

# Horticulture

in New Zealand

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



**34**

**Summer 1984 – 85**



# HORTICULTURE

## IN NEW ZEALAND

ISSN 0110 - 1153

BULLETIN OF THE ROYAL N.Z. INSTITUTE OF HORTICULTURE

NUMBER 34, SUMMER, 1984/85

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Cover photo: *Phoenix canariensis*

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

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

Views expressed are not necessarily those of RNZIH.

Registered at Post Office Headquarters, Wellington as a magazine.

# EDITORIAL

In Canterbury, 1985 has started with some great summer weather which I hope continues long into the Autumn.

However, this means that crops are being harvested early and everything appears to be happening in a rush. It is ironic in some respects that for most people the summer is a time to relax and take holidays except when you are a farmer or horticulturalist. This time of the year there seems to be so many things that can be done in the garden or on a property.

Along with all the hard work you have done over the Christmas, New Year period, I hope you had a happy time and 1985 is shaping up to be one of your best years yet.

The Institute I know will be doing its bit. The local District Councils I feel sure have worked out some interesting talks and visits so please give them your full support. Never underestimate the value of a talk or visit if you wish to learn, also you do not know what you may be missing out on, so please participate.

So now you ask yourself what is in, this, the first issue of 1985. Read on.

Best wishes for 1985.

David Shillito,  
Editor.

## NURSERYMEN BACK BEAUTIFUL N.Z.

The Beautiful New Zealand scheme has come in for further praise from the New Zealand Nurserymen's Association.

The Nurserymen's Association president, Mr Jack Moates, said recently that the Beautiful New Zealand scheme was a tremendous opportunity for the association, the government, and local bodies.

The government had asked nurserymen around the country for significant orders for the scheme, creating economic stability in the industry that had kept many people in jobs.

"Since the downturn in new house building, the market for trees and shrubs has declined. The Beautiful New Zealand scheme is a tremendous boost for production nurseries," he said.

In all the major areas, nurserymen were involved in local plantings for the scheme, and at least four nurseries were working closely with the Ministry of Works landscape officers. "By co-operation and discussion they have managed to get very large orders."

The scheme should be a permanent part of New Zealand's development with at least 50 years work available in the planting of natives and exotics along every major New Zealand highway, he said.

Mr Moates did have some criticism of government nurseries and the "unnecessary entry by government into an area that belongs to commerce."

"The New Zealand industry was highly regarded internationally and the Ministry of Works should not be producing plants against the nursery industry," he said.

Last month, the Minister of Works and Development, Mr Colman, confirmed that the scheme to plant trees and shrubs along the country's main highways will continue under the new government.

Funding had been running at \$1.57 million over the last two years and would be maintained at least at that level in the future.

In the first full year of operation of the scheme (1983-4) 200,000 man-days of employment were generated under the Labour Department's job creation schemes.

# MEET THE INSTITUTE'S SECRETARIAT

1984 was a difficult year for the Institute's office staff. Ashley Foubister retired in the middle of the year and was replaced by Neville Neeson who previously had been Examinations Officer. Unfortunately Neville was obliged to retire at short notice because of illness.

Ashley Foubister returned on a temporary basis until the new Secretary Dave Cameron arrived in mid October.

Dave intends to include an article covering various aspects of the Institute's operations in each Bulletin from now on.



*From left Aileen Taylor (Typist), Dave Cameron (Secretary)  
Enid Reeves (Examinations Officer)*

# FROM THE SECRETARY

Since I joined the Institute in October last year I have been impressed with how friendly 'people in horticulture' have been in welcoming me to the Institute. I hope that Enid, Aileen and I can be equally as friendly in our dealings with you, the members and life blood of the Institute.

My working background is in University administration, where at the University of Waikato in Hamilton I have been involved in student administration, the running of examinations and secretarial work for fifteen years. I hope I can call on some of this experience to help the Institute to run smoothly and efficiently for general members and student members alike. At any time I would welcome feed back from members as to how we might improve our service, what new developments we could consider and how we can build up our membership.

Although I have not had any connection with the Institute of Horticulture before taking up this appointment, it may be of interest to some members to know that the photograph on the front of the Winter 1984 Bulletin (No. 32) included my grandfather, T.C. Brash (Front left) who was, at the time of the first A.G.M. of the R.N.Z.I.H., the President of the New Zealand Fruitgrowers Federation.

On the personal side, I am 41 years of age, married with 2 children (a son aged 13 and daughter aged 11). My wife is a lecturer in Sociology at Canterbury University.

It is my intention to publish in the Summer Bulletin each year a calendar of critical dates so that members can be kept informed as to the deadlines for remits to the A.G.M., Examination Entry dates, scheduled meetings of the National Executive and Examining Board and other critical information. As we have been a bit rushed in the office over the past few weeks the 1985 Calendar has not been compiled in detail. However the following dates should be noted in diaries for 1985:

17 May	National Executive Meeting	New Plymouth
18-19 May	A.G.M. and Delegates Conference	New Plymouth
31 May	Deadline for student registrations	
31 July	Closing date for Examination Entries	
15 August	Late applications for Examination Entries accepted till this date.	

30 September Subscription notices for the  
1986 calander year sent out.

25 December Christmas again (its not far away is it!)

A final thought regarding the Annual Journal. The National Executive was concerned at the low number of orders for the 1984 Journal. Perhaps this was because the Journal was not included as an 'optional extra' on the 1984/85 subscription form as in previous years. There is still time to place your order for the 1984 Journal which is one of the most comprehensive issues to date. Fill in the order form at the back of this Bulletin TODAY to ensure that you do not miss out on all the valuable articles and information in the Institutes major annual publication.

Dave Cameron  
National Secretary.

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Nothing is impossible to the man who hasn't got to do it himself.

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## INTERESTING EXOTICS

by

A.G. Jolliffe

*Crinodendrom hookerianum* - Lantern Tree

Also know as *C. lanceolata*, *Tricuspidaria hookerianum* and *T. lanceolata*, this shrub is a native of Chile. It prefers a cooler, moist location but will grow well in a variety of situations.

Its red pendulous flowers, which are formed in autumn on long stalks, develop in early spring to open later. When open, flowers are urn shaped but with only a small opening as the petals are joined together.

A talking point in most gardens, this evergreen shrub will never fail to please at any time. It will take kindly to pruning and cuttings taken in summer and autumn root freely.

# STURDY TECHNICAL BASE IS A MAIN STRENGTH IN N.Z. HORTICULTURE

by

*Dr M.A. Nichols, Senior Lecturer*

*in Horticulture, Massey University*

*(Taken from 'The N.Z. Fruit & Produce Journal, September/October, 1984)*

In April Dr M.A. Nichols, senior lecturer in horticulture, Massey University, attended a conference on peas at the University of Nottingham in England. On the way there he visited Western Australia, South Africa and Zimbabwe, countries which are either actual or potential competitors with New Zealand horticultural exports.

Dr Nichols gives his views on horticultural education and horticultural production in the three countries.

Western Australia has become very rich during the past decade because of its minerals. No doubt minerals will continue to play a major role in the state's development in the future. But the potential for horticulture is very real, not because of its horticultural technology which, in my view, is not very well developed, but because of the climate and proximity to the markets of South-east Asia and the Middle East.

Three factors may restrict this horticultural potential. First is the lack of trained people. In this respect New Zealand is ahead in that the horticultural degree and diploma programmes have been taught at Massey University and Lincoln College for 40 years and, in the past decade, polytechnics and community colleges have developed a range of sub-diploma day release and block courses.

In Western Australia there is a very real shortage of professional horticulturists, and only now is consideration being given to establish a horticultural degree programme at one of the tertiary institutions.

The second factor is a lack of water, or rather its uneven distribution.

The third factor is poor marketing. This is particularly apparent in the Australian pip fruit scene, where trees are being pulled out, while in New Zealand plantings continue to be made.

Not all of Western Australia's horticulture is restricted to the Perth area, which has a Mediterranean climate (winter rain, summer drought). Large areas of vegetables are grown further south at Manjimup, which has a slightly better rainfall pattern, while further north at Carnarvon and Geraldton out-of-season fruit and vegetables can be produced. Possibly the Ord Irrigation area offers the best potential for winter production, but this area has yet to be exploited horticulturally.

Carrots and cauliflowers are the two main vegetables exports. These crops are grown on the sandy soils which abound near Perth. Because sandy soils have such a low moisture-holding capacity, and temperatures can get as high as 40°C, it is necessary to use a solid set (permanently sited) sprinkler irrigation system which may irrigate two or three times a day.



Carrots in Western Australia - note the type

The carrots produced for export are of the long pointed types, so need a deep sandy soil for successful production. This is apparently the preferred type in Singapore.

Cauliflowers are a difficult crop to produce in warm conditions. Curd formation may not occur when temperatures average not 25°C, and even at lower temperatures curd quality may not be good. The solid set irrigation helps to lower temperatures in the warmest weather.

We can learn from the packaging of cauliflowers in Western Australia. Virtually all the leaves are removed and the curds are marketed in cardboard cartons. This means that two-thirds of the weight is left in the field, and not trimmed off and discarded by the housewife before cooking. The saving in freight could well be worth considering, apart from the improvement in appearance of the product. The present system of "packing" cauliflowers for market in New Zealand can best be described as stone age.

South Africa is a large country, which also depends predominantly on its minerals (gold and diamonds) for wealth. Nevertheless, until this year it has been self-sufficient in food. The "Southern Oscillation" weather pattern which affected our weather in 1982-83 has caused a severe drought in all of Southern Africa, and large quantities of maize are being imported.

This has had little effect on horticulture, however, as the major deciduous fruit growing areas are near the Cape - a winter rainfall area - which stores water for irrigation use over the summer months. Even in the summer rain-fall areas of Transvaal and Natal, most horticulturists do not rely entirely upon rain, but supplement it with irrigation.

For my visit I based myself in four towns - Pretoria (near Johannesburg), Stellenbosch (near Capetown), Pietermaritzberg (near Durban) and George, a small town which is the centre of a vegetable processing industry some 300km east of Capetown. Pretoria, Stellenbosch and Pietermaritzberg are where the universities which teach horticulture are based.

Near Pretoria I visited the government research station at Roodeplaats. I was particularly impressed with the breeding programme being done to develop varieties of outdoor dessert grapes for the summer rainfall areas. The varieties being tested here might well be more appropriate for outdoor dessert grape production in New Zealand than the varieties developed for dry summers in California or elsewhere.



Outdoor dessert grapes - Pretoria, South Africa.

Johannesburg is South Africa's largest urban area and has an extremely efficient flower market as well as a large vegetable and fruit market.

The flower market is run on the Dutch auction system with two clocks running simultaneously. The clocks are linked to a computer and the buyers are also linked into the same computer so that sales are rapidly carried out and are virtually automatically documented, both for the buyer, the auction, and the seller.

Most of the flowers sold are grown locally. Any exporting is done by the buyers who also act as wholesalers (middlemen) for many of the local florists.

Possibly the greatest difference with the New Zealand scene is that, below a predetermined minimum price, the flowers are dumped and destroyed - at growers' expense.

The fruit and vegetable market in Johannesburg is substantially similar to the Sydney market. It has excellent transport facilities by both rail and road into spacious buildings. In my view, however, the quality of the produce generally left much to be desired. No doubt this is because of the wide range of incomes and the need to supply both the top of the market and the lower end of the market. All sales are by private treaty, and this can lead to produce not being cleared from the floor daily.

Near Johannesburg I visited one of the vegetable properties of the giant sugar company, Tongaat. The asparagus operation, of some 500ha, is aimed predominantly at the fresh European market for white asparagus. This is supported by a canning plant, where all the second-grade asparagus is processed.

A major factor in this operation is the low labour cost. The labour for the harvesting and the canning is brought in from the nearly 'independent' Black homeland of Bophuthatswana. Pay is approximately \$NZ3 a day plus housing and food - a huge differential from the \$4 to \$5 an hour paid in New Zealand.

These low labour costs mean that the additional costs of harvesting white asparagus can be covered, and there is virtually a captive market in Europe for the out-of-season asparagus.

I would not see this as being competitive with New Zealand because, firstly, the cost of producing white asparagus in New Zealand is likely to be excessive and, secondly, the air freight costs from South Africa to Europe are so low compared with those from New Zealand.

Cape Province is the main deciduous fruit growing area in South Africa. The quality of the fruit produced is outstanding and, once ripe, it can be shipped rapidly out of Capetown to Europe.

The Cape area is an ideal climate in which to grow quality fruit. The winter rainfall recharges the soil with moisture and refills the dams from which the crops will be irrigated during the summer months. The dry warm summers produce a high quality fruit. The Cape is particularly noted for its apples, grapes (both dessert and wine) and stonefruit.

I would rank the producers I visited as some of the most advanced technically in the world. I was based at the University of Stellenbosch (renowned in New Zealand as the home of a certain Dr D. Craven) but visited a dessert grape producer, plum grower and an apple producer near Paarl.

In all cases the emphasis was on increasing yield per hectare and developing techniques for obtaining heavier earlier yields as efficiently as possible.

It would be fair to say that labour costs are considerably lower than those in New Zealand, but there is an appreciation that this is only an interim stage and that, in time, labour will become more costly as the gap between the wages for white and colour or Black workers gets smaller.

This is the reason why there is a move toward more intensive production of dessert grapes and Japanese plums using the Tatura Trellis System.

Virtually all the fruit I saw in the Cape was irrigated by microsprinklers as opposed to trickle irrigation. The objective clearly being to develop a larger volume of wet soil.

An important part of the production system for fruit exports is to remove the field heat immediately after picking, using coolstores on the property, before the fruit is moved down to Capetown to the docks where there are more coolstores. All this when Europe is only seven days by sea. Such is the emphasis on quality, although no doubt the daytime temperatures of 30°C have an effect on this decision.

Nobody visiting the Cape should miss sampling some of South Africa's wines, and a visit to the Kirstenbosch Botanical Garden on the side of Table Mountain is a must, if only to get an appreciation of how much the world of horticulture is dependent upon South Africa for ornamental plants, as well as for commercial cut flowers such as proteas.

George, on the south-east coast, is a small resort town which produces vegetables for processing. Peas are an important crop, but do not yield well (1.9t/ha) probably because they are sown in the autumn and winter and harvested in the spring.

A major frozen product is cabbage, which is very popular with the Black mine workers near Johannesburg. Apparently if correctly blanched and frozen it produces a very good product.

Although labour is relatively cheap by New Zealand standards it is used pretty efficiently.

Pietermaritzberg is where the Faculty of Agriculture of the university of Natal is based. My host, Professor Peter Allan, had visited New Zealand in 1983 and has considerable interest in kiwifruit.

It would appear kiwifruit are not as easy to grow in South Africa as in New Zealand. In the warmer areas there is insufficient winter chill for good flower bud development while, in the areas where winter chill is adequate, there are real problems with summer hail storms.

So much so that I heard of one grower who had a 40ha block covered in hail netting - a very expensive operation.

I was interested to note throughout South Africa a small but dynamic greenhouse vegetable industry. A very real surprise in view of the ease with which warm season vegetables can be produced in the low veldt during the winter months, and the excellence of the South African transport system. The importance of freshness and quality is as important here as there, and maybe the threat of CER is not as serious as it appears.

And so to Zimbabwe, which I visited at the invitation of the university which plans to introduce horticulture into its agriculture degree programme.



Artichokes in Zimbabwe, a foliage crop for Europe

Zimbabwe before independence probably had the best agricultural research and extension service in all of Africa but, with only two-thirds of the white population remaining, the situation is not very good in the short term.

The potential for horticulture is excellent and I visited one flower grower who exports 1.5 tonnes of flowers a week to Amsterdam. But this is the exception.

In this respect Zimbabwe has a major advantage over South Africa because South African Airlines have to fly round the outside of Africa to Europe whereas Zimbabwe, apart from being closer, can also fly directly over Africa.

Kiwifruit is a crop being developed, particularly in the Eastern Hills, near Inyanga, in a climate which produces good pip fruit. However lack of trained people will be a problem.

I believe New Zealand is in a strong position to compete with all the countries I visited because, although they all have significant natural advantages, proximity to market and excellent climates for horticulture, we have a very strong technological base.

The universities are the key to this base in that they train the future research workers, extension officers, marketers, polytechnic teachers and managers.

In New Zealand the polytechnics and community colleges provide the second echelon of trained manpower for the industry, and thus the opportunity exists because of a skilled workforce, to use technology which is out of the question in the less horticulturally developed countries which are our competitors.

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## INTERESTING EXOTICS

by

A.G. Jolliffe

*Pabiana imbricata*

This plant is very often mistaken for an erica because of its heath-like appearance. Actually belonging to the potato (Solanaceae) family, it has developed heath-like characteristics due to its habitat conditions in Chile.

Growing to about one metre high, the lateral shoots are clothed with evergreen leaves. In spring all the branches are covered with many 20mm long white tubular flowers almost obscuring the foliage.

It is suitable for any sunny position, with a preference for a lighted soil. Given reasonable care it will not disappoint any gardener. Cuttings will root if taken in summer and autumn.

# THE PLANT IS LEUCADENDRON

by

J. P. Salinger

For many years the New Zealand nursery industry has had a reputation for the correct naming of plants and the spelling of plant names. It is all the more regrettable that the name of a significant garden and cut flower genus, Leucadendron, is being misspelt. Increasingly, it is written and published incorrectly as Leucodendron, as in "Flower News" and now as an NZNA Release, published in "Commercial Horticulture", August 1984, and other publications. The spelling with the "O" developed as a result of two misunderstandings. Firstly that the name should be spelt in the same way as other plants that start with "Lueco" such as Leucospermum; secondly some modern U.S. books like "Hortus Third" and "New York Botanic Gardens Encyclopaedia" spelt the name incorrectly with an "O". The name Leucodendron is not only incorrect, it is not valid. Leucodendrum which is the latin form of the greek Leucodendron was published as a name for Protea and subsequently was disallowed and declared "invalid" by botanists.

The name Leucadendron is a conserved name, number 2037 in the "International Code of Botanical Nomenclature 1983". Modern New Zealand books are all very accurate in their plant naming, especially "Palmer's Manual of trees, shrubs and climbers", Matthews "Illustrated Garden Dictionary" and R.D. Harrison's books. Let's consult our own sources first, where we have considerable expertise, rather than refer to overseas "experts". So please don't change those labels which state Leucadendron, and do correct any plant lists, overseas books etc, which misspell this genus. Leucadendron 'Safari Sunset' is an important export flower. Let's name it correctly and keep our reputation for honesty and accuracy.

If anyone is in further doubt I suggest they contact Botany Division, D.S.I.R., for clarification. I am grateful to Dr E. Edgar for confirming the details on this matter.

# THE TWO ENDEMIC PALMS OF CHILE

by

Daniel Bruhin,

(Switzerland)

The two endemic palms of Chile in its country of origin, England, Central Europe and New Zealand. Chile, the long narrow South American Country, is the home of two species of endemic palms.

The Chonta (*Juania australis*) and the Kankan (*Jubaea chilensis*).

*Juania australis* grows on the Archipelago Juan Fernandez, 670 km west of mainland Chile, at approximate latitude 33.5°S and longitude 79° from Robinson Crusoe Island.

The climate is pleasant, oceanic temperate, it can be warm and humidity can be high. Rainfall amounts to 1000 mm or more all year round. Snow has been observed on the highest mountain (1600 m) on the island Alejandro Selkirk. The medium annual temperature is around 15.8°C. The palm grows only on Robinson Crusoe Island, between 190-900m. It has been threatened until recently by man or introduced animals, but steps are being made to protect it.

Juan Fernandez Islands are recognised world-wide for their very endemic flora. 146 species of plants grow on the Archipelago of which 101 are endemic (70%). Some plants have relatives in very distant places such as Hawaii, New Zealand, Magallanes (South Chile), Antarctica and the mountains of the Andes.

In Britain, a young example of this palm is growing at the famous Tresco Gardens in the Scilly Islands. The palm needs wider interest under similar climates, though seeds seem to be quite rare on the seed market.

The palm can grow to 15 m in height and have a section of trunk up to 30 cm. On Juan Fernandez, the warmest month is March and the average maximum temperature is 22.9°C while the coldest month is August with an average minimum temperature of 9.5°C. The coldest temperature experienced by this palm in the south of France, without harm was minus 2°C to minus 3°C. But this is probably the fatal limit.

The second palm species is confined to continental Chile. It was named Kankan by the former inhabitants of Chile. Its botanical name is *Jubaea chilensis*, (ex. *J. spectabilis*). It used to grow in abundance until the beginning of the 19th century from the South of the River Limari (IV region, 30.5°S latitude) to near Curico (VII region, 35°S latitude), from sea level to 1300m.

Today a few remain in isolated valleys with larger numbers in Ocoa (40 km from Valparaiso) in the National Park "La Campana" (32.6°S) as well as at Cocalan (34°S). Therefore, after the New Zealand endemic palm *Rhopalostylis sapida*, *Jubaea chilensis* and *J. australis* are some of the most southerly palms in the world.

The palms of Ocoa have so far been protected in the National Park. However a section of the park was donated at the death of a former owner, and through a clause in his will, his heirs have the right, at any time, to regain possession of the area. They may then do what they wish with the land.

The Palms at Cocalan are also under threat. Cocalan used to be a National Park but was sold back to private enterprise. Ocoa and Cocalan are the only remaining groves of the palms in Chile.

*Jubaea chilensis* is one of the largest Palm-trees in the world. It can reach a height of 25 - 30m and a trunk section of up to 150cm or more. It can reach the great age of 400 - 600 years and many such specimens are present at Ocoa. The leaves are pinnate and the fruits are spheres with a diameter of around 20 - 25 mm. Inside it looks like a real coconut and the taste is like it too, hence their name 'coquitos' in Chile. Nevertheless they are very hard to open.



*Jubaea chilensis* at Isola Madre/Laggo Maggiore (Italy), April, 1984.

The palms are exploited for the small coconuts which does not harm them, but something else is done. The extraction of sap which is warmed up to change it into a kind of 'honey' (200 - 400 litres per palm) is also taken from the palm. Needless to say, that this treatment, which lasts about 6 months means certain death for the palm, as it is cut down. This has caused the disappearance of many of these palms in Chile.

The climate at the National Park of 'La Campana' is mediterranean, with an oceanic influence because it is close to the sea. Coastal clouds are frequent. At the Campana, rain amounts to 400 - 600 mm per year. The highest mountains around La Campana (2200 m) are covered by snow in winter. The medium temperature of the warmest month is 19°C while the medium temperature of the coldest month is 9°C.

*J. chilensis* is very resistant to fire. It flowers at 60 years old for the first time. The 'coquitos' are used for confectionery and pastry. Leaves were used for handcraft basket or brooms. Fibres of the trunk gave paper and board. Outside its natural dispersion in Chile, the palms can grow as far south as the Province of Valdivia (region 10, 40°S). Even in the late 19th century, this palm was very rare.

In Great Britain *Jubaea* is represented by 3 large specimen, but if any reader knows of any more big *Jubaea* growing outdoors in Great Britain I would be glad to know of them.



Tresco Abbey Garden/Scilly Island/England (July 1983)  
(fringed by the beautiful N.Z. Rata *Metrosideros robusta*)

One is the large palm at the temperate house at Kew which is supposed to be the largest plant in any glass-house world-wide. It is 17.7 m high and has a girth of 340 cm at the base (1981). It was planted in 1846, and fruits well.

The second was planted in 1914 in the famous Tresco Botanical Gardens on the Scilly Islands, outdoors of course. Its height is 10.5 m and its girth is 301 cm at the base, (1984)..

The largest but not highest is the only palm of *Jubaea* on the British mainland outdoors, I think. It grows in a private garden in Torquay. Its height is 9.5 m, and its girth 367 cm at the base. Some books describe three such palms in this garden but the 2 others present are most probably *Butia capitata* which makes this garden an exception. The *Jubaea* here was probably planted just a few years before the start of 20th Century.

In Southern Switzerland and Northern Italy, in the regions of the Lakes Maggiore, Lugano and Como, the *Jubaea* seems to be at home. It thrives especially around Lake Maggiore, around Locarno, Ascona and Brissago Island for Switzerland and around Pallanza-Intra and Isola Madre for the Italian side of the lake. In this region alone there are at least 10 palms which I have seen, but there might be 15 or even 20 palms, all of great sizes. Some big specimens have been reported too on Lake Como, near Menaggio, at Cadenabbia and also in the 1950's 2 palms near Lugano on Lake Lugano, but these two palms, or at least one has probably disappeared now.

The climate around Lake Maggiore is quite different to the climate where *Jubaea* grows in Chile. High rainfall up to 1900 - 2100 mm per year seems normal here, 10 days of snow cover is the average in a year. The region enjoys 2350 hours of sunshine a year. The lowest recent temperature recorded (at Brissago Island) was minus 6.9°C (1963) but earlier this century, it was down to minus 9°C. The altitude of Lake Maggiore is around 200 m, and most palms grow on the border of the lake. There is high light intensity and fog is rare. The average temperature for the coldest month (January) is 3.9°C while in summer, the warmest month (July) it is 21°C. The annual mean temperature is 11.6°C.

Most palms in Switzerland have a height of 11 - 12 m, girth at the base vary from 348 to 364 cm.

The largest palm of the region, and probably of Europe is the one on Isola Madre. It is 17.5 m high and has a girth of 402 cm at the base. After good summers, it bears up to 3000 small coconuts which are all able to germinate. It is over 120 years old.

Apart from *Jubaea* 6 other palm species grow outdoors in the south of Switzerland (Ticino) but trials are being done with other species.

*Jubaea* also grows on the Riviera of France and Italy and probably in Spain and Portugal. It is seen too in California, New Zealand, Soviet Union (Crimea) and probably many other places with similar climates.

#### Complement For New Zealand

While I was in New Zealand (1981), my interest in plants started. Nevertheless, from what I remember, I think *Jubaea* is not planted enough. But I hope this will be changed, since this palm is a valuable 'tree-crop species'. I remember the two palms growing together on Kawau Island, and I have heard of a specimen growing in Tauranga. Other sites of this palm in New Zealand would be welcomed by the author.

Anyone wishing to contact Daniel Bruhin with regard to his query can do so by writing to him at the following address:-

Mr Daniel Bruhin,  
Chenaletta 21,  
1807 Blonay,  
Switzerland.



Temperate House, Kew Gardens, London, July 1983.

#### References and Further Reading: (all in Spanish)

- Chile y sus parques nacionales y otras Areas Naturales
- by INCAFO, Madrid, Spain.
- Flora Arborea de Chile of R. Rodriguez, O. Matthei and M. Quezada, Universidad Concepcion - Chile.
- Revista "Naturaleza", number 2 XII/1982. Santiago-Chile.

# THE ROLE OF THE ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE IN HORTICULTURAL EDUCATION IN NEW ZEALAND

*by*

*Ronald C. Close and J.O. Taylor,*

*1 December, 1984*

The Royal New Zealand Institute of Horticulture (RNZIH) was founded in 1922 and granted a royal charter in 1939. Its objects are to promote and encourage horticulture in New Zealand. It does this through action at a national level, and through affiliated District Councils which promote horticulture in their region. Membership consists of a wide cross-section of people including students.

The Institute has been particularly active in horticultural education since the National Diploma system was inaugurated in 1929 by examinations. There were 44 registered students at that time. The examining role of the Institute in horticulture and beekeeping was consolidated and defined in the RNZIH, Act 1953 and the amendment of 1957. The qualifications for which the Institute is the statutory examining authority are as follows:

National Diploma in Horticulture (NDH)

in

- Schedule 1 Amenity Horticulture
- Schedule 2 Fruit
- Schedule 3 Vegetable
- Schedule 4 Nursery Management

Horticultural Sales Certificate (HSC)

National Diploma in Apiculture (NDA)

Certificate in Horticultural Practice (CHP)

In general the requirements for these qualifications are contained in several RNZIH examination Approvals Notices which have been gazetted.

The total number of students in the Institute's examination systems in 1200. The total number and the increase in numbers over the period 1976 to mid-1984 can be gained from Table 1.

TABLE 1

Royal New Zealand Institute of Horticulture, number of registered students during the period from 1976 to 1984 (data included from 5 of the years).

	<u>REGISTRATIONS</u>				
	1976	1978	1980	1982	1984
National Diploma in Horticulture:					
Schedule 1 - Amenity	200	266	385	522	560
Schedule 2 - Fruit	17	39	71	118	147
Schedule 3 - Vegetable	15	27	21	51	40
Schedule 4 - Nursery	102	134	178	233	267
TOTAL	334	466	655	924	1014
Horticultural Sales Certificate	10	20	28	54	63
National Diploma in Apiculture	7	8	22	17	9
Certificate in Horticultural Practice				76	114
TOTAL	351	494	705	1071	1200

This gives the overall structure, but it is necessary to provide some information on essential aspects of the Institutes qualifications.

First, the Institute prepares the syllabus and subject prescription for each of its qualifications, based on information and advice from the particular horticulture sectors involved. Examinations are conducted annually and an important objective is to ensure that standards are maintained on a national basis. The qualifications are revised from time to time to ensure that they continue to meet the needs of horticulture.

It is important to realise that the Institute is NOT involved in teaching students. Thus the Institute is independent and separate from the teaching organisations, and so all the Institute examinations can be regarded as external assessments.

Tuition of students is provided mainly by the New Zealand Technical Correspondence Institute, centrally located in Wellington and it forwards assignments to students living in various parts of New Zealand. This system has been the basis for the tuition requirements. Some of this tuition is now being provided by Community Colleges, or Technical Institutes, which have been established in the last few years in several parts of New Zealand. However, the Correspondence Institute will still have an important role as many of our students are in localities away from the new Tertiary Colleges. Correspondence tuition is not easy for students and a number of students do withdraw from the system after one or two years of study.

The second important aspect is that all students registered with the Institute must be employed full-time in practical horticulture, that is, they must be working on a property which is considered suitable and appropriate for the schedule in which they are studying.

The third aspect is that within each qualification there is at least one oral and practical test conducted at several examination venues within New Zealand. These tests are virtually on the job tests in which a work situation is established and many aspects of their daily work are examined. For example:-

- identification of plants
- identification of pests and diseases, and their control,
- use of pesticides,
- methods of propagation,
- establishment of flower beds,
- pruning techniques,
- planting, staking and tying,
- glasshouse hygiene, ventilation and heating principles,
- pricking out and potting on.

The oral and practicals are designed to determine that they really know what they are talking about, how to do a job and that their knowledge is not just based on theory.

The number of students to be examined in 1984 by means of oral and practicals is as follows:-

## Oral and Practical Examinations, 1984

National Diploma of Horticulture	
Amenity Horticulture	84 students
Fruit	24 students
Vegetable	6 students
Nursery	20 students
Horticultural Sales Certificate	
	9 students
Certificate in Horticultural Practice	
Pip and Stone Fruit	31 students
Citrus and Sub-tropical Fruit	75 students
Viticulture	4 students
Vegetable Production	4 students

The fourth aspect is that written papers are prepared each year, moderated, and then printed for candidates. In 1984 there are over 50 written examination papers to be prepared, and the examinations will be held at 35 centres throughout New Zealand. These are held in November at the same time as our School Certificate exams are held so that supervision can be provided for both sets of students. The papers are then marked and results notified to students. Cross-credits can be obtained from other qualifications - especially those issued by Universities.

Each of the qualifications now is described:-

### **NATIONAL DIPLOMA IN HORTICULTURE**

The National Diploma system, as described in the 1971 Examinations Approvals Notice, consists of 19-22 papers to be completed over a period of five years. There is provision for issuing a National Certificate of Horticulture after the completion of 14 subjects - generally taking 3 years. Some students may end their studies at this stage, others will proceed on to complete the full National Diploma, which does include the writing of a thesis on an approved topic and the thesis must contain some original work. The number of students qualifying each year are 40 - 50 at the National Certificate level and 4 - 12 at the National Diploma level.

The National Diploma in Amenity Horticulture is taken predominantly by people employed in Parks and Reserves Departments, of City and Borough Councils, and in Botanic Gardens. The course is structured specifically for their requirements. They are the biggest single group, and that the numbers have increased steadily in the last few years, as can be seen from the data in Table 1.

There also are large numbers of students enrolled in the nursery production option of the National Diploma. These persons are employed in all aspects of the production of trees, shrubs, seedlings, etc for sale, and in landscape construction work.

The expansion of student numbers in the fruit industry is clearly shown in Table 1, which reflects the increase in areas in Kiwi-fruit, and other sub-tropical fruit, and the developing interest in greater areas of stone-fruit and berry-fruit.

The vegetable section of the National Diploma is not well supported by students. Perhaps vegetable growers do not see education as an essential base for their industry. Another aspect is of course the wage structure in their industry, in which the award does not provide extra income for those having the National Certificate or National Diploma qualification. This is an important aspect; there should be a reward for completing successfully a course of study, and such rewards should be built into wage award negotiations. This is the case in some horticultural industries, but not in others.

## **HORTICULTURAL SALES CERTIFICATE**

The Horticultural Sales Certificate, revised in 1982, has become very necessary for all those engaged in garden centres and other establishments selling plants and horticultural requirements. The Certificate involves a two year course for persons working full-time in garden centres, and consists of two written examinations and one oral and practical examination. The Institute regards this as a particularly important and essential qualification for those who are directly involved with the public and providing information and advice.

## **NATIONAL DIPLOMA IN APICULTURE**

The present structure of this diploma provides for the issuing of a junior certificate, an intermediate certificate and the diploma. This diploma is being revised, and the new system must be linked to developments in apiculture within New Zealand. The aim is to provide appropriate levels of training for all those engaged in apiculture.

## **CERTIFICATE IN HORTICULTURAL PRACTICE**

The qualification, Certificate of Horticultural Practice, was introduced in 1979 with the first persons being examined and qualifying in 1981.

The Certificate was organised by the Horticultural Training Committee of the Agricultural Training Council, in association with the horticultural industries and their Cadet Committees, and this Institute.

The Certificate involves three years of practical work experience, and the completion of a task-based 'doing' component, as well as knowledge components. At the end of the three years, the student is tested by an oral and practical examination in which they must achieve a minimum standard of 80%. The certificate has as its aim the development of a well-trained labour force. The Technical Correspondence Institute provides assignments for the 'knowing' component, and also some Technical Institutes and Community Colleges provide day-release tuition, night classes and block courses for this qualification. There are now seven different examination centres for the oral and practical examination in horticultural production areas of New Zealand. The Certificate is specialised and at present can be awarded in the following options:

- Pip and Stonefruit
- Citrus and Sub-tropical fruit
- Viticulture
- Glasshouse Vegetables  
and Outdoor Vegetables.

## **NEW DEVELOPMENTS**

There is no doubt that horticulture in New Zealand is increasing in area and in its extension into new crops. This means changes in horticultural training and education are necessary. The Institute is prepared to meet these challenges.

National Diploma in Horticulture.

This qualification is being revised during 1984 and 1985 and it is planned that the new programme should be gazetted in 1985 to allow its introduction in 1986. The aim has been to make each of the existing four Schedules similar in terms of numbers of subjects being appropriate only to each specific Schedule. Another major aim has been to provide for a National Certificate and a National Diploma of Horticulture in Floriculture.

Certificate in Horticultural Management

The Institute has agreed to be the Examining Authority for this qualification which is being developed by the Horticultural Training Committee of the Agricultural Training Council in association with the Community Colleges, Technical Institutes and Polytechnics. The full details of this course have not yet been finalised but for some students this will add on to the Certificate in Horticultural Practice.

### Certificate in Horticultural Theory

Planning for this is well advanced and it is intended that this qualification be introduced in 1985. This is being developed to cater for an increasing number of persons, who are not engaged in practical horticulture but who wish to obtain knowledge and a qualification in order to become involved in an aspect of horticulture either on a part-time or full-time basis.

On gaining a position in practical horticulture the subjects of this new Certificate will be able to be cross-credited to the NDH system should they wish to continue their studies.

### Certificate in Parks Practise (Groundsmanship)

This is being developed in co-operation with the Local Government Training Board, and the Institute of Park and Recreation Administration.

It is intended that this be introduced in 1986 following further discussions on the details of the qualification, i.e. tuition required, practical experience necessary, and examination procedures.

The Institute will be the Examining Authority. Further modules such as Landscape Construction and Arboriculture are being designed.

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The Institute plays a vital role in the training and examining of practising horticulturists and beekeepers. It is an organisation carrying out these responsibilities on a national basis. It provides for those persons in New Zealand who can not, or do not wish to attend full-time at University or other training establishments in order to make progress in obtaining horticultural knowledge and skills.

# ENDANGERED PLANT CONSERVATION

*by*

*G. Paterson*

With the I.U.C.N./W.W.F. Plants Conservation Programme 1984/1985 fast approaching the half-way stage, it is opportune to reflect on progress to date.

Are we paying more than just lip service to the programme, are we doing anything?

## The Programme

The main thrust of the eighteen month long programme, is to educate the populous to a state of awareness, to carry out projects in selected areas of the world which are seen as most critical, and thirdly, to draw the network of 600 Botanical Gardens together for conservation.

The Botanic Gardens Conservation Co-ordinating Body of the I.U.C.N. has to date been supported by 250 Botanical Gardens throughout the world.

Is your organisation in a position to assist. If so, write to:-

Conservation Monitoring Centre,  
The Herbarium, Royal Botanic Gardens,  
Kew, Richmond, Surrey, TW9 3AE.  
England.

Part of the education and co-ordination role is achieved via a Threatened Plants Newsletter and the hunt for the various holdings of plants is done by the circulation of lists of rare and threatened plants from various countries or areas. From the information returned, a list of the plants held in specific gardens is compiled. Members also receive annually a list of all the plants they are recorded as holding.

## Don't You Have A Botanical Garden?

Don't despair there is still many roles you can play in endangered plant conservation.

Any old domain, park or land holding will suffice if you have the will to actively conserve.

In March 1983, the New Zealand Native Conservative Council accepted a role as a co-ordinating body, to establish a national liaison between agencies and individuals working in the field of rare and endangered native plant conservation.

Their address is:

Nature Conservation Council,  
P.O. Box 12-200,  
Wellington.

They are compiling a register of organisations and persons growing plants which are from a known wild source. Can you help?

#### Have We Left Our Run Too Late?

The New Zealand Red Data Book lists 66 plants and less than twenty of these have still to be found in cultivation or be brought into cultivation. All is not lost and even the compilation and disclosure of these previously unknown facts is a step forward for plant conservation in New Zealand.

Think positively, act positively and all is not lost.

#### What Can You Do?

The conservation of rare and endangered plants covers so many facets, each interlocked and important enough for persons of varying aspects of interest to find a niche. Grow a plant, propagate them, photograph them, record where you see them, how many, in association with what.

#### The Halfway Stage

1. Nine papers on "Conservation of plant species and habitats" delivered at a symposium of the fifteenth Pacific Science Congress, held in Dunedin, have been published as part of the I.U.C.N./W.W.F. Plant Programme.
2. A border of New Zealand's rare and endangered plants has been established in the Timaru Botanical Garden.

#### What Remains

The Heathcote County Council is considering a proposal to plant a collection of rare and endangered plants from Canterbury at their County Offices in Christchurch.

The Timaru Botanical Garden plans to highlight the plant programme in February 1985 in several ways. A plant display will be mounted at the Oamaru Floral Festival, a public 'walk-about' the Botanical Garden's endangered plant collections will be held, and an address will be delivered to the local group of the Royal Forest and Bird Society.

Surely more is going on, let's hear about it. Remember that just as man's actions have put plants at risk, man's actions can save them.

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## KOWHAIS IN GARDEN OR AS POT PLANT

*(Horticultural Research Centre, Levin)*

The kowhai is one of New Zealand's most popular native plants. As a garden specimen, however, it has disadvantages.

Seedling kowhais may take ten to 15 years to flower, and so can be recommended for reasonably young and extremely patient gardeners only.

Research to improve the ornamental value of the kowhai begun by the late Mr John Goldie, has been in progress at Levin for over ten years. Mr Goldie found time from planting to flowering could be greatly reduced by propagating trees from adult wood cuttings, or by grafting adult wood onto seedling rootstocks. These techniques produced flowering trees in less than three years.

In co-operation with the D.S.I.R.'s botany division, Mr Goldie gathered an extensive collection of kowhai types from throughout the country. This collection, maintained at Levin, displays a wide range of flowering times and plant forms.

Some plants start flowering in mid-autumn, and others are still carrying flowers in late November. Some grow into large, robust trees, while others are small, compact and almost prostrate. One particularly attractive type was collected from Stephens Island in Cook Strait. It is low-growing, compact, and early flowering.

Mr Steve Butcher, Mr Ross Bicknell, and Miss Sheila Wood have carried on developmental work with kowhais. They are investigating the potential of the plants not only as garden specimens, but also as potplants. Improved propagation techniques are being developed and the effect of day-length and temperature on flowering are under study.

Last year the research centre obtained plant selectors' rights on the kowhai cultivar "Earlygold". This cultivar is now being bulked up by the nursery industry for release next year. Further cultivars have also been selected, and will be released in the near future.

# WELCOME: to the following new members

Aickin C.D.	Auckland	Appleton J.H.	Wangarei
Angell C.A.	Auckland	Beilby T.	Dunedin
Bertram P.J.	Hamilton	Bryan M.R.	Christchurch
Clarke M.	Mt. Maunganui	Collin R.W.	Havelock North
Derks M.M.A.	Christchurch	Dudley M.C.	Keri Keri
Ellis M.I.	Alexandra	Ellison K.	Te Puke
Graham A.T.	Tauranga	Heaslip P.T.R.	Morrinsville
Holdsworth K.	Hamilton	Insoll B.S.B.	Hamilton
Leighton C.M.	Manly	Lye M.A.	Raglan
McKenzie Y.D.	Christchurch	Melrose V.E.	Auckland
Mills S.C.	Lower Hutt	Moore N.D.	Hamilton
Morris L.D.	Gore	Muir I.	Upper Hutt
Perkinson G.O.	Auckland	Revell D.R.	Paeroa
Roberts R.S.	Stratford	Southcombe J.G.	Auckland
van Beek J.J.	Havelock North	Vollmer P.M.	Nelson
Webby T.J.	Waitara		

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I. F. P. R. A. 1936 CONGRESS

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AUCKLAND 23 FEBRUARY - 2 MARCH 1986

International Federation of Parks and Recreation  
Administration, New Zealand Institute of Parks  
and Recreation Administration.

International Congress

A varied programme offering opportunity for all sections of the Parks and Recreation industry to participate is being developed for this Congress. Papers will cover Park Management Plans, the Blending of Conservation with Recreation in National Parks and the Community's Involvement in Recreation Management.

Any member who would like more information on the Congress can write to:-

I.F.P.R.A. Congress,  
C.M.S. P.O. Box 3839,  
Auckland.

Telephone:- 770 660

# AUSTRALIAN BLACKWOOD *ACACIA MELANOXYLON*

*Taken from an information sheet compiled by the Utilisation  
Development Division, New Zealand Forest Service*

AVAILABILITY, PROPERTIES, AND USES OF AUSTRALIAN BLACKWOOD  
*Acacia melanoxylon* TIMBER.

## Availability

Australian blackwood *Acacia melanoxylon* is native to the Australian States of Tasmania, New South Wales, Victoria and South Australia. Small plantings have been made throughout New Zealand over the last century, but little has been utilised as timber because trees tend to be of poor form. Well formed trees can be grown on sheltered sites as a source of specialty timber.

## Physical and Mechanical Properties

The heartwood varies in colour from golden honey colours through to dark brownish black tones, sometimes with a reddish tint and/or red longitudinal streaks. The sapwood is straw coloured. The grain is usually straight but sometimes slightly interlocked or wavy. It has a fine, even texture.

Few problems are encountered in sawing except that care should be taken not to overfeed the saws.

The timber machines well and is suitable for turnery. It dresses to a smooth finish which is able to be highly polished.

Australian blackwood dries readily and can be kiln dried from green. Cupping of wide flat sawn boards can generally be avoided by weighting the stack, otherwise it can be removed by a final steaming treatment. Slight collapse may occur. The timber is classed as durable. The sapwood is susceptible to attack by the common furniture borer *Anobium punctatum*. Both heart and sapwood are resistant to preservative treatment.

## Uses

Australian blackwood is a fine decorative timber used for high quality furniture, panelling and cabinet making. It is a suitable timber for interior joinery. Because of its good bending properties it is extensively used for bent work in boat building and furniture. It has been used also in making tennis racquet frames. It forms fine walking sticks, presentation boxes, trinkets, handles and ornamental turnery.

# STUDENT SECTION



ngaio

*Myoporum laetum*

Myoporaceae

## EDITORIAL

Now that the Christmas and New Year festivities are over, the planning for the year ahead has begun. Hopefully one of your New Year's resolutions will be to submit information to this magazine for the promotion of horticulture in New Zealand!!

Time for gardening in the holiday season is somewhat restricted with many other summertime activities to participate in. Continual irrigation work is generally a necessity as is the perpetual chore of weeding. The value of mulches will become apparent in regard to both of these practices, with proper mulching aiding in reducing moisture loss from the soil and suppressing weed growth. As well, mulches provide a cooler root run for plants and their growth benefits.

Examination results will now be known. Hopefully the work put into the exams has produced the desired results. Congratulations to successful candidates.

Welcome to all new students who are beginning a career in horticulture. An interesting and varied occupation lies ahead. Field trips and meetings held by local District Councils are invaluable in giving the opportunity to learn about different aspects of horticulture, and it is for your benefit to attend these.

May I take the opportunity to pass on best wishes for 1985 to all.

Kind regards  
Nick Owers.

# FROM THE TECHNICAL CORRESPONDENCE INSTITUTE

## 1985 TUITION

Royal New Zealand Institute examinations TCI will be providing tuition for in 1985 include National Certificate and Diploma in Horticulture subjects, Certificate in Horticultural Practice options and the Horticultural Sales Certificate subjects. Details of each of these are given in TCI course circulars.

In 1985, TCI will have some new assignments for many examination subjects including Botany I and II, Soil Science II, Plant Protection I and III, Nursery Crop Botany, Horticultural Practice I and II and Horticultural Machinery and Structures. For the first time TCI will also be able to provide some tuition for Fruit Production I.

## ENROLLING WITH TCI

Existing TCI students should have received a 1985 course circular and re-enrolment form before Xmas.

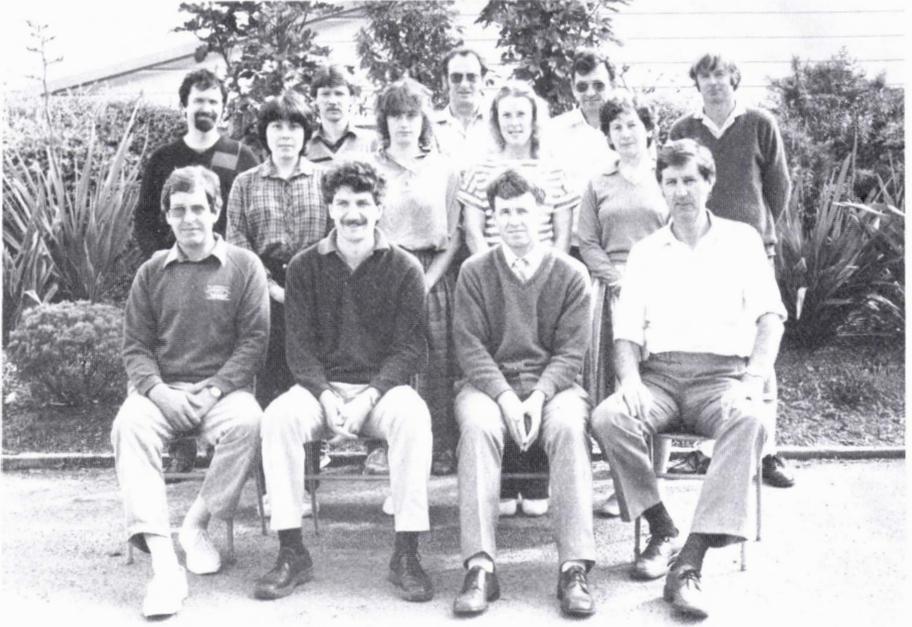
Anyone interested in beginning TCI tuition for R.N.Z.I.H. subjects in 1985 should write for information about courses to Neville Weal or Mike Oates at:-

Horticulture Department,  
N.Z. Technical Correspondence Institute,  
Private Bag,  
Lower Hutt.

## 1985 STAFF

We often get requests asking what TCI tutors actually look like. The photograph shows the faces of some of our tutors with whom you will correspond should you study with TCI during 1985.

The staff of TCI's Horticulture Department wish you all the best if you sat examinations in 1984, and look forward to hearing from you again if you were a TCI student. We hope everyone had a good break over the Xmas and New Year period, and is ready in February to start preparing for the 1985 examinations!



TCI Royal New Zealand Institute of Horticulture subject tutors  
(from left to right)

BACK ROW: Peter Butler, Roger Garrett, Denis Pool, Maurice Rhodes,  
Don Estcourt

MIDDLE ROW: Claire Basham, Jeanie Gilbertson, Frances Palmer,  
Margaret Hancock.

FRONT ROW: Bruce Treeby, Mike Oates (Course Supervisor), Neville  
Weal (Head of Department), Denis Hicks

ABSFNT: Richard Greenhough

# SOWING AND MAINTENANCE OF LAWNS

Taken from

Ministry of Agriculture and Fisheries

Christchurch.

## SEED BED PREPARATION

The area must be well consolidated after initial cultivation before sowing to obtain a firm base and to avoid depressions occurring later. This levelling and consolidation, therefore, should be commenced at least some weeks before sowing time. A rake and/or levelling board are the tools needed for the levelling process. If possible, preparations should be commenced about December-January for autumn sowing, and June-July for spring sowing. Soil pH needs to be as near as possible to 5.0. Final consolidation is best carried out by heeling, that is, by tramping with the heels and raking. Repeat this operation until the whole area is uniformly consolidated. Consolidation is most important to ensure there is no sinking and undulating surface after the lawn is laid. Thereafter it should be lightly hoed with a push hoe each week until sowing time to destroy weeds as they germinate. A mixture of 2 parts of sulphate of ammonia to 1 part of superphosphate (by weight) should be applied evenly and raked in to a depth of 3.5 cm, 2 - 3 weeks before sowing at a rate of 34 g/m<sup>2</sup>, plus 15 g/m<sup>2</sup> of sulphate of potash. If available, include D.D.T. or lindane at rate recommended for grass grub control.

## SOWING

The best time for sowing is the autumn (during March), because at this time of year there is less weed competition and the soil moisture and temperature are generally better than in the early summer. Hence there is a better chance of a quick establishment of the sward. Good lawns, however, can also be developed from spring sowing (September) if proper care is taken.

The most satisfactory grass mixtures for fine lawns are: Browntop *Agrostis tenuis* 1 part, Chewings fescue *Festuca rubra* var. *commutata* 2 parts (by weight). For very sandy soils, 14 g of yarrow *Achillea millefolium* could be added to each 450 g of the above mixture. This will assist in keeping the lawn green in dry weather. White Clover *Trifolium repens* may be added at the same rate if required, but although it stays green in summer it is generally undesirable because of such features as being slippery in wet weather, a tendency to smother grass, gives the lawn a patchy appearance, stains clothes and attracts bees when in flower. A large worm population also builds up in clover which is undesirable for fine grassed lawns.

To secure an even coverage when sowing, divide the seed into 2 two parts and cross sow. 25 - 35 g of the seed mixture per m<sup>2</sup> is ample. 17 g is sufficient if seed bed preparation is good and the conditions are favourable. After sowing, lightly rake the area to cover the seed.

As a protection against damping-off and infection by fungus diseases while the seedlings are establishing (of special importance for autumn sowing), it is essential to dress the seed pre-sowing with 56 g of thiram to 4.5 kg of seed. This will also discourage birds.

#### MOWING

If a light roller is available it can be used with advantage a week before the first mowing is due. Rolling will level out any uneven surfaces so to reduce the tendency to scalp small irregularities when mowing, consolidate the seedlings in the ground and press in any stones that may damage the mower.

Do not allow autumn-sown lawns to grow too long during the winter as this increases the risk of fungus diseases commencing. Mow to a height of 1.5 to 2 cm when the grass reaches about 3 to 5 cm in height and always use a catcher on the mower, because any clippings allowed to lie on the new sward will damage the immature turf, and in the longer term a build up of thatch will result and development of weeds and diseases is made easier. Make sure the mower is newly sharpened and set.

#### MANURING AND WATERING

After establishment, fertilisers should be applied to maintain vigour and to depress weeds and coarse grasses. A mixture of 3 parts of sulphate of ammonia to 1 part of superphosphate (by weight) is most satisfactory. This mixture should be applied 2 - 3 weeks after germination and several times a year, preferably in April, September and December at 34 g/m<sup>2</sup>, 1 part of sulphate of potash once or twice a year will alleviate potash deficiency which results from continual use of sulphate of ammonia and superphosphate. A material for grass grub control can be added when required.

Never allow the soil to dry out completely during the summer. Irrigate when necessary throughout the growing season, especially from November to February (inclusive). When irrigating, make sure the moisture has penetrated to a depth of at least 23 cm. It would require about 5 cm of water to bring the soil moisture of the average soil up to a reasonable level, if it had become fairly dry.

#### GROOMING

Grasses such as browntop *Agrostis tenuis* develop runners and these ensure a good ground covering is achieved. However, if they become too matted, as will happen under poor management, the dead turf matter will inhibit tillering and weaken new growth through competition and shade. Thus this old turf matter must be removed and a good raking with a strong rake prior to mowing is normally satisfactory.

## PHYSICAL TREATMENTS

Alleviation of compaction and aeration of the sward is very important to ensure a fine turfed lawn is maintained. Spiking is one such treatment readily carried out on a home lawn. A strong garden fork is ideal for this purpose.

## DISEASE AND PEST CONTROL

PROBLEM	MATERIAL AND RATE OF USE	REMARKS
Grass grubs <i>Costelytra zealandica</i>	Use proprietary formulations	Apply according to manufacturer's directions
Porina Caterpillars <i>Wiseana cervinata</i> <i>W. umbraculata</i> <i>W. signata</i>		
Worms	28 g of 4% rotenone in 18 litres water, or Carbaryl 28 g	Apply to 8 m <sup>2</sup>  Apply to 30 m <sup>2</sup>
<u>Fungous diseases:</u>		
Damping off <i>Pythium sp.</i>	Thiram 80% 340 g to 450 g to	Apply sufficient water to ensure
Brown patch <i>Pellicularia filamentosa</i>	83 m <sup>2</sup> sprayed on, <u>OR</u>	penetration of fungicide
Red thread <i>Corticium fuciforme</i>		
Fusarium patch <i>Fusarium nivale</i>		
etc		
	Benomyl 50% 56 g to 80 m <sup>2</sup> sprayed on, repeat as needed	On grass lawns only
Algae slime	Thiram as above <u>OR</u>	
	113 g potassium permanganate in 2.25 litres water	Spray on 33 m <sup>2</sup>
Fairy rings	Formalin ½ litre in 25 litres water	Make holes in turf 15-23 cm apart and 23 cm deep.  Keep filling holes until soakage stops and then plug holes and cover with sack for 24 hours. Resow after several weeks.

## MOSS AND WEED CONTROL

The optimum times for treatment are: Autumn - late March and April; Spring - September and October. Apply in calm condition to avoid drift on to garden plants.

A dressing of fertiliser mixture should be applied several days after using moss and weed killers to assist grass growth.

Weak spots should be resown.

These treatments are secondary only to good management.

MOSS: Proprietary moss killer used at manufacturer's recommendations or

28 g sodium pentachlorephenate (santobrite) in 18 litres water sprayed on 25 m<sup>2</sup>.

WEEDS: A herbicide containing a mixture of M.C.P.A. and mecoprop gives control of most weeds encountered in lawns, including clover. Use at manufacturer's recommendation.

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## CABBAGE TREE FOR SUGAR?

An Otago University archaeologist, Mr Barry Fankhauser, believes the native cabbage tree has potential as a source of sugar.

Mr Fankhauser said Maoris processed cabbage trees to provide their sugar.

They produced simple sugars from cabbage tree stems by heating them in large earth ovens at up to 1000 deg.

While sugar cane had been improved by research and breeding, no-one in New Zealand thought of researching the cabbage tree, Mr Fankhauser said.

He believed cabbage trees could be cultivated and used to produce high-fructose syrup.

As well as sugar, there was also the possibility of fibre and ethanol production. By-products could be used for stock feed.

# LETTERS TO THE EDITOR

Dear Sir,

## NOTES FROM WELLINGTON CITY

Peter Heenan, in Bulletin 33, urged members to contribute, asking whether lack of articles indicated apathy. Quite the reverse, Mr Heenan; we are alive and working harder than ever before all over New Zealand, but it takes a comment like yours to force us to look past the more immediate problems of the day and share our work with others.

There are many Wellington City projects of interest, and just as many problems for which we are searching for solutions.

Our Junior Park Ranger programme, launched on Arbor Day this year, has horticulture as well as parks interest. The aim of the programme is to encourage involvement and understanding of local parks so that children will develop a greater interest, awareness and sympathy for plants and other features. The scheme involves children undertaking projects over an eight month period. These can include growing plants in parks, or even growing their own plants for school grounds or parks. Pam Cusack has liaised with schools and found an overwhelming, positive response. Projects are now being submitted and are a reflection of the growing interest in horticulture.

The Botanic Gardens Interpretive Centre, in the historic cable car winding room, has been the venue for a series of winter lectures on horticulture and other subjects. The lecture series was advertised and there were good responses for all subjects, including growing vegetables, the Botanic Gardens, and design of small garden spaces. There are also an increasing number of adults interested in widening their horticultural knowledge.

We are working on a longer term project, a book to commemorate 100 years of management of the Wellington Botanic Gardens. The centenary is 1991 but the publication of the book is hoped for 1987 in the expectation that it will generate interest in the centenary. Mrs Winsome Shepherd is completing the first half of the work, covering the period from 1839 to 1891, and Walter Cook is working on the period up to the present day. The Botanic Gardens were a very vital part of plant evaluation in New Zealand's early European settlement.

Yours sincerely,

DIANE MENZIES,  
Assistant to the Director of Parks,  
Wellington City Council.

# WEATHER AND YOUR GARDEN

The following is the third and final in a series of articles, taken from New Zealand Meteorological Service Publication No. 168.

by

R.W. Heine

## COLLECTING THE DATA

While equipment may be as costly and elaborate as you wish, in fact you can get along on quite inexpensive items, which are stocked by both hardware shops and garden centres.

First on the list of measurements is air temperature. The most convenient thermometer for this purpose is the combined maximum - minimum of the *six* type (invented by James Six in 1782). This is shown in Fig. 1. Not only do these give you the maximum and minimum temperature over any period, but also the temperature of the air at any time. You can also then calculate what the meteorologists calls the *mean* temperature for the previous day, if you make your observations at 9 a.m. which is the official time for making climate observations. The mean temperature is simply the average of the maximum and minimum readings.

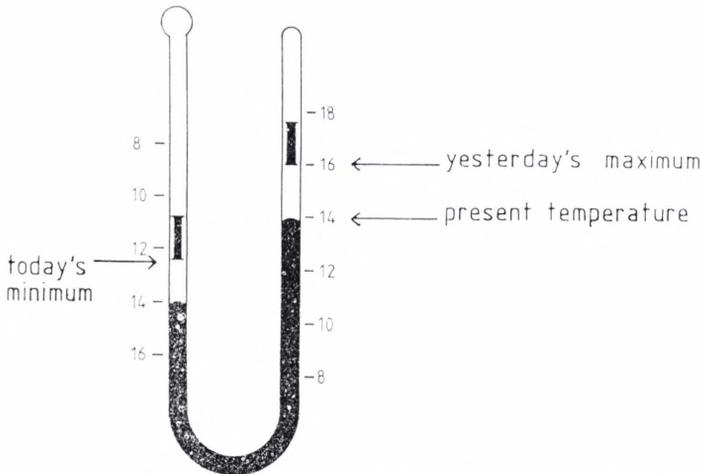


Fig. 1 SIX'S COMBINED MAXIMUM-MINIMUM THERMOMETER

However buying a thermometer is only half the story, when it comes to actually measuring air temperature. It is *essential* that you house the thermometer in a suitable shelter, to keep direct sunlight off it. This is a do-it-yourself job, and a general plan is given in Fig. 2. The detail is not too important, and the more wind that can whistle through it the better. The woodwork should be painted white, to reflect the sun's rays.

In addition to air temperature, you may wish to record frosts. This involves using a so-called grass minimum thermometer, which is an ordinary spirits minimum thermometer placed horizontally on the lawn, 25 mm above the grass (Fig. 3). As the alcohol spirit in the thermometer sometimes distils during a sunny day, it is quite a good idea to take such a thermometer inside in the morning and put it out again in the late afternoon.

Soil temperatures are also of great importance to the gardener. These are measured by mercury thermometers, bent at right angles so that the scales lie along the surface of the ground, Fig. 4. They are made for various depths ranging from 5 cm up to 30 cm, and stay in the ground. The soil above them is always kept bare.

Official rain gauges are cylindrical, made of metal, and require a separate measuring cylinder made of glass. Also available are simple rain gauges made from plastic, some cylindrical, and others in the form of a plastic wedge which are direct reading.

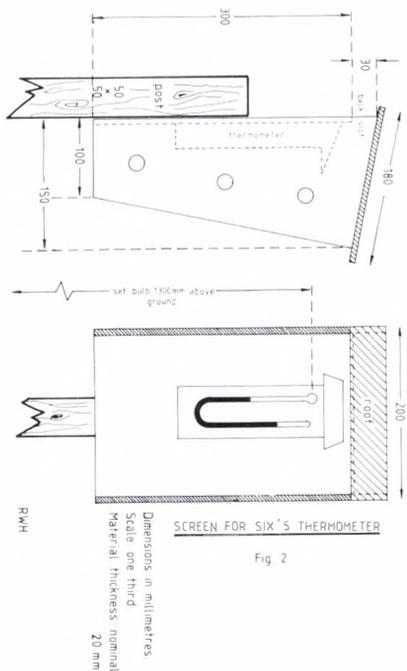


Fig. 2

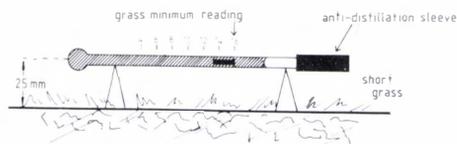


Fig. 3 GRASS MINIMUM THERMOMETER



Fig. 4

Rainfall is measured in millimetres. Older gauges are calibrated in inches, with 1 inch equal to 25 mm. (A 'point' of rain was one hundredth of an inch). A 'trace' of rain is less than 0.05 mm.

Whatever the type of gauge however, some care is needed in siting it. It is important that it be kept well out in the open: the usual rule of thumb is never to be closer to an obstruction than a distance equal to twice the height of the object, Fig. 5. Obstructions include buildings, trees and hedges. If placed on the ground, the opening should be at the standard height of 30 cm above the surface, and the surround should be reasonably level lawn - *not* concrete or other hard-seal, as splashing affects the readings.

Although soil moisture is naturally of great interest to the home gardener, there is no suitable standard instrument available to measure it. Garden centres do sell various 'gadgets', which are probably quite useful, but they are not calibrated in absolute terms, and you will need to find out by experience just what they are indicating.

Finally on this section on instruments, you may be interested in relating the daily weather map as seen on TV or the local newspaper to your own neck of the woods. In this connection - but as something of a luxury item - you will find a barometer useful. Observations of the barometer will show that pressure generally falls ahead of an approaching front, or depression (marked L on the map); and rises behind a front or on the approach of an anticyclone (marked H on the map). Very rapid *changes* in pressure signify that the oncoming weather feature is either approaching very quickly or becoming more intense. Often the first clue that a front has passed over, is indicated by the barometer 'levelling out', or rising, after a period where it had been falling. Clearance of rain or cloud, and a wind change may soon follow.

It is best to have your barometer set to the same reference level as the Meteorological Service, which is sea level. An adjustment screw will be found on the back of the case. The required setting is obtained by simply ringing the nearest branch of the Service or your local airport.

If you are going to buy a barometer make sure that it is calibrated in millibars\* (mb). Terms on the dial, such as 'fine', 'stormy', etc. have no worthwhile meaning, and are to be ignored.

If you find difficulty in judging the direction of the wind, a simple wind vane can be added to your collection. As mentioned above, the passage of a front is associated with a change in wind direction. On the weather map, the wind blows anticlockwise around the anticyclones parallel to the contours (called isobars), and clockwise around the depressions.

However mountains and valleys can markedly affect the wind flow locally, and it may appear to be unrelated to the isobars.

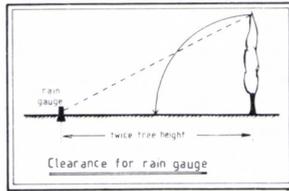


Fig 5

## CONCLUSION

No matter how good the soil, and how proper your applications of fertiliser, there remains always one factor which determines the ultimate success or failure of your garden - the weather. While it is true that on a large scale little can be done to modify the weather, there are many ways in which the alert gardener can modify his local climate, or adjust his gardening operations to allow for local conditions.

By making some simple measurements of the physical environment, both in the atmosphere and in the soil, records can be built up over the years which relate to your own garden. These will help your management programme and provide added interest to your gardening.

No two seasons are ever quite the same, and by adopting some of the suggestions put forward here, you will hopefully develop a better feel for the seasonal changes in your garden. If you keep a gardening diary, then simple meteorological data will help guide you over the years as to the best planting times for your garden - which will encompass the kind of soil you have, as well as the locality.

You may also add phenological data to your diary. These are indicators such as first flowering dates, and provide a kind of weather calendar. The idea behind such observations is that one can compare the earliness of the current spring with that of the previous year. As far as 'first blossom' is concerned, the main species used are honeysuckle *Lonicera sp.* and purple lilac *Syringa vulgaris*. In practice, temperature is the main influence on phenological events rather than moisture conditions.

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