

Horticulture

in New Zealand

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



45

Spring/Summer 1987



HORTICULTURE

IN NEW ZEALAND

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ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC)

<i>Patron</i>	His Excellency the Governor-General
<i>Vice-Patron</i>	The Honourable Minister of Agriculture and Fisheries
<i>President</i>	Mr R.J. Ballinger, OBE, JP, B.Ag. Sc.
<i>Chairman of Executive</i>	Mr A.G. Jolliffe, NDH, Dip PRA, MSc. (Indiana), FIPRA, ANZIM
<i>Chairman of Examining Board</i>	Dr R.C. Close, M.Sc., Ph.D.
<i>Executive Officer</i>	Mr D.B. Cameron, B.Sc., Dip. Tert. Ed. P.O. Box 12, Lincoln College
<i>Annual Journal Editor</i>	Mr M. Oates, B. Hort. Sc. (Hons) (Reading)
<i>Bulletin Editor</i>	Ms P.J. Gibbons, Dip. Hort. Dip. Hort. (Kew)
<i>Student's Editor</i>	Mr N.W. Owers, N.C.H.

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

Views expressed are not necessarily those of RNZIH.

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EDITORIAL

You will notice this is the first typeset bulletin. Apart from looking smarter and having more words per page typesetting has meant you must send articles in earlier for publication.

With three bulletins per year they will be Summer/Autumn — published in early April in order to have all the conference information. Winter — published in July and Spring/Summer published in November.

Closing dates for articles will be as follows:

Summer/Autumn 22.2.88.

Winter 16.5.88.

Spring/Summer 26.9.88.

I hope everyone will take a note of these dates and try to write something for 1988.

Everyone will be receiving an Annual Journal this year. I'm told it is to be a real bumper issue and those who haven't had the Journal before will be in for a pleasant surprise.

In the last Bulletin we published a list of new names reprinted from 'Commercial Horticulture'. Two of these name changes, those of *Cyathea australis* to *Alsophila australis* and *Cyathea cooperi* to *Sphaeropteris australias* have been the subject of disagreement from some Institute members.

I made some enquiries of botanists at the D.S.I.R. There are two different classifications of the tree ferns, using the different names. Both classifications and consequently both names are equally valid at the present state of knowledge. Neither name is more correct than the other. Till more work is done on the tree ferns everyone will just have to choose which classification they like for themselves and will have to remember the synonyms as well.

Botanical names are always a problem. Especially as most people don't have access to the very latest information on classification of plants. This information isn't definitive anyway so horticulturalists have to keep up as best they can.

No doubt students are all breathing a sigh of relief as exams are over for 1987. We have an article in this Bulletin explaining the new two year Lincoln Diploma in Horticulture. Some Institute students may be thinking of tackling this next.

I can't write an editorial without my usual plea for articles, photos and drawings. Students should send articles to Nick Owers. If you want an interesting bulletin it's up to everyone to send in articles. Many thanks to those who do send in articles.

Pamela Gibbons

Editor

Cover Photo: *Myosotidium hortensia*

A well grown and fully developed specimen of Chatham Island forget-me-not must rank highly in any list of notable foliage plants, although it is primarily grown for its flowers. Plants do best in semi-shade and slightly moist soil in a relatively sheltered position. In such places the leaves can attain their finest qualities of perfection in size and colour. The leaves are clearly and deeply veined, large and glossy, dark green. The flowers, which appear in mid-spring and are past their prime now, are variably coloured — azure blue at best. *Myosotidium hortensia* is a monotypic genus, endemic only to the Chatham Islands where it is now rare and so has been placed in the category of rare and endangered plants of New Zealand. The large, corymbose terminal heads of flowers form large, four angled fruits which can produce a good quantity of seed from which seedlings can be raised. Old plants can also be divided up.

FROM THE EXECUTIVE OFFICER

This issue of the Bulletin marks the introduction of the new fully type set format. Hopefully all members will agree that the standard of the production has been considerably enhanced.

Life at the Institute's Head Office is all go with the exam round now well under way. The Examining Board will meet late in January and all students will receive their examination results by the end of January.

Subscriptions

It is pleasing to note that a large number of members have paid their 1988 subscriptions by the "asking" date of 31 October. It appears that the inclusion of a "freepost" envelope for the return of subs has been a success. However I would ask members who have not yet responded to pay their subs in the near future as the Institute relies on subscription income to remain financially viable until examination entries begin to arrive in June.

We have had one or two hiccups with the first round of computer printed invoices but I think all will agree that the new invoices are a vast improvement on previous efforts. I am at present working through the anomalies and errors and I am confident that by next year everybody's invoice will be accurate in all respects.

Constitution

The amended Constitution which was approved at a Special General Meeting in November 1986 has now been printed and copies have been distributed to all District Councils and members of the National Executive. Further copies are available from my office on request.

Associates of Honour and Fellows

This Bulletin contains a full, and I hope accurate, list of all Associates of Honour (AHRH) and Fellows (FRH) of the Institute. If anyone notices any errors or omissions I would be grateful if they would let me know. It was a big exercise to identify all recipients of Awards and Honours but now that we have the information loaded onto the computer it will be easy to keep track of such details in future.

Nominations from District Councils for Awards formally closed on 15 November but nominations that arrive before Christmas can still be considered as the National Executive does not meet again until 21 January 1988. All District Councils are encouraged to make nominations to honour their longstanding and valued members. It is interesting to note that constitutionally we are entitled to have up to 60 Associates of Honour and 500 Fellows at any one time. At present we have only 48 Associates of Honour and 137 Fellows, so there is plenty of scope for further nominations.

"Horticulture: The Career for You?"

This booklet, which was first published in 1985, has now been revised and copies of the revision should be available before Christmas. Copies will again be sent to all secondary schools in New Zealand to assist school leavers to make informed decisions regarding career pathways in horticulture. Further copies will be available from my office at a cost of \$5.00 each. The Institute owes Mike Oates of Wellington a big vote of thanks for undertaking the task of producing this revision: no easy task at a time when horticultural education is undergoing many changes.

Dates to Note in your Dairy

Wed 23 December 1987 RNZIH Head Office closes for Christmas

Fri 25 December 1987 CHRISTMAS DAY (in case you forget)

Mon 4 January 1988 RNZIH Head Office reopens
Tues 19 January 1988 Examining Bd Subcttee meeting (Wgtn)
Wed 20 January 1988 Examining Board meeting (Wgtn)
Thurs 21 January 1988 National Executive Meeting (Wgtn)
Mon 25 January 1988 Examination results posted this week
Mon 15 February 1988 Closing date for submission of remits for AGM
Thurs 10 March 1988 Closing date for nominations for National Exec.
Fri 13 May 1988 National Executive meeting (Lincoln College)
Sat 14/Mon 16 May 1988 1988 AGM & ANNUAL CONFERENCE

Lincoln College, Canterbury

I hope all members have a happy and relaxed Christmas and New Year break. I look forward to seeing many of you in Christchurch for the Conference in May when the RNZIH National Office will be "Open House" to all members for at least part of the week-end.

Dave Cameron
Executive Officer

ASSOCIATES OF HONOUR AND FELLOWS OF THE RNZIH

Associates of Honour of RNZIH

(as at 10 November 1987)

Name	City/Town	Joining Date
Mrs M. Joy Amos AHR IH	Auckland	26 Jun 74
Dr J. D. Atkinson AHR IH	Auckland	30 Apr 76
Mr R. J. Ballinger AHR IH	Blenheim	25 Sept 63
Mrs D. Benstead AHR IH	Lower Hutt	10 Nov 66
Mr I. F. Bonisch AHR IH	Ashburton	26 Mar 56
Mr S. W. Burstall AHR IH	Auckland	7 Feb 75
Mrs B. J. Cave AHR IH	Dunedin	18 Feb 75
Mr S. Challenger AHR IH	Little River	6 May 83
Dr E. E. Chamberlain AHR IH	Auckland	15 Oct 59
Mr H. J. Clark AHR IH	Auckland	1 Apr 70
Dr R. C. Close AHR IH	Canterbury	9 Jun 80
Miss J. Dingley AHR IH	Auckland	15 Sept 59
Mr H. G. Gilpin AHR IH	Christchurch	20 Aug 49
Mr J. H. Glazebrook AHR IH		20 Sept 49
Dr E. J. Godley AHR IH	Christchurch	15 Feb 83
Mr J. W. Goodwin AHR IH	New Plymouth	8 Jul 46
Mrs D. A. Hardwick AHR IH	Tauranga	15 Apr 66
Mr A. J. Healy AHR IH	Christchurch	28 May 54
Mr G. G. Henderson AHR IH	Dunedin	30 Jun 47
Mr B. Hollard AHR IH	Kaponga	28 Jan 48
Mr C. V. Holyoake AHR IH	Auckland	2 May 50
Mr J. P. Hudson AHR IH	Loughborough	4 Jun 47
Mr J. Humne AHR IH	Palmerston North	2 Aug 63
Mr Jas. Hunter AHR IH	Morrinsville	16 Aug 77
Mr P. Jew AHR IH	Auckland	16 Dec 47
Mrs M. Kennedy AHR IH	Whangarei	27 Mar 57
Mr E. H. Latimer AHR IH	Auckland	1 Jun 62
Mr K. J. Lemmon AHR IH	Palmerston North	4 Sep 63
Mr G. B. Malcolm AHR IH	Christchurch	11 May 71
Mr K. H. Marcussen AHR IH	Christchurch	8 Dec 47
Mrs M. M. Martin AHR IH	Whangarei	13 Jul 51
Mrs B. Matthews AHR IH	Waikanae	2 Feb 84
Dr T. M. Morrison AHR IH	Queensland 4345	7 Feb 66
Mr R. Nanson AHR IH	Wellington	8 Feb 54
Mr H. J. Poole AHR IH	Lower Hutt	2 Dec 47
Mrs K. Reynolds AHR IH	Whangarei	13 Nov 52
Mr J. S. Say AHR IH	Waihi Beach	8 Mar 55
Mr A. G. Scott AHR IH	Morrinsville	2 Aug 48
Mrs R. H. Shepherd AHR IH	Wellington	7 Dec 57
Mr P. J. Skellerup AHR IH	Christchurch	10 Sep 55
Mr M. R. Skipworth AHR IH	Wanaka	10 Mar 47
Mr R. Syme AHR IH	Hawera	9 Dec 47

Mr J. O. Taylor AHRIH	Christchurch	11 Feb 48
Mr E. E. Toleman AHRIH	Hamilton	29 Mar 60
Mrs K. J. Veal AHRIH	Auckland	30 Jun 64
Professor J. A. Veale AHRIH	Palmerston North	12 Mar 68
Mr G. P. Ward AHRIH	Christchurch	2 Feb 82
Mr H. B. Williams AHRIH	Gisborne	6 May 76

Fellows of RNZIH
(as at 10 November 1987)

Name	City/Town	District Council	Joining Date
Mrs M. Joy Amos AHRIH	Auckland	Auckland	26 Jun 74
Mrs R. Bagley FRIH	Dunedin	Otago	11 Jun 71
Mr R. W. Barry FRIH	Ohope	Bay Of Plenty	18 Aug 48
Mr A. S. Bathgate FRIH	Otago	Otago	17 Jan 62
Mrs D. Benstead AHRIH	Lower Hutt	Wellington	10 Nov 66
Mr R. J. Berry FRIH	via Gisborne	Poverty Bay	15 Oct 63
Mr H. Blumhardt FRIH	Auckland	Manawatu	1 Apr 46
Mr J. W. Bolton FRIH	Palmerston North	Manawatu	17 Jan 67
Mr I. F. Bonisch AHRIH	Ashburton	Canterbury	26 Mar 56
Mr N. Bowyer FRIH	Tauranga	Bay of Plenty	30 Oct 75
Mr G. J. Bradbourne FRIH	Auckland	Auckland	10 Feb 50
Mrs B. Brown FRIH	Wellington	Wellington	28 Jan 75
Mr B. L. Buchanan FRIH	Auckland	Auckland	14 Feb 61
Mr D. H. Bull FRIH	Auckland	Auckland	14 Sep 65
Mr E. F. Butcher FRIH	Carterton	Wellington	22 May 58
Dr E. O. Campbell FRIH	Palmerston North	Manawatu	27 May 59
Mrs B. J. Cave AHRIH	Dunedin	Otago	18 Feb 75
Mr S. Challenger AHRIH	Little River	Canterbury	6 May 83
Mr L. Clark FRIH	Christchurch	Canterbury	28 Nov 57
Prof. W. C. Clark FRIH	Woodend	Canterbury	9 Dec 65
Mr F. E. Cooper FRIH	Wellington	Wellington	18 Dec 55
Mr K. L. Davey FRIH	New Plymouth	North Taranaki	21 Sep 68
Dr R. M. Davison FRIH	Auckland	Auckland	26 Mar 61
Mrs R. M. Davison FRIH	Auckland	Auckland	26 Mar 61
Mrs F. J. Deldyck FRIH	Palmerston North	Manawatu	19 Nov 62
Dr P. J. Devlin FRIH	Canterbury	Canterbury	6 Dec 59
Mr T. H. Dickson FRIH	Inglewood	North Taranaki	10 Oct 53
Miss J. Dingley AHRIH	Auckland	Auckland	15 Sep 59
Mr F. Dorofaeff FRIH	Hamilton	Waikato	2 May 74
Mr D. Duthie FRIH	Wellington	Wellington	22 Dec 58
Mr R. A. Edwards FRIH	Canterbury	Canterbury	16 Mar 78
Mr J. R. Farthing FRIH	Christchurch	Canterbury	24 Nov 48
Mr W. Fielding-Cotterell FRIH	Christchurch	Canterbury	16 Jan 74
Mr T. N. Flint FRIH	Auckland	Auckland	26 Sep 62
Mr S. S. Foster FRIH	Hawera	South Taranaki	22 Apr 54
Mr A. W. Fyre FRIH	Raumati Beach	Wellington	11 Feb 59
Mr H. H. H. Gardiner FRIH	Darfield	Canterbury	19 Jan 49
Mr P. C. Gardner FRIH	Northland	Whangarei	28 Jan 60
Mr Ian Gear FRIH	Frankton	Waikato	23 Jul 84

Mr H. V. George FRIH	Te Awamutu	Waikato	16 May 59
Mrs D. J. Gerondis FRIH	Wellington	Wellington	30 Jun 65
Mr R. C. Gill FRIH	Hamilton	Waikato	28 Jan 75
Mr H. G. Gilpin AHRIH	Christchurch	Canterbury	20 Aug 49
Mr J. H. Glazebrook AHRIH		Not Applicable	20 Sep 49
Dr M. G. Goodey FRIH	Auckland	Auckland	26 Apr 71
Mr R. Gormack FRIH	Christchurch	Canterbury	3 Mar 48
Mr A. T. Graham FRIH	Kaikati	Bay of Plenty	19 Nov 84
Mrs E. B. Gross FRIH	Auckland	Auckland	5 Nov 75
Mr H. T. Hall FRIH	Auckland	Auckland	24 Oct 69
Dr K. R. W. Hammett FRIH	Auckland	Auckland	9 Mar 62
Mrs D. A. Hardwick AHRIH	Tauranga	Bay of Plenty	15 Apr 66
Mr L. R. Harland FRIH	New Plymouth	North Taranaki	20 Oct 48
Mr A. J. Healy AHRIH	Christchurch	Canterbury	28 May 54
Mr G. G. Henderson AHRIH	Dunedin	Otago	30 Jun 47
Mrs J. S. Hickey FRIH	Opunake	South Taranaki	20 May 48
Mr B. Holland AHRIH	Kaponga	South Taranaki	28 Jan 48
Mr C. V. Holyoake AHRIH	Auckland	Auckland	2 May 50
Miss Dorothy Hooper FRIH	Hawera	South Taranaki	11 Oct 48
Mrs W. J. Hosie FRIH	Manaia	South Taranaki	22 Jul 54
Mr C. H. Howden FRIH	Auckland	Auckland	15 Feb 71
Mr J. Hume AHRIH	Palmerston North	Manawatu	2 Aug 63
Mr M. F. Hynes FRIH	Auckland	Auckland	17 Jan 49
Mr M. L. Jerrard FRIH	Christchurch	Canterbury	29 Nov 66
Mr P. Jew AHRIH	Auckland	Auckland	16 Dec 47
Mr A. G. Jolliffe FRIH	Lower Hutt	Wellington	6 Oct 78
Mr C. H. Jones FRIH	Diamond Harbour	Canterbury	21 Nov 62
Mr N. S. Joyce FRIH	Auckland	Auckland	6 Aug 54
Mrs M. Kennedy AHRIH	Whangarei	Whangarei	27 Mar 57
Mr N. J. Kitchen FRIH	Auckland	Auckland	26 Apr 61
Mr C. Lannie FRIH	Wellington	Wellington	29 May 45
Mr E. H. Latimer AHRIH	Auckland	Auckland	1 Jun 62
Mr K. J. Lemmon AHRIH	Palmerston North	Manawatu	4 Sep 63
Mrs R. Lowe FRIH	Hawkes Bay	Hawkes Bay	19 May 57
Mr R. C. Lowe FRIH	Lower Hutt	Wellington	9 Jun 80
Mr R. MacDonald FRIH	Auckland	Auckland	11 Dec 80
Mr A. Malcolm FRIH	Christchurch	Canterbury	18 Oct 79
Mr G. B. Malcolm AHRIH	Christchurch	Canterbury	11 May 71
Mr G. Mander FRIH	Tauranga	Bay of Plenty	1 May 61
Mr K. H. Marcussen AHRIH	Christchurch	Canterbury	8 Dec 47
Mr J. A. Mashlan FRIH	Hamilton	Waikato	21 Nov 47
Mr A. L. Mason FRIH	Feilding	Manawatu	5 Jul 71
Mr W. L. McFadden FRIH	Christchurch	Canterbury	14 Oct 65
Dr D. McIlroy FRIH	Christchurch	Canterbury	14 Jun 69
Mr C. A. McLaughlin FRIH	Dunedin	Otago	6 Aug 47
Mrs D. Menzies FRIH	Wellington	Wellington	27 Mar 73
Mr W. J. Messenger FRIH	Inglewood	North Taranaki	12 Nov 54
Mr L. J. Metcalf FRIH	Invercargill	Southland	26 Sep 57
Mr L. J. Mitchell FRIH	Christchurch	Canterbury	22 Mar 61
Mr R. H. Mole FRIH	Wellington	Wellington	8 Jul 65
Mr A. C. Morgan FRIH	Christchurch	Canterbury	26 Sep 63

Mr A. F. Morgan FRIH	Greytown	Wellington	9 Dec 47
Dr T. M. Morrison AHRIH	Queensland 4345	Not Applicable	7 Feb 66
Dr H. M. Mouat FRIH	Auckland	Auckland	26 Oct 87
Mr E. D. Moyle FRIH	Christchurch	Canterbury	25 May 82
Mr R. Mulholland FRIH	Southbridge	Canterbury	6 Apr 62
Mrs I. R. Murgatroyd FRIH	Culverden	Canterbury	27 Nov 59
Mr R. Nanson AHRIH	Wellington	Wellington	8 Feb 54
Mrs B. A. Nicholas FRIH	Hawera	South Taranaki	17 Mar 71
Mr G. Nicholls FRIH	Auckland	Auckland	31 May 48
Mr G. P. Nind FRIH	Christchurch	Canterbury	5 Feb 48
Mr M. Oates FRIH	Wellington	Wellington	8 Mar 82
Mr G. Paterson FRIH	Timaru	Canterbury	15 Dec 72
Mr A. L. Poole FRIH	Wellington	Wellington	26 Sep 58
Mr F. W. Poole FRIH	Palmerston North	Manawatu	2 Aug 63
Miss A. M. Presants FRIH	Lower Hutt	Wellington	25 Oct 68
Mr R. A. Proctor FRIH	Christchurch	Canterbury	22 Feb 65
Mr D. R. Purser FRIH	Whakatane	Bay of Plenty	13 Jul 51
Mr G. Rainey FRIH	Auckland	Auckland	26 Jun 66
Mr H. B. Redgrove FRIH	Auckland	Auckland	24 Oct 57
Mrs A. B. Reed FRIH	Whangarei	Whangarei	28 May 63
Mr M. Reed FRIH	Auckland	Auckland	22 Oct 69
Mr D. Riach FRIH	Christchurch	Canterbury	6 Sep 54
Mr F. A. Robinson FRIH	Christchurch	Canterbury	18 Nov 52
Mr D. D. Rowe FRIH	Wellington	Wellington	26 Apr 83
Mrs M. E. Ryan FRIH	Wellington	Wellington	26 Mar 75
Mr J. S. Say AHRIH	Waihi Beach	Bay of Plenty	8 Mar 55
Mr E. A. Scarrow FRIH	Hamilton	Waikato	22 Nov 54
Mr R. S. Scott FRIH	Timaru	Canterbury	1 Feb 61
Mrs R. H. Shepherd AHRIH	Wellington	Wellington	7 Dec 57
Mrs M. Sinclair FRIH	Levin	Wellington	22 Sep 47
Mr P. J. Skellerup AHRIH	Christchurch	Canterbury	10 Sep 55
Mr A. E. J. Smith FRIH	Auckland	Auckland	13 Oct 47
Mrs M. Smyth FRIH	Wellington	Wellington	21 Jul 65
Mr T. A. Snowdon FRIH	New Plymouth	North Taranaki	5 Sep 55
Mr W. R. Sykes FRIH	Christchurch	Canterbury	16 Nov 61
Mr J. O. Taylor AHRIH	Christchurch	Canterbury	11 Feb 48
Mr G. Thiele FRIH	Canterbury	Canterbury	9 Mar 65
Mr E. E. Toleman AHRIH	Hamilton	Waikato	29 Mar 60
Mrs A. J. Upson FRIH	Kaponga	South Taranaki	30 Apr 87
Mrs K. J. Veal AHRIH	Auckland	Auckland	30 Jun 64
Miss J. N. Wallace FRIH	Palmerston North	Manawatu	9 May 60
Mr W. E. Watkins FRIH	Hamilton	Waikato	25 Apr 68
Mr D. I. West FRIH	Stratford	North Taranaki	22 Dec 58
Miss C. G. Williams FRIH	Dunedin	Otago	10 Feb 55
Mr A. R. Wilson	Hamilton	Waikato	22 Dec 47
Mrs M. Yarrow FRIH	Manaia	South Taranaki	6 May 49
Mr K. Young FRIH	Whangarei	Whangarei	28 Jul 71

THE NATIONAL PARK CENTENNIAL 1887-1987

Jolyon Manning

A member of the N.Z. National Parks Centennial Commission

The Centennial Year extends from 1 July 1987 to 30 June 1988 and an extensive calendar of events and projects has been planned to ensure that the interests and enjoyment of all who wish to participate in the year-long celebrations will be fully satisfied.

It has been my special privilege to have been chosen to join the New Zealand National Parks Centennial Commission in its planning of this historic occasion over the past 5 years. As the sole South Island member this follows a 7-year term on the NZ Tourism Council and a 9-year term on the NZ Forestry Council.

New Zealand is a unique country and our National Parks do much to preserve the special qualities of our heritage. Together with all other protected natural areas they account for no less than one-quarter of the entire land surface of New Zealand.

Man has greatly modified much of the Earth's surface. Scientists are now pointing to the serious depletion of equatorial jungle forests, the impact of acid rain in Northern Hemisphere forests and fresh water fisheries, and increasing desertification in many countries - notably in Africa. It is not surprising that steadily rising levels of CO₂ in the atmosphere and depletion of ozone in the upper atmosphere are giving rise to unprecedented international concern about our biosphere.

New Zealand's location in the Southwest Pacific (including its offshore management zone - the 4th largest in the world - and its sub-antarctic islands) makes this a significant part of Spaceship Earth. And apart from the Antarctic Continent this is probably the least modified region on the globe. An excellent post to conduct careful monitoring of the biosphere and elements relating to world-wide climate change. (And supplement the increasingly effective surveillance from space satellites with on the ground observations).

Our national parks provide collectively a sensitive indigenous fauna and flora resource that will reflect minor but important long-term impacts on the environment and provide a key to climate change. The southwestern part of New Zealand is fully ventilated to the regular onshore winds from the deep ocean air mass lying between Antarctica and Australia. Much of it has now been accorded World Heritage status.

Earlier this year the University of Canterbury in conjunction with the North Canterbury National Parks and Reserves Board conducted a wide-ranging week-long seminar on the topic, '100 years of National Parks in New Zealand'. It was generally agreed that the day set aside for considerations of research in national parks was inadequate for detailed enquiry and highlighted the need for a general review on the adequacy of monitoring programmes - both physical and social.

I have recently presented a proposal to interested parties including the Otago National Parks and Reserves Board, the University of Otago, the National Parks and Reserves Authority and others, calling for a seminar on this topic to be held in Duendin - possibly in May 1988 - just prior to the conclusion of the year of Centennial Celebrations.

Worldwide climate impacts in the next few decades are likely to be unprecedented in recorded historic times. It is therefore becoming vital that we more carefully monitor the biosphere - especially in those places least modified by Man and possessing a sensitive biota that will reflect small but significant changes to the global biosphere taking place in our generation.

These matters are of special interest to professional foresters and horticulturalists many of whom have been leaders in the “conservation ethic” for generations.

This is but one outcome of the attention now being accorded the role of our national parks in New Zealand at this time. New Zealand was the 4th country in the world to create a system of national parks. “The Gift” was bestowed upon the people of New Zealand by the paramount chief of the Ngati Tuwharetoa, Te Heuheu Tukino IV, in 1887, when his people gifted the sacred volcanic mountains in the centre of the North Island - the nucleus of today’s Tongariro National Park.

The National Parks Act says of these and subsequent dedications: -To set aside lands in perpetuity as national parks, for their intrinsic worth and for the benefit, use, and enjoyment of the public, areas of New Zealand that contain scenery of such distinctive quality, ecological systems, or natural features so beautiful, unique, or scientifically important that their preservation is in the national interest.

Members of the Commission have been reminded of the relevance of the indigenous Maori culture in shaping our vision for the future in a spirit of genuine partnership as envisaged by the Treaty of Waitangi nearly 150 years ago.

New Zealand, the unique remnant of the ancient continent Gondwanaland, was particularly susceptible to the invasive exotic animals, plants and fire. We are fortunate to have today such a relatively large unmodified natural resource of protected natural areas. Unquestionably the presence of the beautiful and intensely interesting national parks has been a major factor in the rapid increase in tourists - especially those coming from the far-away lands of Europe, North America and Japan.

Latest research indicates that 70 percent of all overseas visitors coming to the South Island include a National Park experience. A survey conducted for the Centennial Commission indicated that in the past two years only one-third of New Zealand residents reported a visit to one or more of our National Parks. It is hoped the Centennial Programme of events will widen interest in our unique heritage and encourage more people to make a contribution to this ongoing act of stewardship for the benefit of the world-wide community.

The Centennial Programme in the Otago-Southland Department of Conservation Region includes the opening of the Rob Roy Glacier access foot-bridge across the flood-prone Matukituki River in the Mount Aspiring National Park, and the exciting new Kepler Mountains walkway track in the Te Anau-Lake Manapouri district of Fiordland. Many other events are taking place - including the screening of the special National Film Unit production, “The Gift” and the television series produced by the Dunedin-based Natural History Unit of Television New Zealand, titled “Journeys in our National Parks” with Peter Hayden playing a leading role.

You should keep an eye open for the wide variety of special publications that will shortly be available from most book stores and National Park information centres. They include the prestigious and authoritative treatise on the National Parks by David Thom, Chairman of the National Parks Authority, and an equally important illustrative publication on New Zealand landforms by Les Molloy. The Treasury have produced an attractive range of special coins to mark the occasion and I commend them to you also.

Every region in New Zealand is staging special events - many of which will become prominent in the coming annual holiday period - and our Commission has every hope that a new awareness of the importance of our protected natural places will emerge that will change our perception of the unique challenge we share in the footsteps of Te Heuheu Tukino IV.

Above all, I hope all foresters and horticulturalists will taken an extra opportunity to enjoy a genuine “park experience” and seek a “magic moment’ or two in the bush and sea-side as you too contemplate this gift - our heritage.

LINCOLN COLLEGE — THE NEXT STEP?

Did you know that there are links between systems of horticultural education in New Zealand?; between your N.C.H., N.D.H. programme and the horticultural diplomas offered at Lincoln College?

Lincoln College has recently revised the diploma programme it offers and the horticultural diploma qualification now includes two years of academic study. Students will complete the final year of study in core subjects and electives to give a general introduction to horticulture. Their second year of study gives the opportunity to specialise in:

Horticultural management
Parks & Gardens Technology or
Field Technology

Students who wish to spend only one year at the College will be granted a Certificate in Horticulture when they have completed 1 year's study and the 15 months requisite practical work.

All diploma students must undertake at least 11 months full-time pre-entry practical work with an experienced horticulturist and complete the remaining months between the academic years to fulfill the 15 months practical work requirement for their course.

During the pre-entry practical work period students are required to complete the following Technical Correspondence Institute papers.

- 623.1 Horticultural Botany
- 644.1 Soil properties & processes
- 645.0 Horticultural Practices

plus assignments for the College (full details of this pre-entry study programme are provided in a Guide for each student at the beginning of the pre-entry period).

If you have completed the requisite T.C.I. papers and practical work you may be eligible to come to Lincoln and begin a horticultural diploma course of study.

Should you have completed your N.C.H. or N.D.H. you may be eligible to enter the second academic year of the horticultural diploma programme of study.

Students considering coming to Lincoln College in 1988 or future years should phone or write to:

Caroline Steans
Practical Work Tutor
Department of Horticulture & Landscape
Lincoln College
Canterbury

TE KAUWHATA

A Proposal for a Living Plant Museum

Ken Nobbs

Which is the most important fruit in the world? Apples, bananas, oranges - um - perhaps. More likely the grape, *Vitis vinifera* holds pride of place.

Te Kauwhata is famous for its grapes. The locally grown grapes stand for good flavour which something in the soil and subsoil of the district seems to bestow on the vines. Perhaps it is not inappropriate that the stained glass window in St Margaret's Anglican Church in Te Kauwhata illustrates Our Lord's claim

"I am the true Vine"

with all that implies.

In the year 1886, just over 100 years ago, a block of land between Lake Waikare and the Great South Road, state owned, the Government of the day through the Agricultural Branch of the Crown Lands Department planted several hectares with Wattle and Eucalyptus seeds. Early growth was slow. It was not until 1892 that the black wattle trees could be stripped of their bark for the tanning of leather. This continued till 1929. From this beginning was started the first horticultural Research Station in New Zealand. All sorts of vegetables and fruit were tested out and in 1896 the first grape vines were planted. Today much of the original block of land has been sold off as orchards and the Research Station run jointly by DSIR and MAF is devoted to research into the growing of a wide range of grape varieties and the making and testing of wines.

In the days before the motor car wine growers would come down by train from Auckland and annual field days were held, the first in 1902 when among those who made the journey was A. A. Corban of Henderson. Corban's wines now have a major interest in the largest winery in the Te Kauwhata district, Cooks Montana Wines. In those early days a man named Bragato was in charge at Te Kauwhata which at that time was known as Waerenga.

Now under the present Government's policy of user pays, the research establishments must reduce their costs. Several times in the past the Viticultural Research Station has been threatened with closure especially in the depression of the 1930 decade but there were no buyers. The answer has been to offer the old and picturesque winery building and the magnificent stand of towering trees nearby for development as a Tourist Complex on lease. A licenced restaurant with a fine view of vineyards and Lake Waikare, some chalets and areas for a caravan park are planned. A local trust sponsored by the Te Kauwhata Chamber of Commerce in which the Waikato County and Viticultural Centre would have an interest would develop an attractive and much needed feature where a small conference centre could be provided in the building complex, and wine making would continue.

There already exists a National collection of all known varieties of grape vines, and an interesting variety of figs. The district has every type of farming, even of goats and deer as well as sheep and cattle, not to mention the breeding and training of race horses for which the Waikato is now famous.

These could be a tourist attraction for both visitors from overseas and native New Zealanders. Orchards, vineyards and kiwi fruit growing are all an attraction.

We have a golden opportunity to create at Te Kauwhata a centre for a living museum of plants and trees with the emphasis on fruits. This could take the form of:

1. A planting of pre European plants and trees which provided for the Maori people sources of food, clothing, building, art and crafts. Perhaps a Maori food store house with appropriate Maori carving could be a centrepiece. This would provide a wide range of native trees and plants. Te Kauwhata means "an empty storehouse".
2. A memorial garden to the founders and pioneers of agriculture, horticulture and animal husbandry in New Zealand going right back to the father of agriculture in the person of Rev Samuel Marsden and the missionary pioneers. Roses and other plants, vegetatively propagated and still surviving in the Bay of Islands could be featured.
3. An assembling of plants and trees of useful and often good landscaping characteristics with edible fruits but not at present developed commercially. Nut trees should be featured.
4. A collection of fruits and ornamentals introduced or bred by the great New Zealand plantsman Hayward Regionald Wright. There is no national Memorial to this Burbank of New Zealand.
5. My own contribution could be in providing the best of the species of rose plants which have been tested over the years for extremely high levels of ascorbic acid (Vit C) in the bright, attractive and edible fruits as well as many other vitamins and minerals. The most important family of plants in the world supplying the greatest number of important fruits belong to the Rose family. Other herbs of importance could also be assembled and grown.
6. The Centre could provide facilities for skilled local craftsmen and women, perhaps potters and the Winery could have an art and craft shop.
7. Children must not be forgotten. They will love the trains that thunder through on the Main Trunk Railway but perhaps a model railway or at least covered in trolleys could take visitors round to see the sites of vineyards, etc. Donkey rides or pony rides are a possibility.

In 'Aparangi' Te Kauwhata has a feature which alone gives the town just cause to be proud. The retirement centre for a rural community the first and probably still the best in the country is a testimony to the unselfish dedication of the people of the district. It surrounds a newly painted Museum (thanks to the Lions Club) housed in the oldest residence.

Te Kauwhata, at least on Wayside road is a staging place for buses and travellers stopping for refreshment from both north and south off No 1 Highway. The new complex could provide a pleasant day's outing for overseas travellers who perhaps have only a day to spare. We underestimate the pleasure and delight people from the crowded cities of America, Europe, Japan or Asiatic countries find in the relaxing atmosphere of our green countryside. We take this for granted. Once Meremere is passed the overseas traveller can delight in the rolling pastures of Whangamarino with the sheep and cattle which we think are so matter of fact. An hour or two in Te Kauwhata tasting wines and fruits from their orchards and then driving through Waerenga to the Maramarua forest, on to the Thames Highway, a visit to Miranda Hot Springs and so back to Auckland via the Kaiuaa-Orere Point coast road, could be a pleasant experience indeed.

Again for overseas visitors planning to travel by road through the country in a dormobile or caravan the winery complex could provide a good place where they could pick up their vehicle being spared the trauma of driving from the airport on congested roads with the problems our unpredictable driving public can provide.

Te Kauwhata may be a small town but all the basic needs of the traveller are available with shops and garages, a good golf course and bowling green, squash courts, doctors' rooms and nursing service, an A & P show, churches, flower show at Waerenga etc etc.

Our tree planting, the 48 odd different rambler roses along the unsightly railway fence

could be further extended. Why not plant roses, honeysuckle and clematis along the boundary fences leading from the No 1 highway. Overseas visitors will love it. Our pioneer settlers often took time off to plant roses on the fence lines and they still remain to delight the eye each November and December. Now we have carefree, healthy rambler roses that will flower right through to early winter.

Trees must have grown for millions of years here in the lower Waikato. An old identity tells me that Kauri logs are buried in the swamps and underground are deep seams of coal stretching up to Maramarua and south to Huntly. There are logs of trees now extinct that the bulldozer can disturb. Trees must still be planted, perhaps a group of the old Black wattle. Would the trees of 100 years ago have been the first real tree crop planted in New Zealand? Let us have in particular some kauri trees.

There is no trout fishing at Te Kauwhata, no beaches and surf but it does have something unique, an eel factory, a delicacy for many European peoples who could well be surprised and delighted to have the local variety served up at the new restaurant. In a few days the duck shooters will be here for the opening of the duck shooting season and Lake Waikare will see a sudden increase in enthusiasts after their annual bag of birds. My sympathies are with the ducks I must confess but I guess provided the annual increase is more than a district can cope with there is a case for the annual shoot. I hate to think that the pheasants and quail I enjoy having on my acre will fall victims to these 'sportsmen' so called!

HELPING THE R.N.Z.I.H. TO PROMOTE HORTICULTURE THROUGH THE 21ST CENTURY

Most members will be aware that the Institute recently received a bequest from the estate of the late Mrs Dorothy D. Baker of New Plymouth. Miss Baker was not a member of the R.N.Z.I.H., but as a garden lover and a believer in the value of New Zealand's natural resources, she bequeathed approximately \$35,000 of her estate to this Institute.

This money, when all of it has been received, will be invested and the annual interest used to further the aims of the R.N.Z.I.H. One of the first uses to which the money will be put will be to pay for the new brochure advertising the Institute. This brochure has recently been distributed to all District Councils, and I am sure most members will agree that it will improve our public relations to a considerable extent.

A number of the Institute's areas of operation would benefit greatly if additional funds were available. The ongoing work of the Notable Trees Committee is continually hampered by lack of available funds to enable Tree Registration Officers to travel to and register our Notable Trees. Likewise a small but dedicated band of R.N.Z.I.H. members are endeavouring to compile an accurate and comprehensive picture of the garden history of New Zealand. Such exercises cannot be funded from the Institute's general funds, so at present much of the financial support is coming out of the pockets of the members of these Committees.

Have you thought of "Helping the R.N.Z.I.H. to promote horticulture through the 21st Century" by considering making a bequest or donation to the Institute? It would not take very many acts of generosity such as Miss Baker's to enable the Institute to project a much higher public profile in the preservation and protection of horticulture throughout New Zealand.

If you would care to discuss the possibility of making bequests to the Institute please feel free to contact (in confidence) either Alan Jolliffe as Chairman of the National Executive, or myself.

Dave Cameron
Executive Officer

NOTES FROM THE DISTRICT COUNCIL NEWSLETTERS

From The Auckland District Council Newsletter

Auckland Regional Botanic Gardens

Since the Institute's 1986 end of year function there have been a number of changes in the Gardens. Many visitors comment on the impression of maturity given by the trees and larger shrubs growing so well and it's with obvious interest and pride that they remark on the improvements in "our Gardens".

Most plants in the Gardens grow well in the heavy, sometimes poorly drained soil natural to the site, however many choice plants are more particular about their requirements. The Rock Garden has been developed on a slope facing the morning sun and sheltered from the prevailing westerly wind. Well-drained pockets have been developed by using rocks, and plants which struggled elsewhere thrive in these conditions. Some plants grew well for a year or two but as their roots grew into the clay subsoil and Auckland's humidity caught up with them they developed dieback or collapsed. Three years ago a small scree garden was developed at the northern end of the New Zealand Native Plant Collection, over-looking the Ground Cover Collection, to provide the soil drainage and open conditions demanded by some NZ plants. It is so successful that this year it has been extended. In nature the scree is formed from a mass of rock debris and stones with some soil and sand brought down by the glacier and left behind when the ice finally melts. It provides conditions for which some alpine plants are well adapted, snow cover protection in winter and in spring and early summer ample moisture from melting snows and a poor but very free-draining soil. These plants often form tight, hard cushions or rosettes and have long tap roots. The scree in the Gardens has been constructed by forming raised beds, using rocks for retaining and appearance, and covering with 100mm of more of fine, free-draining scoria.

Because many of the South African proteaceous plants also dieback and collapse when drainage is poor a scree-type bed has been formed this year in the Southern African Collection. The soil was covered with 150mm of rough scoria and topped with 150mm of fine free-draining scoria.

Last year a bed was established to the east of the Rose Garden for planting of "New Release Roses". The Auckland Rose Society provides funds for the purchase of cultivars which gain awards at the New Zealand International Rose Trial Ground in Palmerston North. This year five new cultivars were added and will be evaluated under Auckland conditions as possible additions to the Rose Garden. Last year's planting has grown well and includes some beautiful roses.

The major development projects this year have been the Kiosk and the Demonstration Home Garden. The kiosk alongside the Information Centre opened in February and is already proving very popular with Garden visitors. The Demonstration Home Garden is being developed around the Carrington Horticultural Classroom on the Eastern Drive. Provided and used by the Carrington Polytech it is the "house" in the demonstration garden. The design is the winning entrant (Boffa, Miskell & Partners) in a public competition held last year and construction and planting is in the final stages. The competition rules call for a garden which: creates an attractive environment for the home, provides an outdoor setting for entertaining, grows a range of ornamental plants, shares visually with neighbours. Talks on Home Garden Design held on Saturday and Sunday of the Gardens' Birthday Festival in February were well attended and the seven Sunday morning sessions

arranged as part of the implementation of the design were also well attended. Garden visitors are observed to be showing a keen interest in the Demonstration Home Garden.

The two plant evaluation panels meet six or seven times a year and have written twenty-two advisory leaflets. They are available from the Information Centre and include results of the plant trials and evaluations conducted at the Gardens together with practical advice on growing and selecting the species and cultivars best suited to Auckland. The NZ Native Plant Panel is chaired by Miss J. Dingley and the Shrub Panel by Mr G. Rainey.

A news item from Copenhagen says that in the Danish town of Hobro motorists who park illegally on the grass instead of being reprimanded are having a packet of flower seeds left on their windscreens. Accompanying letters explain how the town tries to preserve the verges and requests the law-breaking motorists to plant the seeds in their gardens 'so the flowers can open their eyes to the beauty of nature'. (Wonder how such a scheme would work here?)

From the Wellington District Council Newsletter

Revegetation of Mana Island

Mana Island is managed by the Department of Conservation, who are implementing a long term revegetation plan for the island. They encourage environmental groups to become involved in this project, and help with planting, weeding, and so on. On July 19th, six Institute members and friends spent a day on the island. It was a good chance to learn more about the project, and see what the Institute could do to help. We also planted several hundred manuka and encountered first hand some of the problems in implementing such a massive project.

As a result of this visit, the District Council has decided to take a long term interest in the project. However, for this to work, we need the names of people who are prepared to give up some of their spare time and money (we have to pay for the launch trip), to help. Chris Hannan is co-ordinating the District Council's involvement and is compiling a list of volunteers. He is especially interested in getting student members involved. If you're interested, give Chris a call on 288-181 (home).

From the North Taranaki District Council Newsletter

Cool Violets

A more cold-tolerant strain of one of Europe's most popular flower varieties has now been developed.

Most commercially available African violets are cultivars of *Saintpaulia ionantha* and require temperatures of 20 degrees celsius for optimum growth and flowering. Now the Plant Genetic Manipulation Group at the University of Nottingham, in the English midlands, has collaborated with Thomas Rochford and Sons Ltd to produce an African violet that prefers temperatures about 13 degrees celsius.

Hybridisation with *Saintpaulia shumensis*, which is native to higher altitudes where the temperature can fall below 7 degrees resulting in a hybrid that prefers cool conditions. Subsequent outcrossing to commercial varieties has resulted in plants with a range of flower colours and improved leaf characteristics that thrive and flower at lower temperatures.

1988 CONFERENCE and ANNUAL GENERAL MEETING

13th-16th May 1988
at Lincoln College
Canterbury

Theme:

“THE AIM IS THE SAME, A PROSPEROUS NEW ZEALAND”

Workshops:

- Garden History
- Notable Trees
- “Horticulture Education & Research, the Role of the Institute”

Tours:

- Visit the Garden City's Botanic Gardens
- Look at Lincoln College's Nursery and Horticultural Research area
- Visit and sample Mead at Canterbury's only Meadery

Banks Lecturer:

Mr S. (Charlie) Challenger AHRH

Decide NOW to come.

Full programme and registration forms will be sent out in February.
If you have not been to a conference yet; then this is the ONE.

WHAT IS HAPPENING TO HYDROPONICS?

Eion Scarrow

Hydroponics in New Zealand is now in its first decade of business and its now time to review the industry.

When this new growing method was first contemplated in this country, not much technical data was available, but being 'good keen kiwis' with a strong sense of ingenuity, several growers had a go.

The first efforts were encouraging, and the crops chosen were tomatoes, peppers, and lettuce. All technical data was gleaned from books written overseas, by people who tried hard to sell their ideas, but when these ideas were put to practical use in New Zealand, the biggest problem was an efficient nutrient fertiliser to feed the plants on. All the available nutrient formulae were tried, without much success, and other growers scoffed at their attempts.

Plants would grow for several weeks and then deficiencies would appear in leaves, resulting in abandoned units. The Tredgida Brothers of Auckland persevered, and have the most successful growing unit in New Zealand. They took their problem to an analytical chemist who formulated a special hydroponic fertiliser for their tomatoes.

The next problem was efficient controls and measuring instruments, this was easy, because the day of the 'micro-chip' was now with us, and experts in the field of technical 'know-how' soon built automatic controls, that filled this gap.

Then, as so often happens in New Zealand, the fly-by-nighters appeared on the scene, confusing the issue, and giving hydroponics a 'bad' name. Their special brews did not grow good plants, their cheap instruments worked for a few weeks and then broke down, a great deal of 'hard earned' money was invested with these fly-by-nighters' who soon disappeared from the scene. Now in New Zealand, we have a fledging industry being built on integrity and value for money.

Crops being grown successfully hydroponically include: Roses, Tomatoes, Beans, Celery, Lettuce, Melons, Cucumbers, Capsicums, Peppers, Statice, Gloriosa, Lilies, Radish, Ferns, Stephanotis, Gerberas, Babacos, Casanas, Gypsophilas, many Herbs, Narcissus, and a few Lilliums. Several Orchid growers have shown interest in setting up small commercial units, and one of the largest commercial Carnation growers is now assessing the viability of changing to hydroponics.

The future of hydroponics in this country is 'rosy' so long as would-be new growers adopt the attitude that hydroponics is not the 'be-all and end-all' of growing but a very useful tool to be used in conjunction with normal horticultural practices.

I sincerely hope that our Ministry of Agriculture and Fisheries change their 'head-in-the-sand' attitude, and get off their butts and help with some useful contribution instead of 'putting down' hydroponics.

Any person wishing for details about hydroponics can write direct to me:

C/- Hydroponic Growers Association of New Zealand,
5 Bankwood Road,
HAMILTON.

NUCLEAR IMPACTS STUDY

The New Zealand Planning Council has a Consultative Group making a study of the consequences to New Zealand of a large scale nuclear war in the Northern Hemisphere.

They are trying to develop an overview of what nuclear war would mean for New Zealand and to identify and recommend additional research on important uncertainties that remain.

Mr Ralph Ballinger, President of the R.N.Z.I.H. supplied the following information for the Consultative Group to consider.

Although we haven't the space to publish the scenarios given Mr Ballinger's reply will give food for thought.

New Zealand Nuclear Impacts Study

Review of Effects on Horticulture from Royal New Zealand Institute of Horticulture, per Mr R. J. Ballinger, President.

1. Immediate Crises in the Horticultural Industry

Areas for concern for immediate attention would include:

(a) *Produce Supply.* With no nuclear fall-out winter produce in the ground such as cabbage, Brussels sprouts, cauliflower, sprouting broccoli, leeks and lettuce would be safe for eating, but there would be some hysteria and the public would have to be reassured on this subject.

The fall in temperature of 3 degrees C. and cloudy conditions would have some effect on the time of maturity of vegetable crops leading to some shortages in the late spring and early summer. This result occurred this season with 3-4 weeks of cold southerly weather in November along the east coast areas. Summer crops like tropical crops and even tomatoes in the south would be affected in their ripening.

(b) *Export Crops.* There would be still large supplies of apples and kiwi fruit in store ready for export and with no trade in the northern hemisphere these would be surplus on the market. It would be pointless to produce next year's crop with the same area of fruit and immediate plans would have to be considered as to how much need be grown for the local and possibly other markets in the southern hemisphere or what alternative use the land could be put to. Other export markets affected would be flowers, onions, garlic and some other fresh vegetables and citrus.

(c) *Processed Cropping.* The processing of vegetable and fruit crops would become important as a method of storing food for our future needs or for trading with other countries which required them. Planning to decide which would be the best crops to grow to meet over-all needs would have to commence immediately to make the most of the coming season.

(d) *Glasshouse Production.* Production of vegetables under glass or plastic tunnel houses could become very important as they would be safer from any future fall-out and also could produce crops quicker to fill gaps caused by slow growth due to lower temperatures. Glasshouses used for flower production for export could be switched to food production.

(e) *Vegetable Seed Production.* Since most vegetable seed comes from the northern hemisphere this will be a major problem for the horticultural industry to ensure supplies. Seed supplies for the coming season should be in store but immediate plans would have to be made to grow as many lines as possible of those which will not be coming from the northern

hemisphere. This will be treated more fully in Section 3 under longer term problems.

(f) *Chemicals for Pest and Disease Control*. Immediate supplies of chemicals should be in stock but the longer term outlook is most serious and will be treated under Section 3. Planning for this should start immediately.

Section 2 - Priorities

An organisation to find out the food requirements of the country would have to be set up to assess where there are going to be short falls. Where ever possible these would have to be met in this country. We are fortunate that we live in a temperate climate and the people have the skills to produce most of the essential foods for survival. The production from home gardeners should not be under estimated.

Once short falls have been estimated these should be worked out on a national basis where crops could be grown and plans made with the various organisations involved. In England in World War II, War Agricultural Executive Committees were set up in each county to implement directions from a national body, in some cases ordering that certain crops should be grown. This should not be necessary here but planning to advise growers which crops will be in demand would be advisable.

Similar over all planning within various organisations to plan requirements will be necessary in the seed trade, chemical supplies, nursery propagation, processed food production, fertiliser supplies and also in all the individual grower production organisations.

In the first scenario where Australia has only three nuclear explosions. Joint operations on the supply of food, seed, fertilisers, plant propagation material, chemical supplies and plant and machinery production would have to be set up at an early stage.

Section 3 - Longer Term Problems.

The problems in the first six months are mainly involved with planning and are covered under Section 1.

The longer term problems are more serious and will continue for several years after climatic conditions have returned to normal.

(a) *Seed Supplies*. Most of our vegetable seed supplies come from the northern hemisphere and this source would be finished. Also a large proportion of this supply is hybrid seed and the parent material being lost, the cultivars used would not be able to be replaced. The first year's supply of seed should be in store and normally it is not advisable to make increases from hybrid seed, but it would be worth testing these to see how truly they breed. An immediate assessment would have to be made of all open and self pollinated cultivars that were available and increases of the most promising would have to be made for future use. This will probably mean going back to older cultivars that have been discarded in the past.

There is the expertise among growers in New Zealand to meet the demand for a greater vegetable seed production. Over the years the horticultural seed trade has become enthusiastic about making this country more self reliant in maintaining it's own seed supply, but has then dropped the policy when cheaper seed became available overseas. The use of hybrid seed produced by large overseas firms increased this trend to overseas buying. However the ability to grow seed is still here and even though this may be for open pollinated crops, a seed supply would be made available.

A similar situation existed in England in World War II when supplies of vegetable seed were cut off and a Seed Production Committee was set up under the National Institute of Agricultural Botany at Cambridge to assess requirements, advise growers how to produce seed crops and co-ordinate any seed supplies from the United States. I was a member of this committee from 1942 to 1946. It would be important to co-ordinate our supplies and requirements with Australia under Scenario I. Australia is more self supporting in it's veg-

etable seed supply than New Zealand and some seed is already being imported from there.

(b) *Chemicals for Pest and Disease Control.* Our main supplies of pesticides come from the northern hemisphere and even where they are made up here the basic material would likewise be imported. The cutting off of these supplies would have serious results on crop yields of fruit and vegetables, uncertainty in time of supply and a falling off in the quality of the produce. Lack of weedicides would also cause a drop in yields. There are organic growers who will say that the cutting off of chemicals would not be serious, and that other cultural methods would overcome this problem. This may be so but there would be a considerable upheaval and a falling off in yield could be partly overcome by making increased plantings of vegetables. With reduced export demand the supply of fruit would probably be sufficient.

(c) *Fertiliser Supply.* Much of the supply of complete NPK fertilisers comes from the northern hemisphere and this would be cut off. The supply of phosphate from Nauru Islands would also probably be stopped. Some alternative supplies of fertiliser could be found but there would be a serious disruption to supplies for some time and this would affect crop yields.

The urea plant would come into its own for the supply of nitrogenous fertiliser and also since there would be little export of mutton, much of this could be turned into blood and bone and dried blood which would be valuable for many horticultural crops.

(d) *Plant Propagation Material.* New material for plant propagation for nursery and fruit trees would be cut off but that already being used would probably suffice. With little export of fruit there would be little or no demand for new fruit trees. The nursery trade is efficient and could cope with maintaining present stocks of material. The maintenance of parks and reserves and gardens would be important to maintain public morale. The main flower stocks could be maintained by plant propagation or seed production where required.

(e) *Machinery.* Supplies of new horticultural machinery and equipment would be cut off but with maintenance of present plant and adaption of spares and old machinery the position could be held until alternative supplies are built up.

Section 4 - Alternative Systems

(a) *Food Production Council.* A national body to assess food requirements, taking into consideration the needs of a balanced diet and then setting targets for the various production sections to meet these demands.

(b) *Production Committees.* These would be on a provincial basis to meet targets in these areas for seed supply, vegetable production, fertiliser requirements etc. to meet the national demands. Advisory instruction would be part of their tasks.

(c) *Australia/New Zealand Co-ordinating Body.* For scenario 1 a co-ordinating body for these two countries and also giving a lead for other Pacific countries would be essential to plan requirements and supplies in horticulture. In scenario 2 New Zealand would have to go it alone.

(d) *Organic Production.* With the cutting off of the supply of chemicals for pest and disease control and the disruption in the supply of fertilisers, greater consideration will have to be given to the organic growing of crops. This method of growing, with the greater use of organic materials and less use of chemicals, is already being carried out to a limited degree but with the restrictions imposed on production, there could be a great boost to this type of growing.

(e) *Home Garden and Small Unit Production.* The potential for production from home gardens when people are put to a challenge as envisaged in this scenario is enormous. This was shown in the great use of garden allotments in Britain during the last war. There is a natural talent in most New Zealanders to produce excellent gardens and this is reflected in

surveys where gardening is one of the most popular recreations. Some guidance and advisory programmes to assist in planning the best crops to grow would be needed.

Another trend that has developed in many countries over recent years is that for a family to live off a small holding and be nearly completely self supporting. In a time of emergency as set out this trend could develop further and these people would grow all their own food.

Section 5- Time Scale.

It would take two or three years for these new systems to develop to a reasonably efficient scale. In the meantime there would be shortages of certain commodities but not to levels that would be disastrous. This would depend upon the level of law abidance maintained by society.

Section 6 - Key Industries or Services Involved.

Ministry of Agriculture and Fisheries, Department of Scientific and Industrial Research, Lincoln College, Massey University, N.Z. Nurserymen's Association, N.Z. Agricultural Merchants Association (Hort. Seedsmens Section), Pesticides Board, N.Z. Fertiliser Manufacturers Association, N.Z. Agricultural Engineering Institute, and Soil Association of New Zealand.

Section 7 - Action to be Taken to Minimise Post-War Disruptions.

At least one year's reserve of seed to be held by the horticultural seed trade. Mother seed of open pollinated seed to be held and if possible parent material of hybrid cultivars obtained.

(b) If possible reserves of chemicals for pest and disease control be held as well as basic material for future manufacturing.

(c) All organisations concerned prepare emergency programmes.

(d) More in depth research on the organic growth of crops.

Section 8 - Other Relevant Information.

Steps taken in Britain during World War II covering horticultural production.

LIVING FOSSIL TREE AT HOME IN THE BIG CITY

Peter Brown

(Taken from *Australian Horticulture*, September 1985)

Street trees of inner city areas are often hard to find. Even where suitable opportunities for tree planting exist in city streets, successful, healthy specimens may be a rarity. Many of the circumstances of heavily built-up, industrial cities act to create an environment quite unsuitable for the growth of many species.

Pollution of the atmosphere, compaction of the soil, shading from tall city buildings and restricted root zones — these are just some of the problems with which a city tree must contend. Add to this improper or infrequent maintenance (producing nutrient and water stress), damage by vandalism, accident and lopping, and it is little wonder that so few survive to a healthy maturity.

Many examples of old standards such as Elms, Peppercorns and Planes have succumbed to disease and decay brought on by years of bad planning and management, while attempts to avoid such problems by the use of native species, reputed to be tolerant of drought and poor soils, have often proved less than outstanding successes. There is, of course, a difference between tolerance to periods of drought and an ability to maintain growth with insufficient water (or nutrition).

Clearly, before we can expect to have any trees in an inner city area, we must have a suitable place for them to grow — powerline-free, space for expansion of the canopy and sufficient soil space (clear of asphalt and concrete which may restrict access of air and water) for adequate root growth. Given this, and proper care, the possible selection of species will then only be limited by the remaining, unavoidable stresses of the city environment.

One species which appears to be particularly suited to situations such as this comes from a remarkable source. The Maidenhair Tree (*Ginkgo biloba*) was originally known only from fossil evidence. It first appeared in the geological record during the Permian period some 250 million years ago. During the Triassic and Jurassic (the age of the Dinosaur), it became very widespread and a number of distinct species have been described from such 130 to 220 million year old rocks. Following this period, it was noted to rapidly decline and was presumed to have become extinct more than 65 million years ago.

Botanists were, therefore, surprised when specimens were found being cultivated by Buddhist monks in China. In fact, it is now thought that some may even still persist in the wild, reputedly among the mountain forests in South-Eastern China.

Ginkgo has a number of peculiar characteristics which have caused it to be used in cultivation around the world (with a few exceptions), as little more than a novelty specimen. The wood of the tree is similar to that of conifers, but the production of seed is closer to the more primitive noncone bearing cycads. Both cycads and Ginkgo are peculiar among seed bearing plants in producing free-swimming sperm cells. This latter feature is thought to be an adaptation to the very moist tropical environments in which cycads are found. Its value is uncertain in a tree of cool temperate zones. It is a perplexing riddle, still unresolved.

However, it is the leaves of the Maidenhair Tree which are among its more important horticultural features. Their shape, which gives the tree its common name, is unique among gymnosperms. The fact that they are also deciduous (turning bright yellow in autumn) further adds to the tree's novelty and charm. It is also the leaves which are thought to confer much of its tolerance to city air. Ginkgo is strangely insensitive to quite high levels of

atmospheric pollutants, such as oxides of sulphur and nitrogen. It is believed that peculiarities of the stomata and the anatomy of leaf veins are at least partly responsible for this.

The root system, too, is apparently also a little unusual. It has been suggested that it has a greater ability to penetrate compacted soil than many other tree species. How and why this may be so is something of a mystery, but it could be seen as yet another pre-adaptation of the tree to big-city life.

Despite this, the use of Ginkgo as a street tree for inner city areas is rather uncommon. Among the notable and successful examples are ghetto areas of Washington D.C., U.S.A. The trees in use there are about 60 to 70 years of age and were most probably propagated from seed, as many seed producing females are present. Thus, it is known locally as the 'Stink-Bomb' tree, as the seed coat is soft and, when broken, emits an odour reminiscent of rancid butter.

In spite of the unpleasant qualities of the coat, the seed itself is quite edible and nutritious, reputedly being rather tasty when roasted. Indeed, this seems to have been the reason for its cultivation in China. In fact, Ginkgo has been called 'the oldest cultivated nut tree on earth.' However, as it takes some 50 years to mature, it is easy to see why it is not a commercial proposition now.

The unpleasant nature of the seeds has often been attributed to the under-utilisation of this tree. Although it grows readily from cuttings, to reliably produce only male trees requires that these be taken from fully mature specimens, or those whose sex has been determined by chromosome examination (karyotyping). Ginkgos in Australia appear to be at least predominantly male, and so finding a suitable source of material here should not be difficult. Yet the reputation of the female persists, and the tree is avoided by landscapers 'like a bad smell'.

NEW PUBLICATION: TREE PLANTING AND MAINTENANCE

Drawing on the experience gained during the operation of the Beautiful New Zealand Scheme the Ministry of Works and Development has prepared a booklet, "Tree Planting and Maintenance", to assist interested people in the maintenance, establishment and extension of planting projects.

Copies of the booklet are available for purchase at a cost of \$4.00 each (including GST) plus 60c packaging and postage from:

The Publications Officer,
Town & Country Planning Directorate
Ministry of Works & Development
PO Box 12 041
Wellington North.

Government funding for the Beautiful New Zealand Scheme for mass planting of trees and shrubs to beautify roadways throughout the country ceased on 31 March 1987. But it is expected that the idea of enhancing the landscape by large scale planting will continue to flourish in years to come.

"Beautiful New Zealand" was initiated in late 1982. The idea of planting to transform the appearance of roads and tourist routes was a popular one from the outset. In less than five years of operation over a million trees and shrubs were planted at a cost of just over five million dollars for plants and materials. The major part of planting was done by workers funded through the Department of Labour job creation programmes.

A wide range of local bodies and community groups worked with Ministry of Works landscape architects on over 250 projects suited to their districts. As the plants mature the public will be able to appreciate the scale and success of the scheme.

The involvement and enthusiasm of local committees was a marked feature of the scheme and is believed to have contributed to the successful establishment and very low incidence of vandalism or theft of Beautiful New Zealand planting.

It is hoped that this interest will continue, not only in caring for the existing plants, which will become an increasingly visible asset, but also in further independently developed projects.

Many of the resources developed during the life of Beautiful New Zealand are still available to those who wish to carry on. In addition to the new booklet "Tree Planting and Maintenance", video programmes showing a number of projects, display material, and landscape design guidelines are available from Ministry of Works and Development.

EDITORIAL

This edition makes a new format for the Bulletin. Also, there will be three instead of four bulletins per year. However, contributions are still required to make this your section, so I again invite you to submit any articles of interest. Thanks to those who have already contributed as the articles have been most interesting and informative. This bulletin is quite a 'mixed bag' with a range of topics covered.

A 5°C frost on October 1st in this part of the country caused severe losses in some areas with stonefruit trees being particularly hard hit. Frequent rain showers over the spring period has ensured a good growing season. The advantage of irrigation to continue the supply of water to plants over the drier summer months is seen in continued growth and crop yields.

It is interesting to note how deciduous trees transform from winter dormancy into active growth. Bare branches become, within a matter of days, clothed in foliage which produces food for the trees. A relatively uncommon deciduous specimen tree which produces interesting flowers early in spring, is the dove or handkerchief tree *Davidia involucrata* (family Davidiaceae or Nyssaceae). A native of West China, seed was collected by the French missionary Pere Armand David in the mid-19th century who described its 'ghostly white flowers fluttering among the foliage like handkerchiefs'. Hence the generic name *Davidia*. The specific epithet *involucrata* refers to the flowers being surrounded by a bract. It is the bracts therefore which are conspicuous as 'white flowers' and the flower itself is quite small, less than 20mm wide. The two bracts, unequal in size, are 150-200mm long and when these sway in the wind they resemble dove wings hence the other common name.

It seems New Zealand could be on the brink of developing another export crop albeit not a new one, with France and Italy being to the fore in the production of the truffle fungus. This underground fungus, much prized in cooking because of its unique flavour, matures in winter and is best eaten fresh. New Zealand therefore could supply the lucrative European market off season at \$2,000 per kg — it is quite a delicacy! The underground fruiting bodies of truffles grow in a symbiotic relationship with tree roots of some species. Host trees include oaks *Quercus* spp. and hazels *Corylus* spp. and trials are being carried out whereby trees are inoculated with the fungus. Within 3-5 years the first fruiting bodies (truffles) are produced and then annually thereafter. For the fungus to grow, warm summers and cold winters are required and soils with a high pH such as limestone outcrops, are needed. It seems the perpetual mushroom has a competitor in the gourmet stakes!

Now the examinations are over, students have a chance to relax and soak up the summer sun. May I pass on the season's greetings to you all and look forward to hearing from you in the New Year.

Kind regards

Nick Owers
Editor

WITCHES-BROOMS

Greg Salton

I must have been one of thousands whose curiosity has got the better of them and stopped to observe this remarkable act of nature. The tree concerned is an elm, *Ulmus* sp, which I saw while employed with the Ballarat City Council, Victoria.

Being horticulturists, many of you must have encountered sometime in your career, what is known as a Witches-Broom. If you haven't, there is a superb example in Christchurch's North Hagley Park, adjacent to Harper Avenue. The tree concerned is a mature maritime pine, *Pinus pinaster*. Approximately half way up, you should see a tight green ball, which is about 2 metres across, and totally out of character with the rest of the tree. This is typical of a Witches-Broom.

As a rule, all Witches-Brooms have the same distinguishing characteristics. The most common form seen is when a mass of short, crowded shoots arises from one point on a



branch. Normally it is erect and easily distinguishable among larger branches. This type of abnormal growth is often found on birches, cherries (*Prunus* sp), blueberries (*Vaccinium* sp), willows and conifers; notably the Norway spruce, *Picea abies*.

Much to the surprise of some people, Witches-Brooms can be caused by a variety of conditions. The most common cause is by the invasion of a parasitic fungi. The particular genus concerned is usually *Taphrina* sp, and mainly affects broadleaf trees. The mycelium of this fungi lives on the inner bark, eventually causing the genetical structure of the plant's cell nuclei to alter locally in various ways resulting in a Witches-Broom. There can be incredible variation on a tree infected by the same fungi. Fortunately the presence of Witches-Broom poses no great problem as it does not affect the health of the tree. As they are often rather unsightly, they are best removed.

Not all Witches-Brooms are caused by fungi. Some trees develop the same condition after being infected by viruses. Mites are also responsible, in fact our Native Beech trees are attacked by a native mite *Aceria waltheri* causing these abnormal growths. Willows are also prone to Witches-Brooms after mite invasions. *Prunus* sp develop Witches-Brooms after being infected by the fungus *Taphrina cerasi*, whereas in birch, *Taphrina turgidus* is responsible. Silver fir can be infected by certain Rust fungi, notably *Melampsorella caryophyllacearum*.

In most cases the Witches-Brooms on conifers are results of 'Bud Sports' (or Mutations). These play an important role in horticulture, especially for the introduction of new cultivars to the industry. Witches-Brooms can be propagated in the same manner as any other cutting. Once they have developed their own root system they will retain their unique dwarf growth characteristics. Many of the dwarf conifers found in gardens throughout the world originated from Witches-Brooms propagated in this manner.

Hopefully many of you now have a better understanding of what a Witches-Broom is and how it is caused. If any of you are really keen and possess a very long ladder, then perhaps you could make use of the Witches-Broom in Hagley Park? I'm sure it has excellent potential as a new dwarf pine.

WIND VERSUS SUN

(Taken from M.A.F. AgriSearch, November 1986)

Fixed wind-breaks attached to the roof of a glasshouse may do more harm than good. In Swedish tests aimed at reducing wind speed along the roof of the house to curtail heat loss, two sealed houses were clad with 16mm polycarbonate. One was fitted with vertical wind-breaks on the roof.

The advantage gained from the windbreaks was counteracted by the shade they cast on sunny days, reducing solar transmission into the house by eight to 10 percent. The unscreened house was 0.5 degrees centigrade warmer at night after a sunny day.

There were other disadvantages with the wind-breaks. Installation costs were high, the structures put more mechanical stress on the glasshouse roof, and more snow accumulated when they were in position. Researchers believed the money spent on windbreaks would be better spent on further sealing and insulating.

ACID RAIN USEFUL

(Taken from M.A.F. AgriSearch, November 1986)

Production increase of up to 150 per cent from acid rain? This is the conclusion, reported in the New Scientist, of Soviet scientists of the Novosibirsk Research Institute of Geology, Geophysics and Mineral Raw Materials. They have been investigating the effects of thunderstorms on harvests. The research was initiated after "rural inhabitants" noticed that if thunder storms occurred in the spring or early summer, then they had a better harvest than if the storms did not occur.

The thunderstorm, in fact, has the same effect as giving the plant nitrogen fertilisers at the start of the growing season. What happens is this: Lightning creates chemically active nitrogen ions which dissolve in the rain water to produce a weak nitric acid. When the nitric acid enters the soil, it reacts with soil minerals to release nutrients such as phosphorous and potassium, and it also adds nitrogen.

In an experiment with tomatoes at Novosibirsk, one batch of plants was irrigated with water and a second with weak nitric acid. The water-only plants withered and died, while the others flourished.

SEED STORAGE

Clive Westbury

Manager, Webling & Stewart Ltd., Seedsman

Every so often someone publishes an article describing how wheatseed found in Egyptian tombs has been germinated and grown, thus producing “Mummy Wheat” from seed 5,000 years old. This theory has been disproved by scientific studies but some people still believe it. The story is untrue — It is bunk!

“How long will seeds last?” you ask. Experiments using seeds from soils, or from phials buried under foundation stones and even from old seed collections in museums have shown that very few seeds retain germination for more than about 100 years. One notable exception is the Indian Lotus seed found in peatland in China and which carbon-dating shows could be over 1,000 years old. Such age is exceptional for living seeds, and mostly seeds die within a few years of harvest under average storage conditions.

Seed reaches its highest peak of germination and vigour potential at full ripeness in the field. I say potential, as some seeds have a sneaky habit of ensuring that they do not germinate until conditions are right for the plant to grow and mature. Such seed, ripened in Autumn will need a period of cold weather or perhaps a wash of winter rain to remove inhibiting chemicals before the seed will germinate. These seeds are described as having “dormancy” and it is nature’s way of survival. Still, as a good rule, seeds are at their best at harvest time.

Seeds, like us, are living organisms and as such they decline and die by many means. If you hit a seed with a hammer and squash it, it will likely die: also if you cook it in an oven it will probably not germinate when you take it out and sow it. They also die of old age but unlike us they can be held in a sort of “animated suspension” for very long periods if properly stored.

Seed Deterioration

Here are five main causes which in general terms cause seed to decline and die after reaching peak vigour in the field before harvest.

- (1) Genetic — Seeds of some species lose germination faster than others under similar storage conditions (Onion and Parsnips are good examples).
- (2) Mechanical Injury — Poor seed-harvesting and cleaning techniques can cause damage (the heavy hammer principle).
- (3) Pests and Disease Damage — Rats, mice, weevils and fungus can destroy seeds.
- (4) Seed moisture content.
- (5) Seed storage temperatures.

Of these, seed moisture and storage temperatures are very important, as separately each has a very great effect on seedlife while together their effect is vastly increased. If we can make seed last, say four times as long with drying to exacting levels, then use low temperatures which add another four times of life the result is not eight but sixteen times longer life expectancy for our seeds.

Remember the opposite is also true, and adding heat (or moisture) drastically shortens seed life.

Temperature and Moisture

Seed moisture content and its effect on seed-life is quite a complicated subject as the best storage levels for moisture are different for many species. Also, seeds are damaged by removing too much moisture. Generally the established, traditional seedsman is able to con-

dition and then seal seeds into moisture-proof packs in such a way that depending on original germination and vigour, seed-life is greatly lengthened if storage temperatures are low. Seeds correctly conditioned and sealed should never be subjected to heat such as strong sunshine or be stored in a warm room or shed, or in a hot-water cupboard. If you buy your seed packets on a hot Summer's day, don't leave them on the back ledge of your closed car. The temperature generated under such conditions could reduce the seed-life from years to minutes!

Such sealed seeds may be kept in a refrigerator or even deep-freeze but when needed should be removed and held at room temperature for 24 hours before the pack is opened. The reason for this is simply that cold seed will attract moisture when opened (as your cold beer glass does on a warm, humid day) and moisture, remember, is enemy No 4.

Usually, keeping seeds dry and in a cool room is quite acceptable to hold them for a year or so and still retain acceptable germination. Properly conditioned seeds in foil or tin seals can keep for many years if kept cool.

I am often asked if conditioned seeds deteriorate rapidly when the containers or packets are opened. The short answer is no. It is accepted as a rule that correctly conditioned and stored seed will remain in animation for a long time, and when exposed to air, normal aging begins. If you don't use all your seeds at one time you can re-seal the pack (tin lid for cans or cello tape for foil packets) as long as this is done within, say, 15 minutes of opening. Some moisture will have entered with outside air, but this is not too important, but it is always best to use such seed as soon as possible.

Germination Problems

Why do you have germination problems with seeds? If you consider that after testing, conditioning and sealing, seed is distributed all over New Zealand by all sorts of means, including hot rail waggons and trucks, plus being stored in shops before re-sale under sometimes appalling conditions and then displayed, in some instances that I have seen, in full Summer sunlight, then bought by the prospective gardener and thrown in the back of a heated car, it is quite amazing that some people actually do get some seeds that grow!

I have just received results from germination tests taken on six lots of the same two-year-old Onion seed, conditioned and properly sealed, and stored under different conditions in Pukekohe. Results range from 87% (about the original test) for reasonable, cool storage to nil for seed stored in a hot-water cupboard.

Seriously, in the many years that I have been involved with seeds — admittedly on the larger, commercial side — I have seen very few real problems with germination that were baffling. Usually there is a simple explanation for failure traced to one or another of the causes I have listed. Seedsmen, to keep their own reputation, pack seeds of acceptable germination standards, but as living organisms seeds can die through bad storage and handling methods that all of us are guilty of at some time or another.

THE CONEFLOWER

Rudbeckia Laciniata

by N. W. Owers

Among some of the more spectacular herbaceous perennial plants flowering from summer into late autumn is the coneflower or golden glow, *Rudbeckia laciniata*, of the Compositae family. This species makes quite astonishing growth in one season — from ground level in early spring to a flowering height of 2.2 metres!!

The genus *Rudbeckia* is named after O. Rudbeck, a Swedish botanist, and consists of 25 species of coarse annuals, biennials or perennial herbs. The genus is closely related to *Dracopsis*, *Echinacea* and *Ratibida* (synonym *Lepachys*) by virtue of possessing a drooping circle of broad petals around the central cone of stamens and stigmas. In fact, the purple cone flower, *Echinacea purpurea*, used to be classified as *Rudbeckia purpurea* but now all perennial rudbeckias are of some shade of yellow.

Rudbeckia laciniata with vernacular or common name coneflower, in reference to the cone shaped centre, is a native of Eastern North America and was first introduced into cultivation in England and Europe in 1640. It makes an ideal background plant in the herbaceous border because of the height it attains. It can also be used in the mixed shrub/perennial border.

The plant has the following characteristics:-

Foliage: The leaves, borne on wiry, upstanding stems, are ovate and deeply laciniate (lobed) in shape, mid green in colour and are nearly glabrous.

Flowers: The inflorescence are 75mm-100mm across and typical of the Compositae family, it is a group of small flowers arranged to give the appearance of a single flower.

Disc florets: These are the fertile flowers containing stamens and stigmas. They are greenish yellow and turn dark brown. Collectively these florets form the head which is shaped as a cone.

Ray florets: These are the sterile but showy flowers being bright yellow and 35-50mm long. Normally eight of these florets surround the cone and droop when fully developed.

Honey bees *Apis mellifera*, work these flowers abundantly being attracted to the brightly coloured yellow florets.

Seeds produced are 4-angled achenes.

Cultivation

Cultivation of the species is typical of the genus as a whole, being very hardy and thriving in any soil or location although they prefer full sun and well cultivated, free draining soil. Liberal incorporation of organic matter including manure every 2-3 years when lifting and dividing will result in better blooms as the plants are gross feeders.

Irrigation during dry weather over the growing season is essential to keep the plants in good vigour.

Staking and tying of the plants in summer is necessary when grown in exposed conditions.

Lifting and dividing of the plants every 2-3 years will ensure the plants retain their vigour and produce better flowers.

Pests and Diseases

These plants are relatively free of pest and disease attack with slugs, *Arion hortensis*, and snails, *Helix aspera*, being the main pests by devouring the foliage and the ray florets.

Propagation

Propagation of *Rudbeckia laciniata* is by division of the clumps during the dormant season or by seed which is collected upon ripening after flowering.

SOME NOTES ON "ILAM"

Its History and Development compiled by S. W. Gower

Taken from Canterbury Horticultural Society Inc pamphlet

The story of "Ilam" is a fascinating one which goes back to the days when Christchurch was in its infancy and the early settlers made their homes along the banks of the Avon River with the larger estates out from the town centre. Such was "Ilam". Here the Hon. F. C. Watts-Russell, a prominent citizen of early Canterbury and a member of the first Legislative Council of New Zealand, built the first "Ilam" home.

The Name "Ilam" comes from "Ilam Hall" which was the name of the home of the father of Mr Watts-Russell in Staffordshire, England. This new home consisted of two frame houses joined together to give six rooms. Soon gardens were established and at the first Show organised by the Canterbury Horticultural Society in 1852, mention was made in the records of some of the produce from the "Ilam" gardens. At subsequent shows the name of Watts-Russell appears not infrequently.

Lady Barker in her "Station Life in New Zealand" writes in April 1866 of "Ilam" at the time. She says that many professional people of the time preferred to build their homes two or three miles out of a town where drainage was something of a problem. She makes mention of the unhealthiness of Christchurch for young children during the autumn season. It was to "Ilam" she went after the birth of her first child and there she thoroughly enjoyed the hospitality extended to her. Of the home she writes - "It is the most charming place I have yet seen - The house is of wood, two storeys high and came out from England. It is built on a brick foundation which is quite unusual here. Inside, it is exactly like a most charming English house and when I first stood in the drawing-room it was difficult to believe that I was at the other end of the world".

At some length she describes the lawns surrounding the house, the plantation of trees, the stream with its luxuriant growth of water-cress, the ti-ti palms (cabbage trees) and the clumps of flax dotted here and there. "The garden is very pretty and laid out in the English fashion but in spite of the lawn with its croquet hoops and sticks and the beds of flowers in all their late summer beauty, there is an absence of stiffness".

The property was later owned by Hon. W. Robinson who resided there for a number of years after which it was purchased by Mr Leonard Harper from whom it passed to Mr Patrick Campbell. After this gentleman left for England it was occupied by the Countess de Fresnedo during whose occupancy the house was destroyed by fire on 22nd August, 1910.

Although the first occupier had made the home well known for its displays of flowers, trees, shrubs and vegetables it was left to a later owner, Mr Edgar Stead, to earn for it a world wide reputation in horticulture.

By this time many of the trees and shrubs were attaining some maturity but it was Mr Stead who developed the surroundings in something of the style we know today.

It is interesting to record that the house when rebuilt had somewhat the same appearance as that of the original home.

Mr Stead was not only a plantsman, but also an ornithologist of some note. His efforts to locate our native bird, the huia, were commended in Parliament (December 1912) on his return from an expedition into most difficult country in the Ruahines.

However, it is his work with rhododendrons and azaleas for which he is most remembered.

Writing in an article for the Rhododendron Year Book in 1949, Stead states that prior to 1915 there were very few varieties of these plants in New Zealand. He tells of how he first crossed the flowers of two plants derived from seed brought to this country by Sir Cracroft-Wilson about 1860.

While on a visit to Britain in 1925 Stead was given a wonderful collection of rhododendrons by Mr Lioel de Rothschild, Gerald Loder, Lady Loder and several others. Of the 520 plants, he safely landed over 490 in his "Ilam" garden and then began a programme of breeding when thousands of seedlings were raised. On a later visit to England he made further crosses of the best varieties and the seed, when ripe, was sent to him at "Ilam". These produced large trusses of brightly coloured flowers of good size.

This carefully planned programme of breeding resulted in the raising of many "Ilam Hybrids" which achieved world recognition. It is interesting to note that Mr Stead was a pioneer in the use of *Pinus radiata* sawdust as a mulch for his plants.

After Mr Stead's death in 1949 "Ilam" with its 55 acres, was sold to the Government for 33,000 pounds as a site for a growing University. One of the conditions of sale was that the garden be maintained as a whole and thus ended thirty-six years of personal supervision by Mr Stead.

The Canterbury Horticultural Society acknowledges the co-operation of the University in allowing a continuance of "Open Days" when members of the public may enjoy the beauty of this historic spot.

DYGALL INOCULANT

For the Biological Control of Crown Gall

Taken from Mintech (N.Z.) Ltd pamphlet

Crown Gall

Crown gall is a bacterial disease of woody plants. It is caused by the bacterium *Agrobacterium tumefaciens* which produces hard woody galls on plant roots and stems, disrupting the plant's food and water supply. Infected young trees become stunted and grow poorly; infection on older trees often serves as an entry point for secondary wood rots.

The Need for Control

Crown gall is a world wide problem. It was discovered in New Zealand in 1900 and was the first bacterial disease of fruit trees found in the country.

It has since been recorded on pipfruit, stonefruit, berryfruit, vinefruit, ornamentals including roses, chrysanthemums and several other perennial plants.

No resistant varieties are naturally available or have been bred for any susceptible crop.

The bacterium *Agrobacterium tumefaciens* is a microscopic organism which can multiply by division. It lives in soil, in galls and on the surface of infected plants both above and below ground. It enters susceptible plants through fresh wounds made in preparing plants and cuttings at planting time.

The incidence and severity of the disease is greatest when crown gall has already been present, or where galls or infected plants are left in the ground. Once galls appear on a plant there is no practical method of eradicating the disease. Removal of galls from infected plants only stimulates new galls to form.

Traditional Control Methods

Soil treatment with steam or methyl bromide/chloropicrin mixture can be effective but only if all the crown gall bacteria are destroyed. A small residue of these pathogenic organisms can multiply rapidly and reinfest the treated soil, so expensive soil treatment does not always provide the degree of control required.

Dygall - The Biological Answer

Dygall is a pure culture of non pathogenic *Agrobacterium radiobacter*. *Agrobacterium radiobacter* is closely related to the crown gall organism but does not form galls.

Healthy cuttings and seedlings immersed in a suspension of Dygall prior to planting are given lifelong protection from the damaging action of *Agrobacterium tumefaciens*.

Dygall is the safe, natural and effective means of preventing crown gall.

Proven Performance

Many reports from satisfied end users including Government Departments, Research Institutions and Universities bear testimony to this simple and inexpensive means of preventing a troublesome disease.

Our Quality is Controlled

Dygall is produced from cultures supplied by the Plant Diseases Division of the Department of Scientific and Industrial Research. The Dygall production process was pioneered and developed in New Zealand, and is now recognised as the mark of quality for inoculants containing *Agrobacterium radiobacter*.

THE HANDSOME, SUN-LOVING, YUCCAS

Hugh Redgrove

on behalf of the N.Z. Nurserymen's Association

There are numerous species of yucca, few if any man made hybrids. They are native of Central America, Mexico, and the southern part of the United States. They are members of the lily order, and our native flaxes belong to this same order.

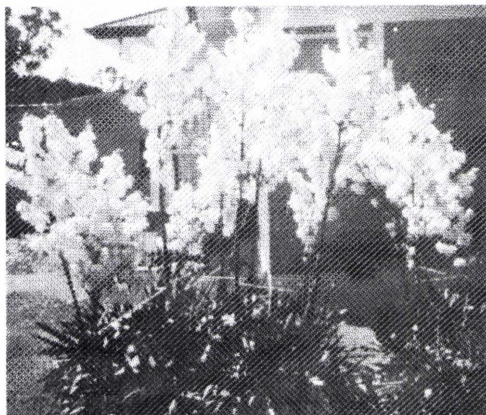
Once or two of these yuccas develop trunks and the well-known *Yucca gloriosa* is one of these. It has stiff dark glaucous green spikey leaves up to 60cm long but it does need to be placed with care because they have sharp spines on their extremities. The flowers are spectacular conical spikes of crowded creamy white flowers and they are produced in late summer and autumn. there is a handsome variegated form of this yucca with the leaves margined and striped with creamy yellow - a fine looking specimen even when not in flower.

These plants are all sun lovers and will not flower feely in shaded areas. They like a well drained situation but are not fussy about the soil, and they are not in the least affected by drought.

The following species and forms do not have trunks and the foliage forms a clump on the ground, nor do they have any spines - *Y. filamentosa* and *Y. flaccida*. The former has erect leaves which turn downwards towards the ends. In both cases there are filaments on the edges of the leaves, but on *filamentosa* they are curled and on *flaccida* they are much straighter. The creamy white spikes of flowers may be anything from 1m to 2m tall.

There is an attractive variegated form of *Y. filamentosa* which has white and green leaves in a lovely rosette. When well established after a year or two a stout flower spike will grow up to 1.25m but it is unlikely to flower every year.

Yucca flaccida also has good variegated forms. From Britain there is quite a good one with yellow stripes on the leaves, and this has been grown in New Zealand for some years.



Yucca filamentosa at New Year



Yucca gloriosa in Autumn

But more recently another variegated plant has occurred at Pukekohe and has been named 'Garlands Gold'. This has much more yellow on the leaves and is a very striking plant which could easily be mistaken for the N.Z. flax called 'Yellow Wave'. From time to time it will have typical creamy white spikes. 'Garlands Gold' has been available around Auckland.

Y. whipplei is from California and is another stemless species making a clump of narrow spineless leaves. The spikes are tall and may reach 3m bearing large greenish white flowers which are tinged with purple. The plants are reasonably frost hardy but do prefer fairly warm conditions and good drainage.

Another California species is *Y. elephantipes* and is somewhat tree-like in its growth reminding us of a Cabbage Tree with its stout stems. The leaves are about 9cm wide and a metre long, and deep green in colour. Fortunately they do not have sharp spines. There is a good specimen in the grounds of Auckland University. Overseas it is sometimes used as an indoor plant for it is tolerant of poor light conditions. It is also tolerant of dry conditions when grown in a large tub. When established outdoors in a sunny position the plant will carry metre long spikes of creamy white flowers on 1.25m stems.

NATURAL FUNGUS CONTROLS SILVER LEAF

A new method of controlling silver leaf disease in stone and pipfruit trees based on the naturally occurring and totally harmless fungus *Trichoderma viride* is now available in New Zealand.

The Christchurch based biotechnology company, Bioscience Corporation Ltd, has extended the development of the new treatment as well as a new system of applying it on a small piece of white pine — dubbed a 'Trichodowel'.

The Trichodowel is impregnated with nutrients on which the fungal organism grows, and is simply inserted into a hole drilled in the tree and sealed with petroleum jelly.

It then begins to produce fungal mycelium which produces an antagonistic effect on the silver leaf fungus. It also releases toxins which discourage or inhibit the growth of other fungi.

Managing director, Dr John Hunt says the toxins are very toxic to other fungi, but not to humans and animals.

"It is also an organism which produces antibiotic-like materials and we believe it also has a lot of potential in this area."

Trichodowels are the most effective means available for treating silver leaf, and field trial research undertaken by the corporation has shown that they are up to 70% effective in eliminating or controlling the disease.

Dr Hunt says research in New Zealand and overseas suggests the Trichodowels can also act as a vaccine to protect healthy horticultural plants against the silver leaf disease.

Contact: Bioscience Corporation Ltd, PO Box 18, Lincoln, Canterbury, phone Christchurch (03) 252-026.

ORANGES . . . WITHOUT A TREE

Orange juice always comes from oranges . . . or does it°

Californian researchers have just discovered a technique of growing the juice sacs of citrus fruits in laboratory dishes, reports the New Scientist.

Plant geneticist, Brent Tisserat, of the US Department of Agriculture's Fruit and Vegetable Laboratory in Pasadena, has also succeeded in growing the fruit without the tree.

The method requires taking pieces of fruit and its skin from the tree and growing fruit tissue on a special medium with correctly balanced nutrients and hormones. Mr Tisserat says, the younger the tissue is when experiments start, the more chance you have of manipulating its growth patterns. Now we can select individual juice vesicles and get them to grow in culture.

The cultured sacs are grown in special cabinets where light, warmth and humidity are controlled by a computer. The tiny segments sprout from the surfaces of the fruit and multiply.

Cultures of citrus usually die off after a few weeks or months as their growth medium becomes polluted with waste material from the plant cells.

Grapefruit and lemons have also been cultivated using this technique.

TOTARA

Podocarpus totara

Norman Clifton

Classical Maori wood carving fell into two broad categories. Firstly, it was associated with a host of small items many of which, alas, disappeared with the coming of the pakeha. These included domestic utensils, agricultural tools, weapons, batons of authority, ornaments, musical instruments, games and treasure-boxes. These were the work of individual carvers using a range of indigenous woods — hardwoods as well as softwoods.

The second broad category comprised the great team efforts — the war canoes and the meeting houses — on which several carvers worked at the same time. Magnificent examples of these still exist one hundred years or more after their completion. Their durability owes something to the wood from which they were carved. This was, almost exclusively, totara (*Podocarpus totara*).

So highly prized was the totara that a chief would sometimes reserve an individual tree for a young son by placing a tapu on it. This would ensure that it was still there when the boy grew up. Trees suitable for large war canoes were especially prized — so much so that possession of them sometimes aroused fierce inter-tribal jealousies and even conflict.

What was it about totara which made it so valuable? In the first place, it was a tree of splendid form. Early reports refer to “. . . massive symmetrical trunks from 60 feet to 80 feet long without a branch . . .”. Ocean-going canoes of impressive size could be hewn from such boles. In the second place, the wood was easy to split — a characteristic which was quickly recognised by pioneer farmer-fencers later on. Of course the latter were interested in totara mainly because of its durability — a property which was well known to generations of Maori wood carvers. A fourth attraction sprang from its evenness of texture and its comparative softness. It was easy to carve with stone tools.

It was probably yet another factor, though, which led to the high development of wood carving in Maori culture. That was the ready availability of totara. Unlike kauri, totara was obtainable anywhere in the North island; and it grew in lowland forests as well as in the high country further inland. Even so, suitable timber was obtained only after much hard work and only after Tane, god of the forest, had been placated by appropriate rituals.

In the hundred years following Cook's first visit many changes occurred in the material culture of the Maori people. Many of the superbly carved small items referred to above were replaced by metal objects. A slab of totara destined to be transformed into an ancestral panel for a meeting house or the stern post of a war canoe was squared up by means of a pit-saw rather than an adze.

The biggest change of all, however, involved the carving tools themselves. Polished stone chisels were replaced by improvised tools made from whatever iron was available. Eventually forged steel adzes and chisels were introduced. Surface decoration, which was once soft and comparatively shallow, became deeper and generally more pronounced. There was less emphasis on sculptural form.

The reason for all these changes of course was the settlement of New Zealand by Europeans. In the North Island in particular, the lowland forests were cleared for agriculture. The land was stocked with sheep and later, cattle. Dairy farming developed in Taranaki and in the Waikato. The more intensive the farming became, the greater the need for fencing. More specifically, the greater the need for fence posts and battens. In the North Island the most obvious material to use, since it was everywhere at hand, was wood: and the most obvi-

ous wood to use since it grew on the flats as well as on the hills, was easy to split, comparatively light to handle, and very durable, was totara.

Although totara must have been a godsend to those pioneer farmers and their descendants, it was not obtained without a prodigious amount of hard work. There are many stories of men splitting posts in the bottom of steep-sided gullies and packing them out by hand, several at a time. The trick was to find a tree which had been lying on the ground for some time. The sapwood would have all rotted away, but the heartwood — except perhaps for a hole up the centre — would be as sound as a bell: and it would have dried out, thus making it lighter to carry.

It is of interest to note that in the early days it was believed that kauri was just as durable as totara. We now know that this is not so. Totara is one of the few indigenous New Zealand woods which is officially classified as very durable. This means that it will last more than twentyfive years in the ground: kauri is rated moderately durable, its average life being eleven to fifteen years in the ground.

While totara has it over kauri as far as durability is concerned, the positions are reversed when it comes to mechanical properties. Totara is not very strong as a beam, being inclined to break when subjected to sudden stress. As a building timber, then, it was used for its durability and its strength as a column. It was keenly sought after for house piles and it was used in early harbour works because it was found to have some resistance to marine borer attack.

Because of its evenness of texture, its evenness of working, its dimensional stability and, again, its durability, totara was also used extensively for window sashes and exterior joinery, including doors. A small problem was encountered here. The same extractives in the heartwood which make it so durable also make it difficult to paint. Normal priming-coats do not dry fast enough. A special paint — known as totara primer — was developed to overcome this problem.

Another point of technical interest is that when totara is kiln dried as distinct from air dried, the above-mentioned extractives are driven out so that the wood is no longer durable. It happens, however, that kiln drying of this species in sash and joinery thicknesses is very slow and uneven anyway, so it cannot be recommended on either score.

These difficulties aside, totara has probably been, next to kauri, the most important indigenous timber in New Zealand. It is still the most eagerly sought after wood for Maori carving. Old house piles and strainer posts — so long as they are not too full of staple holes — are highly marketable commodities.

Long may this be so.

Norman Clifton

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