

Swietenia macrophylla x mahogani

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MELIACEAE (MAHOGANY FAMILY)

Swietenia x aubrevilleana Stehlé & Cusin

Caoba híbrido, hybrid mahogany

Because the ranges of the parent species did not merge, hybrids did not occur before the mahoganies were widely planted; consequently, *Swietenia macrophylla x mahogani* has no native range. However, when *S. macrophylla* King and *S. mahogani* (L.) Jacq. grow or are planted near each other, the probability that hybridization will occur is high. The hybrid is quite common in Puerto Rico and has been reported to have occurred naturally in Cuba (Marquetti and others 1975) and Martinique (Stehlé 1946). Controlled pollination was used to produce hybrids in Taiwan (Lee 1968). Plantations of hybrids have been established in St. Croix, U.S. Virgin Islands (Weaver and Francis 1988), and Puerto Rico, and seeds have been shipped widely throughout the Caribbean and around the world.

First recognized in Puerto Rico in 1935 (Whitmore and Hinojosa 1977), the hybrid *S. macrophylla x mahogani* is a fast-growing tree with a straight trunk and a moderately dense crown. Although the known stands and individuals of *S. macrophylla x mahogani* are relatively young, heights of 30 m and diameters of nearly 1 m have been reached. Much larger diameters appear possible as the trees age. The inherent variability of the population gives *S. macrophylla x mahogani* a very wide ecological amplitude. Mean annual precipitation totals ranging from 700 to 3000 mm and a considerable range of soil textures, pH, and soil nutrient regimes are tolerated. Sites to avoid have soils that have been eroded down to sub-soil, compacted soils, or waterlogged soils. The hybrid outgrew and outsurvived both *S. macrophylla* and *S. mahogani* on moist and dry forest sites in St. Croix in the first two growing seasons (Nobles and Briscoe 1966). Growth of the hybrid did not differ significantly from *S. macrophylla* during the first three growing seasons in wet forests of Puerto Rico (Bauer 1987).

Swietenia macrophylla x mahogani is not yet abundant enough to be considered a commercial species. Small numbers

of trees are cut in Puerto Rico, and the wood is mixed and sold with other mahoganies to use in making furniture, cabinetry, doors, musical instruments, trim, turnary items, and carvings. In a recent study of the specific gravity of plantation-grown trees, *S. mahogani* averaged 0.58 and the hybrid averaged 0.55; *S. macrophylla* averaged 0.47, differing significantly from the former two (Francis in press). The hybrid is used in conservation, shade, and ornamental plantings. Its rapid growth and near-surface roots preclude it from use near sidewalks, curbs, and other structures (Francis and others 1996).

Planted trees begin flowering and fruiting between 10 and 25 years of age. Flowering generally occurs during the dry season or summer in Puerto Rico and fruits ripen during the winter. The small, greenish-yellow flowers grow in panicles arising from the leaf axils near the tips of branches. Because of the relatively even climate in Puerto Rico and the inherently diverse hybrids, trees with fruit can be found at almost any time of the year. The fruits are capsules that split into five parts to release the seeds. Theoretically, the capsules can vary in size from that of one parent to that of the other, or 6.5 to 17.5 cm in length. Lengths of 12 to 16 cm are more typical.

Seed collections are made when a few of the capsules on a tree have opened. At ripening, the color of the capsule changes from greenish gray to gray-brown, red-brown, or brown. The color change is sometimes too difficult to see to judge ripening. However, during collection, capsules with a discernible green shade should be avoided. Using pruning poles, step ladders, or high-lift buckets, capsules are clipped from the trees. They are then sun-dried until partially open. The capsules are then broken open and the seeds removed and further dried over screens in a shaded, well-ventilated area. Bauer (1987) noted 1,538 seeds per kg for dewinged seed and Francis and Rodríguez (1993) measured 2,580 seeds per kg for whole, air-dried seeds.

The seeds are stored in sealed containers. Bauer (1987) found no difference in germination between seed stored for 6 months at 24 °C and seed refrigerated for 6 months at 5 °C.

Pregermination treatments are unnecessary. The seeds of *S. macrophylla* x *mahogani* may be germinated on fine sand, sandy soil, or potting mix in germination trays, germination beds, or directly in nursery bags or pots. Any germination media should be sterilized to prevent damping-off problems. Seeds may be scattered and lightly covered (1 cm deep) or inserted individually part way into the soil. Germination begins in about 17 days (Francis and Rodríguez 1993) and is completed about 50 days after sowing (Bauer 1987). Germination rates of 83 percent (fresh seed) and 73 percent (seed stored 6 months) have been reported (Bauer 1987, Francis and Rodríguez 1993).

New seedlings in germination trays or beds can be transplanted to pots, nursery bags, or nursery beds after they develop two or three leaves. Outplanting of seedlings about 50 cm in height is recommended for large, solid-block plantings. Nursery seedlings reach that height in 6 to 10 months. Seedlings from 50 to 100 cm in height are recommended for line planting. Seedlings to be used as ornamentals should be 1 to 1.5 m or more in height before outplanting. Bare-root

seedlings and stump plants are suitable for moist and wet forest sites if soils are moist at the time of planting and will remain moist for several months. Seedlings must not dry out or heat up before planting. For dry sites, bagged or potted seedlings are recommended. Seedlings must be protected from weeds and grass for about 2 years after planting and cleaned annually of vines until the crowns shade the understory.

ADDITIONAL INFORMATION

Observers in St. Croix noted that seedling leaf size of putative hybrids fell midway between those of the apparent parents (Briscoe and Lamb 1962). Research in Cuba has shown that leaf size of seedlings is manifest according to the 1:2:1 ratio of classic Mendelian genetics (Marquetti and others 1975). In plantations of older putative hybrid trees, the variation in leaf size ranging from that of *S. macrophylla* to that of *S. mahogani* is readily apparent. The capsule size also varies in like manner, but is not necessarily coupled with leaf size. Trees with small leaves may have large capsules, and trees with large leaves may have small capsules. Variation, though less obvious, may be seen in form, limb structure and number, and bark pattern.

