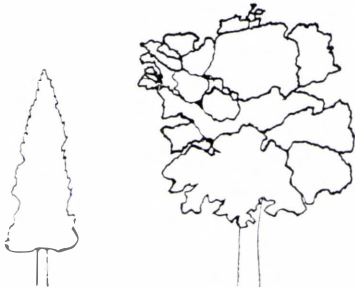
GATHERING CONES

When the seeds are shed they drift a fair distance from the parent tree, generally at least 60 metres. This, together with the fact that they are small and brown and difficult to see amid forest growth, makes collection from the ground impractical for the Forest Service, which instead picks the ripened cones before they break up and scatter their contents.

A reasonable rule of thumb for the best time to gather the seed cones is when the cone scales start to appear on the ground around the foot of kauri in autumn. At Waipoua Forest, where the Forest Service obtains most of its seed, experience has shown the best collecting time to be the first three weeks of February. Eighty kilometres to the east of Waipoua, however, the first fortnight in March is best, although this by no means implies that the further east kauri grow the later the cones ripen.

Trees with trunk diameters of between 30 and 65 centimetres and

heights ranging from 10 to 20 metres produce the best seed. Such trees vary in shape from conical crowned, with light, more or less rightangled branches over half the tree height, to those with a spreading crown topping a more massive long clear trunk. Most of the cones are in the top third of the crowns.



Left. conical crowned young kauri: right. spreading crown of mature kauri.

Skilled Forest Service collectors, using lightweight extension ladders or special roping gear to climb the trees, pick the large firm dark-green cones and place them in a handy sack or other container tied to their waists. If the cones feel really firm though, they can be dropped to the ground and retrieved later.

EXTRACTING AND SORTING SEED

The collected cones are placed on a tray in a warm room or workshed to allow them to break up so that the seed can be extracted. They will generally do this within 10 days, and any that have not broken apart after this time should be discarded. On no account are they ever placed in full sunlight to hasten break-up, since this may cause any bruised cones to ooze gum, sealing the scales to one another and preventing them from separating.

As the Forest Service handles large quantities of cones, it uses sieves to sort the seeds from the scales and then sifts through the seed to separate the good from the bad. One-quarter to one-third of all seeds in any cone are sound, and the rest are infertile or "blind". It is easy to tell the difference as sound seed is fatter and firmer.



The single-winged seeds - actual size

WHEN TO SOW

The sound seeds should be sown immediately, because the longer they are kept the more quickly they lose their ability to germinate. One hundred percent viability at the time of collection declines to only a few percent within a matter of months. Seed not sown straight away can be kept for future

use if dried and put into an airtight jar in the refrigerator (not deep freeze).

Seed held at the Forest Service's Central Seed Store is kept in airtight containers stored at 5°C to retain viability. Once removed from these conditions it too should be sown as promptly as possible.

TREATMENT BEFORE SOWING

To ensure more rapid germination, the seed can be soaked in water before sowing, but not for any longer than 24 hours as the thin outer skin allows it to absorb water quickly. Treated this way, seedlings should appear within 4 to 6 days after sowing, whereas unsoaked seed can take a fortnight or even longer.

When seed is to be sown on a large scale, as in the Forest Service nursery, it is coated with a fungicide, which also helps to protect it from birds and insects. However, anyone raising just a few potted seedlings indoors can ignore this step.

SOIL AND SOIL MIXES

Although kauri seed will "take" in almost any soil, an acid soil or, better still, soil mix, with an acidity level (pH) of between 4.8 and 5.5 will produce stronger healthier seedlings.

You can make your own potting mix fairly easily, and the following two are quite suitable for the purpose:

- * 2 parts loamy soil, 1 part fine scoria or sand, and 1 part peat:
or
- * 2 parts peat to 1 part fine sand.

Preferably use fine river sand. If you use coastal sand it will have to be washed to remove any salt and also sieved to remove shell fragments as these substances can stunt the seedlings. Sieving however will not remove minute shell pieces the same size as the sand grains, and the existence of these can be detrimental, making the acidity level of the overall mix too high.

Some medium-granule NPK fertiliser (containing nitrogen, phosphorus, and potassium in the proportions 7:40:6) can benefit your home-made potting mix added at the rate of 45 grams to 56 pot-lots of soil (i.e. pot size 5 by 5 by 8 centimeters). This works out at about $\frac{3}{4}$ gram of the fertiliser to a pot. The fertiliser must be well mixed in with the potting mixture before sowing.

You may prefer to avoid the business of making up a potting mix and buy one ready made, sterilised, and containing fungicides and fertilisers to protect and promote growth.

If on the other hand you choose to try your luck with ordinary garden soil, you should not need to add any fertiliser unless it is very poor in plant nutrients. An addition of fungicide would not go amiss however, if you have quite a few pots and

are hoping for good results.

SOWING

You are strongly advised to *sow your seeds singly in small tapered plastic pots, 5 centimetres square and 8 centimetres deep, which will give them adequate room to develop for a year, and also make them easily transportable.* With the thousands of seedlings it raises each year the Forest Service sows the seeds in seedbeds and then, within a couple of months of germination, transplants the seedlings into individual pots. This gives them space to grow and helps to prevent root rotting or other mishaps arising from winter damp and cold.

Fill the pots with your soil or soil mix and when you sow the seed *just cover with a depth of soil no greater than the thickness of the seed itself.*

The seed pots, boxes, or beds must be *in a warm ventilated spot out of direct sunlight.* To provide these conditions at its kauri nursery at Sweetwater near Kaitaia, the Forest Service uses a shade house which is basically a framework some 2 metres high, covered with fine-mesh nylon netting fitted to the sides and top, giving shelter and cutting the sun's rays. However a carefully selected spot in a room of your home will be just as good, with your pots away from the windows and not too near heaters or open fires.

Until the seeds have germinated it is essential to *keep the soil moist,* and a good way to do this is to provide cover with a sheet of scrim raised about 30 centimetres above them, or else sheets of glass placed over the pots, boxes, or beds. If you have only a few pots you can use up-ended glass jars, which are just as effective. The covers should be removed once the seedlings appear.

When the seedlings are about a month old they will be standing upright and will have shed their seed caps to display the first two leaves (cotyledons). Should the seed caps however still be persistently clinging at this stage, your plants may not have been getting enough light. If this is the case, it will not hurt to give them some direct sun.

Not all your seeds will germinate and not all your seedlings will survive. Losses arising from soil fungi (for which there is no effective prevention) and from other causes, such as weaknesses in the seedlings themselves, could leave you after a year with no more than 75-85 percent of your original strike.

REPOTTING AFTER A YEAR

Once they are a year old the seedlings have to be repotted into larger containers to give room for their expanding roots, otherwise, if left in their small pots, they will become rootbound and eventually die. The Forest Service uses polythene planter bags (size PB3A, available from plant shops and nurseries), but if you have some plastic or earthenware pots measuring at least 13 centimetres square and 13 centimetres deep, they will be just as good.

Use the same soil mixtures for repotting, although an extra amount will naturally be required because of the larger container size. If you use fertiliser, remember to mix it in well beforehand so that it does not "burn" the seedling roots.

In the autumn after repotting, when the seedlings are about two years old and around 20 centimetres tall, they should be ready for transplanting into the open. They can be successfully grown throughout New Zealand, but when planted outside their present natural range of occurrence (i.e. outside the general region of Northland, Auckland, Coromandel) they need a bit of extra care and protection.

NEW ZEALAND LABORATORY BEATS CROWN GALL

A plant disease which previously cost the horticulture industry millions of dollars has been eliminated in New Zealand through the development of a micro-biological product which protects the plants from the disease.

The disease, crown gall *Agrobacterium tumefaciens*, wiped out up to 40 per cent of any infected crop. Peaches, nectarines, raspberries, roses, kiwifruit, tobacco and similar flowering plants were among those which suffered severely from the ravages of crown gall.

Scientists in a small laboratory near Nelson have produced an answer - called Dygall. When applied to young seedlings or cuttings it provides life-long protection from the crown gall infection.

Mr John Lloyd, head of the scientific team working for Mintech N.Z. Ltd, which produced Dygall, received a presentation from the Under-Secretary of Agriculture, Mr David Butcher, to mark the achievement of eradicating crown gall from commercial crops in New Zealand at a function in the Beehive. The presentation was made on behalf of the National Rose Society of New Zealand.

Crown gall is caused by a harmful bacteria which makes woody lumps or galls grow on the trunk or stem of the plant. These drain the nourishment from the plant.

Dygall is a compound containing a "friendly bacteria" which is harmless to man. This is added, under the strictest of sterile conditions, to a fine sterile peat mixture.

A small 160 gram bag of Dygall contains eight hundred thousand million disease-fighting bacteria which is enough to treat 2,000 peach stones or 7,500 rose cuttings.

The process is now arousing considerable overseas interest. Overseas scientists are reportedly amazed that a major micro-biological product protecting multimillion dollar orchards and horticultural crops is supplied from a small laboratory operated by Mintech N.Z. employing fewer than 20 people.

BIOLOGICAL CONTROL OF GORSE

ULEX EUROPAEUS

Taken from leaflet by

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Gorse, *Ulex europaeus* L. is our most widespread and costly weed. 700,000 hectares of New Zealand has gorse on it, including potentially productive farmland and forestry areas. Techniques for chemical control and gorse management are well known.

This article summarises attempts to control gorse in New Zealand using natural or biological control methods.

The Distribution and Origin of gorse

There are nine species of gorse, though only one occurs widely in New Zealand. Its native habitat is Western Europe where it occurs along the Atlantic Seaboard from Portugal to Holland and throughout the British Isles. It is regarded as a minor weed in parts of Spain, but in the remainder of its native range is valued as a wildflower. Apart from New Zealand, gorse has established and become a weed in many countries including Australia (Victoria and Tasmania), U.S.A. (Hawaii, California and Oregon), Canada (Vancouver) and Chile. The origin of gorse in New Zealand is not certain but Darwin recorded large infestations when he visited in 1835. It was obviously introduced by the earliest settlers, probably as an ornamental, and was propagated as a windbreak in more exposed parts of the country.

The benefits of gorse

The Europeans have regarded gorse (also called furze or whin) as a valuable economic plant for centuries. Before the development of improved pastures, gorse provided an important source of fodder for farm stock (especially horses), and was an important domestic fuel. In Ireland it appears that higher rates were once demanded for land which was gorse-covered because of its value as fodder! Even now gorse is carefully conserved in many European reserves, but for its aesthetic rather than its economic value.

Gorse has been an important hedge-plant in New Zealand for over 100 years. On the exposed Canterbury Plains, gorse hedges are still important windbreaks, though other plants are being used for this purpose more and more. Gorse is no longer used as a fodder plant, but recently it has been suggested that it could be pelleted as a stock food. Other suggestions include growing gorse to supply biomass for energy production and harvesting flowers for the manufacture of cosmetics. The possible value of gorse as a nursery plant for forest regeneration and erosion control in some areas has recently been stressed. Gorse flowers provide a predictable and abundant source of

pollen for bees during August. Very few other plants flower in August, and so gorse is important for building strong hives.

Gorse in New Zealand - Costs

The economic benefits to be achieved from controlling gorse in New Zealand are very difficult to estimate, but control of the weed on just the ploughable land presently infested could probably yield \$24 million in additional production each year. At present the annual costs of controlling gorse in agricultural and forestry land exceed \$20 million.

Biological Control of Gorse - Early work in New Zealand

When biological control of gorse was first suggested, it was decided not to aim at the destruction of the weed (because of its value as a hedge) but to concentrate on limiting the spread of the weed by attacking the seeds. The small, grey seed weevil *Apion ulicis* was introduced from Britain in 1927. In September and October this weevil lays its eggs inside green pods, and the hatching larvae consume the seeds. When the pod bursts it liberates not seeds, but adult weevils which wait until the following spring to attack further pods. Having determined that this weevil did not attack any economic or native plants, 235,000 were released throughout the country beginning in 1931. They established and spread rapidly. Since then the weevil has destroyed between 50 and 100% of all gorse-seed produced each spring, but has not attacked pods formed at other times of the year. It is very difficult to gauge the importance of this reduction in seedfall because the seed survives for over 40 years in the soil, i.e. seed produced before the weevil established is still germinating. The size of the seedbank under gorse infestations may be declining, and the impact of this decline on the density of gorse in New Zealand may become evident in the future.

Recent Work

In 1962-64 and 1980-83 investigations identified all of the insects and diseases which attack gorse in its native range, Western Europe. Only one disease was identified, but it is probably not a possible control agent because it also attacks *Euphorbia* spp. Ninety-four insects attack gorse, but of these only 16 appear to be sufficiently host-specific to warrant further research. Two moths, whose caterpillars feed in pods, could reduce the amount of seed produced by gorse even further, because they feed at times of the year when *Apion ulicis* is not active. There are no host-specific species which attack crowns, roots or stems of gorse. Eleven species attack the green foliage of gorse, and these appear to provide the best prospects for reducing the vigour of gorse.

Caterpillars of the gorse shoot moth, *Agonopterix ulicetella*, infest shoot tips at the onset of growth, and can often kill new shoots entirely. Older larvae feed on spines and other green foliage from a silken tube attached to the stem, and at high density destroyed experimental potted plants. In Europe this species occurs only at low density in the field, but since 50% of larvae can be parasitised and even more are lost through

predation, it is likely that higher population levels would be achieved on transfer of parasite-free material to New Zealand.

Tests were carried out in Britain by D.S.I.R. to determine whether this species attacks any New Zealand economic or native plants. Its host-range proved to be very narrow, and a nucleus colony has since been introduced into New Zealand for final assessment. This colony is reared under strict quarantine at D.S.I.R., Lincoln.

The gorse lace-bug *Dictyonota strichnocera*, is the only hemipteran species which can be considered a potential control agent for gorse. It feeds on leaf contents, and causes bronzing of gorse stems, spines and leaves. Related species are normally very host specific, and tests in Britain suggested that this species is restricted to gorse. It is also being held in quarantine in New Zealand for final assessment.

The red mite *Tetranychus lintearius* is the only species which has been observed to kill gorse bushes. It forms large colonies which move about the bush causing severe bronzing. Heavy infestations cause the death of whole branches, produce very heavy webbing over the remainder of the bush, and on occasions kill whole gorse plants. Safety tests on this species were carried out in Britain in 1984. It appears to be entirely host-specific to gorse. Although it is closely related to the damaging two-spotted mite, *T. urticae*, it cannot interbreed with it. It seems likely that approval to release this species in New Zealand will be obtained shortly.

Future Plans

Several safety-tests remain to be carried out at Lincoln before *Agonopterix ulicetella*, *Dictyonota strichnocera* or *Tetranychus lintearius* can be released from quarantine and liberated in the field. These tests will be carried out in 1985, and should either species fail these tests the colony will be destroyed.

In 1985/86 further research will be carried out in Britain by D.S.I.R. on two further gorse insects. *Apion scutellare* weevils lay eggs in gorse stems, and the hatching larvae produce pea-like galls on the shoot. This species is of particular importance because attack is almost restricted to stems regrowing from gorse crowns after physical damage or fire. The impact of this galling on plant growth is not known, but it may restrict the vigour of regrowth which follows most existing control methods. Safety-tests for this species have yet to be carried out.

A gorse-feeding thrip *Seriocothrips staphylinus* will also be assessed.

Conclusions

It may be some time yet before the first releases of gorse control insects can be made. Then, assuming that these insects establish, it will probably be 10-15 years before we can adequately assess any benefits which have accrued. The current annual costs of gorse control are high, and if biological control could save even a small part of this, the investment would be worthwhile.

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