

# 10

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# Horticulture

in New Zealand

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



# HORTICULTURE

IN NEW ZEALAND



BULLETIN OF THE ROYAL N.Z. INSTITUTE OF HORTICULTURE  
NUMBER 10, SUMMER 1979

In this issue

|   |                |    |
|---|----------------|----|
| Editorial .....   | J.O. Taylor    | 1  |
| Letters to the Editor .....   |                | 2  |
| Gardening with Pentachondra .....   | G. Patterson   | 3  |
| Research and Experiments .....  |                | 4  |
| Notice of AGM .....   |                | 8  |
| The Plant and its Environment .....   | G. C. Morrison | 9  |
| The NDH and the Thesis .....  | J.O. Taylor    | 11 |
| Mount Lees Reserve .....  | Pamela Morrah  | 12 |
| Maintenance of <i>Pinus radiata</i> Grafts Under<br>Excessive Watering Conditions ..... | P. Schroeder   | 16 |
| <i>Pinus contorta</i> .....   |                | 19 |
| Horticultural Training .....  | M. R. West     | 20 |
| Know Your Turfgrass - 2 .....   |                | 22 |
| District News .....   |                | 24 |
| Cover design by Julie Thomas  |                |    |

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

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The Editor welcomes articles, letters and news items for consideration for publication. Deadline dates for material are: Autumn issue, February 20; Winter, May 20; Spring, August 20; Summer, October 20. Contributions should be addressed to the Editor, P.O. Box 12, Lincoln College. Views expressed in the Bulletin are not necessarily those of R.N.Z.I.H.

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# Editorial

In January this year Professor T.M. Morrison took up the position of Director of the Queensland Agricultural College in Australia.

Since 1966 when he was appointed to the Chair in Horticulture at Lincoln College, he has been closely associated with the Institute and up to the time of his leaving was Chairman of the Examining Board and a member of the National Executive.

His contribution to the objectives of the Institute have predominately been through administration channels where his extensive knowledge and understanding of the horticultural profession was of immense help in consolidating the recognition and worthiness of the Institute.

'Mac' as he is known to his friends and colleagues has over the years had one overriding objective for horticulture. His drive and initiative have been directed towards giving horticulture a new professional image.

For the Institute, without fear or favour he has promoted our case to Government departments, and to official and professional bodies to have the work of the Institute supported and understood.

He also promoted directional changes in the Institute. In particular he saw the need for a professional annual publication representing general horticultural science and technology. The Institute's Annual Journal now admirably fills this role and circulation is steadily growing.

Upon retirement of Mr. K.J. Lemmon as Dominion Secretary, Professor Morrison was instrumental in establishing the secretariate at Lincoln College where the association with a large centre of horticultural expertise has greatly assisted in the servicing of the increasing number of National Diploma in Horticulture students. This move also significantly improved the financial viability of the Institute.

With his departure New Zealand has lost one of its forthright leaders and we wish him well in the new challenge which he has accepted.

J.O. TAYLOR

# Letters to the Editor

## Student Fees

Dear Sir,

The Whangarei District Council is very concerned about the fees that students have to pay to become members when they are pursuing their N.D.H. courses. The actual figure may not seem very high, but when one takes into account the books etc. that have to be purchased, which today are not by any standards cheap, the membership fee may become a critical factor.

To this end our Council will be submitting a remit to Dominion Council requesting that students' fees be reduced. In the interim our Council has decided to set up a fund, to be called the Students' Education Fund so that our Northland students can be reimbursed some of the money that they have had to pay to become members. This fund has already been initiated and a number of donations have been received.

Before we submit the remit our District Council would be interested to hear from other Councils on this matter.

Yours sincerely,

JOHN D. SHOLL

Secretary, Whangarei District Council

## Notable and Historic Trees

Dear Sir,

The Committee wondered whether the resolutions passed at the AGM in protection of our native forests which were forwarded to the Minister of Forests could be printed in the Bulletin.

Yours sincerely,

DIANE MENZIES

Hon. Secretary.

We are happy to comply with this request and the text of the letter sent to the Hon. V. Young on 29 May 1978, is as follows:

At the Annual General Meeting of the Royal N.Z. Institute of Horticulture, held in Wellington on May 28, 1978, a motion was carried unanimously that : the Institute strongly supports the conservation of the podocarp forests in the Western Taupo area.

This strong expression of support comes from a group of people which comprises representatives from horticultural interests throughout New Zealand, and whose individual background of experience in horticulture qualifies them, both academically and professionally, to express soundly based opinions on the value of conserving this country's natural forest resources.

The Royal N.Z. Institute of Horticulture has recently launched a scheme to register Notable and Historic Trees in New Zealand, to preserve them for their beauty, their scientific, historic, and national importance, and as a source of rare propagating stock. While this scheme is mainly directed towards saving individual trees, it is also concerned with stands of forest which come within the terms of reference of the scheme.

It is the view of the Institute that the podocarps in West Taupo form an important part of our heritage, deserving of protection from total destruction for commercial purposes.

The Institute would be grateful, Sir, if you would give full consideration to the views expressed by the Motion passed at our Annual General Meeting, when making your decision on the future of the Waiaha and Pureora Forests.

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## Gardening With Pentachondra



GRAEME PATTERSON

*Pentachondra pumila* is a native plant belonging to the family Epacridaceae found throughout New Zealand with the exception of areas north of Whangarei. It is a dwarf shrub, densely branched forming compact mounds.

The plant is notable for its conspicuous flowers and fruits which although small, are placed to their best advantage. The white solitary flowers point skywards from the tips of the branches being tubular and are followed by a dull red drupe-like fruit, quite often still bearing the style or corolla.

The flowering occurs from summer onwards until the autumn and both flowers and fruit are present together on the plant.

The plant is most commendable as a potted or a rock garden specimen provided a moist habitat is available.

# Research and Experiments

*The following reports are taken from publications of the Nursery Stock Research and Extension Advisory Committee. Each year the Committee publishes a summary of the research and experiment being carried out in N.Z. on nursery stock, bulbs and flowers. It is with the permission of the Advisory Committee and the respective authors that we reprint the following reports.*

## Energy Savings in Glasshouses.

An estimate of the annual fuel savings possible from effectively sheltering the entire heated glasshouse area of New Zealand was prepared for a Symposium on the More Profitable Use of Energy in Protected Cultivation held at Alnarp, Sweden, last August. The estimate was based on wind data in the general vicinity of the main glasshouse areas, adjusted for existing windbreak and topographical shelter. Assuming shelter is effective for only one-third of the time the average potential savings in fuel were weighted for the area in glass in each region to derive the national figure. Fuel savings were computed from published figures of the Bristol Meteorological Office relating wind speed to fuel consumption. The resultant figure of 8.5% fuel saving is probably conservative but none-the-less represents a potential saving to the N.Z. glasshouse industry of \$0.5 million per year.

J.W. Sturrock

## Tissue Culture Propagation of Strawberry Plants

'Tioga' and 'Red Gauntlet' strawberries have been successfully propagated from runner tips with a multiplication rate of 10-fold every 2 weeks, giving a potential production of one million plantlets from a single meristem in 3 months. After 3 weeks on a rooting medium, rooted plantlets were transferred into non-sterile potting mixtures with 100% success. The technique appears to have commercial potential for early plantings and for production of high health mother plants, and would be ideally suited for varieties with low runnering ability.

Trials on the virus content and growth performance of tissue-cultured plants are being carried out by the Levin Horticultural Research Centre.

W.D. Sutton; H.C.M. Whitehead  
D. Elliott

### Flowering of *Sophora microphylla* Ecotypes

Four of the thirteen kowhai ecotypes propagated in November 1975 from adult wood are expected to flower this coming spring giving a production time of 34 months.

The most outstanding selection is from Stephen's Island in Cook Strait; plants are about 1 metre high, well branched and could well be a plant with export potential.

Seed collected from Stephen's Island and sown in May 1976 produced very variable seedlings. One seedling is expected to flower this coming spring 28 months after sowing. Other plants have horizontal or prostrate habits. One in particular has light golden leaflets. These three selections could well have a place in the nursery industry.

G.N.J. Goldie

### Tissue Culture Propagation of Tamarillo and Feijoa

Tamarillo plants have been successfully propagated from axillary buds with a multiplication rate of 5-fold every month, giving a potential production of two million plantlets from a single meristem in 9 months. After 2 weeks on a rooting medium plantlets were transferred into non-sterile potting media with 50% success. Their subsequent growth rate and growth habit was similar to that of seedlings.

The technique appears to have good potential for rapid clonal multiplication of superior plants.

Attempts to propagate Feijoa plants from axillary buds by a similar technique have so far been unsuccessful.

D.Elliott;H.C.M. Whitehead

### Advancing Flowering

Bulbs of 'Wedgwood', *Narcissus* 'Fortune', tulips 'Advance' and 'Apeldoorn' and corms of freesias 'Rynvelts Gold' and 'K and M Mixed' were cool stored at 9°C for 7 weeks (Apeldoorn tulip also at 5°C for 10 weeks) before planting in a heated glass-house, in a low plastic tunnel and in the open ground as appropriate to the species.

In all cases, precooling hastened flowering. The flowers produced in the plastic tunnel were of exceptional quality, of good stem length and completely unblemished.

Paper offered for publication to the Journal of the New Zealand Flower Growers' Association.

J.P. Salinger.

### Propagation of *Platanus acerifolia*.

A trial was carried out on the propagation of *Platanus acerifolia* from hardwood cuttings. Results showed that some clones rooted much more readily than others, (94% rooting compared with 2.5%). Using one clone, two preplanting treatments and a comparison between apical and basal cuttings and weak and vigorous cuttings failed to produce any significant results.

*Platanus acerifolia* was successfully propagated by planting metre long wands, horizontally, 8 cm below soil level. This method produced as many as four plants from a single wand containing six buds. Growth rates for horizontally planted cuttings were similar to those for the more conventional vertically planted cutting.

I. A. Duncalf.

### Floral Preservatives

Overseas experience has shown that placing cut Gladiolus spikes in a concentrated sugar solution up to 20%, for several hours prior to marketing increased the number of florets which opened. Experiments were carried out with both Gladiolus and Watsonias placed in different strengths of sugar solution for varying lengths of time. There appeared to be no great advantage in preconditioning these flowers, best results being obtained when the stems were held continuously in standard preservative solution.

J.P. Salinger & A.N. Watson

### A Severe Disease of Plane Trees

A severe disease of plane trees has become important throughout N.Z. in the last 2-3 years. It became very apparent in the environs of Christchurch during the 1975-76 season.

The cause of the disease has been investigated at the Microbiology Unit, Botany Department, University of Canterbury, and been identified as the fungus *Gloeosporium platani* (perfect stage *Gnomonia platani*). Symptoms of the disease have been observed and recorded over the period of a full year.

Work on the life cycle of this anthracnose fungus is presently being undertaken. Several sporing stages have been isolated and the importance of these stages in the inciting of the disease is being sought.

Inoculated cuttings are being used in control studies using a number of fungicides.

Work will be continuing on this project and published on its conclusion.

A.L.J. Cole and L.A. Hitchcock.



## Establishment of Coast Redwood

*Sequoia sempervirens* is currently being evaluated as a species with a possible forestry application. Interest lies in advantages of :

- Deep rooting - particularly valuable on eroding slopes;
- Ability to coppice freely;
- Relatively free of disease and insect pests;
- Moderately fire resistant;
- Wood uses include joinery, panelling, sheathing, shingles and a variety of uses where durability is important but strength is not.

To date successful establishment trials located at Ruatoria Forest, Te Araroa area, have produced the following conclusions:

- Weed control in initial years of utmost importance to reduce change of 'check';
- Fertiliser (Amophos 12,10,10) applied initially to ensure apical dominance particularly on infertile sites;
- Containerised stock (jiffy pots) reduce planting shock setbacks;
- Low stocking rates (130 stems/ha) to reduce difficulties with unwanted coppice following early thinning.

Research is continuing.

G.P. Bowles

## Seedling Quality

Considerable research effort by the FRI at Rotorua has been directed to the production of high quality seedlings, yet similar results are not being obtained by other nurseries. This is often related to difficult soil conditions, adverse climatic factors and a lack of understanding of the principles of inducing plant 'hardiness'. Consequently, there is some dissatisfaction, expressed by forest managers, with tree stock quality, whether seedlings are obtained from private or Forest Service nurseries. Current research is directed towards effecting a marked improvement in the quality of tree stocks delivered to planting sites, in both North and South Islands, by means of co-operative trials at individual nurseries to determine the optimum regimes required. In the South Island, a marked improvement in seedling quality was achieved by:

- seed stratification followed by post-sowing irrigation. This led to a high germination % and the reduction of the seedling emergence period from 10 to 4 weeks.
- More care in sowing with Stanhay sowers (careful calibration is essential), followed during the growing season with thinning out doubles or trebles, resulted in a more even crop with a high proportion of high quality seedlings.

Side dressing with fertilizers boosted growth so that 1/0 seedlings were almost plantable size by mid-March. This allowed an appropriate wrenching regime to be introduced early enough to allow greater root development while growth was still active, associated with a hard woody stem.

Field results following outplanting were striking. Seedlings produced by a conventional regime showed general unthriftiness, with little growth in the first year. Those produced by the regime given above produced twice as much increment in the first year.

J.M. Balneaves

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ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE (INC).

ANNUAL GENERAL MEETING 1979.

Notice is hereby given that the 1979 ANNUAL GENERAL MEETING will be held in TAURANGA on SATURDAY 28th APRIL, at :

St. STEPHEN'S METHODIST HALL,  
BROOKFIELD TCE.,  
OTUMOETAU,  
TAURANGA.

The programme will commence at 10.00 a.m., finishing at 5.00 p.m.

The BANKS MEMORIAL LECTURE will be given at 8.00 p.m. the same day and all members are encouraged to attend.

R.A. Foubister,  
Secretary.

# The Plant and its Environment

G. C. MORRISON

*Printed by kind permission of the Australian Institute of Horticulture Inc.*

Recently a lot of attention has been given to environment and its effect on animal life. "Grow more Greenery" and similar campaigns have advocated using plant material to arrest environmental contamination. However, little seems to have been written about the environment enjoyed by the plant itself and as a horticultural journal we should be more concerned about the plant than about animals.

We have broad guidelines on the suitability of specified plants in large geographical climatic areas. This is a useful guide in a rough sense, but is of little value where the environment can be controlled or where nature controls the environment in small areas. This article will attempt to consider the importance of temperature, light and carbon di-oxide concentration on plant life.

**Temperature** The Q10 factor expresses the rate at which events happen when the temperature is changed by 10°C. For example in photosynthesis, we have two distinct processes; one is the light reaction where-in electrons are shuffled about to produce energy. This reaction is not temperature sensitive so the Q10 factor is unity. Simple physical processes such as diffusion, have a factor of about 1.2 so are mildly temperature sensitive. Chemical processes, such as respiration and the dark reaction of photosynthesis occurring within the plant tissue have factors between 2 and 2.5 over the normal climatic temperature ranges. Is it a fact that higher temperature produces faster growth?

In general terms the photosynthetic rate increases up to a temperature of 30 to 33°C, not because of the light reaction but because of the temperature sensitive chemical synthesis process which is also going on. During the day the respiration rate is also high. It has a Q10 factor of 2, so is temperature responsive. To show some profit for the day's work the plant must produce more food during the daylight period than it uses during this daylight period, for the plant also works at night and should not have to draw on food reserves or its own tissue for survival. Perhaps then, at a temperature of 33°C (91°F), the production level is in full swing but the consumption of energy is also high, (i.e. respiration is high). If the temperature is decreased to 23°C the energy consumption of the plant due to respiration would drop by a factor of 2. If the photosynthetic process does not drop by such a factor then we are making some profit, and this is in fact, what seems to occur.

A typical optimum daytime temperature is from 20 to 22°C (68 to 72°F) on a bright day and even less on a dull day when photosynthesis is not proceeding at such a high rate.

The night temperature is particularly important. Plants make their greatest linear growth at night when food products are translocated. Respiration goes on all the time and uses up food in the process and provides energy for the translocation process.

The optimum night temperature is one where all of the food manufactured during the day is used up in some way or another. At low temperatures say, 10°C (50°F), the energy levels will be low and the food made is stored and not fully used for growth.

At high night temperatures say, 21°C (70°F) the respiration rate is high and consumes more of the food products for this purpose instead of these being available for cellular increase. The plant is wearing itself out as an inefficient machine. The optimum night temperature is between these limits so that the daily food products due to photosynthesis, are used for as much growth as possible after taking sufficient for respiration. Perhaps 15°C (59°F) could be a typical optimum night temperature, i.e. 5 to 7°C less than the optimum day temperature.

The use of optimum day and night temperatures (plus other necessary environmental factors) is part of the "fast crop" technique to get the produce to market at the best time or as soon as possible to allow the growing space to be used again.

**Light** The intensity of light is an environmental factor of some importance and can be controlled by various means. To produce a flowering plant from a seedling requires an amount of solar energy called "cumulative solar energy". High light intensities may produce the necessary amount in 60 to 70 days whereas low light intensity may require 100 to 120 days.

Full sunlight on a bright day has an intensity of some 10,000 foot candles. Few plants seem to be able to take advantage of this value unless supplied with additional carbon dioxide as this latter appears to be the limiting factor. The normal CO<sub>2</sub> concentration is 0.03% or 300 ppm and about 5000 foot candles of light intensity is high enough to take full advantage of this amount. If the CO<sub>2</sub> concentration can be increased to 1500 ppm (too much can be phytotoxic) then greater growth will result from increased light intensity. Also the temperature should be raised by 4 to 5 degrees C above normal daylight optimum to produce maximum net food production, otherwise respiration rate may not be adequate to cope with the synthetic process capability when 5 times the amount of CO<sub>2</sub> is available to the plant.

An increase in CO<sub>2</sub> concentration need not necessarily be derived from bottles of CO<sub>2</sub> connected to a plumbing system and fed into a greenhouse. The respiration of aerobic soil bacteria produces lots of CO<sub>2</sub>, the concentration of which, in good organic soil, can be from 1% to 2%. The diffusion of this from well structured soil into the air just below the leaf surface, where it can be easily absorbed, allows the plant to use higher dry temperatures and higher light intensity with obvious beneficial results.

This is one reason for advocating "organic gardening" and is one of some substance, yet it is one which is virtually ignored by

the exponents of this system who advance various peculiar reasons for their faith.

This article has not been written about any plant in particular but has been a general review of the situation. Some plants thrive in particularly low light intensities, others require full sunlight. It is hoped that the thoughts contained here-in may provide a stimulus to research on specific plant types. If not, then it may guide horticulturists to grow better plants.

*This article first appeared in Vol. 1, No. 3 issue of the Australian Institute of Horticulture Journal (July, 1973).*

## The N.D.H. and the Thesis

J. O. TAYLOR

*Chairman, National Executive*

Recognition of the National Diploma in Horticulture as the hallmark of practical horticulturists in New Zealand has taken a long time.

While the Examining Board understands the need to recognize in some way the attainment of all subjects without the thesis I am firmly of the opinion that the thesis (subject No. 22) is part of the N.D.H. and without it the qualification will become a devalued award. The need to give recognition to all subjects (Nos. 1 to 21) can be met by institutions for the want of a better title, a Higher or Senior National Certificate.

Judging by the small number of students who progress to subjects beyond national certificate it is by no means only the thesis which prevents students finally completing the qualification. An improved guidance system to students preparing their thesis would be the best way of overcoming this part of the problem.

The depth of understanding required to gain the N.D.H. is very considerable. Likewise the horticultural practical experience is lengthy and much valued by both employers and students.

I believe that rather than reduce the value by altering the thesis requirement, the Institute should give serious consideration to instituting a four week or six week university short course at the end of the study period as a terminal course to the Diploma. Adequate background study in several areas could be given as finishing material to several subjects. Included could be a study in depth of the thesis requirements.

# Mount Lees Reserve

## A Gift to New Zealand

PAMELA MORRAH

Reprinted by kind permission of the 'N.Z. Gardener,' in which the article was first published (July 1975).

(Background: The Mount Lees Reserve, Ngaio Rd., Sanson, was created as the result of a gift to the Crown by Mr. Ormond Wilson and is made up of the homestead and garden area of Mr. Wilson's farm. The Reserve is a fine example of a private garden and contains an interesting combination of native and exotic trees, shrubs and flowers. The Reserve is controlled by a small Board, and serviced by the Department of Lands and Survey with assistance from the Palmerston North City Council.)

In time there will be many photographs taken of this very lovely place - about 20 acres of homestead garden and bush, and 80 acres of total reserve recently given to the Crown by Mr. Ormond Wilson.

The Reserve is not quite half an hour's drive from Palmerston North, and the bush walk can take less than an hour or considerably more, depending on one's interest in plants and trees both native and exotic, for it is a remarkably sensitive blending of the two.

Forty years ago this was one of the few pockets of bush in the Ohakea district, basically totara, titoki and manuka - and the problem was how to preserve and tame it, while retaining the worthwhile natives.

The stock was fenced out and the work began. Dead trees which had been strangled and stifled by the muhlenbeckia and lawyer vines had to be removed, dense gorse patches in the clearings had to be grubbed out and grassed, and the low lying bog areas in the gully cleared and prepared for suitable "smothering" plants.

Experiments have since been carried out over many years to see which plants would flourish in certain spots, with many trials unsuccessful. It was a disappointment to a rhododendron lover wanting to plant a collection of species there to find that these didn't thrive but deteriorated after a time because of the unsuitable soil.

But successes were many. Magnolias particularly flourish at Mount Lees and in the spring their already conspicuous beauty is highlighted even more by the sombre green of the forest background.

There is a fine *Magnolia campbellii* and other varieties which lighten the bush with their rich purples and sparkling whites during September and October.

In what is a comparatively small area there is a wide variety of soils and conditions providing a challenge to grow an equally wide selection of plants from the tropical to the temperate



Photo by courtesy of Dept. of Lands and Survey, Wellington.  
Photographer : G. Woodward.

types; the belt of macrocarpa surrounding Mount Lees which serves as a shelter belt probably contributing much to the frost free climate within it.

And so one finds a tropical glade with a dramatic banana palm, its stark simple shape contrasting and fitting in wonderfully with the surrounding natives. Agaves, aloes and yuccas thrive on the dry banks, and in late summer, the driest part of the year, the bush verges are bordered with the lush green swathes of agapanthus with their massive heads of blue and white.

But it is spring which is the loveliest season at Mount Lees. At this time the visitor is welcomed by the thousands of daffodils in front of the homestead or under the nearby oaks, the deciduous trees are beginning to fill in the forest gaps with their new young growth and the dozens of spring flowering shrubs are looking especially fine against their background of bush shadows. August

is the flowering time for a group of *Rhododendron* "Cornubia" and that breathtakingly beautiful relative of the magnolias, *Michelia doltsopa*, which is well placed at the beginning of the bush walk - and ideal lure for the treasures further along.

And there are many of these, large and small. In fact, it is all too easy for the visitor to become so engrossed in the very original choice of ground covers for the forest floor or for the bog areas, that one misses some giant tree of interest towering above. The centuries old kahikitea I missed altogether on my first visit.

It is a surprise, and a delight to walk along paths bordered by the brown-patterned lime green arrowroot, the native *rengarenga* or groups of the handsome sweet ginger and to look down into the bog dells. Some have the striking masculine looking gunnera flourishing in the moist soil, some have bog primulas in yellow, pink or burnt orange. The orange-yellow *ligularia* is there, and many bog irises.

A frill of lily-of-the-valley may edge the path as it curves or there will be a shower of small white daisies among the ferns along the banks. Many of these plants along the bush edges have become naturalised, and give patches of colour at all seasons. There are cinerarias, forgetmenots, the old fashioned honesty, foxgloves, the pale blue chicory and the gentian blue *parochetus* pea with its "butterfly" flowers. And in early December in a good year *Lilium giganteum*, which revels in the bush soil, will thrust up its huge flower stems more than 10 feet.

A bush walk suggests a continuous unbroken path, but this isn't so at Mount Lees as vistas are never far away. Along the walk are several small grassed clearings with well placed specimen trees, including three Japanese maples with particularly attractive autumn foliage or that strange conifer which doesn't look at all like one, *Ginkgo biloba*, so placed that its golden maidenhair leaves will gleam in autumn against an evergreen background. And in a cool spot is the "Ghost Tree," *Davidia involucreta* with its unusual rustling white bracts. There is a Dawn Redwood, *Metasequoia glyptostroboides*, (known only in fossil form until its discovery in China in 1945), which was raised from seed collected there, and nearby a little known variety of the well known "Tulip Tree," its lyre-shaped leaves delicately variegated, *Liriodendron tulipifera* "Variegata."

The visitor looking for dazzling displays of colour will not find it in this Reserve. The New Zealand natives - the trees, vines and the ferns combined with the exotics, have presented a unique landscaping challenge and the resulting colour impact is more subtle than spectacular. The flower colour of the many varieties of shrubs, climbers, perennials and bulbs planted among them takes on a livelier sparkle against its background of the more muted tones of frond, leaf and bark. And their combination satisfies more from the point of view of form texture and colour restraint, than massed brilliance.

But if there is little massed colour from the flowers, there is much from the leaves, especially in the cooler weather. From



the "look-out" in autumn particularly, the maples, liquid-ambers, oaks and dogwoods come into their own, and there is a fine pattern of tree shapes in glowing reds, yellows and golds.

For the botanist there are many rare and unusual plants at Mount Lees, and for the home gardener many well known plants are used in an unusual way. The landscaper or for anyone especially interested in the combining of plants and trees to give interest colour and beauty for almost the entire year, Mount Lees is a gem aesthetically.

There is a continuing of shrub colour from, to name only a few, the japonicas, prunus, viburnums, camellias, abutilons right through to the autumn blues of the plumbagos and ceratostigmas. And the changing leaf colours, the wide variety of leaf shapes and sizes - the mosaic effect of small leaves counterbalanced by huge architectural leaf shapes, the shape of shrub against tree, the drama of forest shadows ...all these have been landscaped into a natural whole with inspiration, originality and impeccable taste, each season bringing with it a different beauty.

It would be wise for those wishing to visit the Reserve and homestead garden - gardeners, bush lovers, horticultural groups, educational parties, and tour and conference groups, to ring the Supervisor first, Phone 733 Sanson. The property is kept in superb order by two young nature lovers, Lawrence and Elizabeth Humphrey, who love every fantail, tui, leaf and flower in it.

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"- - - -do we not already sing our love for and obligations to the land of the free and the home of the brave? Yes, but just what and whom do we love? Certainly not the soil, which we are sending helter-skelter downriver. Certainly not the rivers, which we assume have no function except to turn turbines, float barges, and carry off sewage. Certainly not the plants, of which we exterminate whole communities without batting an eye. Certainly not the animals, of which we have already extirpated many of the largest and most beautiful species. A land ethic of course cannot prevent the alteration, management, and use of these 'resources', but it does affirm their right to continued existence, and, at least in spots, their continued existence in a natural state."

- Aldo Leopold on Environmental Ethics.

# Maintenance of *Pinus radiata* Grafts under Excessive Watering Conditions

PAUL SCHROEDER

## PROJECT BACKGROUND

So that a sufficient number of progeny tested clones\* were available for continued establishment of a *Pinus radiata* seed orchard in Canterbury, the Genetics and Tree Improvement Section of the Forest Research Institute had to consider including clones selected in the North Island as well as those available locally. The Forest Disease Control Regulations 1967 prohibited the movement of vegetative material of *Pinus* species from regions declared infected with the fungus disease *Dothistroma pini*\*\* to uninfected regions. Rotorua, where the North Island clones had been assembled was an infected area, and Canterbury was an uninfected area.

So that the North Island clones could be included in the Canterbury seed orchard a quarantine procedure for their introduction was proposed to and approved by the Canterbury Conservator of Forests. Part of the quarantine procedure stipulated that grafts of scion material sent from the North Island be kept under conditions where the foliage was wet for 80% of the time for a period of 4 months, to encourage spores that might be present to develop. This requirement was fulfilled by keeping the grafts on a mist bench.

During the first quarantine period however, many of the potted grafts died from problems associated with "wet feet". It was evident that before any further grafts could be brought through the quarantine procedure in good health a special potting mix would have to be designed for the unusually wet conditions in which the grafts were being kept.

## POTTING MIX DESIGN

A potting mix should provide adequately for:

- a. plant support

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\* Clone - a group of plants propagated vegetatively from a single individual.

\*\* *D.pini* is a serious disease of *P.radiata*. It mainly infects the juvenile form of *P. radiata* causing premature shedding of needles. In severe attacks trees may be killed. There is an economic cost in that infected trees are less vigorous with lower wood volume production and that aerial application of copper sprays are required to control the disease.

- b. storage of nutrients
- c. storage of water
- d. drainage of excess water
- e. aeration of the roots.

The first grafts were made using stocks potted in a John Innes type mix. After a short period on the mist bench the mix turned to a muddy consistency. Drainage and aeration was seen to be obviously inadequate by both the physical condition of the mix and the sickly appearance of the grafts.

Improvement of the mix required attention to water drainage and aeration. Both of these qualities would be improved by building a larger pore space into the mix. Three sixteenth inch gravel, used as a mulch on newly sown beds in Rangiora nursery, has a large pore space and it was decided to use this as a base for a new mix. Because the water holding capacity of pure gravel is minimal a proportion of peat was added: one part to three parts gravel. Since the mix base was similar to the University of California mixes (U.C. mixes) a U.C. fertiliser base was added to the mix: that for U.C. mix B (75% fine sand and 25% peat).

FERTILISER ADDITION FOR U.C. MIX B

|                    | lb | oz/yd <sup>3</sup> |
|--------------------|----|--------------------|
| Potassium nitrate  |    | 6                  |
| Potassium sulphate |    | 4                  |
| Superphosphate     | 2  | 8                  |
| Dolomite lime      | 4  | 8                  |
| Lime               | 1  | 4                  |
| Gypsum             | 1  | 4                  |
| Blood and bone     | 5  |                    |

The new mix worked very well. It drained well and allowed air to the roots but this second time all nutrients leached away before the quarantine period was complete causing the grafts to become chlorotic, and in this weakened state they soon succumbed to the same fate as the grafts in the first attempt.

On reconsidering the U.C. fertiliser additions it was seen that all the fertilisers were in comparatively quick release and soluble forms that were easily leached away. In the third attempt a slow release fertiliser "Magamp" (magnesium ammonium phosphate) with K at the rate of 4 kg/m<sup>3</sup> was substituted for the U.C. mix B fertiliser addition and proved to be much more satisfactory with the grafts keeping a healthier condition throughout the quarantine period.

## OTHER PROBLEMS AND IDEAS

Although the new potting mix considerably improved the success of the quarantine project it did not solve the overwatering problem completely. The electric leaf control of the mist bench tends to keep the grafts wet 100% of the time, even at its dryest setting. It is difficult to adjust to keep the grafts wet 80% of the time as allowed by the quarantine conditions set. Experimentation with positioning and shading of the electric leaf so that it dries more slowly than the grafts appears to help but needs further evaluation.

The proportion of peat in the mix could perhaps be further reduced as it becomes and remains saturated keeping the mix very wet still. A different absorbant addition to the mix such as vermiculite or sawdust might be more appropriate. A pure pumice mix may be superior although pumice is not readily or cheaply available in Rangiora.

An alternative method of keeping the mix drier would be to fasten plastic caps to the graft stems and over the pots so that excess water is run outside the pot. This has been avoided so far as it would be laborious with the large number of grafts involved and there is the risk that the graft roots would then receive no water at all!

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# Book Review

## *Miniature Shrubs*

by Royton E. Heath. 181 pages £4.25 (U.K.)  
Published in 1978 by Barrie & Jenkins Ltd. London.

This is a very appealing small book on dwarf growing trees and shrubs. The layout and alphabetical listing allows quick, easy reference. There are 48 small colour plates and the book is liberally sprinkled with black and white photographs.

The book is written in England, but is very useful for New Zealand because of the detailed coverage of a wide range of miniature shrubs. *Hebe*, for example, is given authoritative treatment and there are over 30 species and cultivars described. Recommendations on propagation and cultivation are included for each genus and a large number of species and cultivars are listed. This book should prove a valuable asset to both the home gardener and professional horticulturist. The trend to smaller gardens for houses and flats should mean that this detailed account of dwarf shrubs will hold its appeal for a long time hence.

M. B. THOMAS.

## *Pinus contorta*

From the Newsletter of the Nature Conservation Council.

At the April meeting two members of the National Water and Soil Conservation Organisation (NWASCO) and the Director of Environmental Forestry, New Zealand Forest Service (NZFS) attended to discuss *Pinus contorta* and its use in high altitude revegetation and erosion control. A precirculated copy of the joint policy on *P. contorta* which was approved in July 1977 between the Department of Lands and Survey, New Zealand Forest Service and National Water and Soil Conservation Authority, states

### "Use of *Pinus contorta*

- . The Soil Conservation and Rivers Control Council affirm that no general restrictions be placed on the planting of *P. contorta* for erosion control purposes.
- . *P. contorta* should not be planted where satisfactory alternative species are available or where its spread is likely to affect adjacent land unless its planting can be justified.
- . Catchment Authorities are to use discretion and seek the views of interested organisations prior to the planting of *P. contorta* for erosion control.
- . Catchment Authorities are to arrange for inspections and maintenance of protection plantings to ensure that the objectives of plantings are being attained and no adverse aspects are developing.
- . Where adverse aspects are developing, catchment authorities are to advise details to the Soil Conservation and Rivers Control Council".

The delegation noted that both the Forest Service and NWASCO have changed views on the use of *P. contorta*. It is restricted to the most severe erosion sites and *Pinus mugo* is now recommended by Forest Service for normal erosion control as it is a more shrubby tree, having many low branches. The NWASCO delegates said that *P. contorta* is only recommended as a stabiliser in the Tukituki Catchment and that in other catchments of the Ruahine Range *Pinus radiata* is suggested. *P. contorta* is still considered a valuable species, however, as it is one of the best exotics for pulping purposes and produces excellent telegraph poles.

The delegation acknowledged that the spread of *P. contorta* was a problem but it was too valuable in erosion control for its use to be prohibited. Even if all the *P. contorta* is eliminated from Tongariro National Park, the seeds are still available as *P. contorta* has been used as a shelter belt tree in the central North Island for many years. The NWASCO delegates informed the Council that they are endeavouring to eliminate *P. contorta* from Mid Dome. This was well received.

*P. contorta* is not the only exotic species which is spreading in New Zealand. There are large areas of Douglas fir and larch in the South Island.

The Council members availed themselves of the opportunity to question the delegation on the policy so as to clarify some of the points which seemed to them ambiguous and open to misinterpretation. The NZFS delegate commented on a paper on *P. contorta* prepared by Dr. I. Atkinson DSIR, which strongly advised against the use of *P. contorta* in erosion control and which the Council had considered at its November 1977 meeting. The Forest Service is sending the Council further information which will be considered at a future meeting.

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## Horticultural Training Topics

BY M.R. WEST

*Executive Training Officer (Horticulture),  
Agricultural Training Council*

Worried about your business operation - your staff - your own ability - what amount of time is wasted - why - do you know what your job should actually involve - are customers impressed with what they see and hear? Are you and your staff effective? Yes or no. If you really think about it and if your answer is no, perhaps your Horticultural Training Committee could be of some assistance.

Three training-related aspects are now being undertaken. Firstly, to cater for the shorter-term training needs, courses, seminars, etc., are being designed and co-ordinated and will be available in most centres. Do you think you have a need in respect of recording of stock, office management, training new unskilled retail staff, display writing, training production staff, marketing and so on? If you are concerned, please fill in the coupon below and post it off - NOW.

Secondly, a list of courses, etc., currently available is being compiled for your information.

Thirdly, a longer-term job training analysis of the horticultural industry has commenced. It will be of concern to all sectors of the industry and in time will resolve many of the hassles we seem to encounter from choosing careers to training for jobs, to supervising, managing and in attempting to be just plain old satisfied.

The Horticultural Training Committee operates within the Agricultural Training Council and has training officers located at:-

- Kaikohe: Mr. S. Peterson, phone: 729 Kaikohe.
- Auckland: Miss S. Bretherton, phone: 34-643 Auckland.
- Hamilton: Mr. J. F. Ayson, phone: 82-589 Hamilton.
- Rotorua: Mr. L.S. Taylor, phone: 86-577 Rotorua.
- New Plymouth: Miss P.A. Keiller, phone: 78-062 New Plymouth.
- Palmerston North: Mr. B.W. Green, phone 74-026 Palmerston North.
- Hastings: Mr. P. E. Halliday, phone: 88-537 Hastings.
- Masterton: Mr. E. Turton, phone: 81-009 Masterton.
- Nelson/Blenheim: Mr. M. G. Double, phone 88-274 Nelson.
- Dunedin: Mr. D.C. Brown, phone: 77-353 Dunedin.

With the exception of Kaikohe all offices are located with Federated Farmers Offices.

Your Horticultural Training Committee is still in its early developmental stage. Resources available for training within each province vary considerably but the Committee will do its best to assist in any way possible.

TO THE HORTICULTURAL TRAINING COMMITTEE

Name ..... Address .....

.....

.....

I believe there is an immediate need for some form of training in

.....

.....

.....

I understand I will be contacted shortly.

Please post this slip to:

AGRICULTURAL TRAINING COUNCIL,  
P.O. Box 3109,  
WELLINGTON.

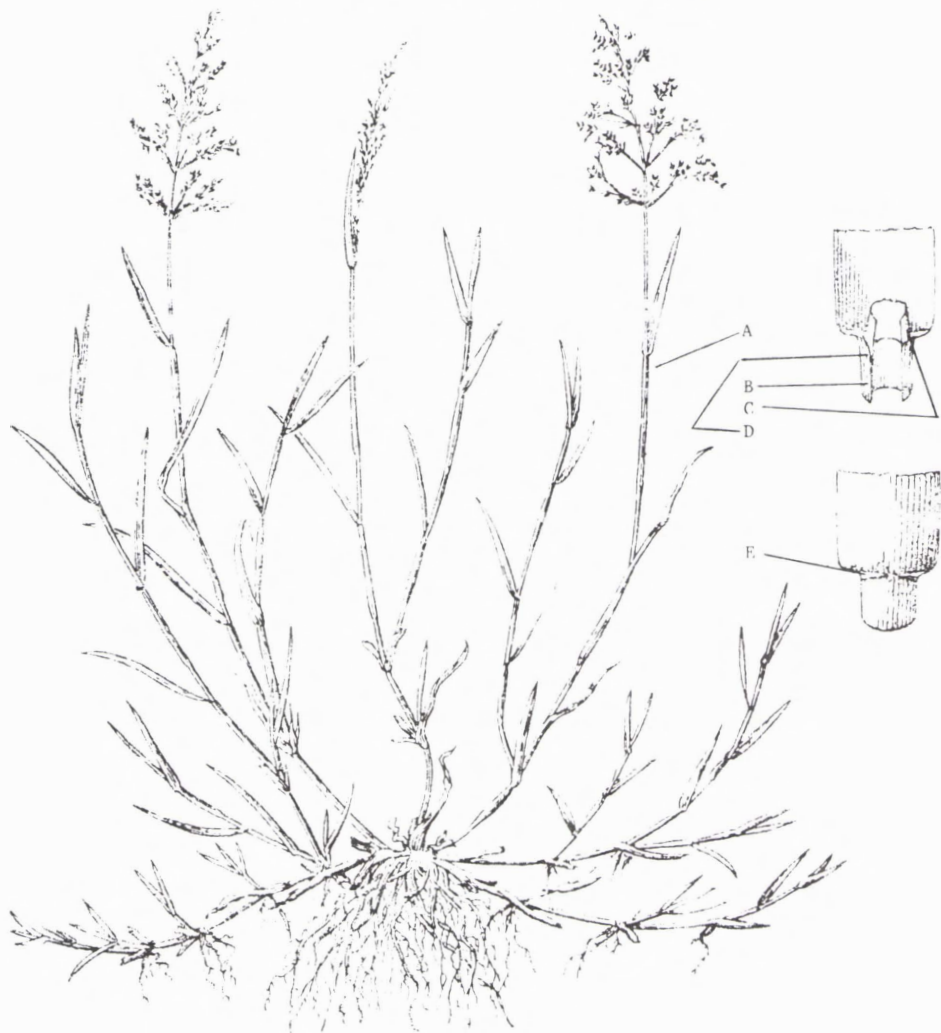
"Nature is often hidden; sometimes overcome; seldom extinguished."

- Francis Bacon.

# Know Your Turfgrass -2

D. E. ALDOUS

Creeping Bentgrass (*Agrostis palustris*)



A - Blade: rolled in the bud. Flat, distinctly ridged on upper surface, hairless.



- B - Sheath: round, smooth, split, hairless.
- C - Ligule: membranous, long, transparent, rounded or obtuse.
- D - Auricles: absent
- E - Collar: distinct, usually oblique.

Remarks: Perennial, loosely tufted or matted with long stolons which root at the nodes. Tolerates low temperature and adapts to moist to wet soils of medium fertility. Extensively used on putting greens, some bowling greens and occasionally for lawns. High maintenance requirement. Propagated either vegetatively or by seed. Major seed type in New Zealand is Penncross, released by the Pennsylvania AES University Park in 1954.

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TEMPLIN TRAVELLING SCHOLARSHIP IN ENGINEERING  
AND HORTICULTURE

The New Zealand Insurance Company Limited, as trustee of the John Richard Templin Travelling Scholarship Trust is now calling for applications for the Travelling Scholarships to be made available to Engineering Graduates of the University of Canterbury and Horticulture or Botany graduates of Lincoln College or graduates who have obtained a National Diploma of the Royal New Zealand Institute of Horticulture from Lincoln College or through the Reserves Department of the Christchurch City Council, as selected by a Committee specially appointed for the task.

The Scholarships are for study in the United States of America and are normally tenable for one year. It is desirable that applicants should intend to study at Ohio State University U.S.A.

Application forms are available from the Trust Department, The New Zealand Insurance Company Limited, Private Bag, Christchurch and should be forwarded to that address to be received not later than 31st May.

THE NEW ZEALAND INSURANCE CO. LIMITED  
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CHRISTCHURCH.

## District News

Our September meeting was put forward one week to the 19th, to suit our Guest Speaker, Mr. J. McGuire. It was held in the Parks Department potting shed.

Mr McGuire is Senior Surveyor of Lloyds of London and has been seconded to W.E.C.O. in Whangarei during the building of the Bounty replica which is to be used in the making of films. He had with him a scale model in framework of Bounty with which he illustrated his talk. He explained the present project and discussed the merits of the sturdy bluffbowed Bounty for the purpose for which she was commissioned:- the transportation of breadfruit trees - Artocarpus - throughout the Pacific and to the West Indies where Sir Joseph Banks had interests in sugar plantations.

Mr. McGuire spoke to an enthralled audience, and the vote of thanks proposed by Mrs. Reynolds, was carried by acclamation.

### WELLINGTON.

#### INSECT PESTS - DR. GEORGE GIBBS - SEPT 28.

The evening opened with the screening of three short colour films (Shell House Library) showing the life cycles of Codlin Moths, Greenhouse White Fly and Leatherjackets.

Dr. George Gibbs followed with a detailed picture of the insect world in natural environments and the problems that arise when man starts growing crops and his battle to control by various methods the damage done by insect pests.

POINTS DISCUSSED: Limited use of insect spray because insect pests build up both resistance and tolerance to chemicals and the survivors breed faster with the removal of their natural enemies.

Among the predators the importance of the Wasps, Ladybird Beetles and the Praying Mantis and among the parasites the Ichneumon Flies and Tachinid Flies.

Attractants which are used for attracting moths in orchards to give a guide to presence of pests and the relative number in an area.

Juvenile hormone control where the insect never matures to be able to breed.

#### N.D.H. STUDENTS.

Jim Say assisted by our committee and with the co-operation of the T.C.I. organized two days of practical work for students sitting their N.D.H. exams in November.

#### SPRING FLORAL FESTIVAL - WILLIAMS HALL, KARORI - September 30 & October 1.

The Spring Floral Festival held in the Williams Hall in Karori was a resounding success. The Festival Director, David Anyon and the Festival Organizer, Mrs. Winsome Shepherd are to be congratulated on their efforts.

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