

ASSOCIATION OF SOCIETIES FOR GROWING AUSTRALIAN PLANTS

EUCALYPTUS STUDY GROUP NEWSLETTER NUMBER 17, March 1988

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Dear Members,

In this, Australia's bicentennial year, all sorts of projects are underway, including tree planting projects. Probably some of you are involved in a bicentennial tree planting scheme, although no-one has written to me about any such project. Quite apart from organised planting, we can all undertake a private planting for the occasion. I recently planted a Eucalyptus obliqua, and have many other species almost ready to plant out.

It is sobering to think that many eucalypts alive today were in existence in 1788. Equally, trees which we plant this year could be alive when the quadricentenary (is that the correct term?) rolls around.

The following people have joined the Euc study group since November. You are all most welcome.

Bicentennial for Eucalyptus

Every Australian knows that 1988 is the 200th anniversary of the arrival of the First Fleet, but it is not widely known that 200 years have also elapsed since the name Eucalyptus was coined and the first species described.

Although eucalypts were seen by early explorers such as Dampier (north-western Australia) and Tasman (southern Tasmania), no specimens were collected until 1770 during the first voyage of Captain James Cook. Joseph Banks and Daniel Solander collected specimens of E.gummifera at Botany Bay and E.platyphylla near the Endeavour River. Of course, neither species was named at that time. In 1773, Tobias Furneaux collected a eucalypt specimen from Bruny Island, Tasmania; then in January 1777, David Nelson collected specimens of E.obliqua at Adventure Bay, Bruny Island, the same place where Furneaux had stopped previously.

Surprisingly, all these specimens languished in the herbaria of London for years, until a little-known French botanist arrived on the scene. He was Charles Louis L'Heritier de Brutelle (1746-1800), who visited England for a few years from 1786, as a guest of Sir Joseph Banks. He was given access to various plant specimens, which resulted in his publication of "Sertum Anglicum" in 1788. This was a small 36-page book, which described thirteen new genera, one of them being Eucalyptus. The species was Eucalyptus obliqua.

Although E.obliqua was then growing at Kew as an immature plant, L'Heritier worked from a dried specimen in the Banks herbarium, said to be the one collected by Nelson from Bruny Island. He coined the generic name from the Greek roots eu and calyptos meaning 'well' and 'covered' in reference to the operculum (or budcap) which protects

the developing flower. In so doing, L'Heritier caused to be perpetuated, most likely by accident, a feature common to all eucalypts - the operculum.

From this humble beginning, the study of Eucalyptus has grown and continued right up to the present day. New species are still being found and our knowledge of this remarkable genus of trees and mallees continues to increase.

Eucalyptus spp. are commonly called "gum trees", and it is also 200 years since this name was first used. Although it is impossible to be certain, the originator of the term "gum tree" was probably the first Governor of New South Wales, Captain Arthur Phillip. Phillip wrote in a despatch from Sydney dated 15th May 1788: "What seeds could be collected are sent to Sir Joseph Banks, as likewise the red gum taken from the large gum-tree by tapping." The tree mentioned by him is now known to us as the Red Mahogany (E.resinifera).

Eucalyptus obliqua L'Herit. (Messmate Stringybark)

This tree was the first eucalypt species ever formally described, in 1788. It is a tall to very tall tree, and under optimum conditions, it may exceed 80 metres in height. The bark is rough, quite stringy and deeply furrowed and persistent to the small branches. The juvenile leaves (those present on young plants c. a metre high) are very broad and glossy green, with short stalks. The adult leaves (those present on mature plants) are broad-lanceolate, dark green, oblique. The fruits are barrel-shaped, about 9mm long. The timber provided by E.obliqua is one of the most important hardwoods in Australia, used for pulp production, construction and manufacture of furniture etc.

Messmate Stringybark is widely distributed in the cooler southern parts of eastern Australia. The principal occurrence is in Victoria and Tasmania, but it is also common in N.S.W. In South Australia it occurs in the Mount Lofty ranges, on Kangaroo Island and in the far south-east of the state. In Queensland, it extends only a little way north of Cunningham's Gap.

E.obliqua generally grows on hilly or mountainous country on a wide range of soils. Summers are mild while winters are cool to cold. Snow may occur in some areas. It is a frost tolerant species, surviving temperatures as low as -10°C . It is moderately drought tolerant.

As mentioned before, E.obliqua has stringy bark, but it is not a true stringybark. In fact, it belongs to the 'ash' group of eucalypts. It can be separated from the stringybarks in the field by its broad green juvenile leaves and barrel-shaped fruits.

A Visit to Lawn Hill

by Graham Bennett, Cairns

In early August I finally managed to leave for an extended trip across northern Australia. With my family, we left Cairns via Ravenshoe, Mt Garnet, Croydon and then Normanton overnight. The next day we travelled to Burke & Wills Roadhouse through large stands of Eucalyptus pruinosus and then via Gregory River to Lawn Hill National Park. My first visit to this area was only briefly some eight years

ago, so a very different camping area awaited us this time. For further information on the park I would suggest the Park Guide available from National Park offices.

My main interest in the area was the eucalypts and in this I was not disappointed. There are some twelve species I identified in the general area of the camping grounds and ridge walking trails with one I didn't see but was told of by the park ranger.

The list includes:-

<i>E. pruinosa</i>	<i>E. confertiflora</i>
<i>E. microtheca</i>	<i>E. tectifera</i>
<i>E. camaldulensis</i>	<i>E. aspera</i>
<i>E. terminalis</i>	<i>E. leucophloia</i>
<i>E. dichromophloia</i>	<i>E. argillacea</i>
<i>E. papuana</i>	<i>E. gilbertensis</i>

Species I didn't see include *E. ptychocarpa* some 5km north of the park boundary.

A short description of some I found interesting;

Euc. pruinosa

Small tree, commonly multi-trunked or mallee. 3-5m high, with a glaucous trunk. It has opposite, ovate sessile leaves. The flowers were small yellow clusters at the extremes of the branches and proud of the foliage. It grows on sandy laterite soils to clay on flats and sides of ridges. The bark is grey, thin and fibrous, persistent on lower trunk. Would make an interesting garden subject in either single trunked or mallee form. It occurs from near Croydon right across the top of Australia to the W.A. coast.

Euc. aspera

This is a small shapely tree found on top of the sandstone plateaux. It has a smooth white trunk with a glaucous sheen, 3-10m high. Leaves are hairy, opposite, ovate to oblong and sessile. Smaller branches are also scabrous (hairy). Leaves have a greenish yellow colour. Seed capsule 3-6mm, paper fruit, cup shaped with fine ribs. The trunk is covered with a tessellated ribbon bark which is shed leaving a pink trunk which turns white with age. A small remnant collar may remain near ground level. A very pretty tree, would probably grow too large for an average garden but would possibly have a place in parks.

Euc. leucophloia

This is a small tree found on ridge slopes and plateaux. It grows 4-6m high, has a smooth white trunk with small black dots visible on the trunk only. Leaves are alternate, lanceolate on mature limbs with ovate leaves on juvenile limbs, greenish yellow in colour. It flowers in axillary umbels on the new shoots. Seed capsules are small to 5mm diam. with exserted valves. It has a short conical cap. It is a crooked tree with very brittle wood. It was mistaken for *Euc. brevifolia* as it is very hard to distinguish the two. *E. leucophloia* also occurs in the Pilbara, *brevifolia* being common in the Kimberleys.

John Hancock (M/S 649, Stanthorpe, 4380) would like to buy small quantities of seed of the following species, or swap it for plants of other rare eucalypts: *benthamii* var *benthamii*, *kartzoffiana*, *moorei* var *latiuscula*, *badjensis*, *imlayensis*, *macarthurii*(red), *albans*(pink), *tereticornis*(pink).

Some new Eucalyptus species.

Several new eucalypts have been described in the literature over the last year or so. These include:

1. E.alaticaulis - a half-barked tree with affinity to E.cypellocarpa, occurring in the Grampians and near Anglesea in Victoria
2. E.deuaensis - a mallee stringybark with smooth bark, having affinity to E.alpina, and occurring in the Deua National Park in N.S.W.
3. E.exilipes - an ironbark with affinity to E.crebra, and occurring in sandstone areas near Pentland, Qld
4. E.fusififormis - an ironbark with affinity to E.paniculata which grows in coastal areas from Kempsey, NSW to Canungra in Qld
5. E.lamprophylla - a bloodwood with affinity to E.intermedia which occurs in rocky areas from Clermont to Greenvale in Qld
6. E.xanthoclada - an ironbark with affinity to E.drepanophylla, common in the Charters Towers area of north Qld

Seeds of the last four mentioned species are available from the ESG seedbank. Of these six species, the one with the most horticultural potential is E.deuaensis, which is briefly described below. All of the other species are medium-sized to large trees, but should not be overlooked for large gardens and arboreta.

Eucalyptus deuaensis

It is a mallee or small tree to 4m tall. Bark smooth and grey throughout, peeling to white. Canopy open, with erect, dark green leaves. Leaves narrow lanceolate, up to 10cm long. Inflorescences 7-flowered, commonly carrying bud crops from successive seasons. Buds without stalks, angular. Fruits up to 10 x 14mm, usually with four valves. Flowering time unknown.

Distribution: It is confined to an area of about 10 hectares near Mongamulla Mtn within the Deua National Park. This is roughly east of Cooma in south-eastern N.S.W. The climatic conditions are not specified, but the new species occurs between altitudes of 500m and 800m. It is most closely related to E.alpina (Grampians Gum), which is also a "smooth-barked stringybark". E.deuaensis has smaller fruits and narrower leaves than E.alpina.

Unfortunately, there is no seed of this species in the ESG seedbank at present.

The Braidwood Eucalypt - Update

In August 1985, a very odd mallee eucalypt was discovered north-east of Braidwood, N.S.W. Since then, it has caused considerable excitement amongst botanists and eucalypt lovers.

The Braidwood eucalypt is soon to be formally published by Dr M.D. Crisp of the National Botanic Gardens, Canberra. The species is to be named Eucalyptus recurva, referring to the "bent-back" leaves which are almost unique in the genus.

It is the rarest eucalypt species in existence. It is known only

from a single stand, which apparently consists of five individuals. However it is quite likely that the five plants comprise a clone ie. genetically identical. Extensive searches have failed to reveal any further stands.

Propagation Problems

In a recent letter, Dr Crisp told me that seed is of low viability and in very short supply. Seedlings have been found to suffer from a lack of vigour. All of these factors are against the ready propagation of this species.

Dr Crisp writes "We now have five seedlings at the ANBG: one is a year old and 12cm high (very slow growth!); the others are about six months old and progressing well. We tried tissue culture of buds from coppice shoots without success. Now we are waiting to build up our stocks of seedlings before trying tissue culture from them. Our eventual aim is to find a way of mass-producing E.recurva before releasing it to the horticultural trade." He assures us that there is not enough material for release to SGAP. However I'm sure we will all follow the progress of this ice-age relic with great interest.

Members Letters

Tony Price from Sydney reports that E.citriodora has naturalised itself in parts of the city. Tony says his specimen is galled by a species of species of gall-forming fly. It is also attacked by Eucalyptolyma maidenii, a species of psyllid. The tree flowers in winter-early spring, providing food for fruit bats, possums and birds. In conclusion, Tony says "the species seems to be important for animals in Sydney and to be beneficial despite its propensity as a non-native to colonise disturbed areas."

Graeme Fletcher lives at Nichols Point, about 8km south-east of Mildura (Vic). Graeme has one hectare of land, and the soils are alkaline loams and clay loams. His favourite species are E.woodwardii, E.leucoxydon, E.erythronema and E.erythrocorys. In addition to these, Graeme has about 40 eucalypt species planted, mostly W.A. mallees.

Rhoda Jeavons (Gosford, NSW) writes: "A candidate for the dwarf eucalypt project would surely be Angophora hispida - common in parts of this area, a magnificent shrub in flower with attractive new growth and buds." She says that its form is rather 'ragged', but that with some tender loving care, a better looking plant should result.

Forestry as a retirement venture by Rhoda Jeavons, Gosford

Our citrus orchard is on the 'good' land of a 40ha property on the central coastal highlands of N.S.W., a ridgetop in very broken country with deep gullies, and above the residual rainforest in the gully bottoms, dry sclerophyll forest surrounds us.

We decided to replace one of our original 1947 plantings with a eucalypt forest, and in April '84 we burned the piles of bulldozed navels and disced the land for planting. The five fire sites were devoid of any soil structure - deep in fine ash, but we could not avoid the areas so we went ahead, and on forestry advice, marked the

block out at $3\frac{1}{2}$ metre centres. Our chosen varieties were E.pilularis, E.agglomerata and about 100 E.maculata, nearly 1000 in all. The tube size trees came from three sources; some were contract grown, the rest from two forestry nurseries. Some of the forestry trees were grown in jiffy pots and most of the early losses were among these, as the tree roots never grew out through the fabric. Quite good general rain had preceded planting and the trees were watered in and kept watered.

Within a year some interesting things emerged:- The fire sites produced outstanding growth. Cicadas climbed the small eucalypts and were picked off with enthusiasm by Currawongs and Magpies. Unfortunately these large birds knocked off a lot of leading shoots. Hordes of sap sucking, leaf chewing and scale insects then invaded from the forest. As the trees have grown insect attack is hardly significant, but the early damage led to many trees developing forked trunks, and in a recent gale we lost a number of trees through splitting - up to three metres long. A problem we expected but did not get, was adverse reaction to the Bomacil herbicide used for many years in the orchard rows, until a year before bulldozing the trees. Some small trees showed mottled leaves for a while but there was no evidence of stunting. At about two metres high we lost some of the E.pilularis which broke off at ground level. Removing them revealed severely twisted roots which had strangled one another.

And then there were the wallabies. Most of the trees they pruned never recovered and had to be replanted, with wire netting guards. We had taken a fancy to E.microcorys in the meantime and a number of the replants have been that variety. So far they have avoided the insect damage from which the others suffered; perhaps because of the small number of trees.

E.agglomerata have so far performed rather better than the E.pilularis, while the E.maculata have been very disappointing with few good specimens. The forest is now about 8 metres high at $3\frac{1}{2}$ years old. A gift of a dozen advanced E.agglomerata, planted 12 months after the tubes took a year to catch up.

We have a scattering of other eucs around the grounds, just because we like them - E.citriodora are a scented joy, E.leucoxydon 'rosea' has a near-mallee habit but flowers often, mainly with flowers borne singly. E.caesia has a very weeping sparse shape but the flowers are simply magnificent. A red-flowered form of E.melliodora looks well but is very small and has not flowered, nor has E.sideroxydon 'Rosea'. E.lehmannii flowers - or rather buds well. Its flowers do not often open, remaining a hard woody head with budcaps intact. E.torelliana took a long time to settle but is now growing well with an attractive green trunk and red new growth. E.argent(?) (I have long since lost its tag) is a small tree with silver grey leaves and profuse but not very striking small white flowers; and little soft, beautiful E.angustissima completes the collection at the moment, but there are more in the pipeline.

Dwarf Eucalypt Project

There is little to report on this front. Several members have suggested species that may be suitable for the project, and a few have ordered seed with the intention of growing trees for the project.

As far as locating outstanding specimens of various small species is concerned, it has been very quiet, but Mark Nicol from Adelaide has pinpointed several superior specimens of ornamental species such as E.rhodantha, E.caesia ssp. magna, E.ficifolia and E.youngiana.

Dwarf Euc project members will soon receive Report No 3, which gives further information on administrative requirements, and states that it is expected that the first plants produced by the tissue culture laboratories will not be available for two years.

Seedbank News

The seedlist will not appear in the newsletter this year. This is partly an effort to save space for more news and articles, and partly because the 1988 holdings are not very different to 1987.

Seeds of about 450 species of Eucalyptus and Angophora are held in the seedbank now. This means that just a small minority of species are not available. Below is a list of additions and deletions compared to the 1987 list. Newer members who do not have a 1987 list and who wish to order seed, are advised to indicate substitute species in case the ones you want are not in stock.

Several members have donated seed over the last year, and these donations have all been most welcome. I will not list the donors for fear that I will forget someone. I will however mention that Marj Bowyer has sent in fresh seed of Eucalyptus obliqua, the first euc to be described, in 1788. Members who would like to plant an obliqua for the bicentenary can get seed from the seedbank now. Also John Hancock has forwarded seed of an undescribed species of stringybark (sp.aff. youmanii) which grows on his property at Eukey in the far south of Queensland.

Several provenances of E.camaldulensis are now available; one is surely suitable for your climate.

Members are invited to request up to 15 packets of seed per order, or up to 30 packets per year. Please send a stamped self-addressed envelope. A 37c stamp will suffice for small orders, but increased postage is needed for large orders.

Additions

acmenoides	sepulcralis
eremaea	micranthera
lamprophylla	fusiformis
microneura	lucens
apiculata	aff.youmanii
crenulata	gillenii
kybeanensis	trivalvis
aff. socialis	carnei
microtheca	intertexta var fruticosa
	rigidula

Deletions

A.hispida
platypus 'red'
foelscheana

Trees to beat salt

Reafforestation is seen by many Australian farmers as a weapon with which to combat soil salinity. But there is now a strong need to find out which trees do the job best.

Soil salinity is a problem common to all Australian states, but is perhaps most severe in the W.A. wheatbelt and adjacent areas. In that state, research into the transpiration behaviour of various tree species has commenced, and some preliminary data have been assembled.

In W.A., 260,000 hectares of cleared farmland has been lost to salinity and a further 10,000ha is going down every year. Salinity is clearly threatening the viability of many farms and has the potential to affect many more.

Hydrologists say it is now clear that reafforestation can lower the water table and contribute to a lower level of soil salinity. Trees such as E.sargentii, E.rudis, E.spathulata, E.kondininensis, E.camaldulensis and Casuarina obesa will perform well near salt-affected or prone sites, but to effectively minimise groundwater "recharge", land upslope from the salted areas must be planted. The areas needed to be replanted to beat salt are substantial, perhaps 30% of the upslope cleared area. The criterion for trees to be planted in these "catchment" areas is not their salt tolerance, but rather their ability to remove water from the soil by means of transpiration.

Researchers have looked at the water usage of particular tree species, ie. trees as pumps. They say trees planted to stop groundwater recharge must be able to consume the annual rainfall even in wet years. The Australian Water Resources Council is sponsoring leaf conductance studies on a 750mm rainfall site in the Wellington Dam catchment in W.A. In 1979 some 70 different eucalypt species were planted and in 1984/85 some 20% of the more promising "pumps" were selected for leaf conductance study. Significant differences in conductance between species was evident. Fast growers E.globulus, E.botryoides and E.viminalis have large leaf areas but low leaf conductance at summer's end. It appears that these species use a lot of water in the spring when moisture is abundant in shallow soils, but they can't extract water from the deeper profile when this moisture is depleted in summer. Hence the above species may be of limited use for dewatering saline discharge areas. Some other species showed encouraging water consumption throughout the summer. These include E.sideroxylon, E.microcarpa and E.melliadora. Eucalypts with good transpiration rates in the harsher and saltier conditions were E.wandoo, E.polyanthemos and E.mannifera. E.largiflorens and E.leucoxylon, which have relatively smaller leaf areas showed good unit leaf conductance. It is stressed that these results are only preliminary and based on just one site. More work is needed.

In conclusion, one researcher comments "If it was my land and I was concerned for water quality, aesthetics, wildlife, stock and crop protection and potential timber value, I would probably commit 30% of my land to eucalypts over a suitable period."

Post script: Euc.ptychocarpa, the Swamp Bloodwood from the far north of N.T. is flowering for the first time at the Points Reserve, Coleraine.