

Dear Members,

Greetings from sunny Queensland - a bit too sunny really. We could use some extra rain!

There has been a lot of correspondence over the last few months, and demands on the seedbank have been high, with over 300 packets sent off.

Subscriptions are now due for the 1986/87 financial year. Please check on page six to see if your subs are due. The subscription rate for this year remains at \$4.

The slide library is currently being updated, a task kindly undertaken by members Chris and Glen Brown of Yarra Glen. This being the case, the slides are temporarily unavailable for loan.

Welcome to the following new members who have joined the Euc study group since March:

#### The Dwarf Eucalyptus project

I'm sure you all saw the article regarding this project in the latest edition of Australian Plants. This is an exciting development which could yield some very useful results.

The objective is to develop dwarf Eucalyptus species as flowering ornamentals and landscaping feature plants. The initial implementation will use the resources of the Society for Growing Australian Plants. The project is to be registered as a research project with the Australian Flora Foundation. Initial studies will be based on scientific research by staff of Sydney University, Dept of Agronomy and Horticulture.

Dr John Clemens will formulate a plan of action and determine the resources necessary. The commercial horticultural industry will be consulted and encouraged to contribute.

SGAP and Euc study group members from all over Australia will be recruited to grow eucalypts developed for trial.

Presently I am unaware of what experimental procedures may be used, but at this stage, I would urge members to write to me and nominate species which meet the objective and give your reasons for selecting them. Please indicate the area and/or the number of euc plants you can grow or are willing to grow for the project. Also observe closely eucalypts in the bush and garden, for particularly desirable individuals. More details in the next newsletters.

#### Hillgrove Gum

The Hillgrove Gum (*Eucalyptus michaeliana*) is a rather rare species from New South Wales which deserves far greater attention from horticulturalists and gardeners.

Its distribution in the wild is centred on the small mining township of Hillgrove, on the eastern edge of the New England tableland. The habitat typically occupied by *E.michaeliana* is a rather special one ie. on the edge of deep gorges, but even there its occurrence is sporadic. It is most easily seen along the Long Point road which starts at Hillgrove. It also grows along the St Albens - Bucketty road north of Sydney, but again it is not common. It has been recorded from Mt Ballow in Queensland, but no-one has been able to relocate it there. *E.michaeliana* is listed as an endangered species by Pryor(1981).

It is a small to moderate sized tree, sometimes attaining 20 metres in height but more usually 10-15 metres. On open sites the trunk is short and the crown is broad and dense with drooping branchlets.

The bark is smooth throughout, generally grey or white, sometimes blotchy and resembling a spotted gum. The leaves are long and lance-shaped, grey green in colour and moderately thick. The buds are borne in peculiar compound axillary inflorescences, or in simpler terms, in big bunches amongst the leaves.

Hillgrove Gum has not been cultivated by non-enthusiasts, except in Armidale. Here it has been very successfully grown throughout the city. Armidale has a harsher climate than Hillgrove ie. more frosts and lower rainfall, but *E.michaeliana* thrives there and maintains its dense canopy.

The Hillgrove Gum is an excellent species for shade and/or windbreaks due to its dense crown and low branching habit. It is drought tolerant and very frost tolerant. It adapts to a wide range of soil types and it is fast growing. However its tolerance of poor drainage is unknown.

It should be suitable for cultivation throughout the southern half of Australia where rainfall exceeds about 800mm per annum. One further note of interest. Taxonomically, this species is an enigma. It has no close relatives and the taxonomists aren't quite sure where it belongs in the scheme of things. It has been placed next to the red gums, but it has no particular affinity with this group. The inflorescence of *E.michaeliana* is highly unusual in *Eucalyptus*.

Growing Trees on Farms by Marie and Bill Gooch, "Wisedale",  
Tas.

We own a farm in central northern Tasmania, in a frost hollow, containing some very wet and very dry areas, and varying types of soil.

Our naturally occurring eucalypt species are *E.viminalis* and *E.amygdalina* which are widespread. Also *E.ovata* on wetter river flats and *E.obliqua* on higher rocky hills.

Approximately six years ago we began propagating eucalyptus from seed (prior to this we obtained seedlings from a local nursery only to have lost them with our harsh winters, as the seedlings had not been "hardened off"). So with great enthusiasm we forged ahead, hoping to grow almost every species of eucalyptus available, but some years and many experiences later..... (and we are still learning and enjoying every minute of it). We would like to share some of our joys and heartaches with study group members.

Our main lesson learned is that seed collected from trees in our own area, or if possible from a harsher environment, have a far greater rate of survival. However we have also introduced quite a few mainland species which have proved successful. Our successful species are:

(a) Introduced

*E.melliodora* - slow to start, no losses, sheep like foliage

*E.mannifera* ssp *maculosa* - moderately fast growing, possums a problem

*E.nicholii* - good

*E.bicostata* - aphids attack juvenile foliage, otherwise very good

*E.cinerea* - very good, no losses, no problems, quick growing

*E.camaldulensis* - one of our favourites. Assumes a low weeping form in Tas, due to frost. Flowers at earlier age on drier sites!

*E.leucoxydon* - some problems with establishment, slow to start

*E.sideroxydon* - hardy, slow growing

*E.crenulata* - a few bug problems, otherwise good

(b) Tasmanian species

*E.cordata* - good growth, bugs a problem

*E.gunnii* - good, bugs again!

*E.ovata* - good

*E.pulchella* - good, must have wind protection

*E.subcrenulata* - very hardy, ants a problem

*E.pauciflora* - slow, but very good

*E.urnigera* - nice, "takes off" in 2-3 years

*E.globulus* "compacta" - showing a lot of promise as windbreak species

*E.risdonii* - very good, very ornamental

*E.nitida* - no problems

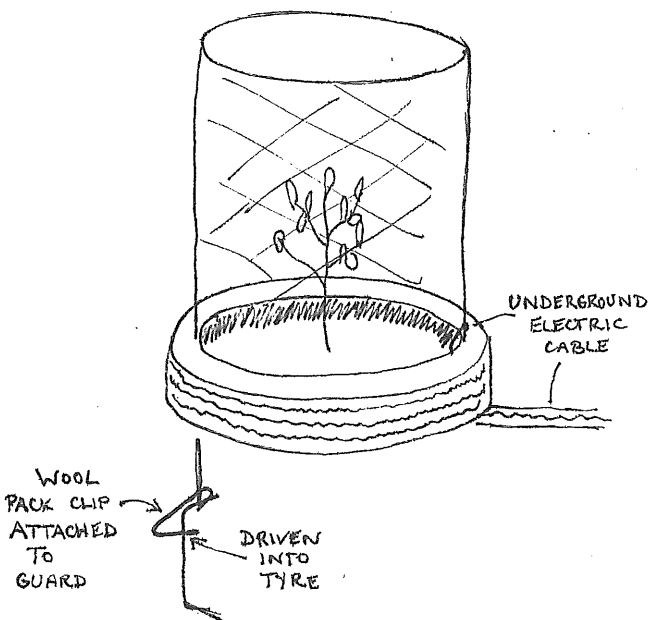
*E.perriniana* - good, fast, possums a problem

*E.brookeriana* - good

Our method of propagation is to sow seeds in punnets with sterilized soil during August-September; then "pot on" into a mixture of 1 part leaf mould, 1 part river sand/gravel, 1 part soil. These seedlings are then planted out the following autumn or spring - depending on season and species.

We have found that protection from wind at planting is vital. Our most economical being:  $\frac{1}{2}$  -  $\frac{3}{4}$  wt fertiliser bag with three small stakes. Mulch is also important.

Since we run both sheep and cattle, and after a great deal of experimenting, we are finding that our best means of tree protection is electric fencing. For spaced plantings we use an old truck tyre as insulation, with a wire netting guard, attached by three wool pack clips. Each guard is electrified by an underground cable, placed just under the turf. This may all sound complicated, but all parts are reuseable after the establishment of the trees. For group plantings, we of course just use boundary fencing.



Chaff

In the dictionary, chaff is defined as "separated grain-husks, chopped hay and straw, bracts of grass flower."

As far as eucalypts are concerned, chaff is the term most commonly used to describe the non-viable portion of a eucalypt seed-lot.

When a eucalypt fruit or "gumnut" sheds its contents, the result is a mixture of viable seeds and chaff. Some species, such as *E.alba*, produce three types of structures. Fertile seeds are produced towards the bottom of the placenta; in addition there are two types of chaff. The first type includes elongated particles derived from the upper part of the placenta. The second type of chaff consists of more cubical particles derived from lower down the placenta. Some species by contrast produce fewer and less variable seed structures. This is true of the Monocalypts (stringybarks, ashes etc). Species in this group have only two vertical rows of ovular structures. Viable seeds develop from the few lowermost ovules.

The proportion of seeds and chaff contained in the eucalypt fruit varies greatly between species, and even within species. In general terms, it may be stated that viable seeds comprise 3-20% of the total weight, therefore 80-97% of the contents is chaff. A few species contain less chaff, and *E.torelliana* is exceptional in that the great majority of particles are viable seeds (chaff content only 14%).

How do you pick seeds from chaff? The chaff particles are smaller and/or more elongated than the viable seeds, and paler in colour. In the case of Monocalyptus and a few other species, the chaff may be identical in size and shape to the viable seeds, but is generally paler. However sometimes separation of viable and non-viable is very difficult. In these cases, seeds can be separated from chaff by placing the mixture in water for about 12 hours. The fertile seeds swell and can then be readily distinguished.

#### Seed Stratification

Viable mature seeds of most eucalypt species germinate under favourable conditions without preconditioning. However, a few species, particularly from alpine areas require cold moist pretreatment to break dormancy. Cold-moist stratification can generally overcome dormancy in seed of all eucalypts that grow naturally in the alpine forests of Australia.

The stratification process is very simple. Firstly, sow the seeds onto a moist substrate in the germination container (tray, punnet or whatever you normally use). That is, plant the seeds exactly as you do normally. Then, cover the germination container with a lid or plastic sheet to minimise drying, and place in a refrigerated environment at 1-4°C. Check occasionally to see that the substrate remains moist.

The species which are generally considered to require stratification, and the recommended duration of treatment; are listed below

Three weeks of stratification is essential to break the dormancy of seeds of Spinning Gum (*E.perriniana*) and will also ensure more rapid and even germination of seed of *E.amygdalina*, *E.dives*, *E.nitens*, *E.pauciflora* ssp *pauciflora*, *E.regnans*, *E.stellulata*. Four weeks is essential for *E.glaucescens* and *E.pauciflora* ssp *niphophila*; six weeks is required by *E.kybeanensis*, *E.mitchelliana* and *E.pauciflora* ssp *debeuzevillei*

This year we are fortunate to have been given a grant from the Greening Australia Fund, which will be most helpful. We know we are very lucky to have ground on which to plant trees; but we consider there is no farm, no matter how big or small, that hasn't got room to plant trees. There is always a site - be it a swampy corner or a rocky knob, and there is a species to suit every site.

Any other members with ideas on eucalyptus plantings, in articles for the study group, would be interesting reading.

while *E.delegatensis* requires 6-10 weeks, depending on seed source. After the stratification treatment is over, simply remove the germination container(s) from the fridge, and leave them at room temperature. Germination will commence within 3-5 days.

#### Some new eucalypts from W.A.

A few months ago, in the journal *Nuytsia*, Mr M.I.H. Brooker and others have described several new species of *Eucalyptus* from Western Australia. These are:-

- (a) *E.suberea*, *E.lateritica* and *E.erectifolia* from the south-west of the state. These are all monocalypts ie. related to *E.pendens*, *E.todtiana* etc.
- (b) *E.celastroides* ssp *virella*, and *E.brevipes* from the south of the state. *E.gracilis* var *yilgarnensis* is also raised to species status as *E.yilgarnensis*. These species are mallees belonging to the Section Bisectaria.
- (c) *E.ferriticola* and *E.pilbarensis* from the Pilbara region of W.A. *E.ferriticola* belongs to the Subgenus *Blakella* and is closest to *E.aspera*. *E.pilbarensis* is a "gum" of the Section Bisectaria and is closely related to *E.trivalvis*.
- (d) *E.ceracea*, *E.rupestris* and *E.chlorophylla* from the Kimberleys. *E.ceracea* is of the Subgenus *Eudesmia*; *E.rupestris* is a "northern red gum" with affinity to *E.umbrarwarrensis*; *E.chlorophylla* is a green-leaved box related to *E.argillacea*.

Of these species, the one with the greatest potential for ornamental use, and hence of greatest interest to ESG members, is *E.ceracea*. A description and discussion of this taxon follows:

#### *Eucalyptus ceracea* Brooker and Done

It is a small tree up to three metres tall with yellow, flaky, fibrous bark. Juvenile leaves are stalkless, densely hairy and glaucous. Crown of the mature tree consists entirely of sessile glaucous leaves. Inflorescences are simple, axillary, to 9-flowered. Buds measure up to 16 x 7mm. Stamens bright orange. Fruits very shortly stalked, barrel-shaped, up to 22 x 13mm. Flowering period is August - November. This species is obviously closely related to *E.phoenicea*, which it resembles in bark, buds, flowers and fruits.

*Eucalyptus ceracea* is a small tree of striking appearance due to its yellow flaky bark, extreme white waxiness of the leaves, buds and fruits, and orange flowers. It has obvious potential as an ornamental plant, and may be suitable for cultivation throughout the frost-free parts of Australia.

It is known from just one locality in the northern Kimberleys, where it grows amongst boulders on a sandstone slope. The common name suggested by the authors is "Seppelt Range Gum".

#### Tasmanian Eucalypts

Tasmania is an island of contrasts; in terms of climate, scenery, and its eucalypts. It is home to the tallest eucalypt (*E.regnans*) and the smallest (*E.vernicosa*). The majestic Mountain Ash (*E.regnans*) towers above other trees in fertile valleys throughout the state, but especially in the Mt Field-Maydena areas. Here trees 80 to 90 metres high, and over 300 years old, are readily found. On high mountains quite close by, grows the Varnished Gum (*E.vernicosa*), a truly remarkable eucalypt, typically less than a metre in height, but every bit as old as the giant Mountain Ash trees. Imagine kneeling down to examine the canopy of a eucalypt, and you can begin to comprehend how unique *E.vernicosa* is!

For garden cultivation, there are many desirable species, but No 1 in my book is *E.pulchella*, the White Peppermint. This is an exceedingly beautiful and graceful tree with very fine foliage and smooth white or yellowish bark.

Silvery foliaged eucalypts are in abundance: *E.risdonii*, *E.tenuiramis*, *E.cordata*, *E.perriniana* and young plants of *E.gunnii* and *E.globulus*; but they often suffer from severe insect attack.

For very cold and frosty areas, *E.coccifera*, *E.gunnii* and *E.rodwayi* are ideal. *E.coccifera* requires reasonable drainage, but the other two species will tolerate fairly swampy sites. *E.brookeriana* and *E.subcrenulata* are very attractive trees with bronzy coloured bark. Both have green glossy leaves, particularly the latter. *E.amygdalina* (Black Peppermint) is a very widespread, and hence, adaptable species. It is a very pretty tree and worthy of cultivation.

The most common eucalypt in Tasmania would surely be *E.obliqua*. It is absent only from the south-west and the central plateau. By contrast, the rarest euc in Tas, possibly in the whole of Australia, is *E.morrisbyi*. This is a highly endangered species which grows near Hobart. Fortunately, it has been brought into cultivation in its home state, and forms a very attractive tree.

Many dedicated botanists and laymen have done much to further our knowledge and understanding of this complicated genus, starting 300 years ago.

Linnaeus and modern botany had yet to be born when William Dampier, the British buccaneer and navigator, landed from the *Cygnets* on the north-west coast of Western Australia in 1688 and noted there some trees with an exudation which he described as "gum". Dampier wrongly thought that this was the same as the resinous substance obtained from the Dragon tree (*Dracaena drago*) of the Canary Islands, then known as the Dragon's Blood of commerce, as was also the gum from *Dracaena cinnabari*. What Dampier saw was a substance now properly called "kino" and derived from eucalypts. Previously, in 1642, another sailor, Abel Tasman, had noted a "gum-lac" in tall trees when he visited Tasmania in the *Heemskerck*, but did not confuse it with "Dragon's Blood".

The next sailor known to bring men into contact with Australia's unique trees was Captain James Cook, who was making his first Pacific voyage of discovery (1768-1771) in the *Endeavour*. Cook not only had on board botanists to observe the eucalypts with more discrimination, but none other than the young naturalist Joseph Banks, who had four years earlier brought back to England from Newfoundland and Labrador, a large collection of plants and insects. Banks and his assistant, Dr Carl Solander, a protege of Linnaeus, noted once more the treacle-like substance from eucalypts near Botany Bay in 1770. It is not surprising, therefore, that Governor Philip, who founded the British colony in Australia, called the eucalypts "gum-trees" when he sent specimens of *Eucalyptus resinifera* to Sir Joseph Banks from Sydney on 15 May 1788. And so the misnomer "gum-tree" has been with us ever since.

Although specimens of eucalypts had been collected from Australia and lodged in England at Kew Gardens for a number of years as a result of Cook's voyages, it was not until 1788 that the first scientific description of any of the species was published in the orthodox manner. Ironically, the honour of doing so was not the lot of an Englishman whose countrymen had been responsible for first making these plants available to botanical science.

The first species to be described in scientific literature is known as *Eucalyptus obliqua* L'Herit. This tree is commonly known as Messmate Stringybark. The botanist concerned was a little known but most interesting character, Charles-Louis L'Heritier de Brutelle, a French minor aristocrat who published his description one year before the French Revolution. L'Heritier spent some time in London as the guest of Banks and was given access to some botanical material. His published botanical description is said to be based on a specimen collected in 1777 by David Nelson, at Bruny Island, Adventure Bay, southern Tasmania, during Captain Cook's third voyage (1776-1779). An apocryphal story suggests that the French botanist, unable to obtain legal possession of the specimen he required, took some seeds, raised a young tree in France and described the species when it flowered. This story seems very improbable: it is just possible that a tree could have been raised to the flowering stage in less than the nine years between 1779 and 1788, but such an underhand method would not have been in keeping with L'Heritier's character.

The names of several other early botanists are linked with the story of the eucalypts: Robert Brown (1773-1858) was naturalist in Matthew Flinders' expedition (1801 - 1805) to explore the Australian coast and he collected many species new to science. Banks made available to him his library and botanical collections. Brown became Keeper of Botany at the British Museum.

William Jackson Hooker (1785-1865) was noted for his herbarium and writings, which achieved world-wide renown amongst botanists, and became Director of the Royal Botanical Gardens at Kew (1842-1865). His son, Joseph Dalton Hooker (1817-1911) was perhaps an even greater botanical worker. Following his voyage with Sir James Ross' Antarctic expedition, he wrote floras of Tasmania, New Zealand and Antarctica. He is best known for his monumental *Genera Plantarum* (1862-1883) written jointly with Bentham. As a leader in British science when botany was still very important, he was President of the Royal Society and Director of the Kew Gardens.

George Bentham (1800-1884) was a nephew of the famous British philosopher, Jeremy Bentham. As a young man he wrote *Outline of a New System of Logic*, but later turned his talents towards botany. His great works were *Flora Australiensis* in seven volumes (1863-1878) and *Genera Plantarum*, written in collaboration with Sir Joseph Hooker.

Ferdinand Jacob Heinrich von Mueller (1825-1896) was the son of a Prussian army officer. Although earlier botanists had contributed much to the knowledge of eucs, chiefly from an examination of dried herbarium specimens, Mueller was the first to work in the field with them in an extensive and energetic manner. He can be considered one of the greatest botanical explorers in Australia.

Subscriptions are now due for the 1986/87 financial year. The subscription rate is \$4 per annum.

Please take note of your financial status, as indicated below, and act accordingly. Thank you.

Your subscription is due - \$4

You are paid up to July 1987 - no money due

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### The meaning of Eucalypt names - Part 6

Some names refer to the buds or fruits, and the Greek root calyx, which means calyx is sometimes used

- brachycalyx - refers to the short "calyx tube" (hypanthium) Gk brachys (short)
- cladocalyx - presumably refers to the prominent location of the fruit on the older leafless branches Gk clados (branch, shoot)
- goniocalyx - refers to the angular buds and fruits Gk gonia (angle, corner)
- leptocalyx - presumably refers to the slender buds Gk leptos (fine, thin, slender)
- pachycalyx - refers to the thick hypanthium Gk pachys (thick, stout)

Several eucalypts have names which refer to their natural habitat:

- arenaria - from the Latin arenarius (growing on sand, sandy)
- collina - presumably in reference to some localities of the habitat  
L. collinus (pertaining to hills)
- lirata - refers to one of the habitats L. liratus (ridges between furrows)
- oraria - L. orarius (belonging to the coast)
- saxatilis - L. saxatilis (dwelling or found among rocks)
- insularis - L. insularis (pertaining to island)
- alpina - L. alpinus (alpine, growing in the Alps or in the alpine zone)
- calicicola - L. calx (lime) and colo (to inhabit) refers to its occurrence in limestone areas
- eremicola - Gk eremos (desert, wilderness) and L. colo (to inhabit)
- rupicola - L. rupes (rock) and colo (to inhabit)

Several eucalypts have names referring to the fruit, and in these cases, the Greek root carpos meaning fruit is used

- cephalocarpa - presumably refers to the fruit crowded into heads Gk cephale (head)
- codonocarpa - refers to the shape of the fruit Gk codon (crier's bell)
- cylindrocarpa - Gk cylindricus (cylindric)
- cypellocarpa - refers to fruit shape Gk cypellon (a cup or goblet)
- gongylocarpa - refers to fruit shape Gk gongylos (round)
- megacarpa - Gk megas (big, large)
- microcarpa - Gk micros (small, little)
- odontocarpa - refers to the toothed top of the fruit Gk odontos (tooth)
- polycarpa - Gk poly (much, many)
- ptychocarpa - refers to the ribbed fruit Gk ptychos (fold, cleft, groove)
- pyrocarpa - refers to fruit shape Latin pyrus (pear)
- sphaerocarpa - Gk sphaera (ball, globe, sphere)

Some other interesting names are as follows:

- brachyandra - Gk brachys (short) and andros (male, man) literally "short man"  
This is presumably in reference to the short stamens.
- angustissima - refers to the adult leaves. L. angustus (narrow) and -issimus (a superlative denoting very much, most)
- caliginosa - presumably refers to the shade provided by a well-grown tree  
L. caliginosus (full of darkness)
- jucunda - application of the name is obscure, but may refer to appearance of the plant. L. jucundus (pleasant, agreeable)
- scoparia - reference rather obscure, but probably refers to the habit under some conditions L. scoparius (broom-like, in the form of a broom)
- setosa - refers to the bristles on the twigs. L. setosus (setose, bristly, beset with scattered ascending stiff hairs)
- laevopinea - refers to the optical property of the essential oil and its similarity to that of pinene from conifers (Pinus spp) L. laevus (left)
- laeliae - refers to the white bark. Laelia is one of the vestal virgins of mythology