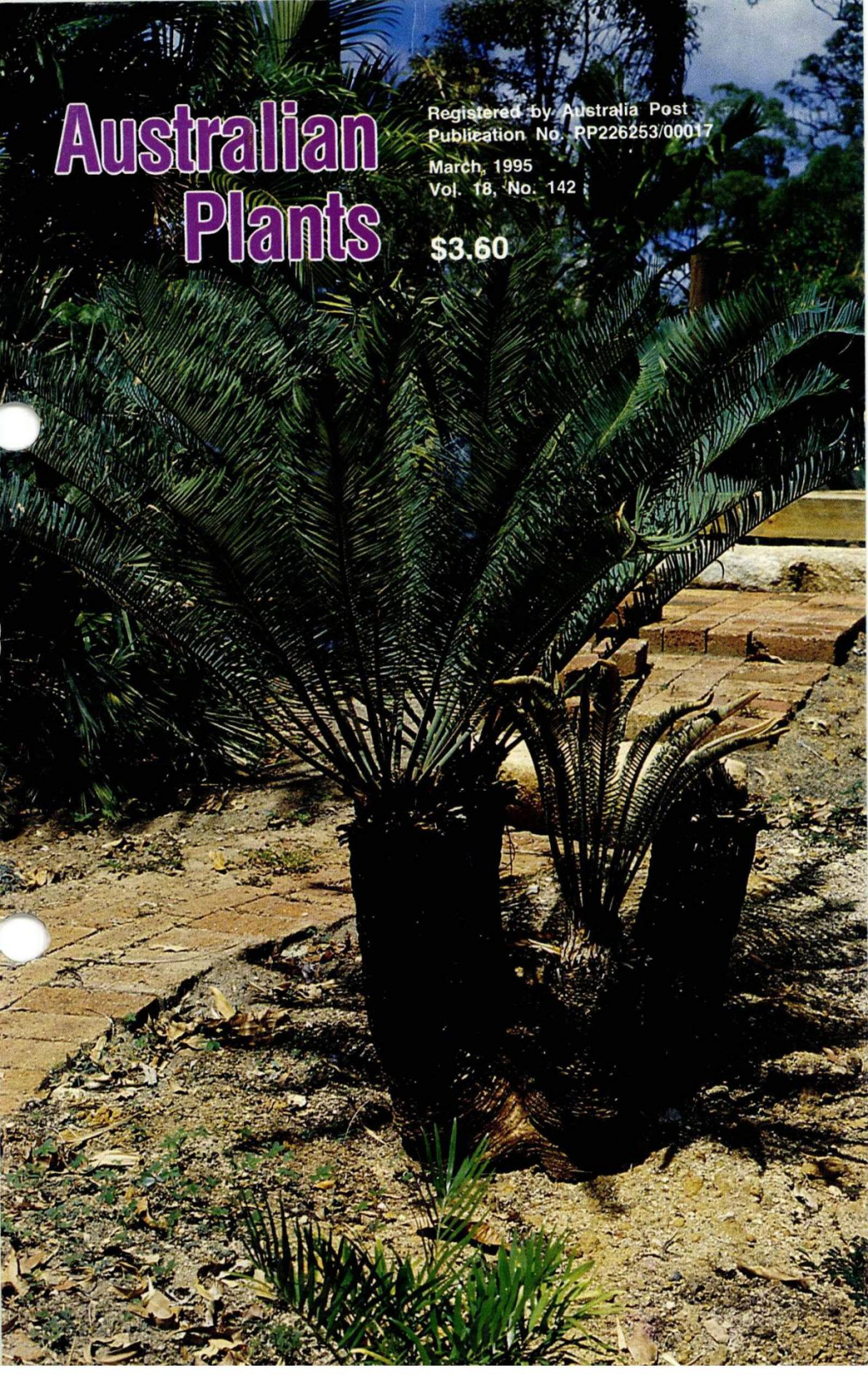


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Public Awareness of Doomsday Pending

This Society and its huge membership spread over all parts of Australia has led the way in practical conservation of our land. This periodical will largely be received by the converted, people already aware and concerned about the future of the Australian flora and the environment on which it is dependent, and the creatures — animals, birds, etc. — so dependent on it. Hopefully, they will show this issue to their friends and political representatives. Hopefully, the emerging young adults now entering the community life in their own right will see our issue, debate it and resolve to do something about the desecration of the land they will shortly inherit. See page 90 for advice on what you can do.

A Major Television Exposure

Based upon, among others, the critical issues defined in these pages, but with professional scripting and scientific help, it is proposed to produce a series of one-minute segments for presentation during prime time television. The series will commence with Australia in the Jurassic Period progressing to scenes of areas of concern but finishing with an indication of action necessary to remedy the devastation descending on our land.

We need a major sponsor, a corporate company with concern for its public image and the very future of the community that has made them prosperous. Hopefully, this humble issue will find its way to a senior executive with concern for his company's image and the resources to translate desperate dreams to reality. Their corporate promotional budget for 1996 to 2000 will not have already been fully committed. Saviour of Australia please contact the Editor.

Meanwhile, on the current basis that there is no money, just a desperate need, will professional promotional companies please come up with the plan and some resources to get us started on the first segments of our series. I am confident that we will find the support we need from the community and from **responsible government** to avert doomsday. ■

CONTENTS OF THIS ISSUE

Australian Plants usually presents articles on the descriptions of Australian wildflowers and notes on their cultivation and propagation for the interested reader with no previous knowledge or experience of the subject. While the Society and its members are very active in conservation of our unique Australian flora, this area of great concern is rarely promoted in the manner of this issue. We have a very special reason, see page 90.

Conservation	W. H. Payne	47
Lush arable land to desert, 54; Growing trees for profit, 56; The feral problem, 58; Wildlife corridors, 60; Have we failed the tourist industry, Australian Flora Botanic Gardens, 62; Maximising Farm Income, 66; Biodiversity, the conservation of life, The forgotten forests, 70; Harvesting of native species, The bird observer, 74; Save the bush from wild picking, Cottage farming of wildflowers, 78; Living with Australian soils, 82; Die-back of trees in our Australian landscape, 84; Outstanding wildflowers, 87.		
After the greening, the browning of Australia	Mary White	51
Australian Cycads	Alex Blombery and Betty Maloney	53
Gardening in Brisbane — Our Garden Series No. 20	Len Butt	56
Cycads, <i>Cycas</i> , Cultivation, 55; Blue-foliaged <i>Cycas</i> of Queensland	Len Butt	57
and others, <i>Cycas coultiana</i> , <i>C. cairnsiana</i> , <i>C. ophiolitica</i> , <i>C. platyphylla</i> , <i>C. brunnea</i> , <i>C. sylvestris</i> , <i>C. angulata</i> and <i>C. conferta</i> .		
Plants of Tropical Rainforest and their uses (edible)	Harry Dick	70
A Beginner's Rainforest — Subtropical gardening	Far North Coast Group	86
Wildflowers Developed for Horticulture	Australian Cultivar Registration Authority	87

COVER PLATE — *Cycas ophiolitica* (possibly crossed with *Cycas megacarpa* as it originated from the Maryborough, Queensland area) growing in the garden of Paul Butt, Forestdale, Qld. See page 59 for a description.

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CONSERVATION

by W. H. Payne

I use this word in the broadest sense — the conservation of planet earth. Now is the time for positive action, in fact, time is running out. This is not a doomsday article. I am convinced that the human race can save the planet from inevitable disaster, disaster that is a direct result of the presence of man and his actions over the past few thousand years. We have the ability to reverse the destruction of the earth's gifts to us. We have the opportunity to show the rest of the world how we can retain our high standard of living and still nurture this huge continent which has been entrusted to us, back to health and prosperity.

Every Australian has a stake in the future of our land and each has the opportunity to be active in its conservation. This issue nominates many courses of action, the first of these being the encouragement of responsible government. Some may find it hard to believe, but our politicians want to do the right thing provided it pleases the voter. It remains for the voter to express concern over the future of Australia and our future is assured. I am not advocating a "green" ticket but a future "survival policy" for whichever party is in control.

Responsible Government and the Environment

There can be little doubt that the current government of Australia is the most environmentally conscious and positive in Australia's history. Whether this is just good politics or sound, responsible government could be debated but their track record is indisputable. Some will say it is not good enough. However, let us give credit where credit is due — a very good **start** has been made.

There is little doubt that the community is now more environmentally conscious. Most people want more positive action provided someone else carries it out, but are often derisive of the "greenie". Perhaps it is the Australian knocker attitude or perhaps there is a concern for their Australian way of life and they are suspicious of anyone who "rocks the boat". I want to focus attention on the very survival of our land in the future after the year 2000.

I do not subscribe to the inevitable **doomsday** when life on this planet collapses due to ignorant exploitation by man. I do recognise that **doomsday** is inevitable unless some positive planned action by mankind is taken on a national, responsible government level. I do believe that scientifically based sound management can save the planet and mankind's comfortable way of life if action is taken now. We are responsible for a large part of the world, a continent that is rapidly deteriorating, and if we hope to induce other nations to clean up their act in their part of the world, we need to show the way with responsible government action here.

The present Australian government has made a start, a very good, in fact an exceptionally good, responsible start with its Landcare Programme. Most people have never heard of this outstanding start in the restoration of the environment but it is the most significant initiative for many years. It may be due to the activities of the despised "greenies", or of responsible environmental societies, or of the bureaucracy administering the programme, such as Dr Peter Bridgewater and his team. Some credit must go to Ros Kelly, the previous Minister for the Environment, and it is hoped that the current Minister reaches such heights of achievement converting politicians' words into positive action. I prefer to think that it is a combination of these reacting to the restless pressures of our young who are very environmentally conscious, and of responsible government.

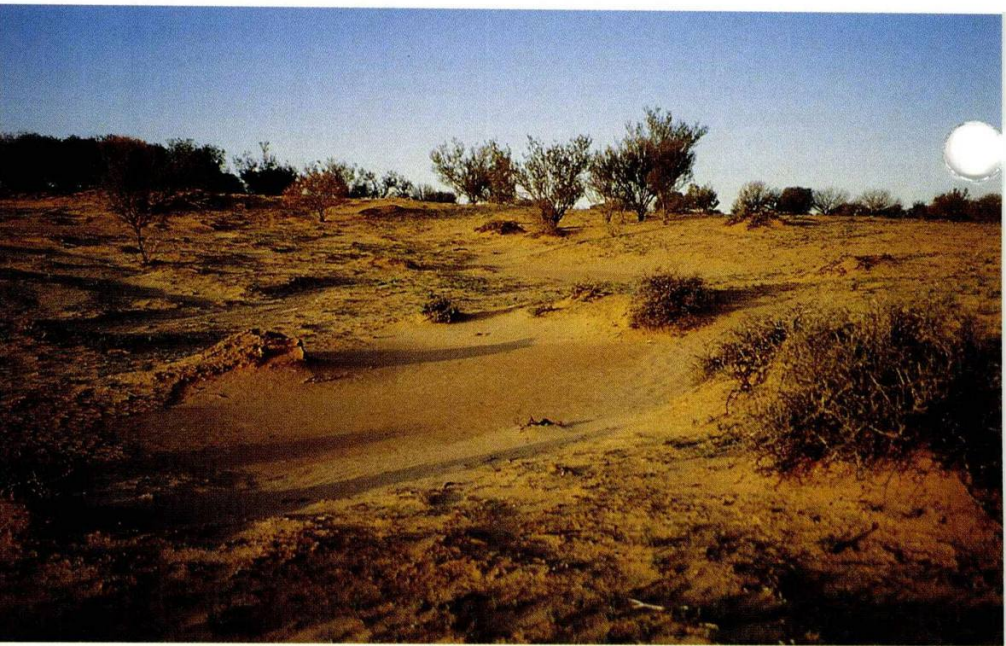


△ Grey-green spinifex clumps and a few eucalypts festooned with mistletoe are all that remains of an area depleted of its topsoil and plant communities by grazing and the invasion of rabbits. Photo by Mary White.

A land destroyed by misuse — a preview of much of the fringe land still being destroyed

I could have used photographs of once lush wheat fields now just sterile land with salt crusted depressions but who wants to look at colour pictures of nothing? Our approach is to not dwell on failures and mistakes but to offer solutions to **responsible government** for the future resuscitation of our land. —Editor.

▽ A pale orange dune is being eroded where its plant cover of salt bush and mulga has been destroyed by grazing. This is where the dust storms start depositing the valuable top soil into the ocean. Photo by Mary White.



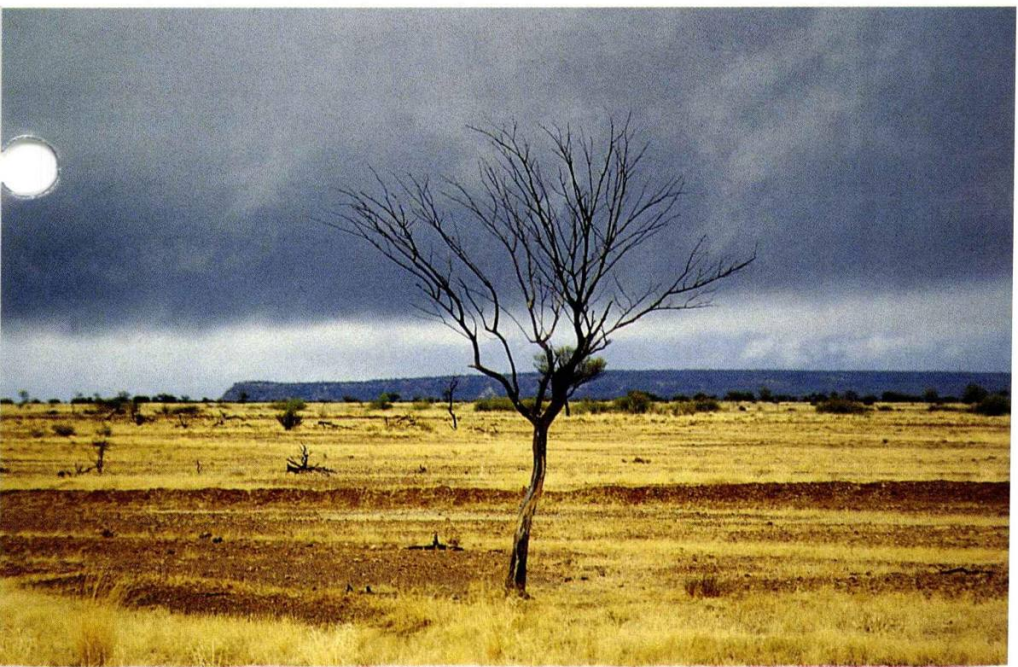


△ Red sand dunes advancing onto the floodplain already damaged by overgrazing. The advancing wall of sand engulfs the surviving *Eucalyptus* trees, the top of some still living, being just visible. Photo by Mary White.

I could have used photographs showing the ruins of homesteads standing in deserts of stone, but who wants to look at such a depressing scene visualising the hardships and heartbreak of the once optimistic families who toiled to make a lush happy home. We prefer to offer scientifically sound solutions for the rehabilitation of our land if **responsible government** will listen to us.

A land destroyed by misuse — a preview of much of the fringe land still being exploited

▽ Rain in the tussock grasslands can no longer bring back the rich grass cover or the mulga where overgrazing has degraded the land to this desert of stone. The top soil and plant life have been blown away to create a sandy desert elsewhere. Photo by Mary White.



Landcare — What is it? Why is it a start on National Survival

If you have a concern for a local environmental problem such as bush restoration of an area down the street that is becoming degraded, or realise that the effluent from a herd of cows is degrading the environment, etc., and you come up with a positive plan to correct the degradation, and you form an action group of similarly concerned people, and you define your plan based upon honorary work by your action group, carefully calculating the cost of materials required, and you submit your scheme to the Landcare Programme run by the Federal Department of the Environment, Parliament House, Canberra, the probability is that you will receive a grant to undertake the work. Your scheme will be carefully vetted by competent environmentalists living in your own area and possibly further advice given. This is not an overcentralised bureaucracy formed to give money away for the asking, as seems so common with a Canberra-based scheme. One million dollars was spent over the last year.

You might well say, "What a good idea, it gets the do-gooders working at little cost and maybe there is a problem with degraded land down the street or with cow effluent, as long as I do not have to do anything." The point is that this scheme has been operating for some years and has grown to cover thousands of these small schemes and actively involved many thousands of concerned people. The results have been spectacular in many thousands of small ways and a start on national survival has been made.

A start! Suddenly we find that thousands of Australians are active in their small way, contributing to the health of our environment. This nucleus of successful, experienced people will provide the core for a national multiplication of their endeavours provided there is continuing responsible government. With the year 2000 approaching and the centenary of national government in 2001, the opportunity is there for responsible government to plan for prosperity and the securing of the Australian way of life into the future.

The Year 2001 Centenary of National Government in Australia

No doubt there will be celebrations. We will smugly look at what a good job we have done in the past but should we be more responsible and also look to the future. No doubt there will be fancy buildings and parks in our State capitals, but do we need these at the expense of the future generations.

We need to go into the future as a united Australian people, not a group of ethnic minorities or indigenes, with a lead by responsible government and a positive plan to stop the massive degradation of our land and the inevitable ultimate sacrifice of our way of life. We have such a plan that does not mean sacrifice or reduction of our way of living, but in fact contributes to the growing prosperity into the future. Will government just listen to the people?

Project 2001 — Throughout this issue you will find, at the bottom of every second page of type, a brief reference to proposals in our package submitted to the Prime Minister, to resuscitate this continent. Each proposal seems so simple but, taken together, the whole make up a plan for survival of the present prosperous Australian way of life. The fact that it will contribute to the saving of the planet Earth may be incidental to some but future prosperity could be assured.

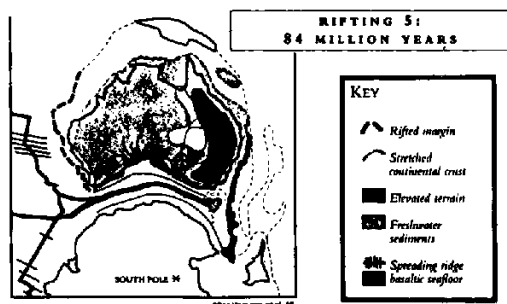
Space does not permit development of the details of our scientifically based proposals or for many other measures the reader would like to promote. Let us not dither or debate the details at this time, but seek the support of **responsible government** to adopt an aggressive plan for 2001.

After the Greening . . .

The Browning of Australia

by Mary White
Review by
W. H. Payne

If you are interested in the past history of our Australian continent and our prospects for the future then read this book.* Travel through time with Mary White from the days when Australia and Antarctica were joined, both covered with dense vegetation and roamed by dinosaurs and creatures of the Jurassic period of history. Marvel at the wonders of the rifting that separated Australia and its voyage north to its present location. The mind boggles at this point. This is not a science fiction story but a science fact-supported story told in a delightful way by a recognised world scientist. The whole incredible story is based on representation of scientific evidence presented with sketches and explanations that anyone can follow.



If you are interested in how our Australian continent has evolved over many millions of years to the present day, then travel through time with Mary White in a science fact-supported story wondering at the impact of the glaciation of the south and north poles, the ocean currents and retreat of the sea to form this largely barren continent.

If you are interested in the flora of Australia, skip the early chapters on rifting and stretching of the old Gondwanaland mass and follow Mary White in her scientific fact-supported journey through time as the lush forests withered and the climate-adapted *Eucalyptus*, *Acacia* and grasses took over.

European settlement adopted practices that turned farmland to desert. These pioneers were simply seeking to make a good living. This destruction is nowhere near as great as the present destruction by introduced feral animals, such as rabbits, goats, pigs, etc. Something should be done before they steal the country from us.

If you subscribe to the **doomsday** theory then you will find all the evidence you want. Our continent is dying. If you are the "eat up and drink, there is nothing I can do" type and wish to pass on the legacy of our inaction to your children's children, leaving them to starve and die out, then here is a toast to you. If you are a concerned, responsible human being then now is the time to speak out. Mary White has some of the answers but for the most part they require informed action by responsible government. You do not need to lie in front of a bulldozer or chain yourself to a fence or tree. You do not have to sacrifice the quality of life, in fact, if our recommendations are followed, they will add to the prosperity of the country and our way of life. You only need to encourage responsible government to adopt a scientifically based plan for the years of 2000 and beyond. See page 90 for suggestions on how to proceed. ■

*After the Greening by Mary White, available for \$59.95.

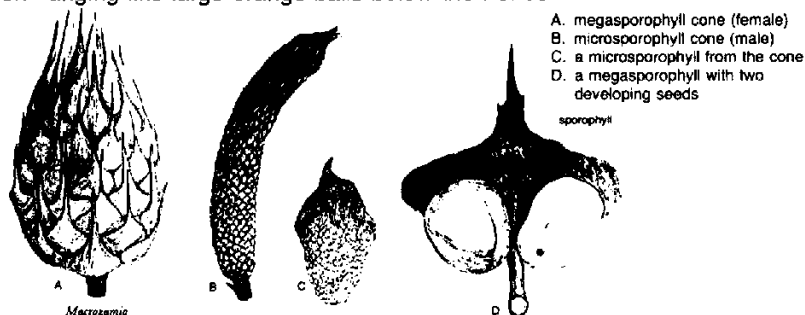


Cycas armstrongii displaying ripened seed hanging from the base of the fronds. Below is a male microsporophyll cone.

Australian Cycads

by Alec Blombery¹
and Betty Maloney

Cycads are a group of plants that, although they bear seeds, are non-flowering. They are said to be a primitive group of plants. In Australia they include *Cycas*, the subject of this issue, *Macrozamia*, *Lepidozamia* and *Bowenia*². The male organs are spores carried on hard, leaf-like scales called sporophylls, with a number forming a dense cone. The female organs are megasporophylls, hard, leaf-like scales each bearing ovules. In *Cycas* the megasporophylls have longer stalks than the other cycads mentioned above, arranged around a central axis which in the early stage of development appears cone-like; as the seeds develop the stalks of the megasporophylls increase in length and become pendulous. In the colour photograph opposite they can be seen hanging like large orange balls below the fronds. ▶



Left, coralloid roots of cycads — Centre, the seed develops — Right, a seed germinating.

Saline Land-Desert

2001

Man — Desert Maker

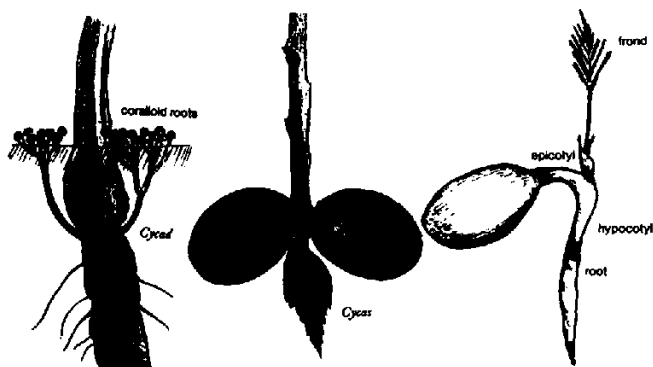
Changes in the planet over millions of years have created the Australian continent as a number of huge shallow saucers inwardly draining. In the arid and semi-arid basins where rainfall is less than 250 mm, dryland salting results from the high evaporation rate vastly exceeding the low recharge rate from rainfall in and on the collection points at the edge of these saucers. At Lake Frome, for instance, which is usually dry and salt-crusted, experiments have shown that the sun draws off the underground water by diffusion and capillary action from below the salt crust to the tune of 460,000,000 cubic metres a year.

It has been established that 4.3 per cent of the Australian landmass is salinised, of which 13 per cent (or 4.2 million hectares) is due to the 200 years of landuse by man. Increasing dryland salinisation is possibly an on-going natural trend which human activities have accelerated. New technology can reverse this process.

We face a future of expanding desert and shrinking productive areas unless **responsible government** action is taken. The Western Australian government is making a token effort being stirred into action by concerned property owners who have watched their prosperous farms turning into salt wastelands. This outstanding work of a few pioneer Australians is well documented, but is it a permanent solution?

Why not remove the salt? Investigations have shown that the pool of brine below the salt crust of badly affected areas is a readily available source of a number of chemical substances used in industry and currently imported at considerable expense. Common salt, gypsum salt, zeolites, magnesium and potash can be recovered by simple technology. The raw materials for fertilisers, food additives, glass-fibre products, building materials and industrial catalysts and many other useful substances are there to be exploited and could form the basis of a lucrative export industry. We desperately need a determined plan by responsible government.

The genus *Cycas* is confined to the tropical areas of Australia, with the greatest number being found in the monsoonal zone where there is a definite summer wet season and a dry winter season. Apart from the northern coast of Queensland, the *Cycas* species become deciduous during the dry season and shed all of their leaves or fronds. New growth rapidly produces a complete crown of fronds to replace those which have been shed. It is of interest that the pinnae of the fronds develop in a circinate manner, that is they unroll in the same manner as fern fronds. The pinnae have a distinct midvein which is absent in the other Australian cycads. Unlike flowering plants where the seed does not develop unless the ovule is fertilised, in cycads the seeds develop to an advanced stage before they are fertilised. The male cones which carry the spores on microsporophylls develop rapidly on separate plants to the female plants bearing the seeds on the megasporophylls and bring about fertilisation with the aid of wind or small weevil insects. ►



Lush Arable Land to Desert

2001

A pending national disaster

The Murray-Darling Basin represents a seventh of the continent in area and is the productive heartland of Australia. A quarter of the nation's cattle and dairy industry, half of its sheep, and half of its crop land are centred here. Three-quarters of the continent's irrigated land is in the Basin. The Murray-Darling is the fourth longest river system in the world, 3 780 km long, and the 20 major rivers which form it carry three-quarters of the country's river water. The system is just an example of what is occurring in other areas.

With ground water rising and salt being added to the river system it has been calculated that 1.3 million tonnes of salt cross the border into South Australia each year which is 2.5 tonnes a minute. The fact that the rivers also act as sewers and drains for the cities and towns along their courses, and that agricultural fertilisers and pesticides and sediments from eroded lands are entering them along the way, is inviting disaster.

Civilisations have collapsed because the soils of their agricultural lands were rendered sterile by salt or their agricultural practices turned lush arable lands into desert. We are not suggesting that people abandon the land but that **responsible government** formulate a determined scientifically based plan to restore the land and the country to prosperity. By determined we do not mean token schemes.

Technology for extraction of valuable salts from salt affected land is entirely practical if the will to succeed is there. Large-scale commercial exploitation is mentioned on page 53 but small-scale equipment available to farmers whose lands are suffering salination could process the salts which they remove from their land and turn a bankruptcy problem into a financial profit. A "pie-in-the-sky" dream? Why not determination to succeed?

In collecting seeds from a stand of *Cycas* it is important to observe the presence of male cones on plants nearby, for although the seeds look mature they may not have been fertilised and will not germinate. The usual flotation test for viability does not count in at least three Australasian species occurring on off-shore islands. These have floating viable seed as their methods of dispersal.

To germinate seed first soak in a 1 per cent solution of gibberalic acid for 24 hours as it speeds up germination. They are pressed into a friable soil in a deep seed box or an individual container and kept watered. The seed slowly produces a fleshy carrot-like root which grows into the soil. Sometimes it may be some months before the first leaf appears. The developing seedling remains attached to the seed for a considerable period before separating. If broken from the seed too soon it either dies or may not grow satisfactorily.

One commercial grower of cycads cuts off the upper part of a mature plant, treats the cut-off end with a hormone cutting powder and places the plant on a bench in a propagating glasshouse. Roots develop in 12 months or more.

Generally, *Cycas* species do not grow successfully in the temperate areas of Australia, particularly in the coastal area. There are exceptions. *Cycas revoluta* from the Ryukya Island of Japan is commonly cultivated in temperate areas. ■

¹This article is based upon a section of an excellent book by Alec Blombery and Betty Maloney *Propagating Australian Plants*. See page 91 for further details.

²*Australian Cycads*. The other spectacular cycads are described in *Australian Plants*, Vol. 13, No. 101 issue by Len Butt and illustrated with large colour photographs. Hopefully someone might go to some trouble to photograph the species not already illustrated in colour. This will apply particularly to the three species newly described in *Telopea* 5(4) 1994, *Cycas arnhemica*, *C. canalis* and *C. orientis*.

Cultivation of *Cycas*

by Len Butt

It is now generally agreed that the genus *Cycas* is probably the most primitive of the living cycads, and some opinions still place it as a very possible link to the most ancient seed ferns. *Cycas* grow best in tropic regions though some will accept the sub-tropics. If climate is temperate, the hardiest one is *Cycas media*, and there has been some success with *C. megacarpa*, and *C. ophiolitica*. Most of the northern species will become deciduous in even subtropical winters and, indeed, *C. armstrongii* goes deciduous in parts of its natural northern territory.

In open landscaping they require built-up beds of good friable loam placed over quinkan volcanic gravel, or small aggregate pebbles to open up the loam. Very large trunked plants are better having their fronds removed and existing roots cut back and treated with a fungicide paste and staked firmly when transplanted. New fronds may not appear for many months.

Cycas are very popular in cultivation as certain of their species look very palmlike and, indeed, display really fast-growing habits, quite different to what we have come to expect from other cycads such as *Macrozamia*.

Container growing seems the most logical when dealing with *Cycas* in the cooler zones. Adequate drainage should be maintained and a regular check made that the basal holes in your container do not become clogged in any way to impede drainage. Good aeration and at least half sunlight is beneficial, and 50 per cent shade cloth cover will help. Even if reported as frost hardy do not take chances and take necessary precautions if frost occurs. ■

Gardening in Brisbane

by L. P. and D. F. Butt

Our Garden No. 20

The garden grew like topsy on a very poor patch of soil. The 1974 flood devastated our front garden with a water depth of 2.5 metres. Since then it has become as much a rainforest as it is possible to make. All branches and leaf drop is shredded and composted back into the soil. Only organic fertiliser is used and hand watering has become our main chore. A micro water system augments our efforts in many places.

We grow most Australian palm species and 70% of the known species of cycads. The Northern Territory cycads are not prospering in our southern Queensland climate. Successful trees include *Agathis robusta*, *Brachychiton discolor*, *B. acerifolius*, *Backhousia citriodora*, *Buckinghamia celsissima*, *Barklya syringifolia*, *Davidsonia pruriens*, *Erythrina vespertilio*, *Euodia elleryana*, *Eucalyptus grandis*, *E. ptychocarpa*, *Ficus rubiginosa*, *Harpullia pendula*, *Meiroleuca erubescens*, *M. irbyana*, *M. quinquerivaria*, *Melia azedarach*, *Pittosporum rhombifolium*, *Stenocarpus sinuatus*, *Toona australis* and *Xanthostemon chrysanthus*. All have been described with cultivation details in past issues of *Australian Plants*.

We found our situation almost impossible for growing *Grevillea* but have had moderate success with *Callistemon*, the most successful being *Callistemon 'Captain Cook'*, *C. 'Eureka'*, *C. polandii* and *C. viminalis*. Vines include *Millettia*, *Freycinetia*, *Kennedia*, *Pandorea*, *Hoya*, *Piper*, *Pothos*, *Dioscorea* and *Tecomaria hillii*. Ground understorey plants grow in abundance, *Doryanthes excelsa* and *D. palmeri* growing along with the tree ferns *Cyathea* and *Dicksonia antarctica*, *Angiopteris evecta*, *Marattia salicina*, the lovely Potato Vine Fern, and a large vigorous *Rhaphidophora pinnata* climbing well in a tree. ■

Growing Trees for Profit 2001

Save our planet by planting more trees

One of our proposals for endorsement by the Year 2001 Authority is the planting of trees to contribute to our nation's income and prosperity for the future. We have been preached at to plant more trees to save the world and thousands of environmentally conscious people are doing just that under the Greening Australia and the Billion Trees Scheme. One of our proposals is to boost these plantings by encouraging property owners to plant for profit. Since proposing this scheme a number of pilot projects have sprung up with some funding under the Landcare Scheme and the Leap Employment Scheme. A number of conclusions can be drawn from the outstanding success of the pilot plantings.

1. An advertisement seeking enquiries from interested people in one area produced an immense response. Property owners large and small want to participate.
2. While those that responded were environmentally conscious, there was a great interest in the cash crop incentive. People wanted to be in it but needed guidance.
3. Those property owners selected for the pilot planting are convinced that it is a commercial proposition and have proceeded in a business-like manner.
4. While the initial plantings received some assistance from government sponsored agencies such as Greening Australia, the private investment in plants and labour was considerable. Their frustrations with lack of government recognition and commitment have led to the creation of their own action/co-operative groups such as the Farm Forestry Association, centred in Lismore, NSW.
5. The most outstanding conclusion is that people want to help themselves. There are many thousands throughout Australia who want to be involved but **need responsible government acknowledgement and direction**. This is not a request for an expensive bureaucracy and major funding. Landcare has created the infrastructure of thousands of honorary workers just waiting for the nod by responsible government.

Blue-foliaged Cycads of Queensland and others

by L. P. Butt¹

Cycas couttsiana

Pat and David Coutts found this striking blue-foliaged *Cycas* on their property, Chudleigh Station. It was introduced into commercial cultivation as Glen Idle. Dr Ken Hill has recently published a scientific paper (*Telopea* 5(1) 1994) formally naming the species as *Cycas couttsiana*. Endemic to the slopes of the Gregory Range, Queensland, it grows on hill slopes in shallow soils and grassy woodland in deep red basaltic soil. I have reports from a very reliable source that one giant specimen growing in the deep soil area has a height of 11.6 m, the caudex having a single trunk showing some similarity to *Cycas angulata* and to *Cycas brunnea* though these do not carry the glaucous blue crown of *Cycas couttsiana*. The base at ground level had many age cracks between the old leaf bases. One can only guess the real antiquity of this plant — certainly many hundreds of years. The average height of mature specimens is recorded as 3 m.

The new growth from the crown is densely tomentose (hairy) with grey-white and some orange-brown trichomes² usually persistent, cataphylls³, slender, thin, pale grey-brown and tomentose. The fronds are 100–130 cm long, strongly keeled, being v-shaped to the rachis⁴, 180–270 pinnae to the rachis; rachis usually terminate by a spine petiole, usually grey tomentose, 17–21 cm long. Photograph on page 61.

Mature leaves are numerous in an obliquely erect to spreading crown; leaf colour bluish, tomentose underside, the colour persisting on the rachis and petiole; pinnae to rachis deeply veed in cross section. From a mature leaf (frond) that appeared typical to me, I measured a rachis length as 170 cm long and, if flattened, 36 cm wide at the widest part; 80 pairs of pinnae, 18 cm long and 5 mm wide, centre nerve or vein to each pinnae was sunken above but very prominent on the reverse side; spines to the rachis in 25 pairs spread from the lowest pinnae to the base of the rachis. The microsporangiate (male cones) are ovoid, 15–20 cm long, 7–9 cm in diameter, the fertile zones being 25 mm long and 12 mm wide, abruptly narrowing. The megasporophylls (female cones) are 16–26 cm long, heavily grey tomentose, 4–6 ovules, the apex regularly dentate with 15–25 mm apical spines. The seed ovules are 3.5–4.5 mm, ovoid, yellow brown when mature and covered with thick pale blue powdery bloom.

Rainfall in the habitat was up to 600 mm annually, mostly in summer. It prefers a tropical to subtropical climate with adequate drainage if grown near the humid coast. It tolerates moderate frost only. Deep red sandy soil would suit it away from its habitat, the pleasing blue look probably being retained.

¹**Cycad Study Group Leader.** Study groups comprise people of similar interests who normally correspond through a group leader exchanging seed, plants and experiences. For information on this, or any other of the specialised study groups, write to your state secretary as listed inside the rear cover.

²Trichomes — a term meant to describe outgrowths of the epidermis (outer skin) such as scales or hairs.

³Cataphylls — reduced scale-like leaves which act as a protective device and spring from bases of leaf petioles in ferns and cycads, generally brown.

⁴Rachis — the name given to the frond stem where opposite pinnae (pointed leaf segments) join the stem. Below this is the petiole or unleafed stalk of the frond.

***Cycas cairnsiana*, The Mount Surprise Gem**

This elusive species accredited to F. von Mueller was first described from material collected by G. E. Armit from the Newcastle Range area. Since then it nearly faded into oblivion until the name was given erroneously to another cycad near Pettford and west to Chillagoe. In 1985 a member of the Cycad Study Group, Irene Champion, sent me the following notes.

"My first encounter with this blue cycad was in 1985 when a colony was discovered beside Lower O'Brien's Creek amongst granite outcrops in the Mt Surprise gemfields. On subsequent visits several other colonies have been observed. All are on granite outcrops and mostly on hill slopes. The surrounding vegetation is mixed, low, open and grassy woodland containing *Acacia* and *Eucalyptus* species and the yellow flowered *Cochlospermum gregorii* together with *Callicarpa candicans* and *Phyllodium pulchellum*. I only noticed them in colonies and never as scattered individuals. There were a few specimens with a height of 3 m from base to frond, a caudex diameter about 20 cm; no branching observed, although suckering was found in one instance. The deeply keeled pinnae were a vivid powder blue and the megasporophylls had three to six ovules. I gave the plant the temporary name of 'Champion's Blue Surprise' in my booklet *Introduction to the Genus Cycas in Australia*. Dr Ken Hill in *Teiopea* 5(1) 1992, defines this cycad as the true type *Cycas cairnsiana*. His notes stated: 'collected also at the O'Brien's Creek site, caudex 2 m tall rarely to 5 ... fronds 60–110 cm long ... strongly keeled in section, opposing pinnae inserted 30–90 degrees on the rachis with 180–280 pinnae, rachis terminated by paired pinnae, petiole, glabrous, 18–27 cm long.' "

The Feral Problem

2001

Man is only second best at land destruction

The feral animal problem in Australia today is out of control. These animals have done far more damage to the environment since their introduction by man than even man himself. If **responsible government** action is not taken, the whole of Australia will quickly become an eroding desert. Some action has been taken in the past with the present result. The pest animals are out of control even with the present controls.

There is a current government programme to 1996 that will be a valuable pilot for a more effective determined plan. The CSIRO is making an outstanding contribution but there is need for a commitment by **responsible government** to meet this national crisis and to win. This is an example of science being used without the resources for a result.

Rabbits — spreading northward and westward from Victoria at 100 kilometres a year. In 1887, 15 million were destroyed but the blue bush and salt bush country of the inland was turned to desert. Despite rabbit fences and myxomatosis they are now in control in huge areas and set to descend in massive numbers after the current drought.

Feral goats — the damage that goats do to vegetation, particularly in drought, is extreme as well as trampling and degrading the terrain. They are now in huge numbers across the southern half of Australia.

Pigs — these are the most serious pest of agricultural land and have grown to many millions in number. Shooting, trapping, poisoning and rounding up from helicopters has not prevented their massive build up.

Horses, donkeys and camels — herds now range across north Australia from the Kimberleys to Queensland with a rapid increase in herd sizes.

Dingoes, foxes and cats — spreading and eating out land and native animals.

Cane Toads — introduced to "control" cane beetles, on which they had no impact at all, are spreading in a manner similar to rabbits and are out of control.

The pinnae of *Cycas cairnsiana* are narrow and strongly recurved, appearing crowded but evenly distributed on the rachis. It is interesting to note that a similar colony in the Forsyth area had wider pinnae. Males' cones, 20 cm by 10 cm narrowly ovoid. Female megasporophylls, loose, open and heavily covered with white bloom and many loose brown hairs; ovules though yellow when mature, were thickly covered with pale bluish bloom. Young fronds in the crown are white to pale blue. Habitat information: tropic climate with usually wet summers, winters dry, night temperature around 8°C, rainfall approximately 600 mm per annum. Photograph on page 61. ■

Cycas ophiolitica

Mrs Brian Bosworth of Ingham first brought this outstanding plant to the attention of our group. Because of the blue-grey colour of the fronds, so significantly different from the local *Cycas media* and growing in proximity to the town of Marlborough, the plant soon became known as Marlborough Blue. Its beauty proved to be its downfall as over-collecting by certain nurseries decimated the natural populations to near extinction. It has now been described as *Cycas ophiolitica* ('ophiolite', a Greek reference to a combination of serpentine rock and soil — reflecting its usual growing terrain of serpentinite over a red clay).

Now it emerges that this cycad has a distribution west of Marlborough to near Yeppoon, Queensland, the colonies mingling with and possibly integrating with *Cycas media*, and west to Rockhampton in the Mount Morgan area, mingling here with *Cycas megacarpa*.

The paper by Dr Ken Hill states that the true form has blue fronds with similarities to both *Cycas platyphylla* and *Cycas couttsiana*, photograph page 45. This form from the Marlborough district has a narrower caudex than *Cycas media*, with a pronounced swollen base just above where it enters the soil. Several have been observed with a trunk to 4 m though cultivated ones appear to mature at 1–3 m. It has a dense crown of arching leaf fronds.

The slightly hairy petioles on mature fronds are to 30 cm long with up to 200 pinnae (leaflets) on a mature frond. The frond colour is a powdery blue sometimes fading to blue/green in older basal fronds. The erect but arching fronds are heavily vee-keeled where the pinnae meet the rachis. The new growth from the crown is a heavily tomentose greyish white in colour and pubescent. The female megasporophylls are about 30 cm in length tipped with a pronounced apical soft spine with dentate edges below, the small green ovules (usually 3 but up to 6) mature to an orange-yellow.

All plants in cultivation appear to do well if planted in a good compost-rich soil with good drainage in full sun. Being a tropical plant they cannot be expected to do well south of Queensland and retain the initial blue sheen but time may tell. Despite the fact that a great many *Cycas* grow in arid conditions, the wisest growing procedure seems to be to keep a friable mulch around them regularly, a light organic fertiliser application and watering during dry periods.

The Mount Morgan Cycad? People viewing the slopes bordering the right side of the steep sloping land when approaching Mount Morgan, remarked on the blue keeled fronds of some specimens. This plant has now been described as an integrated cross between *Cycas ophiolitica* and *Cycas megacarpa*, the characteristics of both parents being apparent. ►

Cycas platyphylla

Mostly known and now described from the Petford district in the northwest of the Atherton Tablelands, this medium growth *Cycas*, has been wrongly referred to as *C. cairnsiana*. Now adequately described by Ken Hill, it is named for the broad sterile tip of the plant's female megasporophyll that has a broad leaf.

It appears that the *Cycas* exists in a crescent shaped habitat, on shallow stony soils on grassy hillslopes, with under soil of volcanic origins. Sightings reported on its habitat state Petford and Dimbulah, Chillagoe being on the western edge, Almaden, Koorboora and Petford central, and Dimbulah on the eastern rise. There appears to exist also a hybrid interzone south of here running into colonies of *Cycas media*. In many sightings it grows in open eucalypt ironbark country with an average plant height of 2 metres, but occasionally it can be found to 4 metres.

Distinguishing features are the crown of dense powder blue fronds, that is, starting blue but becoming yellow-brown as they age, a circle of many of the latter hanging down from the younger erect and arching fresh population of fronds. The pinnae are strongly keeled and vee-ed to the rachis, tips of the fronds recurving. The new fronds rising from the centre are initially blue with many rusty woolly hairs, the basal cataphylls being rusty ginger, very woolly and thick, with tomentum. The fronds mature to 1.5 metres long, the blue coloration persisting on both surfaces of the pinnae, the petiole having small spine teeth, 110–250 pinnae to a mature rachis. ►

Wildlife Corridors

2001

Boost our standard of living with ribbons of green

The benefit of natural belts of vegetation to the environment is obvious but our proposal concerns the maximisation of economy return to property owners and the nation. Pilot schemes in hand confirm that the proposal is not only viable but very much in demand. A noble lady, Kath Wray of Armidale, almost on her own, is creating "ribbons of green" wildlife corridors through the countryside. The corridors provide access "only for the birds and animals", not the public. She now has 538 members and their families supporting her Citizens Wildlife Corridors movement. The following is quoted from her newsletter:

"What's Your Back Paddock Worth?" In dollar terms, perhaps, not much compared with other parts of your property. But on a different footing, it is priceless. Its value lies in its potential to influence insect plagues, control ground-water levels and the movement of soil salts, as well as to provide you with an ongoing source of drought feed, stock shelter, timber and the joys of our Australian bush. All this assumes that your back paddock (or perhaps bush block) contains some mature eucalypts and an understorey of native grasses. From this beginning anyone can establish not just trees but whole systems which will serve to help your farming livelihood continue well beyond the next generation. Sleep rocky hills, water recharge areas, drainage lines, roadways and even swamps can be utilised so that they enhance overall levels of productivity — rather than being the usual drain which is overstocked in order to pay its way, or which has to be carried by your better country." Other articles here will show you how to actually earn cash income from timber and plant products.

Property owners want to be involved and are meeting the expenditure themselves, even in the present economic slump in the country. We can advise on many ways these areas could produce an income as well as providing a wildlife refuge. Another plan is the provision of wildlife corridors adjacent to public roads to beautify the landscape and provide access for commercial exploitation. At this stage no attempt has been made to reap direct economic returns.



△ *Cycas couttsiana* see page 57 Photos, L. Butt ▽ *Cycas cairnsiana*, see page 58



Male cones are 20 cm long ovoid, and golden brown. The female simple, loose cone, is ferruginous, pubescent, the megasporophylls having a small dentated head with an apical spine to 25 mm; 4 to 6 ovules on most megasporophylls, green at first, then blue-green and finally brown, covered with powdery bloom; seed size 3–4 cm by 2.5–4 cm.

The caudex is fairly stout swelling toward the base, the overall picture of this species being outstanding and picturesque because of its arching blue fronds with rusty yellow old fronds lying down like a skirt. Seen against a blue sky on a yellow grass hill slope, the contrast is beautiful. As with the related species, *Cycas ophiolitica*, this population is desperately in need of conserving, both from collector predation, and farmer burning. Its tourist potential alone is worth further consideration.

***Cycas brunnea* 'Lawn Hill Cycas'**

Here, at long last, is some clarification of another species known by the common name 'Lawn Hill', and often referred to in the past as another form of *Cycas angulata*. As far back as 1972 there is a sighting listed by Maconochie but it was properly described by Ken Hill in 1992. Photograph on page 64.

Reports have come in over the years from various researchers of this *Cycas* and mostly it was passed over as probably an intergraded cross of *Cycas angulata*. From the formal descriptions by Ken Hill in 1992 the specific differences recorded are: broader, flatter pinnae to the rachis and wider spacing of these, the generally more strongly glaucous blue leaf frond and the smaller seed. The scientific name *brunnea* refers to the pronounced brown trichome hairs on all the new growth, a distinguishing feature of this species. ►

We Have Failed the Tourist Industry

2001

I have been contacted by the tourist industry for advice as to where tourists can see Australian flora. Where would anyone tell them to go. There are many miles between plants of interest even providing the season is good or you go "the right week".

To see just what the tourist sees I took a commercial bus tour around Australia. The tourist is allowed to see very little indeed. The period was September but the wildflowers seen, except for a fleeting glimpse out a window, were very few indeed. Those seen were of a very poor standard. We did see plenty of rubbish around service stations, which apart from some scenically grand places, were the only stops between motels.

We cannot blame the tour operators. If someone tells them a year in advance where to see wildflowers they will schedule a stop, but nobody does. We need to get our act together before the year 2000 or the tourist industry in 2002 will suffer.

Australian Flora Botanic Gardens

Our proposal is to create well presented botanic gardens for Australian flora at strategic places around Australia with facilities for tourists, their buses and cars. The sites chosen are adjacent to rich tourist orientated towns around Australia. The city managers approached jumped at the idea in full realisation of the financial commitment. These showcases for Australian flora would not be dependant on State or Federal Government but a responsibility gladly accepted by the local government authority and the citizens. Further details are on page 80.

Our detailed submission sets out the conditions to be met before establishment. A major objective is the conservation of the Australian flora, continent wide, based on science and sound management as detailed elsewhere, but the first objective is tourism and local community prosperity. —Editor.

Cycas brunnea is a medium to rather large plant generally being 2–3 m in height, but with reports of specimens up to 6 metres in sheltered forested gullies. The foliage of these latter plants is grey-green rather than glaucous. Mostly it is single trunked but suckers often form on the caudex and from the base, the caudex being rather thick, often to over 30 cm. Mature fronds are numerous and arching 1.8 metres long, 30 cm wide and forming a dense arching crown of a glaucous hue, later becoming, in full maturity, blue green to grey green depending on their climatic exposure. The pinnae, as in the case of many of these “blue” taxa is strongly vee-ed to the rachis. The emerging crown of young frond leaves is light bluish and heavily covered with chocolate brown trichome hairs. Observers report 160–240 pinnae to a mature frond narrowing to small yellow spines on the petiole. The pinnae is 7.5 mm wide slightly recurved and flattened. The male cone is ovoid 21 cm long, 13 cm diameter. Megasporephylls (female cones) are 28–32 cm long, orange in colour and covered with tomentum, narrowly triangular and very finely toothed with the apical spine 32 cm long; ovules 4 to 6, orange when mature, and very pruinose.

There are two distinct habitats, one in Queensland, in the upper waters of the Lawn Hill Creek and its tributaries, near to Lawn Hill station, southwest of Burketown near the Gulf of Carpentaria. These colonies grow in limestone country in exposed situations and along small creek-dominated valleys, with tall forestation. Other vegetation is sparse in the areas. The climate is tropical with dry winters and wet summers and an average rainfall of 700 mm per annum. The other habitat is on Wollongorang Station, Northern Territory, near the Carpentaria coast. These colonies are growing over sandstone and sandstone derived soils along the gorges. The seed is difficult to raise.

Cycas sylvestris

For several years up till now, there have come into commercial prominence *Cycas* from the islands around the top of Australia, with much wider, thinner pinnae, and a much faster growth rate in cultivation than is evident in Australian species. From Sri Lanka and parts of India we get *Cycas circinalis*, from Singapore, *C. rumphii*, and islands down from the Philippines across to New Guinea and the Solomons, some others all bearing some affinity to the *circinalis* pattern.

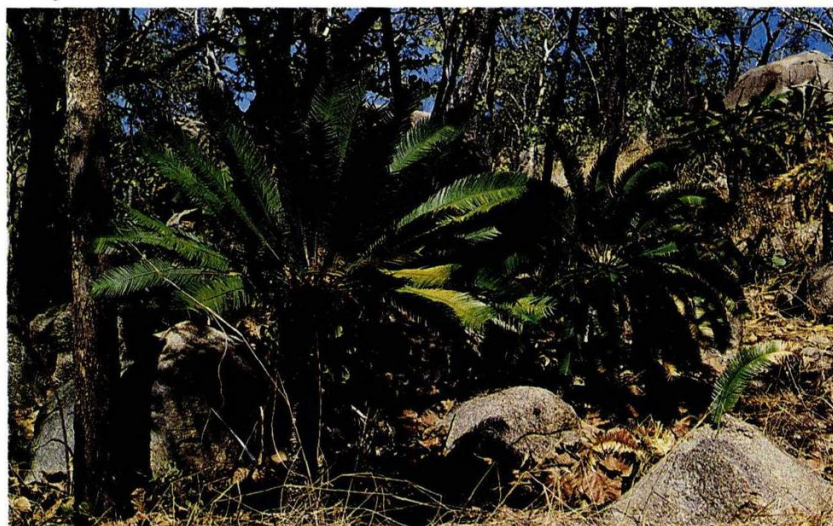
Dr K. Hill searched for and found and described such a *Cycas* from near the eastern tip of Cape York. It seems that there is a record of sighting in 1974, but it was 1992 before it was examined and described, the Latin name emerging as *Cycas sylvestris* (from the forests). The habitat described by Ken Hill is the Queensland Cook district on the eastern coast of Cape York Peninsula, on each side of the Olive River, with some occurrences south to the Pascoe River. The area is thickly forested with rainforest, and near the sand dunes it has a *Melaleuca* predominance; the soil in that area is whitish-grey siliceous sand, the species also occurring among the sand dunes.

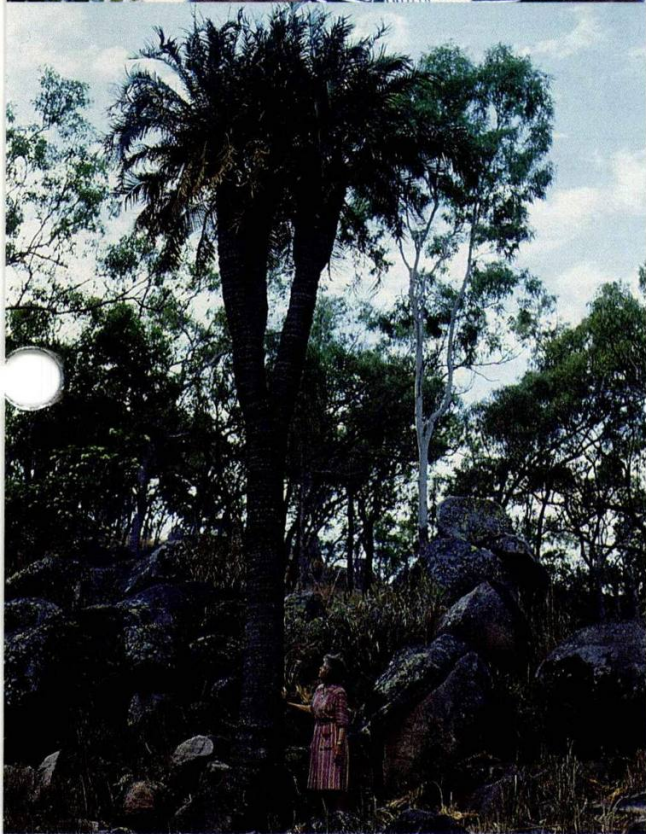
There is some affinity to *Cycas rumphii*, *C. circinalis* and *C. media*. The plant is distinguished from other Australian species by the broader and relatively thinner adult pinnae, the broad falcate pinnae and the non-pectinate megasporephyll apex with a distinct apical spine. It differs from its Pacific island cousins by having strong spiny petioles in its seedling plants. ►



△ *Cycas brunnea*, see page 62

▽ *Cycas conferta*, see page 67





Cycas angulata

- △ female plants in fruit
- ◁ the largest *Cycas* seen

Cycas sylvestris is described as having a caudex height of 3–4 m with an average thickness of 15 cm, the emerging young apical fronds being pale green to grey, densely tomentose, the cataphylls thin to 30 cm long; width of mature pinnae 9–15 mm; length of frond 100–200 cm with pinnae from 90–150 cm; length of smallish seed 30–35 mm without a spongy layer to the seed as occurs with similar plants; seeds ovoid, yellowish, up to 10 per megasporophyll. A report mentions this species also differs from other broad pinnaed taxa by not having the large floating water dispersed seeds as are present in *C. circinalis* and *C. rumphii*. The seed of course is smaller also.

The habitat climate is hot, humid and tropical so it best grown in the tropics or at least on the sub-tropic coast in sandy well drained loam (wallum sand) in full sun when mature, but with some shade earlier. I suspect frost tenderness.

Cycas angulata

First collected between 1802 and 1810 from Bountiful Island, near Mornington Island in the Gulf of Carpentaria (offshore on the Queensland side of the gulf), it is claimed to be the largest *Cycas* in Australia. Sightings and premature namings on the mainland of Queensland are now attributed as *Cycas brunnea*, which it resembles and has affinity with. Other huge *Cycas* specimens seen throughout upper Queensland, such as the occasional giants around the Cairns district and the multi trunk specimen on Brampton Island could possibly be crosses of it probably with *Cycas media*. *Cycas angulata* occurs also in the Northern Territory in the vicinity of the Gulf of Carpentaria where three rivers Wearyan, Folsche and Robinson, enter the Gulf. Growing in grassy and sandy alluvial soil, this cycad is the dominant feature of that landscape and is quite likely to be the main one used as supplementary food by Aboriginal tribes there. The habitat climates of both colonies are typically tropical, hot and wet in summer and mild and dry through winter. Photograph on page 64. ►

Maximising Farm Income 2001 Property Management in the Australian Environment

A rural property, well managed, is to produce and this is the primary concern of the owners. Practices in the past have degraded the land and reduced production and most owners are taking heed of the advice readily available from the relevant government agencies. As defined in the book reviewed below, this includes revegetation of certain areas, usually the least productive areas.

Wind breaks can increase crop and pasture yields over the paddock by as much as 10 per cent even allowing for reduced yields immediately adjacent to the trees. Lambing percentages have also been increased by similar amounts. These windbreaks could become wildlife corridors, see page 60.

The proposals contain numerous ways that wildlife corridors can be utilised to provide an income to the extent that it could be profitable to make them wider and longer. Cropping for timber is an obvious activity as mentioned on page 56. There is a big demand in horticulture for eucalyptus buds and fruits and a range of wildflowers. Why not wildflower farming as a small cash crop as mentioned on page 78. All of our proposals involve a cash return, saving our continent for future economic prosperity being the main objective. Do not reject them as a "greenie" fantasy.

Revegetation Guide To The Central Wheatbelt

The way to restore degraded farmland. This booklet was prepared by CSIRO for the Department of Agriculture, Perth, Western Australia, Bulletin 4231, to assist property owners in the central wheat-belt of south-eastern Western Australia. It is a practical guide designed specifically for people in the target area giving step by step procedures in land preparation, plant propagation and planting procedures using the local species. A guide is given as to which of the 82 plant species described and illustrated will be most suited to any of the nine habitats defined on the basis of soil type and position. ■

Cycas angulata can be massive, the mature caudex being to 40 cm with a swollen base; the caudex colour is naturally darker than most, but as the natives persist in their ritual hunting burn off annually, the true colour is often difficult to find; suckers form on the trunk and around the base. Some of the groups in the Northern Territory colony are reported to be 12 metres in height. On occasions the *Cycas* is found growing in close clumps. Latest descriptions of this interesting taxa are of mature fronds to 170 cm long, keeled in section to the rachis and smaller fronds to 110 cm. Leaflets (pinnae) on large specimens are very crowded to over 300 in number, meeting the rachis at 60 degrees. The petiole below the rachis can be 50 cm long and has small yellow spines. Colour of the fronds is blue-green, finishing to a grey-green. The apex of this extremely palm-like plant forms a dense arching, rounded crown. Emerging new growth is the palest powder blue, heavily tomentose with white and orange hairs. Basal cataphylls are orange and hairy.

The male cone is ovoid, roughly 25 cm by 15 cm and orange brown. The large female megasporophylls are 40 to 50 cm long, covered with a waxy coating and many orange white hairs; their apex is a triangle of small regularly dentated ridges with a needle pointed apical spine 30 mm long. The ovules (seeds) are numerous, up to 10 to a megasporophyll (quite large in comparison to *Cycas brunnea*) starting green and maturing orange with no powdering. They grow best in tropic climes (wet summers and very dry winters). Regardless of the reasons these plants are maligned for their defensive M.A.M. toxicity, they would make excellent feature plants.

Cycas conferta

Previously known as *Cycas* 'Pine Creek', it grows north-east of Pine Creek in creek localities, wooded hillsides among granitic outcrops. Approximate rainfall is 1,000 mm per annum. The average height of caudices is 1.25 m, the maximum observed being 4.3 m with a diameter of 0.13 m. Of *Cycas* observed some were branching, newly developing leaf fronds whitish to palest blue heavily tomentose on the back of young rachis, fawn in colour. The rear fronds are blue-green on both surfaces but a little more so above and inclined to be duller beneath; pinnae opposite and alternate, generally overlapping (this was more so in the top two-thirds of fronds with light brown tomentum on crown of the plants); number of fronds between 40 and 60, the length of these being roughly 1 m; soft spines to 24 pairs on the petiole of a mature rachis; pinnae arranged 90 pairs to a frond; pinnae size, 36 mm top, 66 mm middle, 30 mm at the base, decurrent in almost all cases with the mid rib sunken above. Female cone megasporophylls to a height of 240 mm with 30 to 40 to a crown, ovules per megasporophyll, 4 to 6. The male cone is 170 mm in height and 85 mm in diameter; peduncle height 30 mm $\times$ 170 mm. Photograph on page 64.

The fronds are a beautiful sea blue-green, with an abundance of soft crowned pinnae. The ovules are pear-shaped turning brownish-purple when mature. ■

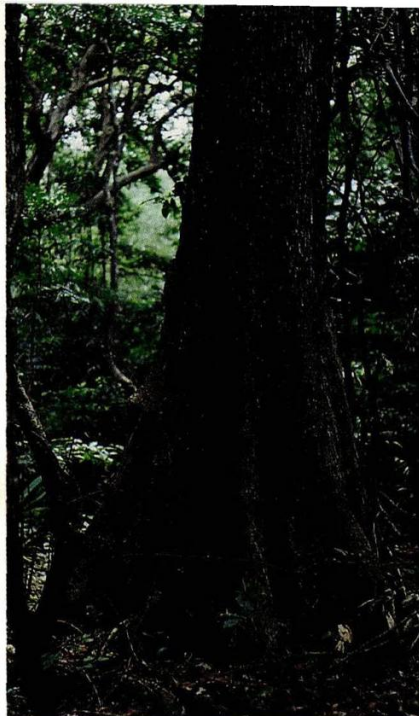
Growing Tropical Australian Rainforest Plants

The issue in Volume 17 for tropical gardening and rainforest plants was No. 138, Vol. 17, pages 237-284. The practical steps for gardening in the tropics were given in some detail with a reference to previous issues describing other experiences and many hundreds of plants. ■



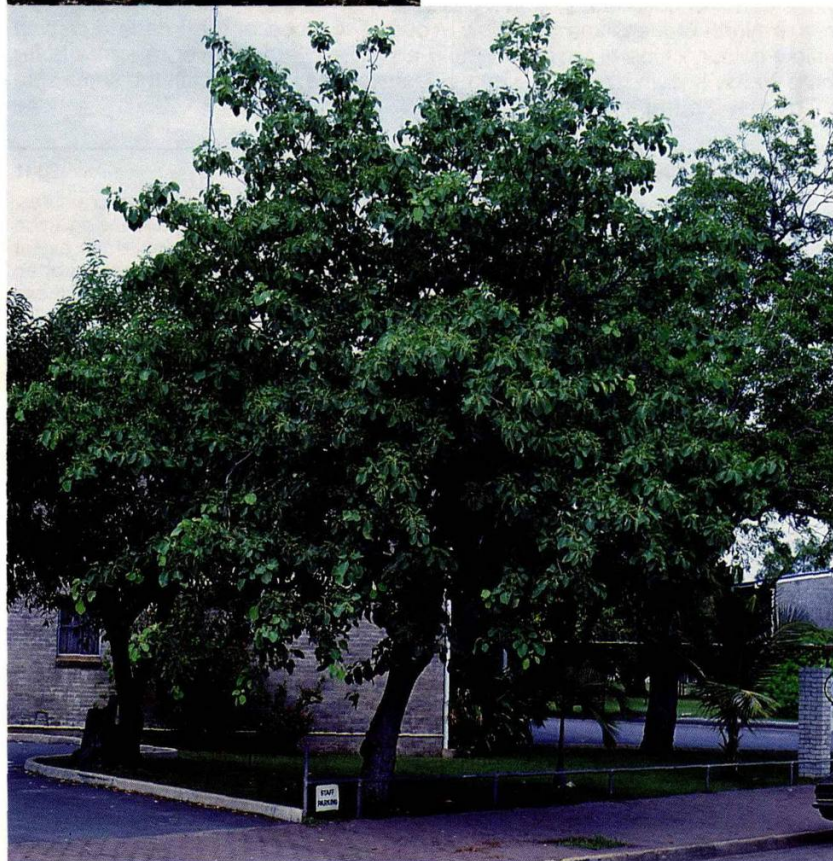
△ *Molincria capitatulata* — see page 79.
▽ *Terminalia ferdinandiana*, in flower, Peter Ball, see page 71.





Terminalia sericocarpa

- △ fruit
- ◁ trunk in rainforest
- ▽ street tree in Darwin.



Plants of Tropical Rainforest

by Harry Dick

With special reference to their uses as food plants

Continuing a series of articles on this theme

Damson or Dead Dog Tree *Terminalia sericocarpa*

A large tree of the dryer areas of rainforest at elevations to 800 m. The bark of the trunk and older branches is dark and rough in oblong scales, while on younger parts of branches and buttresses the bark is smoothish and of a pale grey colour, as is the bark of younger trees to 30 or 50 cm in diameter.

The tree is deciduous, its leaves turning yellow or red sometime in spring — in the dry weather — before falling. Though the splashes of colour of these trees before the leaves fall is noticeable where one can see the rainforest canopy from above, they are not spectacular. Soon after these splashes of colour have disappeared their place is taken by pea-green areas as the trees put on their new leaves.

The leaves are smooth, dark green and shiny above, a little duller below. They are about 8 cm long, 3 cm wide and more or less elliptic with the maximum width two-thirds of the distance from the base.

The flowers, produced on spikes from the leaf axils during October and November, are small, white and numerous, with a scent — or otherwise — that has earned the tree the very appropriate name of Dead Dog Tree — a mixture of the odour of dogs faeces and a dead animal. Another common name for this tree in North Queensland is Yellow Wood. The wood of the tree is a distinct yellow colour, chips of which will yield a yellow dye. However, the tree is far more widely known by its trade name, Damson, associated with the small blue plums that the tree produces. ►

Biodiversity — The Conservation of Life

2001

The balance of nature, an amazing collection of life forms, plants, tiny creatures, animals, birds, fish, etc., all living together in a delicate balance, one depending upon the other for food or survival. The development of humans disturbed this to the extent that vast numbers of plants and animals became extinct. This is still happening at an alarming rate and suddenly scientists have discovered that we may need many of these life forms, many of nature's natural substances for survival ourselves.

The only effective way of preserving the remaining life forms is in natural reserves set aside and managed to nurture the balance of nature in them. We need vast areas to sustain our families in the comfortable style of living we have become accustomed to. The remaining areas need careful scientific management to sustain nature's communities within the threatening boundaries of our artificial world. All life forms need plants. The Australian Flora Botanic Gardens mentioned on page 80 will create a base for scientific study and vital information on how to relocate or maintain threatened species within nature reserves, but they are no substitute for well managed natural reserves.

The Forgotten Forests — Typical Natural Reserves

We must make do with natural reserves that have survived the expansion of our artificial land use. The Forgotten Forests is a small book produced by the Victorian National Parks Association as a "Field Guide to Victoria's Box and Ironbark Country". This is an area north of the lower slopes of the high country and above the alluvial floodplains of the Murray River. It comprises a broad band of substantially cleared land stretching west from Wodonga/Wangaratta, to the Grampians. With 75 per cent cleared and the remaining bush degraded by grazing, timber cutting and mining, the surviving eight reserves are a valuable resource of nature's life forms. The 250 colour photographs and drawings in the book are an excellent reference to the plants and dependant creatures found there. It is available for \$19.95 plus \$5 postage. Buy a copy and visit the areas. The authors, Malcolm Calder, Jane Calder and photographer, Ian McCann have preserved the reserves on paper but how much longer will these and other reserves survive without careful, sympathetic management? A determined plan by responsible government is needed. ■

The purple fruit, ripening in late summer, are covered with short hairs which give them a silvery cast. About 2 cm long by 1 cm wide and slightly flattened, they consist of a thin dark red edible flesh covering a comparatively thick corky covering around the small seed. This corky covering seems quite inappropriate for *T. sericocarpa*, though it is understandable with other species of *Terminalia* which are well known trees across tropical Australia. Some — notably *T. catappa* (Indian or beach almond) with its large red, purple or yellow fruit up to 8 cm long with an edible kernel — belong to foreshore communities so that the corky covering assists in the seeds' distribution by sea, while others often grow in fire-prone areas where the corky covering protects the seed from fire. However, *T. sericocarpa* comes into neither of these categories and is, in fact, rather fire sensitive, though not to the extent of most rainforest trees.

The edible portion of the fruit has a quite pleasant sweet-acid flavour. They are rather small, but when the tree is bearing well they can be picked up in large quantities from the ground in spite of the large numbers of fruit eating birds which are attracted to the tree at this time. In fact, the attraction of fruit eating birds to the trees is one of their desirable features from a regeneration point of view. It is a fast growing tree that does not mind full sun and poor soil so long as it is well drained, and when birds come to feast on the fruit the seeds of other species will be left to grow in the natural manner.

Being a fast grower able to tolerate full sun and poor soil would make this tree a good plantation species. Milled under the name of Damson Plum it is considered an excellent building timber used mainly for framing.

For some reason, these trees are very often infested with mistletoe.

Cultivation Note from Garry Sankowsky — This is a very hardy fast growing tree which is suitable for most of the eastern coast of Australia. It must be grown in full sun for best results. In a rainforest plot, it will grow tall and slender. As a specimen tree it will spread out to form an attractive shade tree.

Cultivation Note from Peter Ball, Darwin — As a landscaping plant in Darwin, *Terminalia sericocarpa* is a leafy shade tree with radiating uplifting branches somewhat similar to *Alphitonia excelsa*. It is common in the top end rainforest and becoming common in top end gardens. It is an attractive ornamental that provides autumn colours in the mid to late dry when it defoliates suddenly for a short period. It prefers full sun and damp conditions with a heavy mulch. The small white flowers are in short spikes, often cradled by the end leaves of branches and are noticeable only when observed close to the tree.

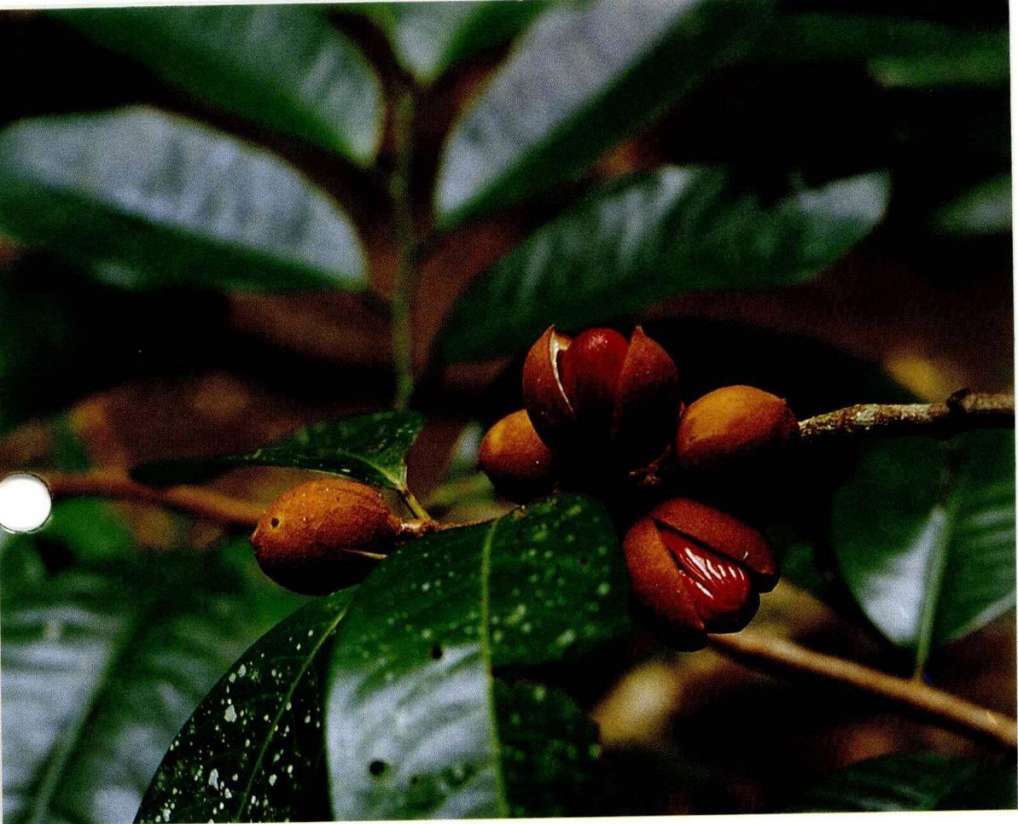
Terminalia ferdinandiana — A large-leaved shade tree from the dry forest areas of the Territory. One of the many broad-leaved trees that gives the top end forest its distinctive look. A nice spreading shade tree that will not grow too tall for the home garden, giving it the broad-leaved shady look. Needing full sun to part shade it mixes well with other trees and is fast growing while young. Prune out the lower branches when the tree is about head high. The long white flower spikes appear in the early wet. They grow from the numerous growing tips and make a fine display. Cradled in a cluster of large leaves they add to the charm of the tree. The green fruits that follow grow on the same slim petiole as the flowers. A slight rib runs around the circumference of the seed. To germinate simply put on the surface of a seed tray after drying. These fruits are a rich source of Vitamin C. ►



▽ *Eupomatia laurina* flower and fruit △ see page 74. Photos by Harry Dick

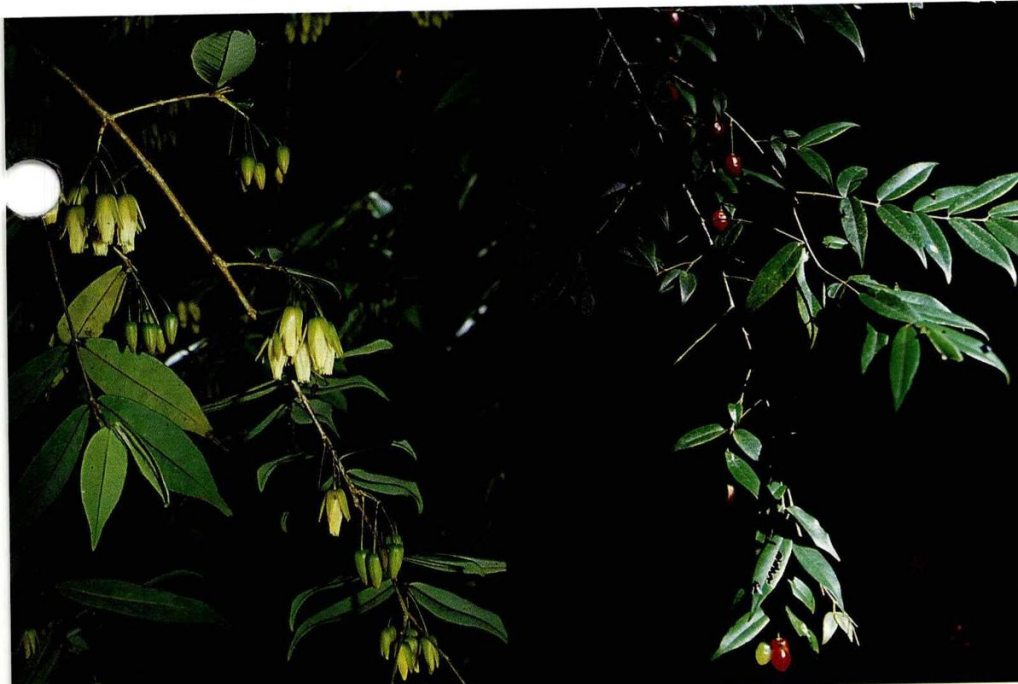
Myristica insipida as a small tree in the Darwin garden of Peter Ball ▽





△ *Myristica insipida*, Nutmeg Tree, see page 80. Photo by Harry Dick

Aceratium megalospermum in flower (left) and fruit ▽. Photos by Harry Dick.



Spear-handle Tree — *Eupomatia laurina*

This tree has several common names, Bush Guava, Copper Laurel, Grey Beech, Bolwarra and Dooral. Bolwarra is probably a New South Wales or South Queensland Aboriginal name and Dooral is used by the Gugu-Yalanji tribe. Since there are a variety of other Aboriginal names perhaps it would be best to use the one thing all tribes had in common, its use as spear handles.

A shrub or small tree growing on the banks of rivers and large creeks, in areas of open canopy or, as a pioneer on the rainforest edge at elevations to 1,200 m. Though 6 or 7 m is the most usual height, very occasionally, a tree may attain a height of 10 m. Spear-handle is the name used between Mossman and Cooktown because of its popularity for that purpose by the local Aborigines and the whites who can use a fish spear. The spear handles or shafts are obtained from the long, unbranched shoots which may arise from any part of the plant, though most often from the butt.

The leaves, up to 20 cm long, are alternate, dark green and shiny, on stems that zig-zag slightly from leaf to leaf. The bark of the younger branches and shoots is a smooth, shiny green which ages to almost black. Later the bark will crack and assume a reddish colour before taking on the grey of maturity. All parts of the plant give off an aromatic smell when damaged with the damaged part soon oxidising to a brown colour. ►

Harvesting of Native Species

2001

¹The Bird Observers Club of Australia in *The Bird Observer*, No. 745, September, 1994, records a marked increase in the amount of vegetation (habitat) or potential food source for birds that is proposed for harvesting under the *Wildlife Protection Act*, 1982. This legal harvesting directly affects the food source for birds and other creatures. They quote the following example:

Xanthorrhoea (Grass Trees) harvesting in New South Wales, Victoria and Queensland includes the foliage, the flower stems (while in flower) and whole plants. One scheme wishes to harvest 200,000 flower stems per year in a 20,000 ha Queensland State Forest area in addition to harvesting on private land. The harvester comments that the plant is of "nuisance value". Another proponent in New South Wales wishes to "salvage harvest" 5,000 whole plants per year from 42,000 ha.

The proponent of any harvesting scheme is required to state the effects of harvesting on the species itself, and on the other species in the ecosystem. Invariably, statements such as "none to my knowledge" or "nil effect" are made (and accepted) but are not substantiated in any way. There is usually no attempt to identify the effects on other species, including birds, or to supervise the harvest and quantities taken.

As opposed to picking in the wild our society approach (see page 78) is to sponsor scientific research on the selection, propagation and cultivation of the best forms of species. It has been shown that if the demand can be met by better forms of consistent quality bush picking ceases. Results of this research are also applied to maintaining the species in the wild and in Australian Flora Botanic Gardens, see pages 62 and 80.

¹The above is only a small part of the content of the magazines published by the club. The bulk of the excellent articles concern the life and habits of birds which in the September, 1994 issue include the Yellow-rumped thornbills and Mistletoe birds. The trials and triumphs of restoring coastal habitat based upon actual experiences with a block of land they acquired makes interesting reading as they battle rodents (rabbits and foxes) and people?. You may join the Bird Observers Club of Australia by contacting them via P.O. Box 185, Nunawading, Victoria 3131. Membership being \$35/40.00 per annum with some concession rates.

The unopened flower buds of *Eupomatia laurina*, which may be in leaf axils, on leafless twigs, stems or older branches, look for all the world like the unopened buds of a eucalypt. The cap is shed in one piece as the flower unfolds. The flower seems to consist of a large number of narrow, white, sticky petals; but a closer look shows that these cannot be petals as they are surrounded — just inside the scar left by the cap — by a ring of white pendulous stamens. What appears to be petals are really sterile stamens (staminodes). With the point of a pocket knife or similar instrument, gently lift those staminodes that are folded down over the middle section of the flower and it is quite likely that you will find at least one, or perhaps three or four, of the tiny, brown beetles that pollinate these flowers. The flowers have a scent very much like fresh pineapple.

The fruit, which are produced in March to May ripen to a dull yellow. They are about 3 or 4 cm across, are topped by a large, flat flower scar and taper to the stem so as to have the appearance of large gum-nuts. There is an outer "rind" enclosing a sweet pulp containing many small, brown seeds. It is best to open the fruit, suck out the pulp and discard the rind as this, though quite tender, is in many cases, too aromatic to be pleasant. The flavour is very like the New Zealand fruit, Feijoa. The fruit here at Mossman, Qld, are obviously very different to those maintained by Tony Irvine below.

They grow quite well from seed — look under a tree growing in a well lit position a couple of months after fruiting and one will find little clumps of seedlings where fruit have rotted away and seemingly every seed has germinated. Although they like some sunlight, they do not like too much. If getting some shade and some sunlight, they will become quite bushy and produce lots of flowers. Too much sun will stunt the plant and cause the leaves to become yellow. However, because of their specialised pollination, they probably would not set fruit grown too far from their natural habitat.

Comment by Tony Irvine — The Dyirbal Aborigines (Atherton Tablelands—Cardwell) cooked the fruit before eating and only ate it in small amounts as the flesh can burn the mouth. Some people have told me that they have felt dizzy or slightly hallucinated from eating this fruit. I have found that I can only eat it in small amounts.

Cultivation Note from Garry Sankowsky — This plant is suitable only for moist areas and does best in semi-shade.

Study Group Report — The plant prefers semi-shade but can be grown in full sun. It makes an attractive indoor plant provided it receives good light and is aired outside every few weeks. The yellow fruit are best when they are completely soft. The translucent flesh is aromatic and sweet, similar to the exotic Guava. The numerous seeds are spat out.

Eupomatia Jelly

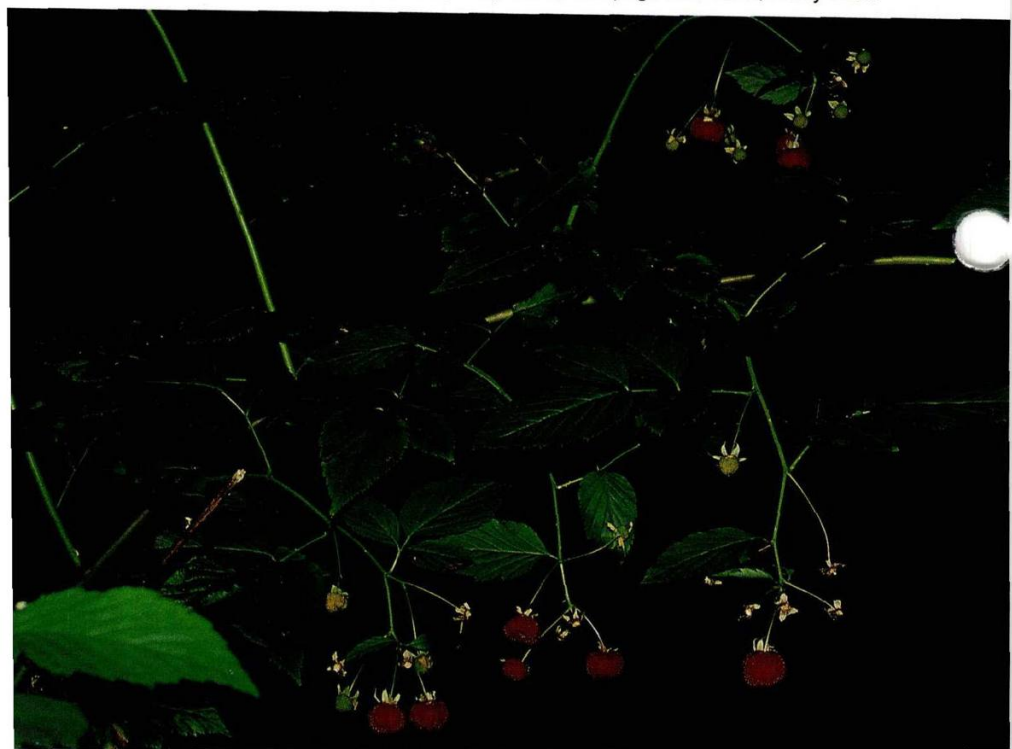
From Wild Food Cookbook, by Jon Sked

Wash fruit and place in a saucepan with enough water to cover. Simmer until very soft. Mash fruit and strain through a fine sieve. Discard pulp and seeds. Heat liquid and allow 1 cup of sugar to each cup of liquid. Stir until dissolved. Boil rapidly until it gels. Bottle and cover.

Eupomatia laurina, Native Guava, is a large shrub with glossy, dark green leaves on thin arching branches. It has cream, daisy-like flowers with a distinctive ether perfume. These are followed by edible, urn-shaped, green fruits, 2–3 cm diameter, with a sweet guava-like flavour. Fruits ripen in winter and are ready to eat when they feel soft. This is an understorey plant common in coastal rainforests from north Queensland to Victoria, also in Papua New Guinea. A suitable garden plant, it should be grown on a protected, well mulched situation in full or partial shade. It is a successful container plant. ►



Calamus moti, the plants Δ and the fruit Δ Photos, Harry Dick.
 ∇ *Rubus rosifolius*, Raspberry Bush, see page 82. Photo, Harry Dick.



Note by Nan and Hugh Nicholson — *Eupomatia bennettii*, Small Bolwarra. For less than one day this beautiful scented flower blooms in the low intensity of light of the rainforest floor. In that time it needs to be pollinated by small beetles if it is to set seed. Each flower produces one seed case with dozens of seed inside. The plant is a small shrub less than 1 m with only one or two slender stems, and is found in moist volcanic soils from the Nambucca Valley in New South Wales to north Queensland. This species belongs to an ancient and primitive family of enormous interest to world science. **In the garden:** it is somewhat straggly and not alluring as a garden specimen but it does not prevent it being sought after. When young it sometimes appears to die back but shoots again in the spring from a tuberous root.

Lawyer Cane — *Calamus* species of the Palm Family

These palms supply the cane used in the manufacture of cane furniture. In North Queensland there are a number of species which resemble *Calamus muelleri* of southern Queensland and northern New South Wales. Their identification is mainly by their degree of spininess, and the number, length and width of the leaflets. *Calamus moti*, Yellow Thorny Mary, can easily be identified as it is the only species in which the long spines on the leaf sheaths are yellow — the spines are also noticeably flattened. This is a robust species with canes up to 5 cm thick, though *C. radicalis* and *C. holrungii* are equally robust.

Supposedly named because, once in its clutches it is difficult to escape, Lawyer Cane is familiar to anyone who has walked in the rainforest, for few have done so without having to unhook, from clothing at least, the long, whip-like “wait-a-whiles” (flagella) with their hundreds of recurved thorns which this trailing palm uses to climb to the tops of the rainforest trees. These “wait-a-whiles” were valuable tools of the rainforest Aborigines. A length, of a thickness to suit the victim, could be used to pull almost anything, from witchetty grubs to rats or even bandicoots, from holes and hollows.

Lawyer Cane was used by Aborigines for many purposes — hefting stone axes and weaving dilly bags to name two — but one of the simplest and most useful tools made with it was tongs to use as a cooking aid. A piece about 60 cm long and 2 cm thick was split in two and one of the pieces, with the help of heat of the fire, was bent double. The Lawyer Cane tongs were a common sight in bushmen's camps, used when cooking a damper, but mainly for picking up glowing coals to light the cigarette or pipe.

Bushmen used to cut the leaves from immature Lawyer palms that had not made a stem and use them to cover the ground where they were going to sleep. The leaves not only protected the sleeper from the damp ground, but by the many stiff, erect bristles on the leaflets, formed a barrier that discouraged the ground leeches that are common in much of the rainforest. Dry Lawyer leaves burn readily with a good flame — a rare attribute for rainforest leaves — and are therefore useful material with which to start a fire. The cane itself has a waxy coating. When it has died this waxy coating renders it resistant to moisture so that, even after prolonged wet weather, it is dry within and may be split with a pocket knife and used as kindling for a fire. ►

Australian Palms — These have been described in *Australian Plants*, Vol. 16, No. 129 issue, by Alec Blombery, together with notes on cultivation by other authors. The large colour photographs are superb. We would like to publish a large colour photograph of all Australian species and your assistance is requested; photograph species not illustrated, or send me what slides you have for inspection. —Ed. ■

Once the palm reaches strong light the "wait-a-whiles" will produce panicles of tiny, yellow-green flowers from the nodes on the main stem, from a leaf axil. By next summer these panicles of flowers will have developed into open, pendulous bunches of fruit. Single bunches of fruit of *C. moti* may be a metre long and contain nearly half a kilo of fruit; and there are often four or five bunches to the "wait-a-while". Other species are not so prolific. The fruit, which are about a centimetre in diameter, have a white, translucent flesh surrounding a smooth, hard seed, the whole enclosed in a white, scaly skin. The flavour is sweet-acid, very like the old acid drop lollies, though if they are not completely ripe they will be unpleasantly astringent.

There is another species of Lawyer Cane in North Queensland which is quite different from any of the foregoing. This is *Calamus caryotoides*, the common Fish Tail Lawyer Cane. The stem attains a maximum thickness of about 10 mm but is often smaller. The name refers to the leaflets which are fused into threes and fours and have squarish ends. They more resemble fishes fins than tails. The fruit of this species is a little smaller, with smaller, tighter bunches and is yellow. It has, however, a similar flavour and the same scaly skin. A scaly skin which was the reason why, as children, we knew all Lawyer Cane fruit as snakes eggs.

Cultivation Note from Garry Sankowsky — *Calamus* species are quite easy to grow but as most of these are quite large vines they should only be planted near mature trees. The lowland species which are found north of Cairns are sensitive to frost. ►

Save the Bush from Wild Picking

2001

Cottage Farming of Wildflowers

Many thousands of wildflower blooms and even whole plants, are harvested from the wild every year, see "Harvesting of Native Species", page 74, for an example. Much of this is done quite legally but rarely with adequate supervision. A much larger amount is done illegally. Rich rewards are there for the pickers to meet the demands of the horticultural trade. The export trade in wildflowers earns Australia millions of dollars annually, only a small proportion being from wildflower farms.

Experience has shown that, even if a desired species is abundant in the wild, cultivated forms are preferred by the market because they are superior forms, of consistent and reliable quality. The relevant state departments of agriculture/industry/conservation recognise this and attempt to foster this industry with very mixed results. Why are their efforts largely frustrated?

The scientific community is anxious to engage in research into the commercial propagation and cultivation of selected species. Many conservation conscientious science pioneers have completed such studies but their results are usually confined to scientific reports and filed away. Why this frustration and waste of a valuable resource? The Australian Flora Foundation is very heavily committed to the promotion of this research and is in desperate need of funding and official encouragement.

On the other hand, the horticultural market is desperately seeking suitable species to meet the growing demand of a local and export market. The demand with a massive money potential at one end and a desire to develop and produce the product at the other end, has a large hole in the middle. Government initiative could correct this and this is one of the objectives of the Society in their submission to the Year 2001 Centenary of Federal Government Authority. Adoption of this and other recommendations will bring employment to thousands of Australians and inject a level of prosperity into the farming community that will affect us all.

Orchid Lily — *Molineria capitulata*

Molineria capitulata is a plant of damp areas of lowland rainforest where it will often form small colonies. The leaves may be 60 cm long and stand tuft-like in three's or four's on 20 cm petioles. They are pleated longitudinally in the manner of the leaves of some terrestrial orchids, which is the reason for the first portion of the common name — Orchid Lily. The yellow flowers, one to two centimetres across, are so much like the flowers of lilies as to account for the second part of the name. Another common name Yellow Stars is because of the perfect symmetry of the flowers. Photograph on page 68.

There is a short, creeping rhizome about 10 cm long and 3 or 4 cm thick from which leaves and flowers arise. The flowers are in a short, dense cluster on a 15 cm arching stem and bloom in three's and four's from among large, papery bracts over a period of a few weeks in summer. Two or three of these clusters of flowers will usually be produced over the flowering period.

Soon after flowering the fruit appear. These are whitish and succulent, about one and a half centimetres long and half as wide. The fruit are tasteless except for a very pleasant, very faint, sweet-acid flavour noticed when first bitten, but disappearing so quickly as to leave one wondering whether there really was a taste there at all.

The rhizomes may be eaten either cooked or raw, though cooked is preferable as there may be a fair amount of fibre, especially if they were growing in dryish conditions. I can say little about the flavour because they do not seem to have any.

Although the flowers cannot be said to be showy, the leaves are handsome, so this very easy to grow plant should be able to find a place in many gardens. A rhizome, of course, is the obvious method of obtaining a plant, but the many tiny, black seeds contained in the fruit grow quite readily. It can put up with quite a lot of sun — broken shade with some direct sunlight — but it must be kept well watered.

Cultivation Note from Garry Sankowsky — Grown in full to semi-shade. Apply extra water during dry periods.

Creek Aceratium — *Aceratium megalospermum*

A small tree of about 10 m which grows at elevations from sea-level to 600 m in areas of high rainfall. It is never far from a creek or river and is most often met with overhanging the water. The head of the tree forms a sparse, open canopy which has a decidedly attractive lacy effect. The bark is pale grey or cream and smoothish; though in old specimens growing out of reach of floods, the bark may be brown and a little flaky and covered with moss or lichen.

The lanceolate, opposite leaves with down-turned edges, about 7 cm long, are borne on very thin, often pendulous, twigs. The tips of the twigs, petioles and larger leaf veins are covered with fine brown hairs.

It flowers profusely during September and October, bearing bunches of the usual *Elaeocarpus* type flowers — cream coloured, five-petalled flowers with the ends of the petals finely divided. ►

The fruit — maturing during November, December or January — are smooth, elliptical, about 3 cm long and half as wide. The colour is varying shades of red to almost black, depending on the tree. They have a crisp flesh covering a hard rough stone similar in shape to the fruit. The flavour is extremely variable, so do not be put off if the first fruit is so sour as to be almost bitter. Try fruit from other trees. There are lots of degrees of sourness and the flavour of a good one is both enjoyable and refreshing.

Cultivation Note from Tony Irvine — The attractive foliage and small form make it ideal for a garden, particularly in high rainfall regions. I am growing this plant at Atherton, in a rather dry site where the dry season can cause drought die back.

Cultivation Note from Garry Sankowsky — This is a very attractive tree and can be grown easily in semi-shade. Given regular water it will flower readily in semi-shade.

Nutmeg — *Myristica insipida*

This tree is very common in lowland rainforest — often forming pure stands — but becomes less and less plentiful with higher elevations until about 600 m where it ceases altogether. It normally grows to about 10 m, although larger specimens are not uncommon. The trunk and branches are very dark coloured, usually with a greenish tinge of lichen. In older trees the lichen is usually thick and moss-like and the bark sometimes lifting in large, brown flakes. The tree seldom forks and the branches are horizontal, in whorls of four or five which, on the lower trunk where the branches have disappeared, leave swellings around the trunk at more or less regular intervals. The leaves are elliptical, alternate, 10 to 15 cm long, dark green above, paler below and, like the leaves of many rainforest trees, with a downturned tip. Photograph on page 73.

Almost any part of the tree, but particularly the bark and the growing tips, will give off a distinctive smell of nutmeg when damaged and quickly oxidise to a reddish brown colour. A small amount of bright red sap will ooze from the cut inner bark or the wood. The plants are dimorphic — the small, brown male and female flowers being borne singly on very short stems along the twigs on separate trees. ►

Australian Flora Botanic Gardens

2001

The proposal involves the creation of botanical gardens for the native flora of Australia in selected areas of Australia.

1. Collectively the network of botanic gardens are to represent the complete range of environmental conditions found in Australia. With each site contributing a unique range of growing conditions, the entire range of flora may be maintained. This off-site conservation of our unique flora will contribute to its on-site conservation in adequately managed natural reserves.

2. The selected site must be on a major tourist route and become, as well as a vital component in a national conservation strategy, an important feature in the promotion of tourism, see page 62.

3. The local government must demonstrate their commitment to the project by providing a suitable site of the order of 200 hectares, engage a competent consultant to prepare a detailed development plan and an estimated total cost of the project, and commence work on a stage 1 of the scheme. There must be a significant demonstrated interest by the local people and a desire for involvement.

4. On establishment, the local government authority must accept responsibility for the continued maintenance of the botanic garden in accordance with a defined management strategy. As a minimum requirement this will involve the employment of a competent Curator and three gardeners. The management plan should allow for community involvement. ■

From July to October or November the fleshy, yellowish-brown, velvety capsules split open to reveal an oval, shiny brown seed enclosed in a lacework of red aril. Although the seed is much smaller than the commercial nutmeg, the flavour is similar and so the dried, grated seed may be used in a similar manner. The red, lacy covering of aril — the mace — is also equal in flavour to commercial mace. This mace, peeled from the seed and dried in the sun until brittle — about two days — may be kept in an airtight container for a considerable time. But it must be sun-dried to retain its bright red colour. Dried in an oven it will darken.

A sweet and a pickle is made in South East Asia with the fleshy, outer halves of the fruit of the commercial nutmeg. I have made the sweet from the local species and it is quite tasty either eaten as a sweet or added to dried fruit in various recipes. For both the sweet and the pickle the fresh halves are first boiled until tender changing the water at least twice so that the flavour will be more mild. To make the sweet the fruit is then put in a pan and covered with a syrup made up of a cup of sugar to each cup of water and boiled in this until the syrup has completely penetrated the fruit. The fruit may then be packed into jars and covered with syrup.

A colour photograph of *Myristica insipida* leaves and fruit, the fruit starting to split open and show the red aril enclosing the seed, is on page 277 of Volume 16, incorrectly captioned *Beilschmiedia bancroftii* Yellow Walnut.

I have not tried the pickle, but here is the recipe. The halves of fruit that have been boiled until tender are packed into jars and covered with hot vinegar that has been sweetened with a tablespoon of sugar to each cup of vinegar. Two days later the vinegar is poured off, reboiled and again poured hot over the fruit. This is repeated in another two days. Leave for a month before use.

Close to some north Queensland beaches where the old dunes and shingles have been colonised by rainforest, one may find a nutmeg that looks quite different though immediately recognisable as a nutmeg; and it is not only that the tree is more compact, which would be expected considering the poverty of the soil. The leaves are consistently larger — up to twice as large — thick and leathery. The fruit are much larger — also at least twice as large — and are in clusters of up to five or six and are not covered with short, brown hairs to the extent of the smaller version, so that they are of a more yellow colour. The seed, little wider but much longer, is virtually tasteless, while the mace is bitter and no part of the plant has any smell of nutmeg. The small, most common nutmeg used to be named *Myristica muellerii*, while the larger, very much less plentiful version was appropriately named *M. insipida*. Only one species is now recognised for Australia, and the name *M. muellerii* has been dropped. It seems a pity that the name adopted should be inappropriate to all but a tiny proportion of the wild specimens.

The nutmeg is an important item in the diet of the Torres Strait or Nutmeg Pigeon — *Myristivora spilorrhoea* — generic name means nutmeg eater.

Seeds germinate readily although, even freshly fallen seeds often contain the grub of a beetle, so many are lost. They are reasonably fast growing trees, but are disappointing as subjects for rainforest regeneration as they do not take at all kindly to impoverished ex-rainforest soils. ►

Rose leaf Raspberry Bush — *Rubus rosifolius*

A plant of northern rainforests at all elevations. It usually grows along the edges of rainforest, in clearings and open places in rainforest and in sheltered parts of wet sclerophyll forest where it is unlikely to be damaged by fire. The plants spread by means of creeping rhizomes and may form thickets — sometimes rather extensive. The height of the canes varies from place to place depending, it would seem, on the quality of the soil and the amount of light. In some colonies the average length of the canes would be about a metre while in others they may be as much as three metres. All stems and the mid-ribs of the leaves are armed with thorns.

On young canes flowering and fruiting is confined to the terminal section, the lateral stems being short and sparse. Flowering and fruiting begins in early winter in the lowlands and early spring in the higher country and progresses into early summer, or later, by which time the lateral stems have lengthened and are fruiting. The fruit may reach 3 cm across. They are flattened and hollow with a very good flavour.

The leaves, which consist of usually five leaflets — though three or seven may also be found — may be used as a tea. The flavour is slightly astringent and pleasant.

Plants are easily propagated by taking a young cane which has a length of rhizome about 15 cm long attached. In cooler areas they do not mind full sun, but in hot lowland areas they do best in light shade or where they get full sun for only half of the day.

Cultivation Note from Garry Sankowsky — This plant is best grown as a tub specimen as it soon becomes a wood. It must have high light in order to flower. ►

Living With Australian Soils

2001

Australia is an old continent and its soils are usually nutritionally poor and highly leached. The surviving flora has adapted to these conditions by forming mutually beneficial associations with micro-organisms which improve the supply of very important mineral nutrients. Bacteria supply some plants with usable nitrogen, the bacteria living in specialised nodules on the roots of plants such as *Casuarina* and various legumes. Most plants, however, form associations with fungi or mycorrhizas in soil. The fungi explore the soil beyond the root and deliver phosphate to the plant along its filaments. In both cases, the micro-organisms are supplied by the plant with energy for their growth and survival. The absence of these microbes leads to some severe nutrient deficiencies being experienced by plants.

Mycorrhizal fungi are killed by severe soil disturbance as in mining or reduced when vegetation is removed as in clear felling in forestry. Absence of mycorrhizas becomes a problem when the disturbed areas come to be revegetated. Seedlings which are planted out often die. Only where the plant is supplied with fertiliser will a few of the hardier species survive. Many Australian plants are said to be hard to establish. In many cases, these plants will not grow without their mycorrhizal associate.

Mycorrhizal fungi also play a direct part in stabilising the soil. Because fungi grow through the soil, the fungal filaments bind soil particles together. It is now accepted that much soil is eroded away because the fungal filaments are no longer dense enough to prevent wind and water removing the smaller particles.

We must learn to manipulate the micro-organisms so that we can make the most of our soils not only to restore healthy vegetation and soil but to commercially grow food sources for ourselves, nature's way. There is an alternative to further adding salts and chemicals to our soils, poisoning our land and rivers. ■

Large-leaved Sandpaper Fig — *Ficus copiosa*

A small tree of the lowland rainforest that grows to a maximum height of 8–10 m. It seems to prefer to grow on the banks of creeks and gullies. The leaves are up to 40 cm long, a third as wide and very "sandpapery". From a truncated base the leaf tapers, with an almost straight outline, to the widest part which is about a third of the length from the apex. Each leaf is attended by two narrow stipules a little more than a centimetre long. Immature leaves are often lobed.

This species normally bears two crops of fruit a year — one in spring and one in autumn during the last of the wet season — of large, pale yellow, almost tasteless figs which are eagerly sought by flying foxes, tube-nosed bats and wild pigs. These figs are quite alright if stewed and a little sugar added. But this tasteless fruit is not the main attraction of this species. What is most interesting and pertinent about this tree is that occasionally one will come across a specimen in which the figs are inclined to be orange, red or brown in colour. The fruit of this darker coloured strain is very good. They are about 4 cm across with thick, juicy, yellow flesh that is almost equal to cultivated figs — only a little less sweet.

This is a well worthwhile tree for the coastal tropics where it is much too hot and wet for conventional figs to grow successfully. It will begin to fruit when a metre and a half high and is most prolific.

Marcotts root readily and plants will grow in full sun so long as the roots are kept cool. Although it prefers plenty of moisture, it can suffer drying out just as it does in spring and early summer in its native habitat.

Tracymene geraniifolia

Growing among the boulders and wind-stunted plants on granite outcrops well within the cloud zone at 1,000 m of rainforested mountains, this plant has come a long way from where the majority of the genus grows in sclerophyll forest or open plains of the dry, even barren, parts of Australia. Many of the dry country species are known as wild parsnips because of their large, white parsnip-like roots. *Tracymene geraniifolia* does not have an enlarged tap-root, no doubt as there is no dry season so prolonged as to warrant either food storage or a period of dormancy in its cloud-swept, rainy habitat.

A young plant is merely a rosette of leaves, each of which is 3 or 4 cm across on a petiole about 5 cm long. As the specific name implies, the leaf is similar in shape to that of a geranium; not so succulent and inclined to become reddish in strong light. From among these leaves it will send up its branched flower stem with its heads of tiny white flowers. It is a slow grower, but eventually, with the progression of leaves and flowers, a centimetre thick, sometimes branched, stem is produced. In large specimens growing in sheltered situations the stem may attain a length of 30 cm or more, though only the last few centimetres will be erect, while the leaves are up to 10 cm across.

The stem is rather soft and fibrous and both it and the leaves have a flavour, though not pronounced, of carrots or celery.

I see no reason why the seeds of this plant — which ripen in summer — would not grow easily enough; and I am sure that it would make a delightful little pot-plant that would enjoy cool weather, a little broken sunshine and plenty of moisture. The soil that they grow in is almost entirely peaty leaf-mould with a sprinkling of coarse sand weathered from the granite boulders among which it has accumulated. ►

Fungus Root — *Balanophora fungosa*

One of the strange plants of the rainforest. Though common, it is not well known, as there are only a couple of months of the year that anything of it is visible and even then it may not be recognised as a flowering plant, but taken to be a rather uninteresting fungus, an exposed root or, particularly if there are spent flower-heads among the group, cassowary or wild pig droppings.

The main part of the plant is a lumpy, warty, shapeless affair up to the size of two fists, growing on to and around one or a number of small roots — never thicker than a pencil — about 10 cm underground, for it is a root parasite. Being a true parasite it does not synthesise its own food so has no chlorophyll. All parts of the plant are yellow, although sometimes the female flower-head may be a dull pink or the scales on the flowering stem may assume a purplish tinge — possibly from being damaged.

During winter flowering stems grow from the tuber upward to the surface. Fully grown, the flowering stem would extend 6 or 8 cm above the ground — about 20 cm long in all. These stems are about 2 cm thick and enclosed in leathery protective scales and vary in number from one or two to a dozen or so. Above the ground, as the stem lengthens, first to emerge from the protective scales are the female flowers, so reduced and so crowded on to the dome-shaped head as to be unrecognisable as flowers and instead have the appearance and feel of a piece of felt.

A little below the head of female flowers the male flowers arise from pits in the stem — pits which contain rather large quantities of nectar with a sweet, though decidedly musty, smell. The male flowers have four narrow, brownish petals which fold back along the pedicel giving maximum exposure to the single round anther covered with white pollen. When pollination has been accomplished the female flower-head becomes brown and expands slightly as the thousands of tiny seeds covering the surface mature. At the same time the stem turns black as it shrinks and disintegrates, so that the round fleshy portion to which the seeds are attached becomes free of the plant.

In south-east Asia the flowering portion of the plant is considered to be an aphrodisiac — probably because of its phallic appearance. This could be so, it tastes dreadful enough to have lots of medicinal properties. ■

Die-back of Trees in our Australian Landscape

2001

The Australian public is becoming increasingly aware of the disaster overtaking the trees in our forests and general landscape. They do not realise, as yet, the full extent of this disaster as the dreaded fungus *Phytophthora* spreads across our land devastating what remains of our trees. If this national disaster directly affected people or pigs there would be a national outcry.

Much space could be devoted to lengthy but graphic details, experiences and facts that lead to the inevitable conclusion, the ultimate destruction of our forests and trees decorating our landscapes. The current plan for The Greening Of Australia will eventually be frustrated and finally aborted as the trees die quicker than we plant them.

Much is being done with very limited resources by concerned scientists in peripheral areas, principally in a futile effort to contain this fungal problem. Theories and proposals are being postulated but none of the authorities involved have the financial resources to attack this problem on the co-ordinated, nation-wide level necessary. As a matter of urgency, a scientific authority should be commissioned to devise a vigorous plan of action for research to resolve this threat, probably by biological controls. ■



Balanophora fungosa. The cream domes are masses of female flowers surrounded by the ring of white flowers below them. When pollinated the female flower head becomes brown with thousands of tiny seeds. Shown below is a whole plant, the soil removed to show its parasitic attachment to the root of nearby tree. Photograph by Harry Dick.



A Beginner's Rainforest

Far North Coast Group
of SGAP NSW

Most people think of rainforest trees as huge forest giants and reject any thought of growing these in their small gardens. But rainforests consist of much more than large trees. There are also small trees, shrubs, ferns, palms, orchids, climbers and ground covers. Many of them are suitable for the smaller garden. The diversity of leaf shape, colour and texture, not to mention flowers, fruits and spectacular flushes of new growth can combine to achieve a stunning effect.

By careful selection of the smaller species, you can create the impression of rainforest on an ordinary suburban house block. Indeed the effect can be created even by planting in tubs grouped upon a sheltered balcony. On larger blocks taller trees may be added. On the far north coast of NSW the beginnings of a rainforest could be achieved within five years. Rainforest species may be grown in most locations along the east coast of Australia. When choosing plants, however, consider prevailing winds and the likelihood of frost.

The area to be planted may be covered fairly densely with small to medium-sized trees, at one and a half to two metre spacings. Shrubs and most small plants should be planted at this time. Contrary to popular belief, most rainforest trees will grow well in full sun. Because rainforest plants are surface rooted, the addition of a mulch is necessary for nutrition and moisture retention. After a few years your fledgling rainforest will be laying down its own mulch from leaf and twig litter. The need for water, particularly in the drier months, will be reduced as the litter increases.

A dose of slow-release fertiliser in the planting hole, and further twice-yearly applications of pelleted fertiliser (e.g., Dynamic Lifter) will get your plants off to a fine start. It is not necessary to limit phosphorus with rainforest plantings.

Once your trees have formed a canopy, you can begin to add orchids and ferns, whilst epiphytes may be attached to suitable trees. These should thrive in this cool forest atmosphere.

Paths, randomly edged with logs or rocks, may be established at an early stage. Seats at strategic points allow you and your visitors to rest and admire your handiwork. Extra luxuries may include nesting boxes as your trees grow sturdier and cat-proof bird baths. Even in the suburbs, birds will soon be attracted to your little patch of native habitat. Adding logs and rocks will make shelters for lizards and frogs, helping control the insect population. ■

Sub-tropical Australian Native Gardens

Compiled by members of the NSW Far North Coast Group of the Society for Growing Australian Plants, this unique small book is well described in its subtitle "How to select, plant and nurture native trees, shrubs, flowers, ferns, palms and orchids in your sub-tropical garden on the North Coast of NSW". The article "A Beginner's Rainforest" is taken from this book, what greater recommendation can be given. Other articles include, Planning your garden; Soils are what you make them; Planting; Choosing the right plant; Popular plants for beginners; Recommended popular plants (240 species); A beginner's rainforest; Recommended rainforest plants (130 species); Seaside gardening (106 species); Container plants; Attracting birds and butterflies; Ferns; Recommended ferns (19 species); Palms; Recommended palms (16 species) and Orchids.

For each of the recommended species you are advised of the scientific name, the common name, growth habit (climber, herb, prostrate, shrub or tree), exposure (shade, part sun or sun), preferred soil (boggy, heavy or well-drained), suitability for tubs, method of propagation, flower colour, flowering season, bird or butterfly attracting and comments indicating its most attractive feature. The book will be useful for gardens from Rockhampton south to Port Macquarie.

Available for \$8.50 including postage from Far North Coast SGAP Book, P.O. Box 4083, Goonellabah, NSW 2480. Wholesale rates apply to SGAP groups.

Wildflowers Developed for Horticulture

by W. H. Payne

The following plant cultivars have been registered with the Australian Cultivar Registration Authority, wildflowers carefully selected for use in the garden, continued from the last issue, page 26.

Grevillea 'Jester' flower is similar in many respects to *G. 'Robyn Gordon'* and the leaves are similar but finer than *G. 'Honey Gem'*. It is said to have arisen in cultivation in the garden and to be a hybrid between *G. 'Honey Gem'* (*G. pteridifolia* × *banksii*) and *G. 'Coconut Ice'* (*G. bipinnatifida* × *banksii*). It is a moderately dense spreading shrub to 3 m and 2 to 2.5 m tall. The leaves are green above and much paler below. Flowers appear all year. Rhachis is 12–14 cm long whorled form densely packed terminal. Each flower is 3–4 cm long and the style is deep orange-red (44B); perianth tube is 1 cm long and pale orange outside and deeper (45A) or curved lobes. Light rose perfume. Leaves are grey, silky long, appressed and deeply lobed with a pungent mucronate tip; 20–21 cm long with recurved edges; leaf segments are angled upwards. Similar in habit to *Grevillea 'Robyn Gordon'*. It is said to be medium hardy to drought and frost and resistant to most rot.

Grevillea 'Red Hooks' is suspected to be a hybrid from *G. longifolia* × *G. tetragonoloba*. It is a rounded, dense shrub up to 3 m high by 4–5 m across, with more or less horizontal branches. The bright green leaves are pinnately lobed, with narrow-linear lobes to about 30 mm. Overall leaf length is up to 15 cm. The bright red, toothbrush-like racemes are usually held horizontally and are about 70 mm long. They appear for most of the year but give a maximum display in winter and spring. The perianth is greyish green (174C) and the long, smooth style is bright red (53A) and tends to bend backwards.

Grevillea 'Red Hooks' has 10 deep lobes in each leaf. Each lobe is 0.1–0.2 cm wide, revolute and up to 4 cm long. *G. tetragonoloba* has deeply divided leaves with three lobes each revolute length 2 m. *G. longifolia* has flowers not as dense as the other two with paler styles but these are very prominent. Leaves are 15.5 cm long. Usually sold as *Grevillea hookeriana* it is a very vigorous, dense grower which adapts well to moist soils and climates. ►

Outstanding Wildflowers

2001

We need a wildflower to commemorate the Year 2001, 100 years of Federal Government, the Olympic Games 2000 and the World Garden Festival. We need an exceptional flower/s. Horticultural research institutions and the horticultural industry will be invited to develop plants for selection. This is a large continent and it is reasonable that there should be such a plant developed for each state, the market demand sorting out the plant with greatest appeal.

As with all our 2001 recommendations there should be an economic benefit to the community of 2000 and beyond. The export income alone for the right plant will be worth millions. The commercial demand is for four categories of plant, for cut flowers, as a flowering potted specimen, a plant most suitable for garden planting and landscaping, and decorative plants for use, say indoors, such as a fern or even an orchid.

Submissions will be received for the development of plants in each of these categories for adoption and mass marketing during the years 2000/2001 and beyond. Submissions seeking funding for research and development must include a summary of procedures to be adopted pending a request for more detail. Further details, next issue. ■

***Grevillea* 'Ruby Clusters'** arose as a chance seedling, its parentage thought to be *G. shiresii* and *G. speciosa* spp *oleoides* or a *G. victoriae* hybrid. It is a dense, rounded shrub 1–2 m tall by 1–2 m wide. Leaves are entire, narrow-elliptical to narrow lanceolate, 35 mm–65 mm long by 7–12 mm wide, with a short (3–5 mm) petiole, upper surface glabrous, dark green, with a prominent mid-vein and less prominent secondary venation, lower surface sparsely covered with a fine appressed indumentum, venation not prominent. Flowers (55A) in erect terminal inflorescences on short lateral branchlets, or occasionally axillary; simple or occasionally branched, ca. 35 mm long by 40 mm wide. It is characterised by the clusters of large ruby red, curiously shaped flowers and the narrow, elliptical glabrous leaves. It differs from *G. shiresii* in having ruby red, not green flowers; smaller, narrow-elliptical leaves; smaller bushy shrub to 2 m. ■

The Grevillea Book, Volume One

by Peter Olde and Neil Marriott

The first of three volumes is available at last. When first I heard that the descriptions of the 340 species together with their colour photographs were confined to Volumes 2 and 3 I was concerned that Volume one would have only limited demand. After all, at \$65 each, how many can we afford. Volume one is a testimony to the dedication and meticulous accuracy of the authors. It is a superb, valuable work because of the presentation aimed to unfold a work of extreme scientific value in a manner for us all to enjoy.

- Chapter 1 — A historical perspective of the genus *Grevillea*. A unique presentation of the early botanical history of Australia.
- Chapter 2 — The people of *Grevillea*. A short portrait of the early botanists.
- Chapter 3 — The structure, evolution and biology of *Grevillea*. An exceptionally interesting study.
- Chapter 4 — The distribution and habitat of *Grevillea* in Australia.
- Chapter 5 — A history of *Grevillea* in cultivation from the period of Joseph Banks.
- Chapter 6 — Cultivation of *Grevillea*. A valuable reference for wildflower gardening.
- Chapter 7 — Propagation: detailed descriptions for the beginner to the expert.
- Chapter 8 — Pests and diseases — not a real problem but well reported.
- Chapter 9 — Landscaping with *Grevillea*.
- Chapter 10 — A complete checklist of all 340 species, giving, in easily followed columns (in fact, 63 columns for each species and sub-species), all the main features of the plant, where to plant it, propagate it and grow it. This 23 pages of tabulated information is exceptionally valuable.
- Appendix — New names and combinations for newly named species.

A key to groups and to the 340 species. Essentially a scientific work that defies me at the moment. However, it is one of those keys that is liberally sprinkled with sketches to graphically illustrate those strange, precise, scientific terms and I can see myself using it in the future.



△ *Grevillea laurifolia*

Photography, Neil Marriott

▽ *Grevillea longifolia*



Our proposals for the conservation of our continent, briefly summarised in the preceding pages, taken individually, do not appear very dramatic, but their effect will be survival and future prosperity. They need further study and development but let us not get bogged down in details. Were you convinced that not only is such action desirable but that it is desperately needed. Believe it or not but your politicians can and will take the action indicated if they are convinced that this is what the nation wants. The problem is to convince them that this is not a "greenie" whinge but a soundly based plan for future economic prosperity.

Do you care enough to do something about it? Go to the trouble of sending a letter to the Prime Minister of Australia, Parliament House, Canberra and a copy of it to your Federal Parliamentary Member. I will send a copy of this issue with comments to the Prime Minister so he will be quite clear as to what you are referring. Bring this journal to the attention of your neighbours and friends and especially the young adults of the community. Encourage them to get the teacher to debate the crisis in school at all levels. If you give your copy to people to help widen the debate and send me \$1.00 for return postage, I will send you a replacement copy. 1995 is the year of decision on these matters so act now or forever hold your complaints about politicians and the establishment.

Wildflower Nurseries in Queensland

Fairhill Plants and Botanic Gardens — Huge range; rainforest plants, grafted grevilleas, rare plants, wildflowers, ferns, orchids, revegetation trees. Extensive display gardens. Open every day 8.30 a.m.–5.00 p.m. Fairhill Native Plants, Fairhill Rd., Yandina, Qld 4561. Tel. (074) 46-7088.

Wildflower Nurseries in New South Wales

Bryant's Native Plant Nursery — Cosy Camp Road, Bex Hill, N.S.W. 2480. Tel. (066) 28-4323. 15 kms north of Lismore. Open 7 days (from 11 a.m. on Sundays). Extensive range of trees, shrubs, groundcovers, rockery, grafted Grevilleas, rainforest plants. Excellent quality and service.

Camden Haven Wildflower Garden — At Kendall Country Living, 105 Kendall Rd, Kendall, N.S.W. 2439. Tel. (065) 59-4102. 1 km from Pacific H/way at Kew. Specialising in grafted natives and rare and unusual plants. Closed Tuesdays.

Dealbata (cold climate) Aust. Plant Nursery — off Bloomfield St., Dalgety, 2630. Tel. (064) 56-5043. Specializing in alpine and dry Monaro plants — grown from locally collected material. Phone to arrange visit.

Floralands — Parry's Nurseries Pty. Ltd. Kariang via Gosford, 2250. Tel. (043) 40-1142. Preservation by cultivation. Send \$1.50 for descriptive catalogue.

Kentilly Native Plants — 206 George's River Rd., Campbelltown, 2560. Tel. (046) 25-1583. Open 7 days.

Newcastle Wildflower Nursery — 45 Pacific Hwy, Bennetts Green 2290. Tel. (049) 48-8576. Extensive range of native plants including rare and endangered species.

Wariapendi Farm Nursery — Church Ave., Colo Vale (7 km north of Mittagong off F5, take Colo Vale exit). Tel. (048) 89-4327, Fax (048) 89-4092. Growers of frost hardy natives from tubestock to advanced. Open 7 days.

Wirrumbirra Native Nursery — Hume Hwy. between Bargo and Tahmoor E. side 2574 (3 km from Freeway entry). Wide range including unusual plants. Tel. (046) 84-1112.

Wirreanda Nursery — End of Wirreanda Rd., Ingleside, 2101. Tel. (02) 450-1400. Growers of advanced and semi-advanced native trees and shrubs. Open 7 days.

Wildflower Nurseries in South Australia

Anne and Colin Dealtry — Lot 2, Trevilla Rd, One Tree Hill, SA 5114. Large range of tube-stock plants. Display Gardens. Open most of the time but phone to check. (08) 280-7079.

Nesbitt's Orchids — P.O. Box 72, Walkerville, S.A. 5081. Tel. (08) 261-1550, Fax (08) 266-0372. Specialists in the propagation of Australian terrestrial orchids. Send S.A.E. for list and culture notes.

Wildflower Nurseries in Tasmania

Plants of Tasmania Nursery — 65 Hall St., Ridgeway 7054. SAE catalogue. (002) 39-1583. Closed Tue & Wed.

Wildflower Nurseries in Victoria

Bushland Flora — Indigenous plants of Melbourne. Ph. (03) 736-4364 for stocklist.

Kuranga Native Nursery has the largest range of native plants in Australia. Specialists in rare, collectors and hardy varieties, rainforest and grafted plants, grasses and Melbourne's indigenous plants in forestry tubes and more. 3913 Marondah Highway, Ringwood 3134. Ph. (03) 879-4076. Open 7 days. Delivery Australia wide. Stocklist free.

Australian Wildflower Seed Suppliers

Nindethana Seed Service — Largest selection of native seed in Australia. RMB 939 Woogenilup, W.A. 6324. Available in 50¢ pks, gram lots or kgs. Please forward a stamp-addressed envelope for free catalogue. Tel. (098) 54-1066 in business hours. Telex: AA 91938.

R. Horner — 1 Grundy St., Alice Springs, N.T. 0870. Seed of trees and shrubs of Central Australia. Please send 45¢ stamp for a list.

Western Australian Wildflower Society — P.O. Box 64, Nedlands 6009. A wide selection of Western Australian seeds is available at \$1.00 per packet, plus postage of 45¢ for a number of packets. Send for a catalogue for \$2.00 plus 80¢ postage. A huge range of seeds at a price you can afford expertly collected, labelled and packed. A book "Hints on Growing . . ." 40 pages, \$3.80 posted.

Propagating Australian Plants

by Alec Blombery and Betty Maloney

Many people enjoy the experience of growing their own plants from seed and cuttings. Anyone who purchased this new book published by Kangaroo Press, even if they have never tried before should have rewarding success. With the easy style shown in *Australian Cycads* on page 53 and the skilful illustrations by Betty Maloney, you will learn a lot about plants as well as growing many for the garden. This would be an ideal book for a young person encouraging their enquiring minds and active hands as the result will be reproduced plants using very basic techniques and readily available facilities.

"Australian Plants", The Australian Flora Periodical

Past issues are available for all volumes (4-10/11), each volume is bound and cased, beautifully presented with green vinyl covering and gold lettering for \$21.00, plus \$5.00 post. Volumes 12, 13, 14 and 15 are available only from The Editor, Australian Plants, 860 Henry Lawson Drive, Picnic Point 2213, for \$40 each plus \$6 postage.

Binders to hold the eight separate issues of Australian Plants in a volume are \$5.50, plus \$3 post.

Other Books Published by the Society:

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"**Australian Plant Genera**" by J. A. Baines. \$9, \$5 post.

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