Association of Societies for Growing Australian Plants
Eucalyptus Study Group
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Sharing information, learning together.

Propagating For Landcare Projects

By Lindsay J Daniels

Since I retired from the Queensland Department of Primary Industries in 2001, I have commenced germinating native species for use by the local Landcare groups. Most species are Eucalypts although there are a few Callistemon, Melaleuca, Casuarina, Acacia and Brachychiton. Species are selected for their suitability for use in Landcare projects and for drought, heat and frost tolerance. All are either local species or from areas of similar climate conditions. All are native Queensland species although some do also grow in the inland areas of northern New South Wales. I germinate using the bog method then transfer when quite small into net' propagating pots. When they are established and their roots reach the bottom of the small tubes I transfer them to vic pots thus not disturbing the seedling roots. The germinating mix I use is two parts peat moss, one part vermiculite and one part perlite. The mix for the net and vic pots is equal parts by volume of sandy loam, well rotted sawdust, leaf mould, horse manure and crushed dust. A slow-release fertilizer is added to both mixes.

Generally germination is good from early September to the end of April. In this period most eucalypts germinate between 4 and 14 days. Germination during the cooler months is slower and more erratic; I generally get good germination but with more losses due to *damping off* when transferred to the net pots.
I have found that fungicides give a reasonable result but are costly. Recently I experimented with *steam fumigation* of the potting mix for the net pots. This was done by the use of an old aluminium boiler, 26 cm diameter with a depth of 15 cm. I moistened the potting mix in the colander section and placed it over the pot of water on a heated ring on an electric stove. Steam was passed through the mix for at least fifteen minutes. I found this quite effective in reducing *damping off* and although some fungicide was needed with some batches, the steam treatment appears to be well worth trying.

Potting mix should be moisture retentive but with good drainage (The air-filled porosity of the potting mix should be 10 to 15%). The pH should be in the range 5.5 to 6.4. It should contain a slow release fertiliser with trace elements. Eucalyptus seedlings often benefit from added nutrients – Kevin Handrick[1] recommends about 0.3 grams of superphosphate per litre of mix; he also mentions, "The only eucalypts that are known to be somewhat sensitive to phosphorus are *obliqua*, *gardneri* and *cladocalyx*." It is also important not to *over* fertilise; it is best to use a fertiliser specific to the plants needs - depending on situation, season and soil. Dousing the soil at the base of seedlings with liquid nutrient such as seaweed, fish or weed emulsion is beneficial to the biota that are important for a healthy organic potting mix.

[1] Synopsis of talk given at the F. J. Rogers Memorial Eucalyptus Weekend, The Points Reserve, Coleraine, 5 & 6 September 1998. "**In many species, natural seed germination takes place mainly in ash beds after fire. Ash beds are rich in plant-available phosphorus, compared with the general soil. The soil baking associated with fire liberates soluble nitrogen in the soil. It is this enhanced availability of phosphorus and nitrogen that is a key to how we should treat seedling eucalypts in potting mixes and soils.**"

Three Eucs

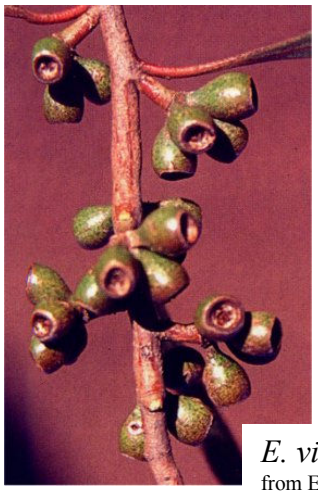
Leigh Murray(NSW)

We've got a few acres on the outskirts of Queanbeyan (near Canberra), on a rocky ridge with water-repellent poor soil. We're blessed with hot, dry summers (mid-30s) and heavy frosts (minus 7s) in winter. This is not an ideal environment for plants, and many struggle. But in an especially harsh part of our block, on a very rocky north-facing slope, two species of euc are thriving (*Eucalyptus viminalis* and *E. viridis*), and another (*E. eximia*) is looking handsomely stunted. These trees were all planted about 17 years ago.

We have three *Eucalyptus viminalis* on the lower part of this slope and a fourth, bigger tree, on the other side of the nearby gully. They're now moderately large trees (15 metres tall or more) and to our biased viewpoint, very beautiful indeed. As I write this (in April), they are flowering (attracting birds) and there are large patches of bright green new foliage contrasting with darker green older leaves. Their bark hangs down in long ribbons from the forks of the branches, and they have handsome white trunks. All four trees are doing surprisingly well – in fact, splendidly compared to most of the other trees we've planted. So it seems that although they would prefer moister conditions and better soil, they're coping just fine with what we've served up.

On the same slope, we have two *Eucalyptus viridis*. These are slender straight-trunked trees topped with small dense crowns; they're both about 6 metres tall with a spread of only 2-3 metres. The trees have a very neat shape overall (although one tree does have a low branch sticking out rather awkwardly – I've never bothered to prune it off because tree-shape is not critical in that location). In early summer, they have abundant white flowers which are attractive to a variety of insects including beetles and butterflies. The treetops are hives of activity when the trees are in flower, and this lasts for quite a few weeks. After flowering, large numbers of small fruit form, and these are reputedly attractive to seed-eating birds such as pigeons and doves. Bronzewings have set up a territory nearby, so perhaps they fancy the seeds. Our trees have proven exceptionally drought-resistant, planted as they are near the top of the dry slope, and they don't blink at our heavy frosts. They're tough cookies indeed. *Euc. viridis*'s form makes it ideal for narrow spaces (but not close to drains). I've sent some seeds from one of our *Euc. viridis* into the seed bank, so if you'd like to grow beautiful bird-attracting trees in a tight spot, the seeds are there for the asking. And *Euc. viridis* are very easy to propagate from seed. Even I, as an inept plant-propagator, have raised trees from these trees' seeds!

The third tree growing on this harsh slope that I want to mention here is *Eucalyptus eximia*. Like the three *Euc. viminalis*, it's planted near the bottom of the slope where conditions aren't as dry and stony as the fierce spots the *Euc. viridis* have to cope with. But after 17 years our non-nana *Euc. eximia* has attained all of one metre. A very handsome one metre. It looks healthy. Very healthy. But dwarf. Very dwarf. Our *Euc. eximia* must be rather more '*nana*' than Tony Cox's magnificent *Euc. eximia nana*!



E. viridis ssp viridis
from Eucalypts of South Australia
by D. Nicolle

Field Guide to Eucalypts Vol 2. 2nd edition. South-Western and Southern Australia in Hardback, 428 pages.
If you don't already have an earlier version of the above book (or you have loads of money!) it is definitely worth investing in, as are all the Brooker and Kleinig books of course!
And Dean Nicolle's book Eucalypts of South Australia *is a jewel for any dinkum Eucalyptian.*

Eucalyptus Germination test

Use a small amount of seed. If normal sowing would require seed pre-treatment, then pre-treat the seed as you would, e.g. 24 hours hot water soak; refrigerate for a period of time, etc. Place the seeds on moist, clean material such as paper towel or cotton wool in a wide, shallow container. Minimize the risk of infecting the seed with fungi or bacteria that could reduce germination rates by using clean materials, boiled water, clean container and clean hands. Cover the dish to retain moisture and keep it in a warm place 20 - 25C. An emerging root indicates the seed has germinated and is viable. This will take from 4-15 days. Keep the material moist with fresh water (but not dry or very wet). Note the percentage of seeds which germinate – an estimate will do and also the date at which most germinate.

Species	Days to Germination	Species	Days to Germination
aquilina	20	pileata	18
brookeriana	20	pimpiniana	12
calycogona	13	platypus 'red'	11
capricornia	13	plenissima	13
coccifera	16	pluricaulis ssp porphyria	18
cordata	10	pterocarpa	27
dwyeri	31	pulchella	15
eremophila	13	pulverulenta	10
erythrandra	25	pyriformis	14
erythronema	9	redunca	16
eximia	14	rhodantha	11
formanii	9	robusta	12
gillii	15	saxatalis	8 - 18
gonophylla	16	scoparia	23
gunnii	10	sepulcralis	21
jacobsiana	22	sessillis	12
johnstonii	19	steedmanii	14
kingsmillii	15	stoatei	12
kruseana	9	stricklandii	16
macrandra	18	synandra	17
megacornuta	11	tenuiramis	16
miniata	19	tetraptera	15
obstans	13	torwood	16
orbifolia	10	wimmerensis	28
peeneri	33		

Above are the species that have germinated in the ESG Seedbank viability tests. Further testing of the species that failed to germinate need to be carried out to ascertain whether they are duds or circumstantial failures.

All the seeds were sown in the months December 2001 and January 2002. No pre-treatment was used. Growers used a variety of potting mix (Yates Seed Raising mix; Tree's For Life mix, Nu Earth general grade) as well as in some cases added sand and humus. Initial watering was either by the bog method, bottom watering or fine surface spray.

Subscription Time! June 2002 – June 2003

$10.00 Australia. $20.00 International

Please make cheques out to: ASGAP EUCALYPTUS STUDY GROUP

Fire resistance and epicormic strand structure:

(an excerpt from Epicormic Strand Theory in New Phytologist (2002) **by Dr Geoffrey BURROWS)**

Although difficult to make direct comparisons it would appear that eucalypts are one of the more fire-resistant groups of woody plants especially in terms of producing epicormic shoots. For example, the eucalypt species studied by Gill (1978), McCaw et al. (1994) and Wardell- Johnson (2000) all produced bole or crown epicormic shoots after moderate to high intensity fires that caused 100% crown scorch. In contrast, low levels of epicormic regrowth were recorded after fire in tropical forests and in shrubs of semiarid woodland. In addition, Williams (2000) found that the sclerophyll plants he studied including three Eucalyptus species were able to reshoot epicormically after low to moderate intensity fires, while 22 species of rainforest pioneer species (including *Rhodomyrtus trineura*) were restricted to subterranean basal stem or root re-sprouting.

The physical or structural basis for fire resistance has been studied, and while various bark types have been investigated, fire resistance has generally been found to depend upon bark thickness, and bark thickness increases as stem diameter increases. Most studies have concentrated on the protection the bark provides to the vascular with less consideration given to the survival of the epicormic strands or buds in the bark.

Jacobs (1995) noted that the epicormic strands of eucalypts are persistent unless fire kills the vascular cambium and '… the dormant buds in the fire-killed zone are lost'. McArthur (1968) noted that 'The dormant bud strands can withstand progressive killing of the bark and phloem until the cambium is reached, and may occasionally survive the death of the cambium'. McArthur also noted that the thick outer stringybark of *E. macrorhyncha* provides excellent insulation for the live phloem layer and thus the dormant bud strands could remain functional. Likewise, Gill (1978) found that the epicormic strands in the crown of *E. dives* trees were killed by fire, while lower on the trunk the ends of the 'bud' strands were killed but enough remained alive for epicormic sprouting to occur. No explanation has been proposed for how the strands survive fires of different severity and different depths of tissue damage.

The survival after fire depends on, the fate of the regeneration buds, the resources available for recovery and various other factors. The key attribute for determining the fate of the regeneration buds is the location of the bud tissues.

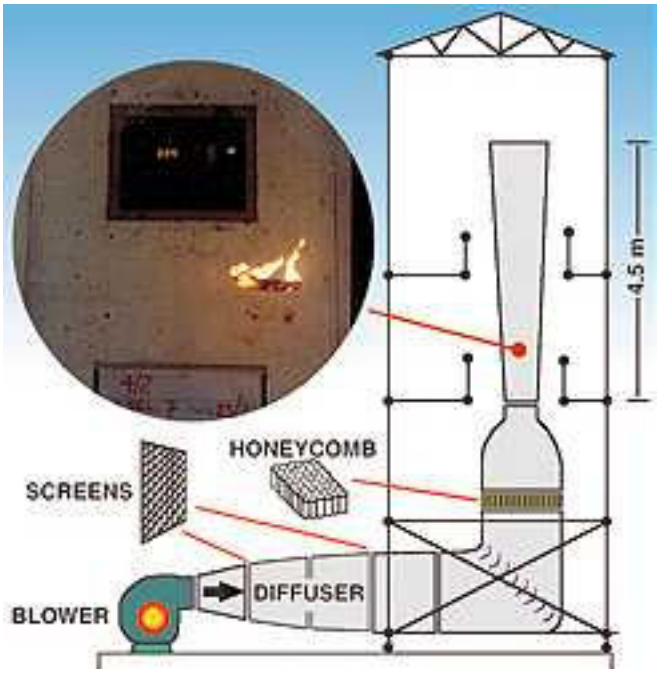
In most investigated angiosperms and gymnosperms the epicormic buds or meristems are usually located relatively close to the stem surface where they can be easily damaged and the remainder of the trace, if present, probably does not have the capacity to initiate buds. Thus, while the cambium may survive certain fire intensities, the bud or meristem reserve could be eliminated. In some species Fink (1980, 1983) described what he termed 'deep-buds' where the dormant buds were not at the bark surface, but were engulfed in the bark. Even so, most bud apices were within 3 mm of the stem surface in 40 – 50 year old trees.

By contrast, in eucalypts the greatest bud forming potential of the epicormic strand would appear to be in the inner bark or even the outer secondary xylem, a position where the meristem strips are protected by the greatest bark thickness.

I will be plucking more excerpts from Dr Burrows article over the next few newsletters but if you want to read the whole article including images of slide section illustrating the evidence for epicormic strands it is available for loan from the ESG library.
You can find New Phytologist online: **www.newphytologist.com**

How far can a bushfire spot ahead?

A study using a specially built vertical wind tunnel at CSIRO Forestry and Forest Products has increased understanding of the hazards posed by burning embers transported ahead of bushfires (Spotting). The data generated will help fire managers predict how far ahead of a blaze spot fires could break out.
In the first study of the firebrand characteristics of eucalypt bark, researcher Peter Ellis used the 12-metre tall wind tunnel to study the behaviour of pieces of burning bark from messmate stringybark (Eucalyptus *obliqua*). This species, widely distributed through hilly country in south-eastern Australia, has a reputation for extensive spotting out to about 5 km.
Mayne Nickless Ltd sponsored the research, which was initiated following the devastating 1994 bushfires in Sydney's Como-Jannali region. Pieces of burning bark from a fire about a kilometre away are thought to have been responsible for one fire which destroyed 100 houses.



When the firebrand appears stationary its terminal velocity is equal to the vertical air velocity which can be measured.

The maximum spotting distance from a blaze depends on many factors, including the intensity of the fire, the wind speed, the initial size of the ember and how rapidly it is burning. A key variable is the ember's terminal velocity - the speed at which it will fall in the absence of an updraft. This decreases as the ember burns away.

Ellis studied the behaviour of hundreds of pieces of burning bark in the wind tunnel. Because the firebrands were not 'tethered' as they often are in wind tunnel studies, their behaviour could be studied until they were tiny - well beyond the point where they would break free from a holding pin.

To measure terminal velocity, he adjusted the upward air flow in the tunnel until the ember stopped rising or falling. At this point the air speed, which was recorded, equalled the terminal velocity. The rate at which the terminal velocity declined could be described from a series of such measurements during flight.

Ellis found the length of time a piece of bark was exposed to flame - the ignition time - had a big effect on how quickly it burned and therefore how long it remained capable of starting a spot fire. Also smouldering embers sometimes re-flamed sporadically, and in one case flame appeared 6 minutes after ignition. This behaviour is important in terms of the probability of ignition of the fuel bed by a firebrand.

Applying his data to a bushfire plume model developed by Dr Mike Raupach of CSIRO Land and Water, Ellis calculated the likely trajectories of embers from fires of varying intensity in different wind conditions. Key influences are how high they are carried in the updraft and the strength of the wind driving them forward. Rate of combustion can have a big impact on their trajectory, because of its effect on terminal velocity, as well as on how long they remain dangerous.

Under extreme fire conditions, most pieces of burning bark will be carried high in the plume and are likely to burn out before landing; a typical combustion time is 2-3 minutes. Larger pieces of slowly burning bark pose a greater risk, as these can exit the plume and a longer burn-out time of up to 6 minutes or more increases the chances that they will still be capable of starting spot fires when they land. This may be several kilometres ahead of the fire.

Under milder conditions, fast burning embers will be the main concern as they may be quickly carried to a height from which they can descend and land perhaps hundreds of metres ahead of the fire before burning out. Slowly burning pieces, because of their slow loss of terminal velocity, will not be carried very high and so will come to ground not far ahead of the fire.

Ellis sees the next research goal as checking that his results apply to other stringybark species, followed by the development of tools that fire managers can use in the field to predict spotting distances for all stringybarks. He has already done some work on candlebark species such as Manna Gum (E. *viminalis*) which can send burning embers out some 25 km, and hopes spotting models for use during bushfires can also be derived for them.

From: Onwood Newsletter

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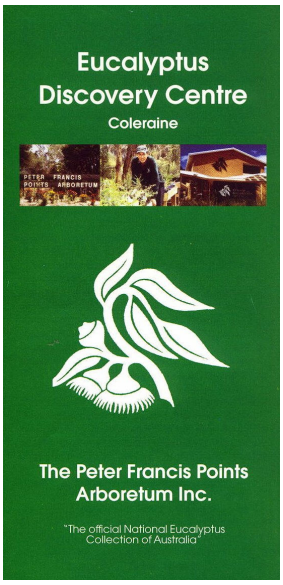
If you have internet access we have a group at this site: http://groups.yahoo.com/group/EucalyptusSG/

THE "INVASIVE SPECIES" CRISIS IN AMERICA: Is it real? By (D. Theodoropoulos Las Sombras Biological Preserve Star Route 2, Box 337 La Honda, CA 94020)

Eucalyptus has been called "*the tree Californians love to hate*". It is said to invade and destroy diverse native ecosystems by allelopathically suppressing understorey and being of no value to native wildlife, as well as being an explosive fire-hazard. However, in reviewing research on the tree, Stein & Moxley (1992) note that California eucalyptus forests are "far from 'faunal deserts'… a number of species not found [in surrounding chaparral] were found in eucalyptus plantings at *Montana de Oro State Park. CA.*
These species included monarch butterfly, Anna's hummingbird, golden-crowned kinglet, starling, dark-eyed junco, great horned owl, and yellow-bellied sapsucker…. Forty-seven species of native birds were known to use eucalyptus in the *Golden Gate National Recreation Area…*" Eucalyptus understorey in the GGNRA included 36 species, cover and abundance was correlated with moisture availability not tree density, and eucalyptus created a microclimate which "permits some native herbs, shrubs and trees to grow on sites that did not support these species before…" (Stein & Moxley 1992). I have found many sites on which native species cover, richness and diversity increase as one approaches a eucalyptus trunk (Theodoropoulos, unpublished field notes). A study found that 3 cm of eucalyptus mulch did not inhibit germination and establishment of 5 out of 6 species of native plants (Yamada & Sandoval 2000). Eucalyptus do not spread at most California sites, and this is mostly unquantified, and site-specific (Stein & Moxley 1992). Eucalyptus groves are the preferred sites for the Monarch butterfly over-wintering congregations in California - 17 of the most prominent 25 sites are in eucalyptus trees (another 4 sites are in other non-natives) (Marriott 1997). Eucalyptus were blamed for spreading the disastrous October 1991 Oakland hills fire, yet many homes were actually shielded from burning debris by the trees (Anonymous fire-fighter, personal communication), and often eucalyptus were untouched while neighbouring houses were incinerated (Larson 1991). In spite of the lack of credible justification, hundreds or thousands of hectares of eucalyptus are being removed as "invaders", including controversial projects such as at Angel Island, which destroyed valuable cultural, historical and scenic resources.

Peter Francis Points Arboretum Coleraine, Victoria.
The Official National Eucalyptus Collection of Australia.



Situated on 37 hectares with, in excess of, 16 000 plants comprising 1200 different species including 500 different Eucalypt species.
In 1966 the site of "The Points" was an abandoned quarry and rubbish dump with only one surviving tree (Casuarina *stricta*). Peter Francis, became interested and involved, he obtained seeds and plants from all over Australia and with great energy, enthusiasm and leadership inspired others to help.
By 1983 – 84 the Department of Conservation; Forests and Lands took over responsibility for the site and hired botanist/grower Neville Bonney to carry out a botanical survey of all the plants in order to be recognised as an Arboretum.
Today it has been transformed into one of the most significant collections of Eucalypts and native plants in Australia.

Eucalyptus Discovery Centre, Whyte Street, Coleraine promotes an understanding of Eucalypts to all educational levels from casual observer to students of botany.

A list of Eucalyptus species planted at 'The Points' in the years 1999 to 2001 is available at the Group (Yahoo) web site or from me.

More information can be obtained from: ***Friends of Peter Francis Points Arboretum***
P O Box 29, Coleraine, Victoria, 3315.

Following on from Lindsay Daniels article (*Eucalyptus Cultivation – Its effect on the evolution of the Species.)* in the last Newsletter (#34) **Sandy Retallick (SA),** makes these points:

I agree that the growing of eucalypts in cultivation will have "considerable effect on the future evolution of the species". One does need to consider how this will impact on biodiversity.

As Professor Hugh Possingham said (AIRM Conference, Getting It Right 11/3/02)

To stop loss of biodiversity we must stop:-

1. Indiscriminate transporting of organisms to new regions;
2. Clearing of remnant vegetation.
3. Not learning from our past errors.

If you introduce eucalypts to an area, where they do not occur naturally and where hybridisation may occur, this may lead to a loss of genetic diversity in the long term or create genetic pollution .

For example - hybridisation of Eucalyptus camaldulensis and E. Globulus.

River Red gums are needed in sites that take water logging(annual inundation) and a hybridised river red may not tolerate this periodical flooding. Loss of this tree, and species of fauna evolved to live with River Red Gum, may result.

Scientists have not yet discovered the full implications of human induced hybridisation of the species and the precautionary principle should be enacted. As another example of hybridisation causing loss of biodiversity in the Adelaide Hills Grevillea *rosmarinifolia* is escaping from gardens (via pollen) and hybridising Grevillea *lavandulacea* this is resulting in loss of our *lavandulacea* and decreasing biodiversity.

By ignoring geographical barriers and introducing non-local native plants, we are continuing to encourage establishment of weeds (Any plant which is growing in the wrong place is classified as a weed whether or not it is an Australian native plant)

Bringing non-local plants to a location removes them from their local predators which are a natural check on over-proliferation of the species. Over proliferation of a species competes against local vegetation and reduces biodiversity. Local indigenous plants are *always* best.

Thanks to Peter Tucker (S.A) who assisted with this information.

The lignotuberous habit:

Lignotubers commence as swellings in the axils of the cotyledons of the first few pairs of leaves formed in a seedling. As the seedling ages the swellings in the individual leaf axils fuse and increase in size, forming a bulbous mass[1]. Most eucalypts develop lignotubers to varying degrees of size and strength, from 0.3 – 0.6m in diameter and sometimes up to 1.5m! The largest recorded is 10m across which carried 103 living stems – Eucalyptus *gummifera* (Mullette[2] 1978) Some species may only develop weak lignotubers and others will lose their lignotuber with age. Some species do not develop a lignotuber at all.
As the seedling lignotuber continues to increase in size there is a proliferation of dormant bud strands within the woody mass. Storage tissues contain nutrient and starch reserves. Although no differences in starch content between some lignotubers and stems has been noted, lignotuber wood can have almost twice the proportion of storage tissue as stem wood and thus a larger potential for starch storage[3]. It is these reserves and the 'dormant buds' which facilitate vegetative recovery following damage by grazing, fire, logging or some other agent of destruction. Mallee lignotubers may carry up to 70 shoots 6 months after fire but this can diminish to about 20 – 30 seven years later and to less than 10 by 100 years[4].
Not all species with lignotubers will respond immediately. Some species, such as *Eucalyptus marginata* (Jarrah) require stable, long-term growing conditions before the lignotuber is capable of sprouting. In most species lignotubers merge gradually into the main stem after the tree attains the young sapling stage. In other species the lignotuber persists throughout the life of the tree.

1. Florence, R.G., (1996) pg. 1~7. Ecology and Silviculture of Eucalypt Forests. CSIRO Publishing, Melbourne.
[2] KJ Mullette (1978) Studies of the Lignotuber of *E. gummifera* (Gaertn & Hochr) The Nature of the Lignotuber. Australian Journal of Botany, 26. pg 9 - 13
[3] RK Bamber & KJ Mullette (1978) Studies of the lignotubers of E.*gummifera*. Anatomy. Australian Journal of Botany, 26. pg 18 - 22
[4] Holland, PG (1969) The Maintenance of Structure and Shape in Three Mallee Eucalypts. New Phytologist, 68. pg 411 – 421.

Request for seed: Euc. *deflexa*, *macrocarpa ssp elacantha, wyolensis, carnabyi, chrysantha, Urrbrae Gem, latens, insularis, fruticosa, kingsmillii ssp altissima, pendens, imlayensis*.
Also we need to replenish stock of *vernicosa*, *kingsmillii*, *gardneri*, *jacobsiana, mitchelliana, stenostoma,* and any others you can think of that aren't on the list.
Thanks to **Rod Kent (SA)** for the donation of Eucalyptus *Torwood*, and *caesia ssp. magna* to our Seedbank.

Steve Harries (NSW)
Plastic Crates for growing approx 8" x 30" x 18" available for $2.00 each. Formerly used for importing bulbs. Lined with newspaper, weed mat or coir they could be good for growing. **Party Pack seeds:** Peppermint, Scribbly, Red Bloodwood, White, Brown Stringybark and possibly Yellow Bloodwood (Beautiful!!) mix (DIY separation) – Does anyone want some? (If you don't have Steve's contact details let me know and I will pass them on.)

Dean Nicolle (SA)
Despite ongoing claims that *E.vernicosa* is part of a cline with *E.subcrenulata*, a recent study based on molecular and morphological data, shows that the two species do not grade into one another and that apparent intergrades in the field are actually just high altitude forms of *E.subcrenulata*

.....

On that note - I recently read in the **May 1991 ESG Newsletter** (Thanks Elspeth); there is an account of a walk through Cradle Mountain, Tasmania, that mentions, "*vernicosa* is considered to be the 'bush form'; *subcrenulata* the 'small tree form' and *johnstonii* the 'tall tree form' of a cline." You have to admit it sounds good! Having read the 3 species descriptions and looked at available pictures I am glad that they don't intergrade! **Tam**

Gerard Stevenson (Vic)
I planted four different species on 10th Feb and they have all germinated to various degrees. I am very pleased just to get them to germinate so I am not sure if the process I have in place could be improved to get better overall germination results. At least we know that the seed is viable. I am using Debco seed raising mixture in Yates mini greenhouses but I am leaving the seeds uncovered. I sprinkle about a quarter of the seed in the packet on top of the soil and then cover as lightly as possible with more mix.

I try to keep the soil moist without it being wet. The trays get an hour or two of sun in the morning and the same again in the late afternoon. The seeds I have germinated so far are: *cerebra* (7 have germinated); *caesia* (magna) (11); *gardneri* (4); *calophylla* (planted 16 seeds and 5 have germinated)

On 28th Feb I planted other seeds and can see that *citriodora* and *cornuta* have both started to germinate. So far so good.

Werner Kutsche (SA)
Last week Jenny and I as well as a few friends went on a eucalypt crawl to the west coast of South Australia and points north and west of Ceduna. It was reasonably successful from a locating the species point of view. Didn't find E. *pimpiniana* though which was a bit of a disappointment. Have to check the books to identify some of the others.

(*Eucalyptus pimpiniana*. Photo from Dean Nicolle's book Eucalypts of SA)

We came across an interesting pair of E. *youngiana* trees. Both were about 6-8m tall, one had greyish leaves and the fruit was quite long compared to its width whereas the other one had greenish leaves and the fruit was much wider than long. The difference in leaf colour was quite distinct and consistent. It was hard to tell what the flower colour was as only some aborted buds were found underneath the trees. They were an off yellow-orange type of colour which may be as a result of weathering. I suspect that at least one of them has cream-yellow flowers. I am going to grow each of these to see what the flower colour turns out to be. The E. *youngiana* on Mt Finke was a dull brick red colour with smallish fruit. The trees on the hill itself were quite small in stature whereas at the base in some of the gullies they were up to about 4-5m tall.