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[Introductory] Len has still not been having much luck with his health, & has seen more hospital walls than enough. I've had many notes wishing Len well, including

from Irene Champion & Harry Krantz. However, his writing arm is still functioning. I have added a few notes to his following two articles, but as footnotes so as not to disturb his flow, & numbered them (1) & so on, & placed them at the end of the relevant article.

[LEN BUTT: CULTIVATION DIFFICULTIES OF INDIGENOUS CYCADALES]

The vast majority of indigenous cycadales will grow best in terrain similar to their habitat, & difficulties arise when trying to cultivate these away from it. There are exceptions to the rule of course, but if growing in a container, the potting mix should try to copy the essence of the plant's place of living. Generally speaking, N.T. Cycas spp. are very difficult to grow successfully in temperate zones if this is not done.

Good drainage is essential, so well-crocked pots are best (1), & my preference is for crushed house brick (2). Many of the cycads & zamiads grow in limestone outcrops under eucalypts, so this must be remembered when potting them up. Some may benefit from limestone chips in the mix. Small diameter gravel to open up a mix helps if the plant is of granitic origin. These plants have excellent landscaping potential, but to our farmers they still bear the stigma of their potentially cattle-paralyzing M.A.M. toxins. What is seldom recognized is the fact that this can be corrected, but of course difficulties arise in the management of 'scrubber' wild cattle, mostly from overstocked stations. Burning off of cycadales is only a band-aid method as the new arising fronds contain an even heavier quantity of poison, manufactured by the plant as a defence mechanism. The older fronds have much less poison.

To attain good looking plants it is wise to stick to varieties that will grow well in your area. Leave the N.T. & Kimberleys species to people living in those regions. The choice still remains quite wide. The genus Macrozamia contains great variety, with large zamiads like *M. miquelli* & *M. communis*, & the smaller members of Section Parazamia. *M. moorei* probably is the grandest of our landscape types, but is suitable only for large properties. The base of many fronds quill into savage spines, so it is not a species recommended for the home gardener (3). However, its eye appeal is better than many a palm. It inhabits the camping sites of Carnarvon Gorge N.P., where it can be seen in all its grandeur.

FOOTNOTES: (1) Crocking, it must be remembered, actually decreases drainage unless one uses an extra-deep pot to compensate for the crocking material. This is because a newly-saturated mix drains excess water all the way down the pot except for a transition layer near the bottom, which stays wetter as the capillary action gets broken. So a deeper pot has more "semi-dry" mix a few minutes after a thorough watering than will a shallower one containing the same volume of mix. Crocking a pot just lifts the "wet" zone higher in the pot, by putting in a pseudo-bottom. The practice arose last century or earlier, when many pots had inadequate drainage holes, often only 1 central one which was easily blocked unless crocked by pebbles & such. Ferns, which like moisture, are often placed in extra-shallow pots for the same reasons.

(2) I've found virtually all cycads & epiphytic ferns & some terrestrial orchids do well in my standard cycad mix, which comprises 50 to 60% power station furnace "ash", & the remainder slightly rotted animal manure (in order of preference, cattle > sheep > horse; Haven't tried poultry),

or anything else organic & rich in nutrients. The ash is actually a clinker-like inert material, neutral as regards pH, weed-free, & analogous to a mineral activated charcoal in that it is full of tiny cracks & crevices which hold air to keep roots healthy. I.e., a soil scientist would say it greatly increases the air-filled-porosity of the mix, which should be well over 25% for cycads. To measure a.f.p., fill a pot with mix, tape over its drainage holes, water until the whole pot is saturated, place over a bucket, remove the tape, let pot drain, & measure the water volume in the bucket. A.f.p. = volume of water/volume of mix, as a percentage. Even the epiphytic cycad, *Zamia gentryi* from Panama, is doing ok in this mix.

Macrozamia communis & some other *Macrozamia* spp. from coastal southern Australia (but not WA spp.) can take wetter conditions than inland spp., as can *Cycas revoluta*, *C. taitungensis* & the *C. rumphii* complex. Most WA & NT cycads require superb drainage. Many grow in sand-&-leaf-mould pockets on hillsides. *C. maconochie* & *C. canalis* are exceptions, growing in deep sand which is seasonally wet for a long period. Grow them like that in a temperate (or wet winter) climate & death is certain.

(3) I believe many home gardens of average size could accommodate a few large cycads like *M. moorei* or *Lepidozamia peroffskyana*, if carefully sited.

□LEN BUTT:LANDSCAPING WITH INDIGENOUS CYCADS AROUND BRISBANE□

There has always been plenty of scope to use the exotic *Cycas revoluta* in public gardens, as it has been with us for a really long time & can be very showy. Many specimens of the indigenous *Macrozamia moorei* were placed in Gondwanaland at the time of Expo 88. To my knowledge they were the only ones that flourished. Plants in the Expo & in the side street entrance just dwindled away. Mainly from neglect. This is undoubtedly the best & most impressive cycad or should I more correctly state zamia grown, & deserves a lot more T.L.C. than was given at Expo. The use of the rainforest species *Lepidozamia peroffskyana* in the main garden driveway at Mt. Cootha Botanic Gardens shows how well it will grow with a lot more attention.

I have seen individual full grown plants of *M. communis* growing in spots around Brisbane (it was the first cycad of any merit to be discovered). As you should know this is the "Burrawang". There are two (male plus female) specimens also at the entrance to the bush house at Greenworld Nursery (Stretton) doing very well.

For shaded areas the small *Parazamia* group are ideal as potted plants. My favourite is *M. pauli-guilielmi* from near Tin Can Bay in Qld. (4).

FOOTNOTE: (4). Landscape architects like to use cycads because they are geometrically interesting (especially some of the cones), give a ferny appearance yet with a hardy plant, & their shape & growth rates are predictable so that a given design is not disrupted by rapid or random growth, as it would be by plants such as wattles, eucalypts & the ever-leaning *Grévillea* Sandra Gordon.

Properly treated, they are drought-resistant & almost indestructible. Rolf Kyburz of the Brisbane firm K-Palms exports *M. moorei* caudexes around the world, & his clients in Asia & Europe report excellent survival from leafless & rootless caudexes. I planted one myself, 2 years ago last February, in a bed of my usual cycad mix. In case of storms, I tethered it to 3 iron posts for 4 months.

First leaves came after 6 weeks--6 of them & each a shade under 0.5m long, then 3/4m leaves about 3 months later, then 4 male cones, then 1.25m leaves, & it recently added 30 or so 2m leaves as well. No leaves have atrophied as yet. For the first 8 weeks I watered it daily, including the 5.5 ft showing of its 6 foot trunk (6' buried). In a less well-drained mix I would not have dared to water it so often. This plant made fronds (& bigger ones) faster than caudexes planted by Rolf & watered less heavily. Incidentally, I'm told the best guess is that 1 foot of trunk height in the wild represents 100 years of growth, so this *moorei* is likely to be around 600.

I've never lost an adult *Macrozamia* transplanted with an essentially undamaged caudex, if it was well watered after moving. Any cuts I dust with elemental sulphur plus a fungicide like Dithane (Mancozeb) for a few days before planting. Northern *Cycas* spp. are less reliable, although most survive. Seasonally deciduous spp. like *C. conferta* & *C. calcicola* may need to be kept fairly dry while dormant, though the coastal spp. like *C. armstrongi*, *C. maconochie* & *C. angulata* are more resilient. *Macrozamia reidleyi* from WA is as touchy as a northern *Cycas*, & seedlings suffer a lot of leaf die-back for several years, possibly due to fungal attack. Eventually they seem to outgrow it.

□NEW BOOKS□: The Palm & Cycad Societies of Australia Inc. (PACSOA) will be publishing the most comprehensive book yet on Aust. cycads during late '98, with the authors being Drs. Roy Osborne & Ken Hill. Roy was a cycad researcher in South Africa, & now runs (with Stan Walkley) a cycad business just north of Brisbane. Ken is a senior botanist at the Sydney Herbarium, & recently revised the genus *Cycas* in Asia & Australia. The book will be very well illustrated.

Knut Norstog, a U.S. cycad researcher, has just published an authoritative but expensive (around \$150) book on cycad biology. Not many pretty pictures, but lots of up to date information.

□THIS ISSUE□ is light on cycad taxonomy & such, but I intend to focus on a lot of new names in the next newsletter. Ken Hill will keep on naming things. And all of you out there, comments on any palm or cycad subject would be gratefully received. None of my native palms have been caught doing anything newsworthy.

□CYCAD FLUSHINGS & SUCH IN MY GARDEN:□ My largest *Cycas armstrongi* flushed on 3-11-97 (29 fronds), & again on 21-2-98 (20 fronds). Both sets of leaves are healthy. I asked Garry Beaumont from Katherine, who dropped in about 2 weeks ago, how common double flushes were in the wild in that species, & he said it wasn't uncommon. Garry's Cycad nursery went 8 feet under water for several days in the recent floods, & the caudexes of many valuable aged specimens collapsed. Others survived; I think he mentioned the *C. rumphii* types. Dioons perished, & most *Encephalartos*. A number of palms had never had it so good, & were flushing madly. At least Garry's house was insured, unlike many other residents.

Of my 6 *Cycas megacarpa*, which usually flush in spring, only one has flushed, & that was the youngest, with no trunk to speak of, although its fronds are 1m or so long. The others have randomish dead (white) patches on perhaps 45% of their leaf area, with the dead patches being more common on the outer margins of the pinnae. Another aberrant cycad was a *C. calcicola* which did not start to flush until

23-2-98.

A *C. maconochie* teenager which had an 180 degree twist in every leaf last year did the same this year, but not until the leaves were nearly fully extended (I don't know if the same applied last year). The twist is about 3/4 of the way along the leaf, & is identical in all leaves. Has anyone got an explanation of this phenomenon? I have seen it before, but I can't remember in what.

Other cycads have behaved as described in my last newsletter. *C. angulata* are at all stages, as per usual. Cold weather in early spring meant *C. maconochie* & *C. furfuracea* did not flush until December.

APOLOGY RE THIS CUT & PASTE JOB; my new printer won't talk to the program I'd written this newsletter on (antique word processor). So I'll have to use Microsoft Word, which it will talk to, for next time.

STOP PRESS: Len Butt died in Greenslopes Hospital on 7-4-98, after 3 weeks in hospital. More next issue.