

## The Laurel or Bay Forests of the Canary Islands

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The Canary Islands, located about 800 miles southwest of the Strait of Gibraltar, are operated under the government of Spain. There are five islands which extend from 15 °W to 18 °W longitude and between 29° and 28° North latitude. The climate is Mediterranean. The two eastern islands, Fuerteventura and Lanzarote, are affected by the Sahara Desert of the mainland; hence they are relatively barren and very arid. The northeast trade winds bring moisture from the sea to the western islands of Hierro, Gomera, La Palma, Tenerife, and Gran Canaria. The southern ends of these islands are in rain shadows, hence are dry, while the northern parts support a more luxuriant vegetation.

The Canary Islands were prominent in the explorations of Christopher Columbus, who stopped at Gomera to outfit and supply his fleet prior to sailing "off the map" to the New World in 1492. Return voyages by Columbus and other early explorers were via the Canary Islands, hence many plants from the New World were first established at these points in the Old World. It is suspected that possibly some of the oldest potato germplasm still exists in these islands. Man exploited the islands by growing sugar cane, and later *Mesembryanthemum crystallinum* for the extraction of soda, cochineal cactus, tomatoes, potatoes, and finally bananas. The banana industry is slowly giving way to floral crops such as strelitzia, carnations, chrysanthemums, and several new exotic fruits such as avocado, mango, papaya, and carambola.

The two eastern islands, Lanzarote and Fuerteventura, were probably part of North Africa, possibly separating from the mainland millions of years ago. The more westerly islands Gran Canaria, Tenerife, La Palma, Hierro, and Gomera probably appeared later, as they are purely of volcanic origin. The native flora indicate the islands are of considerable age, as fossil leaves and fruits in the Mediterranean region are identical to species now found in the Canary Islands.

Among the more famous plants of the Canary Islands is the dragon tree, *Dracaena draco*, some specimens of which are believed to be 6,000 years old. This plant yields a red gum, "dragon's blood," prized in the Middle Ages for its mystical and medicinal powers.

Another famous tree is the "rain tree" of Hierro. This is the "holy tree," or "garoe," which in the time of the Spanish conquest in the 15th century precipitated mist on the leaves in the higher elevations of the volcanic peaks. This mist dripped into cisterns below to provide adequate drinking water to support the people in the otherwise barren desert island.

Among the plants of current universal interest today is the Canary Island Pine (*Pinus canariensis*) now widely planted as an ornamental throughout many parts of the world. The Canary Island date palm (*Phoenix canariensis*) likewise is found in many parts of the world in the subtropical and tropical zones.

Of particular interest to many horticulturists, and to the avocado grower in particular, are the extensive laurel forests which exist on the volcanic islands and of which there are still many fine forests to be seen. In common with many other tropical forests, much of the timber has been cut for industrial use, in building and furniture making, and for fuel and other uses. The remaining forests are still of interest because of their potential value for natural products of timber and the byproducts of oils and extracts which are found widely distributed in the botanical family Lauraceae.

The evergreen forest zones of the Canary Islands are dominated by four species of laurel or bay trees. These represent the remains of a formerly large flora which extended south from Europe and North Africa millions of years ago. Only a few small areas of laurel remain on the islands because of man's devastation through cutting and burning of the delicate and limited hillside plantings. It is estimated that on Gran Canaria only one percent of the original flora still remains, and on Tenerife perhaps less than ten percent of original forested areas still exists.

The laurel forest species are *Laurus azorica* Franco, *Apollonias barbusana* Born, *Ocotea foetens* Benth, and *Persea indica* L.

*L. azorica*, loro or laurel, is a very close botanical relative of the Grecian laurel, *L. nobilis*, widely used as an ornamental and providing the famous bay-leaf condiment. The loro in the Canary Islands reaches a height of 20 meters. The small black fruit is ovoid and about 1-1.5 cm long. It is common in the cloud forests at 500-1500 meters elevation. The leaves are glandular.

*Apollonias barbusana* are small trees up to 25 meters tall with dark green ovate leaves. The ovoid fruits are 1-1.5 cm with a short cupule.

*Ocotea foetens* is a tall tree up to 40 meters with broad lanceolate leaves and small fruits with an acorn-like, basal cup. This species was once widely exploited for its fine lumber quality. This is the species that probably identified with the "rain tree" of Hierro.

*Persea indica* has leaves without glands, pale green when mature but becoming reddish when old. The elipsoidal fruit is bluish-black when ripe. It is a common tree on Tenerife, attaining a height of 20 meters. This plant is used as an ornamental in California. It has been of particular interest to avocado investigators when used as an indicator plant to determine the presence of *Phytophthora cinnamomi* in a soil. Young seedling plants rapidly indicate the presence of the fungus as they are extremely susceptible to attack. It is of interest to note that investigators in the Canary Islands have discovered some forms of *P. indica* that are resistant or possibly immune to the *Phytophthora cinnamomi* fungus.

The comparatively recent volcanic origin of the islands is indicated by the lack of deep soils and the steep sides of the peaks. Cultivation of crops is only possible through the development of terraces on the volcanic slopes and the erection of concrete walls to provide protection against the cool, sometimes rather high velocity winds which can blow from any direction. The lack of deep soils precludes the use of large trees as living windbreaks, hence hollow building blocks are stacked 10 to 12 feet high on the edges and sides of terraces on the steep hillsides to reduce the wind velocity. It is somewhat incongruous that perhaps the most wind susceptible crop, the banana, is the most widely grown of any crop on the Islands. In recent years it has been learned that providing an additional top protection of sheet plastic to cover the banana plants has improved the fruit quality, reduced the use of precious water by slowing wind velocity, and improved the fruit appearance by preventing scarring and abrasion as the result of plant movement in the wind. Thus many terraces are now being developed under plastic cover.

The banana industry on Tenerife, the largest of the islands, consists of 20,500 acres, mostly of the Dwarf Cavendish type, with about 400 acres of the cultivars Grande Naine and Williams. The use of plastic houses to improve fruit quality has been extended to at least 850 acres and this is increasing.

Avocados are produced on approximately 2,250 acres. The major cultivar is Hass, followed by Pinkerton and Reed. Fuerte is no longer planted. The cultivar Reed yields well but the tall trees are susceptible to wind damage. *Phytophthora cinnamomi* is a major threat to the industry, but trunk injection with phosphorous acid apparently has kept this problem under control. The major outlet for the fruit is in mainland Spain. It is anticipated that the European market, which will be operative in 1992-93, will stimulate more production of avocado and other exotic fruits in the islands. Trial shipments of mango, carambola, pineapple, papaya, and cherimoya have provided optimism for increased production of these crops in the near future.

Aside from the purely horticultural attractions and developments, the tourist industry is increasing with many inducements provided in the form of very modern hotel and apartment accommodations, the development of a fine road system throughout most of the islands, and the utilization of a number of natural attractions. Volcanic peaks, pleasant beaches, and still a substantial amount of nature reserve attract many people. The mild to tropical climate is a major factor in developing the tourist trade of the islands.