

# Horticulture

in New Zealand

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



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**Spring 1982**



# HORTICULTURE

## IN NEW ZEALAND

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BULLETIN OF THE ROYAL N.Z. INSTITUTE OF HORTICULTURE  
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Cover photo : *Rhododendron fragrantissima*

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ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC.)

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<i>Bulletin Editor</i>	Mr D.L. Shillito
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# EDITORIAL

Relieved at getting material off to the typist for my first edition of this Bulletin, I can now sit back and write a few words of introduction to this Spring issue.

It is my hope that you will find this issue as interesting as previous Bulletins and approve of the changed presentation. The material published comes from many sources, but unfortunately little is contributed by you, the members. In future issues I hope that you will provide articles or ideas for publication.

To this end there is a questionnaire in this Bulletin that I would like you to complete and return.

In belonging to the R.N.Z.I.H. you have shown genuine interest in horticulture, whether it be as a student or as a general member. Your enjoyment of membership would be enhanced if you also took an active role in its affairs. No organisation will improve or change if new blood is not supplied in some way. A start to a possible change will be provided by every member completing the form and returning it to me as soon as possible. Any ideas you may have for the Institute as a whole, would be welcomed and they can be taken up for discussion, possibly in future Bulletins.

Horticulture has changed dramatically in the last 15-20 years and it will continue to do so. The Institute must also change with the times and provide what its members want.

We now have a large number of student members and we are keenly interested in learning what they want provided. They should make use of the Institute to gain horticultural experience and knowledge. It is a resource that should be used.



Please take the opportunity of the questionnaire to inform us of your interests and ideas.

- DAVID SHILLITO  
Editor

# DISTRICT COUNCIL NEWS

## AUCKLAND

Mr. P. Jew was elected Chairman at the A.G.M. and has written the following :

'I wish to thank members for the confidence they placed in me at our recent annual meeting and to place on record our appreciation of Miss Joan Dingley, our previous Chairman for her untiring efforts.

My hopes for the forthcoming term are threefold.

First, to strengthen the fraternity and friendship of our District Council.

Secondly I would hope that this Council can expand its assistance to horticultural education which is increasing in diversification and now becoming established in many of our secondary schools.

Thirdly, let us take advantage of the present community interest in environmental matters to promote a greater understanding and appreciation of amenity horticulture.

Within the current horticultural boom, let us ensure that ornamental horticulture, landscape gardening - call it what you may - is recognised as an integral part of horticulture capable of contributing significant benefits to this country which cannot be measured in dollars and cents.'

With the exception of Messrs. C. Howden and P. Bilton, who were not available for nomination, other members of the previous Executive agreed to take office for a further year. They have been joined by Mr. Philip Jew and Mrs. Caroline Maiden. Mrs. Maiden is a student and we are particularly happy to have her on the Executive.

### COMING EVENTS

- |               |          |   |  |
|---------------|----------|---|--|
| 16th October  | Saturday | - | A visit to 'Ready Turf' to see how instant lawns are grown and prepared for use.                       |
| 21st November | Sunday   | - | A visit to Mrs. Anne Endt's garden of old roses and many other treasures.                              |
| 4th December  | Saturday | - | Garden ramble and buffet tea at the Regional Botanic Gardens. This is our final function for the year. |



# WHANGAREI

## MAY MEETING

At this meeting Miss Pam Robertson and Mr. Greg Chisnall gave an excellent illustrated talk on their recent study trip to Japan, arranged for commercial flower growers.

Slides were shown of cherry trees in full bloom in April, with single, double and weeping varieties making the landscape breathtaking with their beauty. In the parks, conifers are trimmed to size and the 'Japanese' style to give these areas an uncluttered feeling. Fine examples of bonsai were seen with some as old as 500 years. These trees have been pruned and trained by successive generations of gardeners and will continue to be tended and cared for in this way.

A wide range of glasshouse properties were seen with varying degrees of automation. Glasshouse insulation is an important feature in Japan to retain heat because of the harsh winters they experience. In these glasshouses a wide range of flowers are grown, some examples are Cyclamen, Geranium, Gypsophila and a very wide range of orchids.

An interesting point noted was that our Prime Minister, Rob Muldoon is a very popular personality in Japan!

## JULY MEETING

President Hanley Hutchinson presented the Skellerup prize for the best mark in Subjects 1-9 of N.D.H. to Pam Robertson of Ruakaka and Certificates for Nursery Management to Graeme Mackie of Hikurangi, Margaret Williams of Kaeo and absent David Evans of Keri Keri. It was pleasing to see so many friends, families and students at this meeting and we appreciated the effort they made in travelling some distance to be with us.

The guest speaker was Mr. Ron Gordon, who runs a large sheep station out of Taihape. Mr. Gordon is a member of the Dendrological Society, an international body whose interests lie in conservation and preservation of endangered botanical species and the introduction to commerce of new species.

In 1981, with a group of Society members from throughout the world, he visited China, a country which has tremendous interest for Dendrologists, as China has areas of natural vegetation untouched by man, which contain species previously unrecorded.

A mammoth task being undertaken is a botanical survey and recording of China's plants; the listing of 150 species of Acers (maples) is an indication of the magnitude of the task. During Madame Mao's "Reign of Terror" not only were eminent botanists executed or tortured, but established botanical plantings were destroyed, the re-establishment of which is currently being undertaken.

Paulownias, Paeonies, Cassias, Orchids, Actinidias (kiwifruit), numerous coniferous species, Betulas and bamboos in profusion were all observed by the party.

## WELLINGTON

Wellington District Council held their Annual General Meeting on the 5th July at Turnbull House. Officers elected for 1982/1983 :

Chairman	-	Mr. R. Nanson
Vice Chairman	-	Mr. M. Beattie
Secretary	-	Mrs. D. Menzies
Treasurer	-	Mrs. M. Smyth
Committee	-	Messrs. E. Butcher, D. Duthie, D. Fry, I.D. Galloway, R. Lowe, R. Lucas, R. Jackson, J.P. Martin, B. Pollock, Mesdames B. Brown, M. Ryan, W. Shepherd.

Mr. Nanson paid tribute to the years of tireless service given by Mrs. E. Ramsay F.R.I.H. who was retiring from the Executive after 19 years association with the committee and Institute affairs.

Mr. Ross Jackson, landscape architect to the Beautiful N.Z. Secretariat gave the meeting a fascinating introduction to the 'Beautiful N.Z. Scheme' with illustrations of the points he made.

The initial proposal of the Scheme is to enhance the scenic beauty of New Zealand by a massive planting campaign of the nation's roadsides. The principle objective being for the benefit of tourism. This beautification could not just be limited to roadsides but must relate to the country-side around, to be in harmony with the existing character of the area.

In total a fascinating preview of what is envisaged.

### AUGUST MEETING

There was a good attendance at the August meeting and our new format of an early meeting with the half-hour to relax with friends plus a cuppa is proving very popular.

Councillor Spry of the Wellington City Council presented certificates and prizes to the following :

Jerry Lucero	-	Horticultural Salesman's Certificate
Wayne Phillips	-	National Certificate in Horticulture
David Rowe	-	National Diploma in Horticulture, Dugald McKenzie Memorial Prize, for exceptional ability and the Cockayne Gold Medal.

Mrs. A.M. Leydon was unable to be present to receive the Junior Memorial Prize.

Our speaker was Don Liddle, President of the N.Z. Nurserymen's Association, who gave us his views as a nurseryman on the 'Beautiful New Zealand Scheme'.

He said the trade's first reaction was that it would be good for business and it was our responsibility. Mr. Liddle said he personally would like to see the bold use of colour in plantings and extensive areas of conifers in the South Island.

He felt nurserymen could handle the extra demand if they had time to prepare and gradually build up production. With modern techniques they are able to produce plants twice the size in half the time it used to take.

Wellington District Council is making special efforts to cover Wellington and register Notable and Historic trees. If any members know of any trees in their area, could they please contact the Secretary - Mrs. D. Menzies, P.O. Box 11-379, Wellington.

## CANTERBURY

The tour of the Botanic Gardens propagating department and show houses by the Curator, Warwick Scadden, was a great success, with 100 people attending.

Warwick gave a very interesting talk on what happens behind the scenes in maintaining a Botanic Garden to the expected standard.

Kevin Garnett, the Propagator, gave a talk on what was involved in growing such a wide range of plants.

Afterwards people wandered through the propagating department and show houses, during which time Warwick and Kevin were showered with questions.

The field trip to Victoria Park on Saturday 16th October should be of value to N.D.H. students as Bill Sykes of the D.S.I.R. will conduct a plant study and identification.

- E.D. Moyle  
Secretary

## OTAGO

The A.G.M. was a very successful evening, being held for the first time in the newly opened Visitor Education Centre Botanic Gardens.

Officers elected for the 1982/83 year are :

President	-	B. Cave
Vice President	-	R. Bagley
Secretary	-	R. Scott
Treasurer	-	R. Bagley
Committee	-	G.Henderson, N.Struthers, J.Manning, G.Jolly, K.Weir, C.Fluit, P.Richan, J.Brown, A.Evans, C.Donaldson.

Barbara Cave was warmly welcomed as our new President and thanks were given to Pat Richan, immediate past-President for a job well done.

Chas McLauchlan retired from the committee after having a close association with the District Council for over 35 years. His dedicated service to the Institute, his great love and experience of plants especially Rhododendrons, has been of great benefit to members.

#### COMING EVENTS

- 12th October    Tuesday    - Australian Botanic Gardens.  
This will be an illustrated talk by two students, Brent McKenzie and Peter Heenan, who recently spent some time visiting a number of Botanic Gardens in Australia.
- 24th November    Wednesday    - Historic & Notable Trees.  
We hope to have an evening escorted tour of some of the local Historic & Notable trees on the National Register.
- 

## DEER & MACADAMIA TREES

*by Rod Baker*

Seven years ago I planted four Macadamia nut trees (seedling *Tetraphylla* types) into a rough hillside orchard next to my house. Because it was difficult to cut the grass, I introduced a small herd of Fallow deer. Prior to putting them in I protected the more valuable trees and decided to let the deer eat the rest.

Very soon the deer had ringbarked the plums, apples, cabbage trees and young pines. (I said it was a rough home orchard). However one sickly Macadamia tree was not touched. When I discovered this, I semi-starved the deer for a fortnight by keeping them in the small enclosure with the trees. Other than a couple of slight nibble marks on one tree, there was no damage to the five foot high unprotected Macadamia.

I then let the deer into another enclosure where there were two small trees about a foot high. Once again I kept them hungry and the only damage caused was some of the younger leaves had the ends nibbled off.

From my observations, it could be quite practicable to run deer with Macadamia trees on two tier farming principles in the way sheep are run in vineyards, once the plants are properly established. When the nuts fall to the ground, the deer eat the green outer covering but leave the nut untouched, which makes harvesting easy, particularly with the short grass.

I intend to run my deer in my good Macadamia orchard of 50 trees as soon as the trees are six foot high.



# INTERNATIONAL HORTICULTURAL EXHIBITION 1983 MUNICH

This is the 4th International Horticultural Exhibition in the Federal Republic of Germany which is held only once every ten years. It will be the climax of an international competition and a meeting place for professional horticulturists, home gardeners, plant and flower growers and nature lovers from all over the world.

I.G.A. 83 opens in Munich's new West Park on a 72ha (150 acre) site on the 28th April 1983. 24 nations will be represented, each with a typical national garden.

Visitors will find a full range of ideas for maintaining a natural environment, from the smallest flower pot, to the home garden or even the public park open to all. The natural landscape created in the West Park will itself provide the best example of the "regreening of the city".

Three ecological gardens will expand upon this theme : the "Rock Garden with Arid-Zone Plants", the "Steppe Heath Garden", the "Garden for a Housing Development in a Rural Area", and the "Home Garden with Brook and Pond".

Everywhere in the I.G.A Park, visitors will experience the beauty of plants.

Any member who may be interested in visiting Munich 83 and would like some more information, please write to the editor and I can send out what other information we have or may get at a later date.



A section of the semi-shade herbaceous planting.

# EDWIN BUDDING

When hearing the name Edwin Budding, one's mind does not automatically associate it with the care and maintenance of the lawn, unlike with the name Hoover and carpets, Singer and sewing. However to the keen gardener he was a man of great importance.

This Gloucestershire engineer inventor developed the first grass cutter on the principle of a cloth-shearing machine. In 1832 Ransomes began to manufacture the world's first lawn mower under licence for Budding. The original patent specifying :

'Country gentlemen will find in using this machine an amusing, useful and healthful exercise'.

Can we say that today, I wonder! This prototype was 19 inches wide and the cost was five pounds - not an inconsiderable sum for that time. It was not for another 30 years that a machine with side driving wheels was developed, lowering the cost and bringing the mower within the reach of most people with a lawn.

Horse-drawn machines were the next development and at the turn of the century the internal combustion engine was the most suitable power unit for self propelled mowers. In 1902 the world's first petrol-driven mower was developed. Shortly after this, Edward III ordered a demonstration to be carried out in the grounds of Buckingham Palace. Whether the King actually bought a model is unknown.

The petrol mower spelled the end of both horse-drawn and steam power machinery in this field and then, in 1921 came the next stage in mower development.

In 1914 an American, Worthington of Shawness, had taken out a patent for ganging together a number of side-wheel mowers within a frame, but still to be drawn by a horse. This was the beginning of the gang mower.

In 1926 Ransomes developed the first mains electric mower, primarily for use in private gardens. Today mowers come in all shapes, sizes, methods of power and price. Quite a development from a five pound amusing healthful exercise machine of the 1830's.

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' For every complicated problem, there is a simple solution that won't work.'

# NATIVE BUSH ON PRIVATE LAND — a diminishing resource

*Taken from Nature Conservation Council Newsletter*

Native bush - a valuable and versatile feature of the New Zealand countryside - is slowly diminishing in area. While public attention has focussed on the 'big' forest issues like Pureora, Okarito and the Paparoas, removal of bush from privately owned land has continued. Public opinion can be a strong factor in determining decisions relating to State Forests, but whether or not the private owner chooses to retain or protect forest on his or her land is a matter of personal choice. It is estimated that about half of New Zealand's remaining indigenous forest is State Forest. The remainder is equally distributed between National Parks and Reserves and private land, so the amount in private ownership is not insignificant.

In 1981 the Forestry Council published its Policy Guidelines for Private Indigenous Forests. The guidelines caution landowners not to take lightly the decision to clearfell and advise that if logging is undertaken it should be done in such a way that the forest structure is retained and regeneration is ensured. They conclude that with proper incentives, "the private forest owner will regard his forest area with a renewed interest and realise he is privileged to be the owner of a resource of such importance". Local Government, it is suggested, will need to take a more active role in providing such incentives.

Some disappointment was expressed at the time when the guidelines were published that they did not provide innovative or radically improved incentives for forest conservation on private land. It was also suggested that they focussed on the 'rights' of the owner without the consideration of his obligations to the land, the ecosystem and the community at large. Nor, it was suggested, did they consider the financial encouragement offered by Government towards forest destruction.

Bush covered land on private property is often considered as idle wasteland. In recent years, farmers interest in clearing native bush was dwindling as increased costs for clearance and development began to outstrip eventual returns from improved land. However, the availability of Land Development Encouragement Loans from the Rural Banking and Finance Corporation has re-kindled interest in the clearing of forest for agriculture. Coupled with the Livestock Incentive Scheme, which came to a close earlier this year, these loans have made development economically viable and attractive and are generally held to be the single most destructive influence on forests on private farmland today.

Unfortunately, native bush, whether in State or private ownership, is often cleared without awareness of its longer term values. The proposed New Zealand Conservation Strategy points to the need of "training and retaining courses at all levels of

government and private enterprises". All those who have an impact on natural resources, it states, from bulldozer drivers to rural investment managers, need to learn to manage their activities in ways compatible with conservation. Where forest is cleared there are often severe management problems such as erosion and gorse invasion. Where erosion is a problem, fencing followed by planting with indigenous vegetation will act as an effective control. Where gorse has infiltrated, forest will regenerate if grazing is restricted and a stable ecosystem will in time be created and erosion checked. Bush areas can provide important habitat for native fauna. They also help to retain landscape diversity, important for meeting non-material as well as material needs.

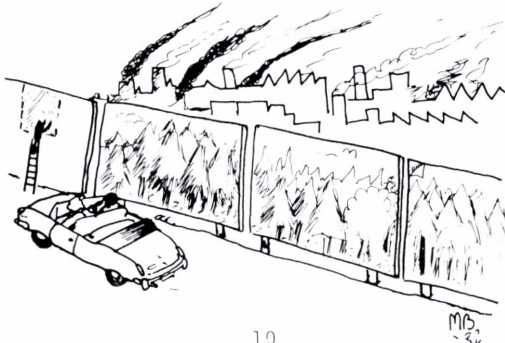
## BEAUTIFUL NEW ZEALAND

### LANDSCAPE DESIGN ON HIGHWAYS

The principal objective of the Beautiful New Zealand Project is to develop and enhance the New Zealand landscape as seen from the road for the benefit of tourism.

Studies have shown that the environment and existing natural beauty is the basis of the tourist industry in this country and is directly contributing over \$1,000,000,000 annually to the economy. This industry generally causes fewer environmental conflicts than other resources such as timber, mineral extraction or HEP schemes.

Considerable discussion, comments and submissions have been forthcoming from a wide variety of groups and individuals and the principal objectives are supported by the vast majority. Differences arise on matters such as exotics versus natives, flowers versus shrubs and similar details but a subject such as this is subjective and it would not be possible to gain total consensus.



However, any enhancement programme must be in harmony with the existing character of an area and logically the first step in the process is to survey and identify the character and features of an area and then to develop and highlight that character in a unified manner.

How this is achieved cannot be arrived at by a standard formula. Any Beautiful New Zealand project is most likely to succeed if it can be used to encourage landowners themselves, be they farmers, forestry companies, local authorities or central government departments, to improve the appearance of their properties.

In general, the majority of plant material should be hardy, not too ornate or conspicuous, and often the fewer species used the more effective the results. Generally, what are accepted as garden plants are misplaced in the highway landscape beyond urban limits as they are psychologically disturbing because we know that a garden plant has been introduced into an environment in which it is out of context. At high speeds, individual plants on the roadside do not read as significant entities. What is perceived are areas, textures, silhouettes, the contrast of large masses and voids, openness and enclosure, a flowing pattern of shapes, constantly changing as the driver goes by. In landscape design, more than in other fields, nothing should be done with preconceived thought, and everything should grow out of the natural, technical and visual conditions of the situation.

The standard of highway design is steadily improving in line with the increasing affluence of the country and the continuing importance of road transport, with the result that the highway is now becoming a more integrated part of the total landscape and not an imposition. Examples of this can be seen on roads such as Dunedin's Northern motorway by grading back cut and fill batters they appear to be natural formations, linked into the surrounding topography, rather than man-made cuttings and embankments.

From Taupo to Wairakei, is another example of a highway successfully integrated into the landscape in a pleasant and varied manner which reflects the character of the area. The vegetation consists basically of trees and grass set out in a park like atmosphere, which, according to a study of public opinion on roadside beautification by Nebraska Department of Roads, is what the majority of the public prefer as they travel. In the same U.S. study, it was found that more detailed flowering plants were preferred at rest areas for the motorist to admire when stopping. It was felt that this type of planting at rest areas would encourage drivers to take more frequent rests and therefore reduce fatigue and the accident rate.

*EDITORS NOTE : I would be interested if any of our readers have views or ideas on this scheme.*



## 2 4 5—T

'Considerable concern has been expressed in New Zealand over the last few months regarding possible effects of the herbicide 2,4,5-T on humans. As is common in many such controversies, arguments are often based on emotional grounds, rather than on scientific evidence. In order to obtain the best evaluation of the quality and quantity of the scientific evidence available for possible damage to humans by exposure to 2,4,5-T it was decided to ask three experts in the fields of the chemistry, pharmacology and human genetics of this herbicide to address the Annual Meeting of the Fellows of the Royal Society of New Zealand in May 1980.

The three presentations were of such quality that it was considered important to make the conclusions freely available.'

This is an extract from the synopsis of these three contributions which are available from the Royal Society of New Zealand.

Anyone who is interested in obtaining a copy of this manuscript can write to the address below, enclosing \$2.00 which includes postage :

Royal Society of New Zealand,  
Private Bag,  
WELLINGTON

## BOOK REVIEW

'Ornamental Horticulture' (Second Edition)

*McDaniel Gary L. 1982. Reston Publishing Co. U.S.A. \$38.10*

This book is for the serious student of horticulture and for the dedicated amateur gardener who prefers to read something about a horticultural subject before going out and doing the job.

If anything it attempts to cover too much because there are chapters of twenty pages or so on such extensive subjects as house plant care, landscape design, turf grass maintenance and the production of nursery stock.

For all that there is a substantial amount of down-to-earth instruction, which is reasonably well supported with black and white photographs, line drawings and charts.

Far from being overpowering, the American influence in the subject matter is refreshing and innovative. Where else will you find a carefully worded chapter on judging flowers and ornamental plants which is detailed for bone-fide horticultural students to encourage the growing of ornamental plants to perfection.

The book is a mixture of commercial horticultural practice and amateur horticultural expertise and is worth adding to your personal library for its all-round common sense information.

- J. O. Taylor

# THE HISTORY OF CHINESE TOON TREE IN NEW ZEALAND

After reading Mr. Redgrave's article on the Chinese Toon Tree and his statement 'this Chinese tree first appeared in a few Auckland gardens in the early 1950's', I thought readers would be interested in the history of its arrival and distribution in New Zealand.

A Mr. H. Wright of Avondale first imported a plant in about 1930 but it was not distributed further at this time. Around 1950 I chanced to see the tree in all its spring glory in the old nursery, though Mr. Wright had long since gone. It was owned by a Chinese market gardener who had cultivated the soil under the tree and had cut through many of the roots. In consequence there was a forest of suckers which he kindly let me have.

I took them to Mr. Jack Clark, who then had a nursery in New Lynn and all the trees in New Zealand, I believe, came from that initial gift.

*Cedrela sinensis* grows freely in the United States and in Santa Barbara they have long avenues of the tree. Seed is also available from America. It is also used as a street tree in Paris. It is not seen so often in Japan and China because the trees are stunted and rather dishevelled as the pretty pink leaves are used in cooking, possibly in recipes that would normally incorporate seaweed.

The plant has long pendulous clusters of white flowers followed by most intriguing seed capsules which are much in demand for dried arrangements.

- From a letter sent in by N. Copsey of Auckland.

## R.H.S. CHELSEA FLOWER SHOW - 1983

It would be greatly appreciated if any Fellow of the Royal Horticultural Society, resident in New Zealand, who is not intending to visit the 1983 Chelsea Flower Show in the U.K. could make his tickets available to two of our R.N.Z.I.H. members, who are planning a visit to Britain in May next year and would like to attend the show.

Could any kind donor, willing to assist, please contact :

Mrs. B.B. Smith  
124 Beerescourt Road,  
HAMILTON

- Editor

# FRUIT TREE VARIETIES FOR THE HOME ORCHARD

Planting various kinds of fruit trees can provide a continuous supply of fruit for several months. The extent to which a continuous supply can be provided varies according to district and size of the orchard.

Where room allows, the harvest period of a particular type of fruit can be spread by choosing several varieties which mature at different times. It is possible to harvest apples from January to May and peaches and nectarines from December to March.

The varieties listed below enable a wide selection to be made, although the lists are not extensive enough to cater for all preferences. They are listed in approximate order of ripening, and those of special merit are marked with an asterisk.

## Apples

Several early dessert varieties of apples such as Irish Peach, Beauty of Bath and Red Astrakhan are not included for the average small orchard, as their quality is not good and they lose their freshness rapidly when picked.

Several of the standard varieties have red strains and generally the red strains can be recommended in preference to the parent varieties.

The varieties listed ripen from January to May.

D = dessert

C = culinary

Variety	Principal Use	Maturity period	District	Suitability
Oratia Beauty *	D C	Early	All districts	
Cox's Orange				
Pippin	D	Early to mid season	Not for Auckland	
Gala *	D	" " "	All districts	
Kidds Orange	D	" " "	" "	
Spartan	D	Mid season	Southern districts	
Jonathan	D	" "	All districts	
Lord Wolseley	C	" "	Southern districts	
Red Delicious *	D	" "	Not for Auckland	
Golden Delicious *	D	Late mid season	All districts	
Splendour *	D	" " "	" "	
Braeburn *	D	Late	" "	
Ballarat	C	" "	" "	
Sturmer	D C	"	Not for Auckland	
Granny Smith *	D C	"	Not for late districts	

## Pears

Pears are only partially self-fruitful and produce better crops when grown with suitable pollinators. The varieties listed ripen from January to April.

D = dessert      C = culinary

No.	Variety	Principle use	Maturity period	District suitability	Suggested pollinators
1	William's Bon Chretien	D C	Early	All districts	5,7
2	Louise Bonne de Jersey	D	"	" "	1,7
3	Doyenne du Comice	D	Mid season	" "	1,5,7
4	Packham's Triumph	D C	"	" "	1,5,7
5	Beurre Bosc *	D	"	" "	1,7
6	Winter Cole *	D	Late mid season	" "	1,5,7
7	Winter Nelis	D	Late	" "	1,5

### Apricots

Apricots do not fruit satisfactorily in North Island districts other than Thames and Hawke's Bay. The varieties listed ripen during late December to February.

D = dessert      C = culinary

Variety	Principle use	Maturity period	District Suitability
Newcastle *	D	Early	All districts
Sundrop *	D	Early mid season	" "
Dundonald	D	Mid season	" "
Trevatt	D C	Late	" "
Moorpark *	D C	Late	Not suitable North Island or Nelson

### Nectarines

The nectarine varieties listed ripen from December to March.

W = white fleshed      Y = yellow fleshed

Variety	Flesh colour	Maturity period	District suitability
Armking	Y	Early	All districts
Morton	W	"	Southern districts
Snow Queen	W	"	All districts
Independence *	Y	Early mid season	" "
Flavortop	Y	Mid season	Not Auckland
Redgold *	Y	" "	All districts
Fillery	Y	" "	" "
Goldmine *	W	" "	" "
Fantasia	Y	Late mid season	" "
Royal Giant	Y	Late	" "

## Peaches

The peach varieties listed ripen from December to early April.

W = white, Y = yellow, F = freestone, SC = semi-clingstone  
D = dessert B = bottling.

Variety	Description	Principle use	Maturity period	District Suitability
Springtime	W F	D	Early	All districts
Candor	Y SC	D	"	" "
Brigg's Red May	W SC	D	"	South Island
Dixired	Y SC	D	"	Not Auckland
Wiggins	W SC	D	Early mid season	All districts
Redhaven	Y F	D B	Mid season	" "
Glohaven	Y F	D B	" "	Not Auckland
Paragon	Y C	D B	" "	All districts
Halehaven	Y F	D B	" "	" "
Cresthaven	Y F	D B	Late	Not Auckland
Golden Queen	Y C	D B	"	All districts
Tatura Aurora	Y C	D B	"	" "

## Cherries

All cherries except Stella need pollinators. Cherries are not suited to the warmer parts of the North Island due to inadequate winter chilling to break dormancy. The varieties listed ripen from November to early January.

W = white      B = black

No.	Variety	Flesh colour	Maturity period	District suitability	Suggested pollinators
1	Early Rivers	B	Early	All districts	6,7
2	Merton Premier	B	Early mid season	" "	5
3	Dawson	B	Mid season	" "	1,5
4	Van	B	" "	" "	5
5	Compact Stella	B	Late mid season	" "	Not necessary
6	Florence	W	Late	" "	1,7
7	St. Margaret	B	Late	" "	1,5,6

## 1980 - 81 STATISTICS ON ACCIDENTS WITH GARDEN TOOLS

The following list is the number of compensated claims for the year 1980-81 issued by the Statistics Department :

Chainsaw	-	764
Axe, slasher, cleaver etc.	-	758
Mower - not hand-powered (incl. lawn)	-	535
Spade or shovel	-	412
Wheelbarrow	-	115
Garden tool N.E.I.	-	113
Lawnmower (hand-powered)	-	68
Fork (garden)	-	24
Hedge cutter	-	21



# CONSERVATION & PRESERVATION OF RARE & ENDANGERED PLANTS

As part of world wide efforts in the conservation and preservation of rare and endangered plants, the undersigned group wish to compile a register of persons actively participating in plant conservation in New Zealand.

The field of conservation of rare and endangered plants is wide and covers many aspects. We believe it is only by the efforts of a large team of enthusiasts that progress can be made.

You are invited to supply details of the area of conservations and specific plants in which your interest lies. What was the source of your seed or plants? Are you cultivating and/or propagating plants? Do you have seed or plants for dispersal?

From this resource information, it will be possible to identify the areas requiring interest to be fostered.

Most important, however, is the knowledge of exactly what is held as plant resources at present.

It is also our wish to record references of articles written on the subject of plant conservation, that you may be aware of.

Your assistance is also sought in tracking down persons involved in this work, and names and addresses are sought.

Your participation in this scheme will ensure you are kept informed of the collective efforts.

Yours faithfully,

G. Paterson A. Jolliffe J. Adam.

Members who have plants or information that they wish to supply should write to : G. Paterson, 26 King St., Timaru.

## OBITUARY

### MR. PERCY EVERETT

Mr. Everett, a past President of the Auckland District Council, died recently in Auckland. Mr. Everett had a long association with horticulture, from working on his father's orchard in Nelson, to owning his own in the Motueka area. Mr. Everett worked for the Department of Agriculture as a Horticultural Inspector for 37 years before retiring to establish a house plant nursery in Auckland.

Mr. Everett was made a Fellow of the R.N.Z.I.H. in 1965 and held a National Diploma in Horticulture and a National Certificate in Fruit Culture. He had a strong interest in sub-tropical fruits and palms which he had spent many years studying.

# WELCOME: to the following new members

Mrs. N. Crawford, Papatoetoe  
Ms. Janet Begg, Auckland  
Mrs. V. Strettell, Christchurch  
P.J. Borell, Christchurch  
M.H. Coulter, Ashburton  
D.B. Monagan, Napier  
C.G. Roebuck, New Plymouth  
A.D. Carson, Auckland  
C.D. Cowie, Wellington  
J.D. McIlroy, Ashburton  
J.B. Wilson, Tauranga  
Ms. M.L. Ayres, Christchurch  
Ms. V.H. Cooper, Rangiora  
Ms. K.J. Gower, New Plymouth  
R.C. Hylkema, Nelson  
N.J. Sheehan, Hamilton  
R.G. Giles-Pain, Auckland  
Ms. J.B. McPake, Hamilton  
F.T.J. Rooney, Dunedin  
W.K. Nelson, Wellington  
Ms. D.C. McInstry, Matamata  
D.A. Singer, Auckland  
O.R. Sutherland, Masterton  
Ms. M.J. Benson, Northland  
K. Dolan, Levin  
J.S. Ecuyer, Northland  
Ms. C.R. Kershaw, Pukekohe  
S.J. Share, Christchurch  
M.J.M. Boyd, Christchurch  
Ms. B.A. Griffiths  
Ms. C.J. Hutchison, Kumeu  
B.G. Macpherson, Auckland  
Ms. K.J. Reader, Te Awamutu  
Ms. M.A. Martin, Rotorua  
G.W. Russell, Keri Keri  
P.J. Scott, Auckland  
Ms. C.J. Torrance, Hamilton  
L.K. Warmington, Dargaville  
Ms. S.M. Willis, Te Puke  
Ms. L.A. Wright, Lower Hutt  
Ms. A.P. Calder, Hamilton  
J.P.C. Doidge, Auckland  
P.J. Forgesson, Te Puke  
Ms. L.J. Jonas, Te Puke  
R. Basile, Auckland  
A.J. Furlong, Tauranga  
Ms. C.A. Quaife, Cambridge  
P.J. Grimmett, Nelson  
P.R. Hopkins, Paraparaumu  
D.A. Carson, Hamilton  
I.A. Godfrey, Christchurch  
D. Looij, Hastings  
Ms. B.E. Nolan, Wellington  
C.P. Ryan, Auckland  
R.F. Tolladay, Auckland

Mrs. M. Walton, Christchurch  
Mr. A.A. Bending, Tauranga  
R.A. Baker, Auckland  
W.R. Brough, Picton  
Mrs. E.T. Crawford, Te Puke  
Ms. V.G. Paterson, Winton  
N.D. Adam, Palmerston North  
G.A. Clark, Mt. Maunganui  
Mrs. S.A. Downes, Hastings  
R.J. Van Rooyen, Waitara  
D.F. Winwood, Invercargill  
Miss P.J. Blount, Tauranga  
R.A. Dalton, Auckland  
Mrs. J. Hayman, Howick  
P.S. Mears, Auckland  
M.D. De Goldi, Greymouth  
Ms. M.S. Gowing, Auckland  
Ms. D.H. O'Brien, Napier  
S.M. Schicker, New Plymouth  
Ms. J.M. McGiven, Whangarei  
G.T. Place, Hastings  
S. Soole, Dargaville  
G.C. Baker, Rangiora  
P.C. Bridgman, Te Puke  
L.M. Dryden, Rotorua  
S.A. Jeffries, Palmerston North  
S.K. Lowe, New Plymouth  
G.P. Swinburn, Auckland  
Ms. L.P. Dee, Mt. Maunganui  
G.L. Harrow, Christchurch  
M. Lloyd, Christchurch  
M.L. Paget, Rotorua  
P.A. Kordina, Auckland  
Ms. K.A. Panckhurst, Hamilton  
Ms. J.C. Samuels, Dunedin  
Ms. T. Stringer, Oamaru  
Ms. C. Wacker, Tauranga  
P.I. Willis, Te Puke  
M.L. Wilmot, Warkworth  
Ms. A.L. Barnes, New Plymouth  
B.C. Daw, Auckland  
A.R. Floyd, Lower Hutt  
G.F. Henry, Rotorua  
N.W. Aitken, Te Puke  
D. Dalton, Auckland  
A.M. Logan, Napier  
Ms. V.R. Williams, Whataroa  
Ms. R.J. Henderson, Tauranga  
M.R. Bott, Waikanae  
Ms. J.S. Gardner, Wellington  
S.K. Kelly, Auckland  
R.A.S. Logan, Dunedin  
J.M. Norfolk, Levin  
S.J. Thompson, Levin  
M.P. Van Tilburg, Tuakau

T.E. Welsh, Palmerston North  
Miss C.P. Anselmi, Whangarei  
B.R. Marsh, Auckland  
L.W. Kane, Hamilton  
A.T. Page, Dunedin  
Miss S.J. Pendreigh, Auckland  
Crawford B.E., Waikanae  
Pedersen Miss D., Auckland  
P. Webber, Auckland.

Miss S. Foster, Auckland  
K. Mackie, Alexandra  
J.M. Hensley, Thames  
Ms. F.J. Macleod, Napier  
Miss R.A. Parkes, Christchurch  
Miss J.M. Wood, Auckland  
Moir J.C. Wellington  
Miss J.M. Veldhoen, Auckland

## HORTICULTURE

Horticulture, the practice carried out by eternal optimists of trying to bludgeon a living out of mother earth by growing things on it or in it and by feeding the results to people direct or by feeding animals with the results and then feeding the animals to the people ..... the greatest con trick, or occupational therapy of all time, and as those in horticulture are not going to let on that they have been sold a pup they put on a brave face, causing the rest of the population to envy the grower his apparently peaceful, satisfying, leisurely way of life and to spend their lives desperately trying to get in on the deal.



## QUESTIONNAIRE

Please complete the following questions and return to :

David Shillito, Editor 'Horticulture in N.Z.', P.O. Box 12, Lincoln College,  
Canterbury.

Please tick the appropriate box

1. Age group    18-25 yrs.     25-45 yrs     45-60 yrs     over 60
2. Are you a :    General Member     Commercial Firm   
                  Park & Reserve Dept.   
                  Student  main field of work is \_\_\_\_\_  
                  Other \_\_\_\_\_  
                  (Please state)
3. Employment : Are you a horticultural apprentice   
                  Do you work in the general field of horticulture   
                  Is your interest in horticulture only part time   
                  Are you retired from a profession in horticulture   
                  Are you retired and have an interest in horticulture
4. Do you have : N.D.H.  Horticultural Diplomas   
                  National Certificates  Horticultural Degrees   
                  Other \_\_\_\_\_  
                  (Please state)
5. Are you going for : N.D.H.  Horticultural Diplomas   
                  National Certificate  Horticultural Degrees   
                  Other \_\_\_\_\_  
                  (Please State)
6. What are your main interests in horticulture :
  - a. Commercial flower production
  - b. Commercial fruit production
  - c. Commercial vegetable production
  - d. Commercial nursery production
  - e. General fruit production
  - f. General vegetable production
  - g. Roses
  - h. Herbaceous plants
  - i. Trees & shrubs
  - j. Bulbs
  - k. Rock gardens
  - l. Orchids
  - m. Indoor plants

Any others \_\_\_\_\_  
(Please state)
7. Which of the above would you like to see covered in future bulletins  
in articles or things of interest related to them.  
(List letters only) \_\_\_\_\_  
                  Others \_\_\_\_\_
8. If you have any other ideas or suggestions for future bulletins or the  
Institute as a whole, please list.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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# STUDENT SECTION



## EDITORIAL

Well fellow students, Spring is upon us again and what a busy time it is. The garden is showing some life once again, the weeds are starting to flourish, and I've had to dig the lawn-mower out of the shed again. Of course there's always an excuse for not working in the garden - exams. Most students will, no doubt, by now have almost completed their assignments and started revision work. Take heed of the advice given in the article on examination technique. It may help you pick up a few more marks which could be the difference between a pass or failure.

A welcome to Dave Shillito to the helm of the Bulletin. His experience and enthusiasm should ensure that this publication continues to fulfil the interests of R.N.Z.I.H. members.

Every success with your exams.

- Merv. Spurway



# PLANT TISSUE CULTURE AS A COMMERCIAL PROPAGATION TECHNIQUE

*by M. Oates, Technical Correspondence Institute.*

A completely new approach to plant propagation has emerged in the last few years, based on the technique of plant tissue culture or micro vegetative propagation. After many years of research and development it is now used both in New Zealand and overseas for the commercial propagation of a wide range of plants. As horticultural students it is important that you understand the principles of propagation by tissue culture, its advantages over conventional methods, and also its limitations.

Tissue culture is the isolation and growing of a small portion of plant material (explant) in sterile conditions on a nutrient (culture) medium in a sealed container, such as a tube or flask. The important factor with this propagation method is complete sterility, as the explant used has no epidermal layer for protection against microbial contamination. The diagram shows a typical tissue culture method. For convenience it is often divided into four stages :

1. Initiating the tissue culture.
2. Multiplication of the explant.
3. Preparation of new plants for transfer to soil.
4. Re-establishing the plants in soil.

Cultures can be started from meristems, leaf pieces, nodal cuttings, root pieces, pollen, embryos and even single cells. Carnation, for instance, is cultured from meristem tips, narcissus from pieces of bulb scale and African violets from pieces of leaf. The nutrient medium supplies the explant with all the substances it needs to maintain growth. The medium also contains growth regulators, usually cytokinins and auxins that control shoot and root growth. During culture the explants are placed in a controlled environment room (see photograph) which is usually maintained at a constant temperature of 25°C. This can however vary slightly depending on the species cultured. Fluorescent lighting is also used for up to 16 hours daily. The intensity is low, and not usually enough for photosynthesis to take place in the explant. The explant does not need to photosynthesise as it is provided with carbohydrates in the nutrient medium.

The main advantages of propagation by tissue culture are :

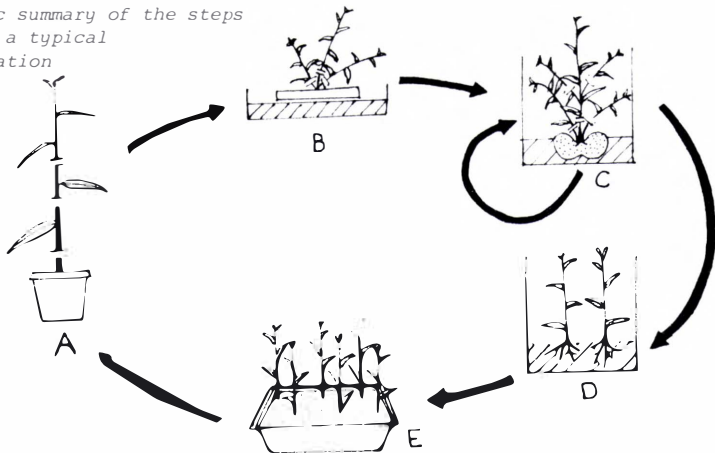
1. The rapid multiplication of slow-growing or difficult to root plants. An example which demonstrates this well would be the propagation of the cut flower gerbera. The usual propagation method for gerbera hybrids was by division of the crown, as seed grown plants would not come true to type. This method produced between 50-100 plants a year from each parent. Using tissue culture techniques, up to one million new plants could be produced from a single parent. In practice however, this number would never be reached because of availability of labour, lack of space, and other practical limitations.

In New Zealand at the moment, tissue culture is playing an important part in the bulking up of new fruit cultivars. This is a way of increasing numbers rapidly, so that distribution to the trade for commercial planting can take place as quickly as possible. This year two new feijoa cultivars, 'Apollo' and 'Gemini' are being released, having been bulked up by tissue culture from promising selections.

2. By using the tissue culture technique of meristem tip culture, virus-free plants can be produced and bulked up in large quantities. The vigour and yield of many crop plants can be greatly increased by eliminating viruses. This technique alone is often not enough to eliminate virus diseases from some plants and is combined with heat treatment or thermotherapy. Meristem tip culture has now become a well established technique for eliminating virus diseases from a number of crop plants including : carnation, chrysanthemum, hops, gooseberry, blackcurrant and strawberry. The New Zealand Nurserymen's Association in conjunction with the Nursery Research Centre is running a programme at the moment to produce high health or virus and disease free stock of ornamental plants. They are using meristem tip culture and thermotherapy to eliminate virus diseases.

3. Tissue culture also allows year round production of plants to make use of the facilities required. Fewer stock plants are also required to provide culture material because smaller pieces of material are taken than for conventional propagation methods and also from each original explant, many new plants can be produced.

*Diagrammatic summary of the steps involved in a typical micropropagation method.*



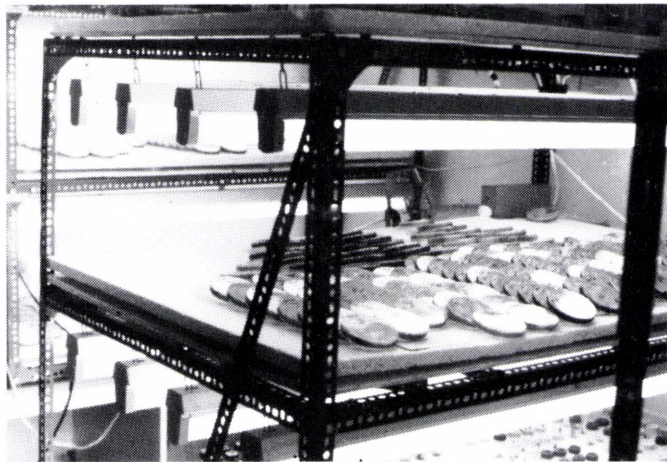
Single node segments are taken from the parent plant (A), and after surface-sterilisation they are planted on a suitable culture medium. In medium containing a cytokinin the axillary bud develops into one or more shoots (B). Individual shoots are excised from these cultures and transferred to a fresh shoot-proliferation medium. Within 3-4 weeks each shoot develops 3-5 new shoots (C). Individual shoots can be excised again and the shoot-proliferation cycle repeated indefinitely. When an adequate number of shoots have been produced, some material is kept for further shoot multiplication and some is transferred to rooting medium (D). After a satisfactory root system has developed, the plantlets are transferred to a well-draining potting mix (E) and maintained under high humidity for the first 10-15 days.

From the information given, you can see that the potential for this propagation method is enormous. There are however a number of serious disadvantages and possible hazards in propagating by tissue culture and we will now consider these.

#### (a) Production methods

A lot of research and development is required before plant species can be grown commercially by tissue culture. Nutrient medium and environmental conditions required vary between plant species and these requirements must first be established before commercial production can commence. For a major horticultural crop this work and its associated costs may be worthwhile, but for many ornamental crops with limited markets these research costs may be prohibitive.

The maintenance of sterility at all stages of culture can also be a serious problem. Despite precautions, contamination can occur during dissection and transfer of plant material from one medium to another. This can prove disastrous in a commercial situation.



*Controlled  
Environment room*

The hardening-off process can also prove difficult. Plants must be transferred from the highly protected environment of a test tube into a normal growing medium. Unless hardening-off procedures are closely adhered to, losses will occur.

#### (b) Production costs

Although tissue culture methods can produce large numbers of plants in a short period, it is not a cheap propagation method. Establishing a commercial tissue culture laboratory requires a large capital investment. Running costs are high and skilled technicians are required to perform the dissection and transfer of explants. This type of propagation is more economic for large numbers of plants. Utilisation of the facility all the year round is also necessary to make full use of the capital.

### (c) The quality of the end product

Propagation of plants by this method, can in some cases produce plants that are genetically different from the parent plant. The chances of this happening depend on the type of growth the explant produces. New plants formed from callus tissue are often genetically different from the parent plant, and so callus production is avoided in commercial production at the moment.

In concluding, you should realise that in years to come tissue culture techniques will be used more widely in commercial propagation. It is not a replacement for conventional methods and is only worthwhile when there is a premium on the rapid build-up of plant numbers, where freedom from viruses and other systemic diseases is required or when it can be of use in some aspect of plant breeding or research.

## DEEP SOUTH PARADISE

by Trevor Wright - N.D.H. Student

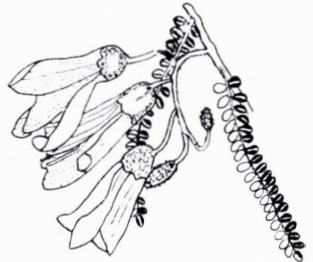
It is often inferred that the further north one ventures, the more wondrous is the world of horticulture, this may be; or perhaps those in the north have convinced the southerners of this?

I have lived in Invercargill through two winters now, and have grown orchids out of doors in the shelter of the eaves. Cymbidiums have been placed inside a glasshouse when flower spikes become obvious, other "cool" orchids have done well also.

Many frost tender shrubs can be seen thriving in Invercargill's Queen's Park, *Erica* spp, *Protea* spp, *Hakea* spp, and so on. I think it must be because of the more temperate nature of the climate.

Why don't all you aspiring plant lovers make a visit to the deep south soon? You will be glad you did!

Did you know the native kowhai (*Sophora* sp.) is POISONOUS? All parts, but in particular the seeds, contain the alkaloid toxin cytisine causing diarrhoea and abdominal pains if eaten.



# UNDERSTANDING THE CONTAINER SYSTEM

*The following notes were in support of an address to the Horticultural Merchants Ltd. seminar, Christchurch, July 1981, by Mr. C.E. Whitcomb, Oklahoma State University, U.S.A.*

Most experts agree that more plants in containers are killed by excess water and poor drainage than any other single factor. However, when it comes to describing why the overwatering/drainage complex is responsible, it is somewhat difficult to explain. This is an attempt to relate some of the factors that influence drainage from a container and how to best maintain plants in the container system.

When plants are watered excessively, the amount of oxygen diffusing to the root system is decreased. The amount of carbon dioxide on the other hand is increased since the carbon dioxide comes from the living roots and bacteria and fungi in the soil. There is evidence to suggest that the carbon dioxide content alone, if it reaches too high a level, can be toxic and cause the deterioration of roots of plants in containers. If the growing medium in the container, "the soil", is made up of materials which create very small pores or air spaces, the growing medium will retain large quantities of water. On the other hand, if the growing medium is a mixture of materials which have some large pores or air spaces, the container is going to retain much less water (Figure 1).

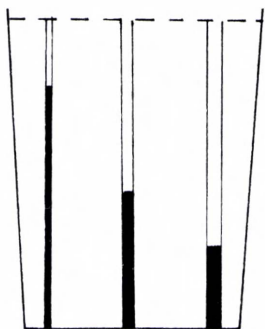


Figure 1. The quantity of water held in a container depends in part on the size of the pores or spaces in the mix, the smaller the pores, the more water held.

Because the column of growing medium is not continuous as soil is under outdoor conditions, the water collects or accumulates where the soil stops, that is, at the bottom of the container. This restriction of downward flow of water occurs in containers with no bottoms or wire bottoms as well since the column is broken. Therefore, the more shallow the container, the less growing medium in the top of the container that is well drained and suitable for good root growth (Figure 2).

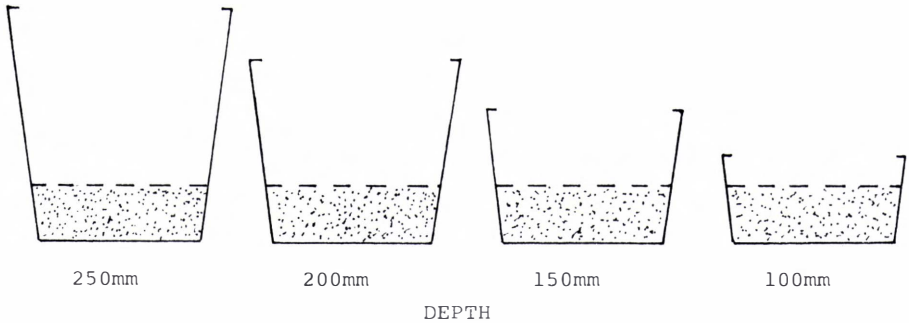


Figure 2. When the same growing medium is placed in containers of varying depth, as the container depth decreases the proportion of well drained growing medium also decreases.

Likewise, the deeper the container, the more growing medium that is going to be well drained and suitable for root growth. The desirable combination is a moderate depth container with a growing medium of moderate texture. Therefore, the more shallow the container, the more porous the growing medium must be. Likewise, the deeper the container, the smaller the pores can be within reasonable limits.

This balance of container depth and texture of the growing medium controls the rate at which oxygen can diffuse into the root zone of the plant. All oxygen must enter through the surface of the pot or through the drain holes on plastic or metal containers or glazed pottery (Figure 3). However, when clay pots are used that are not glazed, some oxygen does diffuse through the side of the container particularly when the container is new and the pores have not become clogged by soil particles or salts. The reason most plants have the bulk of their roots in the surface and around the sides of the growing medium is the higher concentration of oxygen and thus the best growing conditions for the roots. Placing gravel in the bottom of a container has the effect of making the container more shallow and therefore less well drained. By contrast, container diameter has no effect on drainage.

Some water contains considerable amounts of dissolved salts, particularly calcium, magnesium, sodium and bicarbonates. These salts and salts that enter the container from fertilizers build up to levels that suppress root and top growth and may cause "burning" of the foliage. The most practical way to remove excess salts is by leaching the container.

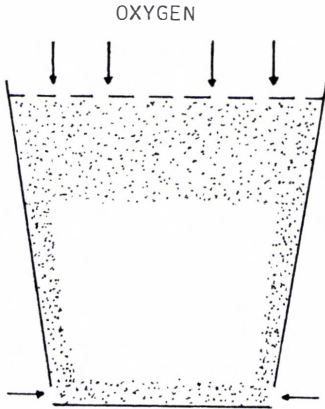


Figure 3. Oxygen must re-enter the container after each watering, primarily from the surface of the growing medium. For best results, use a container as large and as deep as practical. Use a soil mix of a texture that will provide ready movement of water. Do not use gravel in containers with drain holes, however, gravel must be used in drainless containers.

This is a flooding or repeated heavy watering of the container which carries the salts out of the drainholes, away from the root system of the plant. In order for this approach to be effective, the growing medium must be moderately porous to allow water to move rapidly through the container. If the container is sitting in a saucer or depression of a plastic covered production bed, the water may go out of the drainhole but is still in contact with the basic soil mix inside the container, thus little or no benefit is going to be derived. When water exits the drainhole, either through normal rainfall or watering or from extensive watering to leach salts from the container, the water should leave the bottom of the container and enter the gravel below or be carried away by the slope of a plastic covered bed surface (Figure 4).

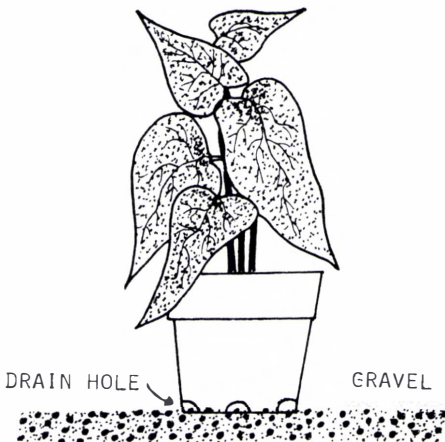


Figure 4. In addition to drainage inside the container which is controlled by the texture of the growing medium and depth, the water which exits the drain holes must be free to move away.



As components in the growing medium break down the texture and depth decrease, reducing drainage and increasing water retention.

To determine the water holding capacity and drainable pore space of a growing medium follow these steps :

1. Select 4 or more containers of the depth to be used. Remember that in shorter or taller containers the air space will vary.
2. Clean the area around all drain holes and tape the holes shut with duct tape. Be sure not to allow folds in the tape which may leak. An alternate technique is to place a freezer bag of sufficient size in the container to act as a waterproof liner.
3. Fill the container with the growing medium in question, firm it as though a liner was being planted.
4. Take a known volume of water and slowly fill the container until the growing medium is fully saturated. Allow the container to sit for one hour or longer. (If bark and peat are components of the growing media and they are very dry, additional time may be required.) Add additional water as needed since the growing medium may absorb a sizeable quantity. Record the total volume of water added. This represents the total pore space for the growing medium in this depth container.
5. Suspend the container over a larger water tight container and remove the tape from the drain holes or puncture the freezer bag liner through the drain holes. Allow 5 to 10 minutes for drainage. Do not tilt or tip the container as this increases the length of the drainage column (depth) and will give a false reading.
6. Record the volume of water drained from the container.
7. Divide the volume drained from the container by the total volume of water added. This figure represents the percent drainable pore space and should be 20-30%. In general, fresh media with values below 20% are unsuitable for most container plants. Likewise, values above 32 to 35% represent excessive drainage and therefore, a limited supply of available water. This means frequent irrigation and probably more leaching of nutrients. However, an exception to this general rule lies in media used for either propagation of cuttings or germination of seed especially subject to overwatering and/or damping off. In these cases, particularly where shallow flats or individual containers are involved, the drainable pore space should be 40% or higher.

It is also advisable to perform a drainage test on growing media that has been in use for some time. Such a test is especially important when new growing medium components are being tested. Compaction and shrinkage of most media occurs with normal settling, watering and decomposition of

some of the organic matter particles. In addition, plant roots fill some of the pores, especially around the sides of the container and at the bottom. In general, values below 15% after 6 months are likely to cause root suffocation if overwatering occurs either from irrigation or rainfall.

## KNIGHTIA EXCELSA IN DUNEDIN

by P.B. Heenan, N.D.H. Student.

*Knightsia excelsa* or as it is commonly known New Zealand honeysuckle or Rewa rewa, is one of New Zealand's two trees belonging to the family Protaceae.

This tree has lovely red bottle brush-like flowers in 10cm long racemes, which appear in Dunedin in December. Tuis and bellbirds are attracted to these flowers which have a pungent odour. These birds are thought to be the main pollinators. The fruit is a follicle which splits into two boat-shaped valves. Its leaves are linear-oblong, up to 20cm in length and are bluntly serrate. Young leaves and branchlets are densely clothed with a reddish-brown velvety tomentum.

Found throughout the North Island and around Marlborough, it is named in honour of Thomas Knight (1759-1838). He was a plant physiologist and friend of Sir Joseph Banks who discovered it in Tolaga Bay in 1769 on Captain Cook's first voyage to New Zealand. The species name 'excelsus' means high, lofty or tall.

Plants can be readily raised from seed which ripens around July in Dunedin. I have seen several self-sown seedlings growing under flowering size specimens in Dunedin. Nurseries also sell them in limited quantities.

Rewa rewa, as the Maoris called it, grows in almost any well drained friable soil in either sun or shade. They will also tolerate a very dry situation, but growth will be slow. For instance, a five metre tree at the Otago Early Settlers Museum is growing under the building's eaves in a very dry soil. It is in a very healthy condition nevertheless. Young plants prefer to be grown in association with other plants until firmly established. Several young plants that I know of tolerated some heavy frosts last winter with no evidence of damage.

In Dunedin's climate New Zealand honeysuckle grows very quickly. A one metre tree planted in my garden in January 1982, has already grown 30cm. This must put to rest the belief held by so many people, that natives (in this case Rewa rewa), grow only slowly.

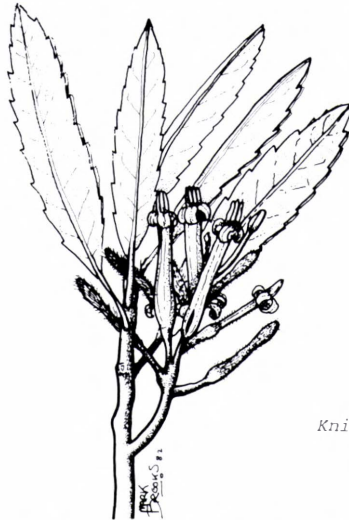
*Knightsia excelsa* is a tree represented in the Dunedin Botanic Gardens by four large specimens. One tree in the New Zealand Plant Border is 12 metres high, and there are three more very

healthy specimens in a section of native bush opposite the Hebe Border on Lovelock Avenue.

The best specimen I know of in Dunedin is in the garden outside the Otago Museum in Great King Street. This tree is about 20 metres high and resembles a lombardy poplar with its tall upright habit, which suggests that it would make an excellent specimen tree. Its striking "rough" foliage is also attractive all year.

There are several other specimens in private gardens in Dunedin, and the University of Otago has used it in landscaping around buildings fronting on to Cumberland Street.

To sum up, it is a tree which has proved itself hardy and quick growing in Dunedin's temperate climate and I think it is a plant which should be used more widely in landscaping.



*Knightia excelsa*

#### CARNIVOROUS PLANT SOCIETY

In response to interest shown in carnivorous plants, the New Zealand Carnivorous Plant Society (N.Z.C.P.S.) has been formed and the first general meeting was recently held in Christchurch.

The Society aims to provide an exchange of information, particularly relevant to N.Z. conditions, and co-ordinate the effects in procuring and propagating carnivorous plants. The annual subscription is \$5.00 which entitles members to a quarterly newsletter and access to a seed bank and plant exchange.

If interested in joining contact :

The Secretary,  
N.Z.C.P.S.  
561 Harewood Road,  
CHRISTCHURCH

# NURSERY PLANTS FOR EXPORT MARKETS

by B.L. McKenzie, Topline Nurseries Ltd., N.Z. (from 'The International Plant Propagators' Society Combined Proceedings, Vol 29, 1979.)

It is essential that a thorough examination is made into the export of live plants before any commitment is made.

In ten years we have seen considerable leaps in the value of live plant exports. The following is the F.O.B. value of live plant exports (ref. N.Z. Statistics Department).

1969	-	\$39,600
1972	-	\$96,800
1976	-	\$141,195
1978	-	\$530,859 (export to 27 countries)
1979	-	\$1,172,844

In the last 12 months (between July 1, 1978 and June 30, 1979) we have seen a jump of over 100%. Once again I stress that these figures are F.O.B., i.e. not including insurance or freight costs.

Over the past three years I have been fortunate to be able to look at market possibilities in England, France, Japan, Saudi Arabia, U.S.A. and Thailand, and from these trips have been able to formulate definite patterns as to crops to grow and what the customer expects. It is very easy to fix in our minds likes and dislikes to certain plants that are always in demand in New Zealand and, if given sufficient thought, one can almost be certain that this plant would be a seller in a certain country. Careful planning and research of markets must be made before expansion and growing plans are implemented. An example of this is the liking the French have for red colours and any such plant giving a display of red and which can grow in their climate results in interest and sales. This certainly does not mean that interest does not exist for general stock. Comparing two plants (1) *Photinia* and (2) *Cortaderia* 'Gold Band', the first is new but is giving what many ask for - the red colour. The second can be found in large numbers and *Cortaderia* as a plant is grown not only for colour of plume but for the flowering period. 'Gold Band' is a new form giving yellow variegated foliage; to sell the plant it is not necessary to sell it as an entirely new plant, but market it purely for its variegations. Still using these two plants as samples, it is necessary to understand what the customer expects as a "liner" so that when delivery is made, disappointment will not occur, which can result in delayed payments. It is also necessary to ensure that the delivery date from New Zealand is acceptable to the buyer - yet delivery times are mainly set by when the plant is suitable for shipping. *Photinia* for delivery in March can be too soft if late growth is experienced, whereas delivery in May/June should be recommended.

## Stock Plant and Seed Sources

Mother plants must be selected for even growth and be true-to-type. When volume is required sufficient stock must be available not only to produce the number required but to allow for those which do not make the grade, as well as rejects when packing. Seed sources must be reliable not only for trueness-to-type, but delivery dates as well, so that the grade can be obtained to meet that which has been quoted to the customer as a delivery date.

## Cutting and Seed Production

A high standard of hygiene throughout the growing season is essential and this starts from the mother stock through to the work area, the propagation area, and the general liner beds. Consideration must be given to all visible pests and diseases but, equally important, root inspection during the growing period is essential so that root rot diseases can be detected at an early date, and the necessary action applied.

## Media for Growing

It is essential to be fully aware of the quarantine requirements of the countries to which you intend to export and, if necessary, grow in a medium acceptable to that country. Recently we have seen the move toward bark in growing media; as this is a wood product and classified the same as sawdust it is not acceptable to ship into countries which currently accept only our peat/sand media on the roots.

## Packing Preparations

A clean well-prepared packing shed is necessary which offers adequate shade and light. Preparation benches should be clean and preferably covered with polythene so that cleanliness can be maintained. Plants once shaken out should be carefully examined, trimmed, and prepared for dipping through a fungicide and insecticide dip. Dipping the plants once they are rolled can be acceptable for certain plants, but where large foliage or dense foliage is present, individual dipping is advised. This avoids foliage remaining wet for a long period; if packed in this condition overheating will occur, resulting in damaged plants at the destination.

Inspection by a Ministry of Agriculture Field Officer should be made at this stage and, if necessary, depending upon the size of the shipment, several inspections may be required. Early advice to the M.A.F. is necessary and where weekly consignments are being shipped, a schedule of times and dates for inspection should be made available to the Field Officers as early as possible.

## Packing Media

Generally accepted world-wide is sphagnum moss and, in some countries, peat. Whichever medium is used, it must be free of foreign material and be of a very high quality. If countries such as Japan are receiving the goods, it is advisable to fumigate the moss or peat first so that any

organism is destroyed. In recent tests large numbers of saprophytic nematodes were found in moss and peat, although we are aware that they cause no harm to the plants, they can be confused with other parasitic nematodes and, if this is the case, the receiving Authorities can and will fumigate without question. It is essential that every factor be considered when shipping as delays can cause losses as well as loss of goodwill. The use of woodwool should be avoided as this is forbidden in many countries; clean shredded newsprint is recommended.

### Cartons

Strong waxed boxes with adequate ventilation are recommended. The plants are stood upright and held firmly into position by each other. At no stage should the plants be covered with plastic as this causes overheating and sweating.

What I have covered here are only a few of the important considerations required for exporting. Before involving oneself to any great financial cost a thorough examination should be made covering all aspects from growing to marketing as one weak link can result in losses to all parties. Growing for export can only be considered a challenging and rewarding market.

## **STORM DAMAGE AT PUKEITI**

Friday 9th April was anything but Good Friday for Pukeiti. Cyclone Bernie, even in its dying stages, hit Pukeiti with such force as to leave a trail of destruction, the like of which we had never seen before.

The bare facts are that the winds increased in velocity all day and that most damage was done between mid-afternoon and midnight. Saturday dawned fine and calm and we were able to survey the devastation. Every track on the property was blocked by fallen trees. More than 100 rhododendrons were destroyed including many as old as Pukeiti itself. More than 3,000 bush trees were blown down. Pukeiti's own pine plantation received severe damage, with the 13 acre roadside block totally destroyed.

On top of this we were without power for 20 hours, the phone for 5 days and road access to New Plymouth for eight days.

On the credit side there were no injuries to staff or visitors and very little damage to buildings.

Clearance work is still underway but thanks to help from members and service clubs the worst has been dealt with. The gaps remain, but major replanting is underway and Spring, Pukeiti blooms again.

# EXAMINER'S COMMENTS

The following brief comments have been forwarded by Mr. J.O. Taylor, written examiner in Special Subject No. 20, First Schedule, N.D.H.

The principles apply to all students sitting written papers.

1. If an examiner cannot read the writing or understand what has been written no marks are given for that part or all of the question.
2. The following statements contribute little or no information from which an examiner can judge the knowledge of the candidate, therefore no marks are given :
  - a) "Remove weeds from the area using a suitable weedkiller." (The answer should read : To remove broad leaved weeds such as plantain, catsear, dandelion, lawn daisy, from an established lawn, use a mixture of M.C.P.P. and M.C.P.A. One good trade mixture is 'Turfmaster'.)
  - b) "If the pH is known then fertilisers can be added to alter this up or down." (The answer should indicate which fertilisers may lower a pH and which fertilisers and lime will raise a pH. Application rates should also be given.)
  - c) "Seed should be sown at the rate of 35g/m<sup>2</sup> using a mixture of browntop and chewing's fescue." (The answer should be : A sowing rate of 20g /m<sup>2</sup> using 7 parts by weight of chewing's fescue and 3 parts by weight of N.Z. browntop. Preferably the fescue, which is a large seed, should be sown first and lightly raked in and the browntop sown later but not raked in.) Further marks would be gained if the student gave the correct botanical names of the grasses and recommended a new cultivar of browntop such as 'Tracentia' and a new fescue such as 'Barfalla'.
  - d) "Most lawn problems are caused by soil fertility, soil type, soil acidity, humidity and watering." This sort of statement is useless in an examination. The examiner wants to find out what the student knows. Generalisations, such as the above are misleading in every sense. If the student has knowledge that soil fertility causes lawn problems, then he or she should make a clear and correct statement. For example : Poor soil fertility where potash, nitrogen or phosphorous may be lacking should be corrected after a soil test has shown which of the elements is deficient. However, the statement by the student said "caused by soil fertility" which could also be interpreted as high soil fertility. Likewise, "soil type", "soil acidity", etc. mean nothing because of their generality. In fact the statement indicates a gross lack of knowledge.
3. Metric measurements should now be used by all students.



# EXAMINATION TECHNIQUE

*(Based on 'SWOT, Study without Tears - A Guide to Effective Study Practices' by P. Jackson, N. Reid and C. Croft, N.Z. Council for Educational Research.)*

There are many ways in which a student can perform poorly in an examination even when the answers are known. The following article provides a guide to improving examination technique.

## Introduction

It is important to start preparing early for examinations. In fact preparation should have started on the first day of your course. By early, planned, study, information is easily remembered and understood and there will be no last minute cram.

Find out as much as possible about the examination, e.g. number of questions, type of questions, if there is any choice. Old examination papers give a good indication. It is important to make up an effective study schedule and use it.

Good examinations are not designed to trick you. The examiner genuinely wants to know how much you have understood. Good examination technique is important.

## Prior to the Examination

1. Do not study the evening before an examination except for a brief review of your notes. Get a good night's sleep.
2. Make sure you have all the materials you are allowed or are supposed to take into the exam room with you, e.g. spare pens, calculator, etc.
3. Plan to arrive at the exam room well before the scheduled starting time.
4. If possible, wear a watch in case there's no clock in the exam room.
5. While a little anxiety before an exam is a good sign (it shows you are concerned about the exam and not over-confident), you should try to relax as much as possible. Use ways of relaxing that you find most helpful.

## In the Examination Room

1. If temperature, ventilation or light are inadequate and they cause you to feel uncomfortable, get something done about it. Tell the person in charge and if necessary change your seat.
2. Check the timing system. Generally a room clock will be used to time the exam, so work out your timings on that clock. If you have a watch, take it, just in case there is no clock in the room.

## The Examination Paper

1. Normally you will be given time to read the instructions before the exam starts. Carefully read the instructions to the exam paper. Any misunderstanding of, or failure to follow the directions will result in lost marks. Be careful that your reading of old exam papers has not led you to false expectations.
2. Plan your time carefully. This is very important and must be done accurately. Failure to do this can result in questions either being left out or rushed through. The best way to divide your time is on the basis of the number of marks allocated to each question. In addition you should ensure that you have a little at the end of the exam for checking. For example, if an exam requires you to answer five questions in three hours and each is worth 20 marks, you should allot 30 minutes to answering each question ( $30 \times 5 = 150$  minutes). This leaves 30 minutes to re-read your answers, add to them if necessary, and generally check what you have written.



3. Read the essay questions carefully. This is essential, especially if there is a choice of questions. Your choice of questions to answer is crucial. It is most important to select questions that you are best able to answer. Make your decisions quickly. Tick those questions that you think you can do well and mark with a cross those questions that you think you cannot do at all or only poorly. This will help you to select questions and also to decide on the order in which they should be attempted.

Make sure your choice of questions to answer follows the instructions; for example, one question from Section A, and two from Section B, and so on. Next decide on the order in which you will answer the questions. In essay exams, firstly answer those you consider the easiest. This gives you the confidence that comes from knowing you have some marks already. Make sure you number your answers correctly. If you number your answer incorrectly or fail to number it at all, you will get no marks for your work. If the exam, or part of the exam, is in objective or multiple-choice form, then you can leave reading the questions until you are ready to answer them. You should answer these types of questions in the order they appear in the exam paper.

## The Answers

1. For essay/short answer questions the wording is very important. You must consider the words in the question which indicate the emphasis required in the answer. Examples of these key words are : compare, contrast, discuss, summarise, outline. Do not just write all you know about a topic. Your answer must be structured to satisfy the wording of the question. So carefully read the question and decide what kind of answer the examiner wants.

The following list will help :

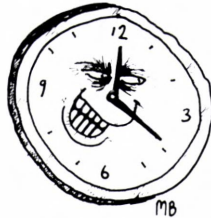
<u>Key Word</u>	<u>Meaning</u>
define	- give the exact meaning
analyse/examine	- look closely and give the essential features
compare/contrast	- give the main similarities and differences
illustrate	- explain by giving examples
describe/discuss/ explain	- give a detailed account of the main features or principles
outline	- give the main features or principles
review/summarise	- give a general account of main features or principles
trace	- give a step-by-step account of the development
list	- give a catalogue

2. Before you begin writing, make an outline on scrap paper. Jot down the main headings and the main points of your answer. Do not start to write your essay until you know how you are going to begin and end your answer.
3. Express yourself simply. Make sure all the relevant facts are included to support your answer. Do not 'pad' your answer; contrary to popular opinion, this fools no one.
4. Take care with handwriting and spelling. Attention to these will make your answers easier to read and therefore it will be easier for the marker to decide on the worth of your answer.
5. Make your answer the length and type specified. If short notes are asked for, then short notes are required. If you are asked to answer something in, say 100 words, then write about 100 words do not write 200 or more.

### Near the End of the Examination

1. Make sure you have attempted all the questions that you had to do. You will find it easier to get the first five marks for a 20 mark essay question or a problem than it is to get the last few marks, that is, to go from 15-20, and every question or part-question left out means marks that you cannot get.

2. Check all your answers. Look for any words that are illegible or mis-spelt. If you have difficulty in reading and understanding your answer, then the marker will find it even harder. If you have time, improve the legibility of your writing where necessary.



3. Make sure all questions are properly numbered. Unnumbered questions may not be marked.
4. Never leave the exam room before time is up. Continual checking can only help, but do not try to rewrite large parts of your answers unless you have enough time to complete your rewriting.

## OLD FASHIONED COTTAGE GARDENS

*by M. Walker, N.D.H. Student*

Old fashioned cottage gardens to some people look rather messy at first glance, but with a closer look at a well planned and planted area, you should eventually end up smiling, then maybe thinking about doing the same in your own garden.

The first thing you should do when planning a garden, especially in the city where all the sections are square or rectangular with boring lines, is to create curves and interesting points like arch ways with old fashioned roses growing over them or creepers clinging to verandah posts. Most modern houses don't lend themselves towards this informal method of gardening and so the house would preferably be an old and interesting one with loads of character. Straight lines of paths can be easily broken by letting low, matting plants such as Livingstone daisies creep over the edges.

Daisies of every description are most attractive and vary in height from 2cm to 2m with every colour of the rainbow available. Some of the newest cultivars are tending towards larger flowers that last longer when cut, and these are best avoided as they put too much emphasis on the one particular plant instead of harmonising with the rest of the garden.

These gardens need a lot of planning as many of the plants are herbaceous perennials and when they are dormant the gaps look awful, so one or two strategically placed evergreens or winter/spring flowering plants and heaps of bulbs detract from any such area.

There should be no need to tell any student about the importance of drainage and fertility, but I've found the best thing to add to the garden is spent mushroom compost. Be careful, as this contains a lot of lime so don't go spreading it around rhododendrons or camellias and suchlike acid-loving plants.

Ideally the new garden should be set out as a plan on a piece of paper first, but a great deal of knowledge or research is needed to get it right, and even if you think it looks right, wait till you plant it - you'll never be satisfied.

To get the natural look, the plants must be planted in drifts with no rows of border plants ranging from short at the front to tall at the back. Instead you must let some of the taller or medium height plants spill forward amongst the short ones, sometimes reaching the front, to break that formal look, thus creating interesting pockets.

Staking is rarely necessary when the plants are in groups. This helps keep one another upright, looks more natural and you don't have to tread on the other plants. Have three to five plants together, depending on the size of the bed and on the size of the pocket.

Most of the older style plants can be obtained from nurseries everywhere or 'granny's' garden and after the initial planting just wait four or so years and you can divide, re-plant or sell the excess stock.

Nearly all the herbaceous perennials used in cottage gardens can be divided in Autumn or Spring, or cuttings taken of the new shoots in Spring simply by removing a basal portion with a few roots attached. Cutting back spent flower heads to ground level immediately after flowering helps in the development of new strong shoots that either flower again or produce energy for the over wintering process with new Spring growth already being thought about.

Here is a small list of some of the more common plants which may give you some idea of what it will look like :

Canterbury bells, cosmos, columbine, gypsophila, cornflower, delphinium, hollyhock, forget-me-not, iris, candytuft, lobelia, foxgloves, Livingstone daisies and English daisies.

A small word of warning about the lay-out. Some plants may clash in colour when planted next to one another, and another point to watch is the clash of foliage forms such as the spikes of irises next to the soft rosettes of the foxgoves.

If anyone is still reading and is in the least bit interested in following up this idea, try reading some of Allan Bloom's books on perennials. These have been my bibles for quite some time now and I find them very hard to put down.

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