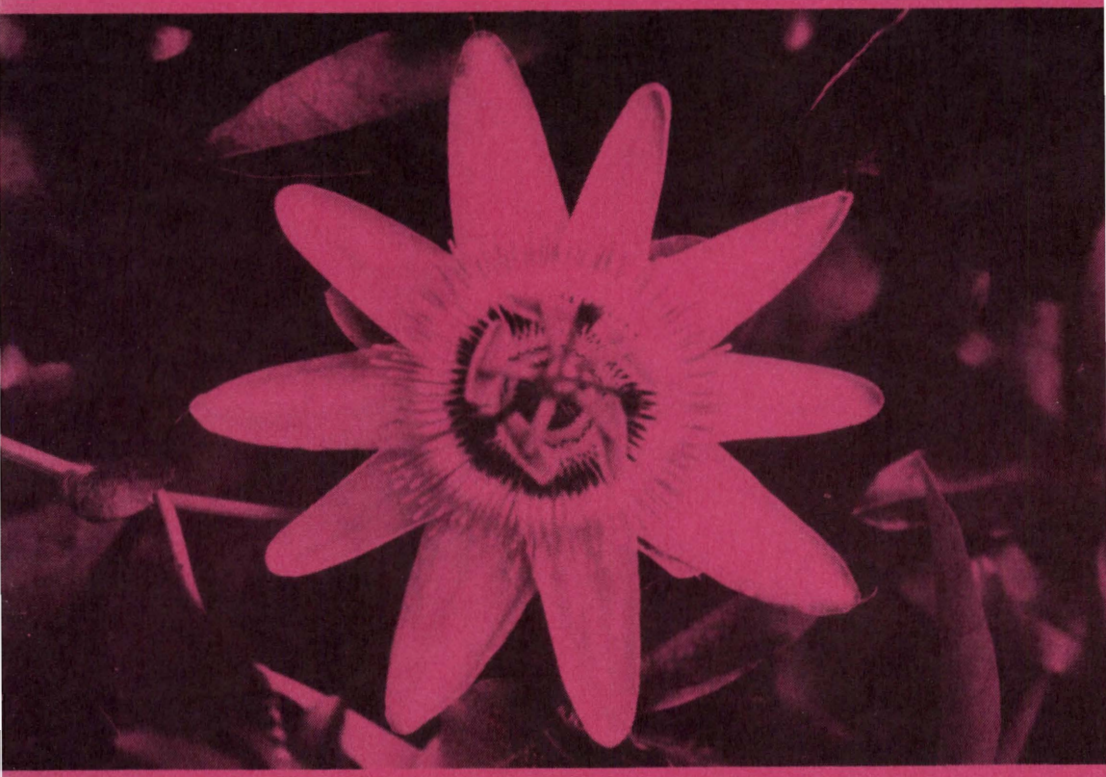
Horticulture

in New Zealand

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



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HORTICULTURE
IN NEW ZEALAND

Bulletin of the Royal N.Z. Institute of Horticulture
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EDITORIAL

As is usual for this time of the year the Bulletin is full of official Institute information, annual accounts, Chairman's & Executive officer's reports.

The annual conference is being held at Lincoln College this year. This will be the ideal opportunity for those of you who haven't been to the South Island for a few years to come on down. Plans are underway for a full and interesting programme.

Before I returned to work at Lincoln I used to listen to the correspondence school regularly. At the end of the year they visited the lighthouse keepers at Stephens Island. They had a very unusual pest problem. Tuataras nesting in the vegetable garden. If the Tuataras weren't too entrenched they chased them away. Once they'd made a home in the vegetable garden the lighthouse keepers just gardened around them. They didn't worry too much about eating the produce.

Hopefully all students will have enrolled with T.C.I. and be well underway with 1988's subjects. The year slips by very quickly, especially if you haven't made a start.

Nick Owers and I are still waiting for articles and pictures to be put in the Bulletin. It is up to everyone in the Institute to contribute if they want a good read from the Bulletin. If you have any ideas on the sorts of things you may like please write in. If we have some ideas at least we have somewhere to work from.

I'm looking forward to meeting people at the Conference in May. I may be able to get some opinions about the Bulletin then.

Pamela Gibbons
Editor

Cover Photo: *Passiflora caerulea*

Passiflora caerulea is a member of the plant family Passifloraceae. It is a native of central and Western South America. The plant is a very vigorous climber and is one of the more hardy *Passiflora* species. P. caerulea has been used as a parent plant to cross with other species to produce cultivars such as *Passiflora* 'Grandiflora' and *Passiflora* 'Constance Elliot'.

The passionfruit commonly grown for its purple fruit is *Passiflora edulis* while the banana passionfruit which is naturalised in some parts of New Zealand is *Passiflora mollisima*. Photo: N. Owers.

REGISTRATION OF TREES IN MARLBOROUGH

For the last few years the two registration officers in Marlborough for the RNZIH Notable Trees Scheme have been Brian Soper and Ralph Ballinger. Trees have been registered both in the borough of Blenheim and also in the Marlborough County.

Within Blenheim a considerable amount of work on the registration of trees under the District Scheme has been carried out by the staff of the Parks and Recreation department of the Borough Council. The registration officers of the Institute and the Council staff have also co-operated in much of this work and their findings have pointed to a need for the revaluation of the Helliwell System of scoring and also for a possible combined approach for the Notable Trees Scheme and the District Scheme for the registration of trees.

The need for a reassessment of the Helliwell System came about when a number of trees in Blenheim were scored and it was found that several trees which had been put on the Notable Trees list had a quite low score and were not even considered to be of merit in the borough. Since the original scoring had been carried out by a team of three officers, it was then decided that a further team of three should carry out a completely independent assessment and the results could then be compared.

When these further results confirmed several irregularities in the scoring all the findings were forwarded to the Notable Trees committee of the Institute. Mr Ron Flook was working on the tree registration scheme at the time and recognising the importance of this in the future of the scheme agreed to come to Blenheim and take part in a workshop on Wednesday, 15th July, 1987. This workshop was organised by Mr Jim Sewell, Parks Manager for the Blenheim Borough Council and since it was held on the same day as the inaugural meeting of the Marlborough District Council several out of town people were present. These included Alan Joliffe, Dave Cameron and Ron Flook from the RNZIH, Andrew Peteram and Peter Grundy from the Nelson City Council, Rod Witte, Jim Sewell, John Masters, Paul Millen and David James from the Blenheim Borough Council and Brian Soper and Ralph Ballinger, tree registration officers for the RNZIH.

After considerable discussion on the Helliwell System Mr Ron Flook agreed to draw up an upgraded evaluation table to be known as the New Zealand System. A pilot trial with this amended system would then be tested in Blenheim as it was agreed that it was only by testing and retesting that credibility could be built up.

It was also important that a standard system should be used throughout the country so that a tree given a specific category would have a similar evaluation in other parts of the country.

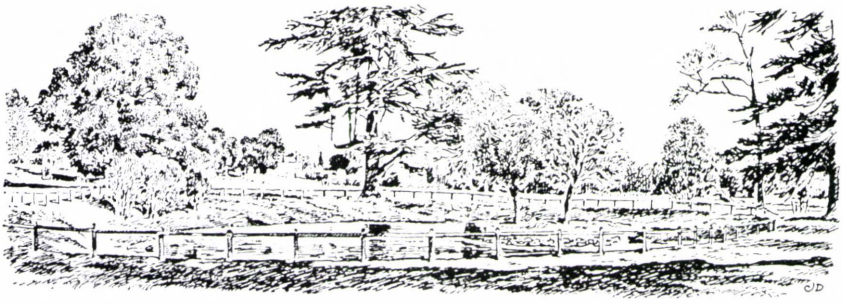
The effective registration of trees under the District Scheme could also be the basis for registration of Notable Trees under the RNZIH scheme. Trees which were of outstanding significance would rise to the top on the scoring system and be listed on the national lists. Co-operation would be needed between the RNZIH and the local bodies for this to come about. There is the possibility that the present green and white label could be used for the national listing and one of different colour for trees of local significance under the District Scheme.

Following on this workshop in July Mr Ron Flook carried out considerable work on the Revised New Zealand Scheme and after each revision testing of the system was carried out. On the 22nd September, 1987 another Workshop was held in Blenheim and Mr Flook brought to this Revision 4 for the approval of the meeting. After considerable discussion approval was given to the scheme and it was agreed that it should be communicated to all local bodies.

This New Zealand Scheme if approved by the local bodies could be a sound basis for tree

registration throughout the country at both the local and national levels. One tree protection group advocates "blanket leglislation" which recommends that any tree over six metres should be automatically protected, no matter what the state of the tree. This could lead to considerable embarrassment to local authorities in cases of legal dispute. Experience in Australia has also shown that developers make sure that very few trees attain the height of six metres in case of legal action.

The RNZIH Notable Trees Scheme has its tenth anniversary in 1988 and if used as the basis for a national scheme under the Town and Country Planning Act as recommended in the Review of this legislation it could continue to protect our nationally important trees.



OBITUARY

Mr Graeme Paterson

Both horticulture and the conservation movement lost a prominent advocate and practitioner with the death of Mr Graeme Paterson in Timaru on 3.2.88. He was 47.

In his working career, which began in Christchurch in the 1960s, Mr Paterson made an outstanding practical contribution to both fields.

As director of parks and recreation for the Timaru City Council, he redeveloped the Timaru Botanic Garden over the last seven years to fulfil a strong educational role in the region and to serve as the focus of a determined and practical campaign to protect New Zealand's rare and endangered flora.

At the same time, he launched a campaign to persuade the administrators of public gardens throughout New Zealand to co-operate in exchanges of specimens and information about rare and endangered plant species of all kinds, and to establish regional collections of important or endangered plants.

Mr Paterson was also prominent in horticultural administration and education and, until he resigned recently, when he became aware that his illness was terminal, he represented the Institute of Parks and Recreation on the examining board of the Institute of Horticulture.

Just before his death, he was advised that his contribution to both fields was to be recognised by the highest New Zealand award available to a plantsperson — an Associateship of Honour in the Institute of Horticulture. The award, which in normal circumstances is not announced until the institute's annual conference in May, will now be made posthumously.

Mr Paterson trained at the Christchurch Botanic Gardens and was chief propagator there when he was appointed deputy director of parks, botanic garden and reserves in Dunedin in 1969. He moved to Timaru in 1981 as director of parks and recreation there.

The move gave him the opportunity to put into practice some of the ideas he had about the value of cultivation in the conservation of rare species. He began to reorganise the Timaru Botanic Gardens in a systematic manner, converted a disused fernery into a display house for rare native species of plants, and built up what was probably the most comprehensive collection in New Zealand of rare and endangered plants. "Theme beds" that he created in the garden presented native plants as they might appear in their natural habitats.

He expressed his views on plant conservation to many groups in different districts, and in forthright papers presented to the Institute of Parks and Recreation and to the Pacific Science Congress. In recent years he established a close working relationship with the D.S.I.R. Botany Division, with which he exchanged plants and information and jointly promoted plant conservation.

His aim was to maximise the genetic resources within rare-plant collections, and he was working towards a goal of having at least 100 individuals of each threatened species in the Timaru collection. Surplus plants from the collection were made available for sale to the public through the rare-plant centre at the garden.

In spite of his deep involvement in conservation, Mr Paterson was a notable horticulturist in the conventional sense as well. He encouraged gardening clubs and societies to take part in the development of the garden and to help select and maintain borders of particular types of plants.

Ironically, one of his innovations was a "therapeutic garden", adjoining the Timaru Hospital and filled with plants selected to create a calm and soothing atmosphere for recuperating patients. Mr Paterson is survived by his wife, two sons and a daughter.

ANNUAL REPORT FROM THE CHAIRMAN OF THE NATIONAL EXECUTIVE TO THE ANNUAL GENERAL MEETING MAY 1988

Fellow Members of the R.N.Z.I.H.

I see from a perusal of the 1987 Report that I began "Out of the Dark Ages and into the 20th Century". That comment referred to the acquisition of computer facilities for many of our Head Office operations. The last 12 months has seen a continuation of the computerisation of our records, and I am sure you will all agree that we are now reaping the benefits of the new technology in many directions. We have purchased additional computing hardware, but the costs have been more than met by savings in the costs of staff wages and salaries. Dave Cameron and his staff are still busy setting up comprehensive records of all membership based activities, and as many of you are aware, a number of anomalies, errors and omissions have been discovered along the way. Dave assures me that these will soon be overcome and that the 1988 examination round will benefit even more from the continued development of the student records database.

Finance

A full set of audited accounts for the year ended 31 December 1987 are set out elsewhere in this Bulletin, but I must mention the one disturbing aspect of our finances that is causing the National Executive considerable concern. At the time of writing, some 580 members have not paid their 1988 subscriptions which were due on 31 October 1987. This represents a total of $22,000 that the Institute does not have, but has budgeted to expect. In addition to these 580 people a further 350 members have now had their membership terminated as they had paid neither their 1987 or 1988 subscription as at 29 February this year.

In a modern world of rising costs, we just cannot afford to forgo $22,000 of income, so I would personally ask those 580 members to forward their 1988 subscription without delay.

District Councils

After a good deal of hard work by our President Ralph Ballinger, Andrew and Jude Petheram (Nelson) and other members residing in the Nelson/Marlborough region it is pleasing to report that we now have active District Councils in both Nelson and Marlborough. The Institute's prime activities (excluding examinations) operate through its regional structure and the advent of two more District Councils in 1987 is a very positive sign.

Notable Trees

Our Wellington based Notable Trees Committee continued with its crusade (and I think it really is a crusade, and one to be won!) to ensure that a trees' protection scheme that actually works is put in place in this country. Crusader Ron Flook will be chairing an important workshop on this topic at the Conference in May.

Publications

This year's Annual Journal is the biggest and brightest ever. All members (who have paid their 1988 subs) will have received their copy recently. Mike Oates continues to produce the Annual Journal and its present high standard is a reflection of Mike's enthusiasm and high professional standards. We are greatly in his debt.

Mike has also been the driving force behind the revised "Horticulture: The Career for

You?" which was produced earlier this year. Copies have been sent free of charge to all secondary schools in New Zealand as well as to many Government Departments and horticultural media outlets. Copies are available from our Head Office at a cost of $5.50 each. I would encourage all our members to promote the distribution of this valuable booklet.

D. D. Baker Bequest

Miss Baker's estate has so far distributed $34,600 to the Institute and we understand that further distributions will be made bringing the total bequest to approximately $52,000.

This is a great boost for the Institute, and already we have purchased an impressive set of display boards with the interest generated from the invested funds.

If the Institute was to receive a few more bequests such as Miss Baker's, our financial security would be assured, and our role in promoting horticulture could proceed without the ever present worry of "how to make financial ends meet". A bequest to the R.N.Z.I.H. would ensure your name lived on forever in the fostering and promoting of horticulture in New Zealand.

Awards and Honours

The National Executive has finalised a considerable number of Awards and Honours in the last year. These will be presented to the recipients at the Annual General Meeting on Saturday, 14 May (at Lincoln College). I would encourage you all to considering nominating, through your District Council, members in your area whom you believe have made a significant contribution to horticulture.

One particular award to be made this year deserves special mention. That is the Award of Associate of Honour to be made posthumously to Mr Graeme Paterson of Timaru. As most of you will be aware, Graeme died early in February as a result of cancer diagnosed only a couple of months previously. Graeme's loss came as a great shock to all those who knew him and of course we extend our sympathy to his wife Irene and the rest of his family. Graeme's contribution to horticulture was immense and is documented elsewhere in this Bulletin. At the time of his death he was an active and respected member of the R.N.Z.I.H. Examining Board. His seat on the Board will be difficult to fill adequately.

Although Graeme's award will be made posthumously it is pleasing to be able to report that the National Executive had decided to make the award to Graeme prior to receiving knowledge of his illness, and we were able to advise him of this during his last weeks.

Conclusion

I have now completed four years as Chairman of the National Executive. If I am re-elected to membership of the Executive at the forthcoming election I can serve only two further years as your Chairman. (Two, three year terms in succession is the maximum allowed under the Constitution). Now is the time for you to start considering who you would like to have replace me in May 1990.

I would like to thank all members of the National Executive who have given of their time so freely over the past 12 months. All are volunteers who fit their R.N.Z.I.H. activities around career and family commitments, because they believe in the promotion of horticulture.

My thanks, and here I hope I speak on behalf of all of you, also go out to our Head Office staff. Dave Cameron, ably assisted by Enid Reeves and Vicki Black have now got the administration of the Institute running smoothly despite the growing complexity of our operation. As mentioned earlier hiccups will occur from time to time as new systems are developed, and I would ask for your tolerance until these can be overcome. I recall a comment that Jas Hunter made recently in a letter to our Head Office: "The person who never makes a mistake probably never makes anything". Perhaps we should all remember that.

Finally, my thanks to all of you — the members who are the lifeblood of the Institute — for your contributions, large or small to the ongoing affairs of the R.N.Z.I.H. over the past twelve months.

Alan Jolliffe
Chairman
National Executive

P.S. If some of this report doesn't sound quite like me, it's because I had a little assistance from a ghost writer along the way . . . *Alan.*

NOTES FROM THE DISTRICT COUNCIL NEWSLETTERS

Auckland District

Alan Mitchell's work with trees was the subject of a Nature Watch programme on TV1 16.12.87. He was a lively interviewee and following are a few of his thoughts and observations.

Mr Mitchell is a professional dendrologist who, whilst employed by the Forest Commission in Britain, logged (in his diary) some 70,000 trees, periodically recording their statistics (height and girth) and their history. The trees were in private and public gardens and forests. Combined with his interest in keeping logs of all "his" trees, Mr Mitchell is an avid twitcher. To twitch you need to watch birds of the feathered variety and to note the number of different species seen in a given period. (The O.E.D. gives no bird-watching meaning for twitch; presumbly it comes from the jerky, convulsive movement involved in quick head-turning). His best record was to see just under 100 different species before breakfast on two or three occasions. Two trees he dislikes are the common lime (*Tilia vulgaris*) and the copper beech (*Fagus sylvatica* 'Atropunicea'), a tree he cannot bear. It apparently arose in a Persian garden in 1880 and was discovered by a M. Pizzani who sent propagating material to France; from there it came to England and thence the rest of the world. He hasn't a kind word to say for it — from its depressing colour to its shape and the way the leaves are attached to the twigs!

Planted in England's suburbia are countless *xCupressocyparis leylandii*. So crowded are they that in 50 years time they will make 100ft high forests. One of the reasons for their popularity is their quick growth compared with 'normal' conifers. To illustrate the point the film had successively larger tree images superimposed on a current suburban street scene featuring the conifers to show what would happen. Referring to Harrison's 'Ornamental Conifers' the conifer illustrated and with this name tag is nothing like that shown in the film. However I am assured by Mr Rainey that there are several clones and one such as 'Green Spire' is the popular one in England.

Mr Mitchell regards home garden tree plantings in suburban streets as 'linear arboreta' which add variety to the landscape and because of this should be encouraged. Buildings are unchanging rectangular edifices which need the fuzzy and irregular shapes of trees to modify them. He is sad to see so much 'prairie' cultivation of the earth in England with consequent destruction of vegetation and bird refuges. The deprivation of the landscape by tree removal when they supply the 'vertical motif' is to be deplored.

At a Flower Show several years ago a white cherry was displayed — Captain Ingram had seen this same cherry embroidered in silk panels in Japan. The Japanese had never been able to match the embroidery to a living plant — but here it was, with verification provided in 1926 when some blooms were flown to Japan and compared with the embroidered flowers! This cherry is 'Tai Ha Kiri'? So another tree was rescued; from the ailing tree in the woman exhibitor's garden sufficient propagating material was obtained to re-establish this cherry.

Of all trees Mr Mitchell's favourite would be the gingko — for its antiquity, the curious shape of its leaves, its spring dressing of lime green leaflets and its autumn colour besides which 'it grows into a noble tree'.

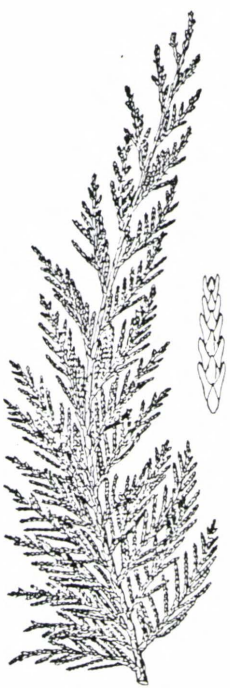
So next time you walk down a nicely clothed suburban street think of it as a 'linear arboretum' and see how many different species of trees (and birds) you can log. Also remember when planting how well trees serve the purpose of providing a 'vertical motif' — in other words a frame in and for your garden.

(This was a repeat programme; if ever there's a repeat of the repeat, try to see it. Sadly with the autumn gales in S.E. England and the consequent devastation many of Mr Mitchell's 'babies' will probably have been destroyed. Reports are that thousands of mature trees are now gone forever; replacement will take generations).

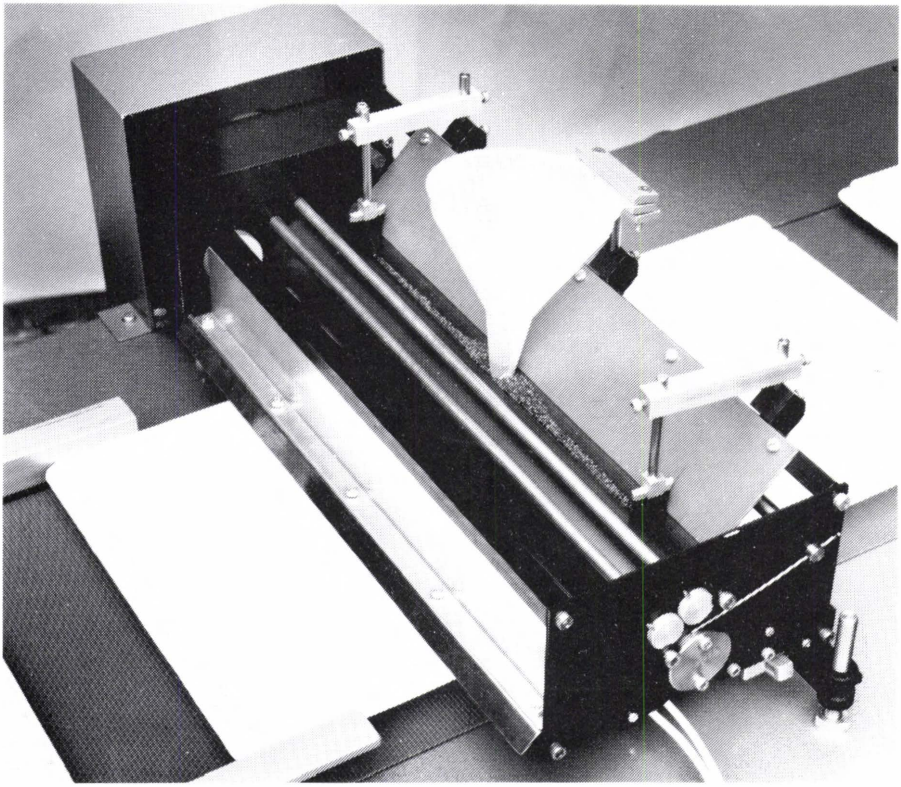
Wellington District

Victoria University's CENTRE FOR CONTINUING EDUCATION is conducting two courses on PLANT PROPAGATION. One will be held in Wellington on Saturday May the 28th. The other will be in the Wairarapa on Saturday September the 17th. The sessions will include "hands-on" experience of plant propagation, seed sowing, cuttings and soil mixes. Indoor plants will be discussed, including identification, propagation, and site suitability. Advice will be given on pest and disease control and safe use of sprays. For further information and enrolment details, write to the:

Centre for Continuing Education, Victoria University, Private Bag, Wellington. Phone (04) 758-677, or (04) 715-356.



X Cupressocyparis leylandii



THE HAMILTON DRUM SEEDER

The Hamilton Drum Seeder is a compact, high-production machine, designed for the grower who needs a high continuous output from his seeder with minimum down-time.

The rotating drum has galleries along its length which connect the pickup holes to a vacuum for seed pickup, and a discharge air blast for seed release. The seed is fed, via a hopper, into the valley between the drum and a roller which rotates in the opposite direction, making the seed flow along the length of the drum to the pickup holes. The seeds pass under an air curtain, removing multiple pickups, and are then released into the seed tray. The pickup holes are then cleaned through with a high pressure air jet before repeating the cycle.

Typical sowing rates for a 392 cell plug tray would be around 700 trays per hour, or 280,000 seeds per hour. With a change of drum the Seeder can sow into almost any plug tray, seed flat or bedding plant container on the market today.

For further information, please contact:

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ENGLAND

TREE REGISTRATION UPHELD

An application made to the Blenheim Borough Council that six eucalyptus trees registered under the District Scheme be removed from the lists has recently been turned down. This particular case caused unprecedented interest in Blenheim and it was due mainly to the fact that sixty three letters were received by the Council objecting to the removal of these trees from the register that it has now been decided that they should remain.

The trees were first registered in 1979 and when advertised no objections were received to them being placed on the Blenheim Borough Council's list. The application to have them removed from the register was placed by two adjoining property holders, but the tree owners were very keen to have them remain on the list. When the Borough Council advertised its intention to consider the application and asked for any objections there followed a flood of letters objecting to the removal.

The objections came from a wide cross section of the community — schools, groups of adjacent residents, the Royal Forest and Bird Protection Society and previous owners of the property. Individual members of the Marlborough District Council objected and at the hearing the point was made that deregistration of sound healthy trees would seriously affect progress in the future registration of trees.

Many objectors wrote comprehensive letters showing their concern in giving several reasons why the trees should remain on the register. Typical of the young people who wrote was the following extract: "Please what would we the children do if you cut down the trees. We couldn't swing off the branches or build huts in it's waving leaves. Every time you let a tree be cut down we lose some of the clean air . . . for the sake of us and future generations please save the gum trees."

Following the public hearing on the 3rd December, 1987 the Planning Sub-committee of the Borough Council gave a reserve decision that the application be declined.

Although these trees were on the local register under the District Scheme the tree registration officers of the RNZIH have been working closely with the Parks and Recreation staff of the Blenheim Borough Council as is indicated in another article in this bulletin. This finding is of great importance since it illustrates the value of having the community supporting the registration of trees. Under "blanket legislation" where it is advocated that all trees be protected, no matter what is their condition, it would be most difficult to get this community support.

With the setting up of the Marlborough District Council of the RNZIH and the increased interest in tree registration in the area the following names have been added to the list of tree registration officers; Mr A. L. Elwood-Smith, Mr G. B. King and Mr D. R. James.

HAYWARD WRIGHT — NURSERYMAN SUPREME

Hugh Redgrove

Few of us today realise that a great many of the fruit cultivars that we are growing now are the result of the enterprise of one man — Hayward Wright, born at Waimate North in 1873, died at Tauranga 1959. He was a true nurseryman of the old school, a fine judge of fruit quality, and had the energy and perseverance to both raise new varieties himself, and to import others from overseas. Fruit growers especially have much to thank Hayward Wright for without his endeavours we would not have high quality Kiwifruit, Feijoas, Citrus or Persimmons.

The N.Z. Nurserymens Assn, prompted by historian Ken Nobbs, asked me to prepare some notes about Hayward Wright and I was lucky enough to be able to visit and consult with Mr John Gracie, who was Wright's foreman for twelve years, before establishing his own nursery on the alluvial flats at Avondale. Much of the information I am now recording is from notes given me, and discussions with John Gracie, and other information has been provided by Dr A. Ross Ferguson of D.S.I.R. in a paper published in the Annual Journal 1983 of the Royal N.Z. Institute of Horticulture.

After an apprenticeship with Hay's Nurseries in Auckland Wright opened his own nursery on 30 acres at Rosebank Road, Avondale, on fertile alluvial soil. Hayward Wright was a pioneer in the use of the hardy Poncirus trifoliata from Japan as a rootstock for citrus, although nurserymen were very slow to accept the idea. The fact that much larger trees could be produced in the same time on orange stock led most of them to continue with it long after the D.S.I.R. were strongly recommending the tri stock. In fact the public were not able to buy trees freely on this stock until well into the 1960's. Nowadays it is fully realised that the Tri stock gives better quality fruit, in most cases equal to that imported from warmer climates overseas, and that it imparts greater frost hardiness to trees.

The varieties Hayward Wright grew on the Tri stock included Washington Navel, Carters Navel, Harewoods Late, the tree forms of Satsuma Mandarin — Owari, Wase, and Silverhill and the Clementine. He was responsible for importing the 'Clementine' mandarine, widely grown today, the first to distribute the 'Meyer' lemon and 'Wheeny' grapefruit, and the orange 'Carters Navel'. The oranges 'Robertson's Navel' and 'Best's Seedless' were raised in Avondale and distributed by him.

Hayward Wright introduced many of the stone fruits which we grow today both in orchards and home gardens. He imported and tested many from the U.S.A. including Peaches J. H. Hale and Meteor and he raised Paragon, Golden Honey and Nectarine Goldmine.

In Plums he introduced Purple King and Billington and raised Wrights Early, Wrights Late and Delicious. The first two are still popular varieties today.

Although the first introduction of Feijoas was by Alexander Allison, Wright himself imported seed from Egypt and also obtained from overseas the first large fruited varieties Choicana and Coolidgii. He grew seedlings from these and produced several excellent varieties — Triumph, Mammoth, Superba and Large Round which he propagated and sold.

Alexander Allison was also first in the field with the Chinese Gooseberry now universally known as the Kiwi fruit. The seed was brought to N.Z. from China early this century and Wright planted some seed in 1924 and 1925, and from some 40 seedlings came 'Wrights Giant' later renamed Hayward'. It was wonderfully good luck that such an excellent female form came from such a small batch of seedlings for 'Hayward' is the only cultivar

in commercial cultivation in New Zealand and the predominant one grown overseas. Or perhaps the 'good luck' was due to Wrights ability to pick a winner.

Hayward Wright also had a great liking for persimmons. He grew and sold some twenty named varieties but he found it difficult to popularise the fruit in N.Z. He raised some himself including Wrights Favourite, Wrights Ruby and Foursquare and the first named is still a standard astringent variety although not suitable for export.

Included in one of his imports from Japan there were several seedling crab apples and one of these was exceptionally good. It became known as 'Georgeous' and is still grown by nurserymen. 'Jack Humm' is another very fine crab apple and this was bred from Gorgeous.

Another ornamental that he imported but did not put on the market was the pink foliaged form of *Cedrela sinensis*, now named 'Flamingo'. Said to have been brought in from Holland, I have considerable doubts, for it is never described as having pink foliage in any of the comprehensive reference books describing Northern Hemisphere trees. It was first propagated by Jack Clark, founder of Eden Garden and young trees are now being exported to Britain.

Mr Ken Nobbs has explored the possibility of a memorial garden in the vicinity of Waimate North and has reported some interest in the idea by the Historic Places Trust. His idea is that there should be a National memorial to the pioneers of our Agriculture and Horticulture.

On the other hand there could be a good case for a collection of Hayward Wright's introductions to be established in a small garden in the district where he worked — in Auckland.

It would appear to the writer that a small garden at the ARA Botanic Gardens at Manurewa could be a very suitable and interesting memorial. I feel sure that all the necessary trees would be supplied without cost by the tree growers and the fruit growers themselves for they are people who are still benefitting most from Hayward Wright's work. But we all eat and enjoy the fruits of his efforts and I feel sure that support for the scheme would be widespread. Even the garden staff themselves might enjoy some of the fruit!

GARDEN HISTORY GROUP

John Adam of Auckland has been working towards forming a Garden History Group in Auckland. No doubt we will hear about the meeting that was held on March 1st in the next Bulletin.

These are some small articles sent by Mr Adam for publication in the Bulletin.

Kitchen Garden Design

The following description of a kitchen garden design comes from "The Management of the Kitchen Garden arranged for the Seasons and Climate of New Zealand." It was written by David Hay, gardener of Monpellier Nursery, Auckland, and published by G. T. Chapman in 1867.

The discovery of this rare book in a local library provides interesting insights into not only the design but social importance of gardening and skills applied in the cultivation of food plants.

"If the ground will admit of it, lay your garden out as a parallelogram or a square, these two forms being undeniably the most economical. The allotment of too much space is the greatest and commonest mistake of all; in this way people very frequently go beyond what they require, and still more beyond what they can cultivate. It is better to err on the safe side, and have rather less than more ground than you can manage under cultivation. A quarter of an acre is enough to supply the wants of a family of moderate size with vegetables all the year round, and even less might be made to suffice for this purpose. The reason that a square or oblong piece of land is so convenient for a garden is, that it can be laid out in four quarters, with a border ten or twelve feet wide round the sides; a space of four feet for a walk can then be left, and the square afterwards cut through the centre by two four feet walks, thus giving you four square beds within the outside walk."

Early Gardening Find

Archaeologist Simon Best unearthed a ko or digging stick, used in gardening, close to Queen Street, Auckland.

The ko was stated as being more than 200 years old and indicated perhaps that prehistoric gardens were buried nearby.

It was found on the site of Auckland's first prison that dated from 1841 to the early 1860s that archaeologists spent several weeks in October excavating.

About 100,000 European artifacts were also found.

An original plan of the prison layout, displayed as a poster around the site to inform the public who could view the project from the surrounding streets, showed a garden marked in what seemed to be a courtyard within the prison complex.

Another Scottish Connection

Thomas CLEGHORN (1799-1853). Cleghorn served as superintendent of the Auckland Domain for about 18 months in the early 1840's following the first Superintendent Alexander Daziell about whose career nothing is known.

Thomas Cleghorn was born in Scotland in 1799. He arrived in New Zealand 'under high recommendations' from a Dr Pat Neill who is described as a Scottish publisher and botanist who lived in Edinburgh and was founder and long time secretary of the Caledonian Horticultural Society and Wernerian Society.

Dr Neill was a member of the Edinburgh Town Council during the 1830's and was given charge of 'enclosing and forming' East Princes Street Gardens in central Edinburgh.

Thomas Cleghorn was employed by Dr Neill to assist with the cultivation of the East Princes Street Gardens.

In Thomas's obituary in *The New Zealander* for 7th January, 1854 it records he was 'appointed by the Colonial Government . . . to form a garden for the reception and cultivation of fruits, vegetables and plants, and superintendent of roads and other public works, which duties he performed successfully and satisfactorily . . .' He died in Honolulu, Hawaii, on 24 September, 1853, from a heart attack.

FROM THE EXECUTIVE OFFICER

Summer has all but gone, and soon autumn leaves will begin to fall from the trees not already blown over by a series of storms throughout the country.

With winter comes the Annual Conference and Annual General Meeting of the R.N.Z.I.H. This year the venue will be Lincoln College, and the Canterbury District Council will be acting as host.

I do hope a large number of our members take the chance to gather together and exchange ideas and information, make new friendships and renew old friendships. In addition, this year members will be able to visit the R.N.Z.I.H. Head Office and see just how the administrative engine room actually operates.

Membership of the National Executive

Enclosed with the 1988 Annual Journal, recently distributed to all financial members were voting papers for the election of four members to the National Executive. As the Executive exists to run the Institute according to the wishes of the members, please do not forget to exercise your right to cast your vote for the people you would like to see elected to membership of the Executive.

Subscriptions

As mentioned in Alan Jolliffe's Chairman's Report, a considerable number of members have not yet paid their 1988 subscriptions. This is creating considerable financial problems as can be seen from a perusal of the 1987 Annual Accounts and Balance Sheet. It would be considerably easier for me and my staff to run the National Office efficiently and effectively if the outstanding subscription income could be paid in the near future.

Student Records

Having already got most of our membership records set up on the computer, this year should see the completion of the Student Record System which will enable us to handle all details of examinations, results, mark lists etc. with a greatly improved degree of efficiency.

Although we have spent a good deal of money on computer hardware, and supporting software, we are now reaping the benefits more and more as the months go by.

I look forward to seeing many of you in Christchurch at the Conference and Annual General Meeting.

D. B. Cameron
Executive Officer.

THE ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC.)
BALANCE SHEET AS AT 31 DECEMBER 1987

1986 $		$	1987 $
	CURRENT LIABILITIES		
199	G.S.T.	1,746	
12,535	Accounts Payable	23,037	
2,630	District Council Funds Suspense (Note 3)	2,925	
15,364	TOTAL CURRENT LIABILITIES		27,708
	ACCUMULATED FUNDS		
39,478	Balance 1.1.87	30,457	
(5,413)	Examinations Account (Note 2)	(585)	
(3,608)	General Account	(20,939)	
30,457	ACCUMULATED FUNDS 31.12.87		8,933

1986	TRUST ACCOUNT BALANCES	Capital	Income	
2,354	Endowment Fund	1,750	919	
1,833	F. Cooper Memorial Fund	1,050	930	
828	J. A. Campell Memorial Prize Fund	500	374	
762	Junior Memorial Prize Fund	500	292	
871	D. Tannock Memorial Prize Fund	500	449	
2,484	P. Skellerup Prize Fund	2,000	949	
2,509	R. Skellerup Prize Fund	2,000	974	
895	D. MacKenzie Memorial Prize Fund	500	441	
236	Sir Victor Davies Award	200	62	
—	D. D. Baker Bequest	22,800	—	
12,772		31,800	5,390	
				37,190
$58,593				$73,831

1986 $		$	1987 $
	CURRENT ASSETS		
3,271	Bank of New Zealand	5,080	
500	Sundry Debtors	—	
2,238	Books on Hand for Sale	4,343	
—	B.N.Z. Autocall	5,633	
22,162	B.N.Z. Finance — Debenture Stock	—	
28,171			15,056
	DEPOSITS HELD FOR FUNDS (note 5)		
4,047	B.N.Z. - Autoaccess Account	7,791	
4,300	B.N.Z. Finance Co.	4,300	
400	Christchurch City Council	—	
—	B.N.Z. Finance	22,800	
6,800	B.N.Z. Term Deposit	6,800	
15,547			41,691
43,718	TOTAL DEPOSITS HELD		56,747
	FIXED ASSETS		
20,635	Office Equipment (at cost)	24,140	
5,760	Less: Accumulated depreciation	7,056	
14,875			17,084
$58,593			$73,831

THE ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC.) GENERAL ACCOUNT STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 DECEMBER 1987

		1987	1986
INCOME	$	$	$
Bequest — D. D. Baker	22,800		—
R. M. Skellerup	250		—
P. J. Skellerup	250		—
Subscriptions (Note 5)	57,997		34,734
Donations	767		746
Sundry Receipts	93		220
Interest	4,153		5,551
Sales — 'Flowers for Sale'	671		—
Net deficit from Publications Account (Note 4)	—		(15,100)
Sponsorship	—		2,000
TOTAL INCOME		86,981	28,151
LESS EXPENDITURE			
Bank Fees and Interest	509		—
Accident Compensation	1,115		274
Advertising	858		367
Capitations paid to District Councils (Note 7)	3,077		4,139
Staff Salary, Wages	17,300		12,081
Audit and Accountancy Fees	430		342
Depreciation	688		532
Printing and Stationery	5,014		2,149
Postages, Telegrams, Telephone Charges	2,165		1,600
General Expenses	180		661
National Executive Travel & Expenses	6,830		7,713
Grant — Notable and Historic Trees Committee	1,000		1,000
Office Rent	680		698
Typewriter Expenses	163		203
Bulletins & Journals (Note 4)	32,635		—
Insurance	335		—
Computer Software Development	3,639		—
Ian Galloway Memorial Lecture	560		—
Loss on Disposal of Fixed Assets	2,652		—
Printing — Careers in Horticulture	4,790		—
TOTAL EXPENDITURE		84,620	31,759
		2,361	(3,608)
Less Bequests transferred to Trust Accounts:			
— D. D. Baker	22,800		—
— P. J. Skellerup	250		—
— R. M. Skellerup	250		—
		23,300	
EXCESS EXPENDITURE OVER INCOME		$20,939	$3,608

The notes on pages 4 and 5 form part of and are to be read in conjunction with these accounts.

THE ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC.) EXAMINATIONS ACCOUNT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 DECEMBER 1987

		1987	1986
INCOME	$	$	$
C.H.P. Enrolments	13,039		9,970
Registrations	9,917		8,874
Examination Entry	81,914		67,631
Sundry Income	802		938
Government Grant	30,785		35,308
Loder Cup Committee	1,215		1,350
TOTAL INCOME		137,672	123,891
EXPENDITURE			
C.H.P. Enrolments	10,167		10,313
Audit and Accountancy Fees	1,715		1,368
Exam Board Expenses	11,722		11,921
Examiners Fees and Expenses	18,739		12,487
General Expenses	—		92
Loder Cup Committee	1,215		1,350
Postage and Telephone	5,917		5,839
Printing and Stationery	10,329		13,263
Secretarial and Office Wages	69,382		67,747
Office Rent	2,740		2,800
Depreciation	2,754		2,124
Computer Software Development	3,147		—
Repairs and Maintenance	180		—
Insurance	250		—
		138,257	129,304
EXCESS EXPENDITURE OVER INCOME		$585	$5,413

The notes on pages 4 and 5 form part of and are to be read in conjunction with these accounts.

THE ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC.)
NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED 31 DECEMBER 1987

NOTE 1 STATEMENT OF ACCOUNTING POLICIES

The following accounting policies have been adopted.

Inventories

Books on hand are valued at the lower of cost and net realisable value.

Depreciation

Fixed assets are depreciated on a straight line basis which will write off cost over a period of five years.

Interest Received

Interest received has been included in the accounts on a cash basis.

NOTE 2 EXAMINATIONS FUND

As from 1979, the Examinations Fund is accounted for by a separate Income and Expenditure Account. All costs relating to the Examinations Account are charged to that account. Some items of expenditure relating to both the General and Examinations Account, namely salaries and audit fees, have been apportioned between the two accounts on a basis determined by the Executive.

NOTE 3 DISTRICT COUNCIL FUNDS IN SUSPENSE

These are funds received from District Councils which are no longer operating. Interest is compounding and the funds are held separately in the Bank of New Zealand Savings Bank.

NOTE 4 PUBLICATIONS ACCOUNT

As from 1987 the National Executive adopted the policy of including a charge for publications as part of the annual subscription. Accordingly a publications account is no longer presented.

The costs of printing and distributing four issues of the quarterly bulletin free to members are included in the expense of bulletins and journals.

THE ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC.) NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 1987

NOTE 5 TRUST ACCOUNT BALANCES

The funds in Trust Accounts are represented by investments and bank accounts. The capital portion represents the unexpended portion of accumulated income to date.

	1987	1986
	$	$
District Council Funds in Suspense	2,925	2,630
Trust Account Balances	37,190	12,772
Notable and Historic Trees Committee	—	—
	$40,115	$15,402

NOTE 6 The National Executive introduced a policy during the year ended 31 December 1984 of converting the timing of subscription payment from an 'arrears' situation to an 'advance' situation.

Subscriptions in relation to the period ended 31 December 1988 are levied on members in September 1987 and are taken to income in the year in which they are received.

NOTE 7 Further to the National Executive policy as per Note 6, capitation fees are calculated and paid to District Councils six months after billing of subscriptions, and are recorded in the accounts on a cash basis.

AUDITORS' REPORT

We have audited the attached balance sheet and income and expenditure accounts in accordance with accepted standards, and have carried out such procedures as we considered necessary.

Some sources of publications income cannot be verified prior to entry in the records, and our examinations of these has been confined to testing recorded receipts to the bank accounts.

In our opinion, but subject to this limitation, the balance sheet and income and expenditure accounts give a true and fair view of the state of the Institute's affairs as at 31 December 1987, and of its income and expenditure for the year then ended.

TOUCHE ROSS & CO
Chartered Accountants

Christchurch, N.Z.
17 March 1988

Student Section

EDITORIAL

Already we are about a third of the way thru 1988 and the study year has commenced. Congratulations to students successful in their 1987 examinations. Welcome to new students who will no doubt be getting into the study routine. Remember to support your local District Council activities throughout the year.

There has been quite a time span since the last edition of the Bulletin — incidentally any comments on the new format? Summer has been and gone although at times it seemed the Winter Olympics could have been staged in New Zealand instead of Canada!! Interesting to note during film of the skiing the coniferous trees, typical of the northern mid-latitude zones, providing a picturesque backdrop to the snow clad slopes.

Over the Christmas period one of my favourite natives, the mountain ribbonwood, *Hoheria lyallii* (family: Malvaceae); flowered in our garden. This deciduous tree has attractive bright green foliage which is covered with a heavy hoary pubescence. This in itself is a distinctive feature. In addition when the white flowers appear in single or 2-5 flowered axillary cymes, the specimen becomes even more conspicuous and beautiful. This tree grows in cultivation to 3-4 metres (in the wild it may grow up to 7 metres) and makes an ideal garden plant.

The continuous cycle of plant life is forever in evidence. At this time of year, most plants are preparing for dormancy, whereby metabolism slows right down. This process enables the plant to survive the unfavourable environmental conditions of winter. However, a sign that spring is on its way is seen with the presence of plump, floral buds on several plant species. For example, *Rhododendron* 'Chrysomanicum', (family: Ericaceae), a New Zealand raised hybrid, is laden with floral buds which open in early spring to provide a brilliant, vivid display of soft, yellow flowers.

The national R.N.Z.I.H. annual conference is approaching again. I would encourage any student to attend where possible. The conference provides a chance for students to find out more about the Institute and meet other members, as well as gaining knowledge from the various meetings and field trips taking place.

Kind regards,
Nick Owers

CHRISTCHURCH BOTANIC GARDENS

Since the first tree recorded planted in the grounds, the Albert Edward Oak on 9 July 1863, the Christchurch Botanic Gardens has been developed during the years to its present state. Today the Botanic Gardens stand as an example to the foresight of the original settlers and to the dedication of various curators who have planned and planted the many trees, shrubs and plants. These gardens are one of the finest in New Zealand and have been classed in the top ten Botanic Gardens of the world.

Control of the Botanic Gardens and Hagley Park was, until 1946, vested in the Christchurch Domains Board, but because of financial difficulties the Government dissolved the Board and placed the control in the hands of the Christchurch City Council with the Director of Parks and Recreation as principal officer. All finance for running the Gardens is derived from the general rate of Christchurch City.

The grounds of the Botanic Gardens total an area of some 30 hectares of which the majority is inside the loop of the River Avon. First impression is one of many large and stately trees which dominate many parts of the grounds. These trees, many of which are over 100 years old, form a very pleasant and interesting background to the many sections of the Gardens.

During the summer and winter each year over 30,000 annual bedding plants are planted each time in various parts of the grounds. The main displays centre around the Armstrong Lawn where formal beds are planted to show off the plants' best qualities. Those plants used for this purpose are fibrous rooted begonias, pelargoniums, petunias, pyrethrum, marigolds, wallflowers, polyanthus, myosotis and pansies. Near the Observatory a trial ground has been established where new and old types of bedding plants are grown and studied for their worthiness in formal bedding schemes.

During the summer and autumn the Herbaceous Border provides a continuous display as the many different perennials freely produce their flowers. Nearby the Rose Garden, which contains over 250 different roses, is always a summer attraction for visitors. Both old and new types of roses are grown, especially those suitable to Canterbury, and visitors can pick out those that appeal to them in flower and order rose bushes from a nurseryman in winter.

A most attractive area of the Gardens is situated on the southern side and includes the Primula Garden, Heath Garden and Rock Garden. The Primula Garden is a quiet peaceful area landscaped around a small stream where Asiatic Primulas, Rhododendron species, Paeonias and all other associated plants are cultivated. It is most attractive in late spring after all the daffodils in the nearby two hectare Woodlands area have finished their most spectacular show. The Heath Garden contains many Ericas and Callunas which provide a succession of flower throughout the year. This area is laid out quite naturally with the groups of plants being planted to grow together to form large clumps which look very natural.

Adjacent is the Rock Garden where a large number of rock garden and alpine plants are cultivated. Springtime is best for visiting the Rock Garden where almost every day another different plant has started to flower. Right through summer and well into autumn many plants here continue to flower and bring life and colour to this area. Some of the main plants cultivated here are Dianthus or pinks, Pulsatilla, Potentilla, Sempervivum, Primula, Iris, Narcissus and Gentiana.

The water or Bog Garden was formed around two ponds which were created about 1920 when shingle was excavated and sold from that area. Revenue from the sale of shingle (6d a dray load) was used to build the Director's residence in 1921. This cool, quiet and peaceful area is enclosed by large trees and several shrub borders and on a still and sunny day reflec-

tions of the surrounding trees, shrubs and flowers make this a most attractive area. Associated with this area are many beds of deciduous rhododendrons or azaleas and in spring these are a magnificent sight.

A very important area in the Gardens is the New Zealand section and it contains only plants native to New Zealand. It is divided into two parts — the Cockayne Memorial Garden opened in 1938 as a living memorial to one of New Zealand's greatest botanists, and the bush area where plants have been established to grow quite naturally. The Cockayne Garden has two sections. An Alpine Garden where many different alpine plants collected from all over the mountain regions of New Zealand are grown quite successfully. This area was fully reconstructed in 1960-61 to enlarge it to accommodate more plants. A more formal part of the Cockayne Garden is the lawn area on which are laid out several large beds containing shrubs and small trees. Some of these trees and shrubs are *Hebe* species, *Sophora microphylla* or Kowhai, *Carmichaelia* species, and *Leptospermum* or manuka cultivars. The bush area was established about 1920 when many of the trees, which have now grown together to form a canopy, were planted. Under this canopy many shade tolerant and half hardy plants including ferns have been established.

A large show house complex of five glass-houses can be found near the centre of the Gardens. The largest is Cuningham House opened in 1923, which is 30m long and 13m high and it contains a gallery, reached by an easy staircase, which runs around the circumference. A very extensive display of tropical plants is displayed here, both in pots and growing in the "Jungle" area.

The original Townend House, and the first in the Gardens, was bequeathed to the Botanic Gardens in 1914 by Mrs A. Q. Townend but was eventually replaced in 1955-56 by the present structure. This is a conservatory show house where a regular succession of popular green-house plants are grown. These include: *Primula obconica, P. malacoides*, cinerarias, cyclamen, calceolaria, poinsettia, schizanthus, tuberous begonias, fuchsias and chrysanthemums.

Next door Garrick House contains a large collection of cacti and succulents from most

parts of the world. While many are grown in pots the feature of this house is the fine diorama in front of which larger cacti and succulent specimens are planted. Orchids and bromeliads are featured in the next glass-house. Here many specimens of these beautiful and unusual plants are cultivated.

A recent addition is the Alpine House in which is grown a large collection of alpine and rock garden plants, many of which are native to New Zealand. There is no heating in this glass-house which serves to protect the plants from adverse weather conditions allowing these attractive and sometimes rare plants to be grown to perfection. A few that are grown here are Celmisia, Rhodohypoxis, Sedum, Narcissi, Lewisia, Dianthus, Cotula and Anisotome.

To service this complex a comprehensive nursery of eight propagating and growing-on houses has been established nearby. It is here that the plants are grown on to flowering size and then staged in the public show houses for visitors to admire.

Staff at the Christchurch Botanic Gardens have for many years been aware of the importance of the Gardens for educational purposes. To this end most plants grown have permanent labels which give such details as botanical and common names, its family and country of origin. In the last few years larger posters and information notices have been produced describing the more interesting points about the plants in greater detail. School groups are encouraged to visit the Botanic Gardens and can arrange for a talk by staff members on various aspects of plant life and wildlife.

Hagley Park and the Botanic Gardens are administered under the Reserves and Domains Act 1953 and Amendments, and under this act it is classified as a reserve for both plants and wildlife. A recent survey of birds in the Gardens revealed that 26 different birds lived or visited the Gardens during a year and these included ducks, grey ducks, mallard ducks and paradise ducks, fantails, bush pigeons, kingfishers, herons, chaffinch as well as the many exotic birds. Not only are the birds protected but also the fish — in the ponds and in the river — and these include carp, golden carp and trout.

The future of the Botanic Gardens is assured and further development of the grounds, plant collections and educational programmes will help to make these Gardens even greater than they are now while still serving the various needs of our community and nation.

CHRISTCHURCH BOTANIC GARDENS

Re: CHRISTCHURCH BOTANIC GARDENS — 125 YEARS ANNIVERSARY

1988 is the 125th anniversary of the founding of the Christchurch Botanic Gardens. It is planned to celebrate this event with a number of activities culminating in some special functions over Labour Weekend 1988. The actual dates are from Friday evening, 21 October through to Sunday, 23 October.

A major objective for the Labour Weekend is to bring together as many as possible former (and present) staff members to share in the celebrations.

Over the years quite a number of former staff have moved away from Christchurch to work in other local government parks departments or similar authorities. There are also probably those who have moved to the private sector while others for a variety of reasons have left the parks/horticultural field altogether.

Some of those currently employed in local authorities are already known to us here in Christchurch. Others on the other hand have been lost track of and this is where Institute members may be able to assist. Should any member or reader know the whereabouts of former Christchurch Botanic Gardens staff or were themselves at one time an employee, we would appreciate hearing from you.

For those interested please diary Labour Weekend 1988. This promises to be a most enjoyable occasion and official invitations and programme details will be forwarded to invitees once all names have been assembled.

It is hoped also to provide further information in subsequent issues of this Journal.

CHRISTCHURCH BOTANIC GARDENS 125 YEARS ANNIVERSARY

I am interested in further information for the 125th Anniversary, and wish to receive further programme details.

Name: _____

Address: _____

Period Employed: _____

Please return to Director of Parks and Recreation,
Christchurch City Council, P.O. Box 237, Christchurch.

GYPSOPHILA — ACHIEVING AUTUMN/WINTER FLOWERING

Bronwyn Sinclair

Reproduced from Canterbury Cut Flower Grower Newsletter July 1986

Recently I obtained some information on Dutch cultivation methods for gypsophila. This was timely because visits to gypsophila growers this autumn have indicated that flower initiation in greenhouse crops destined for autumn/winter flowering is extremely variable.

Firstly, I will briefly outline some relevant points made in the Dutch articles and secondly I will outline some possible reasons for poor flower initiation.

1 *Gypsophila in Holland*

Gypsophila is the ninth most popular flower in Holland. In 1984 100 hectares were grown in Holland and 70 hectares of that was produced under glass. It is available all year round on the auctions but is produced in Holland from April to December only. This is because light intensity in winter is a limiting factor and cheaper imports are available in the Dutch winter.

Soils should be well drained and nutrient levels not too high. Although drought-resistant, the plants should not be deliberately dried out during cropping and stems must be turgid at harvest. The crown of the plant should be kept dry as it is prone to attack by stub rot (*Fusarium culmorum*). CO^2 enrichment is regularly used for winter crops (1000-1500 ppm). Minimum temperature requirements are 10-15°C. Spacing of young plants is 2-2½ plants/m^2 greenhouse area. One year old crowns may be brought in and flowered in the second year but twice the plant density is recommended otherwise yields will be halved.

In Holland flowering in autumn can be achieved without the use of artificial daylength extension by planting under glass up to 15 June (NZ 15 Dec). Later planting increases the risk of bad flowering caused by the prevention of initiation and development of flowers, due to day lengths of less than 15 or 16 hours.

The usual artificial lighting treatment is 15W/m^2 for three weeks dusk to dawn. Shoots are responsive once eight pairs of leaves have been developed. Two periods of lighting may be given if the stage of shoot development is variable. Propagators claim to have some 15 hour day length responsive cultivars. "Perfecta" requires 17 hours. All night lighting is the preferred treatment. Experimental work in Holland has compared the following lighting regimes —

1 No lighting (control).
2 17 hour day.
3 Day length 24 hour cyclic (15 min light, 30 min dark).
4 Day length continuous 24 hours.

The light intensity was 15W/m^2. Planting date was 15 July (NZ 15 Jan). The crop was lit from 3 August to 14 September (NZ 3 Feb to 14 March). All lighting regimes advanced the date of first harvest by one week compared with the control.

In the control treatment, flowers developed from the main stem only, side shoots didn't flower. All lighting treatments produced a higher yield than the non-lit control. Treatment 4 gave a clear stimulation of yield and a higher proportion of first grade stems when compared with treatments 2 and 3.

Experimental work also looked at pinching the main shoots. For first year plants a yield increase of 35-40% was achieved by pinching an early August (NZ early Feb) planted crop as compared with an unpinched crop.

2 *What are the Likely Causes of Poor Flower Initiation* —

From reading, observing and talking with growers there are certain circumstances that seem to induce poor flower initiation and development —

- Insufficient day length to trigger the initiation response.
- Low temperatures (night minimum less than 10°C).
- Stress factors, eg drought stress, over-watering, excessively high temperatures during the establishment phase, root restriction by containerisation.

I have one more suggestion to make in relation to this problem and this was partly highlighted by findings in Florida where they have also experienced poor winter flowering. It relates to the selection of plant material. Plant material for a crop to flower autumn/winter is likely to be selected in summer from plants which have the characteristic of abundant cutting production at that time of year. Florida researchers have suggested that the ability to produce cuttings and be floriferous in summer is in no way related to the ability of the plant to produce well under the shorter day lengths of winter. Therefore, unless plant propagators are selecting plant material from stock plants which are checked for their ability to flower in winter, this may inadvertently result in the selection of material which is unsuitable for winter flowering.

I don't know whether any plant propagators in NZ maintain stock plants under short days to check for winter floriferousness but I rather doubt it.

This could perhaps explain why this problem of poor winter flowering appears to have become progressively worse in the last few seasons.

To sum up, winter flowering ability of gypsophila may be improved by 24 hour continuous lighting, avoiding stress on the plants, pinching out main shoots and being aware when selecting plant material that summer vigour is not an indication of good winter flowering ability.

REMINDER

Have your returned your registration form for the 1988 AGM and Conference.

13-16 May 1988
Lincoln College, Canterbury.

Banks Lecture: "AMENITY HORTICULTURE IN CANTERBURY, 1850 - 1880"
Mr S. (Charlie) Challenger AHRIH, AILA, FNZILA.

Keynote Address: "NEW ZEALAND'S CONTRIBUTION TO IRELAND'S GARDEN HERITAGE"
Dr Charles Nelson
National Botanic Gardens
Dublin
Ireland.

CAN YOU AFFORD TO MISS IT?

Your Hosts: Canterbury District Council.

Please refer to your programme for full details and registration form.

If you have not received a programme & registration form, please write to:

RNZIH Conference & AGM
Education Unit
Lincoln College
Canterbury.

HERBICIDES: USES IN THE HOME GARDEN

Reproduced from M.A.F. Aglink

Cultivation and good hygiene can keep weed problems under control in the home garden. If the need arises to use a weedkiller, then care must be taken to select one that is appropriate.

Always read the herbicide label carefully before purchase or use.

Pay particular attention to the recommended use rate. Excessive amounts of weedkiller can damage plants that would not normally be affected.

Avoid Drift

There is always a risk of herbicides drifting in the confines of a small garden and damaging non-target plants.

Drift can be minimised by spraying under still-air conditions, using a low pressure rather than high-pressure sprayer equipped with nozzles delivering medium-sized spray droplets.

Fine droplets sprayed under high pressure will readily drift off target.

Sometimes a physical barrier may be usefully carried beside the sprayer to prevent drift. Alternatively garden plants can be covered to prevent damage.

Lawns

Weeds will invade lawns when the lawn grasses do not completely cover the soil. Good chemical weed control can only be achieved when combined with soil fertility maintenance and a sound mowing regime.

- Raise the mower height to at least 2cm. The grass will then have enough leaf to compete more effectively against the weeds.
- Apply fertiliser to the lawn in the spring or autumn. An annual application of a general-purpose lawn fertiliser is required, particularly if lawn clippings are removed.

Clovers, flatweeds, daisies: A herbicide product containing MCPA or 2,4-D should be applied for flatweeds and daisy control, but dicamba is needed for clover control (table 1).

The herbicides should be applied in early spring (August to September) for best results.

Warning: Don't use the lawn clippings in the garden (for mulch, compost, etc.) if the herbicide contained dicamba. Dicamba will leach out of the clippings, causing damage to susceptible garden plants. For the two mowings following spraying, it is best to discard the clippings at the dump.

Onehunga weed: Faneron should be used to control Onehunga weed. (Proturf will also control the weed, but it is available only in large quantities).

Faneron must be applied once in autumn and again in mid spring (September) to ensure complete control. A single application may allow some plants to survive and produce their prickly seeds.

Waxweed (hydrocotyle): Banvine and Woody Weed Killer give better control of waxweed in lawns than the lawn herbicides other than Proturf in table 1.

Warning: These herbicides contain dicamba in high concentration, therefore discard lawn clippings as discussed above.

Proturf controls waxweed, along with many other lawn weeds, but the large size of the packs make it unsuitable for the home gardener.

Newly sown lawns: Newly sown lawns should always be sprayed to make sure the lawn gets off to a good weed-free start.

Table 1: Herbicides for the Home Garden*

Product	Active ingredients and formulation
	LAWNS
Faneron (Yates)	500 g/litre bromofenoxim (liquid)
Lawn Master (Coopers)	100 g/litre MCPA, 200 g/litre mecoprop (liquid)
Lawn Spray (Shell)	2.52 g/litre mecoprop, 0.62 g/litre MCPA, 0.08 g/litre dicamba (aerosol)
Lawnweeder (Selleys)	150 g/litre MCPA, 25 g/litre dicamba (liquid)
Moss 'n Weed Control for Lawns (Bug Bar)	Anhydrous sodium sulphate, heptahydrate, ammonium sulphate, ferrous sulphate (crystals)
Proturf† (May & Baker)	274 g/litre dichlorprop, 54 g/litre ioxynil, 36 g/litre bromoxynil, 119 g/litre MCPA (liquid)
Turfclean	42 g/litre MCPA, 168 g/litre mecoprop, 21 g/litre dicamba (liquid)
Turfix (Yates)	100 g/litre MCPA, 200 g/litre mecoprop (liquid)
Turfmaster (IWD)	100 g/litre MCPA, 200 g/litre mecoprop (liquid)
	DRIVEWAYS, PATHS, WASTE AREAS
Amdal (Yates)	370 g/kg 2,2-DPA, 250 g/kg amitrole, 45 g/kg sodium thiocyanate (wettable powder)
Amitrole (Yates)	400 g/litre amitrole (liquid)
Amritole T-L (Yates)	200 g/litre amitrole, 183 g/litre ammonium thiocyanate (liquid)
Banvine (IWD)	200 g/litre 2,4-D, 100 g/litre dicamba (liquid)
Dalapon (Yates)	740 g/kg 2,2-DPA (wettable powder)
DAS (Yates)	257 g/kg 2,2-DPA, 125 g/kg amitrole, 400 g/kg simazine (wettable powder)
Network (Shell)	4 g/litre glyphosate (aerosol)
Network (Shell)	50 g/litre glyphosate (liquid)
Pathclear (Cooper)	25 g/kg paraquat, 25 g/kg diquat, 50 g/kg simazine (soluble pellet)
Permazol (IWD)	257 g/kg, 2,2-DPA, 125 g/kg amitrole, 400 g/kg simazine (wettable powder)
Prefix Granules (Shell)	75 g/kg chlorthiamid (granule)
Roundup (Monsanto)	360 g/litre glyphosate (liquid)
Trigger (Yates)	6 g/litre amitrole (liquid)
Universal Weedkiller (Yates)	590 g/kg sodium chlorate (wettable powder)
Weedazol 4-L (IWD)	400 g/litre amitrole, 100 g/litre ammonium thiocyanate (liquid)
Woody Weedkiller (Yates)	100 g/litre, 2,4-D, 50 g/litre dicamba (liquid)

GARDENS

Basamid (BASF)	990 g/kg dazomet (granule)
Network (Shell)	4 g/litre glyphosate (aerosol)
Network (Shell)	50 g/litre glyphosate (liquid)
Garden Clear (Yates)	25 g/kg paraquat, 25 g/kg diquat (soluble pellet)
Roundup (Monsanto)	360 g/litre glyphosate (liquid)

BUILDINGS

Mosskiller (Shell)	115 g/litre pentachlorophenol (liquid)
Moss Mould Mildew Killer (Bug Bar)	49.5 g/litre quaternary ammonium chloride

*These herbicides were found to be generally available in small packs at garden retail outlets.
Note that the weed species controlled are listed on the herbicide labels, and the labels must be read carefully before use.
†Five and twenty litre packs available only.

Lawns so treated may remain weed free for several years, provided soil fertility is maintained and mower height is no less than 2 cm. Perennial weeds such as yarrow may be controlled as seedlings, whereas mature plants cannot be.

Moss: Use the ammonium sulphate/ferrous sulphate mixture or pentachlorophenol (used also on buildings).

Paths and Driveways

Herbicides for paths and driveways are of two types: knockdown and residual.

Knockdown herbicides will control the existing vegetation, but will often not control weed seeds, which will germinate and reinvade the sprayed area within a very short time. These herbicides include paraquat, glyphosate, and amitrole.

Residual herbicides, such as simazine, sodium chlorate, or chlorthiamid, will last up to 12 months at recommended rates.

Most mixtures contain both knockdown and residual herbicides (table 1).

Warning: Do not exceed the recommended rate. These herbicides may move out of the treated area and cause damage to trees, lawns and shrubs if the recommended rate is exceeded.

Heavy rain falling within a few days of treatment will also enhance the lateral spread of residual herbicides.

Gardens

Either paraquat or glyphosate will control most annual weeds, though glyphosate will also control perennial weeds such as couch. Both herbicides can be used with care around trees and shrubs.

Herbicides should not be allowed to drift on to the foliage of desirable garden plants. New plantings can be made 3 days after spraying with these particular herbicides.

Use a "wick wiper" applicator with glyphosate to treat isolated weeds, particularly if they occur amongst desirable plants. Avoid treating weed foliage that is likely to come in contact with desirable plants — glyphosate can be transferred by contact.

Chlorthiamid can be used around trees and some shrubs for residual weed control. Some species of ornamental plants are very sensitive to this herbicide, so read the label.

Amitrole can be used instead of paraquat or glyphosate, giving a residual weed control of approximately 3-8 weeks.

Oxalis control: The soil sterilant dazomet gives effective control of all species of oxalis (stoloniferous and bulb-forming types) but cannot be used in areas with perennial plants. It will also kill many other weed seeds in the soil. Dazomet can only be used before planting and on cultivated soil. Read the label carefully.

If the oxalis is around trees or shrubs, the best form of control is regular treatment with glyphosate. Several applications will be required.

Convolvulus: Convolvulus is best controlled by application of herbicides containing dicamba. Where it is growing over trees and shrubs, apply the herbicide to the leaves of the convolvulus with a paint brush or "wick wiper" applicator.

Buildings

Mosses, lichen and algae can become a problem on roofs, paths and walls. They are commonly found on steep, southfacing roofs, and on concrete paths, paving, and vertical brick and concrete walls which are shaded and remain damp during winter.

Control can be obtained by the application of pentachlorophenol. Moss and algae may also be controlled with quarternary ammonium chloride.

Disclaimer

The proprietary names used in this text are given for reader convenience and do not imply MAF endorsement of the products concerned. All chemicals/products listed are however registered with the New Zealand Pesticides Board.

SOIL STERILANTS — RELATIVE EFFECTIVENESS

Reference: UK Grower Guide No 1 — Freesias

Sterilant	Pest or Disease				
	Weeds	Eelworm/ Nematode	Root Rots	Fusarium	Insects
Steam	Good	Good	Good	Good	Good
Formaldehyde	Fair	No	Fair	Fair	No
Metham sodium	Good	Fair	Good	Good	Good
Dazomet (Basamid)	Good	Fair	Good	Good	Good
Chloropicrin	No	No	Good	Good	Fair
Methylbromide	Fair	Good	Fair	Fair	Good

It is most essential to provide suitable soil conditions prior to sterilizing. This may vary for the specific sterilant.

More information is available on method of application and time between application and planting in AgLink HPP 53.

INTERNATIONAL PLANT PROPAGATORS SOCIETY (N.Z. REGION)

STUDENT PROJECT AWARD

The New Zealand Region of the IPPS has established an award which is designed to encourage young people to carry out research projects in the fields of plant propagation and production. The award is open to people aged 28 years or under who are actively involved in plant propagation and/or production either as students or as nursery workers. Applicants do not have to be IPPS members.

The Award

The winner of the award will be invited to an Annual Conference of the International Plant Propagators Society with all travel, accommodation and conference expenses paid. The awardee will be required to present a paper based on their work to the conference and will be presented with a scroll commemorating the award.

The Research Project

Award applications should be submitted in the form of a written report and can be based on:

1. Research undertaken as part of a formal educational course or
2. Research undertaken through a place of work in the industry.

The project should be relevant to the general field of plant propagation and production. Research projects in allied subjects such as pest and disease control will be suitable only if their relevance to the field of plant propagation/production is clearly established. The project need not be of an advanced nature; comparisons of commercially available propagation trays for example would be regarded as satisfactory to the aims of the award.

Administration of the Award

The award is to be administered by a Student Award Committee consisting of three IPPS members of whom at least one is a staff member of an educational institution and one a grower.

Entries for the award close on 30 August 1988. Further details and application forms can be obtained from:

Mike Oates,
Department of Horticulture
NZTCI
Private Bag
Lower Hutt.

BITTER PIT CONTROL IN APPLES

George W. Kerse

Reproduced from 'Canterbury Top Fruit' Bulletin

Introduction

Bitter Pit is a physiological disorder of apples and it is strongly correlated with the concentration of calcium in the fruit. Low calcium levels in the fruit can cause localised breakdown of the cell structure and result in the formation of corky tissue. These are the brown bitter tasting "pits" which are called bitter pit. These can occur in the flesh of the fruit ie internal pit, or near the skin of the fruit ie, external pit. If the concentration of calcium in the fruit is 2.0 mg/100 g (for small fruit) to 2.5 mg/100 g (for large fruit) or greater, the development of bitter pit is unlikely. As well as calcium concentration, fruit maturity at harvest can influence bitter pit incidence (immature fruit are more susceptible) and delaying the rate of fruit ripening, by using polybags or controlled atmosphere, will delay or reduce bitter pit incidence. There also appears to be varietal susceptibility to bitter pit incidence.

Calcium Nutrition

The uptake of calcium into the fruit occurs mostly during the first four to six weeks after fruit set. This is because calcium is transported in the transpiration stream in the xylem. After this period the developing fruit is fed via the phloem, where nutrients and other minerals (eg nitrogen, potassium and magnesium) are transported, but not calcium. Calcium is not re-distributed within the plant, therefore there can be adequate calcium in the leaves but at the same time a deficiency in the fruit. The total amount of calcium in the fruit is achieved at this early stage and subsequent increases in fruit size result in a dilution of the concentration of calcium (see Fig 1). It can be seen that calcium nutrition of the tree during these early stages of fruit development is very important, particularly for the prevention of internal pit.

The calcium nutrition of the tree can be affected by a number of factors. There is normally adequate calcium in New Zealand soils for healthy plant growth. Adequate soil moisture is required for calcium uptake (because calcium is transported in the transpiration stream), but water-logged soils may impede calcium uptake as well as drought conditions because roots cannot function efficiently under water-logged soil conditions. The tree must have a healthy root system and calcium is primarily taken up by the young roots which also take up most of the water. The balance of minerals in the soil is very important. Calcium has to compete with minerals like potassium, magnesium and ammonium for uptake so if these minerals are present in excessive amounts, calcium uptake may be impeded.

Therefore when fertilisers are applied the minerals and the form of the minerals being applied should be considered to avoid mineral imbalance in the soil. The optimum soil pH for healthy plant growth is 5.5 - 6.5. However, care should be taken as to how pH is adjusted. For example if dolomite is used to raise pH, calcium uptake may be reduced because of the extra magnesium applied in the dolomite.

Foliar Sprays

After the initial period of calcium uptake into the fruit, (see Fig 1) the only other way of getting more calcium into the fruit is by foliar sprays or post-harvest dips. These are only supplementary measures and will not compensate for soil mineral imbalances. However, the calcium content of the fruit may be boosted by up to 25%, eg from 2.0 mg/100 g to 2.5 mg/100 g. Good coverage of the fruit is essential when applying foliar sprays. Research at the Cawthron Institute has shown that on an individual apple, calcium sprays applied to one half of the apple prevented bitter pit occurring in that half of the apple, but bitter pit still occurred in the untreated half. Also because calcium is not redistributed from the

leaves to the fruit, any spray landing on a leaf will not improve calcium nutrition of the fruit. Measures that can be taken to improve the efficiency of foliar sprays include — correct calibration of spraying equipment, propping up of laden lower branches, a judicious amount of summer pruning to improve coverage of the fruit and tree management to avoid the formation of over-sized fruit.

The timing of the foliar sprays is important. Calcium which has been applied early in the season may be located in more physiologically critical parts of the fruit. Also the ease of penetration is greatest at the beginning and the end of the season. However, not all calcium sprays can be applied safely at all growth stages of the fruit. There are currently three materials approved by the New Zealand Apple and Pear Marketing Board. These are — calcium nitrate, calcium chloride and wuxal calcium. Under certain conditions, eg drought, calcium nitrate may cause fruit scorch, particularly during the early growth stages of the fruit. Calcium chloride can cause leaf scorch, a higher incidence of russeting in the early fruit growth stages and premature leaf fall under certain conditions when the plant is under stress, eg drought. Wuxal calcium is a suspension concentrate and all the minerals are present in a chelated form. It is safe to use and is also compatible with most commonly used pesticides. Extensive trials in New Zealand and overseas have shown wuxal calcium to be as effective as calcium nitrate or calcium chloride in improving the calcium nutrition of apples. Wuxal calcium is more expensive but it contains macro and micro nutrients other than calcium and some additional benefit may accrue from these.

Results From Early Sprays with Wuxal Calcium

A trial conducted in Nelson on Cox's Orange apples showed some interesting results from early sprays with wuxal calcium. The treatments and results from the trial are shown in Table 1.

Table 1: Treatments and Results from Nelson Bitter Pit Trial (cv Cox's Orange)

Treatments	Fruit Calcium Concentration mg/100g	Bitter Pit Incidence %
1 Untreated	2.0	45
2 Calcium Chloride 360 g/100 l (11 sprays from mid Dec. to harvest)	2.4	32
3 Wuxal Calcium 350 ml/100 l (3 sprays from petal fall-mid Dec) Followed by — Calcium Chloride 360g/100 l (11 sprays from mid Dec to harvest)	2.6	8

In the untreated fruit, calcium concentration was 2.0 mg/100 g and the incidence of bitter pit was 45%, ie 45% of the fruit had bitter pit. The normal calcium chloride programme (Treatment 2) increased the calcium concentration to 2.4 mg/100 g and reduced the bitter pit incidence to 32%. The early wuxal calcium sprays (Treatment 3) followed by the normal calcium chloride programme further increased the calcium concentration in the fruit to 2.6 mg/100 g and reduced the bitter pit incidence to 8%.

The interesting result is that the early sprays of wuxal calcium (applied at a time when it is risky to use other calcium sprays) improved the calcium nutrition of the fruit and significantly reduced the incidence of bitter pit when used in addition to the normal programme of calcium chloride.

Wuxal calcium can be used as a full season programme but if growers want to cut costs they can use the cheaper calcium chloride and calcium nitrate sprays later in the season when it is safer to use them and use the wuxal calcium for the early sprays.

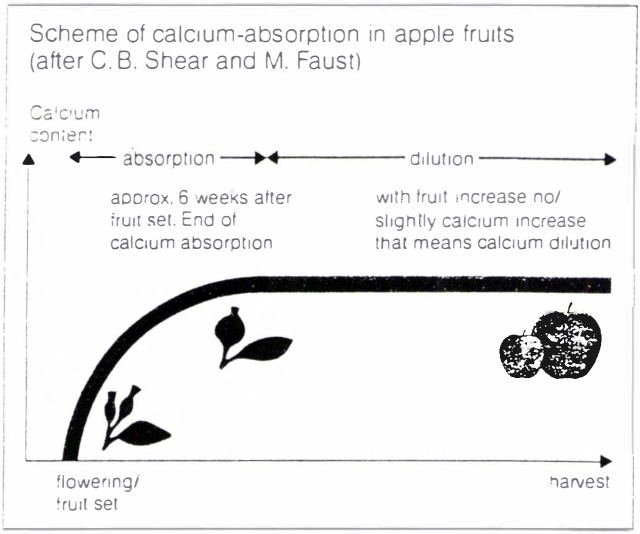
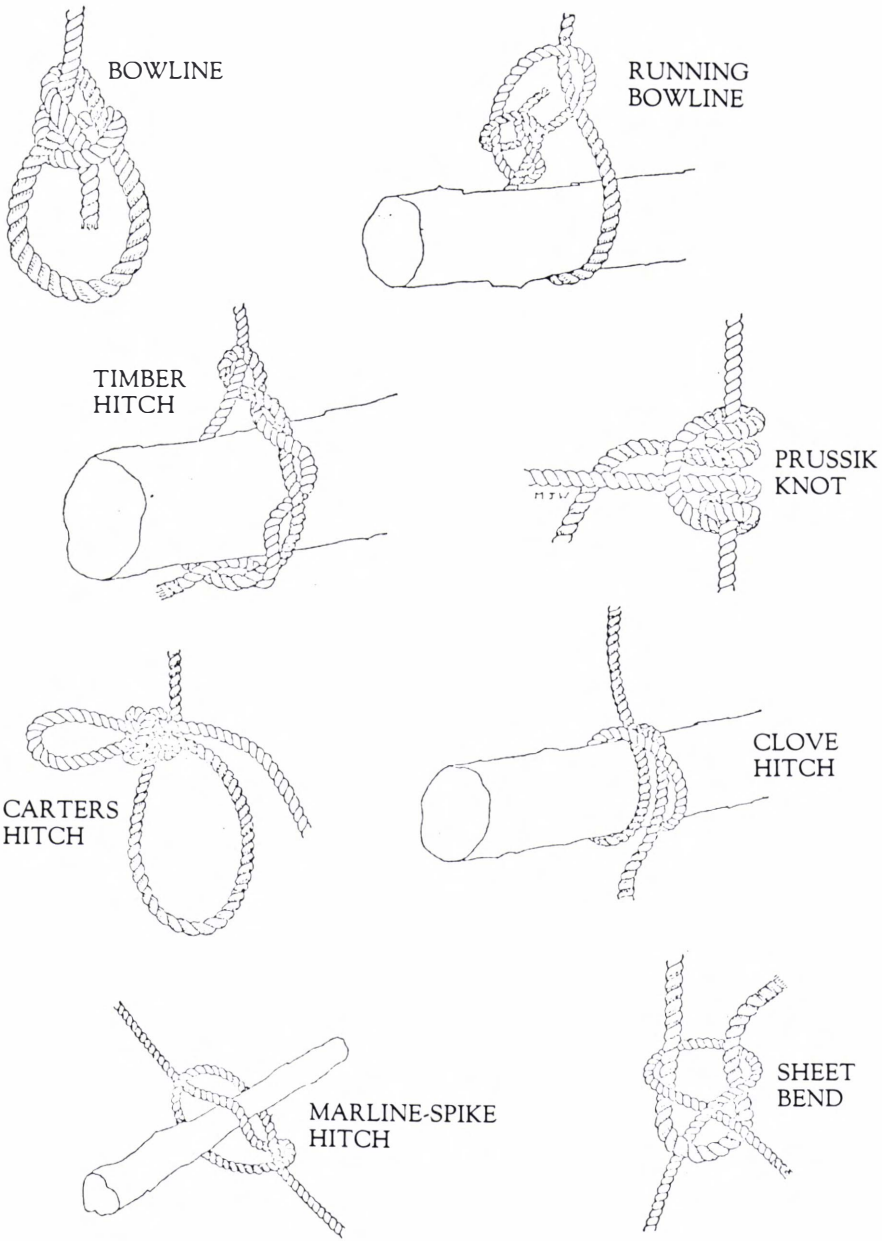


Fig. 1:

KNOTS COMMONLY USED IN TREE SURGERY



R.N.Z.I.H. PUBLICATIONS

Members are reminded of the various publications that the Institute has available. Don't miss out on these valuable items:

1. "FLOWERS FOR SHOWS"
   A "must" for everyone involved in flower shows, whether as a judge or exhibitor.
   Cost $10.00 plus GST.
   Quantity discounts available on request.

2. ANNUAL JOURNALS
   Back copies, expecially 1986/87 available at greatly reduced rates. Contact the Executive Officer for further details.

3. "HORTICULTURE: THE CAREER FOR YOU?"
   This very valuable book for people contemplating a career in horticulture has just been revised. Copies have been sent free of charge to all secondary schools in New Zealand. Further copies are available from the Executive Officer at $5.50 each (including GST and postage).

MEMBERSHIP APPLICATION FORM

Please return this form, together with a cheque for your 1988 subscription, to the RNZIH Executive Officer if you wish to become a member of the Institute. Subscription rates are as follows (all inclusive of GST):

A) Individual Member	$38.50
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Subscription accounts will be sent to all members at the end of September and are payable by 31 Oct 1987.

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