

NOTES ON EUCALYPTUS SPECIES AT AVONDALE, CO. WICKLOW

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There is hardly any family of trees so beneficial to man as the genus *Eucalyptus* (or Eucalypts) which comprises over three hundred different species, growing in the most diverse conditions of soil and climate. They are all natives of Australia and its adjacent islands—Tasmania New Guinea, etc.—but are extensively grown in many other countries nowadays. They are all evergreen and mostly big trees, some in the valleys growing to the astonishing height of 400 feet, others high up in the mountains, reduced to mere shrubs. Those species which come from the parts where frost and snow are common in the winter and where the rainfall is somewhat like our own, do best here. Those that come from the warmer climate are unable to stand our winter frost.

The genus *Eucalyptus* belongs to the natural order of Myrtaceae which includes myrtles. The name is derived from the Latinized Greek words meaning "well concealed." This refers to the flower bud which is in the form of a little woody cup in which the flower is hidden and protected by a cap until the suitable season arrives when the cap falls off and the flower, comprising only stamens and pistil, unfolds. It is

in these cups that the seeds develop and are shed through valves or slits in the top. The size and shape of these seed receptacles are important identification marks for the different species.

For the first few years all species have juvenile leaves which are tender and are of a different shape from the adult leaves which develop afterwards and are much more hardy. Consequently all species require protection from severe frost during the first winter or two, and many species tender during this period prove hardy afterwards. The presence of a belt of old wood to shelter the young plants from the cold winds is very beneficial, and a mixture of evergreen conifers with dense crowns is also helpful.

In the spring of 1908 Mr. Forbes, the Director of Forestry then, procured from the Government Department of Tasmania four small packets of Eucalyptus seed labelled *E. Muelleri*, *E. urnigera*, *E. coccifera* and *E. Gunnii*. The latter, judging by the development of the plants, should have been labelled *E. ovata* (*E. Gunnii* is a small but very hardy tree). Seed beds were prepared in the garden nursery at Avondale by inserting inverted grassy sods (turves) 6" wide by 4" deep into the garden soil and covering the sods with leaf-mould and fine soil. The seeds were then sown thinly in lines over the inverted sods and covered very lightly. The seedlings were kept watered during dry weather throughout the summer and during winter were covered by laurel branches kept in position by light poles nailed on stakes 1½ feet high. In the spring of 1909 groups of holes were prepared on Avondale lawn amongst the old beeches and oaks. The plants were lifted from the nursery by inserting the spade straight down behind each plant, lifting it with portion of the decayed sod attached to the roots. The plants were then inserted and tightened in the prepared holes, keeping every species separate, and the plants being set out 5 feet apart each way.

During the first two years the plants were kept free of weeds and there were few failures. After that little was done to them for twenty-five years, after which some lanky and suppressed poles were removed. All the species made rapid growth and proved hardy until the severe winter frost of 1939 when *E. ovata* suffered badly from "frost crack," and though not killed got a severe set back.

The following are particulars of the trees that remain from measurements taken in January, 1945. The heights were determined with a Brandis hypometer and the volumes are rough estimates based on the heights and basal areas:—

Species	No. of trees	Av. Height	Q.G. B.H.	Av. Vol per tree	
<i>E. Muelleri</i>	.. 11	105 ft.	12½"	43 c.ft.	Q.G.o.b.
<i>E. urnigera</i>	.. 7	108 ft.	13¼"	50 c.ft.	"
<i>E. coccifera</i>	.. 5	73 ft.	11¼"	29 c.ft.	"
<i>E. ovata</i>	.. 11	107 ft.	12½"	45 c.ft.	"

One nice plant of *E. ovata* planted out by itself made rapid growth and formed a beautiful tree which is now (in 1945) 112 ft. high with a quarter girth at breast height of 23¾ inches. It, too, suffered from frost crack in the winter of 1939, but its wounds are gradually healing over. All the trees in the group of *E. ovata* grew tall, straight and clean but the heavy frost killed about half their crowns and split the bark down to the base. Had they been closely surrounded by dense crowned trees like spruce the damage would not have been so great. The bark of *E. ovata* peels off the upper part of the tree leaving the new bark of a light grey colour. The seed cups are about ¼" wide, and of the same depth with dome-shaped top and narrow base. 3 to 7 cups forming an umbel. The juvenile leaves are stalked and oval opposite at first but gradually becoming alternate. The adult leaves are lanceolate and alternate and of the same dark green colour on both sides. The foliage of this species got damaged again by the severe frost of January, 1945.

E. Muelleri, a native of Tasmania, proved perfectly hardy, formed tall straight, clean trees with light crowns. It is easily recognised by its bowl-shaped fruit about ¾" wide at top and about the same depth, sloping to a narrow base, three sessile fruits forming an umbel. Each fruit is green and ridged on the outside, generally three-celled and opening by three valves on a whitish plate on top. Its old bark peels off in strips, leaving the new bark of a greenish-grey colour. Its juvenile leaves are round to oval, sessile or short-stalked, gradually becoming stalked. Adult leaves are alternate four to five inches long and ½" to 1" wide, tapered

at both ends, both sides of the same glossy dark-green colour. Leaf-stalk 1" long. It is sometimes called *E. Johnstoni*.

E. urnigera, a native of the mountains of Tasmania, also proved perfectly hardy, forming tall, straight trees but inclined to be a bit more branch and rougher than *E. Muelleri*. The old bark peels off every year leaving the new bark of a greyish-white colour, more or less blotchy. Its fruit $\frac{3}{4}$ " wide and $\frac{1}{2}$ " long, is urn-shaped and stalked, normally three fruits (cups) forming an umbel with a stalk about an inch long and each fruit three or four celled opening by the same number of valves situated well down in the cup. Its juvenile leaves are sessile, round or cordate and opposite. The adult leaves are alternate 4-4 $\frac{1}{2}$ " long, $\frac{1}{2}$ -1" wide, on stalks about 1" long, lanceolate, glossy green on both surfaces. The name *urnigera* was suggested by its urn-shaped fruit.

E. coccifera, a native of the high mountains of Tasmania, is extremely hardy, but hardly suitable for timber, as it is inclined to grow rough and branchy. It sheds its bark, leaving the stem whitish. The shoots and fruit are often covered by a white encrustation. The fruit, about $\frac{1}{2}$ " wide at top, is like an inverted cone, four-celled, flat-topped. The leaves are about 3" long and $\frac{1}{2}$ " wide, tapered at both ends on stalks about $\frac{1}{2}$ " long.

Other species subsequently planted at Avondale were *E. globulus*, *E. gigantea* and *E. regnans*. The former was soon killed out by frost *E. regnans* also disappeared but *E. gigantea* withstood the frosts and is growing vigorously. In the spring of 1942 a $\frac{1}{4}$ -acre plot was planted on the lawn with *E. Muelleri* and *E. urnigera* mixed with a few *E. viminialis* and *E. ovata*. These were mixed with beech (25%) and all are doing well.

At Ballymanus, near Gleanealy, in Co. Wicklow, and within about four miles of the sea, the following species, planted in the years 1934 and 1935, withstood the frost and are growing vigorously:—*E. Muelleri*, *E. viminialis*, *E. urnigera*, *E. amygdalina*, *E. gigantea*, *E. Dalrympleana*, *E. radiata*. These trees are now up to 35 ft. high with average quarter girth at breast height of 4". At Kilmacurragh, Co. Wicklow, there is a large tree of *E. cordata*.

The name "gum trees" is loosely applied to trees of the genus *Eucalyptus* but in modern books the name is reserved for those species that shed their bark annually. Many species do not shed their dead bark yearly but retain it for a time as a covering over the new bark. In some of these the old bark becomes fibrous, and these are known as "stringy barks." In others the old bark becomes hard and deeply fissured and these are called "iron barks."

The seeds of the *Eucalyptus* ripen in the second harvest after flowering. Slight heat is sufficient to open the valves for the escape of the seeds, which can be stored in a linen bag suspended from a rafter in a cool dry place until spring.

The seeds should be sown in finely prepared beds in March or April and protected from frost by laths or branches overhead. Watering during dry weather is also essential. Most species are bad transplanters, and need special treatment when young. Transplanting into pots when a few inches high is a good plan. The pot might be sunk in the ground and kept watered. The plants can be planted out of the pots without disturbing the roots. Transplanting with balls of earth around the roots is also effective. Sphagnum moss is often used to keep leaf mould and fine soil around the roots. After "mossing" the plants can be lined out in the nursery for a year and protected from winter frost.

Eucalyptus in general have the following advantages:—

1. They are eminently suited to the three types of forest management—high forest, coppice, and coppice with standards—but it is as high forest that they are mostly used. They produce clean, strong and durable timber which is used for a great variety of purposes—house construction, furniture, transmission poles, fencing and firewood, etc.

2. Their leaves yield valuable oils and resins much used in medicine and in the manufacture of soap, disinfectants, etc.

3. Their flowers are rich in honey and are much patronised by bees for honey and pollen.

4. They produce a large quantity of seed and commence bearing at an early age (5-10 years). The seeds are very small and can be sent long distances by post.

5. They reproduce themselves freely from stool shoots, so once a crop is established further planting will not be necessary.

6. They are evergreen and very desirable from an aesthetic point of view, especially in the winter when other broad-leaved trees are bare.

7. They are supposed to have a salubrious effect on the climate in which growing, giving out fragrance and balm into the atmosphere.

8. A species can be chosen for almost any soil or situation, so varied are the conditions under which they grow in their own natural habitat.

9. They grow much faster than any other broadleaved trees and the planter can see the trees mature in his own lifetime.

It will, therefore, be interesting to keep under observation the older trees of the various species of *Eucalyptus* which have been planted for some time, as well as those more recently planted and to secure others for trial purposes.
