THE VALUE OF EUCALYPTS FO/56/E-3-f

EUCALYPTUS TREES IN THE UNITED STATES

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History

Eucalyptus trees have been growing in California for one hundred years, as seeds from Australia were brought by ship in the middle 1850's. Blue gum (Eucalyptus globulus) and a few other species made such rapid and sustained growth under California conditions, that many exaggerated claims were made as to the utility and value of these remarkable trees. Based on the high quality of mature trees of Karri, Jarrah, red ironbark and other timber species in Australia, and with virtually no experimentation as to the quality of wood from trees grown in California, interest in planting grew to boom proportions by 1900 and continued until about 1910 by which date it is estimated that about 50,000 acres of eucalyptus groves had been planted. The University of California had been conducting experiments in growing a number of promising species at Santa Monica Forestry Station in Los Angeles County and in 1908 published Bulletin 196 of the California Agricultural Experiment Station, EUCALYPTUS IN CALIFORNIA, by N.D. Ingham who was in charge of the Station. About the same time the United States Forest Service issued reports showing that volume growth in the oldest plantations was much lower than had been estimated on the basis of the growth of isolated trees. About this same time the United States Forest Products Laboratory detailed H.D. Tiemann to conduct studies in the manufacture and seasoning of lumber from an older plantation of blue gum (E. globulus) trees growing on the hills east of San Francisco Bay. His report indicated very great losses of volume from checking and warping of boards and timbers during seasoning. These factual reports were a check on further large scale planting, but some was continued until about 1915.

The writer assumed charge of studies at the Santa Monica and Chico Forestry Station in 1915, and in the spring of 1916 took over from the U.S. Forest Service a study of eucalyptus plantations which had been started a few years previously by J. Alfred Mitchell. With Mr. Mitchell a large number of plantations were inspected and measurements of typical plots were made. The results of these and later studies were published in 1924 as Bulletin 380 of the University of California Agricultural Experiment Station under the title, GROWTH OF EUCALYPTUS IN CALIFORNIA PLANTATIONS.

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About 1910 it became evident that citrus and other crops in southern California were subject to severe damage by recurring hot, dry "Santana" winds. It was soon found that eucalyptus windbreaks gave effective protection from such damage and studies were made to demonstrate the results of such tree rows. From about 1920 the Farm Advisors in Orange, Los Angeles, San Bernardino, Riverside and Ventura counties actively promoted the planting of such windbreaks which have now become a major feature of the landscape throughout all of this citrus growing area.

About twenty years after their introduction into California, a few of the hardier eucalypts were planted experimentally in the warmer sections of Arizona, New Mexico, Texas and along the Gulf of Mexico to Florida. Blue gum proved unsuited to these sites and no large plantations have been set out, and now only occasional trees are met with as ornamentals. These are usually red gum (E. camaldulensis (rostrata)), gray gum (E. tereticornis), desert gum (E. rudis) and perhaps one or two other hardy and drought resistant species.

During the last twenty years, the area devoted to eucalyptus groves in California has been gradually shrinking, as irrigation water became available, and agricultural crops offered opportunities for much larger financial returns. Most of the groves which still remain are on soils of relatively poor quality, or hillside sites too steep for agricultural use. Utilization until recently has been for fuel, temporary fence posts, marine piling. Wherever soil and climate are favorable eucalypts are used for shade and landscape beautification.

Eucalyptus Species Used in California

It is probable that about 150 species of eucalyptus have been tried out in California in the last hundred years, but comparatively few have made vigorous and sustained growth, even as ornamentals where given consistent irrigation and care. Many species are limited by temperature requirements to the coastal and lowland country from Santa Barbara south; and very few are able to withstand the heat of the interior low desert areas. Blue gum (E. globulus) made up about 80 percent of the original plantations, most of which were within a few miles of the coast from Sonoma County south to San Diego. It has succeeded on redwood cut-over lands and windy coastal plantings through Mendocino County and on the flats adjacent to Humboldt Bay, but it does not do well in the Sacramento or San Joaquin Valleys. Manna gum (E. viminalis) does well in most places where blue gum thrives, and does somewhat better in interior valleys as it is slightly more frost resistant. It grows almost as rapidly as blue gum, but does not have as good form, or maintain as good density in plantations. Red gum (E. camaldulensis (rostrata)), gray gum (E. tereticornis (umbellata)), and desert gum (E. rudis) are quite similar in site requirements, appearance, and in habit of growth. Often it is virtually impossible to distinguish between them. Gray gum is usually tallest and of the best form. Red gum is usually crooked in habit of growth and its slender foliage is decidedly weeping in habit. Desert gum has broader leaves, with a gray-green cast, larger fruits and lower trunk bark which is apt to be more fibrous and persistent than the smooth, mottled bark of the other two. All three do better in interior valley and low desert areas than do blue or manna gums, and red gum is about as frost resistant as is manna gum. Sugar gum (E. cladocalyx (corynocalyx)) is best adapted to south coastal areas where most of it is found, though until

recently one good grove was growing on deep, fertile soil near Arden, Alameda County. It is not adapted to interior valley conditions because of damage by frost. These six species are the only ones used in plantations except in the test plots of small size at Santa Monica Forestry Station. Red gum, gray gum and desert gum are the principal species in the San Joaquin Valley and throughout interior dry sections of southern California. All are commonly seen as ornamentals.

About fifty additional species were growing at Santa Monica Station up to the time it was abandoned by the University in 1922 including a fine specimen of the great timber tree of Australia, Karri (E. diversicolor); virtually unknown elsewhere. Twenty-five years ago Eric Walther listed 89 eucalypts as growing at Golden Gate Park in San Francisco, but recently he stated that only about 25 were now alive. The Huntington Botanic Gardens at San Marino planted 100 species of eucalyptus in a test plot about 1935, but I do not know how many of these have survived. Evans and Reeves Nursery of Santa Monica and Max Watson of Santa Clara have in recent years introduced a number of flowering shrub type "mallee" eucalypts, but most of these seem poorly adapted for growing except in warm and sheltered situations. The Los Angeles State and County Arboretum at Santa Anita is now building up a collection of eucalyptus ornamentals adapted to that site with 250 species now in the arboretum.

The following species are most commonly met with as ornamental trees:

Red ironbark (E. sideroxylon) - Quite frost hardy in San Joaquin Valley.

Narrow-leaved ironbark (E. crebra) - Frost hardy but very slow growing.

Red box (E. polyanthemos) - Stands winds off south coast. Used by florists.

Red flowering gum (E. ficifolia) - Brilliant red flowers. Not very frost hardy.

Messmate (E. obliqua) - Large specimens on Berkeley campus. Not common elsewhere.

Lemon-scented gum (E. citriodora) - Smooth white trunk, fragrant foliage. Not hardy.

Swamp mahogany (E. robusta) - Fibrous, brown bark, broad leaves. Semi-hardy.

Some of the most promising ornamental species for southern California from indications at the Los Angeles State and County Arboretum are reported as:

Eucalyptus neglecta	Eucalyptus torquata
Eucalyptus cosmophylla	Eucalyptus calophylla var. rosea
Eucalyptus calycogona	Eucalyptus maculata
Eucalyptus sepulchralis	Eucalyptus niphophila
Eucalyptus sieberiana	Eucalyptus mega-cornuta (a hybrid)
Eucalyptus orpeti (cross macrocarpa x caesia)	

Of special interest is a recent report from Mr. Donald Woolley of the above station, that several eucalypts have been successfully propagated by vegetative means. Thus it may soon be possible to have an assured supply of planting stock of both ornamental and timber eucalypts of uniformly fine quality.

Eucalypts for Pulp and Fiber Products

For several years a large manufacturer of roofing felt in Los Angeles has used Eucalyptus globulus shipped from the Nipomo area in San Luis Obispo County in the manufacture of this fiber product. They now own about 2,000 acres of blue gum groves in that area which were planted about 1910. At present they are not cutting trees from these lands as their requirements for wood fiber are being supplied from local scrap softwood lumber at some saving in cost, but they are holding the groves for future utilization.

In recent months one of the large manufacturers of Kraft papers and corrugated containers has experimented successfully in mixing a certain proportion of chips from Eucalyptus globulus with Douglas fir, pine and other softwood pulp in a semi-chemical process. This was worked out so well that they now plan to use about 10 million board feet (20,000 cords) of blue gum annually. The logs do not require removal of bark before chipping, and they are paying $6.00 per ton for freshly cut, unbarked logs at the mill. This is now providing a market for eucalyptus groves in the central coast area of California which up to now have had no commercial value except for firewood, piling and shear timbers in dock construction.

Experiments are also being conducted in the development of a portable chipping machine of new design. Preliminary tests indicate that tree length logs up to 12 inches in diameter can be handled by this machine in a horizontal direction and effectively reduced to chips right at the grove. This chipper which is driven by a 300 horse power engine is being developed by the Sumner Iron Works.

These developments are too recent to draw any definite conclusions about the future demands for eucalyptus raw material, but it seems probable that the trend will continue, and that other pulp companies will become interested. There is a considerable area of land near the coast north of San Francisco Bay of about Site II quality from which a potential yield of about 360 cubic feet (4 cords) per acre per year could be anticipated with a rotation of ten to twelve years. Much of this land is producing very little of value at the present time, but with growing population, other uses may develop within a few years. A few Eucalyptus globulus plantations on redwood cut-over land indicate that on warmer sites it will persist and make good growth in areas between natural sprouts of redwood, and such sites are worthy of further experimentation, using blue gum and some other fast growing and frost resistant eucalyptus species. It should be noted here that several native oaks and some other hardwoods may be used for this purpose in the future; in which case they will be in competition with eucalypts.

Eucalypts in Arizona

Eucalypts are the most widely planted evergreen shade trees throughout southern Arizona according to Horticulturist Harvey Tate of the University of Arizona. Of the several species used red gum (E. camaldulensis (rostrata)) is most widely planted - often up to elevations of 3500 to 4000 feet. At these elevations it is occasionally nipped by frost but rarely badly damaged. It is the preferred tree for windbreaks.

Gray gum (E. tereticornis) is used in the Salt River Valley where a tall, vigorous tree is wanted and blue gum (E. globulus) is commonly planted in parks and estates where there is sufficient growing space for a large tree.

Desert gum (E. rudis) is not used as much as formerly as it is described as being short lived and subject to poor crown development called "frazzle top" which sometimes yields to applications of iron sulfate.

Red box (E. polyanthemos) is a slow growing but hardy and beautiful species which is popular as a shade tree and for avenue plantings.

There are no grove plantings in Arizona.

Eucalypts in Florida

Extension Forester L.T. Nieland reports as follows in a letter dated May 21, 1956:

> "Although several species of eucalyptus are found in Florida, mostly in the southern half of the peninsula, I know of no plantings for windbreaks, fence posts, fuelwood or other wood products. Apparently the northern half of Florida is too cold for most of the species, as one seldom finds an old tree even as far north as Gainesville. Also it is my observation that eucalypts are not well adapted to many of our soils, and when planted in such locations they are of more or less scraggly appearance.
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> "Several species have been introduced. One of the best adapted is swamp mahogany (E. robusta). Another widely planted species is red gum (E. camaldulensis (rostrata)). Gray gum (E. tereticornis), desert gum (E. rudis), blue gum (E. globulus) and red mahogany (E. resinifera) are occasionally found.
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> "In all cases I have observed, eucalyptus species were planted for shade and ornamentation. Now and then, one finds them planted on avenues in towns of south Florida. There is little or no indication at present that eucalypts will become of more importance in Florida than they are at present."

Eucalypts Along the Gulf Coast

Director Philip A. Briegleb of the Southern Forest Experiment Station in New Orleans reports:

> "There was a flurry of eucalyptus planting throughout the South at the turn of the century and there has been some sporadic planting since that time. Frost, however, has discouraged even ornamental planting except in southern Florida and Texas. Where southern pines or hardwoods grow naturally there is little incentive to plant eucalypts, as they are usually less hardy, less valuable and not much faster in growth. Most of the planting in Texas was south or west of the naturally forested area."

Eucalypts in New Mexico

Horticulturist W.J. Wiltbank, of State College, New Mexico, says:

> "Eucalyptus has not been planted to any extent in New Mexico. Undoubtedly, there are a few trees in the State but their occurrence would not be widespread enough to demonstrate anything regarding their culture or commercial possibilities."

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