

National Pleione Report

incorporating
Hardy Orchids

1997





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HARDY ORCHIDS

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LEAF TIP DIE BACK (LTDB) IN PLEIONE

Is it caused by overfeeding, unbalanced nutrition
and/or cultural conditions ?

Introduction

For several years now we have been investigating the nutritional requirements of *Pleione formosana* in an attempt to devise a suitable 'feed recipe' for large scale use. During these studies we have frequently encountered one of the most disfiguring orchid leaf disorders, the progressive breakdown or necrosis of the leaf tip known as die back. Symptoms include localised brown lesions or spots near the tip which join together spreading down the leaf blade. Eventually more than half the leaf blade may be affected with consequent loss of photosynthetic ability. The cause is physiological rather than pathogenic since soft-rotting bacteria and fungi e.g. grey mould or Botrytis only invade secondarily i.e. at later stages of symptom expression.

Occurrence/High Risk Situations/Predisposing Factors

- * Rapidly grown 'protected' plants with restricted root foraging capacity.
- * Hot weather followed by sporadic cooler periods.
- * Relatively low humidity at night.
- * Excessive concentrations of salts in rooting zone.
- * Varietal sensitivity.

Possible Causes of LTDB Heavy fertiliser usage adversely affecting either root growth or excessive salt deposition in leaves causing fertiliser 'burn'. Both Poole & Sheehan (Cattleya) and Reed (Pleione) have encountered increasing incidence of LTDB with high phosphatic fertiliser applications. This is clearly suggestive of phosphorus antagonising the absorption of other important nutrients by root systems. Erratic watering is another possibility limiting supply of essential macronutrients.

Why is it not encountered in the wild? It is perhaps noteworthy that plants in the wild are seldom affected by LTDB (P.J. Cribb, personal communication). In native China the plants generally grow 'hard' in "soils" of low nutrient status with no restriction on foraging by root systems. Rapid growth and high nitrogen levels would be uncommon. This would seem to indicate cultural practice as the major cause with fertiliser NPK under the spotlight.

Evidence for Calcium Involvement

In an excellent article in an earlier National Pleione Report, Redshaw (1995) has drawn attention to the possible role of calcium on the grounds that most of the cultural conditions described above influence transport of this essential major element. Moreover lowered levels of calcium in damaged leaves were found using the technique of atomic absorption, although it was not clear if determinations were made on single leaves or bulk samples. Calcium mobility is governed by the evapo-transpiration (water) stream and a continuous sustained supply to active growing regions is generally required, with reports of correlations between LTDB incidence and lack of water (or waterlogging) and/or high temperatures. A deficiency of calcium is also implicated in other physiological

leaf disorders with similar external symptoms e.g. leaf tip burn of lettuce and strawberry.

Calcium is an essential major plant nutrient with characteristic extremely low mobility and reliance on the water or transpiration stream for the continuous supply of adequate levels to rapidly expanding and growing regions of the plant. Its principal function lies in strengthening cell walls and maintenance of membrane integrity inside the plant cell. Any deficiency, or lack, often results in breakdown (necrosis) of tissues following cell wall/membrane malfunction and degradation.

Drought or overwatering (e.g. stagnant waterlogged conditions), aberrant or erratic water supplies, root damage/rotting and antagonism of root uptake from other nutrients present in excess quantities, can all lead to calcium unavailability and deficiencies in foliar regions. This is in spite of adequate presence, or even abundance, of the element in the soil/nutrient solutions. As Redshaw (1995) points out, merely applying lime to the growing medium, as a remedial treatment, should therefore have little effect.

Temperature/light intensity-induced high growth rates or "spurts", particularly under conditions of low transpiration (upward movement of water through the stem), increases the risk that calcium supply falls below critical threshold levels required for cell wall stability. This frequently results in calcium deficiency-related physiological disorders such as leaf tip-burn of lettuce, blossom end rot of tomatoes and watermelons and internal bitter pit of apple fruits.

We have employed the relatively new (for biological analysis) technique of

X-ray Fluorescence spectrometry (XRF) to determine calcium contents of LTDB affected leaves using certified standard reference materials for comparison. Additionally XRF's elemental profiling facility allows comparison with other macro and trace element contents and is therefore ideal for investigating inorganic nutrient ratios. In material from both our own experiments (using a large sample pool) and that of commercial growers of Pleione, no significant differences in calcium contents were apparent between healthy leaves in control plants and unaffected and affected parts of leaves exhibiting classic symptoms of LTDB at the time of analysis. In both our material, and that from two commercial growers, there was however considerable variation in calcium levels ranging 0.7% (bordering on the inadequate) to well over 2.3%. Critical concentrations for calcium i.e. the concentration at which a 10% reduction in growth occurs, have yet to be determined. It is perhaps worthy of note that monocotyledonous plants such as the grass and onion families, apparently have lower requirements for calcium than broad leaved species.

There are several explanations possible for these findings. The most obvious inference to be drawn is that calcium is not involved in the symptomology of this disorder. We do not believe this to be the case and are preparing to test this further using foliar applications of mobile calcium forms to try and alleviate the condition and to investigate the adverse effects of high root phosphate supply. The use of oxalate which is known to immobilise calcium in plant cell vacuoles and increases severity of the disorder, is also being investigated.

One of us (SBR) working at NVRS Wellesbourne (now Horticultural Research International) a few years ago, encountered a similar situation in cauliflower

with the element boron, one suspected cause of stem hollowing in Brassicas. Boron, like calcium, moves with the transpiration stream and if there is an interrupted supply, as a result of under/over watering, coinciding with rapid stem expansion growth then demand will not be satisfied, and it was suggested that the disorder can be triggered. On resumption of normal watering regimes boron supply returns to previous adequate levels as evidence by foliar analysis. It was tentatively concluded that the transient nature of boron supply and its unequal distribution throughout the plant might be the cause, and that once the disorder was initiated, its further progress would be irreversible. We are tempted to speculate that if interrupted water supplies, and hence calcium transport, coincides with the period of active leaf expansion then irreversible LTDB is triggered. Subsequent resumption of water supply restores near-normal calcium levels in affected leaves, and foliar analyses show no significant differences in calcium levels.

A further possibility is that calcium is not acting alone. One of the most significant findings of our LTDB results, again on large numbers of samples to-date, is the different nutrient element ratios between affected and non-affected leaves. There was evidence of imbalances between calcium and other essential elements. We are also convinced that the amount of fertiliser nitrogen supply, both N form (organic/ammonium or nitrate) and timing of application has a significant bearing on the disorder, and we will be seeking to investigate this more fully in the coming season.

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BECAUSE OF, OR DESPITE?

Having grown hardy orchids for a number of years and read much on the subject, I have come to the conclusion that no one specific method is necessarily the best way to have some measure of success.

When I first started, I was sure that there was some 'magic formula' necessary for successful cultivation. I concocted numerous elaborate composts, individually tailored to each plant's need, copied from books or overheard in conversation. Initial results were acceptable (i.e. they lived!) but after the first season things never looked good. I tried to analyse what went wrong and to devise a set of general rules from my own observations.

I concluded that as many people have success using a multitude of individually different methods, that no one definitive method can be essential. Admittedly, a few basic rules have to be observed, but in the main a broad cultivation technique can be adopted for the majority of terrestrial tuberous/rhizomatous orchids.

Plants, like all living things have adapted over the millenia to survive in their chosen/given ecological niche. Much can be learned from a study of the geographical and climatic conditions of orchid rich regions, but any attempt to copy these conditions to the Nth. degree will almost certainly end in disaster. It is important to realise ones own limitations when choosing cultivation methods - it's no good copying a natural soil type if it is so free draining that water has to be supplied twice a day, if ones work or social commitments do not allow the necessary time to do so.

I grow orchids from many different areas of the world; from the Mediterranean region, northern Europe, North America, Asia and Australasia and tend to grow

them all in the same way (if the same species' can be grown by a number of different methods, by a number of different people, I decided that they can't be too choosy and that there was probably a common point at which these methods overlapped, forming one general method to cover a number of species). On analysis I have decided on three fairly important factors from all that I have read and heard, frost hardiness, soil texture and growing/dormancy requirements. Frost hardiness is best covered by a knowledge of where the plant grows, choosing the distribution epicentre as the best guide - always err on the side of caution until stocks are sufficient to experiment. I have found, for example, that at least two species of the reputedly tender Australian genus *pterostylis* will come through several degrees of frost unscathed in a covered bulb frame. I choose the phrase soil texture because this seems to be the only commonality I can see between the many composts suggested. My bulk standard mix is 50/50 John Innes N°1/sandy grit for all mediterranean, Northern Europe and Australasian species - the exception being the addition of an equal part of sphagnum moss peat and medium grade bark (1:1:1:1-John Innes:sandy grit:peat:bark) for dactylorhiza and rhizomatous species (cyripediums, epipactis etc.) - this gives a more moisture retentive medium which I find is necessary for good root/tuber growth. It could be argued that I am also altering the pH. by the addition or non addition of peat but this is by accident rather than design. The oriental species; calanthe, bletilla etc. have the addition of live sphagnum moss, halving the John Innes portion (1:2:2:2 - John Innes:sandy grit:sphagnum:bark), this gives a very open yet moisture retentive mix. It should also be noted that I am growing exclusively in plastic pots - at the moment! As for growing/dormancy requirements, I mean by this, the time of year that water should be withheld from the plants to accommodate what they would have been used to in the wild. Of course it is impossible to match these conditions

exactly and after all no two years are ever the same anyway. Suffice it to say that it is necessary to carry out some form of water limitation for any plant that loses its top growth annually. I have found that no orchid requires the often quoted "baking", as all this does is leave space for future experimentation with new stock (perhaps suggested by a nurseryman?) Standing the pot on damp sand and not watering the pots directly or merely placing the pots outside, out of direct sunshine for the period of dormancy seems to be enough (allowing for the vagaries of very dry or very wet years and remembering that I use plastic pots). This is the treatment I give all of my tuberous orchids; Mediterranean, European and Australasian alike. The oriental species are never dried out and get some direct watering throughout the year, decreasing at around flowering time for a short period. Many experts have their eccentricities when it comes to specifics on growing, My findings are that they must be right to some extent, success being measured by results, but do their plants grow because of, or despite the fuss?

Ray Drew Essex.

PLEIONE MACULATA - 20 YEARS SURVIVAL IN CAPTIVITY

BUT ONLY JUST

I purchased a few pseudo-bulbs of *Pleione maculata* from India in 1976 and it is the offspring of this importation I still grow and flower.

Pleione maculata, one of only two Autumn flowering species of *Pleione* is to be found in some areas of North East India, Burma, Northern Thailand and Southern China. Apparently it occurs at a lower altitude and in somewhat warmer conditions than the other Autumn flowering species - *praecox*.

The flowers are quite small - about 2-2½" across and appear in October and November when the leaves have fallen. Usually solitary but occasionally two in each inflorescence the flowers have a pleasant smell of apples.

The tepals are white, sometimes streaked with purple. The lip is white blotched with purple at the apex and has a yellow throat.

I re-pot annually, usually as soon as flowering has finished. The remains of the old bulbs and sheaths are removed from the bulbs taking care not to pull off the new growths or damage the new roots, which are forming even at this stage. The old roots are trimmed to 1-2". The bulbs are then carefully washed. (This is probably the best time to buy *Pleione maculata* unless bought potted. Not so long since, I saw some large bulbs of *Pleione maculata* for sale - bare root, in late April, with the new growths well developed, and very badly marked - almost certain to give poor results).

I generally re-pot in a 6" plastic pan.

A fairly generous layer of polystyrene pieces is placed in the base to assist drainage.

The compost used is a mixture of five parts of fine bark (sieved to remove fine

dust), three parts of coarse perlite and $\frac{1}{2}$ part charcoal - measurements are only very approximate.

The pot is filled to $\frac{2}{3}$ depth with the compost. The bulbs are laid on top of this, quite close together. More compost is added to $\frac{1}{3}$ way up the bulbs. A top dressing of fresh well washed sphagnum moss helps to stabilise the bulbs.

A light watering is given at this time. The compost is then kept only just damp until the new growths are well developed in the Spring. From May onwards watering is fairly frequent and can be required every 2-3 days depending on conditions.

The feed I use is Liquinure - every - 7-10 days during the Summer at the same dilution as for pot plants. I usually start feeding in April at $\frac{1}{4}$ strength, always making sure the compost is moist first. Feeding is continued until the leaves start to turn brown in the Autumn. When watering try to avoid getting water onto the new growths to reduce the risk of rot developing.

My greenhouse is 15' X 10' and runs North-South. Shading is by 'cool glass' - first applied in late April with a second coat in May. All shading is removed by early September.

Heating is by electric tubular heaters. *Pleione maculata* is grown in the warmer section which is kept at a minimum night temperature of 58-60 degrees Fahrenheit, rising to 65 degrees Fahrenheit during the day in Winter and hopefully not more than 85 degrees Fahrenheit in the Summer.

Air circulation fans run constantly.

Pests so far have not been a particular problem with *Pleione maculata*.

Although I have been able to give a few pseudo-bulbs away from time to time. I cannot claim that my results have been other than fair at best.

I keep trying and experimenting, but like many other growers I am still looking for that 'magic something' which will enable them to grow and flower in profusion.

Dr. Stewart Knox. Middlesbrough.

THE CULTURE of PLEIONES at the BOTANICAL GARDENS MUNICH GERMANY

Munichs Botanical Garden on its present site is, compared to other Botanic Gardens in Europe, quite young. It was relocated from its old site in the centre of town to Nymphenburg in 1914. The garden borders on Nymphenburg Park, a large English landscape garden belonging to the mansion (Schlob) Nymphenburg, the former Summer residence of the kings of Bavaria.

The botanical garden covers an area of twenty hectares and has a glasshouse area of 8,000m², of which the Orchid Unit has 750m² of glasshouses with three horticulturalists working with the plants, plus an additional student from the nearby horticultural university, Weißenstephan.

As special collections we have: Paphiopedilums, Pragmipediums, Cyprripediums, Cymbidiums; "Fan-shaped-orchids", Acineteas, Catasetums, Stanhopeas, plus many other orchids. Altogether, approximately 1,200 different taxa, and increasing steadily.

But we want to talk here about the culture of our Pleiones. Two years ago I wouldn't have been able to give you any information on culture. The few pans we had didn't look too good and I wasn't satisfied at all. I started as supervisor of the Orchid Unit four years ago, having worked with orchids in Heidelberg, Kew, Marie-Selby/Florida and a large commercial nursery in Germany. The Pleiones were kept too warm and in a very open mix. I changed the temperature in my cool orchid house mainly to grow "my" Cymbidiums and it suited the Pleiones perfectly. Gathering as much information as I could I changed the soil mix to a much heavier one and started feeding more regularly. But only after I started using Osmocote were the results satisfying.

Pleiones grown: *bulbocodioides*, *formosana* 'Blush of Dawn', *formosana* 'Oriental Splendour', *formosana* 'Snow White', *X lagenaria*, *praecox*, *speciosa*, *wallichiana*, **Gerry Munday**, *Shantung* 'Gerry Munday', *Versailles* 'Bucklebury'.

Temperature: 11°C night/Winter, 16°C day/Winter and night/Summer, 27°C day/Summer. The pans stand at the cool end of the cold house.

Shading: The house receives no shade in Winter, early Spring and late Autumn and has outside shading of wooden blinds in Summer. *Pleurothallids* and *Odontoglossums* which are kept in the same house get an additional shading of white-wash. Interestingly this paint is prepared from flour and water (10 Litres of water - 300/500gr of flour). A cheap and environmentally friendly way of protecting your plants from the sun's rays. One sprays it on when the sun is shining, making sure to wash one's sprayer beforehand with clean water as well

as well as immediately after spraying. Cleaning it off is easily done with a stiff brush and some water, it slowly washes off anyway throughout the Summer, which means one has the highest percentage of shade in Spring/Summer and it lessens when the plants need to ripen at the end of Summer/Autumn.

Soil mix: coconut fibre, German peat moss, fine bark, silver sand, loam and vermiculite. The mix should be quite open and when squeezed together fall apart after opening your hand.

Pots: I use shallow clay pans, which hold between five and ten bulbs according to their size.

Repotting: I repot every year in December or January, **praecox** and **X lagenaria** after they have flowered. We cut all the old roots back and place the bulbs according to their size in the pans. We cover the bulbs with the exception of **praecox** and **X lagenaria**.

Water: Deionized water with a pH of 5.5 and an electrical conductivity reading of 80 - 120 uSiemens.

Watering: Plants get watered according to their root development and the amount of growth they make and of course to the prevailing weather conditions.

Fertilizer: After the plants have made their roots a sprinkle of Osmocote is put on top of the pan. Don Wimber told me once never ever incorporate Osmocote in ones soil mix, only put it on top. I keep to his warning and have never failed so far. If you know how this type of fertilizer works with temperature and humidity you will understand the recommendation. But my plants get a liquid fertilizer too. Depending on the amount of sunshine received, I feed once or twice a week in Summer with a well balanced fertilizer (Poly Crescal 14-10-14) at a strength of 600 uSiemens.

Pests and diseases: So far there are no pests, besides the notorious slugs and with the new compost black fly, try to bother me. The Alpine Unit has had some

problems with a kind of fungus, but I don't use parts of the old compost and my plants grow with a lot of ventilation. Even with closed vents , paddle fans keep the air moving and if the outside temperature is above freezing the bottom vents are open a crack.

Bert Klein, Munich Botanic Gardens

BIOLOGICAL CONTROL OF GREENHOUSE PESTS

Biological control of greenhouse and garden pests has been used commercially for many years. Increasingly amateurs are turning to this type of control to deal with whitefly, redspider etc.

This article answers some of the questions commonly raised by amateurs about biological control and deals specifically with the control of whitefly, thrips, redspider mite and vine weevil.

Why use biological control?

Biological control is replacing chemical control because a number of pests have developed resistance to the main insecticides - whitefly is a good example.

Spraying is time consuming leaving chemical residues on the plant. The sprays will also kill other beneficial insects. With the growing number of conservatories, using chemicals 'in the house' may not be acceptable. Biological control overcomes all these problems and has the added benefit that once established it will work twenty four hours a day seven days a week - even when you are on holiday!

Which pests can be controlled

The range is increasing all the time - whitefly, redspider mite, vine weevil, aphids, caterpillars and mealy bug have been routinely controlled biologically for a number of years. With the introduction of Western Flower Thrip into this country biological control of this pest has been researched and predators are now available. Recently we have seen the introduction of a parasitic nematode to control slugs.

Are the biological control agents safe?

The parasites and predators used are specific to the pest they control. They will not attack anything else - which makes them ideal for use in a conservatory where household pets (and people) play! Where more than one pest is a problem - whitefly and redspider mite for example - then both biological control agents can be introduced together and they will not interact.

What are the chances of biological control working?

Good - providing you follow a number of simple steps.

- * Introduce the biological control as soon as you see the pest.

- * Make a number of introductions so that the population of the pest and predators are in balance.

- * Help the biological control agent by using traps and soft soap to reduce pest numbers until a balance is achieved.

What will upset these helpful bugs?

Conventional sprays should not be used unless they are specifically recommended for use in conjunction with biological control. A number of insecticides leave residues that can be harmful for a long period after application. The residues of insecticides containing permethrin are harmful to encarsia - the parasite used to control whitefly - for ten weeks after application. Low temperature in the Spring can be a problem - most of the biological control agents need temperatures above 10°C/50°F to survive and in the mid 60s to breed. The chart

below gives an indication of the effects of sprays on the main predators and parasites.

Name	Active Ingredient	Whitefly Encarsia	Red Spider Phyto.	Thrips Ambly.
Fumite smokes	Permethrin	H.60-80	H.60-80	H.56+
Tumblebug	Permethrin	H.56+	H.56+	H.56+
	Heptenophos			
Natures Answer	Pyrethrum	H.7	H.7	H.10+
Derris	Rotenone	H.14	H.10+	H.10+
Sybol	Pirimiphos-methyl	H42+	H.42+	H.42+

H = harmful for the number of days shown.

There are a number of biological control agents available and the number is increasing each year. The table below summarises the most commonly used at present.

BIOLOGICAL CONTROL AGENTS CURRENTLY AVAILABLE

Pest	Control Agent	Method of Control	Method of Introduction
Whitefly	Encarsia	Parasite	As parasitised whitefly scale on cards
Red Spider mite	Phytoseiulus	Predator	As adults in tubes

Aphids	Aphidius	Parasite	As parasitised aphids in a tube
Vine weevil	Nematode	Parasite	Nematodes in solution
Mealy bug	Cryptolaemus	Predator	As adult 'ladybirds'
Thrip	Amblyseius	Predator	As a breeding colony
Caterpillar	Bacillus	Bacterium	As a spray
Slugs	Nematodes	Parasite	Water onto soil

Other products are available - details on request.

The biological control of whitefly

The use of biological control for whitefly has been around for many years. It is straightforward to use provided that the introduction of the encarsia is timed correctly. The following steps should be followed.

1. In the Spring hang yellow sticky glue traps as close to the tips of the plants as possible. Inspect regularly for the first sign of whitefly.
2. When the first whitefly arrive, introduce Encarsia provided that the minimum temperature is above 50°F (10°C) and the day temperature is likely to exceed 61°F (16°C).
3. Make a number of introductions - for all but the smallest greenhouses - we recommend four introductions at fourteen day intervals.
4. On introducing the Encarsia, raise the glue traps to six inches above the tips of the plant.
5. If local 'hotspots' of whitefly develop spray with a soft soap concentrating on the underside of the leaves.
6. If the temperature is too low use glue traps and soft soap to control until

temps rise.

The biological control of thrips

The introduction of Western Flower Thrips into this country has made this a much more important pest both on vegetable and ornamental crops under glass. The successful biological control of thrips depends on early identification. The thrip damages plant cells particularly in the growing point by piercing them and sucking out the contents leaving silvery grey spots. As the plant grows these can develop into 'blisters'. The thrips also attack the flowers causing distortion. If the flower is placed over a white card and tapped, the thrips fall onto the card in large numbers. They are normally orange/brown in colour and will move quickly.

Thrips are controlled by a predator - *Amblyseius*. This predatory mite pierces the thrip and sucks it empty. It normally feeds on young thrip as the more mature thrip are able to fend off the predator. The mite also eats pollen and can therefore survive on plants even if there are no thrip present.

Where there has been a history of thrip damage *Amblyseius* should be introduced early in the Spring before any damage is seen. It is introduced as a breeding colony in a sachet. As they breed, large numbers of predator are released onto the plants. Where there is an outbreak of thrip for the first time the predator should be introduced as soon as the outbreak is identified. This is particularly important as the predator prefers to eat young thrip.

The use of yellow sticky glue traps to catch whitefly is well known. Thrip can be caught on blue glue traps hung adjacent to the tips of the plant. This is a good method of monitoring the onset of this pest.

The biological control of vine weevil

This has become a major pest both under glass and outside in recent years. The adult vine weevil is on the move in the Summer months taking notches out of the edges of the leaves. It lays its eggs on the surface of the soil. These hatch and the larval stage attacks the root system causing the death of smaller plants and reducing the vigour of the larger ones. The larval stage is active through the Summer. It then overwinters and becomes active again as temperatures rise in the Spring. It pupates in May to produce a new generation of adults in the Summer.

Control is straight forward using a parasitic nemetode that is watered onto the compost/soil. This should be applied in August and again in the late Spring outside when the soil temperature is above 14°C. It can be applied at any time under glass. The treatment will cost about 1.3 pence per plant.

The biological control of red spider mite

Red spider mite is very difficult to control chemically because of the restricted number of chemicals available and the build up of resistance to them. The most critical aspect to biological control is to introduce the predator at the first sign of attack.

1. If there has been a history of red spider attack watch carefully in the Spring for the first attack. This will normally occur after a sudden change in the temperature in the Spring - normally late April. This change stimulates the overwintering females to become active and to start laying their eggs. The first symptom to be seen will be a 'crazing' or mottling of the leaf.

By holding the underside of the leaf up in bright sunshine it should be poss-

ible to see the red spider moving on the underside of the leaf.

2. Introduce the predator - phytoseiulus immediately provided the temperature is above 10°C. It arrives in tubes of 500 and 2,000 and is sprinkled onto the leaves of affected plants.

3. Plant leaves should be touching so that the predator can chase the red spider from plant to plant. If the plants are isolated then some form of bridge such as twine will need to be stretched between the plants.

4. Raise the humidity to help the predator.

5. Once the predator is established it will continue to work until all the red spider have been eaten when it will die out.

6. Be careful not to reintroduce red spider on clothing or by bringing in an infected plant.

With the increasing range of biological control agents available and the reduction in the range of chemicals, the use of biological control will become more important to amateurs bringing with it the advantages of safety to the plants, the gardener and the environment.

John Manners, Managing Director, Green Gardener.

For details of the full range of biological control products available to the amateur contact Green Gardener on 01603-715096 or write to them at
41 Strumpshaw Road, Brundall, Norfolk. NR13 5PG

CULTIVATION of *PLEIONE HOOKERIANA*

SUCSESSES and AIRBORNE FAILURE

All of my *Pleione hookeriana* pseudobulbs were planted on top of branches in moss, above a loose mixture of my normal pleione compost (shown in last year's N.P.R.). All grew well, and I even had some exquisite flowers from my larger pseudobulbs.

I lost one batch of eight pseudobulbs however, not to the dreaded brevipalpus or slugs, but to marauding birds. A destructive blackbird or passing song-thrush, intent on nesting, flew away with eight pseudobulbs and all the moss from one pan. So, somewhere in the sunny climes of Wolverhampton, *Pleione hookeriana* is growing truly epiphytically up a tree in a bird's nest. They are probably doing far better than their land-locked cousins in my care.

A few notes now on my winter care of pseudobulbs, that I did not mention in last year's article. After leaf fall in October, the plants are brought indoors into a cellar that remains at a temperature of below four degrees centigrade. From then on, I don't do a lot with them, apart from spraying them every couple of weeks with a fine mist of water. This I think keeps the small pseudobulbs plump, and stops them becoming too desiccated. The misting has also kept some of my bulbils of *Pleione humilis* alive long enough to produce growth and small leaves in the Spring when planted. Unsprayed bulbils became desiccated and useless.

My other pleiones have all been kept by standard methods, except for *Pleione maculata* which has been grown the same as *Pleione hookeriana*. *Maculata*, however is kept under glass at the beginning of the year, for extra heat. This complements its earlier growth pattern. As I write this (07/12/96), I have three

pseudobulbs sending up flower buds. **Pleione praecox** is also coming into flower, along with three very early **Pleione humilis**. Are these Autumn flowering species late this year, or are flowers at Christmas normal?

Pleione forrestii has been grown in wood moss, pine needles, bark and limestone chips. I can't say I have seen any growth changes compared with normal compost. **Forrestii** just seem to tick over what is the secret?

Pleione limprichtii, **speciosa**, **bulbocodioides**, and my new **chunii**, have all fared well on leaf mold, perlite and pine bark. Fortnightly all species are fed with a weak fertiliser (the same used by Eric Humphreys). They have all produced good sized pseudobulbs, and flowering should be spectacular.

One of my highlights for 1966, was the talk and slide show by Ian Butterfield in glorious 3-D, given at the Birmingham Orchid Society. Spectacular is all I can say. If he returns again to the Midlands to talk, I have several non-**pleione** growing friends coming along to be converted! If you get the chance to hear his talk and admire his slides, seize it - you'll not regret it.

Carl Hardwick. Wolverhampton.

THE CHELSEA EXPERIENCE

This begins in September, the year before exhibiting, when an application for space is made to the Royal Horticultural Society. If you are lucky, confirmation of your space is received in December, which is just in time for selecting and potting all the **pleiones** needed for the exhibit. If **pleiones** are left to their own devices, even in a cold greenhouse, they will normally flower three

or four weeks before Chelsea so they have to be put in a cold store to retard them. Although they will be in a temperature of about 1°C, and in the dark, they will not stay completely dormant. They will eventually start to grow with different varieties starting to grow at different times so the pleiones have to be removed from the cold store over a period of about three weeks. The pseudo-bulbs are potted in the usual bark/peat type of compost in pans which have been scrubbed in a solution of Jeyes Fluid and put in the cold store (unwatered) by the second week in January. Any later than this and some will have already started to grow. **Pleione Eiger** is one hybrid that it is impossible to exhibit at Chelsea as it will flower in the cold store (in the dark at 1°C). I think it is important to produce an exhibit which is balanced for colour with a selection of dark pinks and pale lavenders and also yellow and white. It is also a good idea to exhibit large and small flowered varieties and also to include a selection of species as not everybody is interested in hybrids. Our space allocation at Chelsea is usually around 14'X10'. This needs about one hundred and seventy pans of flowers in assorted sizes, ranging from ten inch round pans to four inch square pots. All the varieties are potted in a range of pot sizes so that the flowers can be staged in natural looking drifts, and all these pots should be full of flower on the day. Timing the flowers:- Seven weeks before the Show **Pleione bulbocodioides** and hybrids with **P.bulbocodioides** in their parentage are removed from the coldstore and stood on the open bench in a frost free greenhouse. The ventilators are open during the day and also during the night unless it is frosty. Five or six weeks before the Show most of the other varieties come out of the cold store. **Pleione Shantung** clones and other yellow hybrids, **P. Piton** and the **P. formosana** clones 'Snow White', 'Clare' and 'Avalanche' are taken out of the cold store

about four weeks before the Show as these usually have quite large buds showing at this stage.

When all the pans are on the greenhouse bench they are sprayed with an insecticide to eliminate any greenfly problems on the emerging flower buds. Water very carefully at first, but with the longer day length and more sun heat in April they will start to grow more quickly than usual. Shading must be applied now so that when the flowers open the colour does not fade.

The first flowers need to be opening about seven to ten days before the Show. If any of the pans are obviously lagging behind the majority they are moved into warmer conditions. If the weather happens to be too hot the flowers will open too quickly but these can be retarded by putting them back into the cold store (in the dark at 1°C) and only bringing them out one day before staging at the Show. This does not affect flower colour, but the flowers do go over more quickly.

Chelsea Flower Show lasts from Tuesday to Friday, but exhibits in the Great Marquee must be ready for judging by 2-30p.m. on Monday. This means that we stage our exhibit on Sunday, arriving around mid-day.

It looks as though chaos reigns everywhere, but we eventually get unloaded. Inside the Marquee space is at a premium but the other exhibitors soon move their plants and equipment and we have our 'pleione oasis' to work in. Sometimes gangways have to be blocked with empty crates to stop sight seers from walking through our plants while we are trying to work.

Our exhibit, when finished, will be a mountain/woodland scene with all the flowers looking as though they are growing naturally. In fact, in the wild they never flower as profusely as we display them at Chelsea. As well as all the pans of flowers, we have brought a hundred smaller pots of ivies and mixed hardy ferns. There are also three two to three foot tall pine trees in pots.

To raise the pans of flowers we have forty eight wooden boxes ranging in size from 15" to 9" square and from 9" to 1" high. These will give us the basic shape of the exhibit. To make it look more interesting a few tree stumps and assorted pieces of interesting tree roots are added as well as a selection of 'rocks'. These are made out of shaped and painted polystyrene, and are very much easier to handle than the real thing. Visitors to the Show have been known to touch them just to see if they are real. All the boxes, tree roots and rocks are moved around until the exhibit looks right, with high points and slopes etc.

The pans of flowers are now put on the exhibit using the different sizes of pans to create drifts of flowers. Dark flowers are used to compliment the paler colours and larger flowers are staged next to small ones to create interest. Once all the pans of flowers are on the exhibit, the ferns and ivies are placed in between the varieties of pleiones to produce a natural effect and also to separate the different varieties.

Now comes the longest job. We have brought six bags (about eighty litres per bag) of moss collected in the wood and a small bag of mixed leaves. (Both collected legally with the owners permission). We use the moss to cover all the mechanics of the exhibit (boxes, pots etc.) Even the compost in the pans of flowers needs to be covered as any pots showing during judging means a loss of points and usually a lower grade medal. Mossing up can take four of us three hours to finish the job to our satisfaction. The whole exhibit is then sprayed with water and left to settle down overnight.

I arrive at the Show on Monday morning about 10 a.m. just to check that there are no dead flowers to remove and that all the pots are still covered with moss, as it moves as it dries out. Just before judging the whole exhibit is lightly sprayed with water so that it sparkles.

We have done our best. It is now up to the judges. It is hard work but it is also a wonderful experience to be part of the Best Flower Show in the world - Chelsea.

Ian Butterfield, Bourne End.

MORE on the ELUSIVE PLEIONE ALBIFLORA

I must start by apologising to the readers of the Pleione report for an erroneous conclusion that I published last year: to wit that the second parent of **P.confusa**, along with **forrestii** as the first parent, was **P.chunii**. I now know that to be false. The proof is quite simple and incontrovertible. It is that I flowered my own hybrid between **forrestii** and **chunii** last year and it is **kohlsii** (which I also flowered) and not **confusa**. (Note: the artificial hybrid of **forrestii** and **chunii** has been registered by Ian Butterfield as **P. Edgecombe** in September '96). This of course confirms Dr. Cribb's hypothesis that **kohlsii** was of that parentage.

How could I have made such a mistake? My excuse is an almost incredible coincidence which is I think of sufficient interest to publish. It also gives me an opportunity to "come clean" on a long cherished secret which is unlikely to benefit a septuagenarian but which must be made public for the benefit of Pleione enthusiasts in general.

The story goes back to my visit to the Peking herbarium in May 1980. Professor Chen and I went over the Pleione material. The **hookeriana** folder included ten sheets, the majority of which matched **hookeriana** sufficiently well for me to

accept them. There were however a few sheets (two or three?) that looked more doubtful. They were larger flowered, the leaf was less well developed at flowering time, and what excited me in particular was that in one of them there was a well developed nectary spur-pouch at the back of the flower below the ovary. The flower was purple-pink in colour. This sheet matched my tentative description of the second parent of **confusa** - and apart from flower colour it also matched what we then knew as **grandiflora**.

I don't know of course whether the sheets of **hookeriana** that Dr. Cribb saw with Professor Chen some fifteen years later were precisely the same as the ones I saw, but they must have been essentially the same. Dr. Cribb too was struck by the fact that the folder was not a single species, and among the larger flowered sheets he recognised **aurita/chunii**. On learning this I concluded that both Dr. Cribb and I had spotted the same aberrant sheets and thus my 'second parent' was now officially recognised as **chunii**. Clearly that is the conclusion that was in error - so what is the explanation for the muddle-up? This is where the incredible coincidence crops up. I am now convinced that whereas both Dr. Cribb and I could see that the **hookeriana** was not pure, what we neither of us recognised was that the folder included not just two species, but three, i.e. **hookeriana** in the majority and also **chunii** and **albiflora**. The only details I have of the **albiflora** sheet is that it was collected in Ra Shan County in Kweichow Province.

Moving on to the Kunming herbarium which I also visited in 1980 working with Professor Wu Cheng-yih and Mrs Li Hen, again the sheets of **hookeriana** did not look to me to be sufficiently coherent to be one species, but now the larger flowered sheets were in the majority. My thought at the time was that the Chinese form of **hookeriana** was larger flowered and later leafing than the Indian form, and that both were present in the one folder. One of the large

flowered sheets particularly interested me because it was a match with the Peking sheet above. It was S. Kweichow 923 (Guizhou), April 1959, 1800M. Mrs Li Hen thought that it could have come from Ra Shan County. I now suggest that this sheet is of **albiflora**, and that possibly some of the others are too. At the time of my visit to Kunming the substation at Lichiang (Likiang) had recently been closed down and the Lichiang herbarium was being incorporated into the Kunming collections. Three of the Lichiang sheets caught my eye - and again I suggest that, in spite of the flower colour!, these are of **albiflora**.

Lichiang 100801, April 1962 at 2750M. light purple collected as **forrestii**! provisionally identified as **bulbocodioides**, large flowered with a well developed spur-pouch nectary.

Tamashan 51470, April 1956 (Tamashan is 10K N.W. of Kunming), similar. Feng 665, April 1939, Likiang: Pai-Shu-Ho by E. Snow Range. Flower 4-6" across, scarlet-rose on open hillsides, not in pine forest. Identified as **bulbocodioides** but big flowered and with a large spur-pouch nectary.

It is my hope that the publication will be a sufficient stimulus to recognising that **albiflora** is normally purple-pink flowered and that it is already known to Chinese field workers. Hopefully this will lead to its being brought into cultivation in the West.

D.J.Harberd, Leeds.

"An experience shared is an expansion of knowlege"

GROWING HARDY ORCHIDS ON THE SOUTH COAST

My interest in orchids arose directly from encounters with the wide diversity of orchids on the South Downs and in the woodlands of the Sussex of my teenage years; in fact for a long time I had no idea that there were other orchids which were not hardy. First and foremost I was fascinated by their biology and intrigued by the tales of the ladyslippers and the ephemeral **Man Orchid**; Summerhayes' book, on the Orchids of Great Britain, was a constant companion. In these respects I guess that many of today's orchid enthusiasts could cite similar formative experiences. My downfall came when I saw a book, in Boots the Chemist, on tropical orchids. I was hooked, and for the next thirty years hardly gave our native orchids or any other hardy orchids a second thought. There are many reasons for this, some of which I am sure I have forgotten, but I can recall the abject failure of trying to grow a *Pleione* given me by a colleague at work. Similar lack of success came with ***Pleione humilis*** and ***praecox*** from Wallace and Barr, from whom I purchased my Lilies (another lifelong passion). These poor experiences were compounded of course by the complete lack of cultural information with regard to hardy orchids and our own native orchids at that time. Although I am experimenting again with a variety of hardy orchids recent experience has led me to feel more confident with *Pleiones* and *Disas* so I offer below some of my thoughts and experiences on growing these.

Pleiones

On our return to Sussex from Manchester in the early 80's, I saw some of Ian Butterfield's *pleiones* at a show and thought I had to have another go, despite previous experiences. I went slowly and economically! Not for me the beautiful

hybrids, but plain old **formosana** and its alba form. Being busy at work and running an expanding collection of non-hardy orchids I could not afford to devote much time to them. But I did recall some of my poor earlier experiences. I had been told to grow them cool, but not too cool and to give them an open compost of bark and leaves. So I did just that, in with my cool-house **cymbidiums** and **odontoglossums**. Failure was rapid; they dried out too quickly, never made roots and succumbed to the red spider which seems to be endemic to most cymbidium collections. So, I reasoned, I should give them more protection from summer heat and try a more moisture retentive compost; the north side of our garden shed seemed ideal and Levington's compost worth a go as the new growing medium. Much to my surprise they survived - and they multiplied and they flowered the following year. This despite staying out all winter, being frozen solid in their pots at times and soaked through at others; they were even out when the mercury fell to 16F. I have often wondered how they did survive, for they did so for many years. They were never repotted as I did not know what you had to do, they were just potted-on into bigger pots. An explanation for their survival in these pretty adverse circumstances could lie in their winter quarters, by the shed. They were covered, from mid-October onwards in a thick layer of leaves deposited there by the eddies round the shed when the strong south westerlies blew in the Channel, about half a mile away and this must have served both as a blanket and a watershed from the worst of the winter rains. Whatever the reasons for their continued survival, I was greatly encouraged and "shelled out" on more exotic hybrids, like **Stromboli 'Fireball'**, **Versailles 'Muriel Turner'**, **Hekla**, **El Pico** and so on. All did well with the regime above and relative neglect for most of the year, with a flurry of activity to clean the pots up around flowering time. Then I tried **P.forrestii** and **P.Shantung!**. I gave them the same treatment, they did not appear the

following year! Ah well, lesson learnt - don't buy expensive pleiones.

Luckily for me two things happened to rescue me from this situation. First, I bought the Kew Monograph on Pleiones, which was fascinating and wonderfully informative, and second two very good orchid-growing friends, Molly and Bill Pottinger introduced me to the National Pleione Report. They had all the back numbers and I devoured them with great enthusiasm, I joined with elacrity and was soon on the phone in answer to all those mouth-watering offerings. Some of those phone calls were longer than maybe they should have been, (nowadays they would qualify for inclusion in "Friends and Family"!), but I learned so much. It really has transformed my view of Pleione growing.

So what happens now. Well Levington is no more, it's O.K. for pelargoniums, pansies and polyanthus, but pleiones....? My basic mixture is very similar to those recommended by many modern sources. It is basically medium bark, Perlite, a little coarse peat, oak and beech leaves, charcoal and sphagnum. It has a lovely crunchy feel to it and drains very well, yet the moss and peat allow for good moisture holding as well. I am now seeing bulbs the size of which I had no idea was possible. I have even learned that you can split them up around the year-end, so my pans now look a bit more as if they were planned that way. As for the rigours of life outside, behind the shed. Well for spring, summer and autumn that is still broadly true, but I do not take chances with the freezing and the wet that I used to. Having said that, I'm not sure that **formosana** (pink and alba) are quite as floriferous as before or are they? This year too, I intend a small experiment in which I shall grow a few in with the cool-house orchids. My conditions are less drastic than they were, the temperature rarely goes over 85F and the humidity is higher. Some plants of **Barcena**, which have been there since flowering in December, are growing vigorously and

showing very good roots already (early April), so I thought I might try a few others to see if they prefer the less rigorous climate compared with life behind the shed.

My adventures into the more modern hybrids goes slowly, but experiences so far have been most encouraging. Shantungs now do well for me, and I have been quite bowled over by **Rakata** and **Irazu 'Cheryl'**. I have even managed an enormous **P.chunii** from a small bulb purchased three years ago and it is in flower as I write. **Forrestii** is still a pain, I can grow bulbs from one year to another - but they do tell me that it's supposed to flower as well.

Challenges for the future apply to the other species. I'd love to be able to grow **yunnanensis** well, it grows for me but that's all, it doesn't flower. To get **praecox** to grow and flower would be a miracle, but I keep trying. And the other Indian species a pipe dream? Maybe someone out there, reading this report has the answer.

Disas

I first got into Disas, as did many other growers, following Keith Andrew's wonderful exhibit at Chelsea in the early 80's. Fortunately for me, my results were reasonable right from the start and I have not been subject to the bad experiences that I know attended the first-time experiments of many of my orchid growing friends. A year or so ago I might have tempted fate and offered confident advice on how to avoid problems with Disas. Now I will be more cautious. There is a Murphy's Law of growing most plants which states roughly that "Just when you are feeling confident that you know how to grow a plant well it dies". My experience has been slightly better than that, but I still think that I have yet to sort out the variables which combine to make a Disa

grow and flower well. I am in fact writing this reluctantly, driven only by a sense of obligation to Peter, having offered in an unguarded moment to give him a few lines on Disas for the report.

I think Disas fall between, on the one hand the hardy orchids of Europe, Asia and America, which most people regard as hardy to the U.K. and many of which demand a very cool to cold period in order to flower and, on the other, the high altitude cool-growing tropical orchids of South America, South West Asia and India. During the winter of 1995/6, through the force of circumstances I had to "board out" my Disas in an unheated greenhouse. This was on an unused nursery and they were on wire benches in an enormous, empty span house which faced south. On sunny days there was a good lift and the temperature would rise to 70+, but with such short days it would fall rapidly to near the outside temperature once night fell. On cold, dark days the temperature would stay at or below freezing all day long. At times, the water in their trays would have ice on it They grew and survived. So did the cymbidiums, dendrobiums and cyclamen with them. One or two even flowered. It was not ideal and to use such to describe them as "hardy" would be misleading. Similarly during the summer. They do alright out of doors, especially if shaded from the midday and afternoon sun. And that is how I used to grow them during the summer, again through force of circumstance, I had no room for them in the cool hose, so the next best thing was outside in a relatively shady place. They thrived and flowered and multiplied. Until the last three hot summers. The sun seemed to be stronger, the foliage went yellow/green much quicker, but above all I believe the problem was keeping the pot temperature low enough. Even sitting in rainwater, as they do throughout the summer, and renewing it every day, the water was luke warm by mid-afternoon. They showed their

displeasure by failing to put out the new growths that they usually do around, and just after, flowering and a few seedlings even failed to make new tubers. They are now in their new quarters in a greenhouse, still in trays kept wet with rainwater with light shading, but close up to the glass. Temperatures can fall to 40F before the heating cuts in and temperatures seldom exceed 80F. They are showing their pleasure by growing vigorously and throwing lots of spikes, albeit small ones in most cases as they did not make big plants last year for the reasons given above.

With regard to potting materials, about half are in sphagnum with the rest in a mixture of 50% sharp granite sand or Perlite and 50% peat with the fines sieved out, to which I add Dithane powder as a fungicide. This addition of fungicide is something I have done ever since I started, as so many people had told me of their experiences of plants rotting. That is the only rationale and I have not dared leave it out. Whether or not it is necessary I am not in a position to say. I have been fortunate in having few plants succumb in this way any way but, if anything, my impression is that those in the moss are doing best - rooting is really vigorous and the foliage is very healthy.

Just a few words about water quality and fertilising. I never use tap water. Ours on the South Coast comes from the chalk and has a pH of nearly 8 and a very high level of dissolved minerals, not something Disas experience in their native habitat of bog or streamside. A grower just thirty miles North of here says he uses tap water all the time, but his water comes from the Ashdown Forest watershed and is acidic and has few dissolved solids, so maybe that is how he can get away with it. Nor do I fertilise, yet! I have been tempted and may experiment this year, now that the plants are bulking up in their new home.

But I find it is very interesting to note that the sphagnum, and the peat mixture, both seem to offer the plants breakdown products. The rainwater that goes into the pots reads about 70 on my meter, yet the run-off, out of the pots, often reads as high as 250. So their roots are obviously getting some extra minerals from the breakdown of the potting medium. What I do not know however is the nature of these products - yet. I am assuming they are helpful.

In the quest for bigger, more vigorous plants I always try to repot quite soon after flowering, say in July or August. Leave it too late and the growths are too advanced and easily broken. The trouble is this is often a hot period and, with holidays, a time when the plants have to look after themselves for a while. This last year, I had no time to repot and they just had to get on with it in their old compost until I was ready, which was January. Some I did not bother with and left them to grow on and hopefully flower to be repotted at the correct time this year. Others I took the risk with. If they looked as if they needed it or were too tightly clumped, I had a go at dividing them. It is not something I wish to repeat, as it was so tricky with so many small and brittle stolons running round the inside of the pots. The repotted and divided plants are doing well, but I lost a lot of potential divisions in the process.

For growers looking to try Disas for the first time, the decision is probably one of "Do I try the species or hybrids, and if so which one?" The range of species which is available here is limited anyway and comprises **D.uniflora**, in a wide range of colour from yellow (rare) through orange to red, **tripetaloides** in white or pink, **aurata** (yellow) and, occasionally **cardinalis** (red). In my experience none of these are as easy as the hybrids, although **D.uniflora** and **tripetaloides/aurata** are reasonably amenable. For starters I would go for the

line bred hybrids based on **D.uniflora** such as **D.Veitchii**, **Diores** or **Foam** or for the smaller growing tripetaloides hybrids such as **Kewensis** or **Auratkeu**. These hybrids have been made in order to increase the flower size or number of flowers open at one time, as well as intensifying colour and could justify an article on its own. For the moment that will have to do. I hope that some readers will be tempted to have a go. The number of growers in Britain is fairly small at the moment and it would be good to have others try different ways of growing and, who knows, we may learn more from each other how best to grow these beautiful plants.

John Davison, West Sussex.

THEN AND NOW

During the last forty years many things in the pleione world have changed but some things have remained the same.

In some old notes I came across the names of varieties I did not recognise and wondered how valid the names are or were. **Humilis pulchella**, **hookeriana brachyglossa**, **praecox tenera** and **birmanica** to name just a few of the fifteen species and clones listed. No doubt some of them have had their names corrected and we would know them still. A further four were mentioned, **hui**, **mairei**, **laotica** and **diantha** but it was thought that these had not been grown in Europe. One that particularly caught my attention was **P.reichenbachia** reputed to have a pseudobulb $2\frac{1}{2}$ " tall and to be slightly waisted. Something that made it of special interest was that it flowered in mid winter and needed heat. Flowers

2½" across with lilac rose sepals and petals and they were suffused with purple. The lip being almost white and marked with purple.

When it comes to compost, the requirement was the same and a free draining mix was called for. The recommended mix was, equal parts of leaf soil, peat, coarse sand, loam, old cow manure and chopped moss. The types of peat and moss are not specified and I guess the leaf soil to be leaf mold.

A number of years ago I carried out some compost experiments. I tried to keep everything uniform in the hope that any differences that showed up would be valid information. 3½" pots, all the same make and colour (black) were chosen. Into each pot was placed one flowering size bulb, two one year off flowering and two bulbils. Ten different composts were mixed. One was just mulching bark another just composted bark. The remainder were made up in all different combinations from the following: composted bark, mulching bark, sphagnum moss, peat, chopped oak and beech leaves, Perlite and coarse grit. The pots were regularly moved around so that they all had the same opportunity to develop and they were all fed and watered the same time as each other without regard to whether they needed watering or not. At the end of the growing season a friend and myself were prepared for the big day when great things would be learned about the choice of compost. Each pot was tipped out. The roots were inspected and the bulbs were cleaned and placed in small separate groups with the identity of the compost they were grown in. When all were cleaned and ready for inspection the results were heartening or disappointing (depends how you view them) as all the bulbs looked identical. The bulbils had grown larger and the other bulbs were flowering size.

I have also grown pleiones in pots filled with lumps of Oasis. The pots were stood in half an inch of water all the growing season and the plants grew well. It was necessary to top dress the Oasis with grit or fine charcoal to prevent

aphids making their home on the pleione roots. Growing in this very open material allowed the roots to be seen in the spaces between the pieces of Oasis. The roots were very succulent and were covered in fine hairs. Pleiones grown in moss raked from the grass grew and flowered perfectly well and have stood several winters outside unharmed. Pleiones grown in wood shavings and Perlite performed well but needed more nitrogen to compensate for the shavings decomposing. I've also seen them grown and flowered in 1" cubes of rock wool which were stood in shallow water. Although roots only $\frac{1}{2}$ " or so long were produced they were very sturdy roots and new pseudobulbs with flower buds on them were produced.

I conclude from all this that it is unimportant what you grow pleiones in provided you become familiar with how to water the compost chosen. I fear that many of us did not realise this in spring 96 and watered too much too soon not allowing for the lack of root growth owing to the poor light levels. I lost a great many pseudobulbs as did many people I have met and talked with. Just two or three people said they had had their best season ever but unfortunately I have been unable to persuade them to write a piece for the report.

Peter Bradbury Buckinghamshire.

REPOTTING OPHRYS

High summer is the time to repot ophrys, or bee orchid collection, while the plants are fully dormant underground avoiding the potentially hot and dry weather conditions which would be unsuitable for growth. For me, and I suspect

other enthusiasts, this is a time of great excitement which is, in its own way, as pleasurable as flowering time. The utter satisfaction of knocking out pot after pot each containing a good-sized tuber is hard to beat, of course, conversely, the misery of finding that plants have been lost hits very hard at this time too. The foundations of the year's growth are laid during repotting and while it is always tempting to get the job done as quickly as possible, it is worth investing time and effort to try and ensure that healthy and strong plants develop.

It is surprising in many ways that ophrys will grow in quite a range of soil types provided that they are nutrient-poor and suitable for symbiotic fungi, and yet we growers devote hours to finding "the right compost" and become compulsive experimenters. The mix in use at Kew at the moment is,

- 3 parts sharp grit
- 2 parts loam
- 1 part leafmould
- 1 part fine orchid bark

although it must be understood that if it does not feel right, then the proportions of each ingredient will be changed until it does. The quality of the loam is the most variable of the mix. It is bought-in from sites in the Thames Valley and, as you would expect, it is often very silty and fine to the point of being dusty. If the loam is a little more clayey then less will be used in the mix or alternatively, more grit is added to maintain an open airy structure. The two organic components contribute to the openness of the structure and also serve as a food supply for the fungi with which the bee orchids grow. We find the mix ideal for growing ophrys in plastic half-pans with a minimum diameter of five and a half inches. If clay pots were being used then a more moisture retentive mix would be required since their sides traspire water unless they

are plunged however we tend not to plunge ophrys as we wish to keep fungal cultures separate and plunging might result in fungi moving its way to the bottom of the pot and this is exactly the reverse of what is wanted. Using the mix damp causes the loam to wash downwards a little leaving proportionately more grit at the surface which is ideal. One third of the compost from the old pot is placed around the tubers when repotting to ensure that fungi are present in sufficient quantity in the new pot.

Frequency of watering is dependant upon the mix used and other aspects such as the weather and the pot size and the material. In our experience, fungi benefit from stability of the soil moisture and excessive wetting and drying is not good for them. This is why we use large pans in proportion to the size of the tubers. Those who grow tropical epiphytic orchids find this particularly difficult to grasp as underpotting is the norm with their plants.

The time spent in repotting provides an opportunity to muse upon the performance of the plants over the past year and to marvel at how little we understand them. At Kew we have tuber records going back ten years now and can chart the sizes and numbers of new tubers over that period. Why some clones consistantly increase in size, others diminish and others periodically produce several small new tubers remains something of a mystery and suggests new avenues of research. Small wonder then, that the long task of repotting the ophrys collection has a fascination all of its own

Sandra Bell RBG Kew

A NEW NURSERY FOR KEW'S ORCHIDS

Those readers who have visited the orchid collection at Kew in recent years will be aware that the glasshouses on Lower Nursery had reached the end of their lifespans and that their dilapidated condition was giving us great concern because it was having a detrimental effect on the plants inside them. At last I am able to report that funding has been secured to demolish the old houses and rebuild anew on the same site.

The old nursery was built piecemeal beginning with a range of teak houses which were installed in 1964 for bedding plants. Aluminium houses were added in 1978 and followed by the prototype for Kew's prestigious tropical display house, the Princess of Wales Conservatory, in which the various new technology to be used was tested prior to the showhouse being built. The glasshouse which housed the terrestrial orchids and pleiones was the most recent dating from only 1983 and, although it could have been retained for another few years, it would have been uneconomical to leave it and build new houses around it so it was decided to demolish it with all the others. During the Orchid Festival this year the mammoth task of moving the orchid collection, and all the other tropical reserve collections to alternative accommodation began and continues at the time of writing. We expect to complete it by the end of May. Although all the plants are still at Kew, they are spread amongst several nursery sites in the Gardens and while this is not a situation which we enjoy, it is certainly one which we will happily tolerate for the sake of the improvements it will bring.

The new nursery has been planned in collaboration with the Agricultural Development and Advisory Service and promises to be very exciting. While it will house other tropical collections, their arrangement will be much more efficient than is presently the case. At the moment orchid houses are spread over the

nursery but in the new building all the houses will be together. We will have the advantage of properly cooled environments for those species coming from high altitudes and intolerant of high temperatures. We should also have a lot more space for future expansion of the collection. A year or so of less than convenient accomodation is a small price to pay for such benefits.

Unfortunately, while the nursery is being rebuilt, our normal routine of guided visits for orchid enthusiasts has had to be suspended as the cramped conditions under which the collection is being kept make it difficult for groups to be shown around safely. Many of you will be aware that the Terrestrial Orchid Study Day which is usually held at Kew each March had to be cancelled this year for this reason. Although we will not have moved into the new nursery by next March we intend to run the Study Day in 1998 as we hate to disappoint so many regular supporters and we enjoy the day ourselves. If any readers have requests for lectures for next year's day then please do contact me at Kew and let me know.

Sandra Bell RBG Kew

ROUNDUP

I hope you have all enjoyed reading this year's report and that you have found something to increase your knowlege. Many thanks to all the people who have so generously contributed articles and have shared their experiences with us. If you haven't yet contributed to the report, please consider writing a piece for 1998. Experience in writing is not necessary. What you say to one another you can write down to share. No reader participation = **NO REPORT.** **P.B.**

