

ASSOCIATION of

# *S.G.A.P. Fern Study Group*

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## **GROUP REPORTS & FORTH COMING EVENTS**

### **Programme For Sydney Meetings**

**June Meeting 11 am Sunday 20<sup>th</sup>** at the home of Ian & Tamara Cox, Ivy Place, Kenthurst. The topic for discussion is Colysis & Microsorium - how do you tell them apart? We should also take the opportunity to look around their excellent garden of both ferns & other natives.

**July is the "Fern Gully Day" Meet 10. 30 am Saturday 17<sup>th</sup>** at the Waterfall Picnic area opposite Chimney Cottage, Mt Wilson. We have issued an invitation (see Native Plants – April 2004) to the rest of the Native Plant Society members to join us on this very ferny walk. There are steps down the moderate descent and ascent on this circular walk. Bring winter woollies, wear sensible walking shoes plus packed lunch & refreshments. **see page 2 for further details.**

**August Meeting 11 am Sunday 15<sup>th</sup>** at the home of Betty Rymer, 48 Annangrove Road, Kenthurst. The topic for discussion is Drynariaceae. Betty's bush block style of garden is also well worth a tour.

**September Meeting 11 am Saturday 18<sup>th</sup>** at the home of Graham & Dot Camp, (RMB 6154) Toomeys Road, Mt Elliot – See Map – if lost phone (02) 43676368. Its about four years since our last visit, it will be interesting to see how their plantings have fared, particularly through last summer and autumn drought. No study just a good day out and easy walking around the property. The steep track down to the creek is too overgrown to be enjoyable

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### **Programme For Sth East Qld**

**Sunday 6th June Meet 9.30 a.m.** at Merle and Geoff Goadbys home 123 Haven Road Pullenvale Topic Ferns of Tasmania

**Sunday 4th July meet 9.30 a.m** at the Car park of the Knoll Nat. Park Mt Tamborine U.B.D. Reference Gold Coast Map 13 K.8

**Sunday 1st August meet** at Home of Ian Inglis 59 Elizabeth St. Nambour U.B.D. Sunshine Coast Map 66 C2 Study Athyriaceae

**Friday 10th September meet 1p.m.** at Mt Cootha Botanic Gardens Auditorium to set up Fern Study Display for the Spring Flower Show.

**N.B. For all enquires regarding Fern Study in Sth East Qld Contact Peter Bostock Phone (H) 07 3202 6983 (W) 07 3896 9508**



## SYDNEY FERN GULLY DAY, 2004

RON WILKINS

**Saturday 17<sup>th</sup> July is Fern Gully Day.** The members of the ASGAP Fern Study Group would like to invite Sydney members of the Australian Plants Society (no outsiders please because of accident insurance concerns) to join us for a conducted walk through a fine example of a ferny place in the Blue Mountains at Mount Wilson. Most APS members probably do not often have the opportunity to enjoy such a walk in the company of fern enthusiasts. Fern gullies are just about the ultimate in peaceful places, if you don't mind the occasional leech!

The Waterfall Walk is a loop trail of about 1 hour duration with some ascending and descending steps. It gives us the opportunity to make the acquaintance of a wide variety of local native ferns. To reach the point of departure for the walk, take the Bells Line of Road to Mount Wilson, turn right at the end of the road through the township (most traffic goes left) and follow the road to the picnic area on the left, opposite Chimney Cottage.

We plan to meet at 10.30am and do the walk in small groups before lunch. Please wear sensible shoes and bring a picnic lunch and water. For those who have an insatiable appetite for more ferns, we can visit the nearby Cathedral of Ferns (*Dicksonia* forest) in the afternoon. On a previous Fern Gully Day, the organisation was severely stressed due to too many participants. To enable us to properly cope with all who may be interested we ask that you record your intention to participate by telephoning the Secretary of the Fern Study Group, Ron Wilkins (9876 1948) or contacting him by email at the address [ronwtwilkins@hotmail.com](mailto:ronwtwilkins@hotmail.com) (He will be more difficult to contact between 28 April and 11 June so for preference record your interest before or after this period).

If you love ferny places, or even if you find these ancient plants intriguing and want to learn about how they are classified, reproduce or how to grow them from spore, you will enjoy this small excursion. We hope to see you in the fern gully on July 17<sup>th</sup>.

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## Outing to the Gibraltar Range and Washpool National Parks

compiled by Claire Shackel

On the Friday night of the Anzac long weekend, contingents from Queensland and New South Wales fern study group meet in Glen Innes.

Saturday morning was cool and clear and the party of thirteen Queenslanders and five New South Wales members headed for the Gibraltar Range national park. After morning tea at Mulligans hut, the majority of the party set off on the World Heritage walk with the idea of visiting the Tree Fern Forest.

Initially the walk was through dry forest where a *Banksia spinulosa* type plant with cream flowers and black styles was a novelty to Qld members. Growing under the skirts of a group of grass tree were *Davallia pyxidata*, *Asplenium polyodon* and *Platynerium bifurcatum*. The terrestrial ferns of this area were *Calochlaena dubia*, *Cyathea australis*, *Gleichenia dicarpa*, *Hypolepis glandulifera*, *Lindsaea linearis*, *Sticherus flabellatus* and *S. lobatus*. As the track descended into Richardson's creek the environment became wetter with a rainforest canopy overhead. The rest of the ferns for this walk (track A) were observed around this location. Of particular interest was the *Crepidomanes* found growing on a *Cyathea australis* trunk that was leaning over the stream. Time ran out so the party returned to Mulligans hut for lunch.

The more active members of the group set out again after lunch along the track to Dandahra falls. Again the track was through dry forest and *Selaginella uliginosa* was found. As the track rose out of the valley the environment changed to wet forest and *Diplazium assimile* and *Arthropteris tenella* were seen as well as many ferns observed during the morning (track B). *Psilotum nudum* grew out of a tree fern trunk.

On the homeward trip the party visited Raspberry Lookout. There were few ferns but the wonderful view over the Clarence/Mann River basin was admired. *Hypolepis rugosula* had been seen at the Lookout by Calder Chaffey some years before, but was not recorded this time.

Sunday was again a beautiful day and the group headed for the Washpool area. Morning tea was at the Coachwood picnic area and the Coombadjha track started at the top of the ridge and descended

## Outing to the Gibraltar Range and Washpool National Parks Cont.

through coachwood forest with few understorey plants i.e. no ferns. There were large Banksia trees that had their cones high up in the canopy. The track dropped down into Coombadjha creek. This was a lovely clear fast flowing stream with a wonderful array of ferns in and beside it (walk C). *Grammitis billardierei* was common among the moss on the rocks and tree trunks while *Hymenophyllum cupressiforme* was quite uncommon. *Asplenium flaccidum* grew on moss covered tree trunks high above the water. The only *Adiantums* seen all weekend were two small plants of *A. silvaticum*.

After lunch a drive up Moogem Road to a locked gate yielded *Lycopodium deuterodensum* growing among a tangle of plants on the creek bank. On the return trip a roadside cutting was investigated but no new ferns were found (site D).

Granite Lookout was on a high, very dry harsh granite outcrop that had been burnt not too long ago. *Schizaea bifida* and *Lindsaea microphylla* grew among the stubble and *D. pyxidata* was surviving under a large rock (site E). A few flower spikes of *Pterostylis daintreana* were also seen in shallow soil on the granite.

Tin Ore Creek fire trail was the last stop on the way home. This ran beside a swampy area where a few Christmas bells were flowering. *L. deuterodensum* was common around one creek crossing. This ended our fern discoveries for the weekend (road F)

On Monday, after packing up, the group visited Mole River wholesale nursery 40k west of Tenterfield. This is situated in dry harsh country but grows many interesting native flowering plants.

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### REPORT ON THE COOLOOLABIN FOREST ON 7<sup>TH</sup> MARCH

Compiled by Claire Shackel

This was our third attempt to visit the area. The weather in South East Queensland was very wet and wild on Friday and Friday night. As the Weather Bureau forecast, Saturday dawned bright and sunny and gave the creeks time to subside. Sunday was overcast but fine and a party of eleven members and a visitor/guide met for morning tea before moving to the Browns Creek Road, side of Cooloolabin Forest. The party followed a clay based, very wet, washed out vehicle track down to the first creek crossing.

Initially we walked through open forest with a grass/heath understorey, where *Calochlaena dubia*, *Pteridium esculentum* and *Cheilanthes tenuifolia* (not common around Brisbane) grew. The vegetation changed abruptly to Rainforest as we approached the valley floor. *Adiantum silvaticum*, *Blechnum cartilagineum*, *Christella dentata*, *Cyathea cooperi*, *C. leichhardtiana*, *Doodia aspera*, *D. heterophylla*, *Hypolepis muelleri*, *Lastreopsis marginans* and one plant of *Adiantum hispidulum* var. *hypoglaucum*, and one of *A. hispidulum* var. *hispidulum/whitei* were seen in the area. After crossing over two branches of the creek, the valley rose steeply back to a Casurina forest and *Drynaria rigidula* covered the exposed rock faces and *Cheilanthes sieberi* was among the grass.

For lunch the party drove up the Cooloolabin Creek Road to the other end of the forestry track we had followed in the morning. Initially our afternoon walk was through open forest with shrubby understorey. *Blechnum cartilagineum*, *Calochlaena dubia*, *Hypolepis muelleri* and *Pteridium esculentum* were present as well as *Nephrolepis cordifolia* and *Microsorium grossum* growing among garden rubbish i.e. probably not native to the area.

The track took us across the wasteland under high voltage power lines where a gem of an area containing *Dicranopteris linearis* var. *linearis*, *Cheilanthes tenuifolia*, *Lindsaea ensifolia* subsp. *ensifolia*, *L. linearis* and *Gleichenia dicarpa* was discovered. The track descended steeply into another branch of the creek and after some wet feet, *Sticherus flabellatus* was confirmed on the other bank. Another lonely *Adiantum hispidulum* was found on the return walk.

Also of interest were the ferns we did not see. There appeared to be a complete absence of any epiphytes or climbing ferns and *Adiantums* were in short supply. The area had been logged but there appeared to be suitable habitats for non-terrestrial ferns. [3]

FERN SPECIES	A	B	C	D	E	F
<i>Adiantum silvaticum</i>			X			
<i>Arthropteris tenella</i>		X	X			
<i>Asplenium australasicum</i>	X	X	X			
<i>Asplenium flabellifolium</i>	X		X			
<i>Asplenium flaccidum</i> subsp. <i>flaccidum</i>			X			
<i>Asplenium polyodon</i>	X	X				
<i>Blechnum cartilagineum</i>	X	X	X	X		
<i>Blechnum nudum</i>	X		X	X		
<i>Blechnum patersonii</i>	X	X	X			
<i>Blechnum wattsi</i>	X	X	X	X		
<i>Calochlaena dubia</i>	X	X	X	X		
<i>Christella parasitica</i>	X					
<i>Crepidomanes venosum</i>	X					
<i>Cyathea australis</i>	X	X	X	X		
<i>Cyathea leichhardtiana</i>	X	X	X	X		
<i>Davallia pyxidata</i>	X	X	X		X	
<i>Deparia petersenii</i> subsp. <i>congrua</i>	X					
<i>Dicksonia antarctica</i>	X					
<i>Dictymia brownii</i>	X	X	X			
<i>Diplazium assimile</i>		X				
<i>Diplazium australe</i>	X					
<i>Doodia aspera</i>	X	X				
<i>Gleichenia dicarpa</i>	X	X	X			X
<i>Grammitis billardierei</i>			X			
<i>Histiopteris incisa</i>	X		X	X		
<i>Hypolepis glandulifera</i>	X					
<i>Hymenophyllum cupressiforme</i>			X			
<i>Lastreopsis decomposita</i>	X	X				
<i>Lastreopsis microsora</i> subsp. <i>microsora</i>	X	X	X			
<i>Lindsaea linearis</i>	X	X				
<i>Lindsaea microphylla</i>			X		X	X
<i>Lycopodium deuterodensum</i>				X		X
<i>Microsorium scandens</i>	X	X	X			
<i>Pellaea nana</i>	X		X			
<i>Platycterium bifurcatum</i>	X	X	X			
<i>Psilotum nudum</i>		X				
<i>Pteridium esculentum</i>	X	X	X		X	
<i>Pyrrosia confluens</i> var. <i>confluens</i>		X				
<i>Pyrrosia rupestris</i>	X	X	X			
<i>Schizaea bifida</i>					X	X
<i>Selaginella uliginosa</i>	X	X				
<i>Sticherus flabellatus</i> var. <i>flabellatus</i>	X		X			
<i>Sticherus lobatus</i>	X		X	X		
<i>Todea barbara</i>	X		X			

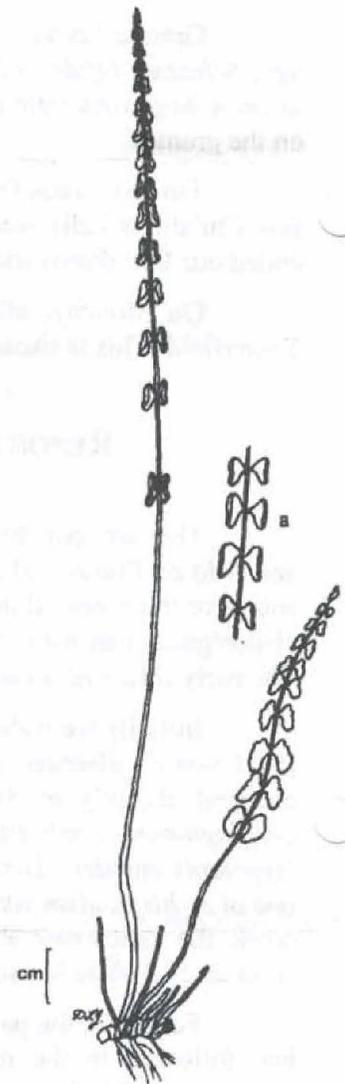


Fig 210 LINDSAEA LINEARIS XI  
a) Broad fertile pinnae x1

A - Fern Tree walk B - Dandahra Falls track C - Coombadjha Creek

D - Moogem Road E - Granite Lookout F - Tin Ore Creek fire trail

Fig. 210 Jones & Clemesha Australian Ferns & Fern Allies (1980)

## SYDNEY GROUP VISITS THE GOADBYS

The Sydney group enjoyed a very pleasant outing to Anne and Geoffrey Long's property near Kiama on the 17th April. The Longs warmly received about 10 members and we broke into two groups, one lead by Geoff taking steep trails through their private Illawarra rainforest wet sclerophyll forest, and the other lead by Anne into dangerously leechy country across a creek and along flatter ground. Much blood was shed by one of the members of the latter party in the cause of fern study, but Geoff's bandaging skills saved the day. Most of the ferns and trees on the property have been identified and listed so that we were able to relate variations in the fern flora to their well-studied habitat. Afternoon tea was a good demonstration of why some refer to the group as the Gourmet Fern Club!

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### BICHENO NURSERY

RON WILKINS

Michael Garrett is well known to all of us through his book on Tasmanian Ferns. In February I had the opportunity to visit his fern propagation nursery at Bicheno on the mid east coast of Tasmania. The nursery is a major supplier of ferns to the mainland wholesale plant nursery trade. What I found most interesting is the contrast between the methods usually recommended for amateur small-scale propagation from spore, and the methods Michael uses for full-scale commercial production.

Except for *Asplenium bulbiferum* which is propagated from bulbils, all of more than 50 ferns on the current list have been propagated from spore. About half are Australian natives including a few uncommon ferns such as *Cyathea australis norfolkiensis*. Propagation is carried out in long poly-tunnel greenhouses with large benches serviced by two aisles. In the first, trays sown rather thickly with spore on a pure peat moss medium are brought to the prothallus stage. Michael finds that under greenhouse conditions better results and fewer contaminations are observed if the spores are sown rather thickly. Indeed it is with lightly sown trays that contaminations occur. Thus in trays where germination has occurred, they are completely covered with prothalli, a crowded situation which seems to invite fungal attack in sealed pots used by amateurs, but is quite the reverse under the conditions used in this nursery.

The polythene covering allows strong diffuse light to bathe the ferns. In summer the temperature is uncomfortably high during the day in the tunnels so that much work such as sowing is done in the evening. The effect of high temperature is counteracted by high humidity from water sprays. Liquid fertiliser is applied at full diluted strength even from the prothallus stage. At the young sporeling stage, plugs of prothalli are placed on a mixture of peat moss and small (5 mm diam) polystyrene balls in shallow tubes in trays of 64. The polystyrene balls assist drainage in the same fashion as coarse river sand recommended in amateur propagation methods. The polystyrene - peat moss mixture has a lower density and this cuts the cost of air freight to distant destinations.

From the young sporeling stage the tube trays, which contain perhaps a dozen plants per tube, are moved through the sequence of poly-tunnels. The *Cyathea*s are an exception; only one plant is grown in each tube. As the plants increase in size they are progressively hardened off by making the growing conditions more severe. The ferns are sold in cartons containing six trays.

The quality of the ferns ready for sale is excellent. I took home several tube plants of the New Zealand fern *Cyathea medullaris* (minus the tubes) in a plastic bag and they survived four days in perfect condition. Tube fern lists for wholesale quantities can be obtained from the Bicheno Nursery, PO Box 43, Bicheno, Tasmania 7215.

As each tube contains many small plants it is possible that a group of enthusiasts could share the cost of a carton and pot up the many hundreds of small plants for distribution or sale.

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Fig 1. The master fern-propagator with hundreds of thousands of small ferns in one of his poly-tunnel greenhouses at Bicheno, Tasmania

The application of the term "deciduous" takes on a different emphasis depending on whether one is a gardener, a botanist or a lexicographer. As mentioned in an earlier article by Dr. Wagner, deciduous may take on different meanings by different botanists as well. I would like to present the gardener's point of view.

Anyone who has dealt with the gardening public knows one of the fundamental questions asked by the gardener is, "is it evergreen or deciduous?" The gardener is primarily interested in knowing if the plant is evergreen or will it "die down" on a seasonal basis. Of less immediate concern is how the "die down" will occur, that is, will it be shed by an abscission layer or wither in place. Gardeners want to know if there will be a gap in the planting bed at a particular time of the year. Most gardeners become concerned about foliage decline at clean-up time. Does the clean-up require cutting of each withered leaf to remove it or does it require only a rake?

If one wishes to narrow the dictionary definition of deciduous to make the meaning more precise as Dr. Wagner proposes, one can pick the words "fall", or "shed" to emphasize, or the words "seasonal" or "annual". Both sets of words are used by lexicographers in their definitions. Some dictionaries will add, "as opposed to "evergreen" or "perishing after a seasonal life" which in my mind tilts the meaning toward emphasizing "seasonal or annual", the gardener's choice. If the meaning of deciduous becomes limited to mean shedding by an abscission layer then what objection is there in saying the foliage is "jointed" or "abscised" instead? These terms are already in use and understood by the vast majority of botanists.

Deciduous could then be retained as a word which opposes evergreen.

The use of wintergreen instead of evergreen is again an introduction of another term. How is it better than evergreen? Could wintergreen imply that it is not summer green? If one thinks of winter in terms of certain months instead of a season with short days, it then becomes confusing when wintergreen is used to describe a fern from the southern hemisphere. One could imagine a discussion of various other issues such as "evergreens" not really being evergreen (as applied to individual leaves), or the precise meanings of dormancy and rest periods, but these are not particularly pertinent to this discussion.

The usage of marcescent may describe ferns in a given geographical area, but outside that area may be inaccurate. Admittedly some ferns seem to be obligate deciduous and marcescent wherever they grow, but many have their behaviour governed by climatic factors. In one climate they may be promptly deciduous or marcescent and in another climate they may be sub-marcescent or even essentially evergreen. Precise usage may require more explanation than we would like.

In summary, I propose we emphasize the seasonal or annual part of the dictionary's definition, which is to say deciduous, is the seasonal perishing of the foliage as opposed to evergreen. The term abscising (Jointed) and marcescent may then be used to describe how the foliage declines. This is the least disruptive change, maintains the popular understanding of deciduous, provides evergreen with an opposition term, and still maintains acceptable precision.

marcescent = withering but not falling off

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### **TASSEL FERNS -**

by Ron Robbins Vic. Fern Society Newsletter Vol 26 No.2 March/April 2004

Whatever we know these ferns as, they are a remarkable and attractive species, one of the fern allies, as we know them, dating back to the carboniferous age of approximately 350 million years plus.

There was no documentation on these ferns then and I'm afraid not much more today, references are very limited on this subject, one

### **LYCOPODIUMS - HUPERZIAS**

finds that most information today results from word of mouth, hand downs, the propagators, or from inquisitive people prepared to delve into the complexities that Mother Nature has bestowed upon us. Basically, I feel that this perhaps has stifled the interest in this unique group of ferns.

Tassel ferns are epiphytic, grown on trees and in platycerium pads, or as a lithophyte on rocks,

**TASSEL FERNS -LYCOPODIUMS – cont.** totally independent and not parasitic. They can in nature grow to be very large and pendulous, becoming an object of beauty seen in its natural habitat, this being usually in rainforest locations.

They are becoming increasingly rare in Australia, probably overseas as well, caused mainly by logging in rainforest areas, man's greed to obtain and profit by them, regulations that make it virtually impossible to collect from their natural habitat, therefore making us reliant on the dwindling number of propagators of today, to own one.

As previously mentioned, tassel ferns are epiphytic or lithophytic, and according to literature they are seldom, if ever, grown from spore, this therefore raises a big question. Years ago colonies of these ferns were found in different areas some distances from each other, so if, as we are told, that they do not germinate from spore, the question being raised is how do these colonies form, is it from natural propagation, i.e. from spores that are shed and settle on a suitable surface, or are they transported by castings, or are the fertile spikes eaten and deposited, both by birds? Interesting.

Contrary to what has been documented in publications by various authors, regarding propagation from spore being nigh on impossible, I have been told by "old time" growers that they can, so who or what do we believe, what we read or what someone knows to be fact.

The terminology for tassel ferns differs slightly from other species they have leaves, stems, and strobilus or tassel, and quite often referred to as plants. On the lighter side a grower once referred to them "as sticks with leaves"!

Reading references from our books tell us that we can propagate from cuttings, here is where controversy and misinformation is belied, the interpretation by a layman would be the selection of what appears to be an appropriate stem, such as taken from a fuchsia or similar, cutting off the required piece and planting the same in his own potting mix hopefully to take root, and eventually potting on. This is what I would interpret a layman would assume as a procedure for the removal of a cutting. If we do as I have described, what one would eventually get is a stem or tip in a pot that appeared to be growing. In actual fact one would have a stem that did not make roots, but a stem that was slowly developing a jellified gunk at its base and very slowly dying.

A procedure that does give results is where we can take a "cutting" or an appropriate section of the stem that terminates with stroboli or tassels, laying it horizontally on a propagating mixture or coarse

sand, after a period of time this may produce lateral growths that eventually become separate plantlets. It must be emphasized however, that experienced propagators can tell which stem and when they can be layered, at times one will find that small plantlets will grow on tassel ends. These can be treated as above, eventually taking root and forming new ferns.

Another method of stem propagation is technique whereby taking an apical section that has turned at an angle likened to a bent elbow", and having a minute root, this can be pegged to the surface, and given time could take root and become another fern, if this happens I would suggest one leaves it to become self supporting from parent plant prior to potting on.

Tassel ferns will not survive in soil they must be grown in a coarse well-drained epiphyte mix that at the same time retains moisture. This coarse mix will ensure that the fine roots of this fern have a free run allowing them to cling to the surfaces of the open mix thus giving enough aeration around their roots for successful growing.

Materials for the mix could be from tree fern fibre - chunky pine bark - charcoal -styrene foam - elk peat - peat moss - all suitable, to be mixed to your individual requirements.

These ferns can be tolerant of heat, cold (but not frosts), damp and dry conditions, therefore making them a quite versatile fern for the enthusiast. They evidently can survive the temperature range of 3<sup>c</sup> - 38<sup>c</sup> aspect in growing these ferns appears to be air circulation, this is a must. Too much water can cause root rot to develop, also a dying off at the base of the stems, therefore one must calculate the amount of moisture that they require to simulate their natural requirements and conditions.

Fertilizing appears to be essential, it would seem that an ideal frequency could be every two to three weeks during their growing period, but not during their dormancy, through the winter.

Tassel ferns as a group have simple leaves termed microphylls, which may be born in whorls, or in a spiral pattern on the stem. The sporangia are modified and consist of a simple shaped sac, which contain the spores, all of which are a single type.

Each sporangium is borne singularly and is subtended by a special leaf termed sporophyll. The sporophylls may be borne on non-specialized parts of a stem, or grouped in cones

## **TASSEL FERNS -LYCOPODIUMS – cont.**

or tassels, called stroboli. These may be simple or dichotomously branched. Roots can be of interest also, as they descend through the cortex of the stem for some distance before emerging.

Controversy is rampant, due to growers with whom I have made contact, being adamant that their potting mix is the best one to use. I have found that what suits conditions in one area, does not suit the climatic conditions of another, therefore trial and error until you find the best mix that suits your requirements and climatic conditions.

All of this may appear to some to be one hell of a drag, why bother, but at least we can try

to gain some satisfaction in the creative side of things, be it a recipe, dress design, or another way of growing vegetables. We can only persevere to achieve what we believe in.

We owe it to ourselves to succeed in our efforts to propagate ferns, particularly tassels, because once the rainforests and natural habitats of this fern are denuded, hopefully never, by man or nature, no more tassels or epiphytes. Then it will be too late. I sincerely hope this article is self-explanatory enough to induce someone somewhere to receive the same sense of achievement that I have experienced by coming into contact with this special fern.

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## **GROWING TIPS FOR FERN LOVERS**

By Peter Wilkins

**Vic. Fern Society Newsletter Vol 26 No.3 MAY/JUNE 2004**

As most of us are not blessed with a tropical climate, I would like to share with you some experiences I have had in trying to grow delicate ferns, either from plants or spores:

- ◆ Plant with hessian.
- ◆ Do not bring in new plants from tropical areas after February.
- ◆ This will give them a chance to acclimatise.
- ◆ If you are growing spores like *Platyserium*: Do not plant the sporelings out too small. Let them set two pairs of leaves first.
- ◆ Keep sporelings in a warm area and let them get some filtered sunlight.
- ◆ Also use the same soil mix you sowed the spores in. Do not make use of manure for the first transplant.
- ◆ Give sporelings regular feeds with a mild solution of organic fertiliser.
- ◆ Before winter you should give a good feed and during winter on warmer days you can carry on feeding. This keeps plants strong.
- ◆ When transplanting plants or sporelings, do not go to a too bigger pot. I found that from tubes the next best size is a **50 mm pot**.
- ◆ Remember that small pots dry out quickly.

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## **WATER REPELLENCE IN POTTING MIXES**

**Vic. Fern Society Newsletter Vol 26 No.2 March/April 2004**

Peats, barks and sawdust's used in potting mixes are hard to wet, and even harder to re-wet once they have dried out in pots.

Initial wetting is improved enormously by the use of wetting agents as indicated below. These are added via the water normally added to bring mix materials to potting water content. The agitation of mixing ensures rapid wetting of even the driest of particles.

The best wetting agents are effective for at least 3 months and possibly up to 12 months in some situations.

A nurseryman can really have a problem if highly organic mix which had not been treated

with wetting agent dries out in a pot. Water simply channels down the sides, not remaining long enough to even start the rewetting process. Mechanical agitation is difficult or impossible. The only effective way of achieving re-wetting is to stand the pots in water containing wetting agent. Leave them in the water until bubbles stop coming out of the mix and it is obviously wet right to the top.

Another aid to easier wetting is to have at least 30% sand in the mix. Of course the other way is to keep the mix moist all the time.

**Wetting agents** - Wetting agents are synthetic chemicals that allow easier spreading of water across surfaces. Common household detergents

are one type of formulation of wetting agents. However, these detergents must never be applied to turf or potting mixes. They may be toxic to plants. Laundry detergent powders contain high percentages of sodium compounds that can severely damage growing media and plants alike.

Some have very high levels of boron.

Only a couple of the many wetting agents made are suitable: some which are effective are also toxic to plants. Table 1 gives examples of the effectiveness of some commercial wetting agents.

**TABLE 1. WATER REPELLENCE**

Effect on water penetration and runoff of wetting agents applied to a water-repellent sand.

The sand was treated with the wetting agents at the rate of 5 mL/m<sup>2</sup>. Water was applied at a rate of 2.5 L/0.1m<sup>2</sup> plot for 10 Minutes (a total of 25 mm). (From McGhie, D.A. and Tipping PI Proc. Natl. Soils Conf. Aust. Soc. Soil Sci., Brisbane, 1984).

Aquasoil Wetter and Wetta Soil have been shown by Australian research to be outstandingly effective, but other recently developed products may be as good.

TREATMENT PENETRATION	TIME TO RUNOFF	RUNOFF VOLUME	
	(min)	(ml)	Depth (mm)
Water only	0.45	1342	3.1
Aquasoil wetter*	9.30	2.5	20
Wetta Soil	No runoff	nil	25
Aquagro	2.30	720	8
Terrawet 100	1.15	1205	15
Pro Am	1.00	1513	2
Nonion C04	1.15	1377	5
Gardiquat	1.00	1197	2
Detergent (domestic)	1.00	1123	5

\*Manufactured by W.A. Chemical Manufacturers Ptv Ltd. Perth. WA

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## FERTILIZERS IN SOILS AND TYPE OF FERTILIZERS

from Fern Society of Vic. Inc. Vol.26 No3 May/June 2004 which in turn is reprinted from Western Australian Fern Society March. 2001

Ferns must extract nutrients from the soil so that they can grow and reproduce. These nutrients, or elements, are present in soils in various chemical forms.

### Major elements are:

Nitrogen      Phosphorus      Potassium  
Calcium      Magnesium      Sulphur

### Minor elements are:

Iron      Manganese      Boron  
Zinc      Copper      Molybdenum  
Chlorine      Cobalt      Sodium

Healthy ferns need a balanced supply of all of the above elements. If one is in short supply, growth will be reduced or malformed. Most soils provide these elements in sufficient quantity for normal fern growth. However, they can become short, and we then have to boost the levels with fertilisers. The following summarises briefly what each of these elements does to ferns, both in normal supply and when deficient.

**Nitrogen** is necessary for vigorous growth throughout the growing season, and produces a lush greenness in the fronds. A nitrogen-deficient fern is usually stunted in growth, with uniform, pale green or yellowish-green fronds which are smaller than normal.

**Phosphorus** is for the storage and supply of energy in transpiration and photosynthesis. It is also important for root growth and reproduction. A phosphorus deficiency results in stunted plants with very dark green fronds and a reduced root system.

**Potassium** is important for the lengthening of tissues such as stipes and stems. It also is a protection agent against disease by thickening the outer cell walls of plant tissues. When in short supply, plants may show marginal patches or a border of dead tissue on the older fronds.

**Calcium** is used for cell wall construction, cell division, and protein formation. It is also very important for the development of a healthy root system. Calcium-deficient plants develop stunted, distorted fronds which die back from the tips.

**Magnesium** is vital for photosynthesis, as it is an important component of chlorophyll. Magnesium may be in short supply in acid or sandy soils. Magnesium-deficient ferns display chlorosis on the older fronds, with the main veins remaining dark green.

**Sulphur** is a necessary element in the formation of roots. Sulphur deficiency is not very

Cont. page 10

## **Fertilizers In Soils & Fertilizer Types cont.**

common; affected plants are a uniform pale green overall.

**Iron** is needed in continuous, small amounts, for the functioning of chloroplasts and in production of enzymes. It is usually abundant in soils. Ferns suffering from a lack of iron have pale green or yellow new fronds with prominent dark veins.

**Manganese** is required in small quantities for enzyme production, and also for photosynthesis. It is commonly lacking in alkaline soils rich in organic matter. Deficient ferns show curled or cupped fronds, and chlorotic patches with the veins remaining green.

Most ferns appreciate well rotted animal manures or organic fertilisers such as blood and bone. Inorganic fertilisers can be very useful for strong, vigorous ferns such as tree ferns, but they should be used with care on weak-growing ferns. Liquid fertilisers can be beneficial, especially for ferns in containers. So, too, are organic extracts.

Fertilisers should not be applied right against the active growing regions, as burning may result. The best time to apply fertilisers and/or manures is during spring or late summer, while the plants have a long growing period ahead of them.

Late applications of fertilisers or manures may interfere with the plants' dormancy, producing late growth which will reduce their ability to survive a cold winter. This, of course, is a generalisation. In Western Australia our winters can sometimes be quite mild, and ferns tend to continue to produce new growth anyway. Again, the growth of some ferns can be at its most active during winter months, especially the cooler-climate species, and these examples may be fertilised during the winter period.

### **TYPES OF FERTILISERS**

The following summary first appeared in 1995, in the Victorian Fern Society's newsletter. It was subsequently reproduced in our own newsletter in June 1996, and it also appeared in the newsletter of the San Diego Fern Society.

The type of fertiliser used depends on the fern and the growing conditions. Some fertilisers are:

**Blood and Bone** – a slow acting nitrogenous fertiliser, easily obtained and long lasting.

**Boron** is required in small amounts for cell construction in actively growing parts such as meristems and root tips. Boron is frequently lacking in calcareous soils. Boron-deficient plants may show thickened, malformed fronds

**Zinc** is of prime importance in plants for the production of growth hormones responsible for leaf and stem development and expansion. Zinc-deficient plants produce markedly shortened, malformed fronds, which may show irregular yellowish interveinal areas when young.

**Copper** is needed in small quantities for use in enzyme systems. Deficient ferns may show wilting and dieback of young fronds, and malformation.

### **Reference: Encyclopaedia of Ferns, by David Jones**

**Osmocote** - a slow-release fertiliser in pellet form which can be purchased in a type specifically for ferns. It is relatively expensive but long-lasting. Can be obtained in 3 - or 9 - month grades. Best placed in the top layer of soil and near the bottom if potted. A typical amount would be about 12 grains at top and bottom in an 8 -inch pot. The lifetime depends on the amount of watering and the temperature. If used with manure, it should definitely not be mixed in the bulk medium since the heat from the manure may cause a rapid release of nutrients from the Osmocote, burning the plant. Osmocote may burn the foliage of plants if the granules are in direct contact (eg if placed in Platyceriums).

**Nutricote** - another slow -release fertiliser in pellet form, especially formulated for ferns and palms. One application will last for up to five months.

**Aquasol** - a faster-acting liquid fertiliser. As with most liquids, it must be applied more often than a solid product. As the potassium nitrate in the original formula has or been replaced with urea, the nitrogen is not immediately accessible to the plant, so that Aquasol is not as good as formerly. Products with ammonia or urea must first have their nitrogen converted to nitrate before being accessible to the plant. This may take 2-3 weeks.

**Thrive** - nearly all urea and not as good as a nitrate fertiliser. Rather alkaline.

**Maxicrop** - an improved liquid product with nitrogen, phosphorus and potassium. May be used on its own or in a 1:1 mixture with Aquasol for hand watering every 1 to 2 months.

**Cont. page 11**

## Types of Fertilisers Cont.

**Cow manure** - can be used as a solid or applied as a liquid extract.

**Nitrosol** - another liquid nitrogenous product. Fertiliser spikes - long-lasting and effective for reviving potbound plants.

**Dynamic Lifter** - a compressed and pelletised fowl manure, shorter-lived than blood and bone. The lifetime depends upon watering frequency.

**Dynamic Lifter Plus** - as above but with extra nitrogen

**Dried chicken or horse manure** - also used by some growers.

**Ground eggshells, limestone, dolomite, gypsum** - these supply calcium and increase the pH, resulting in a more alkaline medium. This may harm acid-loving or calcium-sensitive ferns such as *Blechnum spicant*. 

### THE GARDENER'S PRAYER:

adapted from a Fern Society of Vic. Inc. Vol.26 No2 March/April article.

Lord, grant that in some way it may rain every day, say from about midnight until 3 o'clock in the morning, but you see, it must be gentle and warm so that it can soak in ...

Grant that at the same time it would not rain on the *Asplenium flabellifolium*, *Pleurosorus rutifolius*, *Cheilanthes austrotenuifolia* and the others which You in Your infinite wisdom know are drought tolerant - I will write their names on a bit of paper if you like ...

And grant that the sun may shine the whole day long, but not everywhere (not, for instance, on *Pyrossia rupestris*; *Microsorium pustulatum*; *Asplenium nidus*; *Polystichum proliferum* and *Platycterium sp.*; and not too much...

That there may be plenty of dew and little wind, enough worms, no plant-lice and snails, no mildew, and that once a week thin liquid manure (suitable for natives) may fall from heaven. **Amen!**

## SPORE BANK

CONTRIBUTED BY BARRY WHITE

All types of spore are welcome including fresher samples of ones already on the list. There is no necessity to separate the sporangia from the spore. The whole, or part, frond may also be sent in, all is acceptable. Please include date of collection and, if collected in the bush, the area. In the list, the month and year of collection is shown. The area of collection is available on request.

**ORDERING SPORE:** Spore is available free of charge from Barry White, 34 Noble Way, Sunbury. Vic. 3042  
**When ordering please include a stamped self-addressed envelope.**

### CURRENT SPORE LIST

Thanks to spore donors Claire Shackel and Nev Deeth

Arachniodes aristata 12/03	Cyathea brownii 2/04	Hypolepis rugosula 5/02
Asplenium aethiopicum 4/03	Cyathea cooperi 1/04	Lastreopsis acuminata 10/02
Blechnum articulatum 1/02	Cyathea howeana 5/02	Platycterium bifurcatum 3/03
Blechnum camfieldii 9/02	Cyathea robusta 4/02	Platycterium superbum 12/03
Blechnum fluviatile 5/03	Dennstaedtia davallioides 2/04	Polystichum australiense 2/04
Blechnum minus 5/02	Dicksonia antarctica 2/04	Polystichum fallax 4/02
Blechnum wattsii 5/02	Diplazium australe 2/04	Pteris tremula 2/04
Blechnum wattsii (bifurcated) 5/03	Doodia media 2/04	Pteris umbrosa 2/04
Christella dentata 4/04	Histiopteris incisa 5/02	Pteris vittata 3/03
	Hypolepis glandulifera 2/04	Sticherus urceolatus 5/02

### NEWSLETTER EDITOR'S THANKS

- Thanks to those who sent articles over the past 5 years. I have found the job challenging and enjoyable and it has certainly provided me with much information re. growing ferns. I wish the new newsletter editor all the best and hope you will support them - including constructive feedback. **Mike Healy**

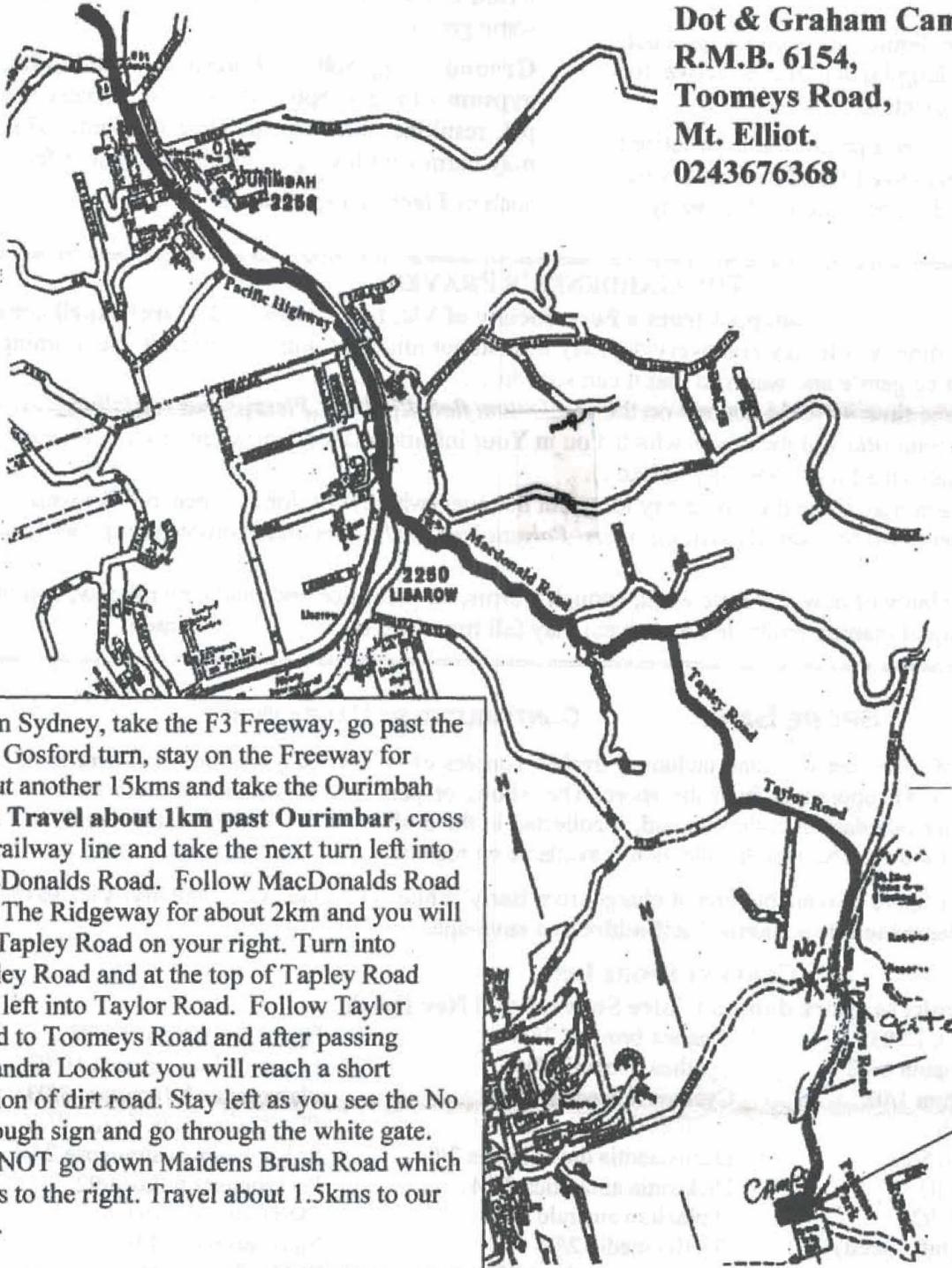
**DEADLINE FOR COPY:(AT THIS STAGE TO RON WILKINS)**

**Closing date for the SEPT. 2004 Newsletter is AUGUST 15<sup>th</sup>, 2004.**

## Direction for Sydney Excursion 18<sup>th</sup> Sept.

From F3 freeway

**Dot & Graham Camp**  
**R.M.B. 6154,**  
**Toomeys Road,**  
**Mt. Elliot.**  
**0243676368**



From Sydney, take the F3 Freeway, go past the first Gosford turn, stay on the Freeway for about another 15kms and take the Ourimbah exit. **Travel about 1km past Ourimbah**, cross the railway line and take the next turn left into MacDonaldis Road. Follow MacDonaldis Road into The Ridgeway for about 2km and you will see Tapley Road on your right. Turn into Tapley Road and at the top of Tapley Road turn left into Taylor Road. Follow Taylor Road to Toomeys Road and after passing Katandra Lookout you will reach a short section of dirt road. Stay left as you see the No Through sign and go through the white gate. **DO NOT** go down Maidens Brush Road which veers to the right. Travel about 1.5kms to our gate.

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