Quercus seemannii Liebm.

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FAGACEAE (BEECH FAMILY)

Quercus eugenifolia Liebm., *Q. granulata* Liebm., *Q. citrifolia* Liebm., *Q. bumelioides* Liebm. Fide Trelease, *Q. borucanas* Trel., *Q. eugenifolia* f. *petiolata* Trel., *Q. boquetensis* Stand., *Q. panamandinaeae* Muller pro parte as to stems and leaves only, *Q. sapotaefolia* as to Costa Rica, *Q. chiriquiensis* Trel. ex C.H. Muller

Encino, encino blanco, roble

Quercus seemannii grows in Central America.

Quercus seemannii is a slow-growing tree that reaches 6 to 25 m in height and 40 to 60 cm (in some cases, 1 m) d.b.h. The trunk is cylindrical or slightly furrowed; the crown, round and dense; the smooth bark, gray or brown; and the foliage, dark green. Twigs are 1 to 2.5 mm thick, fluted from sparsely pubescent, and soon glabrate and dark red-brown buds with prominent light lenticels. The buds are 2 to 4 mm long, ovoid or elongated, acute, glabrous, and light brown; the lingulate stipes are soon caducous. Leaves are subevergreen, thin but rather hard, and alternate. Sometimes persisting for a short time after new flushes of growth, leaves are 4 to 8 cm long (sometimes 16 cm) to 4 cm broad. The blade is narrowly oblong to elliptic, lanceolate or narrowly obovate, usually tapering gradually to the acute and aristate apex. Occasionally, it is blunt and rounded on the same stem or on different trees, tapering to the acute base or, rarely, obtuse and contracted abruptly at the petiole. The margin is entire, usually becoming revolute. The lamina evolves from chartaceous to subcoriaceous. The tree grows in premontane, lower montane, and montane wet and rain forests between 1400 and 2400 m, but it is occasionally found as low as 1100 m and as high as 3100 m. This area of distribution includes a wide variety of soil types and climatic conditions (2000 to 3500 mm of annual rainfall and 8 to 22 °C average temperature).

Quercus seemannii is considered a complex species due to its considerable variability (Burger 1977). This species probably integrates with *Q. gulielmi-trealease* C.H. Müll and hybridizes with *Q. rapurahuensis* Trel. and *Q. tonduzii* Seemen. *Quercus seemannii* and its close relatives in Costa Rica are related to entire-leafed black oaks (subgenus *Erythrobalanus*) of northern Central America. These species combine to make up the most difficult complex in Central America's oaks.

The wood of *Q. seemannii* is heavy with a specific gravity of 0.67. Sapwood is white-yellow to white; the heartwood is dark-brown to brown with well-defined growth rings (Van der Slooten and others 1969). The heartwood has a straight grain, rough texture, and a good figure in the radial surface, although its luster is poor (Carpio 1992). It dries at a moderate rate, with serious defects. It is hard to work and preserve but has good natural durability. The wood is used for flooring, agricultural tools, charcoal, poles, mine posts, wine barrels, and railway foundations.

Flowering of *Q. seemannii* reaches its highest peak during the month of March when leaf fall is high and rainfall is very low. However, two additional flowering peaks occur (Céspedes 1986), one at the beginning of the rainy season (May) and one during the transition period between the rainy and the dry seasons. Staminate catkins 3 to 10 cm long are loosely flowered; the flowers are attached to minute and sparsely puberulent rachis, and the apiculate anthers are slightly exerted. Pistillate catkins are about 1 cm long, anther flowers are solitary or in groups of two to four. A good crop of acorns appears in January and February, the largest crop occurs in May and June, and a small crop occurs in August and September. Fruits mature within 1 year. They are subsessile or on very short peduncles, and solitary or in groups of two to four. The light brown acorns are 10 to 18 mm long, 8 to 14 mm thick, broadly ovoid to hemispheric, and about one-fourth to one-third included in the cup.

Quercus seemannii has good capacity for natural regeneration and is commonly found growing in almost pure natural stands. It is a common practice in Costa Rica to collect seedlings from the natural forests and outplant them in small

plantations without any nursery care (personal observation). The seedlings of natural regeneration are also kept in small nurseries for 6 months before being outplanted.

ADDITIONAL INFORMATION

One individual tree planted on the campus of the University of Costa Rica in San Pedro de Montes de Oca (Premontane, 1200 m) has grown at a rate comparable to trees growing in the natural range of the species (16 m in height and 60 cm d.b.h. in 32 years).

Céspedes (1986) carried out a detailed phenological study of this tree species in a lower montane moist forest of the central mountains of Costa Rica (1700 m, 2148 mm average rainfall, and 16 °C average annual temperature). He observed that leaf flushing is very low during the dry season (December through April), but a large amount of new foliage is produced at the beginning of the wet season in May. A lesser peak of vegetative growth was observed during the wettest months of September and October. Leaf fall occurs throughout the year but peaks during the dry season.

Dirphiopsis flora (Lep., Saturniidae) attacks the foliage of this species in Costa Rica (Arguedas and others 1993).

2cm
1cm