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Photo by Ron Hill

CORREA REFLEXA

A small long flowering winter shrub for home gardens.

HOW TO GROW CORREA

By A. E. BROOKS

Perhaps no plant attracts more attention in the bushland of south-eastern Australian than a *Correa*. A single plant with only one or two pendant red bells displayed bravely during the winter months will attract the attention of the casual bushwalker just as readily as that of the earnest colour photographer. It has never been my intention to specialise in growing any particular genus of native plants, but for various reasons I have a large number of *Correas* in my garden. A check has just revealed 44 individual plants which include about ten different forms of "Common *Correa*" (*C. reflexa*).

Who could have a more fickle love than the "Common *Correa*"? She appears in different dress in every district where we meet her. Not only are the flowers of different colour, size and proportion but the foliage is just as variable. How do these numerous forms respond to cultivation and propagation? I believe that it is reasonable to say that the ease or difficulty of cultivation and propagation is almost as variable as the forms of the plants.

CORREA REFLEXA

In my garden there are varieties of "Common *Correa*" which occur naturally at Anglesea, Traralgon, Nelson, Mount Zero (in the Grampians), Lakes Entrance and Beaumaris; all in Victoria; Eden in New South Wales and other places. The form from Anglesea grows on a heathland adjacent to cliffs fringing the Southern Ocean where the winds must frequently be both very cold and fierce. Consequently this is one of the hardiest forms which is easy to cultivate and propagate. One of the most attractive forms is from South Traralgon. The flowers are large, beautiful red, tipped with yellow, in colour and the flowers are produced in large numbers chiefly in late winter. Although no great difficulty has been found in propagating any of the varieties mentioned from cuttings, some, including that from Traralgon, are very slow to strike. Mount Zero produces one of the best forms. The flowers are not so inflated but are long and large and dark-red like pendant ear-drops fit for a princess.

Garden experiences and recommendations for these forms are:

C. reflexa (Anglesea form): One of the hardiest forms suitable for exposed position. Grows naturally on a heathland so that light soil and good drainage suit it best.

Beaumaris form: Similar conditions to the last but would prefer shelter from winds. Greenish-yellow bells.

Gippsland form: Narrow, red bells but hardy and easy to propagate. Ideal conditions would be a cool, moist position with light to medium soil. Suitable in a fairly sunny position but protection from winds would be advisable.

Lakes Entrance form: One of the best. Cool, moist position, light to medium soil, can be grown in a fairly sunny position. Slow to strike from cuttings. Shelter from winds desirable, otherwise may need to be tied to a stake to prevent roots being loosened resulting in loss of the plant.

Mt. Zero form: From north end of Grampians in sandstone country. Longer, darker red bells which are quite large. Tall, upright grower, so needs hard cutting back after flowering and probably staking as well. Tends to split where main branches join. Will grow in a fairly open position, preferably in light soil and sheltered from winds. An E aspect would be ideal. Shoots strongly after severe pruning. Good drainage would be important.

Nelson form: Smaller red bells tipped with yellow, only small growing but flowers are in very attractive clusters. S aspect seems very suitable. Light soil, good drainage, shelter from winds preferred.

Traralgon form: Similar in most respects to Lakes Entrance form described above but the red bells are often more inflated, it flowers later in the season and the leaves are rather longer and narrower. Similar conditions.

CORREA SCHLECHTENDALII (previously known as *C. turnbullii*):

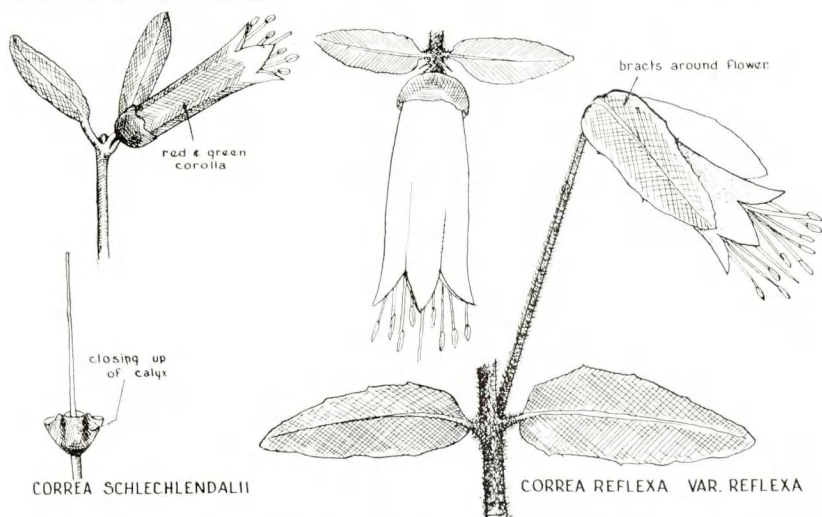
Is worth a place. The red bells, tipped with yellow, are small but it flowers chiefly in mid-summer. It stands drier conditions much better than other species and its small, greyish leaves add variety to the colours of the foliage in the garden. A sunny position is needed with preferably a N or W aspect with some protection from winds. Light or medium soil.

Pride of place for hardiness must be to the "White *Correa*" (*C. alba*). It

The Genus *Correa*

By PAUL WILSON

The genus *Correa* is found only in Australia (including Tasmania). On the mainland it is confined to south-eastern Queensland, eastern New South Wales, Victoria, and southern South Australia. It is found in a variety of habitats ranging from the seashore to the banks of alpine streams. The first scientific collections of it (and of any Australian plant) were made by Sir Joseph Banks and Dr. Daniel Solander when they landed at Botany Bay in May, 1770, from Captain Cook's ship the "Endeavour". They found several species growing in the Bay, three of which were later drawn and described by Solander, unfortunately his work was not published until about 130 years later, however one of the plates prepared by Solander was seen by Sir J. E. Smith who altered Solander's name "*C. rubicunda*" to *C. rubra*, and published it in 1807. This name has been indiscriminately used by many authors ever since but the plant illustrated was in fact a hybrid between two other species collected at the same locality, *C. speciosa* (now included under *C. reflexa*) and *C. alba*. It is unfortunate that the plant first collected in the genus and given the name now in commonest use, should be a hybrid. However this incident illustrates the fact, which was very quickly appreciated by the 19th Century horticulturalists in Europe, that all *Correa* species are capable of being crossed, which character resulted in the production of numerous cultivars, often of unknown or doubtful parentage, and a host of new names.



Since these plants became so popular with the glass-house enthusiasts in England, it is not surprising that many of the species were first described from cultivated material, which led unfortunately often to the same names being given to both the original plant and to hybrid progeny subsequently raised. Thus it is that the names "*C. speciosa*" and "*C. pulchella*" appear in the literature for both the species and the cultivars.

Some of the species, e.g., *C. baeuerlenii* have a very restricted range, others such as *C. reflexa* and *C. lawrenciana* are very widespread, in this latter case one finds that there is considerable variation in the same species or variety when it is gathered from different regions. In fact it appears that

a collection from any particular locality will be found to be different from any other locality. In some cases this difference is a gradual one, as is the change in form of *Correa alba* when followed around the coast of Australia. In other cases it appears to be more abrupt, although here the apparent discontinuity in appearance may be due to lack of collections (or to the fact that the plant has been cleared from a particular region). Owing to this gradual variation within some species it is difficult to divide them naturally into sub-specific categories, although collections made at random may appear to consist of so obviously separate entities and to warrant distinctive varietal epithets.

The genus *Correa* belongs to the family *Rutaceae*, to which the genera *Boronia* and *Phebalium* also belong. It was named by Henry Andrews after the Portuguese botanist and man of letters Jose Correa da Serra. All the species within the genus are woody, some are tall shrubs, while others are small sometimes prostrate bushes. It may be distinguished from all the other members of its family by having opposite simple leaves, flower parts in fours, and petals normally joined together, at least at the base, and not overlapping. Eleven species are known, all of which can be found, at least occasionally, in cultivation.

KEY TO THE SPECIES OF THE GENUS

1. Filaments of the stamens widened at their base, anthers oblong to lanceolate the margins not folded back, corolla falling off after flowering (except in *C. aemula*).
2. Calyx plus or minus truncate or if lobed then the lobes not as long as the calyx; corolla white, green, or red.
3. Corolla green or red, over 1.5 cm. long, not splitting into separate petals.
4. Calyx without lobes between the calyx teeth, or if present, then inconspicuous.
5. Pedicel under 3 mm. long; calyx closing up after flowering.
6. Bracteoles soon shed; leaves smooth above, thin, the base rounded to obtuse.
 7. Corolla green. *C. glabra*
 7. Corolla red with green lobes. *C. schlechtendalii*
6. Bracteoles persistent; leaves smooth to rough above, the base usually heart-shaped.
 - C. reflexa*
5. Pedicel 4-8 mm. long, bracteoles soon shed; corolla entirely pale red or green; calyx plus or minus glabrous remaining wide open after flowering.
8. Pedicel densely hairy; corolla green leaves dark green. *C. barkhousiana*
8. Pedicel almost glabrous becoming thicker beneath the calyx; corolla pale red, leaves light-green plus or minus glabrous. *C. vutchella*
4. Calyx with prominent lobes between the calyx teeth; plant usually procumbent.
 - C. decumbens*
3. Corolla white (or very pale pink), small, becoming split into separate petals.
 - C. alba*
 - C. calycina*
2. Calyx very deeply 4 lobed.
 10. Pedicel under 0.5 cm. long; corolla not splitting into separate petals.
 10. Pedicel over 1 cm. long; corolla becoming split to the base.
 - C. aemula*
1. Filaments of the stamens scarcely widened at their base, anthers lanceolate with recurved margins; corolla not falling after flowering is over.
 11. Calyx rounded at the base. *C. lawrenciana*
 11. Calyx with an inverted saucer-shaped outgrowth at the base. *C. baeuerlenii*

1. *Correa reflexa* (Labill.) Vent. (Syn. *C. speciosa*, *C. virens*, and "*C. rubra*").

Shrub 1-4 feet high, semi-prostrate to erect. Leaves usually thin with an irregular margin. Flowers often borne in threes at the end of branchlets bearing only a terminal pair of leafy bracts which partly hide the flowers. Corolla green or various shades of red with green tips.

This species is the most widespread and variable of the *Correas* and is apparently the only species known in Western Australia (just!) where it is found on Wilson's Bluff on the border between Western Australia and South Australia. Coastal and inland forms often have leathery leaves rather like some forms of *C. alba*.

The epithet "*reflexa*" is derived from the presence of two reflexed bracts around the flower. In Gippsland is found a variety (var. *cardinalis*) with oblong leaves and relatively large corolla. This variety appears to have caused quite a stir when first raised from seed in England (sent by Ferdinand von Mueller), in the year (1856).

Grow *Correa* in Pots

A General Method for Growing Plants in Pots — By R. HARDIE

Some of you may be keen to grow some of our Australian plants in pots, tubs, etc., either as indoor plants, as specimens placed out of doors near the house on a porch, or for exhibition in the shows. The beautiful *Correas* mentioned in this issue are among the many natives ideally suited for pot plant culture as (a) they are easily propagated by cuttings, (b) they come into flower quickly, (c) their long flowering period extends from autumn, through the winter, into the spring, and (d) most forms have a neat, bushy, sometimes spreading habit becoming handsome healthy pot plants.

1. Site and facilities required.

Choose a place in the garden which is sheltered from wind and receives plenty of light, but no direct sun in the hottest part of the day. Small home-made wooden cold-frames are very helpful for propagation by seed or cuttings and also for pricking-off and hardening-off seedlings and rooted cuttings. Plastic or glass can be used to cover cuttings, hessian for seedlings and rooted cuttings. As the plants grow larger, a small bush house is a great help; otherwise the plants may be stood near a tree which gives a thin shade and protection from wind.

2. Soil for potting.

A potting compost which has proved suitable for most kinds of plants is given as follows: 7 parts good garden loam, 3 parts peat or leafmould, 2 parts coarse sand (or fine gravel $\frac{1}{8}$ "), add 2 oz. bone and organic and 2 oz. mineral mix per bushel. Pass all through 1" sieve and mix thoroughly.

(Note that 1 bushel = 8 gallons or 2 kerosene tins, whilst 21 bushels = 1 cubic yard).

The above compost is only a guide and growers may vary the ingredients as they see fit for native plants which prefer special soils, e.g., acid lovers such as *Bauera*, *Epacris*, *Thryptomene*, etc., would no doubt appreciate extra leafmould or peat (both of which increase acidity and moisture-holding capacity of the compost) and the pH can be further lowered by the addition of powdered sulphur at 1 oz. per bushel. For plants which come from limestone areas, e.g., *Lasiopetalum*, it may be helpful to cut down on the peat (or leafmould) and mix in a little extra lime. For plants from sandhills or those requiring perfect drainage, again reduce the peat or leafmould and increase the proportion of gravel or sand, e.g., *Dampiera*, *Clianthus*. While speaking about potting composts, it may also be of interest to growers who wish to propagate their own plants, to note the composts recommended (a) for seed-sowing and (b) for cuttings:—

- (a) Seed compost—2 parts loam, 1 part peat, 1 part coarse sand plus $1\frac{1}{2}$ oz. super per bushel.
- (b) Cuttings compost—1 part peat, 3 parts coarse washed sand, no fertilizer.

Cuttings from *Correa* may be taken at any time of the year, but preferably in summer when the plants are not in flower. These will root in 2-3 months, and may be potted singly into $3\frac{1}{2}$ ins. pots and allowed to overwinter in these. The next potting into 5-inch pots could be done very early in spring and the final potting to 7-inch pots in mid-summer.

3. "Potting-up" the young plants.

You may have raised your own plants from seed or cuttings or you may have lifted small seedlings from the bush. Whatever the method used, the young plants need to be individually planted as soon as they are large

enough to handle, into small pots, tubes or small tins (this practice is called "pricking-off" or "potting-up") and stood in a sheltered spot as noted above. Do not place small plants in large containers of soil and do not water newly potted plants too frequently. Water more often as roots and top growth develop. The soil to use for this first potting need not be as rich as the general potting compost recommended above; a sandy loam is satisfactory.

4. "Potting-on" the growing plants.

(a) When to pot-on.

Having begun with small plants in small containers it becomes necessary to "pot-on" into a slightly larger size from time to time as growth takes place, e.g., 3½" to 5" pot, 5" to 7", 7" to 9", 9 inch to a tub, etc. The time to pot on is when the roots have reached the sides of the container and are seeking fresh food material, having exhausted the nutrients in the soil. Do not wait until the plant becomes pot-bound, but move it on gradually from size to size as required. Eventually the plant reaches its final container and after some weeks or months will again have exhausted the soil nutrients—a feeding programme is then commenced (see below) so that the plant can be further nourished without disturbance.

Plants which are grown for flowering in pots should receive their final potting about two months or more before flowering time (e.g., *Correa pulchella* or *Epacris impressa* to be flowered say in 7" pots in late autumn through to early spring, would need their final potting about February). Good flowering plants of *Correa* in 7-inch pots can be expected in 1½ years after taking cuttings. Liquid feeding should not commence until flower buds start to form—otherwise leaf growth may be encouraged at the expense of flowers.

Fairly large foliage plants (e.g. *Ficus*, *Schefflera*) which need repotting only once a year are best done in the spring before active growth commences—repotting such plants in the autumn is unwise because growth is slowing down as winter approaches.

Very large plants in very large containers need special treatment, for they have reached the stage when further potting on is not practicable. They may have become too unwieldy even to lift. Trim the roots and repot into the same container, working in a little fresh soil around the roots. Eventually such plants have to be planted out in the open garden, but their life in the tub or other large container can be prolonged for a few years without disturbance by removing some of the surface soil and top-dressing with some fresh soil enriched with bone and organic fertilizer—this is done each spring and followed up by liquid manuring throughout the subsequent growing period. Penetration of fertilizer into the ball of roots is improved by making deep narrow holes with a steel spike or pointed stick.

(b) How to pot-on.

This is best shown by actual demonstration, but we may keep the following points in mind:

(i) The soil of the plants to be potted must be moist beforehand. Ensure also that the potting compost is nicely moist, neither too dry nor too sticky.

(ii) Scrub pots clean with warm water and a mild disinfectant soap such as "Clensel" in order to reduce chance of disease infection and also to enable the plant to be knocked cleanly out of its pot at a later date.

(iii) Carefully crock the pots to ensure good drainage—place a curved crock over the hole and add further broken crocks, gravel, fibre or other suitable drainage material in proportion to the size of the pot.

SMALL EUCALYPTS

Some smaller *Eucalypts* to suit heavy red and black soils of the Central and Western plains of N.S.W., and homoclimes—*Mallees* excluded.

By W. McREADDIE

Thoughts invariably tend here to the many well-known highly ornamental Western Australians. Unfortunately most of these are unreliable in the conditions being dealt with here. The occasional wet season writes finish to most of them, and this has proven a disillusionment to many enthusiasts of my acquaintance.

One species, however, outshines all others for reliability under all conditions and this is *Eucalyptus torquata*. Four hundred of them currently thriving in the streets of Bourke provide ample testimony. I noticed recently that they are getting a trial at Wilcannia—and these look healthy enough. *Eucalyptus torquata* hardly needs description as it is so well known and widely grown. I would like to see it get in the hands of competent hybridists and line breeders though, as its potential is unlimited. This species is a quite satisfactory tub specimen too, for those of limited space. It generally blooms in the second season.

Some others which have proven reliable are:—

Eucalyptus lansdowneana—a mauve form is available that is quietly attractive. Forms a compact shrub. Good in a shrubbery or as a hedge. Up to 15 feet.

Eucalyptus lehmanni—Heavy soils tend to slow its growth rate down considerably and for a long time it remains a compact bushy shrub up to 20 feet. Similar uses to *E. lansdowneana*. Has bottle green flowers in large clusters and curious welded fruits. Takes a few years to flower.

Eucalyptus cladocalyx var. *nana*—Has been grown successfully for many years in moderately heavy conditions. Trees of good type give good shade and pleasing form up to 20 feet. A useful tree for specimen or wind-break row.

Eucalyptus nutans—A fine dwarf of shrubby habit up to 12 feet. Deep red flowers and dark green leaves. Use in shrubbery. Reliability beyond the Central West is doubtful but would probably be worth a trial within good windbreaks or building lees.

Eucalyptus kruseana and *E. tetragona* are fairly reliable and the silvery foliage provides good contrast. Both for use in a tall shrubbery from 12-18 feet.

Eucalyptus grossa—Shows promise in heavy conditions. It has large shiny leaves and yellow flowers. Grow amongst other specimens from 3-9 feet high.

Eucalyptus gracilis—Extends into the Mount Hope region from South Australia and, though not well known, is a particularly fine and reliable small tree. Has very narrow shiny leaves and a dense aspect. A good specimen tree.

A word here on shrubby, and mallee *Eucalypts*, not of advice but of warning. They, like nine hundred and ninety-nine out of a thousand other shrubs, will not stand on their own and be anything. They need to be mixed in and grown with others so that they complement, and are complimented by, their fellows.

All species are frost hardy for the conditions dealt with unless specifically stated otherwise. They should not be staked, unless in such a position that the wind twists them around screwing them off. A certain amount of wind action is necessary for the development of strong trunks and root systems.

EUCALYPTUS ERYTHROCORYS

Illyarie or Red-cap Mallee by E. J. Thomson

This is one of the best of the small eucalypts and good use of this should be made in street plantings. In its native surroundings at the Murchison River, W.A., it may be found growing as a small shrub 8'-10' high. The name *Illyarie* was given by the natives on account of its ornamental character. It may also be grown on a single trunk, making a tree up to 30' high with gleaming white bark. The bud cap (operculum) becomes a brilliant red before lifting from the emerald green calyx. The brilliant yellow flowers, some may be two inches across, give a spectacular display as both flowers and buds appear on the tree at the same time. Flowering time is somewhat irregular but is usually about March to December. The long pointed leaves $3\frac{1}{2}$ "-7" are soft and crinkly at first and later smooth and deep green. The fruits are large, four-sided and may be 2" x 2" in size. It does best on fairly heavy loams and calcareous soils.

Several local authorities have made plantings of *E. erythrocorys* in South Australia. At the time of writing I have not made any recordings of any being grown in any of the areas from which reports have been submitted in connection with the street tree survey. The flowers of the species are certainly very striking and an avenue of these would be most pleasing.

FROM F. C. LULLFITZ, WEST AUSTRALIA:

I find that *Eucalyptus erythrocorys* is quite adaptable and thrives over a wide range of soils and climate. Nice ones are on the red soil river bank at Donnybrook, on red clay loam at Gosnells just out of Perth, and on the coastal sand near Perth, at Pingelly, Cunderdin, Geraldton.

It appears that the addition of organic fertiliser with possibly nitrogen as the limiting element gives best results. I had 500 seedlings in six-inch tubes here and they were dying off until I had 45 left, all looking sick. I dressed them with lime and lots of good wishes to no avail. Just to kill them a bit quicker I dressed them heavily with blood and bone and they leaped out of the ground. I found the answer by accident.

Use good well-drained soil and add some organic manure with humus and keep well-watered and watch them grow. Damping off doesn't bother mine. I dust a bit of "Captain" about and give a light dressing of blood and bone when they are moving. I put a shovel full of stable manure in the bottom of 4 gallon tins to grow larger stock and it works. I have no trouble with germination. I get good germination over a long period using fumigated soil with some sieved manure or a little blood and bone, and I can grow them any time. *E. erythrocorys* is easy!

FROM I. G. HOLLIDAY, SOUTH AUSTRALIA:

Eucalyptus erythrocorys, the red cap mallee, is easily grown in most soils of the Adelaide plains. It is particularly suited to the heavy clay soils overlying limestone or limestone marl which are frequently encountered here.

I have planted this tree in a saline clay loam with poor drainage at Glenelg, near the sea coast. Growth was rapid and flowers prolific after only two years from planting time. The usual flowering period is from late March to May, the typical flowering habit is for the flowers to appear near the top of the tree only.

There is, however, a specimen at Erindale, an eastern Adelaide suburb, which literally covers itself with flowers each year, rivalling *Eucalyptus ficifolia* for a massed display. This particular tree is not a very shapely specimen.

FROM W. McREADDIE, Central N.S.W.

This highly ornamental species has proved satisfactory on well-drained soils in the Central West of N.S.W. Not many mature specimens are known to the writer but a few that have been in twenty years or more have reached fifteen to twenty feet. Some are growing on well-drained red soil ridges and some on light sandy soils. Growth development has favoured the sandy soils. The species is not recommended for heavy soils.

The blossom is a brilliant yellow and the contrast of white limbs, leaves, red caps and yellow flowers is striking. The matured fruits are among the larger of the Eucalypts and are, in themselves, highly ornamental, being much in demand in several overseas countries, notably the U.S.A., where they are used in floral and dried material work.



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Eucalyptus erythrocorys — Illyarie or Red Cap Mallee

STREET TREE SURVEY REPORT from Section Leader E. J. Thompson

I should like to take this opportunity of thanking all persons concerned with this survey who have completed their questionnaires. The task is rather onerous at present and I wish to apologise for delay in answering some of the very interesting letters I have received. The desire for experimental planting is obvious by the number of replies that I have received on this question.

GROWING SMALL EUCALYPTS

FROM L. O'GRADY, West Australia

The West Australian Forests Department uses what apparently is termed the "bog plant method" as a convenient and simple way of germinating seedlings of Eucalypts to determine the viability of seed. In the tests the seedlings are usually pulled out, counted and discarded but occasionally pots containing germinated seed have been allowed to remain in about one inch of water and the seedlings have kept growing to planting out size. A fairly coarse yellow sand was used.

I would suggest this method for germinating Eucalyptus seed although in this case the water level in relation to the surface carrying the seed is lower and hence the surface is not quite as wet as the true bog method previously described. After germination transplant the little seedlings to large tins, the size of the tin depending on how tall you wish to raise the plant before planting out. Small pots or tins cause the roots to curl around and plants, especially trees, with curled roots do not make satisfactory planting stock. The roots will persist in growing around in circles and trees so affected will strangle or blow over in a wind. For advanced tree plants 2-4 gallon tins are necessary.

I feel that most trees benefit from manuring, i.e., rotted organic or light applications of blood and bone. I also feel that it is harmful to pour water around the butts of plants. Many people, including council employees, hold the hose against the butt of the tree and water a circle about two feet. The result could cause collar rot as tree roots have a remarkably wide spread.

FROM W. McREADIE, Central N.S.W.

If the Eucalypts are being used for wind breaks, I do not believe in watering except for an initial dose when planting the seedling. It is vital that the ground be well-worked by deep ripping and cultivating for six (6) months to two (2) years prior to planting, awaiting a good season for planting. For those who cannot stay the hand with watering, then do it this way—allow the hose to just trickle at the base of the plant for at least half an hour every fortnight. This will ensure deep penetration of the water. Light watering with sprinklers is fatal. It forces roots too near the surface areas where they will scald in summer.

If the Eucalypt planted is a garden specimen or part of the shrubbery, then it may receive the same watering as the rest of the garden.

From N. S. Bishop, Lake Grace, West Australia.

I obtained my coral gum, *Eucalyptus torquata*, from a nursery as a one year old plant and grew it for 12 months in a four gallon tin. It was then planted out into the natural soil, a grey clay, in June and watered periodically during the following summer.

For the next three years it made little progress, growing to about six feet, relying on 14 inch yearly rainfall only, and contending with roots from huge salmon gums twenty yards away. Last year it flowered very well and is now growing vigorously. We have just had a long dry summer, with only ten points of rain from a thunder storm in January. It has received no other water and is now ten feet, very bushy with a new growth and masses of buds.

From N. Kent, 12 Winchester Street, St. Peters, South Australia.

We have a *E. torquata* growing well. Planted two years ago, it is now ten feet high with hundreds of buds flowering from February onward. The soil is rich with a considerable amount of limestone in it. (The pH is unknown but judging from the trees doing well and from others which have suffered from lime chlorosis. There is also a manganese deficiency). The tree is in an area which has been well watered. It was an untidy little bush in its early stages, but on removal of its bottom branches it is now a well shaped tree.

From Jean Galbraith, Tyers via Traralgon, Victoria:

The only *Eucalyptus torquata* I grew was "leggy" and unthrifty with few flowers. Its position was sheltered, well drained, very dry in a soil clay loam. Another six miles away, is a fine bushy tree of 12 feet, almost always with some flowers and flowering regularly and heavily each year. The difference was that there was much humus in the soil in the second instance and the tree was watered when necessary.

EDITOR'S NOTE: A number of comments sent by readers will appear in the next issue. I would like to hear from more growers of small eucalypts about their experiences. I would like as many comments on *E. ficifolia* as possible also.

Cultivation of Epiphytic Native Orchids

By NOEL C. JUPP

Each year probably some thousands of orchids are torn from their chosen positions in the host trees, rock ledges, mossy banks, etc., of our natural bushlands. They are taken "home" and in the majority of cases are placed in a pot or similar receptacle without any thought or observations on the ecological conditions required for the maximum of growth and propagation, which is what we should aim at, not just collecting them for the sake of collecting or being able to say "I've got that one".

Media used in cultivating native orchids are tree fern blocks, varying composts in pots, hardwood blocks, and planting out on host trees. The most suitable material for binding or fastening plants to blocks is undoubtedly nylon fishing line. However, care must be taken when choosing materials for hanging tree fern or hardwood blocks. In cases of *Dendrobiums* galvanized wire can be used with safety, but when mounting *Sarcophilus*, etc., the use of galvanized wire can eventually be disastrous. The zinc salts washed from the wire during watering or rain cause a burning of the roots and over a period of time eventual collapse of the entire plant. To avoid this possibility copper, plastic covered, or stainless steel wire should be used.

The most suitable and natural way to grow our epiphytic orchids is, of course, on suitable host trees. Orchid species should be placed on the tree in suitable situations, i.e., *Sarcophilus* should be placed on the southern side of the tree, *Dendrobium* can take more sun and can be placed practically anywhere on the tree. *D. cucumerin* and *D. linguaforme* should be placed on the vertical not horizontal limbs and trunks. Other epiphytic plants such as *Platyserium grande* and *P. hilli* can be used to advantage amongst the orchids.

However, many people who wish to grow native orchids do not have a suitable host tree to grow their orchids on and so must build a bush-house. This necessitates growing plants in pots or on blocks. Very few of our epiphytic orchids succeed very well when grown in pots and so must be grown on blocks for optimum results. They will all succeed on tree fern blocks but this means felling or mutilating a tree fern, a very necessary and beautiful part of our flora. To avoid this destruction I decided on growing my orchids on other media. As dead hardwood trees are available in huge quantities in my area I decided to experiment with them and found much to my surprise that provided certain precautions were taken our epiphytic species grew wonderfully well on the hardwood blocks. Due to their long life and slow decay under moist conditions I always choose pieces from the trees commonly known as tallow wood or from the narrow leaf grey gum. However, my experience has been that providing sufficient time has elapsed to completely weather the surface and dry out all sap any species of hardwood are suitable.

Species such as *D. linguaforme*, *D. aemulum*, *D. speciosum*, *S. falcatus*, *S. oliveaceus* and many others succeed admirably well fastened directly to the wood but some species such as *D. tetragonum*, *D. striolatum*, *D. rigidum*, *D. kestevenii*, *S. fitzgeraldi* require a reservoir to supply moisture, plant foods, etc. This is best provided by materials such as dead layers of *Platyserium hillii* or by a small pad of live moss placed directly under the plant. When placed on the blocks plants require only enough moisture to prevent undue shrivelling and once established will stand quite long periods of drought. In fact, once established my plants are never watered except

during exceedingly hot dry periods. I make a practice of allowing all available natural moisture such as rain, fogs and dews to fall on the plants. This can be done by providing for full side ventilation during all weather and even providing easily removed overhead shade materials during nights to allow dews, etc., to fall on the plants. However, if you suspect any chance of a frost forming leave all overhead covers on but leave spaces to allow for air movement.

When plants have been well-watered applications of liquid manure such as Aquasol will be found to be beneficial. One teaspoon to two gallons of water will be found to be beneficial. Any richer liquid manure will tend to produce soft lush growth which is easily burned by frost or sun. Apply this fertiliser to the whole plant not just the roots.

Other semi-epiphytic orchids such as *Cym. sauve*, *C. canaliculatum*, *C. iridiflorum* are grown in pots in a bewildering array of composts based on leaf mould, tanbark, sand, chopped up natural bark, etc. All these composts are usually successful but a good base to work on is one third tanbark or peat moss, one third leaf mould containing a large proportion of undecayed leaves and a third part sand all measured by volume will be found to be quite suitable. Small quantities of fowl manure or cow manure can be added for stimulus. Epiphytic orchids such as *D. speciosum*, *D. gracillimum* can also be grown in this mixture using pots or hardwood blisters.

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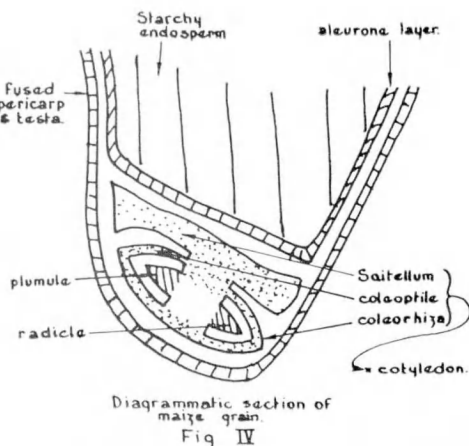
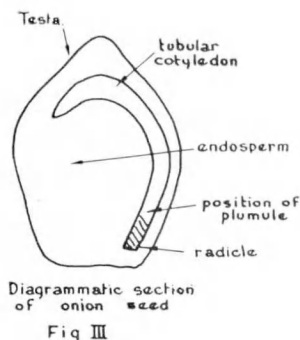
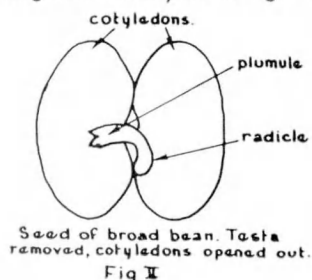
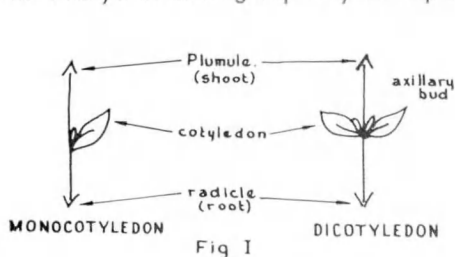
THE SEED

By HELEN LEE

In a previous article we saw that a seed develops from a fertilized ovule and the subsequent maturing process occurs mainly in the fruit. The shape, size, colour and surface markings of seeds are very variable and most flowering plants can be identified by seed characters alone.

A seed consists of an outer seed-coat or testa surrounding the embryo or young plant. A food storage tissue, the endosperm, may also be present. In some seeds there is an additional tissue, the perisperm, which develops from the nucellus of the ovary. If present, the perisperm is also a food storage tissue. The embryo has several parts, viz., the radicle or young root, the plumule or young shoot, and one or two cotyledons which are concerned with the nutrition of the young plant in the early stages of growth. The cotyledons are modified leaves and a minute bud is found in each axil.

The flowering plants are divided into two major groups, the dicotyledons and the monocotyledons. The seeds of plants belonging to the former group have two cotyledons while those of the latter group have one cotyledon. These major groups have other distinct characteristics besides the cotyledon number. The embryo of each group may be represented diagrammatically as in fig. 1.



All seeds contain a store of food which provides nutriment for the young plant. The food may be stored outside the embryo in the endosperm and such seeds are called endospermic, or it may be stored in the cotyledons which then occupy most of the seed and such seeds are then called non-endospermic. Endospermic and non-endospermic seeds are common in the

dicotyledon group, but the seeds of the majority of monocotyledons are endospermic. The structure of some representative seeds will now be described. If readers are interested in dissecting seeds in order to find the various structures, it is suggested that seeds soaked in water until they are swollen are more easily handled.

1. Dictotyledonous, non-endospermic seed. e.g., broad bean.

On one end of the seed, on the outside of the testa is a dark scar called the hilum. This scar was the point at which the seed stalk or funicle was attached. At one end of the hilum the outline of the radicle can be seen through the testa. Between this and the hilum is a tiny hole in the testa, called the micropyle. If a soaked seed is squeezed gently water will emerge from the micropyle and its position can be determined. If the testa is removed, the inside of the seed is seen to be occupied entirely by the embryo. The two cotyledons can be opened out and the plumule and radicle are exposed. Fig. 2. Other plants with similar seeds include most of the family Leguminosae, e.g., peas, beans, wattles, etc.; the Eucalypts, Proteaceae, and many others.

2. Dictotyledonous, endospermic seed, e.g., castor oil bean.

On one end of the testa of the bean there is a yellow spongy outgrowth called the caruncle. If the testa is removed and the embryo opened out, it can be seen that the cotyledons are very thin and on the outside of each a white fatty tissue, the endosperm, is attached.

3. Monocotyledonous, endospermic seed.

Usually, in the monocotyledons, the cotyledon is a tubular structure which encloses the plumule and may also enclose the radicle. However, the cotyledon is frequently highly modified and it is difficult to relate it to the structures as seen in the dicotyledons. In the monocotyledons, unlike the dicotyledons, the cotyledon may increase in size during germination and it nearly always has an absorptive function at this stage. An example of this type of seed is onion (*Allium*), Fig. 3.

In the grass family (*Gramineae*) the so-called seed or grain is actually a fruit as the pericarp and the testa are fused together. The structure of the grain of maize is typical of the family. See Fig. 4. Most of the grain is occupied by the endosperm which is extremely starchy in nature. To the outside is another layer of cells, called the aleurone layer, which is mainly composed of protein material. The embryo lies at one end of the grain. The single cotyledon is composed of three structures; the coleoptile, which forms a sheath over the plumule; the coleorhiza, which forms a sheath over the radicle; and the scutellum, which is a shield-shaped structure lying in contact with the endosperm. It is believed that the scutellum acts as an absorbing surface for nutrients passing from the endosperm to the embryo during germination.

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THE GENUS *CORREA*—Continued from page 4

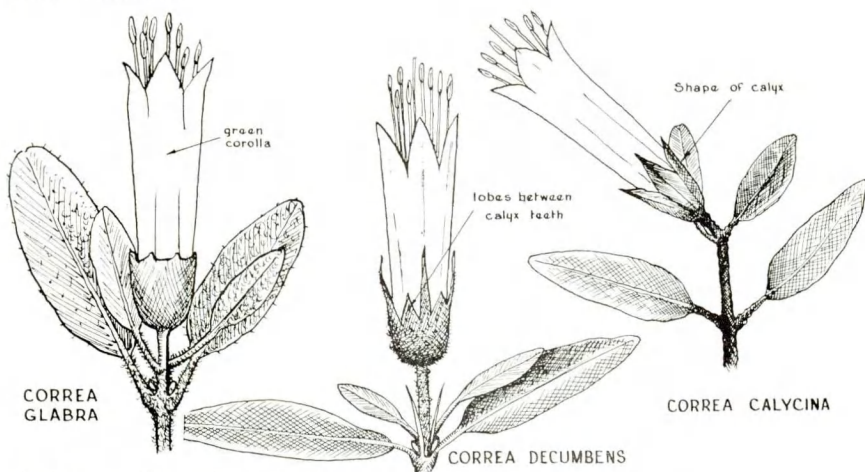
The original collection of *Correa reflexa* was made by Labillardiere in 1791 at "La baie de L'Aventure" on the south coast of Tasmania. It had green flowers surrounded by the typical reflexed bracts. Only in the north of the island around Georgetown is found a red flowered form which is otherwise very similar.

2. *Correa schlechtendalii* Behr. (syn. *C. turnbullii*).

Erect shrub to 6 feet. Leaves oblong to broadly elliptic, thin, glabrous above, sparsely pubescent below. Flowers solitary on short branchlets. Corolla red with green lobes. Anthers prominently exserted. It is found in the Mt. Lofty Ranges and Murray scrub, South Australia. This species differs from *C. reflexa* in having smooth often glabrous leaves, which are not cordate at the base, and in flower shape.

3. *Correa glabra* Lindl. (syn. *C. rubra* var. *megacalyx* and *C. leucoclada*).

Erect shrub to 9 feet high. Similar in appearance to *C. schlechtendalii* but with green flowers. Distribution. South-east Queensland, central and eastern New South Wales, Central and western Victoria, Mt. Lofty Ranges of South Australia.



4. *Correa decumbens* FyM.

A procumbent woody plant or low shrub. The red and green flowers are usually erect on the horizontal branches. This species may be easily distinguished by the calyx which has long narrow lobes with smaller triangular intermediate lobes. It is found in South Australia in the Mt. Lofty Ranges and on Kangaroo Island. A form which appears to be intermediate between this species and *C. reflexa* is found in the Grampians, however, although possibly of hybrid origin, I do not know of any specimens of the true *C. decumbens* having been found there.

5. *Correa calycina* Black

An erect shrub up to 8ft. high. The entire leaves are narrowly ovate to oblong, 2-4 cm. long with an obtuse or rounded apex. The green flowers are borne singly on the end of short branchlets. The distinguishing feature of this species, and from which it derives its name, is the calyx which is tetragonal in cross section and is divided from half to two-thirds of its length into broadly lanceolate lobes.

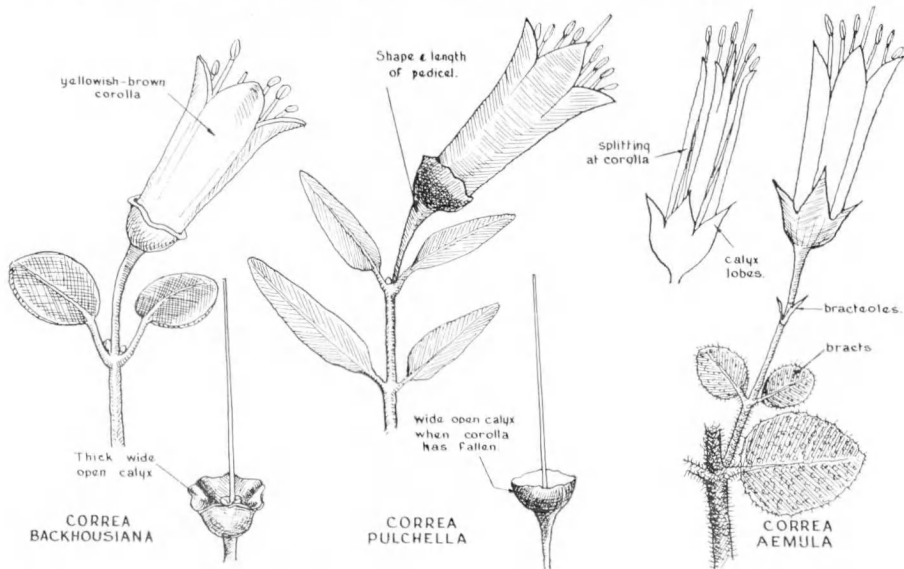
It is only known to occur in a few valleys at the southern end of Fleurieu Peninsular, South Australia.

6. *Correa backhousiana* Hook.

A large dense shrub to 15 feet high. The leaves are broadly ovate, leathery; dark glossy green above and densely tomentose beneath. One to three pale green flowers are borne on the end of short branchlets. The calyx is cup-shaped, sometimes with the rim curved back, and unlike most other species in the genus, remains wide open after the corollas have fallen. This species is found around the south, west, and north-west coasts of Tasmania, apparently always near the sea, where it may form dense, impenetrable stands. It was named by Sir William Hooker after the Quaker missionary James Backhouse who, when touring the Australian settlements, made collections of plants, and extensive notes on the vegetation. He wrote the first "Flora" to be published in Australia.

7. *Correa alba* Andrews

Shrub to 5 feet high. Leaves ovate to rounded, to 4 cm. long, glabrous to pubescent above, usually densely tomentose below. The flowers are borne singly or in clusters at the end of short branchlets. The comparatively small white corollas soon split into four distinct petals which spread outwards.



The calyx is cup-shaped, varying from truncate in northern forms to four-lobed in southern and western forms.

This plant grows near the sea around the coast of New South Wales, Victoria, and Tasmania. It is the only species with white flowers, which are smaller than in any other member. In the early 19th century it was used extensively for hybridising with other species to produce a multitude of variously coloured cultivars. It has been used as a stock on to which other less vigorous species have been grafted.

In south-west Victoria and around Encounter Bay in South Australia is found the variety *pannosa* Wilson [synonym var. *rotundifolia* (Lindl.) Benth.], this differs from the type in having smaller flowers, and smaller, more or less rotund leaves.

8. *Correa pulchella* Mackay ex Sweet (syn. *C. neglecta* and *C. minor*).

Small shrub to two feet high (rarely more). Leaves oblong to broadly elliptic, more or less glabrous, light green in colour. Flowers solitary on the end of short branchlets; pedicel glabrous 4-10 cm. long, thickened below the

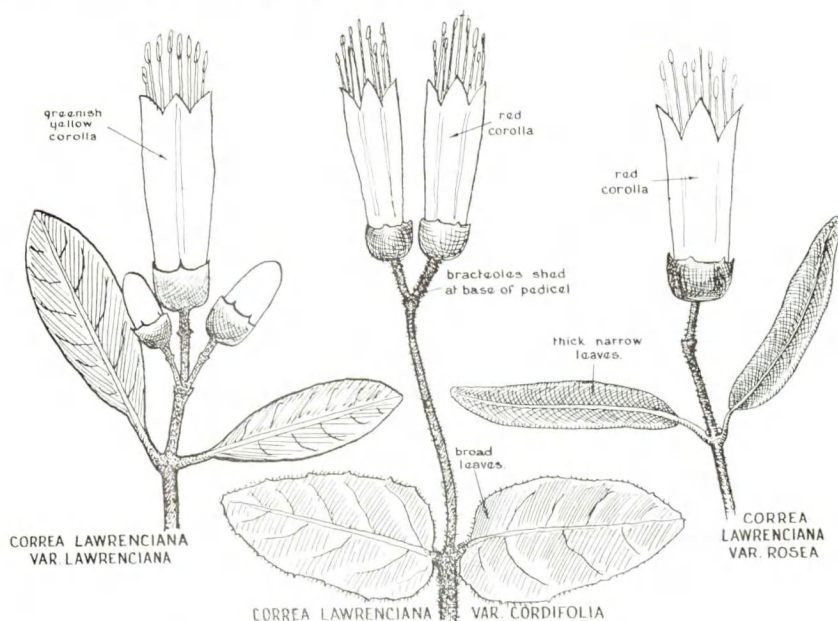
calyx. Calyx broadly cup-shaped, margin more or less truncate, glabrous remaining wide open after the corolla has fallen. Corolla various shades of pale red (no green lobes).

This species is one of the most pleasing of those *Correas* commonly found in cultivation, a horticultural form, which is possibly a hybrid with *C. reflexa*, is often sold by florists under the name of "*C. speciosa*". *C. pulchella* is found only in South Australia where it is restricted to southern Yorke and Fleurieu Peninsulas, Eyre Peninsula, and Kangaroo Island. It may be easily distinguished by its flower colour and its more or less glabrous leaves.

9. *Correa aemula* (Lindl.) FvM.

A small, straggling bush 2-3 feet high, semi-procumbent to erect. Leaves thin, ovate to cordate, to 3 cm. long. Flowers solitary on the end of short branchlets which bear a pair of subsessile leafy bracts and above them a pair of small linear bracteoles. Calyx with four long, acuminate lobes; corolla green to pale purple (the colour deepening with age), becoming split into four petals each of which infold around their neighbouring pair of stamens.

This species is recognised by the characteristic bract and bracteoles on the long peduncle and pedicel, and by the deeply lobed calyx. Hybrids between it and *C. reflexa* appear to be common in the Grampians of Victoria. The species is found in South Australia in the Mt. Lofty Ranges and Kangaroo Island, and in the Grampians of Victoria.



10. *Correa lawrenciana* Hook.

Shrub or small tree 2 to 30 feet high. Leaves narrowly to broadly elliptic or ovate, 2-9 cm. long, upper surface glabrous, lower surface glabrous to densely tomentose. Flowers usually borne in an axillary cyme of 1-3 (-7) flowers. Calyx shallowly to deeply cup-shaped, 4-toothed. Corolla greenish yellow to red remaining on the fruit after flowering.

This species may be subdivided as follows into several varieties:—

1. Calyx without any apparent glandular dots, plus or minus pubescent.
2. Flowers greenish yellow or red, leaves broadly elliptic to broadly ovate, thin to leathery.
3. Leaves thin to leathery, plus or minus elliptic base wedge-shaped to obtuse; peduncle to 1.5 cm. long; calyx 3-5 mm. high; flowers green (rarely red).
var. *lawrenciana*
3. Leaves thin, broadly ovate, base obtuse to sub-cordate; peduncle 1-5 cm. long; calyx 4-10 mm. high.
4. Bracteoles (soon shed) inserted at base of pedicel, corolla red (or rarely greenish yellow).
var. *cordifolia*
4. Bracteoles (soon shed) inserted at apex of pedicel beneath the calyx; calyx (5-) 7-10 mm. high, sparsely pubescent; corolla greenish yellow.
var. *macrocalyx*
2. Flowers red; leaves oblong-elliptic, leathery.
var. *rosea*
1. Calyx with prominent glandular dots, subglabrous or glabrous.
5. Calyx lobes merely tooth-like (Queensland-N.S.W. border).
var. *glandulifera*
5. Calyx lobes lanceolate, acuminate, from half as long to as long as the calyx tube (S.E. Victoria).
var. *genoensis*

C. lawrenciana var. *lawrenciana*

Extremely variable, the leaves are narrowly to broadly elliptic, glabrous or densely tomentose, 2.5 to 6.5 cm. long. The flowers are normally green, although in a few localities red-flowered forms occur, 1.5 to 2.5 cm. long. The type variety is found in Tasmania, in the mountains of Victoria and south-east New South Wales. In the Grampians is found a small bushy form with thick leaves and short thickly pubescent flowers, while around Mts. Buffalo and Latrobe is found a magnificent large-leaved form with large velvety flowers, this latter plant was named by Mueller *C. latrobeana*.

C. lawrenciana var. *cordifolia* Wilson

Shrub to 8 feet high, leaves thin, broadly ovate with a subcordate base. Flowers borne on slender peduncles. Corolla usually pale red about 2.5 cm. long.

This variety is found near the coast in south-eastern New South Wales.

C. lawrenciana var. *macrocalyx* (Blakely) Wilson

A loosely branched shrub 3-12 feet high. Leaves thin, broadly ovate. Flowers borne on slender peduncles, calyx very deeply cup-shaped, sparsely pubescent; corolla greenish yellow, velvety. This variety differs notably from that preceding in having a larger calyx, green corolla, and bracteoles inserted directly beneath the calyx. It is found near the mouth of the Hawkesbury River, New South Wales.

C. lawrenciana var. *rosea* Wilson

Shrub 6-12 feet high. Leaves thick, narrowly elliptic, to 6 cm. long. Corolla "crimson". This variety was first noticed by F. von Mueller in his travels to Mt. Kosciusko in January, 1874. In the following month he sent a portion to Dr. M. T. Masters in England for presentation to the Royal horticultural Society with an accompanying letter which was overflowing in its praises. However this variety never appears to have been accepted in the horticultural world as have some of the other *Correa* species. It is an alpine plant and occurs only in the Snowy Mountains of New South Wales and Victoria.

C. lawrenciana var. *glandulifera* Wilson

A tall shrub to 20 feet high. Leaves thin, ovate, sparsely pubescent beneath, to 8 cm. long. Peduncle short bearing 1-5 flowers. Calyx shortly cup-shaped with prominent glandular dots. Corolla about 2.5 cm. long, greenish yellow. This variety has been found only in the Macpherson Range in south-east Queensland near the New South Wales border, it is the most northerly occurring of the *Correas*.

C. lawrenciana var. *genoensis* Wilson

A low shrub with broadly ovate leaves, tomentose beneath. The flowers are borne on very short peduncles; calyx urn-shaped about 10 mm. long including the four prominent lanceolate lobes; corolla about 2 cm. long probably pale red in colour.

Regional Map of Australia—Part II

By C. N. DEBENHAM, *Museum of Applied Arts and Sciences, N.S.W.*

The figures following are the standard 30 year normals of stations which may be taken to represent the over-all climatic pattern found within each region.

REGION	RAINFALL IN INCHES			TEMPERATURE F		RELATIVE HUMIDITY %
	Annual	Jan.	July	Jan.	July	Av. annual
EREMAEAN (Interior) ZONE						
North	13.8	4.0	0.2	76-99	51-75	34
South West	11.1	0.6	1.4	62-94	39-62	56
South East	9.2	0.6	0.7	65-91	41-60	47
TROPICAL ZONE						
WEST	22.9	7.3	0.1	79-91	57-82	63
North						
Coast	58.7	16.2	0.5	77-90	68-87	68
Inland	24.7	6.8	0.3	76-98	54-84	49
East						
Coast	43.1	10.9	0.7	76-87	60-76	70
Highlands	23.3	4.9	0.7	71-93	52-76	63
SUB-TROPICAL ZONE						
Coast	40.1	5.7	1.9	69-86	49-69	68
Highlands	29.0	3.9	2.1	57-81	34-54	68
Inland	9.1	0.9	0.5	74-98	42-65	38
TEMPERATE ZONE						
South East						
Coast	35.7	4.5	2.6	61-74	44-60	70
Highlands	24.3	2.2	2.0	56-82	36-52	65
Alpine	48.7	3.3	4.2	42-65	25-39	67
Inland	20.9	2.0	1.9	64-92	38-60	58
South						
Coast	25.9	1.9	1.9	57-78	43-56	65
Highlands	27.4	1.3	2.7	51-76	38-50	79
Inland	15.5	0.6	1.7	55-84	39-57	59
Tasmania	28.6	1.5	3.1	52-76	37-54	70
South West						
Coast	36.0	0.3	7.1	63-85	48-63	62
Inland	18.0	0.5	3.6	61-92	42-62	62

GENERAL FEATURES OF THE REGIONS

(A) THE EREMAEAN

The prominent feature of the continent is the large tracts of desert sand hills, desert loams, desert sand plains and stony deserts of an interior from which encircling belts extend of progressively higher rainfall. This arid area (about one third of the total continent) is referred to as the Eremaean and extends westwards to the coast around Sharkes Bay, eastwards to the Darling River of N.S.W. and the far south-west of Queensland. South of the tropic of Capricorn, its boundary approximates the 10" isohyet (i.e., the rainfall does not exceed 10" annually) but north of the tropic, the boundary reaches the 20" isohyet. Much of the Eremaean is made up of the Great Plateau (1,000-2,000ft. elevation) but in the east the much lower elevations of the Great Artesian Basin cover about 550,000 sq. miles.

To the south-west and east, local conditions have altered the general pattern of the Eremaean so that an interchange of arid and higher rainfall floras proceeds. These areas make up the inter-zones shown on the map as G-A, B-H, C-I (in the east) and E-K in the south-west.

The tropic of Capricorn provides a theoretic boundary to regions of wet summer and dry winter with high atmosphere moisture (absolute humidity) and high temperature—the tropical zone—and the wet winter/dry summer, low absolute humidity, lower temperatures and wider dispersal of rains over the seasons of the temperate zone. The true boundary, however, is further south and at about latitude 30 degrees is marked the southern limit of the south-east trade winds which bring to the eastern coast and near-coast of the mainland the heaviest rains of the continent.

EDITOR'S NOTE—The map referred to in this article appears in the previous issue, *Australian Plants*, Vol. 1, No. 10, March, 1962.

(B) TROPICAL ZONE

- (i) **WEST (F)** . . . from the south at Onslow, the region follows the semi-arid belt (10-20" isohyets) of the coast and nearby lower slopes of the Great Plateau. Northwards, includes the area of greatest precipitation (over 30"), the Kimberley district. The area is influenced by the prevailing winds blowing from the interior and depends chiefly for its rain on the tropical cyclones—it is the driest coast of the continent.
- (ii) **NORTH (A)** . . . covers the sub-equatorial coast, the tropical inland (south to latitude 18 degrees) where the Plateau of Arnhem Land rises from the peneplain of the Great Plateau (at 500-900 ft. elev.) and the well-drained fringe of coastal lowland around the Gulf. Rainfall is influenced by tropical cyclones and summer monsoons, and there is a seasonal drought of from 5 to 7 months.
- (iii) **EAST (B) and SUB-TROPICAL ZONE.**
 - (a) north of the tropic . . . from Princess Charlotte Bay, south to Rockhampton, covers the coast, the eastern slopes of the Eastern Highlands (i.e., the Divide) and the Atherton Plateau. North of Townsville the Bellenden Ker Ranges rise to 5,000 ft. and more. The region is included by the 30" isohyet but 2,000 sq. miles around Cairns, receives over 100" annual rain. Frosts are experienced at higher elevations (e.g., the Atherton).
 - (b) south of the tropic . . . includes the sub-tropical coast and highlands extending to about latitude 30 degrees. In the north, the summer wet season and the dry winter are marked, but in the south abundant rain is spread over the seasons. The higher elevations of the Macpherson and New England Ranges result in cold winter nights with frosts, and winter snow. Moderately high absolute humidity is maintained.

(C) TEMPERATE ZONE

- (i) **SOUTH EAST (C)** . . . from about Maryborough in the north to Port Macquarie in the south, the average annual rainfall in many parts reaches up to 70" and sub-tropical conditions prevail; in other parts, the lesser rainfall and lower temperatures provide temperate conditions. Within the area, both sub-tropical and temperate types of vegetation are supported and, to show this, a sub-region B-C (or overlap) has been given. The region extends to the western slopes of the Divide in N.S.W. and, in Victoria, the Gippsland, north-eastern and south central districts are included. The highlands of this region are a series of tablelands and ranges over 3,000ft. in elevation (Mt. Kosciusko, 7313ft.) with steep slopes towards the sea and a gradual fall westwards to the plains (below 500ft.). From the north of the region there is a gradual change from uniform rain to pronounced winter rain. Alpine conditions prevail in the southern parts of the ranges with snow and frosts appearing for extensive periods. Tasmania appears as an extension of this region, its rainfall, as in the following two regions, is reliable, light to moderate, brought by westerly winds.
- (ii) **SOUTH (D)** . . . with the exception of the arid northern Mallee district, includes the remainder of Victoria and that part of South Australia with annual rainfall greater than 10". Much of this area is below or at 500ft. elevation (e.g., the plains of the Wimmera and the Mallee). The Divide merges into the Murray Basin, relieved by the horsts of the Grampians (3,827ft.) while in South Australia elevations of 2,000-3,000ft. are provided by the Shatter Belt formed from the



The Sunshine Wattle

Acacia botrycephala,
(Vent.) Desf.

(Formerly known as
Acacia discolor, Willd.)

By R. D. CROLL, B.Agr.Sc.

Reprinted from *Wildflowers*.
Blocks by courtesy of Angus &
Robertson.

Of the many *Acacias* that are native to Australia two always stand out in my mind as having a quality of yellow colour which seems to light up the bush. The little *Acacia myrtifolia* for this reason well deserves the title "Light of the Glen"—*Acacia discolor* has the same effect on the forest country of Gippsland and merits the common name of Sunshine Wattle. It is well known that it is the yellow portion of the spectrum to which the eye of man is most sensitive—but there are yellows and yellows. Perhaps one day some physicist will determine for us just what wave lengths are present which make *A. discolor* appear to emit a light of its own at dusk.

The specific name *botrycephala* which means "heads like bunches of grapes" is an apt description of the fine flower balls which are carried in axillary racemes, the upper racemes forming a terminal panicle. It is a pretty wattle as a tree also and well worth growing in the garden. As the illustration shows, it is one of the pinnate-leaved wattles having relatively large pinnulae with quite a shiny green upper surface which contrasts with a lighter green below. It is not particularly difficult to grow from seed though puncturing the seed coat and pouring boiling water over the seed will improve percentage of germination. The mature plant, too, appears to grow satisfactorily in a wide range of soil types from light sands to clay loams (preferring the former) and is little affected by low temperatures.

There are quite a lot of synonyms for *A. botrycephala* the one in most common use being *A. discolor*, Willd. Others are *Mimosa paniculata* Wendl., *M. discolor* Andr., *A. discolor* D.C., *A. maritima* Benth.

The species occurs in Victoria, New South Wales and Tasmania and, like so many of our Australian *Acacias*, was introduced into England and grown successfully very early. Johnson's *Gardener's Dictionary* records the growing of *A. discolor* in England in 1784 and that it is a shrub of about ten feet in height which flowers in May in that country. In Victoria the Sunshine Wattle flowers from May to July and is more usually a small tree of about fifteen feet.

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WILDFLOWERS by Clarice Morris

This small 120-page book is suitable for beginners. It describes the parts of a flower and then proceeds to describe 72 species of wildflower, from all parts of Australia, in simple botanical terms. The plants are grouped in accordance with their flower colour and each is illustrated by a clear line sketch. Eight colour plates are included, one, *Acacia discolor*, being reproduced in this journal. No mention is made of the methods of cultivation, although their native habitat given may serve as a guide.

AUSTRALIAN NATIVE PLANTS AND TREES

This is a well produced little 12 page booklet containing eight colour plates of West Australian wildflowers, the quality of which may be judged from the plate of *Eucalyptus erythrocorys* reproduced in this journal. Simple, very brief instructions are given on the germination of seed and cultivation of wildflowers, but its appeal to some readers will be because of the whimsical prose accompanying the illustrations.

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PERTH'S NEW BOTANIC GARDEN FOR INDIGENOUS PLANTS

By J. S. BEARD, D.Phil., Director, King's Park and Botanic Garden

In 1959 as a result of public interest aroused by the visit of Dr. W. S. Stewart, Director of Los Angeles State and County Arboretum, California, the Government of Western Australia asked the King's Park Board to submit a report and recommendations for the creation of a Botanic Garden for the indigenous plants of Western Australia in King's Park, Perth. In consultation with Dr. Stewart the Board submitted a report which was accepted in principle by the Government and this led to the appointment of a director.

Recently more detailed plans have been prepared and in February, 1962, the Government announced its further approval of these and its willingness to vote the sum of £33,000 per annum for the next five years.

A site of 25 acres in King's Park has been selected for development during the first five years. This lies on the south side of Forrest Drive with a view over the Swan River. It is in one of the most scenic parts of the Park and continues the existing park development further along the Swan River bluff. In addition there is to be an arboretum of about another 25 acres for the planting of large trees which cannot be conveniently accommodated in the Botanic Garden itself.

The objects of the Botanic Garden are to be as follows:—

1. To foster public interest in the conservation and cultivation of Western Australian flora.
2. To contribute to public education in this field.
3. To become a centre for botanical and horticultural research in the flora of Western Australia.
4. To provide a major tourist attraction.
5. To foster generally interest in botany and horticulture over the whole field of the plant kingdom.

It is laid down that these objects will be attained as under:—

1. The growing and display in garden form as aesthetically pleasing as possible of the maximum number of West Australian native plants.
2. Collection of seed of the widest possible range of West Australian plants for distribution to kindred institutions and for sale.
3. Collection of research on propagation, cultivation and horticultural improvement of Australian plants, and publication of the results.
4. Provision of suitable facilities for public lectures and demonstrations dealing with matters of horticultural and botanical interest; and encouragement of the work of horticultural bodies.
5. Organising visits by schoolchildren to the garden and children's classes in gardening.
6. Cultivation of botanically interesting plants from similar floras, e.g., the Eastern States, South Africa, California and the Mediterranean.

The collection of seed to provide plants for this Botanic Garden has been in full swing since the end of last year and some 2,000 collections are already available for sowing at the time of writing, autumn 1962; a nursery is being prepared and it is intended to raise plants for setting out in the field in the winter of 1963, by which time it will have been possible to prepare the site and install the necessary watering system.

As one of the main objects of the garden is to obtain information on the cultivation of plants there is no point in attempting the short cut of transplanting from the wild. It is our intention to carry out research at every stage—seed collection, sowing, germination, pricking-out, and vegetative propagation. Data obtained will be made available by publication from time to time.

It is the intention to carry a large stock of West Australian wildflower seed for public distribution and it is hoped to have the first seed catalogue ready for issue within the next few months, although the range of species available will not at first be very large.

We have been very pleased at the interest shown by members of the West Australian Wildflower Growers' Society and the encouragement received from them. Results obtained by members of the society in cultivating West Australian natives to date are on the whole very encouraging.

HOW TO GROW CORREA continued from page 2.

grows into rounded bushes at places like Cape Schanck and Phillip Island right on the edge of the Southern Ocean where it must withstand some of the most vicious salt-laden blasts that ever come from the direction of the Antarctic. Unlike other *Correas*, the attractive, white, starry flowers face upwards and split right down to the calyx. In the garden the plants are not so compact but are worthy of inclusion in a collection of *Correas*. Give a position of full sun in light or medium soil.

CORREA BACKHOUSIANA:

Leathery leaves more like *C. alba* and brownish-yellow bells makes a unique little shrub. It grows in rocky places among others but in my garden is thriving under trees, so it should stand up to a variety of conditions.

The Mountain Correa (*C. lawrenciana*) is more noted for its large leaves, up to about three inches long, than for its small groups of rather undistinguished yellowish flowers. A mountain species and so requires a cool position. Doing well in light soil with no special watering. Good drainage is possibly essential but it does grow in moderately heavy soil. The purple-flowered form of *C. lawrenciana* has smaller, more greyish leaves. As mine came from Bill Cane I assume that it is from a mountainous part of Gippsland. It is growing much more compactly than the usual form under similar conditions, except that it is in a more moist part of the garden.

A species previously known as *Correa mannii*, a horticultural hybrid between *C. pulchella* and *C. reflexa* is the hardiest *Correa* which I grow. It is the easiest to cultivate and also is easy to propagate. Should be in every garden. All red bell, pinkish inside. It does require a fairly open position but does reasonably well in heavy soil and does not need any special treatment except, perhaps, good drainage.

Then there is the "Chef's-cap Correa" (*C. baeuerlenii*) from N.S.W. with large, lance-shaped, bright green, un-correa like leaves which grows near my *C. lawrenciana* but in an even more shady position. The yellow flowers have the calyx of unusual flattened shape so producing the resemblance to a chef's cap. Light and medium soils in a cool moist shady position should be very suitable.

The Mount Lofty Correa (*C. decumbens*) and *C. pulchella* are growing successfully under conditions similar to those for most of the other species.

Propagation of *Correas* is from cuttings. Rather larger cuttings than for some plants, say up to about four inches, seem to do well. Spring or late summer are good times for setting cuttings.

As with most other shrubs a light pruning is beneficial at the end of the flowering season. If cut flowers are taken freely from a plant this often provides an ideal answer to the problem of keeping a plant compact. I do not support the theory held by some growers that plants should be left to grow untouched, they are always growing under more or less artificial conditions in the garden but can often be kept much more shapely than in nature.

In some cases, *Correas* require a stake, otherwise a strong wind will loosen the roots and the plant will collapse and die rapidly. I have not tried any experiments in manuring *Correas* since they have done very well in the light sandy soil without attention of this kind. There are some *Correas* which I have not tried yet but perhaps the secret of happiness in the garden as elsewhere is to have a fair share of the things you want but still have some that you hope to get some day.

EDITOR'S NOTE: Mr. Brooks has agreed to act as the *Correa* Study Section Leader and invites readers interested in growing these beautiful plants and developing better forms, to write to him at Hyndman Villa, Tulip Street, Cheltenham 522, Victoria.

A GENERAL METHOD FOR GROWING PLANTS IN POTS—Continued from page 6.

(iv) Arrange yourself and your materials at the bench in an orderly and systematic manner so that the job can be done with ease and economy of movement.

(v) In the act of potting remember not to unduly disturb the root ball (unless pot-bound, when some unravelling and root-pruning will be necessary); set the plant into the new pot at the same depth as, or slightly deeper than it was in the smaller pot; do not press down on the top of the ball of soil, but firm the new soil around the ball by pushing the fingers down vertically, palms outwards. Level the soil by one or two firm taps on the bench.

(vi) Finally, water thoroughly, so that the entire ball of soil is moistened.

The principles of tinning are the same as mentioned above for potting, except that good drainage is even more important, since a tin is not porous. Always punch some holes in the sides of the tin near the base as well as below, and be liberal with the coarse drainage material placed in the bottom of the tin. Most native plants grow very well in tins which are much cheaper than pots and usually quite easy to obtain in various sizes and types. Pots however, look much better and can be used repeatedly and there is no need for tin-snips when re-potting or transplanting.

5. Watering.

The watering of plants in pots, especially when grown indoors, requires much more care and observation than watering plants in outdoor garden beds. Note the following points:—

(a) Treat each pot-plant individually, giving water only to those which are becoming dry—fill each drying pot to the rim, so that the whole ball of soil is thoroughly moistened. Common mistakes are to water too often, especially in winter, and also to sprinkle the surface of the soil, which then looks moist on top but which is not properly moist all through.

(b) How often to water depends on such factors as the weather, the type of plant, its stage of growth. We need to know something of the climatic conditions preferred by the plant and whether a dormant drying-off period is required. When growth starts to slow down gradually reduce the frequency of watering; increase as growth becomes more rapid. Realise too that newly-rooted plants, having been given one good thorough watering after potting, do not require watering as often as plants which are nearing the pot-bound stage. To sum up, in watering pot-plants it is never a question of "how much?" for that is always the same (i.e., fill the pot to the rim and thoroughly moisten the whole ball) but of "how often" and this is learned by observation and experience and also by a knowledge of the plant's water requirements in its native environment.

6. Feeding.

The art of feeding plants lies in anticipating starvation rather than waiting for it to happen; yet, not starting to feed until it is really necessary. Overfeeding may well do more damage than none at all, causing rank sapov growth and delay in flowering. Judicious feeding on the other hand, will prolong the flowering period and give larger, better blooms and healthier foliage.

As already noted, after a plant has received its final potting (two months or so before due to flower), it continues to grow well in the fresh compost for some weeks, tending to become pot-bound before flowering. By now most of the nutrients in the soil have been either used up by the plant or leached out by watering. At this stage commence liquid feeding, repeating every 10-14 days during the period of maturity after which feeding may be stopped.

Foliage plants which are repotted annually each spring are given

liquid manure from about December to March to keep the plants healthy during the active growing period. Growth begins to slow down naturally in April and there is no point in feeding after that—the plants are allowed to grow quietly until repotting time comes again in spring. Practically all plants respond to liquid feeding, provided they are growing strongly.

Weak solutions of well-decayed animal manures (especially old cow-manure) are excellent for liquid feeding by pot application but they are not easy to obtain. In recent years, various artificial liquid manures have been marketed (e.g., Keogh's, Aquasol, Urea, Urea Plus, etc.) and these can either be applied in solution or as a spray over the foliage—the latter method is useful and time-saving where large masses of foliage plants need feeding. Always observe closely the maker's directions; scorching can result if the solution is too strong—also avoid sunny weather.

For pot plants showing early signs of leaf-chlorosis (yellowing due to lime-induced iron deficiency) apply to the pots a solution of $\frac{1}{2}$ oz. sulphate of ammonia and $\frac{1}{2}$ oz. sulphate of iron in 1 gall. water at fortnightly intervals. Avoid spilling on foliage. Iron chelates are now being tried for the same purpose.

'Dry' feeding is sometimes done, i.e., a little Bone and Organic, Hoof and Horn, or Mineral Mix fertilizer scratched into the surface of the soil in the pot and watered in. There is no doubt that artificial fertilizers, used wisely, are helpful to the growth of Australian plants.

The feeding of *Correas* could commence about April to coincide with the commencement of flowering. Continue feeding every 2-3 weeks to prolong the flowering period and to keep the pot-bound plant in good health. After flowering, cease feeding and either pot into still larger pots (or say three plants into a big deep pan or tub) or harden off for planting out.

7. Hygiene.

Hygiene simply means cleanliness. The prompt and regular removal of weeds, decaying leaves, etc., is important. Sterilization of soils, pots, etc., is desirable though not essential. Keep an eye open for pests and diseases and apply chemical controls when necessary, prevention being better than cure. Scale insects of various kinds are worst enemies of our Australian plants and these can be controlled by such measures as (a) judicious pruning, (b) sponging, and (c) spraying with White Oil mixed with Malathion throughout the summer months when nymphs are hatching and moving out from under the protective coats of their dead mothers.

Australian Plants for Pots in Outdoor Situations or for Shows

Fast growers have a limited life in pots so that most of the *Eucalypts* and *Acacias* are not really suitable. However, *Eucalyptus kruseana*, *Acacia drummondii* and other dwarf species would be well worth trying. Interesting to note that English gardeners have been using *Euc. globulus* and *Grevillea robusta* for many years as pot plants under glass and for sub-tropical bedding. Kew Gardens have also tried *Swainsona galeifolia* and *Clianthus formosus* in baskets with quite good success—such plants also suggest themselves for window boxes. In the Australian Glasshouse at Kew Gardens, *Epacris longiflora*, *E. impressa* varieties and *Correa pulchella* proved excellent pot plants with a long flowering period.

Other dwarf or small shrubs to try out in pots, pans and other containers include *Isotoma petraea*, *Scaevolas*, *Goodenae*, *Frankenias* (all these might be best massed together in wide pans), *Ruellia primulacea*, *Prostanthera incisa* var. *rosea*, *L. scoparium* varieties, *Grevilleas* (dwarf types) *Melaleucas* (dwarf types), *Eriostemons*, *Thryptomenes*, *Baueras*, *Eremophilas*, *Crowea saligna*, *Anigozanthos flavidus* and many others.

Australian Plants Indoors

The remarks already made on basic principles of pot plant culture apply also to pot plants indoors, but let us now consider briefly what plants miss most when brought indoors.

(1) LIGHT

As noted above, some plants will tolerate rather dark places for a few weeks or months, but the general rule is to provide as much light (but not direct sunlight) as possible. The best lighted positions should be left for flowering plants (which are temporary house plants only), variegated and succulent plants.

(2) FRESH AIR

Indoor plants like as much fresh air as they can get, but not draughts. Rooms with gas fires are not suitable for many plants, though some are tolerant.

(3) RAIN AND DEW

House plants quickly become dusty and need frequent spraying over with water (daily in summer) and a monthly sponging of the foliage with "Clensel" or White Oil solution (at the Botanic Garden we often use 1 oz. Clensel and ½ oz. White Oil in 1 quart dipper of water). Regular spraying and sponging prevent pests, the worst of which are scales and mealy bugs. A very important point is that indoor plants should be regularly replaced. Some plants like *Ficus*, *Schefflera*, etc., are capable of lasting several months indoors without replacement and may be termed "permanent" indoor plants run if replaced, say once a month, by reserve plants left in the brush house—nevertheless these will last much longer and look much better in the long or in a sheltered part of the garden. It is better to have two or three nice specimens indoors with a reserve of five or six in the shade-house than to try to grow them all at once indoors. Keep changing them regularly and they benefit greatly from the rest and refreshment of shade-house conditions—there they receive the things they have been missing most inside—proper light, fresh air, rain and dew.

Main causes of failure with indoor plants may be summarized as lack of light, neglect of repotting and feeding, overwatering in winter, failure to keep leaves clean from dust and pests, and neglect of regular replacement.

EDITOR'S NOTE—Readers can report on what they grow indoors.

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THE GENUS *CORREA* continued from Page 18

The two collections made of this variety have been along the banks of the Genoa River in the far east of Victoria. It appears to grow in places where it is subject to periodic floods, however further collections are required in order that one may obtain a more complete knowledge of the plant.

11. *Correa baeuerlenii* FvM.

A small shrub to about 6 feet high. The leaves are thin, ovate to lanceolate or elliptic, glabrous when mature. Flowers solitary; the calyx broadly cylindrical, subglabrous, with the base produced into an inverted saucer-shaped rim. Corolla greenish yellow about 2.5 cm. long.

This species is peculiar in having the curiously shaped calyx. It is found in damp gullies in the Clyde River District of the far south-east of New South Wales.

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CORRECTIONS TO VOL. 1, No. 10 MARCH, 1962

PAGE 19—The *Leptosperminae* is a subtribe not a tribe of *Myrtaceae*.PAGES 23 and 24—The correct spelling of a species is *M. macronychia*.

PAGE 17—The fifth sentence does not make sense and is deleted.

PAGE 16—Tasmania is not a separate region L but is included under C. South-East temperate.

PAGE 28—line 9 "Ravenshorpe" and on line 12 stands not sands is correct.

PAGE 23—Para 2, line 8, omit Vol. 2 and line 11, read "Arbor Alba Caju—P.11"

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1. Study Sections—These comprise readers who, receiving the benefit of free advice, seed, and sometimes plants, agree to grow plants of known beauty and value, in their gardens and report results once a year. No experience is necessary to contribute to this national effort. Sections already exist for *Acacia*, *Dryandra*, *Eremophila*, *Orchids* (terrestrial), *Orchids* (epiphytal), *Telopea*, *Verticordia*, *Eucalyptus*, *Stylidium*, *Melaleuca*, *Leptospermum*, *Correa*, *Boronia*, and *Street Trees*. All enquiries c/- Editor.

2. Assist in preparation of articles by forwarding small flowering specimens which grow in your district in a jam tin by parcel post (cost 5d.) as below:

Species of *Orchids* (terrestrial) to Mr. L. Cady, "Milford", Saddleback Rd., Kiama, N.S.W.All species of *Prostanthera* to Mr. G. W. Althofer, Nindethana Nursery, Dripstone, N.S.W.All species of *Melaleuca*, Mr. A. L. Hargrave, 13 Brynmair Rd., Camberwell, Victoria.All species of *Hovea* to Mrs. H. Snurway, 11 Steilmark Street, Everton Park, Queensland.

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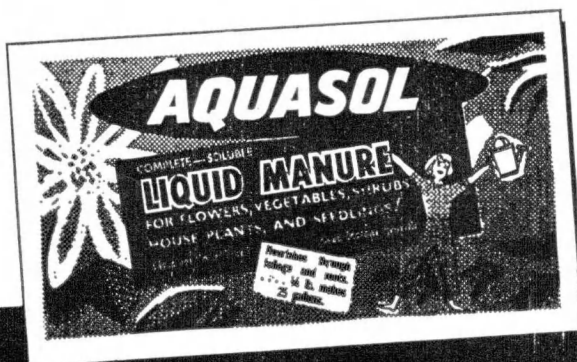
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Native Orchids from Seed

By R. B. BEDFORD

At the request of the S.G.A.P. I am endeavouring to improve and preserve our native orchids by raising them from seed. The prime object is to obtain bigger and better orchids by the self-pollination of outstanding species, and by carefully planned hybridisation; the preservation of rare and unusual species is also being given every attention.

A number of flasks of species and hybrids were sown in January, 1962, and I am pleased to say that 14 of them have germinated successfully, in most cases the first small leaf and hair-like roots are already in evidence on the protocorms. These flasks include such species and hybrids as *Cymbidium suave* x self, *Dendrobium kingianum* var. *alba* x self, *D. striolatum* x *D. kingianum*, etc. It is hoped that the first release of seedlings from these flasks will be made late this year, 3" seedlings of *D. kingianum* x *D. falcorostrum* and 1" seedlings of *D. kingianum* x *D. gracilicaule* will be released about August.

Seed of the following species is urgently required—can you help?

Dendrobium delicatum, *D. fusiforme*, var. *blackburnii*, *D. moorei*, *D. mortii*, *D. schneiderae*, *D. schneiderae* var. *major*, *D. tenuissimum*, *Sarcochilus falcatus* var. *magnificum*, *Bulbophyllum weinthalii*, and any other rare or unusual species.

If you have a native orchid with any outstanding characteristics such as size, colour, shape, texture, etc. would you please self pollinate it when it is next in flower, or if you can spare a piece of the plant itself it would be of great assistance to me when considering hybridisation. All seed and/or plants should be sent to me c/- The Editor, S.G.A.P., 250 Picnic Point Road, Picnic Point, N.S.W., with as much relevant information as possible. All donors whose seed or plants are used will receive gratis, a selection of seedlings as soon as they are sufficiently large to withstand a move. When sending seed please pack in folded paper as phials, plastic bags, etc., encourage the growth of harmful bacteria and should not therefore be used.

DENDROBIUM SPECIOSUM — Continued from page 32.

them down with a 75 pound rock on top. Before long roots had run out on the base rock and new growth had come up the sides. Within 2 years I was able to lift up the stones and they have grown well for the last 20 years.

Dendrobium speciosum occurs down almost the full length of the eastern coast of Australia from Cape York and possibly even into Victoria.

The growth is extremely robust. Large curved bulbs as thick as ones wrist with 2-5 large leathery, almost indestructible leaves. The flower spikes form at or near the apex carrying up to 100 or more flowers. They keep fairly well lasting to perfection for a fortnight on the plant or cut, in water.

A variety *D. speciosum* var. *hillii* is almost always found on trees particularly big fig trees in the coastal forest. It has more slender straight bulbs up to 4 feet in length and takes kindly to cultivation in large well-drained pots. The flowers are almost pure white but are smaller with sepals and petals more slender than the species.

Rupps "The Orchids of N.S.W." list *D. speciosum* var. *aracillimum* in error as it is now generally known that it is a natural hybrid between *D. speciosum* and *D. gracilicaule*.

Dendrobium speciosum—a large plant, many stems, 8-18" high, often deeply ribbed, bracts persistently with scales closely appressed, leaving ring like scars. Leaves 2-5, stiff, strong and leathery, 6-12" long at or near the apex. Flower spikes terminal or in the upper axil up to 18 inches long, many flowered. Flowers white to yellow, very fragrant, variable in size but up to 2½ inches when spread. Sepals and petals about equal, all segments narrowly lanceolate. Labellum shorter, dotted with purple, sometimes red spots too, 3 lobed, lateral lobes short, incurved, mid-lobe broader than long, mucronate. Column much shorter than labellum.



Photo by Reg Dallimore

This plant which is 8ft. high and wide when in flower was too large to get wholly on the block. It is growing on a large old tree stump.

Dendrobium speciosum

By R. F. LEANEY, F.R.H.S.

I feel *Dendrobium speciosum*, while possibly not the most common of our orchids, must be the best known. Under the quite erroneous name of "Rock Lily" it has been cultivated being first described in 1804. The sandstone cliffs and rock faces all around the central west of N.S.W. were richly covered with this plant.

Dendrobium speciosum takes well to cultivation. It likes the top position on well-drained rockeries, the forks of large garden trees or the top of stumps. Full sun is the order of the day, it just does not seem to be possible to give it too much sun. Like all epiphytes, it should be very firmly attached to its host.

I have established quite a nice colony of *D. speciosum* in my garden on an outcrop of rock. There being no way of firmly attaching the plants I just placed

Continued on page 31.