

EUCALYPTUS STUDY GROUP



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EUCALYPTUS MACROCARPA - WILL IT SURVIVE IN THE WILD?



The largest flowering eucalypt *E. macrocarpa* shares the fate of many of the spectacular Western Australian mallee species. It now relies largely for its existence in the wild on its presence in roadside verges such as the one pictured above.

Whilst this species is relatively widespread over the Avon, Irwin and Roe districts of Western Australia, many of the individual trees are under stress and are being attacked by pests as can be seen in the photo at bottom right.

One of the answers to the conservation of this beautiful species lies in it being widely cultivated.

It is reasonably common as a planted specimen around Perth. Unfortunately it does not adapt well to the heat and humidity of the eastern states. Perhaps members could volunteer their experiences with this species and other equally spectacular but rare eucalypts such as *E. rhodantha*, the rose mallee.



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Eucalyptus

The Novel

Australian writer Murray Bail has written a novel members will enjoy, entitled *Eucalyptus* a romance about love for Eucalyptus species, highly recommended reading.

FEATURE EUCALYPT ILLYARIE (*EUCALYPTUS ERYTHROCORYS*)

Eucalyptus erythrocorys must rank in the top line of ornamental flowering eucalypts. Its most unique feature is undoubtedly its flaming red operculum (bud cap) that is unlike any other in the genus.



This species is restricted to a small coastal area a couple of hundred

kilometres north of Perth from south of Shark Bay southwards to near Jurien Bay. A photo of this species in its natural habitat amongst limestone boulders with *scaevolas*, *lechenaultias* and *conostylis* is pictured below.

Illyarie is extensively planted around the Perth region as a street



tree and it is also successfully grown in southern California for the cut flower trade. Unfortunately it does not adapt well to high humidity areas such as the Sydney region. In its natural habitat the rainfall is about 450 mm annually

and this may be a good guide as to areas where it can be successfully cultivated.



It makes an excel-

lent cut flower and is easily raised from fresh seed. According to Rodger Elliot and David Jones Encyclopedia of Australian Plants its main requirements are neutral to alkaline soils with good drainage and plenty of sunshine. They also recommend that pruning helps to promote bushier growth and that mature plants respond well to coppicing.

Western Oil Mallee Project—by Associate Professor Allan Barton, Murdoch University

The author, Allan Barton, is Associate-Professor in Chemistry at Murdoch University in Perth, Western Australia. Since 1980 he has been working towards the large-scale replanting of *Eucalyptus* oil mallees to control dry land salinity, with the resulting leaf oil replacing environmentally unacceptable industrial solvents. The author's work has been recognised by various awards for his work aiding the environment.

A few *Eucalyptus* species produce a leaf oil ("eucalyptus oil") for which there is a worldwide trade as a pharmaceutical product. Although some "mallees", with multiple stems, woody lignotubers, and the ability to regrow repeatedly after harvesting (particularly *Eucalyptus polybractea*, the blue mallee) are harvested for oil in eastern Australia, most of the world's production of eucalyptus oil comes from overseas plantations of *E. globulus*, Tasmanian bluegum, grown primarily as a source of wood. The

pharmaceutically active component of eucalyptus oil is 1,8-cineole, which is a cyclic ether, chemically stable and unreactive, and with the ability to readily penetrate tissue, presumably the reason for its efficacy in various decongestants and pain relief products. Cineole is completely biodegradable and relatively non-toxic. It occurs in complex mixtures with numerous other terpenoid compounds in the leaf oils of many eucalypts, but to differing extents - about 60% in the case of bluegums, and up to 95% in some oil mallees.

There was an embryonic eucalyptus oil industry based on WA mallees, but no significant single species areas appear to remain. Thus it was not possible to harvest leaf from the coppice regrowth of natural stands as in Victoria and New South Wales and it was necessary to locate remnant specimens of preferred species that yielded high cineole levels to serve as seed sources for plantations. To do this, we first developed an efficient

analysis procedure.

Cineole contents vary between varieties, between individuals and to some extent with the season. The effects of other environmental factors, such as soil type or position of the leaf on a tree, on oil content and makeup are also important questions. With the help of a variety of funding sources, and assistance from Western Australian Government departments like Conservation and Land Management (CALM), AgricultureWA and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and from individual volunteers, particularly farmers, we have answered many of these questions. Murdoch University campus and small-scale farm plantings in 1986 led to Woodanilling demonstration plantations in 1988. When the Woodanilling mallees were three years old, they provided evidence that these eucalypts, all except one native to the wheatbelt and adjacent pastoral districts of (continued on pg 4)

Valley of the Giants



Western Australia is well known as the home of a colourful and diverse flora but in addition some of Australia's largest and most spectacular eucalypts can also be found there. In the southwest of the state, where the rainfall climbs there are spectacular forests of tall eucalypts such as Jarrah (*E. marginata*) and Karri (*E. diversicolor*). Perhaps even more spectacular than these species are the Tingle eucalypts.

The Tree Top Walk between Walpole and Denmark provides a spectacular window on a particularly good stand of red tingle (*E. jacksonii*). The reserve is managed by the Department of Conservation and Land Management and is open between 8.00 am and 5.15 pm during WA school holidays and between 9.00 am and 4.15 pm other days. It is closed Christmas Day and during hazardous conditions.

This latter statement makes a lot of sense once you have done the walk. The Tree Top Walk is a wire mesh structure that reaches as high as 40 metres above the ground and is a one way loop of 600 metres. There is considerable sway even under still conditions. Those with a fear of heights may find the walk a little daunting.

One thing that is particularly impressive is the educational signage around the walk. To give an example I quote from a sign at the beginning of the walk:

"Tingle Facts — Known to live up to 400 years the red tingle (*E. jacksonii*) is one of the biggest trees in Western Australia. They can measure up to 16 metres around the base and grow over 60 metres tall.

Large buttressed bases are often a feature of red tingle. As they have relatively shallow root systems and grow in shallow soils, the trees develop these buttresses to support themselves.

Other types of tingle trees are the yellow tingle (*E. guilfoylei*) and Rate's tingle (*E. brevistylis*). Once more widespread, the distribution of tingle has declined with changing climate conditions over

millions of years. Today the only occurrence is in the Walpole-Nornalup National Park and the surrounding high rainfall area where it rains the equivalent of 185 days each year."

The photo below shows an Elegant Parrot, a species as common and as colourful as the Rainbow Lorrieket of the eastern states. The shot also gives a good idea of the bird's eye view provided to the walker. The trees are full of hollows that support a wonderful diversity of birdlife.



WESTERN MALLEE OIL PROJECT (CONTINUED from pg 2)

Western Australia, can assist in arresting degradation and rehabilitating farmland. The species display reasonable salt tolerance, and are deep-rooted, making them effective in lowering groundwater levels. In agroforestry situations their root systems compete less with those of shallow rooted arable crops than some other perennials. Mallees can be harvested as early as three years after planting and they coppice readily from their lignotuber systems. Indefinite reharvesting at intervals of two years is expected to be readily achievable, as it is from blue mallees in Victoria and New South Wales.

CALM adapted the "tree sharefarming" concept already used in bluegum planting and obtained funds from the Commonwealth's Farm Forestry and National Landcare Programs. Collection of leaf samples was scaled up for oil content screening at Murdoch University, so that seed could be obtained from superior trees. (These trees are also being used in a genetic improvement program by CALM and for the establishment of seed orchards. Production of orchard seed is expected to commence this year.) Capital costs and restricted mobility of harvesting and extraction equipment dictate that for efficient operation the plantings should be concentrated into a limited area. To provide a demonstration on a wide range of Western Australian wheatbelt environments, six centres were selected (Woodanilling, Esperance, Wickiepin, Naremben, Kalannie/Goodlands, Canna), with the aim of establishing 5000 hectares within a 30 km radius at each centre. The total area planted reached 1000 hectares in 1994, 4000 hectares in 1995, and is continuing this year. Farmers make a commitment to these plantings on the basis of their landcare benefits alone, with any future commercial value being considered a bonus. In 1995 the farmers at the six planting locations formed a growers representative body, the Oil Mallee Association of Western Australia.

These agroforestry crops are designed to be integral and multi-purpose components of total farm plans. This is

achieved by various combinations of a standard "hedge", which is a double

planting row 2 metres apart with 1.5 metres between trees in each row. Plantings can be in belts of one or more hedges in alley farming configurations, or in block planting with hedges at 5 to 10 metre intervals. Planting density is typically 1110 per hectare of block planting or 1330 per kilometre of hedge.

AgricultureWA obtained a grant to build and operate a small-scale extraction still that can be moved from site to site to produce small quantities of oil from existing crops for commercial assessment, and the Oil Mallee Association received funding from the Soil and Land Conservation Council's Regional Enterprise Scheme to assist in developing a commercial scale still and harvester, and from the Farm Forestry Program for a business plan. Recently, further Western Australian State Landcare funds were allocated. However, funds for equipment development are less than ideal. In order to be competitive, it is important that the harvesting and extraction systems be technically advanced and energy efficient.

The replanting of *Eucalyptus* oil mallees indigenous to the semi-arid agricultural lands of Western Australia provides a means of rehabilitating land degraded by waterlogging, salinity and soil erosion. High oil-yielding species and provenances have been identified and selected. Prototype commercial plantings are in place, and a substantial new market has been identified for eucalyptus oil as an industrial solvent. The Western Oil Mallee Project brings into focus the importance of extensive networking between committed individuals in numerous organisations to develop an idea into commercial reality.

Editor's note: This research was found on the internet. Allan was happy for me to reproduce his work in our newsletter. Anyone interested in pursuing it further can contact Allan at the following addresses: email: barton@chem.murdoch.edu.au

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Everything New Is Old

A fantastic story has emerged courtesy of Mr. Jon Steeds. A visit to a 2nd hand bookshop yielded some original newsletters of the SGAP I quote from the SGAP Newsletter No. 2, September, 1957.

The article dealt with propagation of eucalypts from cuttings by Mr. Bill Cane. I quote: "In a 6-inch pot, a crock & 3 inches of gravel were overlaid by a mixture of equal volumes of coarse sand (for air) sawdust (any, to keep down "damping off") & peat moss (to hold water). A dip, half to one inch deep, of water, just pink with Condy's crystals (potassium permanganate), slightly warmed, was mixed with one-third as much honey. (the honey must never have been made hot—above 150 degrees F.—or delicate aids will have been destroyed.) Cuttings were best at three months, never more than six, about four inches, taken from tops or growth after cutting back. After standing from eight to 18 hours in the dip, they were planted and kept in a close box with fitted glass top, whitened from August on.

The necessity of avoiding the least sign of wilting at all times was stressed. If cuttings had to be carried, a branch with several was best, plunged in water, shaken and enclosed in a polythene bag slightly inflated to contain more air. Close packing and exposure were bad.

Discussion brought conjecture concerning the action of permanganate and the honey. In brief, it is believed that permanganate may block rot at first: but either retards destruction of hormones. A salt of manganese might be too drastic with organic substances, soon turns to insoluble manganese dioxide to liberate manganese ions as required. Honey definitely contains growth hormones. "

Editor's note: A very interesting story and one that deserves further investigation. Do members have any interesting stories on cutting propagation of eucalypts to share with the group?

Member's letters



The photo above shows the coral gum *Eucalyptus torquata*. I can understand why Don goes to the trouble of grafting such beautiful species.

Editor's note: Thank you to all the members who have written me letters full of interesting information. I would love to receive more member's letters in similar vein as these shared experiences is what the Study Group is all about.

The following is correspondence from ESG member Don Petts

Here is a list of eucalypts which I have growing, some in the garden, two in wine casks, and the rest in five inch plastic pots. My land consists of two suburban blocks, end to end, which means that I have frontage to two different streets.

Eucalypts in the garden are:-

Eucalyptus caesia, 3 in a clump about eight feet high.

Eucalyptus crucis, grafted thirty inches high, one on its own roots was struggling.

Eucalyptus erythrocorys, around twelve feet becoming straggly, about to be coppiced.

Eucalyptus eximea nana, twenty feet, very healthy, lots of buds forming.

Eucalyptus ficifolia, grafted, (2) fifteen feet, very healthy.

Eucalyptus forrestiana subs *Dolichorhyncha*, newly grafted.

Eucalyptus Kruseana, newly grafted, to replace one struggling on its own roots.

Eucalyptus macrocarpa, (2) very healthy on own roots in raised beds.

Eucalyptus nutans, (2) planted together on own roots in raised bed, six feet high.

Eucalyptus orbifolia, grafted, about six feet, very healthy.

Eucalyptus preissiana, on own roots, six feet tall, big healthy buds forming.

Eucalyptus Point Anne, a prostrate euc., from Neil Marriott.

Eucalyptus pyriforms, not healthy, still trying to find compatible root stock.

Eucalyptus synandra, two feet high, struggling, have some grafted to replace it.

Eucalyptus torquata, only one foot

high, grafted recently.

Two Eucalypts in wine casks are:-
Eucalyptus lansdowneana subs *Albo Purpurea* and *Eucalyptus rhodantha*

Grafted Eucalypts in pots are:-

Eucalyptus crucis

Eucalyptus ficifolia

Eucalyptus forrestiana subs., *Dolichorhyncha*

Eucalyptus lansdowneana subs *Albo Purpurea*

Eucalyptus macrandra

Eucalyptus orbifolia

Eucalyptus ptchocarpa

Eucalyptus rhodantha

Eucalyptus synandra

Eucalyptus torquata

Eucalyptus rhodantha was grafted onto the unlikely root stock of *Eucalyptus camaldulensis* on 17/02/99, so far it appears healthy and has a large flower bud on it, the other Eucalypts are on various rootstocks, long term compatibility as yet unknown.

Eucalyptus erythrocorys has failed to unite with every rootstock so far tried, although it did last for twelve months on *Eucalyptus maculata*. *Eucalyptus ficifolia* seems to work well on *Eucalyptus maculata* also.

The garden soil here is heavy clay, into which I have incorporated grit, which is crushed rock of around a quarter inch size, building the beds up in the process. The *Eucalyptus erythrocorys* is supposed to be difficult to grow here, having lost my first one, I put a rubble drain beneath where I wanted to plant my second one, built up the area and added lime. This tree puts on a beautiful display in early autumn every year, but due to its becoming straggly I think it best to coppice it this year.

I don't claim to have a high success rate with grafting eucalypts, but considering that I am only grafting them for myself and family I am well satisfied.

Don Petts

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If its not a gum its not worth growing

Membership information

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