

Dear Members,

I hope you are continuing to observe, propagate and promote eucalypts in your area. Please write and tell me what's happening in your area. Even things like what's flowering at the moment, the effects of the weather on your eucs, any tree planting going on etc. What is the attitude of your local city or shire council towards tree planting? Are eucalypts being used much, and if not, why not? A warm welcome to the following new members who have joined since March:

### Vegetative Propagation of Eucalypts

By far the most common method of propagating eucalypts is from seed. This is for a good reason. Eucalypt seeds are readily available, and very easy to germinate under a wide range of conditions.

But what about vegetative propagation? Well, it certainly is desirable where you wish to preserve a particular strain or form. The most serious problem preventing the more widespread use of vegetative propagation of eucalypts is the fact that cuttings from adult trees do not form roots. Therefore, by the time a tree has shown its potential for characters such as growth rate, insect and disease resistance, unusual flower colour; it cannot readily be propagated by vegetative means. However, vegetative propagation of eucalypts is possible under certain circumstances. There are instances of veg. prop. under natural conditions i.e. rhizomes formed by some tropical species, and separation of large lignotubers to form individual new plants in some other species.

Artificially, vegetative propagation can be attained in a number of ways.

#### 1 Stem Cuttings

Cuttings taken from young eucalypt seedlings readily form roots. However, only young seedlings, less than a few months old, will respond in this way. Therefore, the advantage is not great, as relatively few cuttings may be obtained from any one seedling. Seedlings of *E.polybractea*, a species having a high concentration of essential oils in the leaves, has been vegetatively propagated from seedling cuttings, so the potential exists for the building up of high-oil forms. In all species examined, the rooted cuttings grow as vigorously as seedlings. *E.deglupta* is exceptional in that roots form readily on cuttings taken from plants up to a year old.

#### 2 Epicormic Shoots

Epicormic shoots (coppice growth) develops in most eucalypt species following felling or girdling, and after damage due to fire or insect grazing. Stem cuttings taken from vigorously growing epicormic shoots near the base of a tree retain the ability to form roots. This is a useful method of propagation as many eucalypt species have the ability to produce very large numbers of basal epicormic shoots. However, the use of basal epicormic shoots as cuttings does not provide a universal method of propagating adult eucalypts vegetatively, as several important forest species do not coppice readily eg. *E.regnans*, *E.delegatensis*, *E.fraxinoides*, *E.nitens*, and *E.astringens*. Seasonal effects are important in the rooting of cuttings derived from coppice shoots, even in equatorial climates. These seasonal effects, obviously not due entirely to temperature changes, have been little studied, and there is plenty of room for experiment.

#### 3 Lignotubers

Most eucalypt species develop lignotubers (woody swellings at or around ground level) which contain numerous buds and meristematic tissue. Lignotubers may form shoots after the trees have been damaged by fire or insect damage. These shoots may often be used successfully as cutting material. Also, pieces of lignotuber tissue have been used to propagate 2 year old seedlings of *E.tereticornis*, after the lignotuber was treated with Indole Butyric Acid (IBA) and planted in pots at soil level.

#### 4 Layering

Air layers can be applied to young trees or to the basal epicormic shoots of adult trees. As with cuttings, the rooting of air layers is affected by season. About twenty eucalypt species have been successfully layered so far.

#### 5 Grafting

Grafting is a method of propagating difficult species, or to exploit certain characteristics. It is however, a labour intensive operation, and so its use is limited by cost. The most useful grafting method for eucalypts has proved to be Approach grafting. Delayed graft incompatibility is a problem. The establishment of a graft union is not necessarily related to the future growth and compatibility

of the graft. In ornamental horticulture, a particularly desirable species or form is grafted onto a related but hardier species eg. *E.ficifolia* can be grafted onto *E.gummifera*; *E.phoenicea* can be grafted onto *E.baileyana* rootstocks.

#### 6 Tissue and Organ Culture

Tissue and organ culture techniques are now often used in preference to other methods of propagating trees vegetatively because of the very high multiplication rates that are possible (usually millions per year). Eucalypts have been successfully propagated using these methods, but the best growing media and plant parts to use, are still under investigation.

EUCNEWS

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An exciting new eucalypt species from Queensland has recently been described by Mr M.I.H. Brooker. This is *Eucalyptus rubiginosa*.

It is a small to moderate sized tree with soft, finely stringy, red-brown bark persistent to the small limbs. The adult leaves are up to 15 x 2cm, dull dark green above, much paler below. Leaf venation is densely reticulate. Inflorescences are apparently terminal and compound, but in fact, there is a vegetative shoot at the apex. Buds are diamond-shaped, to about 1cm long. Operculum single. Fruits are pedicellate, cupular to shallowly campanulate, 6-9 x 11-14mm, disc level to slightly ascending. Valves four, slightly exserted. Seed lustrous red-brown, oblong or deltoid to ovoid, dorsal side smooth, ventral side with a few ribs ascending to terminal hilum.

At the time of publication, *E.rubiginosa* was known from just two places, namely north of "Glenhaughton" (north-west of Taroom), and in the Isla Gorge National Park. Very recently, a further stand of the species has been located in the Barakula State Forest, north of Chinchilla. There are only about 90 trees in this stand. In all cases, it grows on shallow sandy soils over sandstone. While it is certainly a very rare species, it could not be considered "endangered" because of its occurrence in state forests and national park.

*E.rubiginosa* is similar in appearance to the white mahoganies, and was in fact originally thought to be one. However later studies proved that it is quite distinct from the group, and is in fact a distinctive relict species which may warrant recognition as a new subgenus. In comparison with the White Mahoganies (*E.acmenoides*, *E.umbra*), *E.rubiginosa* is distinctive in several ways:

- it has more fibrous, redder bark (very similar in texture to *E.tenuipes*)
- the seedlings are quite distinct with their long, narrow, shortly petiolate leaves
- the fruits are similar to , but larger than any white mahogany fruit
- the adult leaves are more densely reticulate
- the inflorescence is a rare type unknown in *Monocalyptus*
- the ovules are in four rows. This differs from all *Monocalypts* (except a couple of snow gums) which have ovules in two rows.

In conclusion, the author says that "*E.rubiginosa* has strongest affinities with the informal subgenus *Monocalyptus* but may be better interpreted as a proto-monocalypt or a monotypic subgenus in the sense of Pryor and Johnson(1971)."

The specific name 'rubiginosa' means rusty, and refers to the conspicuous orange coloured bark. A suggested common name for the species is Woollybark.

Seeds of this species are available from the ESG seedbank.

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#### Early flowering eucalypts

This is a request for information from members.

Many eucalypt species take four or five years from seed, to come into flower. A few species, such as *E.dunnii*, may take ten years or more to flower. Equally, a few species flower early in life, perhaps less than two years from seed! I would be interested to hear from any member who has grown or seen precocious flowering eucalypts.

Which species, in your experience, flower earliest? Has anyone had their eucalypts flowering in the pot?

It may be that certain individual plants of one species are more precocious flowerers. I recall an article in an early volume of *Australian Plants* dealing with a very small, but flowering *E.maidenii*. Similar instances may occur in other species. Also, which species will flower while still in the juvenile leaf stage? With careful selection of early flowering forms, it may be possible to breed flowering eucalypt pot-plants.

Sawflies are widespread in Australia, and can cause considerable damage to eucalypt and angophora leaves. Despite their name, they are not flies at all. Sawflies are in fact wasps, and they are sometimes called Thick-waisted wasps, because the adults generally lack the constriction between thorax and abdomen that is so conspicuous in most wasp species.

The adult stage does not do any damage. The adult females insert their eggs into leaves or twigs by use of a saw-like ovipositor which slits the tissues. A few species of sawflies are predators or parasites of other insects, but the majority are pests in the larval stage.

Where eucalypts are concerned, sawflies fall into two categories (a) leaf eaters and (b) leaf miners

The leaf eaters are the most commonly encountered. The eggs are usually laid in a neat rectangular block at the edge of a leaf. When the eggs hatch, the caterpillars commence feeding in a group. During the day, they cluster together on the stems, but at dusk they move up onto the leaves to feed. When disturbed, they raise either end of their bodies and release a yellow fluid smelling of eucalyptus oil, no doubt as a deterrent to birds, or other insects which parasitise them. At maturity they may reach seven centimetres in length. A small cluster of caterpillars can defoliate a small tree very rapidly. Sawfly larvae are easily controlled by physical methods, and chemical controls are rarely warranted. They are unpleasant to handle, but when they are grouped together on the stem, they can be readily removed with a stick and dropped into a bucket or other container.

The leaf miners.

Not all leaf mining insects are sawflies, but the leaf blister sawflies (*Phylactophaga* spp) affect certain eucalypt species. One or few eggs are laid per leaf (under the cuticle), and as the larva begins to feed, the damage becomes evident. The affected area of the leaf looks like white tissue paper, because the feeding of the larva kills the leaf tissue in that area. The pupa is formed within the "mine", and eventually the adult (a tiny wasp) emerges. Physical control is easy on small trees, by removing the tissue-paper cuticle and killing the larva. However, larger trees may defy physical control, although systemic insecticides may be effective.

#### Sawfly mimics?

Some leaf-eating beetle larvae (*Paropsis* spp) should be mentioned here. These beetle larvae are sometimes mistaken for sawfly larvae because they feed together in groups on the leaves of eucalypts, and when disturbed, they raise their bodies in the fashion of the sawfly larvae. The caterpillars are plump, and white and black in colour. They are black at both ends and with some black strips along the body. They are found on the undersides of the leaves and are easily removed. The adult is a "hemispherical" beetle, and in some species of *Paropsis*, the adults are also leaf-eaters.

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#### Floral Bracts in Eucalypts

Eucalypt inflorescences generally consist of groups of buds borne on a common stalk called the peduncle. All of you would have noticed the umbels of buds on eucalypts, and that each species has umbels with a certain number of buds eg. *E. tereticornis* has seven flowered umbels.

However, a lesser known fact is that all eucalypt inflorescences, at the earliest stage, are covered and protected by bracts, which are shed as the buds begin to develop. Within a few weeks, or even days, the bracts are discarded, either by splitting, or shedding like an operculum. In the great majority of species, the presence of floral bracts passes totally unnoticed, but in a few species, such as *E. kitsoniana*, they are more prominent.

An interesting exercise is to go around the eucalypts in your garden, and try to find a species in which the buds are just beginning to form at the ends of the twigs. You will see a cigar shaped or teardrop shaped structure (the closed bracts) on a stalk (the peduncle). Keep your eye on a particular branchlet over the ensuing days or weeks and watch the development of the buds and the time and method of bract-shedding. When the bracts have fallen off, note the perfectly formed buds, present in specific numbers. These numbers are 1,3,7,11 etc. and are generally consistent for any given species.

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Australia was home to the tallest tree ever measured. Archives hidden for 112 yrs state that an official government survey taken in 1872 measured a Mountain Ash (*Eucalyptus regnans*) at 132.5 metres - much taller than any tree now standing, Australian or otherwise. Guinness Book of Records.

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#### The Meaning of Eucalypt names - Part 4

The Greek root oides indicates resemblance. Several species have names ending with -oides. In most cases, the reference is to another genus:

- eudesmioides - Eudesmia; a genus described last century to include some eucalypts
- acmenoides - leaves thought to resemble *Acmena smithii*
- eugenioides - leaves like *Eugenia* spp.
- fraxinoides - refers to the resemblance of the timber to the northern hemisphere ashes (*Fraxinus* spp)
- botryoides - botrys (cluster, bunch of grapes) oides (resemblance). Presumably refers to the sessile buds and fruits
- angophoroides - bark like *Angophora*
- celastroides - leaves like *Celastrus*

A handful of species have names which arise from comparisons with other, previously described eucalypt species.

- similis - *L.similis* (like, similar) J.H.Maiden wrote "the specific name is given in view of the affinity of this species to *E.baileyana* F.Muell".
- accedens - *L.accedens* (approaching, coming near to) Refers to the apparent similarity of the species to *E.wandoo*
- intermedia - *L.intermedius* (intermediate) Refers to acids of the essential oils being between those of *E.gummifera* and *E.eximia*.
- propinqua - *L.propinquus* (near, related, allied) Refers to the similarity of the bark to that of *E.punctata*
- major - *L.major* (greater) Refers to the leaves, buds and fruits being coarser than in the type (*E.punctata*).

A few other interesting names are:

- tectifera - (pronounced tek-TIFF-ika) *L.tectum* (roof) and facere (to make). Probably refers to aborigines using bark of this species for shelters as referred to in the protologue.
- buprestium - In the type description, Mueller wrote "just before flowering the plant freely attracted Buprestium beetles".
- sepulcralis - *L.sepulcrum* (a grave) and alis (pertaining to). Mueller applied this name in view of its extreme weeping habit, his reasoning being "because this eucalypt will be destined to add another emblem of sadness to the tree vegetation of cemeteries in climes similar to ours"

#### Cap-fruited Mallee (*Eucalyptus dielsii*)

Cap-fruited Mallee is a neat, bushy, densely-crowned tree up to five metres high, or a mallee, with smooth, shiny brown bark grading to grey as it ages. The leaves are glossy green, alternate, linear-lanceolate on slender stalks. There are up to seven flower buds in the umbel which has a drooping, angular peduncle up to 2cm long. The budcap is usually blunt, conical to dome-shaped, about 10x6mm. Its bright yellow flowers occur abundantly in early summer. The distinctive fruit is cup-shaped or almost urn-shaped, about 10mm long and slightly wider. The rim is broad and vertical at first, but expanding outwards to form a horizontal wing or ring around the fruit. The disc is broad, flat to slightly convex. Small triangular valves project slightly from the fruit.

*E.dielsii* occurs naturally in the Salmon Gums-Ravensthorpe-Lake King area of Western Australia. The average rainfall in this area is 300-380mm, mainly in the cooler months. An average of 27 frosts are experienced per year at Salmon Gums. It usually grows in clayey soil and its associated species include *E.annulata*, *E.diptera* and *E.calycogona*.

*Euc. dielsii* is an attractive, profuse flowering, small tree suited to most soils in dry to moderately dry areas of southern Australia. Rarely cultivated. Could be effectively used as a street tree.