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# ORCHIDS IN NEW ZEALAND



July-August, 1976

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## IDEAL GLASSHOUSE

by J. Hennessey, Auckland

The ideal glasshouse has to perform various functions, protection against adverse weather—heat or cold, fluctuations of light or humidity. All of these functions can be automated at little expense, and do the job better. It is possible with careful design and construction to accommodate these requirements into the house minimising manual operation of controls.

The popular glass to ground house was built for growing plants at ground level in beds, where the light intensity is low, i.e. in the north of England. It is expensive because of the amount of glass used, and also because of the amount of heat lost through the glass which has a coefficient heat loss of 0.32 watts/sq. ft./deg. F. This can be compared with brick breezeblock, timber or fibrolite, the comparable coefficients are 0.188, 0.129, 0.24 and 0.26, all of which are alternatives to glass.

The question is How much glass do we need? In the southern hemisphere the sun obviously cannot shine through the southern end of the house. This should be built with one of the alternatives, fibrolite being the cheapest. The sidewalls and lower front walls can also be made of fibrolite, if they are then lined with polystyrene sheeting this will cut the heating bills considerably, a further advantage is that the house will not overheat to the same extent in the summer.

Double glazing? The fear is of condensation drips, let us look at the facts, if damping down is carried out to the same extent, there would be more atmospheric moisture, so it will not be necessary to damp down as often, the lower layer of glass or horticultural grade plastic is insulated from the cold outside air, therefore condensation does not form to the same extent as it does on single glass, it will stay in the atmosphere which is exactly where we want it.

Ventilation—If plants are to be grown on benches as is usual, side vents would be detrimental, as they cause draft.

Bottom vents must be used, combined, with wet pads they will cool and humidify the air as it is drawn in. In winter the pads are left dry, the incoming air may be cold, but it cannot rise to plant level until it warms, and therefore will rise replenishing the air.

Top ventilators are far from satisfactory, they seldom close tightly and heat losses occur in winter. In summer, if top ventilators are opened for cooling purposes, two things happen. The first is that any humidity you have created by damping down immediately goes out through the open vent. Leaving behind an arid atmosphere only slightly cooler. As can be seen opening a top vent has caused the atmosphere to deteriorate, from a hot moist condition to one that is slightly cooler but arid. It does not need to be pointed out which is the more deleterious to plant life.

How do we overcome this problem, a small domestic type extraction fan will cope with a house of approximately 5m x 3m which would have a total volume of approx. 25.3 cu. m and of course all smaller sizes. Two can be used for a larger house.

Plants require  $1\frac{1}{2}$  air changes per hour for optimum growth, a 19cm (Expelair 7 $\frac{1}{2}$ " 1500 cu. foot) fan of the vent—axia type will move around 420 cu. m. per hour. All in excess of 38 cu. m is used for cooling.

The addition of a fan thermostat gives automatic control, and a speed controller would be an added refinement.

Shading can be accomplished by any of the usual methods, or can be automated. One of the readily available pneumatic vent openers can be connected to venetian type blinds and with an increase or decrease in light intensity will open or close the blinds.

All that remains is to water and feed your plants, and enjoy them.

## ORCHIDS IN NEW ZEALAND

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## ANOTHER ORCHID "TREE"

by Ben Hardy, Sante, California, U.S.A.

I read with great interest the article in the January-February 1976 issue of Orchids in New Zealand on the Orchid "Trees" by Oncidium. Three years ago I had to cut back a large section of a Bottle Brush Tree (*Callistemon lanceolatus*, syn: *C. citrinus splendens* A. DeCandolle) that was partially blocking my drive way. While cutting away at it, a wild thought ran through my head, that with the fine rough bark on it, I should be able to grow some orchids on it. So after several days of mauling it over in my mind (really I was just procrastinating) I got the pruning shears out and cut off all the fine twigs and thinned out some of the cluttering branches in the centre of the tree. I then set it in an eight inch deep by seven inch diameter styrofoam flower pot with concrete. The "tree" is eight foot tall and holds, at present, 30 orchid plants and yet only takes up the room of a six inch pot on the bench in the orchid house. I often tell other orchid growers and plant lovers that I have 30 orchid plants that only take up the room of one six inch pot on my bench. Usually I get looks of disbelief until I get around to explaining my "Orchid Tree".

After the concrete had set, I went into the hot house and removed five cross-boards from the staging. I then set the "tree" in place with the pot resting on the floor of the hot house. The cross-boards were nailed back in place and the trunk of the "tree", which is only two inches in diameter where it comes through the bench, was securely in place. Most of the staging benches in my hot house are only 24 inches from the floor.

Early on, while I was thinking and planning this project (sounds impressive, doesn't it? Really I was still procrastinating!) I decided I would mount species only on the "tree". Naturally with the size of the remaining limbs and small branches, the size of the orchid plants were dictated to the smaller growing, somewhat miniature types in general, though there was room for a couple of the larger size plants.

After the "tree" was in place, I commenced checking around the greenhouse to see what species I could snip off divisions of to attach to the "tree". One of the first plants to win a coveted spot on the "tree" was *Phalaenopsis equestris*. (It has bloomed each season for the past three years.) It's place of honour was picked and with a small chunk of *osmunda* fern root I tied it in place with a piece of monofilament nylon fishing line. Using the fine six pound line makes it very inconspicuous. Many of the plants have over the period of time securely fastened themselves in place by attaching their roots to the rough surface of the Bottle Brush Tree. In some cases after a period of time when the plants have established themselves, I have removed the nylon fishing line, except where it is used to hold a small  $\frac{3}{4}$  inch x  $2\frac{1}{2}$  inch label to identify the plants. One exception to the tying on practice was tried with *Oncidium calochilum*. This very small terete leaved *Oncidium* does best growing on the dry side. So instead I experimented with a system a friend of mine uses with bromeliads. Five small plants (one inch tall) right out of the community pot were **GLUED** in place using Borden's Elmers' Glue. This is a milk based product and there is nothing harmful to plants in it's make-up. By placing a drop of Elmer's Glue on the spot where I wanted the plant to grow and waiting a few minutes while the glue started to partially dry. I then set the little plantlets on the drop of glue. I waited a couple of days before watering until the glues had dried solid. In a very short time some new roots were soon fastening themselves to the rough bark of the Bottle Brush Tree and within two months the little jewels were blooming. And they stayed in bloom for over two months emitting their wonderful fragrance.

Listed below are 30 species that are on the "tree" and most of them are doing well. On the enclosed list an (F) indicates the plants that have bloomed since they have established themselves. As this is a continuing process of attaching plants and replacing those that have chosen not to grow successfully for me, a lack of the (F) does not indicate failure, or lack of adaptability at this time. Some have not

## ORTHO CERAS

by Jim Forrest, 19 Fairview Place, Te Puke  
This is a monotypic (one species only) genus found also in Australia and New Caledonia.

This is a large plant but can be very variable as to both size and colour of the flower. It gets its name from the Greek *orthos* meaning straight, and *keras*, a horn. This alludes to the narrow upright lateral sepals.

The tuber is large, often 3-4 centimetres long and the new one grows close to the old. It sends up several leaves and until the flower comes is very similar to the Australian *Diuris*.

It flowers from December to March depending on locality. Flowers range from green to dark red brown and in my experience the latter are usually larger. The flowers numbering up to a dozen remain open for some considerable time, but the plant is self pollinating.

I have found *Orthoceras* in many places but usually on slopes in fairly open positions. In the Kaimais you will often find it in dry clay slips which get a good baking.

In cultivation it is difficult, I have never kept one for more than four years. Each year the plant gets smaller therefore something has to be learned about the cultivation, so here is a subject for you to experiment with.

## AID FOR ORCHID GROWERS

by N. C. Miller, of Auckland

**Watering Nozzles:** A type of sprinkler which I have found very satisfactory is the 'PEKA' nozzle. This is constructed of moulded plastic and stainless steel, and is very compact. Holes are drilled, and tapped into rigid PVC pipe, and the nozzles are simply screwed into place. They are mounted at three foot intervals, and will cover a strip up to 12 feet wide. The spread of any individual nozzle can be simply adjusted, or shut off altogether. They give an even, gentle spray. These nozzles can be obtained from Western Growers Supplies, Matua Road, Kumeu, and cost about 25 cents each.

## ORCHID SEEDLINGS

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## MR. TED BARTOSH

### LONG-TIME ORCHID ENTHUSIAST

by Julian Matthews

The Golden Coast Orchid Society has now entered its fourth year of operation and foundation president, Mr. E. T. (Ted) Bartosh has stepped down, his successor being Mr. W. Ross-Taylor. Mr. Bartosh is well known for his informal and warm style of chairmanship. His comments on the culture of orchids are a feature of meetings and always helpful to new members as well as old hands at the orchid game.

Always keenly interested in flowers, his involvement with orchids started with a present of several Cymbidiums many years before they were well known, and he was advised to leave them under a tree and keep them dry! Not surprisingly, they all died. This provided a challenge which had to be taken up, so replacements were purchased and advice of a more helpful nature secured with successful flowering of the plants following.

"Orchid Mania" had set in so the next step was the building of a glasshouse specially to accommodate his new hobby, then the acquisition of some Cattleyas from Mr. Herbert Poole of Lower Hutt, one of the first orchid nurserymen in New Zealand. Today Cattleyas are still Mr. Bartosh's first love although he rates his Phalaenopsis a very close second. His 18 x 5 metre heated glasshouse is a beautiful display throughout the year. Phalaenopsis in various colours abound with Cattleyas of all types, Dendrobiums, Oncidiums and assorted hybrids and species orchids of many genera. He is especially proud of his large collection of top quality Paphiopedilums. Many of his plants have been collected or bought on overseas trips. Setting off the orchids and growing beautifully in association with them are assorted fern, bromeliads, and various foliage and flowering house plants.

Mr. Bartosh believes in sharing his beautiful plants with everyone, and displays his orchids regularly at the monthly meetings of the Golden Coast Orchid Society at Waikanae and the Hutt Valley Horticultural Society's

Orchid Circle. He is also president of the Otaki Horticultural Society, an office which he has held for the past 27 years and his orchids and other glasshouse plants as well as daffodils, begonias and gladioli of which he is an expert commercial grower, are always on display at the four public shows held at Otaki every year. He also grows many other plants of unusual interest especially for these shows, which are a feature of the Golden Coast area which extends from Paekakariki to Otaki.

And what does such a remarkably enthusiastic flower grower do when not involved with his hobby? Mr. Bartosh has been growing cut flowers commercially in Otaki since 1942 and somehow fits in bowls, a special enthusiasm, and golf during his quiet moments. Although he has stepped down as president of the Golden Coast Orchid Society, he continues to give his popular talks, and bring his displays, adding greatly to the mounting enthusiasm for orchids which has sprung up in this area since the society was formed.

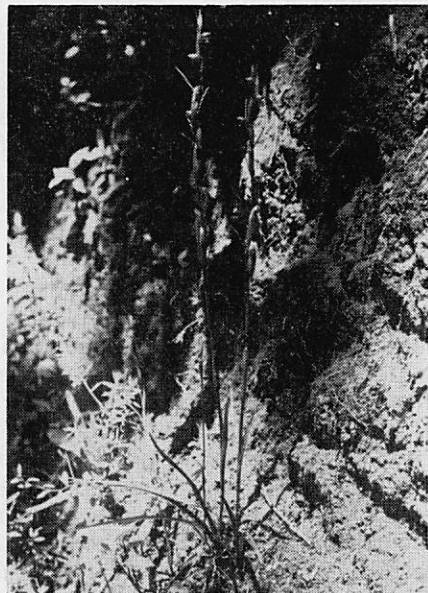


Photo: G. Fuller.

**Orthoceros stricta.**

reached their blooming season or established themselves well enough to have bloomed by now. (April 1976)

Also to keep the "tree" from looking so sere or naked I set a pot of Polypodium piloselloides fern at the base and trained many of the runners up the trunk and limbs and it has given a very pleasant green colour along the branches and around the chunks of the osmunda that serves as a base for the majority of the orchid plants. In some cases the fern has completely covered the osmunda and helps to hold moisture around the roots of the orchids. Before too long it should be heavily laden with species orchids.

- |  |     |
|--|-----|
| Brassavola nodosa (L.) Ldl.            | (F) |
| Dendrobium devonianum Paxt.            |     |
| Dendrobium kingianum Bidw. ex Ldl.     | (F) |
| Dendrobium terminale Par & Rchb.f.     |     |
| Dendrochilum cobbianum Rchb. f.        |     |
| Encyclia belizensis (Rchb. f.) Schltr. | (F) |
| Encyclia bractescens (Ldl.) Hoehne     | (F) |
| Encyclia dichroma (Ldl.) Schltr.       |     |
| Encyclia hanburii (Ldl.) Schltr.       |     |
| Encyclia nematocaulon (A. Rich) Acuna  | (F) |
| Encyclia selligera (Ldl.) Schltr.      |     |
| Epidendrum porpax Rchb. f.             | (F) |
| Gongora leuchochila Lem                |     |
| Kingiella decumben (Griff.) Rolfe      | (F) |
| Laelia rubescens Ldl.                  | (F) |
| Lockhartia oerstedii Rchb. f.          | (F) |
| Nageliella purpurea Wms., L.O.         | (F) |
| Notylia barkeri Ldl.                   | (F) |
| Odontoglossum grande Ldl.              |     |
| Odontoglossum rosii Ldl.               | (F) |
| Oncidium calochilum                    | (F) |
| Oncidium lanceanum Ldl.                |     |
| Oncidium microchilum Batem.            |     |
| Oncidium ornithorhynchum HBK           | (F) |
| Oncidium stramineum Ldl.               |     |
| Phalaenopsis luddemanniana Rchb. f.    |     |
| Phalaenopsis equestris Rchb. f.        | (F) |
| Rodriguezia venusta (Ldl.) Rchb. f.    |     |
| Stanhopea tigrina Batem.               |     |
| Thrixspermum formosanum Schltr.        | (F) |

## ONCIDIUMS

by Mr. D. J. Langdale — Australia

One of the easiest to grow orchids is the Oncidium.

These mainly Brazilian orchids really thrive in our climate. The main virtue of these orchids is that they give a blaze of colour during the late summer, autumn, and early winter when most Cymbidiums are not blooming. Some of the species have up to 200 flowers, in golds, yellows and browns, and many variations of the above colours.



Photo: G. Fuller.

### Oncidium forbesii.

There are several ways these can be grown either in fir bark in pots, or on blocks of fibre or paper bark.

If the grower wishes to grow them on fibre blocks the simple way to do this with a small plant is to place a piece of fibre down the side of say a 10 cm pot then plant the Oncidium in the pot in the normal manner. As the plant grows, tie it back onto the bark through which it will soon send roots. This is better than tying the plant straight onto the bark as it is in no way set back.

Oncidiums require abundant water during their growing season which usually starts about the end of August; the shoots grow rapidly during September through to December, and spikes usually start to show early January, although some species produce the spike on the old bulb.



The flowers vary a lot in size according to the different varieties or species they are hybridised from; some flowers range in size from 1-2 cm up to 7.5 cm, in fact in some cases even larger flowers may occur.

From the culture point of view, this genus does better in the shade house than under glass, mine are grown hanging up with the Cymbidiums under 28 per cent light green orchid shade.

Feeding is best done with foliate fertiliser or soaking the plant up to the base of the bulb, generally use  $\frac{1}{2}$  recommended strength and apply every fortnight during the growing period or as long as you can see the green feeding tips on the roots.

There are so many different species and hybrids that it is quite easy to have different Oncidiums flowering every month of the year.

A few of the Oncidiums do require heat, but the beginner is not likely to be offered these; however, the simple solution is to be sure of purchasing plants that will grow in your condition, you should have no trouble.

Many new hybrids of Oncidiums are now being developed and great improvements can be expected from these crosses.

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**Cover photo:** Out door display of orchids in Paraparamu shopping mall, 1975. This display is believed to be the first of its kind in New Zealand.

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### GOLDEN COAST ORCHID SOCIETY

Revised Show Dates:

14, 15 & 16 October, 1976.

## ORCHID OBSERVATIONS

In an earlier article I wrote that *Pleione formosana* was easy to grow and flower here in New Plymouth. This is one of the problems of the written word of course. Orchids, no matter how clever they are in attracting insects and other fauna for pollination purposes, are no better than any other plant when it comes to reading. Consequently it was very mortifying to see such a poor showing of these plants last October. This was general here, even Mr. George Fuller commented upon it at a Monthly meeting of the Taranaki Orchid Society.

The bulbs had grown well during the previous year, were good and fat and the winter of 1975 wasn't unusually different from previous ones. Nevertheless, there are factors that we perhaps don't understand fully, and the successful flowering of *Pleiones* or any orchid for that matter must be the correct combination of temperature, humidity, watering, not only how much but the ph value, feeding, light length and strength, etc. etc.

Perhaps because of the poor flowering the plants this season have put their energies to growing and my bulbs at any rate are larger than in previous years so I am hoping for better things this coming October. The cooler summer may have helped also.

Other plants have been affected by this unusually cool and wet summer, notably Aussie dendrobes. They all flowered as usual in spring, but several flowered again in March and April of this year. I have never observed this before, perhaps other readers can comment more lucidly about *Dendrobiums* of the kingianum group.

Other garden plants are showing unusual symptoms, my plum trees have been flowering on and off since March, but the flowers seem smaller and weaker looking, and are quite sparse compared with the Spring crop, and of course no plums are forming.

Perhaps this is one of the attractions of growing live plants—one is never really on top of the elements.

## PEST AND DISEASE SPRAYING PROGRAMME FOR CYMBIDIUM ORCHIDS

by Allen Smith, 16 Beverly Crescent, Hamilton

This contribution is the first in the series of four articles dealing with a number of pests and diseases which are commonly found in New Zealand Cymbidiums.

To be successful in controlling a range of pests and diseases there are a number of criteria which should be employed:—

- The grower must be aware of the habits or life cycles of insect or fungi problems. If this is done results from spraying programmes will be more effective and reliable.
- Keep a record of what is used and when various sprays are applied.
- Most growers like myself are growing orchids for a hobby so chemicals used must have a place in any home garden spray programme.
- Ensure that materials used are compatible with each other when mixed together and do not exhibit toxic effects toward plants.
- The most important aspect is to ensure that spray materials are the least toxic to the user and yet provide an effective job against the problem. Safety is of paramount importance when dealing with chemicals in any home garden.

It is a well known fact that those who use sprays on a wide variety of plants find that wettable powders (singly and in combination) are less prone to causing phytotoxic problems than emulsifiable concentrates. The prime reason being that oils and emulsifiers can cause leaf burning or stunting of fresh foliar growth. When using wettable powders a general rule is not to mix more than three at any one time. Combinations when mixed together are formulated in such a way that they have sufficient wetting agent (or surfactant) and the addition of a further quantity is not considered necessary.

Most fungicides and insecticides wettable powders are compatible when mixed together in water. Further specific details will be provided in later articles. A point to remember when mixing wettable powders is to partly fill a spray tank with water. Mix the chemical to a smooth creamy paste with water in another container and then strain through a 50 mesh filtered funnel to the spray container. Mix thoroughly while adding the remainder of the water to top the spray tank up.

Care must be experienced when handling and mixing the concentrates with water. Similarly adequate precaution must be observed when spraying operations are undertaken. **Safety** is an all important watchword especially when using insecticides.

Five basic requirements should be observed when contemplating a spray programme:—

- Always keep chemicals safely locked away and out of reach from small children.
- Read the label on the container carefully. Be fully aware of the label directions, special precautions and first aid guides. Even if the same product has been used for a number of years labels tend to change and be up-graded. Information on them is there for your guidance. Use it to advantage.
- When mixing and applying chemicals which are considered hazardous wear rubber gloves, protective clothing and an appropriate mask which can filter out organic vapours. With insecticides in particular do not breath in the fine spray particles during a spraying operation. Similarly do not mix the concentrates in water with bare hands.
- Ensure that your spraying equipment is in good condition and does not leak. Keep it in first class condition.
- Once the spraying operation has been completed make sure you practise good hygiene. Wash all utensils thoroughly with clean water including the sprayer. Seal the containers well and store away safely.

My next article will cover a number of aspects concerning recommendations for controlling insect pests.



## FAVOURITE ORCHIDS

by Bruce Douglas—Kawerau

What makes an orchid a favourite with you (and me) or some group of persons? There must be many answers. Perhaps this is the way it should be for it would be a dull world if we all thought the same way and liked the same plants.

Over the years I have grown orchids a number of plants or rather their flowers have become favourites and it is here that I would like to share with you some points that have set them apart, at least for me.

Perhaps over some period of time I may be able to slip a few other little "homeys" past the Editor and so give you an insight into what has made these various orchids for me, the most interesting and rewarding experiences in my life.

### Coelogyne pandurata

Not my top favourite but I am always attracted to its flower. This orchid does not seem to be often grown by orchid enthusiasts so far as I know. Many books group it with *C. dayana* in its growing needs and as this is a more often grown species perhaps we should see more of *C. pandurata*.

This orchid comes from Borneo but extends through to Malaya, grows on trees overhanging water and where there is some shade. This gives plenty of air circulation and humidity. To you, the reader, this could mean warm humid conditions but I am sure not all *C. dayana*s in New Zealand are grown under these conditions and they still produce quite reasonable displays. Perhaps then you may wish to try *C. pandurata*.

Picture if you can (or find an illustration in a book) a bright clear green flower, this by the way is the colour of the sepals and petals while the lip has the same colour with black contrasting markings. Further, the lip has a violin sort of shape with the crest on it warded. Flower spikes come from the centre of the growth (like *C. cristata*) and arch above the leaves displaying possibly twelve or so 7.5cm flowers as described above. With several flower spikes on a plant it becomes quite a sight

and one can then readily see why it is sometimes called the "Black Orchid".

I always grew mine in a shallow basket for they are not deep rooting. Give them plenty of room for the pseudobulbs grow, say 5cm apart, not close together as in the *Cymbidium*.

My mixture was open and lasted a long time for no plant in this family seems to like root disturbance. If disturbance occurs they often do not flower the following year or perhaps even longer. It seems advisable therefore to think in terms of "potting on" rather than "repot" but before doing so make sure the existing mixture is in good heart to stand up to such a move.

There are very few green flowers about for a garden or glasshouse and so to my mind this is a worthy plant to have in any collection that can handle it.

Oh, by the way it was introduced into England in 1853, no doubt direct from its natural surroundings by one of those keen old time, orchid hunters.

## CYMBIDIUM DISPERSAL AUCTION SALE

at  
4 Lomond Street, Takapuna  
on  
Saturday, 11 September, 1976  
Starting at 10.30 a.m.

Because of age and ill-health we have had to confine our orchid collection to miscellaneous genera and will sell by auction all of our *Cymbidiums* both Standard and Miniature whether carrying spikes or otherwise. The plants have been selected over many years for flower export and the show bench.

For further particulars apply to—

**ALBERT & ALICE  
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## THE PURE-COLOUR CYMBIDIUMS

by Mervyn E. Dunn,

Valley Orchids Pty Ltd, Reynella, South  
Australia

I have adopted the term 'pure-colour' because it aptly describes and accurately designates a strain of *Cymbidiums*, the hereditary factors of which are pure for a colour characteristic. That is, the group's genes are homogeneous (pure) for the lack of any red colouring. The group's prominent, visible distinguishing feature is the complete absence of any red colouring in the plants or their flowers. The normal red spotting or barring on the lips of the flowers is replaced with yellow.

The pure-colours are not freaks, nor are they albinos. The absence of the red colouring is an inherited quality carried on, often in an unseen way in some of the progeny of a species or perhaps a variety of species. This inherited factor must be present in both parents of a cross pollination to produce plants of the pure-colour strain. When this is so, the results are predictable and have proven many times to follow the normal Mendelian recessive laws of heredity. The fact that all known pure-colours are traceable back to *Cymbidium lowianum* indicates that the one sub-species *Cymbidium lowianum* var. *concolor* is the probable progenitor of the pure-colour strain.

The lack of any red colouring allows the other colours of the flowers of the purecolour *Cymbidiums* to literally glow in pure, unadulterated colours of white, yellow and green and intermediate shades of these colours. Another noticeable feature of the pure-colours is the flowers do not 'stain' even when flowered in full sunlight. Also, when the lips are broken or when the flowers are pollinated, the columns, the lips or the flowers, of course, cannot turn red, nor do the flowers collapse or die. This associated phenomenon causes many expressions of amazement by visitors to our orchid farm when near perfect flowers are seen on

the ends of five inch long seed pods. These features each give the pure-colour distinct commercial advantages over the standards. The colours are true and pure without any 'muddy' appearance and they travel well as indicated by the spike of *Cymbidium Sleeping Dream 'Tetra-gold'* AM/RHS, which was flowered in Australia in August, awarded in London on 24 September and later shown at the RHS 'Great Autumn Show'.

Serious development of the pure-colour *Cymbidiums* started in Australia. In the late 1950's the eminent orchid hybridist Mr. Alvin Bryant of Sydney noted the characteristic differing features of the pure-colour flowers in some *Cymbidium Durham Castle* (*C. Ruth* x *C. Plover*) seedlings. Mr. Bryant correctly deduced that the plants were not chance albinos but were, in fact, caused by the joining of certain hereditary characteristics. He commenced a breeding programme designed to determine the behaviour of these hereditary traits and was rewarded by approximately one half of the seedlings of the cross made with the pure-colour *Cymbidium Durham Castle 'Brilliance'* x the standard colour *Cymbidium Sussex Dawn 'Dorothy May'* being of the pure-colour strain. Mr. Bryant registered the cross as *Cymbidium Sleeping Beauty* and presented his findings, including the genetic laws governing the breeding of pure-colour *Cymbidiums*, at the 6th World Orchid Conference: In a simple tabular form the genetic laws can be stated as follows:

If: P = clones with pure-colour flowers  
and F = clones with coloured flowers  
carrying the P factor

and C = clones with coloured flowers  
not carrying the P factor

then in a breeding programme:

$$P \times P = P$$

$$P \times F = \frac{1}{2}P + \frac{1}{2}F$$

$$P \times C = F$$

$$F \times F = \frac{1}{4}P + \frac{1}{2}F + \frac{1}{4}C$$

$$F \times C = \frac{1}{8}F + \frac{1}{2}C$$

$$C \times C = C$$





**Sophronitis coccinea Rchb.f.**

The derivation of 'sophon' is modesty and if we consider that this Brazilian species is a close relative of, and breeds readily with the Cattleya group, yet is less than 8cm tall, that description would apply. However, as the illustration suggests, few orchids have such large blooms relative to the size of the plant and this fact, coupled with brilliant colouration ensures that few could see a well grown plant in bloom and resist the urge to stop and inspect it closely.

*Sophronitis coccinea* often found also under the synonym of *S. grandiflora* Ldl. has other virtues strongly in its favour from the enthusiasts point of view, for coming from the Organ Mountains of Brazil, it is cool growing

and would be suited to conditions comparable to those required for *Cymbidiums* or *Odontoglossums*.

It is grown quite successfully in this area in unheated glasshouses and one of the best plants is in the hands of a master in the art of soft cane *Dendrobium* culture.

I believe that this species would be tolerant of a wide range of potting mixes provided that free drainage was a characteristic. Most references suggest a *Cattleya* mix but of finer texture and shallow containers. Colour of the flat well formed 6-8cm wide blooms can vary considerably, ranging through scarlet and cinnabar to carmine—purple, but always spectacular.

**INDIAN DENDROBIUMS**

by Ken and Lou Graham,  
298 Ocean Beach Road, Mt. Maunganui

Of all orchid genera in our collection we must class the Indian *Dendrobiums* as some of the most beautiful. The colour range from very delicate shades to bright rich and bold, and the flowers from very tiny to 7½cm in size.



Photo: G. Fuller.

***Dendrobium chrysotoxum* var. *suavissimum*.**

One of our favourites and certainly a queen amongst orchids is *Dendrobium pierardii* var. *latinifolium*. It flowers during the time of year when there are not too many orchids in bloom, producing from its long leafless canes masses of delicate lavender and yellow flowers. There are hundreds of 7½cm flowers covering canes ¾ to 1m in length.

*Dendrobium devonianum* (known as king of dendrobes) has beautiful creamy white flowers tinged pinkish magenta, the lip is orange at its base. *Dendrobium chrysotoxum* has masses of rich yellow flowers with deep orange patches. The racemes are a lovely sight especially when you are lucky to have six to seven spikes of flowers open at the same time.

These are just three of the hundreds of these beautiful *Dendrobiums*. Culture:—We grow ours in a media consisting of chopped, well matured tree fern, a small amount of charcoal and seasoned pine bark. For *Dendrobium pierardii* var. *latinifolium* we use chopped

tree fern and live sphagnum moss. *Dendrobiums* require a very open media and will not tolerate stale conditions at roots, hence drainage is extremely important for their successful cultivation. Fertiliser:—We use half strength Seagrow and Nuosol at 2 week intervals in the growing period.

Have found that clay pots cut with a cross at the base approximately 3cm deep, suitable containers, also baskets lined with fir fibre. This latter kindly supplied by a good friend.

**HINTS FOR THE TWO MONTHS JULY AND AUGUST**

by Gordon Maney — 7 Harrow Place,  
Palmerston North

With the advent of winter really setting in and cold frosty mornings; watering or rather when to water is of vital importance. It is always better to water plants early in the morning, those that need it of course, with the promise of a fine day; and then they will dry by evening. In the Manawatu the winters are often cold and therefore particularly the larger plants need little or no water for several weeks.

It is however important to water the walks and benches to keep up the humidity. A dry glasshouse invites red spider which spells disaster to flower spikes, that by July and August are either coming into flower or are certainly well advanced.

The staking of plants should have been done by this time particularly for those spikes that tend to come out horizontal to the base of the bulb.

Keep throwing slug bait around with gay abandon once per week without fail.

By the middle of August and certainly sometime earlier depending on the weather of course, watch for Green Aphids; I usually dust with Rose dust as a preventative, although Pyrethrum or Pyrox as a liquid spray is most effective for insects and will not effect the buds of flowers. Do not mix with fungicide.



# CAVE MONSTERAM

by Rev. Fr. B. J. Edwards — Levin

In the due course of attempting to cultivate plants belonging to the orchidaceous persuasion, the grower can encounter a variety of mysterious machinations by "person" or "persons" unknown. This brief tale of woe is set down before you to illustrate the complexities of the problem and vicissitudes facing the grower.

The scene is set in the so-called springtime of 1975. No-one was in dire need of roll-on Mum, except, perhaps the cumulous gathering of nimble clouds. They at least were suffering from the effects of constant exposure to the heat of the sun and consequently were subject to profuse perspiration. This, in turn, meant that the track from the house to the inner sanctum of the glasshouse could be achieved only with the aid of a mini-jet boat.

For days on end the glasshouse became, or was inclined to become, merely a fleeting phantasm of the memory banks. The contents of the glasshouse, particularly those of a vegetative type of the orchidaceous family were neglected by your chagrined author. Nevertheless, a great deal of interest was being shown by a pair of interesting, but ugly specimens. As with all growers (with the exception of some experts; c.f. ORCHIDS IN NEW ZEALAND, Vol 1, No. 4, page 60) one can see the ravages caused by some little beastly from time to time. Great hunks could be seen eaten out of leaves, new growth munched away, and worst of all, flower spikes chewed off in the bud.

The first beastly was found lurking under a piece of ponga which had an unknown specie attached to it (it wasn't just another odd bit of debris, but that will be disclosed later). This delightful little specimen in its prime had seven spikes appearing. By the time of the uplift, only one and a half were left. Things were not right! And lo! lurking under my prize weed was the beastly—all of two inches long, gigantic feelers sensing every move I made, and looking as though she (it was Inter-

national Women's Year!) was desirous of tasting fresh, human flesh—uncooked and unmarinated.

A couple of nights later, another sortie was mounted to inspect how all the little darlings were progressing now that the insecticidal Mata Hari had been annihilated! "Voila", I exclaimed in my best schoolboy Greek (seeing I did not take French at school) another beastly looking sluggish and overfed after a rich diet of prize orchidaceous species turned his back on me with an air of disdain.

Not to be outdone by such goings on, and seeing that the pair had obviously been indulging in all sorts of nefarious practices, retribution came with swift and sudden vengeance. One deftly applied shot from the can of Cooper's fly spray convulsed the brute into the mortal death throes which Nemesis had decreed for such as they. Such is the fate of all who dare to cross the sacred portals of the glasshouse uninvited.

You may think that you can identify these lurid beasties. Unless you are particularly adept or have read Vol. 3, No. 10 of the Hawkes Bay Orchid Society's NEWSLETTER, one hint will be given. I have never seen one before. I am told that they can be found quite easily in the bush or in caves, but this pair were the first I had encountered anywhere. According to all the local experts on bugs and other strange creatures, the two nocturnal munchers were nothing less than WETAS. How do you like that?

It may have been my fault for not keeping the place a little tidier than it was, but the story would not be too good unless I could say that I'd been terrible busy!! But the lesson of the story highlights the great importance of keeping glass/shade/house free of unnecessary debris, or else the nocturnal prandial perignations of assorted mini-monsters will take on undreamed of proportions. Snails, slugs, slaters and even mealy bugs are all commonplace. If you can think of a better piece of one-upmanship, let me know and I'll swap you a dead weta for it.

# CYMBIDIUM ROOTS AND MYCORRHIZAL FUNGUS HARMONY

by Russell Martin, McBean's Orchids (Australia) Pty. Limited

**INTRODUCTION:** Extensive investigation of root systems, which was carried out about the turn of the century by eminent botanists, has established beyond all doubt, the positive fact that harmonious relationships between fungal growth and the root system of plants exists.

It has been proven that almost all plants, especially those which inhabit dry soil areas, are all provided with MYCORRHIZA—the term given to a fungus infiltration of outer cells in the root system. This infection assists the host plant by means of facilitating direct intake of carbohydrates which the fungus has wrested from decayed humus, together with nutrient salts and plant growth hormones, such as auxins—an advantage denied uninfected plants of a similar species.

So far as we know today, all orchids live in symbiosis, at least in the young stages of their growth, with a root fungus.

**WHAT DOES ALL THIS MEAN TO THE ORCHID GROWER?** It means that a particular state of harmony exists in nature, whereby the fungal threads or, as they are correctly known, HYPHAE, infect and penetrate the epidermal or outside layers of cells of the orchid root and wander through approximately ten outer rows of cells unhindered. It is in this region of the root that the fungus is able to draw some of its requirements from the orchid, to sustain life. In turn the orchid root beyond the tenth layer of cells, is armed with a single row of defensive guard cells. The area between this row of guard cells and the central core, is used by the orchid for intensive farming. Fungal threads are encouraged to enter the cells in this region, grow and multiply, until they entirely fill each single cell. When a cell is filled, the orchid has the ability, no doubt through a chemical action, to devour and digest the fungal threads within this cell. It is here that the orchid extracts its

requirements from the fungus, in the form of carbohydrates, nutrient salts, and plant growth hormones, so necessary to accelerate the healthy growth of the orchid plants.

**NATURAL SEED GERMINATION:** Orchid seed consists of a tiny embryo encased in a flimsy outer testa, and entirely lacks any nutriment tissues. The outer casing is a very loose structure with a high degree of resistance to wetting. This makes seed dispersal from the pod possible in air currents and also enables it to float on water. Water alone is not sufficient to induce germination and this tiny embryo must rely on the dramatic part played by the infection of a mycorrhiza.

The fungus which inhabits a Cymbidium is a species within RHIZOCTONIA genus and besides being present in the root of all cymbidiums, its presence can also be found in other forms of vegetation. Provided that the tiny seed comes to rest on a suitable MYCELIUM, (a network of fungal threads), the outer casing becomes infected by the fungal threads, which in turn supplies the nutriment, auxins and minerals, which, with the addition of moisture, is sufficient to cause the tiny embryo to germinate.

**ASYMBIOTIC CULTURE:** Professor Knudson of the U.S.A., worked from 1911 on orchid seed germination, among other things, and made a tremendous break-through around about 1929, by discovering that orchid seed could be germinated in an aseptic manner on agar jelly, with chemical additives acting as a source of food. This process naturally eliminated all forms of fungal infection and in fact revolutionised the hybridisation of all genera of orchids. Since this dramatic break-through, little attention has been paid to mycorrhizal infection of orchid seedlings, after their removal from flasks.

When commissioned to undertake the seed raising and mericlone programme on behalf of



McBean's, it was necessary to explore all avenues pertaining to the growth of plantlets after their removal from flasks. Like all new ventures, a number of difficulties were experienced, resulting in some failures. Modifications had to be introduced to overcome different growing conditions in Australia and I am happy to say that these new introductions especially the introduction of mycorrhiza, have proved most successful.

**DEFLASKING OF PLANTLETS:** Upon removal from flasks, all Cymbidium planters are washed free of agar and dipped in a solution of Natriphene before planting in red pine-boxes. This contains a special mixture which has a quantity of fern leaf mould. You may wonder why I insist on using fern leaf mould? I have found this to be a particularly fine source of fungal spores of the **RHIZOCTONIA** genus. This is because the tree fern is itself dependent upon the same mycorrhiza. Once the seedlings have been boxed, they are watered and placed in a hot bed run to 20 degrees Celsius (77 degrees Fahrenheit). This hot bed is fitted with a mist propagating unit, thus assuring that the leaf area of immature seedlings never dry out. These conditions are also ideal for the rapid infection of the medium by fungal HY-PHAE which in turn infect the agar roots of the plantlets. I have proven beyond all doubt that this initial infection takes place within five to ten days after their removal from flasks. I am convinced that this method has been instrumental in the encouragement of the agar roots to continue growing, and by altering the structure, is able to extract its nutrient requirements from a normal potting medium, aided by the fungal infection.

I am well aware of the fact that fungal infection is not necessary for successful plant growth, but it is my firm belief that with the introduction of a mycorrhiza, the development of a sound and healthy root system rapidly follows. This in turn is followed by rapid leaf growth, due to the readily available nutrients and auxins, which speeds up the progressive growth of the seedling to such an extent that flowering is now possible within two years from flask removal. This mycorrhizal infection

is maintained through all stages of growth, from seedling to mature plants. I believe that if the right type of potting mix is used, rapid infection by the correct type of mycorrhiza will follow. This has the effect of stimulating strong healthy root and consequent luxuriant plant growth.

**Caution**—Not all varieties of mycorrhizal fungi are beneficial to all orchid species. What is advantageous to one orchid genus, may be detrimental to another. This may be a partial explanation why many growers who attempt to grow a number of different genera in one house, experience great difficulty in obtaining success with each and every genus.

It has been discovered that an undesirable species of fungus can cause the complete failure of germination and indeed the death of seedlings, by sheer dominance. Regular repotting in a mixture designed to encourage the correct fungal growth, is very necessary and I would stress repotting, at least annually. This new mix provides the mycorrhiza with a new source of carbohydrates which, through the agency of a fungus, becomes readily available to the orchid roots and thus stimulates a high growth rate.

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## AIDS FOR ORCHID GROWERS

by N. C. Miller of Auckland

Here are a few ideas and hints which some growers may find of use.

**Glasshouse Insulation:** This idea was spotted in the American Orchid Society Bulletin, tested, and found eminently satisfactory. A modern plastic soft packaging material known as 'poly-bubble' or 'bubble-pack' will readily adhere to wet glass, and act as an effective insulating layer. The inside of the glasshouse is wetted, and the 'bubble-pack' is smoothed onto the glass by hand, with the bubbled side to the glass. On overhead roof glass it may prove necessary to apply the flat side to the glass. The material sticks to the glass indefinitely, but is easily peeled off during the summer. It costs only a few cents per square metre and is available from packaging suppliers. Not quite as good as double glazing, but much cheaper and very much easier to install. It comes in 60 metre rolls of various widths.

**Labelling Pens:** Having tried virtually all the 'indelible pencils', 'garden pencils', and felt pens available, and having discarded them all as far as long-term labelling is concerned, I then found the following pen very satisfactory. It is the 'Foliograph' technical (drawing) pen, made by Rotring. It is designed to use a special 'K' ink (Pelikan K is the brand most frequently available) which etches into the plastic surface. Originally intended for drawing on clear plastic film, it is absolutely waterproof and is impossible to erase from plastic surfaces. The ink does not fade, and will outlast the label. Various thicknesses of nib are available, but I would recommend a nib diameter of 0.5 to 0.7mm.

Most stationers or drawing office suppliers would be able to obtain one from the distributors, as it is not generally a stock item. They would also order the special ink, and the cleaning fluid required. I have had trouble obtaining the cleaning fluid, but find that acetone (available from chemists or chemical suppliers) works well.

Do NOT use 'K' ink in an ordinary fountain pen or drawing pen, as it will dissolve the pen. The total outfit would cost about ten dollars, but gives a permanent marking method, easily readable yet fine enough to write ample details on the label. Similar pens may be available under such names as 'Acetograph', but be sure they are etching pens. It is essential that the pen is stored with the cap firmly in place, and it should be stood with the nib uppermost, to prevent clogging.

This pen will also write on plastic adhesive tape, a length of which may be taped onto the basal stalk of pollinated flowers as a label to identify the cross—much safer than hanging plastic labels from a flower spike.

**Greenhouse benching:** A good many growers prefer to use open benches, feeling that the extra drainage and air movement are beneficial. The main problem is the choice of material for the bench surface. In Australia and the U.S.A. the preferred material is galvanised welded wire mesh. In N.Z. this has apparently been unavailable, and the nearest approach has been woven wire mesh, which is very expensive.

However a material which seems to solve the problem has recently appeared on the market. It is a galvanised welded wire mesh called 'Weldfab', made by Hurricane Wire Products. It comes in 90cm (three feet) wide by 5m (16 feet) rolls, each costing about \$4.90 at present. This works out at \$1.00 per square metre, which is very reasonable.

The mesh size is 5cm (2 inches), on which pots of 7.6cm or over will sit quite steadily. The square plastic propagating tubes which are so popular will sit down into the mesh, which is a good feature, as these tubes are rather top heavy.

'Weldfab' is made of rather lighter wire than would be ideal, but a heavier gauge, if available, would probably cost much more.

The material needs support every two to three metres along the bench, depending on the weight of the plants, and seems likely to give a long lasting, neat and hygienic bench top.