

Magnolia virginiana L. Sweetbay

Magnoliaceae Magnolia family

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Sweetbay (*Magnolia virginiana*), also called swamp-bay, white-bay, laurel, swamp, or sweet magnolia, and swamp-laurel, is at times confused with loblolly-bay (*Gordonia lasianthus*) and redbay (*Persea borbonia*), since "bay" is the term commonly used in referring to any of these three species. Sweetbay is readily distinguished from the others by the white pubescence of its lower leaf surfaces (11,21). Sweetbay is a slow-growing small to medium-sized tree found on wet, often acid soils of coastal swamps and low lands of the Coastal Plains. The soft aromatic straight-grained wood is easily worked and finishes well, so it is much used for veneer, boxes, and containers. Its flowers and foliage make it an attractive landscape tree.

Habitat

Native Range

The range of sweetbay (figs. 1, 2) extends chiefly along the Atlantic and Gulf Coastal Plains from Long Island south through New Jersey and southeastern Pennsylvania to southern Florida; west to eastern Texas, and north into southern Arkansas and southwest Tennessee; sweetbay also appears in isolated portions of eastern Massachusetts, where it may reflect only older ornamental plantings. Sweetbay is most abundant in the States of Alabama, Georgia, Florida, and South Carolina (13).

Climate

Rainfall per year within the geographic range of sweet bay varies from a minimum of 1220 mm (48 in) in the northern reaches of the Atlantic Coastal Plain to a maximum of 1630 mm (64 in) in some areas of the southern Gulf Coastal Plain and south Florida (13).

Because of the extensive geographic range of sweetbay, the average length of the growing season extends from approximately 180 days near the northern limit of the range to about 340 days in the south. The climate is described as humid to moist subhumid with an average minimum temperature range of -23° C (-10° F) in Massachusetts to 4° C (40° F) in southern Florida (13).

Soils and Topography

In the Atlantic and Gulf Coastal Plain, sweetbay is found mainly east of the Mississippi River on sites that are usually moist throughout the year. Sweetbay sites are characterized by acid soils of low base saturation and with poor to very poor drainage and are frequently flooded during the winter or wet seasons. Trees are not usually found in bottoms of major rivers (4). Many sweetbay sites have never been cultivated and represent virgin soils. These soils are the poorly drained Ultisols, the ground water Spodosols, and Coastal Plain Histosols. Typical soils where the species is found are Bayboro and Portsmouth in South Carolina (24,25) and Bibb and Myatt soils in Alabama (4).

Most of the natural range of sweetbay is less than 61 m (200 ft) above sea level, although some isolated populations exist at higher elevations. The latitudinal range of sweet bay is approximately 26° N. to 41° N. (13).

Associated Forest Cover

Sweetbay is a major species in only one forest cover type, Sweetbay-Swamp Tupelo-Redbay (Society of American Foresters Type 104) (3). Also associated with this type are such hardwoods as red maple (*Acer rubrum*), blackgum (*Nyssa sylvatica*), loblolly-bay, redbay, sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), laurel oak (*Q. laurifolia*), yellow-poplar (*Liriodendron tulipifera*), American holly (*Ilex opaca*), Carolina ash (*Fraxinus caroliniana*), southern magnolia (*Magnolia grandiflora*), and flowering dogwood (*Cornus florida*); conifers such as slash pine (*Pinus elliottii*), pond pine (*P. serotina*), longleaf pine (*P. palustris*), loblolly pine (*P. taeda*), Atlantic white-cedar (*Chamaecyparis thyoides*), baldcypress (*Taxodium distichum*), and pondcypress (*T. distichum* var. *nutans*). Varying soil and moisture conditions influence the composition of this type. Sweetbay can be totally eliminated in this type by deep flooding of swamp and pond centers (15).

Undergrowth of sweetbay sites is as diverse as are the soils. Some of the evergreen shrubs and small trees are buckwheat-tree (*Cliftonia monophylla*), swamp cyrilla (*Cyrilla racemiflora*), southern bayberry (*Myrica cerifera*), odorless bayberry (*M. inodora*), dahoon (*Ilex cassine*), yaupon (*I. vomitoria*), large gallberry (*I. coriacea*), inkberry (*I. glabra*), coast

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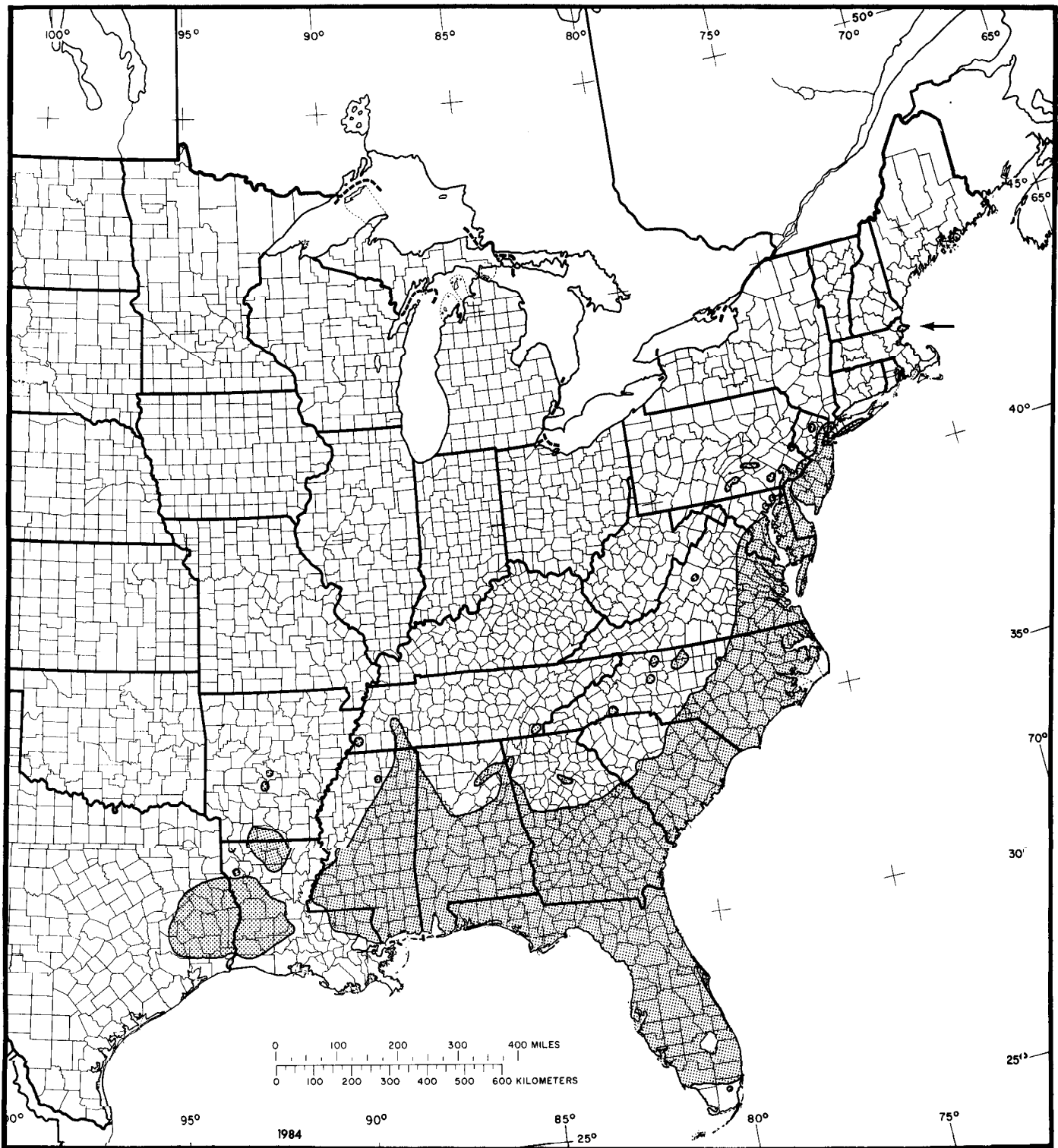


Figure 1—The native range of sweetbay.



Figure 2—Sweetbay.

leucothoe (*Leucothoe axillaris*), fetterbush lyonia (*Lyonia lucida*), staggerbush lyonia (*L. mariana*), sweet pepperbush (*Clethra alnifolia*), and small switchcane (*Arundinaria tecta*). The deciduous shrubs commonly found are Virginia-willow (*Itea virginica*), hazel alder (*Alnus serrulata*), swamp dogwood (*Cornus stricta*), red chokecherry (*Sorbus arbutifolia*), poison-sumac (*Toxicodendron vernix*), American snowbell (*Styrax americanus*), and possumhaw viburnum (*Viburnum nudum*) (3).

Such perennial vines as greenbriers (*Smilax* spp.), muscadine grape (*Vitis rotundifolia*), poison-ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), southeast decumaria

(*Decumaria barbara*), and climbing hempweed (*Mikania scandens*) may also occur. Some common herbaceous species present are ferns (*Polypodium* spp.), mosses (*Polytrichum* spp.), pitcher plants (*Sarracenia* spp.), pipeworts (*Eriocaulon* spp.), yellow-eyed grasses (*Xyris* spp.), and sedges (*Cyperus* spp.) (3).

Life History

Reproduction and Early Growth

Flowering and Fruiting—The perfect flowers of sweetbay are fragrant; they are 5 to 7.5 cm (2 to 3 in) in diameter and 5 cm (2 in) deep. Three pale sepals surround six to nine creamy white petals. Inside the cup-shaped corolla are many stamens with purple bases, and within these stamens are many pistils spirally inserted on a spikelike receptacle (6,9). The flowers are borne singly at the ends of branches and continue to open during a period of several weeks from April into July. Pollination is by insects (20,23).

The fruit is an ellipsoid or subglobose aggregate 2.5 to 5 cm (1 to 2 in) long and 1.25 to 3 cm (0.5 to 1.25 in) in diameter and consists of many one- or two-seeded follicles (15,20). The fruits become ripe from July into October and are dull red, brownish red, or nearly green at maturity (2,20). At maturity, the follicles dehisce, and the 6 to 13 mm (0.25 to 0.5 in) long scarlet seeds emerge to hang suspended for a time by fine silky threads (15).

Seed Production and Dissemination—Sweetbays usually produce some fruit annually, but the yields are small (11). Seed dispersal is by wind, birds, and occasionally by water and occurs soon after ripening (23).

The seed of sweetbay is drupelike. The outer portion of the outer seedcoat is fleshy, oily and soft; the inner portion is stony. If seeds are to be sown soon after collection, the fleshy outer portion should be removed by maceration in water or by rubbing on hardware cloth. Cleaned seeds average about 16,600/kg (7,530/lb) (23).

Seeds can be kept either cleaned or in the dried pulp for several years with little loss of viability if they are stored in sealed containers at 0° to 5° C (32° to 41° F). Seeds stored at higher temperatures should not be cleaned (23).

Seedling Development—Sweetbay seeds show embryo dormancy that can be overcome by 3 to 6 months of low temperature stratification at 0° to 5° C (32° to 41° F). Various tests with stratified seeds

have yielded germinative capacities averaging from 32 to 50 percent. Germination is epigeal (23).

In the nursery, unstratified seeds may be sown in the fall or stratified seeds may be sown in late winter or spring. Spring sowing appears to be best in areas where depredation by rodents is a serious problem. The sown seeds should be covered with about 6 mm (0.25 in) of soil, and mulch should be kept on the

beds until all danger from frost is past. The emerged seedlings need half shade during much of their first summer. Normally, plantings are established with 1-0 seedlings (23).

The possibilities for natural regeneration of sweetbay are greatest in natural openings or in clearcut swamps. In such openings, survival of the germinated seedlings is high unless they are inundated for an extended period. First-year growth usually averages between 30 and 60 cm (12 to 24 in). First-year seedlings are fairly tolerant of shade and competing vegetation (19).

Vegetative Reproduction-Sweetbay can be propagated through layering and grafting and through cuttings treated with root-promoting chemicals (7). Sweetbay stumps produce sprouts (fig. 3) but their vitality and growth potential are not known (18).

Sapling and Pole Stages to Maturity

Growth and Yield-Sweetbay is usually smaller in diameter than the southern magnolia (15). The trunk of the tree is usually straight with small, short branches forming a narrow round-topped head and branchlets which become glabrous in their second year. Growth rate averages poor to medium (19), though it can be rapid for the first few years under favorable conditions. As a shrub, growth and form are diverse and irregular.

In the more northern climates sweetbay is mainly a shrub, but it is a tree in the southern portions of the range. As a shrub, sweetbay usually attains a height between 60 and 150 cm (24 and 60 in). In the southern portions of the range the tree may range in height from approximately 15 to 30 m (50 to 100 ft) and vary in d.b.h. from less than 10 to 90 cm (4 to 36 in). A record-size sweetbay 128 cm (50 in) in d.b.h. and 27.7 m (91 ft) tall has been recorded in Florida (1,15).

Rooting Habit-No information is available on rooting habits of sweetbay.

Reaction to Competition-Sweetbay is classed as intermediate in tolerance to shade and to flooding as evidenced by its growth in bay heads and mixed swamps that are only seasonally shallow-flooded (16), and at the outer edges of cypress ponds that are only seasonally flooded (17). Among southern hardwoods, sweetbay is very resistant to fire; and as bark thickness increases, so does this resistance (5). Repeated burning, however, may eliminate sweetbay



Figure 3—Sweetbay with root-collar sprouts resulting from wildfire wound.

from some of the poorly drained flatwoods and Carolina bays (22).

Damaging Agents-Fungal infection of sweetbay leaves is a common occurrence. Small angular spots may be found in early summer and are caused by the *Cercospora* stage of *Mycosphaerella milleri*. The ascospore stage of *M. milleri* may be found on overwintered, fallen leaves. *M. glauca*, which causes large circular leaf spots, can be found any time of the year on attached leaves. *Sclerotinia gracilipes*, a species confined to sweetbay, can cause the petals of the flower to rot.

A light-brown stain in the wood is caused by *Cephalosporium pallidum* and is associated with the galleries of an ambrosia beetle (*Xyleborus affinis*). Ambrosia beetles usually attack sick or dying trees (8,10).

Special Uses

Its persistent leaves, fragrant white flowers, and decorative fruit make sweetbay attractive as an ornamental shrub or tree (11). Larger trees are used for veneer and some box lumber. The tree is also utilized to some degree as pulpwood (15).

Sweetbay is also a favorite food of deer and cattle. Deer browse the leaves and twigs all year. Cattle utilize sweetbay especially in the winter, when it can account for as much as 25 percent of their winter diet. Analysis of browse samples from Georgia and east Texas indicate that sweetbay contains 10 percent crude protein. The seeds are a favorite food of gray squirrels and are eaten to a lesser extent by white-footed mice, wild turkey, quail, and songbirds (11,12,15).

Genetics

As previously stated, sweetbay in the northern portions of its range is basically a shrub and becomes more treelike in the southern portions of its range. There is no information readily available on race differences of sweetbay.

A hybrid cultivar, *Magnolia x thompsoniana*, which is intermediate in character between *M. virginiana* and *M. tripetala*, is grown as a garden plant in the Eastern United States and in Europe. It was first raised in an English nursery more than 200 years ago (21). No varieties of sweetbay are recognized (14).

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