

Swietenia Jacq.

mahogany

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Growth habit, occurrence and use. There are 3 species of mahogany and 1 important hybrid, all of which grow in dry or moist, tropical or subtropical forests of the New World (table 1). All are large trees capable of reaching to 20 to 40 m of height (depending on site) and more than 2 m in diameter. Mahogany species are medium- to long-lived, mid-successional species. Their wood is used for furniture, trim, cabinets, carving, boat building, timbers, posts, and fuel (Chudnoff 1984; Francis 1991). Mahogany wood is particularly desirable because it is dimensionally stable, easily worked with hand and power tools, and very attractive. The mahoganies are also extensively planted as shade and ornamental trees.

Flowering and fruiting. The small greenish white flowers are borne in panicles attached at leaf axials near the ends of branches. The flowers are pollinated by insects and usually produce only 1 fruit (a capsule) per inflorescence. Flowering generally takes place during the spring, with fruits ripening 9 months later. Season of fruiting varies between portions of the range and individual trees. Occasional trees can be found with fruits at any season of the year in Puerto Rico. Fruiting begins when trees are between 10 and 25 years old for open-grown and dominant or codominant trees. A few to more than a hundred capsules may be produced, depending on the size and vigor of the tree. Mahogany species produce good seedcrops nearly every year. Table 2 lists the fruit sizes, seeds per fruit, and seeds per weight for members the genus.

Collection, cleaning, and storage. As the fruits mature, they turn from gray-green to reddish brown. At maturity, the capsule walls split into 5 carpels from the bottom upwards and then fall off. The exposed seeds (samaras) dry quickly and are released a few at a time, usually in the afternoon. Borne on papery wings (figure 1), they spiral downward and outward and usually land within 1 or 2 tree lengths of the mother tree.

Small quantities of seeds can be picked up from the ground near seed-bearing trees. Seeds can be collected in quantity by clipping the capsules from short-statured trees with pruning poles after the first few capsules on a tree have opened. Large trees must be climbed or collections must be made at logging sites. When spread on trays in ventilated rooms or in the sun, the capsules open in a few days and the seeds can be separated by hand. Two or three days of further drying at mild temperatures is recommended before storage, but no precise guideline for storage moisture content is available. Considerable volume, but little weight, can be saved by de-winging the seeds. Room temperature is adequate for short-term storage (up to 4 months); for longer periods, 4 EC is recommended. Perhaps because of their high oil content, mahogany

seeds lose their ability to germinate during storage. Storage at temperatures ranging from 0 to 30 EC resulted in significant losses in germinative capacity after 3 or 4 months. Reductions in germinative capacity were more severe for seedlots having high initial germination than those with moderate germinative capacity (Vivekanandan 1978). Bigleaf mahogany in Puerto Rico stored at room temperature also began to lose germinative capacity rapidly after 3 to 4 months and finally approached 0% between 1 and 2 years (Marrero 1943). Seeds of bigleaf mahogany from Cuba that were stored at 5 EC with an initial germination percentage of 39% had 13% germination after 2 years and 4% germination after 3 years (Montalvo and others 1991).

Germination. Seeds from 14 provenances of bigleaf mahogany in Cuba were subjected to cutting tests (figure 2). Ninety-eight percent were sound, 1.2% were empty, and 0.9% were diseased (Montalvo and others 1991). However, sound endosperm is not a reliable indicator of germinative capacity. Seedlots of fresh mahogany seeds normally give 39 to 98% germination (Campbell de Araujo 1971; Francis and Rodríguez 1993; Marrero 1949; Montalvo and others 1991; Ricardi and others 1977). Conditions during the seed year appear to affect the ability of fresh seeds to germinate. Mahogany seeds usually began to germinate (figure 3) 12 to 18 days after sowing, with complete germination within about 30 days of sowing (Campbell de Araujo 1971; Francis and Rodríguez 1993; Marrero 1949; Ricardi and others 1977). No pretreatments are necessary.

Nursery practice. A common method of sowing mahogany seeds is to insert them edge-wise by hand, leaving half of the seed's width exposed and keeping the medium moist until germination. Orientation of the seeds is for convenience only, as it has no significant effect on germination or growth (Mondala 1977). Seeds may also be sown and covered with about 1 cm (½ in) of sand, sawdust, or loose soil. In a test of depth of sowing on bigleaf mahogany seeds, depth did not affect germination, but deep sowing adversely affected early seedling growth (Schmidt 1974). In a Brazilian test of deep sowing at 6 cm (2.4 in), germinants failed to reach the soil surface (Campbell de Araujo 1971). In nursery beds, seeds are sown 5 to 10 cm (2 to 4 in) apart in rows spaced 20 to 30 cm (8 to 12 in) apart. Seeds are spaced at about 2 cm (1 in) in germination trays and pricked-out after they develop 1 or 2 true leaves. Another approach is to sow directly into nursery containers (usually 2 seeds/container) and thin the plants to 1 seedling/container.

Mahogany species are easy to grow in the nursery and transplant well. They may be grown in full sun or light shade. The most common method today is to grow mahogany seedlings in plastic nursery bags. Bareroot seedlings with the leaves removed (striplings), stump plants (Jacalne and others 1957), and top- and bottom-pruned large seedlings about 1 m (3 ft) tall—all have performed well. Bigleaf and hybrid mahogany seedlings are ready to outplant in 6 to 9 months and West Indies mahogany seedlings are ready in 1 year. Bigleaf mahogany seedlings in a Brazilian nursery were reported to reach a maximum of 30 cm (12 in) in 3 months and 60 cm (24 in) in 6 months (Campbell de Araujo 1971). Direct seeding, which is best done with prepared seed spots, has been successful on several occasions (Lamb 1966). Bigleaf mahogany can be reproduced with cuttings (Burgos 1954; Zanoni-Mendiburu 1975).

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Figure 1—*Swietenia*, mahogany: seed, illustrating the papery wings.

Figure 2—*Swietenia*, mahogany: bigleaf mahogany seeds from 14 provenances in Cuba, subjected to cutting test.

Figure 3—*Swietenia*, mahogany: germinating seedlings.

Table 1—*Swietenia*, mahogany: nomenclature and occurrence

Scientific name & synonym(s)	Common names	Occurrence native (& planted)
<i>S. humilis</i> Zucc.	Pacific coast mahogany	Mexico to Costa Rica
<i>S. macrophylla</i> King <i>S. candollei</i> Pittier	bigleaf mahogany Honduras mahogany	Mexico to Bolivia (Puerto Rico & Hawaii)
<i>S. mahagoni</i> (L.) Jacq.	West Indies mahogany littleleaf mahogany	Florida, Cuba, Bahamas, Jamaica, & Hispaniola (Puerto Rico, US Virgin Islands, & Hawaii)
<i>S. macrophylla</i> <i>Hmahagoni</i>	hybrid mahogany	St. Croix, Puerto Rico*

Sources: Blake (1920), Francis (1991), Lamb (1966), Whitmore and Hinjosa (1977).

* Arose spontaneously from the introduced parent species.

Table 2—*Swietenia*, mahogany: seed yield data

Species	Median fruit dimensions (cm)	Seeds/fruit	Seeds/weight	
			/kg	/lb
<i>S. humilis</i>	17 H 11	50 +	1,500	680
<i>S. macrophylla</i>	15 H 8	50–70	1,400–2,400	640–1,100
<i>S. mahagoni</i>	7 H 4	35–60	5,400–7,800	2,500–3,500
<i>S. macrophylla</i> <i>H. mahagoni</i>	12 H 7	45–65	1,900–3,000	860–1,400

Sources: Blake (1920), Francis and Rodríguez (1993), Marraro (1949), Montalvo and others (1991), Whitmore and Hinojosa (1977).